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Introduction

EVERY year the Bureau of Labor Statistics publishes from 25 to 30 bulletins, each representing an original investigation in the labor field. In addition, the bureau regularly issues its Monthly Labor Review (now in its 24th volume) in which are presented not only the results of current bureau work but also digests and abstracts of studies and reports on labor subjects made by other authoritative agencies. As a result, after a short lapse of time, the accumulated volume of material becomes so great as to make reference difficult, particularly for those so situated that they do not have available a complete file of the bureau's publications.

The handbook here presented seeks to meet this difficulty by bringing together, in convenient form for reference purposes, digests of the material published by the bureau of sufficiently recent date to be of present-day interest and value, and relating, for the most part, to the years 1924, 1925, and 1926. There has been, however, no rigid exclusion of earlier data, the policy, in general, having been to include a maximum number of subjects, and to give the latest available information for each of them, provided that the information is still significant. Also, it is to be noted that while this volume contains very little material that has not already been published either in the bulletins or in the Monthly Labor Review of the bureau, most of it has been completely rearranged and rewritten in order the better to adapt it to the plan of making this publication essentially a work of reference.

The material presented represents in large part the original work of the Bureau of Labor Statistics, but this is by no means entirely the case. For instance, the Bureau of Labor Statistics does not attempt to cover certain fields of interest to labor which are already adequately covered by other official agencies. Thus, the Children's Bureau of the United States Department of Labor reports on child labor as well as on other phases of child welfare. The Women's Bureau of the same department makes comprehensive investigations of various phases of the general subject of women in industry. Since the creation of the women's and children's bureaus, the Bureau of Labor Statistics has made no special studies in the fields assigned to those bureaus. Also, other governmental agencies, outside the Department of Labor, make studies and investigations of very direct interest to labor. For example, the Bureau of Mines of the Department of Commerce regularly reports on mine accidents, and the Interstate Commerce Commission makes similar compilations of

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railroad accidents. The Bureau of Labor Statistics makes no attempt to do original research on these subjects. It does attempt, however, in its Monthly Labor Review to follow such of the activities of these other agencies as have a labor interest, and in the preparation of this volume it has drawn upon their work.

Examination of this volume shows certain very definite limitations upon the labor statistics available for the United States. Certain subjects of primary interest are covered with reasonable adequacy either by the Bureau of Labor Statistics or by other official agencies. There remain, however, other subjects of possibly equal interest which either are not covered at all or are covered very inadequately, and upon which the available information is very scanty. The resources of the Bureau of Labor Statistics do not permit extension of its activities into these fields, nor indeed even to make such frequent studies as would be desirable of certain subjects which it does cover from time to time. For instance, wage surveys of the more important industries of the country should be made annually. The best the bureau has been able to do, however, is to make an annual survey of union wages, biennial surveys of a few large industries, and occasional surveys, at irregular intervals, of other industries.

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APPRENTICESHIP

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Types of Apprenticeship Plans

THE present century and particularly the period since the end of the World War has seen a great revival of interest in apprenticeship. The abrupt shutting off of immigration called attention to the fact that many of our skilled workers had received their training in their native countries, and that as a Nation we were not turning out our own supply of craftsmen. The period of industrial prosperity which has prevailed for the greater part of the time since 1918 has increased the demand for good workmen and emphasized the fact that the old methods were not producing them in sufficient numbers. As a consequence, the trade-unions, the employers' organizations and, to some extent, the general public became interested in fostering apprenticeship, and several movements were started with that end in view.

Nominally, apprenticeship is used as a means of training workers in a great variety of trades and occupations. In its report for 1921–22, the Wisconsin Industrial Commission gave the following list of occupations in which it had placed apprentices: Bricklayer and mason, carpenter, painter and decorator, plasterer, plumber, steam fitter, tinsmith, tile setter, electric wirer, machinist, toolmaker, pattern maker, metal-pattern maker, draftsman, molder, core maker, boiler maker, sheet-metal worker, die sinker, welder, blacksmith, compositor, pressman, lithographer, plate printer, copper etcher, power press embosser, photo-engraver, commercial artist, knitting-machine adjuster, dressmaker, tailor, weaver, warper, milliner, auto mechanic, auto electrician, auto painter, auto-body builder, baker, cabinetmaker, cigarmaker, jewelry engraver, jewelry repairer, watchmaker, shipbuilder, wire weaver, meat cutter, shoemaker, stonecutter, photographic retoucher, paper ruler, stone and metal artist, artificial-limb maker, junior engineer, furrier, pharmacist, sign writer, upholsterer, and bookkeeper. Also the following railroad occupations: Machinist, car repairer, upholsterer, electrician, template maker, boiler maker, blacksmith, and sheet-metal worker.

In any good plan of apprenticeship there are two essentials: A supervising authority to see that both sides do their part; and a well-thought-out and well-enforced plan of training by which the apprentice may advance from operation to operation until he has mastered all important parts of the trade. Generally these essentials require cooperation between the unions and the employers. The various effective apprenticeship plans now in force have sometimes developed within a trade with little attention from outside, have sometimes been established by the unions or the employers taking the initiative and enforcing the acquiescence of the other side, and sometimes have been carefully worked out and adopted by the cooperation of all concerned. There are three large groups of trades in which apprenticeship methods have been worked out successfully by one or

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all of these methods—the printing trades, the building and construction trades and the metal trades. The developments in the building trades since the war have illustrated several different methods.

Apprenticeship Plan of the New York Building Congress

AT THE close of the war the building situation was far from satisfactory and for the purpose of readjusting conditions building congresses, made up of representatives of all the interested parties, were formed in some of the larger cities. Apprenticeship received early attention. The plan worked out by the New York body is described as follows:

In January, 1922, the congress took up the question of apprenticeship, moved thereto by the increasing scarcity of skilled workers in the building trades. It is a commonplace that for many years past these trades have depended for their trained workers mainly on immigration and that since the beginning of the century the supply from this source has been steadily diminishing. The apprenticeship system existing in the industry has utterly failed to supply the normal demand. Some of the reasons advanced for this are that there has been no systematic course of training planned to produce well-rounded mechanics, skilled in all branches of their trades; no attempt to supplement shop and field instruction with school instruction calculated to make men more intelligent and better citizens; no systematic attempt on the part of employers to provide continuous employment; no certainty that the young men, when trained, would be admitted to union membership and thus be given an opportunity to earn their living at the trades they have learned.

A general committee on apprenticeship was appointed, consisting of representatives of employers, employees, engineers and architects, investment interests, suppliers of materials, and educational interests. Its first recommendation was that since there already existed in all the trades joint trade boards, "consisting of employer and labor representatives, for the regulation of policies and settlement of adjustments in relation to trade agreements," the establishment, control, and operation of apprenticeship systems should be in their hands, unless they wished to appoint special committees to take charge of the work. Further, the committee outlined for submission to these boards a plan covering the matters common to all branches of the industry, but leaving the details for the several trades to be worked out by the proper joint board. By the end of May an apprenticeship system for the woodworking trades had been worked out, approved, and adopted by the carpenters' joint committee on trade agreement, and is now in operation.

Under this scheme 16 years is fixed as the minimum age for beginning apprenticeship. The course of training covers four years, divided into periods of six months, for each of which a definite program is laid down which the apprentice is expected to complete before he can be advanced to the next stage. For the first six months the minimum daily wage is to be 30 per cent of the journeyman's daily wage, after which it is to rise at each semiannual period by alternate increases of 5 and 10 per cent to 80 per cent of the

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journeyman's wage for the final six months. The apprentice is to have a normal working week of 44 hours, and in addition is to put in at least four hours a week at school. During the first year he is to be paid half-time rates for the time spent in school, but thereafter no payment is made for this time. The school attendance is obligatory, and employers are to discontinue employing and unions to exclude from membership apprentices who do not discharge this obligation. Apprentices are to pay semiannually to the general apprenticeship committee a fee equal to the wage for one day of the period they are entering, such funds to be used for apprenticeship development. The apprentice is to be guaranteed continuous employment, and a carefully worked out analysis of trade processes has been made, covering the field of his trade instruction. The school work is to include "related mathematics, trade sketching and drawing, shop practice, related science, and general information."

Apprentices are to be enrolled with the general apprenticeship committee of the congress, which is to keep a close oversight of their work and advancement. The committee is to make the periodic examination which shall determine the fitness of the apprentice to pass on to the work of the next six months, and, together with the carpenters' joint committee on trade agreements, is to see that the apprentice receives the continuous employment guaranteed. It is also to provide general supervision.

> The apprentice shall be supervised at work and in school by highly qualified educational experts, who shall report periodically to the general apprenticeship committee of the congress as to the progress and satisfaction rendered. A complete record of the apprentice performance shall be kept by the educational adviser of the congress and reported semiannually to the carpenters' joint committee. (New York Building Congress. Bulletin No. 2: Apprenticeship system for the woodworking trades in the metropolitan district, etc. New York, June, 1922, p. 3.)

On the successful completion of the four-year course, the apprentice is to be given a diploma "containing a statement concerning his trade experience, educational training, journeymanship standing, and wage rating, regularly certified to by employer, labor, and educational authority," and having this he is thenceforth entitled to employment on a full journeyman basis.

It will be seen that the apprenticeship committee of the congress cooperates closely with the carpenters' joint trade board in the administration of this plan, and it also supplies a general organization which will be useful to other trades as they develop their apprenticeship systems. An office to serve as a general apprenticeship headquarters has been provided and placed in the charge of a specialist on apprenticeship, who is employed as educational adviser. This the congress hopes to make a center for the apprenticeship movement, maintaining a permanent staff of experts on vocational training and preparation of courses of instruction and textbooks, and a force of inspectors to coordinate the work in the shop, in the field, and in school, with whatever clerical help may be necessary.

This plan worked so well that it was soon extended to other trades, and three years after the inauguration of the scheme, the data following were given as to its growth.

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At the end of March, 1925, the number of indentured apprentices in the several trades with which the commission is cooperating was as follows:

Carpentry and joinery	1,500
Painting and decorating	193
Electrical	520
Upholstery	111
Cement and masonry	35
Plastering	470
Bricklaying	1,392
Total	4,221

Under the plan fostered by the commission, the apprentices while working at their trades, are expected to attend evening vocational schools. The schools have not been able to provide facilities for all, but 2,240 apprentices were attending 75 classes in 1925, and it was hoped that within the year teachers and accommodations could be provided to take care of all. This training, requiring special teachers and equipment, is expensive, but the public authorities are sufficiently convinced of its usefulness to do their share toward providing it.

The board of education has set aside $60,000 in anticipation of the growth of the New York Building Congress apprenticeship work during the coming year, to care for their phase of the work. The industry itself now needs to do its part.

One interesting development in this part of the work has been along the line of training teachers. A special class, composed of the best workers, has been organized, in which instruction is given in methods of teaching. In 1925, 23 were enrolled in this class, and 18 of these were doing part-time teaching in the evening classes.

Short-Term Intensive Training

THE plan described above involved years of training, and some of the interests concerned felt that the need for workers was too pressing to permit of such delay. As a consequence several plans for short-term training were advocated in 1922 along two distinct lines. One group took the ground that apprenticeship in the old sense is unnecessary; that it is better to begin with older boys and men, and that for these a short, intensive training in the elements of the trade is all that is needed. This program seems to have won special support in the West. In San Francisco and Chicago special classes and schools based on this theory have been started as part of a campaign for the so-called American plan or open shop. In San Francisco early in May, 1922, the Industrial Association, an employers' organization, opened a school for plasterers and another for plumbers. Students came from all ranks—college graduates, sailors, artists, medical students, and workingmen all being included in the first classes formed. The "Beta" tests, as used in the Army during the war, were utilized in passing upon the applicants. The program for the two schools differed somewhat. The plumbers were to receive class instruction for two weeks, then to go out on jobs as apprentices at $2.50 a day for four weeks, return to the class for two weeks of instruction, and so on, until they had completed 8 weeks of instruc-

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tion and 16 weeks of practical experience. Some 60 students were enrolled in the first class, and by August a second class was being formed. The plasterers' course required 12 weeks, the students working a 44-hour week, during which time they received no pay, but were provided with tools and materials. At the end of the course it was expected they would be ready for practical work and within a year should be earning full journeyman's wages. In the autumn the secretary of the General Contractors' Association of San Francisco reported on the progress made:

> The local American-plan plasterers' school * * * graduated its first apprentice July 1, and since then has furnished a total of 70, only one of whom has failed to give absolute satisfaction and several of whom are to-day drawing full journeyman's wages. There are at present 16 students in the school. The plumbers' school, the students of which are formed into groups and alternate between the school and the job, has a total of about 80 students, all of whom are giving a good account of themselves. (The Constructor, October, 1922, p. 50.)

In June the citizens' committee of Chicago, a group formed to enforce certain conditions in the building trades, opened a school for plumbers conducted along similar lines, although a longer time was allowed for training, which was to consist both of class instruction and work on the job. The course was to take one year, and the aim was to "turn out competent and efficient plumbers, capable of laying out and supervising any plumbing job." It was planned to start similar classes for each of 13 trades specified by the citizens' committee. In Oakland, Calif., a bricklayers' school for youths from 18 to 22 years old was opened with the expectation of turning out competent bricklayers as a result of six months of intensive training. From Texas and some other places come reports of similar experiments.

Such plans are looked upon with disfavor by a number of builders, who maintain that their only result will be to increase the number of half-trained workmen already in the trades, not to turn out the skilled craftsmen so urgently needed. A four years' apprenticeship is none too long, they say, to give the worker a full knowledge of his craft in all its details, and to insure the skill and power to secure desired results which characterized the old-time craftsman.

Cleveland Plan of Building-Trade Apprenticeship

THE unions do not favor the short courses, preferring that the apprentice should learn his trade on the job, with provision for technical instruction through courses given in schools or classes established for the purpose. Sometimes such schools are maintained by the unions themselves, but more often they are carried on in connection with the public educational system or by the cooperation of several bodies. Cleveland offers a good example of such a system, and in connection with the first graduating exercises of apprentices the following summary of its method was given:

For several years past training courses for building-trades apprentices have been maintained in the Cleveland public schools, and in April of this year the first group of apprentices were publicly and formally presented with diplomas. The formal graduation is a new departure, and an elaborate commencement program was planned to

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give impressiveness to the occasion. The graduates numbered 150, divided among the classes in carpentry, plumbing, and bricklaying.

Courses in these three trades were the first to be established, and their work has proved so satisfactory that in January, 1925, courses in painting and electrical work were started. The American Contractor of March 21, 1925, reported that approximately 1,000 apprentices were attending the part-time courses in these five trades, and there was a long waiting list of boys anxious to enter as soon as places could be found for them.

The Cleveland plan involves the cooperation of the school authorities, the unions, the contractors, and the manufacturers and dealers in building materials. Part of the cost of carrying on the courses is met by the Federal Government, under the terms of the Smith-Hughes Act, and the remainder is provided by the local board of education. The building materials used are supplied by local manufacturers and dealers, free of charge. The course in each trade is under the supervision of a committee made up of representatives of the board of education and of the contractors and the unions in that trade.

The boy who wishes to become an apprentice must pass an examination by this committee to show that he is able, both physically and mentally, to meet the requirements of his trade. If he succeeds in this, he is indentured to a contractor, and thereafter for four years his trade work and school work are correlated so as to give him both the manual dexterity and the technical and theoretical training required. Throughout the entire period of apprenticeship four hours each week must be given to the school work, and for this his employer is to pay him the regular time rates. If a contractor finds himself unable at any time during the four-year period to employ a boy indentured to him, the boy is temporarily transferred by the committee to another contractor who can give him work, and in this way continuous employment is insured. This is considered an exceedingly important feature, for where no such system exists an apprentice may find himself out of work for months at a time, and may as a natural consequence lose interest in the trade, look for a job at which he can be sure of steadier employment, and gradually come to prefer the work he thus takes up and drop out of the building trades altogether. Even when this does not occur he loses just so much of the time which should have been devoted to training in the trade he has chosen. Under the Cleveland system, on the other hand, at the close of his apprenticeship the youth has had four years of steady work, so planned as to give him a progressive training in the fundamentals, both manual and technical, of his craft.

Wisconsin Plan

IN WISCONSIN the State undertakes to act as the supervising and coordinating authority in apprenticeship, and the technical training of apprentices is made a recognized part of the public educational system. The present law on the subject was passed in 1911, but was materially amended in 1915, and the main development of the system has come since the close of the war. The Wisconsin Industrial Commission is charged with the enforcement of

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the law. Apprentices must be indentured according to a standard form, and the indenture must contain a schedule of the processes, plans, or methods which they are to be taught, with the approximate time to be spent on each. Advisory committees of employers and journeymen in the different trades cooperate with the State commission in determining rules and regulations for apprenticeship, supervisors are appointed to deal with local problems and to promote interest in the whole question, and the law specifically requires all school officers and public-school teachers to cooperate with the commission and with employers of apprentices to furnish in the public schools or in any schools supported in whole or in part by public moneys such instruction as may be needed for apprentices according to the requirements of the different trades. According to recent reports, the results of this system have been satisfactory.

In reviewing the progress of the movement the Wisconsin Apprentice (March, 1926), issued by the Industrial Commission of the State, notes that the past four years have been more nearly normal than any other period of the law's operation, and therefore gives figures relating to them as illustrative of the advance made.

> Four years ago 1,250 indentures were in force. At the present time there are 2,545. (These figures do not include special apprentices over 21 years of age.) During the same period 724 apprentices were graduated into journeymen. To-day 746 employers employ indentured apprentices as against 325 four years ago. This shows that apprenticeship has grown considerably among the many smaller employers and not merely as applied to the few very large ones.

Emphasis is laid on the fact that the number of indentures in force is far from being a true measure of the success of the plan. What really counts is the good will of employer, apprentice, and journeymen toward the system, and their combined effort, in cooperation with the vocational school, to make it function effectively. In this respect the trades differ considerably. The metal trades began promoting apprenticeship in a more or less organized way 20 years ago, so that they naturally show more progress than some of the others. These trades are thoroughly converted to the apprenticeship idea, and, realizing that if they want skilled workers for the future they must train them now, they are taking apprentices numerously, have apprenticeship committees that function, employ apprentice supervisors, and generally are cooperating vigorously with everyone who can help on the campaign.

The situation in the building trades is less satisfactory. The charge is made by some that contractors are unwilling to hire apprentices, and that the supply of journeymen comes from the smaller towns where the boys can pick up the trade without a definite training. The commission holds, however, that the trouble is not so much an unwillingness on the part of the contractors to hire apprentices as a reluctance to take the trouble to keep them continuously employed and to see that they get a complete training. A contractor takes an apprentice, for instance, and finds him an ambitious and willing worker, but after a few months completes the job upon which he has been engaged, and having no present work for the lad lets him go, instead of taking the trouble to find a place for him with another contractor or to give him odd jobs that will keep him busy until another contract is in hand. The apprentice perhaps finds work with another contractor, or may take up another line of work. So

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he drifts about from one employer to another, and either is lost to the trade altogether, or has to pick up what he can for himself, instead of having a systematic course laid out to give him an all-round training. The seasonal nature of the building industry, and the custom of contract working, of course, have much to do with this attitude of the contractor, but the effect is detrimental to the supply of skilled workers. The trades differ in this respect, the plumbers being fully awake to the importance of training new men, and having over 300 apprentices indentured at the present time. "If the rest of the building trades were as progressive as the plumbers there would be little else to be desired."

The railroad shop crafts present a very satisfactory situation in this respect, with over 300 apprentices, and with a larger proportion of apprentices carrying their training through to graduation than is found in any other of the trades. The printing trades also are doing fairly well, though they are still feeling the result of the last great strike.

Considering the whole situation, the commission feels that the apprenticeship system in Wisconsin is being developed on a sound and systematic basis, that while the progress made is slow it is evident, and that there are encouraging evidences of a growing interest in the movement and of organized cooperation among all the parties concerned.

Corporation Apprentice Schools

A NUMBER of large establishments throughout the country have built up schools of their own in which to give the necessary technical instruction to their apprentices. In general, such establishments have an apprentice department or committee or other body charged with the supervision of the apprentice's training, both on the job and in the school. The work on the job is planned to give a progressive knowledge of the various operations, and the technical instruction is coordinated with the practical training. The practice differs among the various establishments as to whether the school training is given in the daytime or at night and as to whether the apprentice is paid for the time given to this part of the training. The nature of the courses and methods of training vary according to the kind of work in which the boy is being trained, but the following account of methods used at one large plant may be taken as fairly typical. (U. S. Federal Board for Vocational Education. Bulletin 87: Apprenticeship education.)

Instruction

"(a) Time and nature of instruction:

"(1) In the shop—

"The apprentice is under the watchful and sympathetic eye of the foreman, who takes personal interest in his boys, encouraging them, and cooperates with the supervisor for their welfare. In some departments the foreman has an instructor or designates the assistant foreman or other assistants to look after the interest of the apprentices. This instructor sees to it that the apprentices have every possible opportunity to learn the trade and are transferred from machine

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to machine and from operation to operation for the purpose of giving them a training which will enable them to become all-round mechanics.

"(2) In the classroom—

"Class instruction on the company's time is a great factor in maintaining the enthusiasm of the apprentices. All week they see the practical end of their course, and on Saturday morning they are instructed in the theories relating directly to their work in the shops and the yard. This instruction is given by trained teachers, supplemented with talks by the foremen, superintendents, and general manager. This kind of instruction, taken with regular work going on in the plant, gives the apprentice a sense of responsibility which is essential to sound and lasting instruction. Being paid to go to school appeals to the apprentices and affords them refreshing and, at the same time, inspiring and instructive diversion.

"Apprentices are given opportunity of advancement through study other than that of the apprentice school at the plant. Evening classes are conducted from October to April, inclusive, at the Wilmington High School, arrangement for same having been made by the management and city school authorities. Courses are arranged for the special benefit of apprentices and the technical, combined with the practical, side of ship and car building are taught from every angle. Evening classes from October to April, inclusive, are a part of the apprenticeship system, and apprentices are under obligation to attend classes of the Wilmington Evening Industrial School, unless excused to attend other approved night schools or otherwise excused. Credit for outside study stimulates the application of an apprentice, and credit is given apprentices for attendance based as follows: In the case of an apprentice attending 75 per cent of the sessions, the number of hours spent will be doubled and this credit deducted from apprenticeship course and shorten it accordingly.

"Failure to attend night school will result in termination of apprenticeship, or a penalty of 160 hours a year will be added to the term of apprenticeship.

"Instruction is given in shop mathematics, science, applied physics, mechanics, chemistry, mechanical drawing, English, industrial history, spelling, and civics.

"The apprentice begins with shop arithmetic and gradually advances to more difficult shop problems, which involve practical geometry, mechanics, and strength of materials; the examples applying directly to his work in the shops. In drawing he is first taught to make freehand sketches, with dimensions, then mechanical drawings of the various parts he is working on in the shops, and to pick the various parts off of blue prints; in this way he becomes accustomed to drawings and learns to read them. The study of industrial history gives the apprentice a knowledge of the industry. The course in English includes letter writing, written and oral descriptions of machines, processes, etc. Civics is taught to increase loyalty and citizenship. Spelling is improved by written work in English and by spelling the terms and names of tools, parts, etc., he will come in contact with during his apprenticeship course.

"Apprentices are graded in the school and transferred from one classroom to another according to their ability.

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"(*b*) Type of instructor: The faculty is made up of a head instructor and six competent teachers.

"Apprentice instructors are chosen for the various trades by considering their practical experience in the crafts involved, and their instructional ability. Instructors trained in technical subjects are also chosen to teach the theory related to trades in the apprentice school. In some instances the instructor in the shop is the teacher in the classroom.

"Often the foreman in a department where there is no instructor will designate a subforeman, or leading man under his supervision, to look after the interests of the apprentices."

Supervision

"By supervisor or apprentices. The apprenticeship system is under the industrial relations department, of which the assistant to the general manager is head. The supervisor of apprentices reports to the assistant to the general manager."

Incentives to Effort

"Vacations for two boys making highest marks in shop and classroom work. Publishing standing of pupils during the publication of plant paper, as well as sending reports to parents."

Apprenticeship Provisions in Building-Trade Agreements

THE Bureau of Labor Statistics receives annually a large number of agreements made between workers and employers covering wages, hours, conditions of work, and other subjects on which unions and employers have come to an understanding. In 1925 11 important building trades were selected, and a list was kept of all agreements received from these with a view to seeing what provisions they might contain as to apprenticeship. In many cases the agreements were of such an informal kind that no such references could be expected. Often the unions reported a verbal agreement or a mere memorandum covering wages or hours but not taking up anything further. In other cases, custom seemed to have taken the place of annual negotiations, and while there was an understanding as to wages and hours, it could hardly be called an agreement. In every case, however, in which a written contract was sent in it was listed, and note was made of what provisions, if any, it contained relating to apprenticeship. The tabulation was confined to agreements made either in 1925 or earlier but continuing into that year.

During the year, 179 such agreements were received, distributed unequally through the various trades. The number of unions concerned far exceeds the number of agreements, for often a contract is signed by a district council which represents a number of unions and in other cases it may be signed for all the unions of a given trade within a specified area. Thus, one agreement covered "certain bricklayers' unions of Greater New York and Long Island," another included the electrical workers of three adjoining communities, and

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another was signed by five unions acting in combination. The apprenticeship provisions were sometimes found in the agreement itself and sometimes in the working rules or in the constitution of the unions concerned, which were considered as forming part of the agreement.

Leading Provisions

THE agreements differed widely in the extent to which they dealt with apprenticeship, the provisions running from a mere statement that the use of apprentices should not be prohibited, with perhaps an age qualification or an arrangement for progressive rates of pay, up to elaborate and carefully worked out systems. Twenty-three (12.8 per cent) might be considered as having no provisions, since they contained either no mention of the subject or the mere formal statement that the use of apprentices should be allowed. The others all went into the subject more or less elaborately. The number of agreements considered, by trades, and the number containing various important provisions, are as follows:

APPRENTICESHIP PROVISIONS IN BUILDING TRADE AGREEMENTS

Trade	Number of agreements	Number of agreements establishing—				Number requiring trade-school training
		Age limit on entrance	Length of apprenticeship	Ratio of apprentices to journeymen	Cooperative administering body	
Bricklayers, masons, and plasterers	16	6	8	9	9	3
Bridge, structural, and ornamental-iron workers	5	1	1	5	----	----
Carpenters and joiners	32	18	17	22	7	3
Composition roofers, damp and water proof workers	4	----	----	1	2	----
Electrical workers	34	1	17	28	3	3
Elevator constructors	6	6	6	6	----	----
Heat and frost insulators and asbestos workers	11	----	7	8	----	----
Painters, paper hangers, and decorators	27	9	15	23	----	----
Plumbers and steam fitters	27	5	16	19	7	2
Sheet-metal workers	11	1	8	9	4	2
Wood, wire, and metal lathers	6	2	2	2	----	----
Total	179	49	97	132	32	13

These figures should not be taken too seriously as indicating the attitude of the unions, yet they certainly have some significance. Naturally, the more importance the unionists in general attach to a given provision, the oftener it will be found in their agreements. Judged by this standard the unions, contrary to common opinion, do not seem to attach special importance to limitations upon the age of entering apprenticeship. The only trade in which an age limitation is included in every written agreement received is that of the elevator constructors, who, as their work is heavy and calls for strength, provide without exception that no one under 18 shall enter apprenticeship, but place no upper age limits. Of the 49 agreements which impose some age restrictions, 3 place the upper limit at 18 years; 1 at 19; 2 at 20; 14 at 21; 20 at 22; 2 at 25; and 1 at 30 years; while 6 impose a lower but no upper age limit. Of the 43 which impose an upper limit 53.5 per cent set it at 22 or over, while

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only 14 per cent place it as low as 20 or under. Thirty-three of the agreements set an age below which apprentices will not be admitted, 11 placing it at 16 years, 16 at 17 years, and 6 at 18.

Four years is the commonest period set for the duration of the apprenticeship. In many cases this term is so well understood that the only reference to the matter consists of setting the wages for each of the four years before the apprentice is entitled to journeyman pay. The bridge and structural-iron workers and the asbestos workers each in one instance set a limit of two years. Seventeen agreements, scattered through the various trades, set a period of 3 years, and 14 set 5 years. The 5-year limit is found mainly among the plumbers, who impose it in 11 cases. In some of these agreements the fifth year is a kind of intermediate stage in which the novice is known as a "junior," draws higher wages than the fourth-year apprentice and has more independence, but is not yet a full-fledged journeyman. In several of these agreements it is provided that an apprentice may apply for an examination at the end of the fourth year, and if he passes this satisfactorily the fifth year is not required.

The ratio of apprentices to journeymen permitted in these various agreements varies too widely to permit of any general statement. In a very few cases, mostly among the electrical workers and the sheet-metal workers, the number of apprentices allowed is based on the number of journeymen in the local union, but the general practice is to base it on the number of journeymen in the shop or on the pay roll of the employer wishing to take a beginner. On this basis any number of combinations are worked out. Thus in different agreements the ratio is set at 1 apprentice to 2 journeymen, 1 to the first 2 plus 1 for each additional 5 journeymen, 1 to the shop regardless of size, 1 to the first 5 journeymen plus 1 for each 10 additional, and so on. Sometimes the employer may take one apprentice each year, while in one case he is restricted to one every four years. The most restrictive ratio found was 1 apprentice to 20 journeymen. It is perhaps significant that this appears in an agreement which was drawn up in 1922 and has been continued without change, and that this is the only provision in the whole document bearing on apprenticeship. At that time the importance of apprenticeship was not appreciated either by the workers or the employers, and the fact that this is the only mention of the subject in an agreement intended to cover working conditions shows that neither side was particularly concerned about the matter.

Administration and Technical Training

A TRIFLE over one-sixth (18 per cent) of the agreements provide for administering the apprentice system by a joint body, or, in Wisconsin, by the industrial commission, which has charge of the State apprentice system. Generally speaking, the administering body is a joint arbitration board or a joint apprenticeship committee appointed for the special purpose. In the vicinity of New York City the agreement sometimes indorses the "apprenticeship plan of the New York Building Congress," which makes careful provision for joint administration. Where such a joint body is not provided

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there is usually no stipulation in regard to the matter, the union presumably taking full charge.

Very few of the agreements definitely require trade or technical instruction during apprenticeship, though this is indirectly required in some instances by a provision that the apprentice must pass an examination before becoming a journeyman. Where technical training is required the definiteness of the provision varies. In seven cases it is merely stated that the apprentice must attend a trade or technical school. One agreement stipulates that educational classes are to be established for the benefit of the apprentices. In one case attendance is required during the last two years, in another the apprentice must attend school for five hours throughout his apprenticeship, while in another case one-half day's attendance weekly is required whenever the schools are in session. Sometimes it is stipulated that the school attendance is to be in the employer's time, and in one case it is provided that special technical instruction may be taken at the employer's expense. One agreement provides that a failure to attend school regularly will lead to the apprentice's suspension, and if it is persisted in to the cancellation of his registration—that is, to his expulsion from the trade. Another provides that the time of the apprenticeship may be shortened if the school attendance is regular and the school standing good. Where there are no trade schools or technical classes within reach requirements concerning such training would be useless, and this may account in part for the rarity of these provisions.

A number of the agreements contain miscellaneous provisions designed to make the apprenticeship a period of real training. Frequently it is provided that the beginner must serve a probationary period of from three to six months, and that unless he proves satisfactory at this time he shall not be admitted to apprenticeship. Often he must be registered with the local union, and is not permitted to change from one employer to another without the consent of the union, or of the joint administrative body, if there is one. Sometimes it is provided that if an apprentice fails to get on satisfactorily with one employer he may, after a sufficient trial, be placed with another, but if after one or two such changes he still can not get on he is dropped from the trade. On the other hand, it is provided that the employer must give him progressive training and allow him a chance to learn all branches of the trade. In some cases he is obliged to give the apprentice continuous employment, unless released from the obligation by the administering body.

Significance of Agreements

IN CONSIDERING the extent to which apprenticeship is dealt with in these local agreements it must be borne in mind that some of the crafts have worked out through their national or international governing bodies a complete plan of apprenticeship, with full details as to number allowed, age, duration, kind of training to be given, protection of both employer and trainee against possible abuses of the plan, admission to journeyman status, and so on, and that when this has been done a local union might feel it unnecessary to take up the matter. The extent to which the national plan is observed

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depends largely upon the strength and character of the local union, but it is entirely possible that such a plan governs the training of apprentices in a number of places where the local agreements make no mention of the subject. In other localities, also, plans peculiar to the district may exist, and a reference to these may mean cooperation in carrying out an elaborate scheme of training. Thus, when, as in a case previously mentioned, agreements contain an indorsement of "the apprenticeship plan of the New York Building Congress," they are assenting to a comprehensive and systematic handling of the whole matter.

Bearing these considerations in mind, the results given above seem to show that the building-trades unions are giving a considerable amount of attention to the subject of apprenticeship, and that where they are strong enough to secure written agreements they are quite numerously putting the matter upon a definite basis and endeavoring to secure conditions which shall make the apprenticeship a genuine preparation for the craftsman's work, instead of merely a period in which the beginner works for low wages and picks up what he can for himself.

Union Rules and the Scarcity of Apprentices

IT WILL be noticed that in most of these apprenticeship plans the unions take a full share of the responsibility for keeping up the supply of trained workers. In some cases special trade schools are maintained by the unions, and in others a very thorough system of instruction in the particular craft concerned has been worked out and enforced as part of the trade training. Naturally the members of some trades are more interested than others in the question of training, and naturally, also, the amount of interest shown by a given trade varies according to local circumstances.

The theory that trade-union restrictions are responsible for the scarcity of trained workers is so frequently voiced, and so many inquiries have been made of the Bureau of Labor Statistics on this point, that the following compilation has been prepared by the bureau:

The Conference Board on Training of Apprentices, made up of national associations of manufacturers, founders, metal-trades employers, and the like, in its Bulletin No. 1, issued in 1916, stated:

> The average employer, not from necessity but because of thoughtlessness or habit, still prefers to get workmen whom someone else has trained. * * * Limitation of apprentices by trade-unions has helped to develop this condition of indifference on the part of employers. Many, however, do not employ the full allowable quota of apprentices which the trade-union specifies, and often, for professed convenience's sake and because they do not realize the investment value of apprenticeship training expense, employ none whatever.

A detailed study of the situation in Indianapolis was made about 1918 by Thomas Larkin and its results were published under the title: "A study of apprenticeships, trade, and educational agreements." According to this none of the trades for which data could be secured were using their permissible number of apprentices.

In 1924 the University of Pennsylvania published a thesis entitled: "A study of existing programs for the training of journeymen mold-

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ers in the iron and steel foundries of Philadelphia," based on a detailed investigation. The union rules permitted one apprentice to five journeymen, plus one for the shop. The actual number in training fell far below this ratio.

The ratio in floor molding then becomes 1:13.8 as compared with 1:5. To put it differently, instead of a quota of 61 floor-molding apprentices there are now 22, four of whom are definitely in the short-course group. In bench molding a count of bona fide trainees only, gives a present ratio of 1:25.7; instead of 31 apprentices there are 6.

The journal of the Boston Society of Civil Engineers, in its issue for November, 1923, reports a conference of the Boston Building Trades Congress dealing with the work of the congress respecting apprenticeship. No complete figures are given, but frequent reference is made to the fact that contractors are not using the number of apprentices allowed. For instance, the unions had agreements with over 100 bricklayer contractors. Union rules allowed 3 apprentices to a contractor. Instead of 300, there were 80 bricklayer apprentices in the city, and of these, 41 were apprenticed to their fathers, not to contractors.

The American Contractor, in its issue for May 3, 1924, contained an account of a drive for more apprentices in bricklaying undertaken by the Mason Contractors' Association of the United States and Canada. They began by listing the contractors in their trade and finding how many employed apprentices.

An accurate survey of 58 cities and towns in 1923 showed that 714 contractors had only 358 apprentices on the wall. "These figures," says Mr. Gillespie, "prove conclusively that the so-called union restrictions are not a factor in holding back apprenticeship. The work to be done is to get all contractors to take on boys at least to the limit of the rules laid down by the union."

As a result of this survey, it was estimated that it would be possible to put 10,000 more apprentices to work without any interference with the rules of the bricklayers' union.

Experience of Apprenticeship Commissions

AT A conference of the apprenticeship commission of the Boston Building Congress, reported in the Boston Transcript, February 21, 1925, the commission points out that so far there has been no difficulty in getting boys to enroll as apprentices, but much trouble in getting contractors to employ them, and that 35 to 40 per cent of the apprentices enrolled during the past year were unemployed. The enrollment is done with the assistance of the building-trades unions, and in accordance with their rules.

A report of the apprenticeship commission of the New York Building Congress, March, 1925, summarized in the Labor Review for July, 1925 (p. 180), states that one of the most serious difficulties confronting the commission is to persuade employers in certain trades to take their quota of apprentices.

There are four trades in which this difficulty is especially apparent: Carpentry and joinery, which, with an estimated membership of over 31,000 journeymen, has only 1,500 enrolled apprentices; painting and decorating, with over 10,000 journeymen, and 193 enrolled apprentices; and upholstery and cement masonry, neither of which has ever exceeded 75 per cent of its allowable quota of apprentices.

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ARBITRATION AND CONCILIATION

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Railroad Labor Act of 1926

THE outstanding event of 1926 in the field of railroad labor was the passage by Congress of the railroad labor act, often referred to as the "Watson-Parker Law." This act passed both Houses of Congress by large majorities and was approved by the President on May 20. A striking feature of this legislation is that the bill was an agreed measure formulated by representatives of the carriers and of the employees' unions, and the act as passed was thus in effect a collective agreement sanctioned by Congress.

The new act abolished the United States Railroad Labor Board, which had been functioning for six years under the transportation act of 1920, and substituted therefor a radically different type of adjustment machinery, which, however, incorporated many of the features of earlier Federal legislation.

Provisions of the Act

THE four agencies described below are provided by the act, two of them at least being potentially permanent while the two others may be created on occasion.

(1) Boards of Adjustment

These may be created by agreement between employers or employees on one or more railroads. No term is provided, but apparently such bodies may be continuing. These boards are composed exclusively of representatives of the parties in interest and deal with disputes arising from grievances or from interpretations or applications of agreements as regards rates of pay, rules, or working conditions when such disputes can not be "handled in the usual manner up to and including the chief operating officer of the carrier designated to handle such disputes." The decisions of adjustment boards "shall be final and binding on both parties to the dispute."

(2) Board of Mediation

A board of mediation is established as an independent agency in the executive branch of the Government and is composed of five members appointed by the President by and with the consent of the Senate. No person in the employment of, or who is pecuniarily or otherwise interested in, any organization of employees or any carrier may be a member of the board. The first five members of the mediation board were appointed for terms of one, two, three, four, and five years, respectively. Succeeding terms will be five years.

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Either party to a dispute may invoke the services of the board or the board may take the initiative in offering its services to the disputants in the following cases:

(*a*) A dispute arising out of grievances or out of the interpretation or application of agreements concerning rates of pay, rules, or working conditions not adjusted by the parties in conference and not decided by the appropriate adjustment board;

(*b*) A dispute which is not settled in conference between the parties, in respect to changes in rates of pay, rules, or working conditions;

(*c*) Any other dispute not decided in conference between the parties.

In the event a dispute arises as to the meaning or application of any agreement reached through mediation under the provisions of this act, either party to the said agreement, or both, may apply to the board of mediation for an interpretation.

In case the board of mediation does not succeed in bringing about an amicable settlement of a controversy such board shall immediately endeavor to induce the disputants to submit their controversy to arbitration under the provisions of the act.

(3) Boards of Arbitration

Special boards of arbitration of three members (or six if the parties so stipulate) may be created by the agreement of the parties in interest whenever a controversy arises between one or more railroads and its or their employees, which is not settled either in conference between representatives of the parties or by the appropriate adjustment board or through mediation. It is especially provided, however, that the failure or refusal of either party to submit a controversy to arbitration shall not be construed as a violation of any legal obligation imposed upon such party by the terms of this act or otherwise.

The board of arbitration is chosen as follows:

(*a*) In the case of a board of three the carrier or carriers and the representatives of the employees, parties respectively to the agreement to arbitrate, shall each name one arbitrator; the two arbitrators thus chosen shall select a third arbitrator. If the arbitrators chosen by the parties shall fail to name the third arbitrator within five days after their first meeting, such third arbitrator shall be named by the board of mediation.

(*b*) In the case of a board of six the carrier or carriers and the representatives of the employees, parties respectively to the agreement to arbitrate, shall each name two arbitrators; the four arbitrators thus chosen shall, by a majority vote, select the remaining two arbitrators. If the arbitrators chosen by the parties shall fail to name the two arbitrators within 15 days after their first meeting, the said two arbitrators, or as many of them as have not been named, shall be named by the board of mediation.

Each member of an arbitration board who is designated by either party to the arbitration shall be compensated by the party designating him. Each arbitrator designated by the arbitrators or by the board of mediation shall receive from that board such compensa-

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tion as it may fix, together with necessary traveling expenses and expenses for subsistence during his service as arbitrator.

Testimony before the board of arbitration shall be under oath or affirmation, and the members of the board shall have authority to administer oaths or affirmations.

The agreement to arbitrate shall provide that the award, when filed in the manner provided in the act in the clerk's office in the district court of the United States for the district in which the dispute originated or the arbitration was begun, "shall be final and conclusive upon the parties as to the facts determined by said award and as to the merits of the controversy decided." Any difference, however, which may arise concerning the meaning or application of an award shall be referred back to the same arbitration board which made such award or to a subcommittee of that board. The resultant rulings, when acknowledged or filed in the same manner as the award, shall have the same force and effect as the original award.

Arbitration awards arrived at and filed as above provided may be appealed to the courts only on the following grounds:

(*a*) That the award plainly does not conform to the requirements of the act or that the proceedings were not in conformity with such requirements.

(*b*) That the award does not conform or confine itself to the stipulations of the agreement to arbitrate; or

(*c*) That a member of the board rendering the award was guilty of fraud or corruption, or that a party to the arbitration practiced fraud or corruption.

(4) Emergency Boards

An emergency board may be established by the President if a railroad labor controversy can not be settled in accordance with the preceding provisions of the act and, in the judgment of the mediation board, such controversy threatens "to interrupt interstate commerce to a degree such as to deprive any section of the country of essential transportation service."

The number of members of an emergency board is decided by the President, but no appointee thereto shall be pecuniarily or otherwise interested in any organization of employees or any carrier.

Such an emergency board shall be created separately in each instance, and it shall investigate promptly the facts as to the dispute and make a report thereon to the President within 30 days from the date of its creation.

After the institution of the board and for 30 days after its report has been made no change, except by agreement, shall be made by the parties to the controversy in the conditions out of which the dispute arose.

Appropriations

THE act fixes the compensation of the members of the board of mediation at $12,000 per annum, together with expenses for subsistence or per diem and for necessary traveling. This board is authorized to appoint experts and assistants and make various expenditures in connection with its operations.

The law also authorizes appropriations for arbitration and emergency boards.

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Developments Under the Act of 1926

AS CONTEMPLATED by the act, boards of adjustment have been created by employers and employees on various roads and groups of roads, but no formal record is available regarding their number or activities.

The permanent board of mediation of five members was duly appointed by the President and began to function in July, 1926. Since that time the members of this board have exercised their mediatory functions in a large but unrecorded number of cases. In several important cases the board was unable to effect adjustment but secured the consent of both parties to arbitrate under the plan set forth in the act. In two of these cases—conductors and trainmen on the eastern railroads, and the American Express Co. employees—the arbitrations have been held and awards made (February 15, 1927). The decisions are summarized in the section of this handbook, "Principal arbitrations of 1926."

No occasion has as yet arisen for the appointment of a special emergency board, contemplated by the act as a final step in case all other means of peaceful adjustment should fail and such failure should seriously interrupt interstate transportation.

Federal Legislation Regarding Railroad Labor Disputes Prior to Act of 1926

THE railroad labor act of May, 1926, was the culmination of a series of Federal experiments in the settlement of railway labor disputes. It contains many features of previous Federal legislation and activities in this field, and its significance can be best understood by a brief review of these earlier developments.

Act of 1888

ON OCTOBER 1, 1888, a law was enacted by Congress permitting the selection of arbitrators to adjust labor controversies which threatened to interfere with the movement of trains in interstate commerce, and authorized the President to select temporary commissioners to examine the cause of disputes and to make recommendations for their settlement. The use of arbitration was merely a legal privilege which might be initiated by the disputants. When there was a mutual desire to arbitrate each side selected an arbitrator and the two thus chosen selected a third person, but the three arbitrators were to be wholly impartial and disinterested in respect to the controversy. There was no provision for appointing the neutral arbitrator in a case of disagreement. The Government bore all the expenses incurred in connection with arbitrations and investigations held under this law.

Erdman Act of 1898

ON JUNE 1, 1898, the Erdman Act was placed on the statute books. This law empowered the chairman of the Interstate Commerce Commission and the Commissioner of Labor to act as mediators in

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railway labor controversies when called upon by either of the disputants, and made it the duty of these representatives of the Government to propose arbitration when their efforts at mediation and conciliation were unsuccessful. Upon agreement of both parties to arbitrate, the carrier and the employees each selected an arbitrator and the two thus chosen selected the third, but in case of disagreement the neutral arbitrator was named by the foregoing officers of the Government. Arbitration awards made under this law were to remain in effect for one year. The provisions of this law applied only to employees engaged in the operation of trains.

Newlands Act of 1913

THE Newlands Act, which was enacted on July 15, 1913, was in effect only an amplification of the Erdman Act in that it continued the principles of mediation, conciliation, and arbitration. This law established the office of Commissioner of Mediation and Conciliation and provided for the selection of an assistant commissioner; also for the appointment of two other officials of the Government who together with the Commissioner of Mediation and Conciliation constituted a board known as the United States Board of Mediation and Conciliation. The members of this board not only responded to calls for assistance in the adjustment of disputes but proffered their services to the respective parties when such action seemed desirable to them. When mediation failed it was the duty of the commissioners to induce the parties to submit their differences to arbitration, and when this form of adjustment was agreeable arbitrators were selected in the manner provided for in previous laws. The number of arbitrators, however, was increased to six, except when the parties to the controversy preferred a board of three. Upon failure to agree upon the two neutral arbitrators they were named by the board of mediation and conciliation. The agreement to arbitrate was to be made in writing, and stipulated among other things the period during which the award should continue in force. The provisions of this law also applied only to employees engaged in the operation of trains.

Adamson Law

IN THE fall of 1916 the train and engine service brotherhoods threatened a strike for the so-called 8-hour day. Mediation had failed and arbitration had been refused by the unions. This strike was prevented at the last moment by the enactment of the Adamson Act. This law, while clearly a special arbitral proceeding of practically compulsory effect, made no general provision for the mediation or arbitration of disputes; in general it provided a basic 8-hour day for employees in train, engine, and yard services and named a commission to observe and report upon the effects of such establishment. As a result of events leading to the enactment of this law, President Wilson, when Congress met, presented the question of new legislation on the subject of the adjustment of railroad labor controversies, and this matter was under consideration for several months, until the World War and Federal control temporarily interrupted. Had not the war intervened, Congress in all probability would have

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enacted a new law supplanting or substantially amending the Newlands Act.

Procedure under Government Control

ON JANUARY 1, 1918, the Government, proceeding under a war emergency act, took over the operation of the railroads of the country and promulgated a new scheme of adjusting railroad wages and rules. It created a wage commission of four members upon whose report the first wage order of the Director General of Railroads was based and by whose recommendation there was created a Board of Railroad Wages and Working Conditions, with authority to hear and investigate future matters affecting changes in rates of pay and revision of rules governing working conditions of service. This board was also empowered to issue interpretations of such orders. The application of all rules, as well as the personal differences and disputes arising between the carriers and their employees, were made by three bipartisan adjustment boards, created through agreement between the managers and the employees. A majority of any adjustment board could render a decision on matters referred to it, but in case of a deadlock final settlement reverted to the Director General.

Railroad Labor Board

ON FEBRUARY 28, 1920, the transportation bill became a law. The section relating to the adjustment of labor disputes was incorporated in Title III, entitled "Disputes between carriers and their employees and subordinate officials." The act provided for the creation of the Railroad Labor Board, and made permissible the establishment of labor adjustment boards by agreement between carriers and employees. In accordance with the latter provision the President, under date of March 1, 1920, requested representatives of the carriers and labor organizations to form a board for the immediate consideration of this vast problem. This was done and to the so-called bipartisan board was referred the whole question. After deliberation of approximately one month the conferences of this organization ended in complete failure and the whole matter was referred to the Railroad Labor Board.

The Railroad Labor Board was organized on April 16, 1920, its personnel being composed of nine members, three of which comprised the labor group, three the management group, and three the public group. Appointments of each group were made by the President with the concurrence of the Senate.

The law provided the routine by which questions of controversy were to come before the board and the bases to be taken into consideration by the board in making its decisions. Generally speaking, the first step prescribed by the law to be taken before a dispute was eligible for consideration by the board was a conference between the representatives of the carriers and the employees. Failing of agreement it might then, if it was a dispute involving grievances, rules, or working conditions, be referred to an adjustment board organized by agreement between the employees and the carriers, then, if agreement could not be reached, or in the absence of such board, to the labor board. The adjustment boards were not author-

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ized to handle disputes involving changes in rates of pay, and such disputes had to be referred directly from conferences between carriers and employees to the labor board. The labor board was directed to hear and decide disputes upon applications of the chief executives of the carriers or organizations of employees directly interested; upon written petitions of not less than one hundred unorganized employees directly interested; or upon its own motion in cases of disputes which it deemed likely substantially to interrupt commerce.

In all of its decisions respecting wages and salaries the board was directed to base its determination upon the following elements:

(1) The scales of wages paid for similar kinds of work in other industries;

(2) The relation between wages and the cost of living;

(3) The hazards of the employment;

(4) The training and skill required;

(5) The degree of responsibility;

(6) The character and regularity of the employment;

(7) Inequalities of increases in wages or of treatment, the result of previous wage orders or adjustments;

(8) Other relevant circumstances.

The law did not give the labor board power to enforce its decisions; however, in case it had reason to believe that any decision was violated by any carrier, or employee, or subordinate official, or organization thereof, it might upon its own motion, after due notice and hearing to all persons directly interested in such violation, determine whether in its opinion such violation had occurred and make public its decision in such manner as it might determine.

Wage decisions.—For more than three months after its organization, the board conducted hearings and considered voluminous data in its determination in connection with the tremendous wage controversy inherited from the Railroad Administration. On July 20, 1920, Decision No. 2 was issued, retroactive to May 1, 1920, providing increases for all classes of railroad employees and causing an addition to the operating expenses of the carriers of approximately $600,000,000 per annum. Based upon the increased operating expenses effected by this award, the Interstate Commerce Commission authorized the carriers to increase transportation rates. Subsequent wage decisions made by the board, until the latter part of 1922, resulted in decreases in rates of pay.

After July 1, 1922, wage decisions were not general in effect, but in many instances were used by employees and carriers on roads not before the board as guides in their own wage adjustments. Most of the wage decisions issued after that date provided slight increases.

Rules decisions.—At the end of Federal control a good many of the groups of railroad employees were working under what were known as "national agreements." These agreements had all been negotiated shortly before the end of Federal control by representatives of the Railroad Administration and of the labor organizations.

On April 14, 1921, it issued Decision No. 119, which terminated all rules and working conditions of all classes of employees, excepting those in train and engine services, effective July 1, 1921, called upon the carriers and employees to begin conferences with a

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view to agreeing upon just and reasonable rules and working conditions to replace them, and set up certain principles to be used as a basis for such considerations. In practically all instances only minor rules were agreed to by the carriers and employees in their direct negotiations and the entire rules question was subsequently resubmitted to the board for solution.

Decision No. 222 and addenda constituted the board's determination of just and reasonable rules for shop-craft employees. Decisions Nos. 501, 630, 707, 725, and 757 replaced the rules granted by the Railroad Administration governing the working conditions of maintenance-of-way employees, clerks, signalmen, firemen and oilers, and telegraphers. After the early part of 1922 there were no major rules decisions issued by the board, although, as with decisions affecting rates of pay, some of the rules decisions applying to limited numbers of carriers were used by other carriers and employees as guidances in their own negotiations.

Other questions considered by the board.—Besides questions involving rates of pay and working conditions, other major questions which were referred to the board for solution were of employee representation and contract work, both of which were highly controversial subjects and were very difficult of disposal. Other disputes referred to the board pertained to grievances resulting from inability of the parties to agree upon proper application of existing rules or practices, of the application of decisions rendered by the labor board or other tribunals of competent jurisdiction, and to the question of discipline of individual employees.

Volume of work.—From the date of its establishment to December 31, 1925, 13,941 disputes were referred to the board. Of this number 6,006 were of a local nature, affecting individual roads and their employees in one or more classes of service or possibly two or three railroads at one point; and 7,935 were of a general nature, affecting large groups of railroads and their employees in any or all classes of service, such as general requests for wage increases or wage decreases or general revision of rules governing working conditions. The board during this period disposed of 13,447 of these submissions, 5,549 of which were of local nature and 7,898 of general nature. Of the total number of disputes, 912 did not reach the status of regularly docketed cases.[1]

Principal Arbitrations of 1926

THE most important industrial arbitrations of 1926, as regards the number of persons affected, were those relating to the conductors and trainmen on the eastern railroads and to the employees of the American Railway Express Co. These arbitrations were of particular significance also as being the first to develop under the new railroad labor act of 1926, and to be carried on under the forms of procedure laid down by that act. These two awards are presented below, as are also summaries of such other important arbi-

[1] Data regarding organization and activities of Railroad Labor Board are from the Report of the United States Railroad Labor Board, Apr. 15, 1920, to Dec. 31, 1925. No report has been published covering the early part of 1926, prior to the board's discontinuance.

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tration awards of 1926 as came to the attention of the bureau and appear to be of general interest.

Conductors and Trainmen on Eastern Railroads

THE decision of the arbitrators in the eastern trainmen's case was announced December 1, 1926. It dealt with the wages and with certain rules governing work and pay of conductors, baggagemen, flagmen, and brakemen, members of the Order of Railway Conductors and of the Brotherhod of Railroad Trainmen, employed on 50 railroads in the eastern part of the United States.

Demands for the increases had been submitted to the employers several months prior to the enactment of the railway labor law of 1926, and on the enactment of this law the procedure therein provided for was followed. First, an attempt to settle the controversy through the agency of boards of adjustment, representing the two parties, and, this failing, the second proviso of mediation by the United States Board of Mediation was resorted to. This in turn was not successful, but an agreement to arbitrate was secured. Arbitrators were selected by the two groups; the neutral arbitrators selected by these arbitrators, however, declined the appointment. The neutral members were thereupon appointed by the board of mediation.

The board organized October 27 last, and examined the evidence offered. The men had asked for an increase in pay averaging about 19 per cent. The board awarded them an increase of 7½ per cent over the rates in effect November 30, 1926, the increase to date from December 1, 1926. The two representatives of the railroad filed a dissenting opinion in regard to the amount of increase. The text of the majority report and award was as follows:

Report and Award of Arbitrators

This board of arbitration was created under and in accordance with the provisions of the railway labor act, approved May 20, 1926, for the purpose of arbitrating questions of rates of pay and certain rules governing work and pay upon which the Order of Railway Conductors, representing the conductors, and the Brotherhood of Railroad Trainmen, representing the other trainmen and the yardmen, and the railroads of the eastern district were unable to agree. The railroad companies were represented by a conference committee of managers, duly authorized to act for them. A list of the railroads so represented is included in the agreement to arbitrate.

The railroads selected as arbitrators R. V. Massey and William A. Baldwin. The employees selected E. P. Curtis and D. L. Cease. The United States Board of Mediation appointed William D. Baldwin and Edgar E. Clark.

The matters to be arbitrated were requests for increased rates of pay and working rules, as follows:

Passenger service

	Mile	Day	Month
Conductors	$0.05166	$7.75	$232.50
Assistant conductors and ticket collectors	.0456	6.84	205.20
Baggagemen handling express, dynamo, and Government mail	.04786	7.18	215.40
Baggagemen handling dynamo and express	.0456	6.84	205.20
Baggagemen handling dynamo and Government mail	.0456	6.84	205.20
Baggagemen handling express and Government mail	.0456	6.84	205.20
Baggagemen handling either dynamo, express, or Government mail	.04333	6.50	195.00

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	Mile	Day	Month
Baggagemen	$0.041	$6.16	$184.80
Flagmen and brakemen	.04	6.00	180.00

NOTE.—Where flagmen or brakemen are required to handle baggage, express, dynamo, and Government mail, or either of them, the same differential as applies to baggagemen will be added to their rates.

For service paid local or way freight rates under schedules now in effect the rates shall be as follows:

	Mile	Day
Conductors	$0.0774	$7.74
Brakemen	.0624	6.24

For service paid the through freight rates under schedules now in effect the rates shall be as follows:

	Mile	Day
Conductors	$0.0734	$7.34
Brakemen	.0584	5.84

Yard service

	Day
Car retarder operator	$8.44
Foremen	7.64
Helpers	7.16
Switchtenders	5.72

Other service

1. The same increases shall apply to milk, mixed, work, miscellaneous, or any service not enumerated as are applied to the service in which they are now classified. Where there is a separate rate for milk, mixed, work, miscellaneous, or other service it shall be increased in the same amount of money compared with rates in effect this date as the freight or passenger rate, according to the overtime basis on which it is calculated.

2. All rates of pay in excess of standard rates and all mountain, desert, or other differentials to be maintained—that is, the same amount of money now paid in excess of standard rates to be paid in excess of rates which may be agreed upon.

3. The adoption of the rates suggested shall in no case operate to bring about a reduction in compensation now paid.

4. Literal application of the following language "In all classes of service trainmen's time will commence at the time they are required to report for duty and shall continue until the time they are relieved from duty."

5. A through freight train is one that neither sets off nor picks up cars nor loads or unloads freight en route, nor does station switching. On all other freight trains, trainmen shall be paid not less than local or way freight rates.

6. Not less than one brakeman shall be assigned to every passenger train of two or more cars or on other passenger trains of less than two cars that carry either baggage, mail, or express matter for distribution.

7. All rates and rules herein enumerated to be effective as of January 1, 1926, except where agreements in effect have been made to a later date.

The board met and organized on October 27, 1926. Hearings at which evidence was presented and received began on October 28 and continued until and including November 10. The parties were heard in oral argument on November 12.

The railroads estimate that the requests of the employees would, if granted in full, equal an increase of 19 per cent in their pay, which would amount to $38,000,000 per annum.

All facts, conditions, and circumstances relied upon in support of the proposals of the employees were presented and replied to in evidence and in argument. It is not contended that these railroads can not afford to bear some increase in the wages of these employees.

After full consideration of all of the conditions and circumstances presented in the record, and of the peculiar, exacting, hazardous, and responsible character of the services performed by these employees, the board adjudges and awards as follows:

The standard rates of pay per mile, per day, and per month for conductors, assistant conductors, ticket collectors, train baggagemen, train flagmen, and

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brakemen in passenger service; for conductors and brakemen in local or way freight service; for conductors and brakemen in through freight service; for yard conductors or foremen; for yard brakemen or helpers; and for switch-tenders shall be increased 7½ per cent over the rates in effect on November 30, 1926.

In applying the 7½ per cent increase the daily rates will be used as bases. Mileage rates will be determined by dividing the new daily rates by 150 and 100 for passenger and freight service, respectively, and monthly rates will be determined by multiplying the new daily rates by 30.

Car retarder operators shall be paid 80 cents per day more than the rate herein fixed for yard conductors or foremen.

Train baggagemen required to handle express shall be paid 34 cents per day more than the rate per day herein fixed for train baggagemen.

Train baggagemen required to handle United States mail shall be paid 34 cents per day more than the rate per day herein fixed for train baggagemen.

Train baggagemen required to handle both express and United States mail shall be paid 68 cents per day more than the rate per day herein fixed for train baggagemen.

Train baggagemen required to handle dynamo shall be paid 34 cents per day more than the rate per day herein fixed for train baggagemen.

Train baggagemen required to handle dynamo and express or United States mail shall be paid 68 cents per day more than the rate per day herein fixed for train baggagemen. If required to handle dynamo and express and United States mail he shall be paid $1.02 more per day than the rate per day herein fixed for train baggagemen.

The extra allowance for baggagemen handling United States mail will not apply when the amount of such mail handled does not exceed in volume between any two points that provided for the minimum space that can be authorized by the Post Office Department, viz, 3 feet or its equivalent, 54 sacks or pieces. Loading United States mail into car, storing it in car, sorting it en route, or unloading it at intermediate or terminal points will constitute "handling" under this rule. The extra allowance for handling United States mail will not apply when "storage" mail is in charge of the baggageman, provided he is not required to "handle" it.

The extra allowances for handling dynamo, express, and/or United States mail by train baggagemen will apply to other trainmen who may be assigned regularly or temporarily to that work.

On the adoption of the above award covering rates of pay W. D. Baldwin, Clark, Curtis, and Cease voted in the affirmative. Massey and W. A. Baldwin voted in the negative.

On the proposed rules submitted the board adjudges and awards as follows:

Rule 1 shall read:

"The same increases shall apply to milk, mixed, work, miscellaneous, or any service not enumerated as are applied to the service in which they are now classified. Where there is a separate rate for milk, mixed, work, miscellaneous, or other service it shall be increased in the same amount of money compared with rates in effect on November 30, 1926, as the freight or passenger rate, according to the overtime basis on which it is calculated."

Rule 2 shall read:

"All rates of pay in excess of standard rates, including daily and monthly guarantees, and all mountain, desert, or other differentials shall be maintained; that is, the same amount of money now paid in excess of standard rates shall be paid in excess of rates which are herein awarded."

Rule 3 shall read:

"The adoption of the rates herein awarded shall in no case operate to bring about a reduction in rates now paid."

Rule 4: The request submitted under this head is for enforcement of a rule that is very general in the pay schedules of these railroads. It is not suggested that the language of the rule is ambiguous nor is any change in the wording of the rule sought. The board is not clothed with police powers to enforce this or any other pay schedule rule.

Rule 5 shall read:

"Trainmen in through or irregular freight service required to pick up and/or set off a car or cars at four (4) or more points during any one trip or tour of duty will be paid local freight rates for the entire service performed. Stops made (1) at first point to pick up cars other than cabin or caboose, and at last point to set off cars other than cabin or caboose; (2) at foreign line junction

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points, not exceeding four in number, when interchange cars only are picked up and/or set off; (3) for setting off defective cars; (4) doubling hills; (5) for setting out cars or picking up cars (but not setting out and picking up at the same point) for the purpose of adjusting the tonnage of the train to established engine ratings, will not be counted as stops under this rule.

"Except as provided in (5) a stop covers picking up and/or setting off cars at one point between the time train is stopped and the entire train is coupled up and ready to start.

"Trainmen required to load or unload freight or to do station switching will be paid local or way freight rates. Switching necessary in picking up cars will not be considered 'station switching.' Switching for the purpose of placing at loading or unloading places cars other than cars loaded with livestock or highly perishable freight will be considered 'station switching.' If, in order to set out car or cars clear of main line, it is necessary to move from 'spot' a car or cars that are set for loading or unloading, such car or cars will be replaced on 'spot' and so doing will not be considered 'station switching.'"

Rule 6: This request is denied.

Rule 7: The rates of pay and the rules embraced in this award shall be made effective as of December 1, 1926.

On the adoption of the rules above awarded, the vote of the board was unanimous, except that W. A. Baldwin voted no on Rule 2.

Employees of American Railway Express Co.

A DECISION affecting 65,000 employees of the American Railway Express Co. was rendered January 13, 1927, by arbitrators appointed under an agreement signed by the company and its employees December 1, 1926.

Negotiations had begun January 21, 1926, when the Brotherhood of Railway and Steamship Clerks, Freight Handlers, Express and Station Employees asked the express company for an increase in wages of 11½ to 12 cents per hour. March 27, upon the company's definitely refusing the brotherhood's request, the dispute was laid before the Railroad Labor Board. When that board dissolved without having acted in the case, a new demand for increase was made on the express company and this being refused the matter was brought before the newly created United States Board of Mediation.

The company agreed to arbitrate the question, the Order of Railway Expressmen and the American Federation of Express Workers, representing other employees of the company, joining the brotherhood for this purpose. The arbitration board consisted of Hon. William B. Wilson, Secretary of Labor during President Wilson's administration; Emory A. Stedman, of Chicago, a vice president of the express company, and John H. Clarke, former justice of the United States Supreme Court; the last named being selected by the other two, who were appointees of the employees and company, respectively.

The board, after hearing both sides, rendered the following unanimous decision:

Upon full hearing and consideration of the questions submitted, the following award is made:

1. An increase in the rates of pay of 2½ cents per hour shall be paid to all employees comprehended within the terms of the agreement of submission.

2. The same relative increase in the rates of pay shall be applied to all employees comprehended within the terms of the agreement of submission and rated upon daily, weekly, or monthly bases.

3. Rates of pay in effect upon December 31, 1926, shall be the basis upon which the increased rates of pay prescribed herein shall be computed.

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4. The increases in the rates of pay hereinbefore provided for shall be effective as of January 1, 1927.

5. Messengers in train service required to handle baggage shall be paid 4¼ cents per hour in addition to the general rates hereinbefore established by this award.

6. Messengers in train service required to handle United States mail shall be paid 4¼ cents per hour in addition to the general rates hereinbefore established by this award.

7. Messengers in train service required to handle both baggage and United States mail shall be paid 8½ cents per hour in addition to the general rates hereinbefore established by this award.

The extra allowance to messengers in train service handling United States mail will not apply when the amount of such mail handled does not exceed in volume, between any two points, that provided for the minimum space that can be authorized by the Post Office Department; viz, 3 feet or its equivalent, 54 sacks or pieces. Loading United States mail into car, storing it in car, sorting it en route, or unloading it at intermediate or terminal points will constitute "handling" under this award.

The extra allowance for handling United States mail will not apply when "storage" mail is in charge of the messenger provided he is not required to "handle" it.

The extra allowance for handling baggage and/or United States mail by messengers will apply to other train service employees who may be assigned regularly or temporarily to that work.

The extra allowances herein provided for handling baggage and/or United States mail by messengers shall become effective as of January 16, 1927.

Newspapers, Washington, D. C.

AT THE expiration of the Agreement of Typographical Union No. 101 with the newspaper publishers of Washington, November 11, 1925, the union asked for an increase in wage rates, which the publishers at first refused altogether, though later they offered an increase of 30 cents a day. Finally they offered to arbitrate the matter, and Justice Hitz, of the Supreme Court of the District of Columbia, was selected as arbitrator.

Justice Hitz on May 12 rendered an award modifying the existing contract in a few respects, granting in the main the requests of the union—$9 per day and $10 per night, increasing the day rate by $1.30 and the night rate by $1.60, the number of hours to remain at seven, Washington's Birthday added to the list of recognized holidays, and the provision allowing an office to work its force overtime up to four hours a week at a single price removed. The remaining clauses in the award are as follows:

1. The printers' proposal that section 2 of the existing contract, relative to rates for day work, night work, and day and night work and day rate on Sunday afternoon or evening papers, be changed to the rates requested by the printers, is granted, and the amounts proposed by the printers shall be the scale of wages embodied in the new contract in effect on and after November 11, 1925.

2. The printers' proposal relative to linotype operators, when required to do mechanical work on typesetting machines other than operating the keyboard, is denied.

3. The publishers' proposal relative to any member of the union who, by reason of advanced years or other cause, may not be capable of producing an average day's work, etc., is granted, with the substitution of the "president of the union" in lieu of the "foreman of the office," as stated by the publishers' proposal.

4. The printers' proposal that "if men are required to work at such time that the seven hours fall partly in the hours during which the day rate prevails and partly during the hours in which night rate obtains, they shall receive the night scale, except that, etc.," is granted, to take effect on and after May 24, 1926.

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5. The publishers' proposal in regard to the same condition—namely, that "if men are required to work at such time that the eight hours fall partly in the hours during which the day rate prevails and partly during the hours in which the night rate obtains, etc."—is denied.

6. The publishers' request for no change in the provision governing in case of a recall after the men have left the office for the day is granted.

11. It is the finding of the arbitrator that the contract should run for one year from November 11, 1925, except as otherwise provided herein.

13. Section 9 is to remain the same, dealing with journeymen, as it is in the present contract.

14. The printers' proposal to limit apprentices in the ratio of 1 to 10 journeymen, with the further limitation that not more than five may be employed in any one office, is denied.

15. The printers' proposal under "(d)" paragraph of section 2, "sphere of work," relating to the third year of an apprentice, is granted, the publishers having agreed to it.

16. The change requested by the publishers under section 3 with regard to substitution of an eight for a seven hour day is denied.

17. The scale governing apprentices after the first year, referred to in section 4, shall remain as in the present contract without change either in day work or night work.

Stereotypers, Detroit

AN ARBITRATION award by Judge Frank Murphy was issued August 16, 1926, in a dispute between Stereotypers' Local No. 9 and the Detroit Free Press and Detroit Times, relative to the scale of wages to be in effect from May 1, 1926. The union demanded $9 per 8-hour day or 7-hour night, with $2 bonus for double shift, and $10.30 for an 8-hour Saturday night. The publishers offered $7.75 per 8-hour day or 7-hour night, with $1.50 bonus for double shift, and $8.85 for an 8-hour Saturday night.

Extracts from the opinion follow:

It has been difficult to avoid in this dispute principles that come to all wage disputes, foremost among them being the cost of living and conditions of industry. In the present instance both have been given careful consideration. The former question—cost of living—was presented in argument by both sides, while the latter was largely ignored. The publishers argued that this board should not take into consideration in determining the fair and reasonable wage for stereotypers the financial conditions of the publishers' business nor the conditions under which they operate or are likely to operate. It is contended that the condition of the publishers' business is not an issue and therefore should form no part in the deliberations and plans of the board. However, separating the two principles is easier to do in theory than in practice. Experience has gone far to demonstrate that neither the cost-of-living principle nor the condition of industry, if used one without the other, is a completely satisfactory basis for a policy of wage settlement. Both general conditions and conditions in the particular industry should be given weight in every wage dispute, and the latter itself should be a primary basis of decision. A study of general conditions throughout the country discloses general prosperity and high production, and in local newspaper business there is an obvious prosperity.

In industry, as in all else, the present is fleeting and the future is difficult to forecast, and an arbitration giving consideration to the condition of business principles must keep this fact constantly in mind. In the interest of industrial efficiency and friendly cooperation between the employer and employees wages should bear some relation not only to national wealth, but specifically to the product of the industry concerned. In the present instance the union has a right to assume that the growing productivity of the publishers' business entitles its members to a progressive standard of living. Under all the proofs and having in mind the recognized present general prosperity, it is fair to conclude that in the business of the publishers profits are likely to be high and on the increase. Therefore, generally speaking, they should be able to pay higher wages.

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Great improvements have been made in recent years and still are being made by those who are engaged in industry. A limit to the possibility of increasing production has not been reached, and no doubt invention, new methods, and common sense, if worked together, will help increase production in the future as it has in the past. This industrial progress and the standard of living of workers should constantly move forward, and for this reason there is grave danger in paying wages exclusively on the cost-of-living principle and the living wage.

Economists, employers, and employees have in recent years directed their attention to a large extent to the question of real wages as distinguished from money wages for the reason that what dollars will buy is more important than the number of dollars received as a wage. It is only by constantly raising real wages and not just money wages that prosperity is brought about. An increase in wages may be illusory if it is an increase in name only, because the purchasing power of the money may be appreciably decreased. This consideration makes it necessary to measure with fine accuracy changes in price levels which occur from year to year and from month to month.

Careful examination has been made of all the exhibits introduced in connection with price levels from the base period, December, 1914, to December, 1925. Likewise, the wage scale during the same period has been closely scrutinized. This study has established the following facts:

First. That prices in Detroit advanced from December, 1914, to December, 1925, 88.2 per cent.

Second. That wages of stereotypers in Detroit advanced during the same period from $24 to $48.

Third. That 53.1 cents in December, 1914, would purchase as much as $1 would purchase in December, 1925, and that the increase in real wages for stereotypers during this 10-year period was only $1.48 per week, or, expressed in percentage, 6.1 per cent.

Fourth. That the percentage of increase in cost of living in Detroit from December, 1914, to December, 1925, is greater than for any other of the 32 American cities covered in the survey.

No attempt is here made to draw any other conclusion from these facts than that the increase in real wages to Detroit stereotypers from December, 1914, to December, 1925, has been trivial; that for a good portion of this time the stereotypers must have labored under conditions that made life difficult to sustain, because the advance in real wages failed completely to keep pace with the advancing cost of living; and that in comparing wages in other American cities with the Detroit scale some consideration should be given to the fact that the cost of living in Detroit has increased by a larger percentage during this period than in any other of the 32 cities considered. It follows that a money wage in other cities that appears to be equal to Detroit, or even less, may be appreciably more, depending upon cost of living, hours of labor, and other social and economic factors.

The present industrial organization of society is built upon the wage system, and as long as it survives it must justify itself by providing the wage earner with sufficient to live on in a manner becoming to his dignity as a man. This is not accomplished by furnishing him with a mere subsistence. The gulf between a mere subsistence wage and a decent and comfortable living wage should broaden, and especially when the industry concerned is not imperiled or in any way embarrassed as in the present case. A wage is not a living wage unless through frugality a wage earner may earn sufficient to develop within reasonable limits his physical, spiritual, moral, and intellectual faculties and in addition be able to set aside a reserve to provide for accident, old age, illness, and misfortune.

Under the present social order the father is the natural provider for all members of the family. It follows that whenever the wage earner lacks the means to provide for the becoming maintenance of his wife and children marriage and home life are discouraged, women and children are obliged to labor, and there is brought about a steady deterioration and lowering of standards in the families affected. Therefore a living wage means a family living wage.

Budget studies are essential and helpful in giving application to the living wage principle, but can not and should not control its use completely. All of the budgets submitted have been studied and compared. The visiting housekeeper's budget for Detroit, $2,010.72, submitted by the publishers, is hardly

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applicable to the present dispute without considerable modification upward. Throughout this controversy it must constantly be borne in mind that we are seeking to determine a just wage for the members of a well-established skilled craft. The budget referred to was not calculated to apply to a skilled worker's family such as a stereotyper's. On the contrary, it was designed in the main as a guide for relief work for relief-giving organizations. It would be unfair to impose this budget on the families of Detroit stereotypers and would mean a recession with no good excuse from the standard of living now prevailing. Acceptance of this standard would only add to the perplexing problem now existing and would have a tendency to oblige housewives and children to labor.

It is not necessary here either to approve of the budgets offered in evidence or to arrange one as a model. However, a careful study of items and costs of the California commission's budget for clerks leads to the conclusion that the present stereotyper's wage of $8 per day, or $2,496 for a year of 312 working days, falls short of what is necessary for the comfortable and decent support of a stereotyper's family living in Detroit.

It is the contention of the publishers that under the present scale the average wage of stereotypers of Detroit is $51.08, indicating an average annual income of $2,656.16. These figures, of course, are built on the overtime earnings of the men, and for this reason these averages should not be a deciding factor in determining a just wage scale. Overtime work saps the physical and mental strength of the men, denies them recreation, and takes from them both the attention they should give to and care they should receive from home. In this connection it is observed that stereotypers of Detroit have not enjoyed the general reduction in weekly hours of labor that has taken place in their craft throughout the country, and that they still labor on an 8-hour day and 7-hour night schedule.

While there is no direct evidence bearing on the ability or inability of the employers to bear an increase in wages, there is abundant evidence of an increase in prosperity in the business of the employers. There has been no substantial change in the relation between wages and cost of living since December, 1914. No sound reason or principle requires that the relation between cost of living and wages which prevailed in December, 1914, should remain always constant and be adhered to as an ideal standard. At that time, for example, there was little difference in wage between stereotypers and day laborers. In the interest of both employer and employed, a progressive increase in standard of living and improvement in the economic situation of the wage earner should accompany a general increase in prosperity and living standards. It is the opinion of the board that an increase of $3.60 per week in the wages of stereotypers would not be unreasonable in view of conditions in the industry and would be justified by the evidence submitted and the considerations herein mentioned. The following award is made:

(1) The minimum scale for journeymen working two consecutive full-time shifts in the same office at the request of the office representative shall be paid a bonus of $2 for the second full-time shift over and above his regular pay.

(2) Eight consecutive hours or any part thereof between the hours of 6.15 a. m. and 7 p. m. shall constitute a day's work. Seven consecutive hours or any part thereof between the hours of 5 p. m. and 5 a. m. shall constitute a night's work, except on Saturday, when 8 consecutive hours between the hours of 2 p. m. and 5 a. m. Sunday shall constitute a night's work, and the pay for that night shall be $9.84.

(3) The minimum scale of wages to stereotypers shall be as follows: Journeymen, $8.60 per 8-hour day or 7-hour night.

Eastern Massachusetts Street Railways

AN ARBITRATION award was made September 24, 1926, between the Eastern Massachusetts Street Railway Co. and its employees, members of 15 locals of the Amalgamated Association of Street and Electric Railway Employees of America. The award was signed by John C. Leggat, chairman, and James H. Vahey. A dissenting opinion was filed by Fred A. Cummings.

Several questions were laid before the board for decision, but most of them were brushed away with the statement that concerning them

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"there shall be no change made in the existing contract." The only changes made in the existing agreement related to wages and hours, regarding which the board spoke as follows:

1. Wages of all employees affected by this arbitration shall be increased 1½ cents an hour.

2. For all work performed over 8 hours per day men shall be paid at the rate of time and one-half. The 8-hour day is in force on three other systems in this State, on two of which at least the conditions are fairly comparable to those on this system. It was admitted by the company that so far as it concerned the operating of this system and furnishing of proper service it made no difference whether the hours of labor per day be 8 or 9. The 8-hour day is becoming more universal each year and is recognized by law in Massachusetts for public employees.

The request of the men for a 12½ per cent increase is not warranted by the evidence introduced. The present cost of living figures show that there has been little change from those of last year and then downwards about two-tenths of 1 per cent.

Explanatory of the working of the overtime rate, the board inserted the following illustration in section 12 of the agreement:

Runs 8 hours and less than 8 hours and 30 minutes shall be paid 8 hours and 30 minutes. Runs containing 8 hours and 30 minutes and less than 9 hours shall be paid 9 hours. All other runs shall be computed in 15-minute periods. To prevent misunderstanding in the interpretation of this paragraph, it is agreed that for work actually performed between 8 hours and 8 hours and 30 minutes employees shall receive pay at the overtime rate of time and one-half; and for any remaining part of the one-half hour they shall receive pay at their regular hourly rate. For illustration: A man operating a one-man car with a run of 8 hours and 10 minutes shall receive pay for 8 hours at 67½ cents an hour, or $5.40. He will receive time and one-half for the 10 minutes at his regular hourly one-man car rate. For the remaining 20 minutes of the half hour he will receive pay for one-third of an hour at the regular hourly one-man car rate, the one-man car rate referred to being 62½ cents plus 5 cents, or 67½ cents an hour. If a run is 8 hours and 25 minutes and up to 8 hours and 29 minutes, both inclusive, he shall be paid at the rate of time and one-half on 30 minutes. For work actually performed between 8½ hours and 9 hours employees shall receive pay at the rate of time and one-half, and for the remaining period within this one-half hour they shall receive pay at their regular hourly rate. All schedule runs with total time less than 8 hours shall pay 8 hours.

Street Railways of East St. Louis and Vicinity

THE East St. Louis & Suburban Railway Co. and the members of Locals No. 805 and No. 125 of the Amalgamated Association of Street and Electric Railway Employees of America, June 10, 1926, submitted to arbitration a dispute between them concerning the wages to be paid for the period beginning April 30, 1926, and ending April 30, 1927. The arbitrators in this case were Frank M. Slater, chairman; C. E. Smith, B. F. Thomas, jr., J. R. McMurdo, and W. L. Perry.

Under the existing agreement wage rates of motormen and conductors were as follows:

	Cents per hour
First 6 months	45
Next 6 months	50½
Next 6 months	55½
Next 3 months	56½
Thereafter	57

One-man car, 5 cents additional.

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The wage rates asked for motormen and conductors for the period beginning May 1, 1926, and ending April 30, 1927, are as follows:

	Cents per hour
First 3 months	65
Next 9 months	70
Thereafter	75

For operating one-man cars and busses for regular hours work, an additional 15 cents per hour.

Interurban motormen and conductors 2 cents above city rates.

In the course of the award the board made the following statements:

The record consists of almost 500 pages of testimony, together with about 100 exhibits, which we have most carefully considered to arrive at a fair and just conclusion in the premises.

Evidence has been presented by both sides to sustain the issues, both for and against an increase of the wages, the condition of the employers, as well as the employees, the character of the work of the men, as well as the character of the property of the company.

We have very carefully examined and weighed the evidence submitted on behalf of the company, especially that part relative to comparable wages of street-car men in other communities, wages of firemen, policemen, clerks, and other industrial employees in this community. The financial status of the company and this evidence is very impressive. However, the evidence submitted on behalf of the association, of merchants in all classes and kinds of business, real estate men and the authority reports issued by the United Sates Bureau of Labor Statistics show that within the last year there has been an increase in the cost of living in East St. Louis and vicinity of approximately 3 per cent. This is a paramount question in fixing wages. This increase in the cost of living, based on the scale of wages paid conductors and motormen, gives approximately 2 cents per hour, and it is the finding of this arbitration board that all employees covered by these arbitration proceedings shall receive a horizontal increase of 2 cents per hour. Inasmuch as this increase is based on the increased cost of living, we further find there shall be no change in the differentials now paid for one-man car and bus service.

These findings shall be in effect as of May 1, 1926.

Carpenters, Denver

THE Industrial Commission of Colorado, on April 9, 1926, rendered a decision in the matter of the Carpenters' District Council of Denver and Vicinity against the Master Builders' Association and other employers in the city of Denver and vicinity. The wage received by the carpenters was $9 per day. A demand for $11 per day, effective May 1, 1926, had been refused by the employers, and the case was brought before the commission by the employees March 15, 1926.

From the findings and award the following extracts are taken:

The said employees contend they are entitled to said increase on account of the increased cost of living; that said employees are able to secure work for only a part of the time throughout the year, and that their average annual earnings are not sufficient for living purposes; that the other trades are receiving more wages per day and per annum than the carpenters; that the carpenters are the lowest paid of any members of the skilled building trades in the city of Denver; that the carpenters are required to furnish more tools than any of the other trades, and that the expense of maintaining and keeping said tools is greater than the other trades.

The employers contend that the carpenters in Denver receive as high wages as paid in other cities of similar size, and that only in four or five other cities of the United States are higher wages paid carpenters than in Denver.

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The employers further contend that the increases in wages that the carpenters have already received greatly exceed any increase in the cost of living.

It appears from the evidence herein that the carpenters in skill and experience equal, if not excel, the other building trades; that said employers within the last three years, by agreement with the members and unions of the other trades, voluntarily increased and fixed the wages of such other crafts as follows: Bricklayers to $12 and $13 per day, plasterers to $12 and $14 per day, ironworkers to $10 per day, electricians to $11 per day, plumbers to $12 per day or more, painters to $10 per day, steamfitters to $11 per day, sheet-metal workers to $10 per day, tile layers to $11 per day, common building labor to $6.50 and around $7 per day, lathers to $11 per day.

The carpenters insisted at the hearing that at the time wages of other crafts were raised they could have likewise obtained a similar increase and could have received a wage proportionate to that paid other crafts, considering their skill and ability, but that on account of strife within their own union, and because of the strong influence of an entirely extraneous organization, they were not able at that time to come to any arrangement or agreement among themselves and that they were deprived of the opportunity of requesting increases granted to the other crafts.

From the evidence introduced herein it appears to the commission that the contractors should be protected in a large measure against any increase taking effect on work contracted prior to the time that they had notice of a demand for an increase in wages, and feels from the evidence herein that no such increase should take effect prior to June 1, 1926.

The commission finds from the evidence herein that the members of this craft are at this time entitled to a wage of $10 per day, for the reason that the wage scales paid other members of the building-trade crafts are higher than the present wage scale of said carpenters.

Therefore it is the order and decision of the commission that, commencing June 1, 1926, said employees be paid a wage scale of $10 per day.

Ladies' Clothing Industry, Cleveland

THE board of referees in the ladies' garment industry of Cleveland granted an increase of about 5 per cent in the wage scales of the workers in that industry, basing their decision on an increase in the cost of living since 1923. This board is a permanent one for the adjustment of disputes, and consists of Morris L. Cooke, chairman; Jacob H. Hollander, and John R. McLane. The award, with the omission of the detailed schedules, was as follows:

The regular wage hearing scheduled for December, 1925, was postponed under an agreement between the manufacturers and the union until April, 1926, and then again postponed by mutual consent until this time. Therefore in determining the wage schedule which will obtain until our next regular meeting the board is obligated to take into consideration general business conditions, national and local wage levels both within and without the ladies' garment industry, the status of the local garment industry, as well as such change as may have occurred in living costs since our last consideration of the wage scale. In fixing rates the board necessarily has in mind not only the situation as it is on the specific date when the hearing is held but such variations in the level of prices and wages as have occurred during the interval since the present scale was established as well as the apparent trend for the period between now and the next wage hearing.

In this instance the union is asking for a very considerable and specific wage increase, basing their request on the higher cost of living and on what appears to them to be a favorable business outlook and a betterment in the local garment industry as well as an increase in the output for individual workers due to a stiffening in the standards. The employers have argued strenuously against any raise during this period of what they concede may be one of returning prosperity to the Cleveland market. They have argued that due to the guaranteed 40 weeks of work and the present scale the Cleveland workers now receive higher annual returns than those of any other market. The manufacturers—perhaps not very strenuously—argued for a reduction of present rates.

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We feel that everything considered there are not sufficient grounds for any general increase in real wages at this time. Local and national business conditions do not warrant too positive assumptions as to whither we are going or where we will be six months from now or at the time of the next wage adjustment. We are hopeful that the union's prediction may be fulfilled. However, it has been established that whatever have been the ups and downs in living costs since April, 1923, such costs are now in the neighborhood of 5 per cent higher than they were then and we are ordering an increase in the schedule which will adjust for the change. [The old and new schedules follow:[2]]

The union has asked for "an award of a proportionate increase for workers receiving week-work wages above the minimum because of their productive ability." As a matter of practice the board has always found it impossible to do more than establish the minimum. We have in this decision raised the minimum. We can register an opinion that equity demands the adjustment in rates which have been for good reason fixed above the minimum, when there is a general advance in minimums. But it is not feasible to do more than this. The same also applies to the case of the unclassified workers. As we have provided for an increase in the minimum, it seems reasonable to suppose that employers will make corresponding changes above the minimum for such unclassified workers. The referees, however, as stated above, can not depart from their previous refusal to interfere in the actual wages of unclassified workers. It would be inexpedient to do so. We agree with the contention of the union that there should not be a group of unclassified workers falling outside the protection of the agreement. We suggest that the union and the manufacturers make an effort to work out some mutually satisfactory scheme for bringing these workers under our jurisdiction. In case of failure we request a list of such workers, together with their compensations be brought before us at our next meeting for such action as may then seem wise.

Conciliation Work of the United States Department of Labor

AS ITS title indicates, the work of the conciliation service of the Department of Labor is that of mediation in labor disputes. The following description of the work of the division is taken from the 1926 annual report of the Secretary of Labor:

"Experience has demonstrated that no hard and fast rules or policies can be laid down to guide commissioners in the work of mediation. Nearly every strike or lockout presents distinct problems, which require different handling. This is due to the collective characteristics that are generally found and that make necessary the exercise of different methods and procedure by the commissioner. Local situations, markets, physical conditions, and the personal equation enter into cases of trade disputes, and these elements practically make each a case unto itself.

"The authority for the work of conciliation gives the Secretary of Labor the right to assign commissioners of conciliation whenever he believes it advisable to do so. The Secretary, however, unless it is a dispute of unusual character or great importance, believes it the best policy not to intervene unless one or both of the parties directly affected or officials or representatives of the community concerned request the good offices of the department. Very often negotiations looking toward a settlement are in progress and it would be unwise for any agency, governmental or otherwise, to intervene while there is a real prospect of securing a settlement.

[2] These schedules are given in the Labor Review for August, 1926, p. 221.

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"In these circumstances the commissioner in touch with the situation takes no part other than quietly to advise the committee or representatives of both sides, and then only when invited to do so. Often he is able to give assistance at the proper moment that aids in clearing up the issue in dispute. In other cases it at once becomes apparent to the contestants in an industrial dispute that an experienced Government mediator is necessary to guide the negotiations, and the record of success that has attended the different kinds of cases has been very gratifying.

"A trained, neutral Government representative generally finds both sides to a trade dispute willing to accept his services. He enters a case without bias and immediately proceeds to bring about conferences where the differences are taken up and discussed at the council table where he can by counsel and suggestion guide the interested parties in the negotiation of a satisfactory settlement.

"The success of our commissioners in securing acceptable settlements is more worthy of note from the fact that their services are largely required when personal feeling runs high and attempts at adjustment through other agencies have failed. It must be remembered that a break in industrial relations due to a strike or lockout is conducive to an abnormal state of mind of the disputants. Incidents that would have no particular significance in times of industrial peace, in time of dispute are magnified and distorted. Men say things in times of conflict they would not say at other times—things which distress and anger. The whole atmosphere is surcharged with suspicion and resentment. It is not unusual to find the economic causes of the dispute quite lost sight of in the human desire to win the struggle in order that lost prestige may be regained and wounded feelings assuaged.

"Again, stressing the fact that the department deems it wise policy not to intervene where amicable negotiations are in progress between the disputants or other agencies are successfully at work to bring about a satisfactory settlement, attention should be called to the real desirability of requesting the services of our commissioners before the strike or lockout stage has been reached.

"The efforts of the representatives of this service are directed always toward the prevention of an open break that stops production, with the consequent loss in wages and profits. They endeavor to have work go on while negotiations are being conducted to bring about a settlement of the existing differences. If this be impossible and a strike or lockout occurs, then their task is to secure a prompt and workable adjustment, having always in mind the interests not only of the employer and employees, but of the public as well.

"The success that has followed as a result of the work of this branch of the department during the fiscal year can not be definitely set forth in the records because in scores of instances employers and representatives of employees have counseled with and accepted the judgment and advice of the commissioners on matters of industrial relationship which possibly might have resulted in serious strikes or lockouts. There is no way of recording the exact results of this important part of the work of the commissioner of conciliation."

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During 1925–26 the service used its good offices in 551 industrial disputes, and was successful in securing settlements in 377 cases. In 70 cases, the commissioners aided State and local agencies and civic committees in clearing up disputes. In 61 cases, they were unable to secure an adjustment but in a few even of these the dispute was later adjusted along lines suggested by the commissioners.

Data supplied to the Bureau of Labor Statistics by the conciliation service show that since the creation of the service in 1913, it has handled 7,503 industrial disputes, involving directly and indirectly approximately 11,000,000 employees. During the past five years, 2,558 cases, involving some 2,800,000 workers, have been referred to the conciliation service, and in from 84 to 87 per cent of the cases settlements have been reached. The average of cases handled per month during the five-year period is 51.

The service at the end of 1926 has before it for settlement 68 cases involving the relationship between men and management. These cases are from 17 States.

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CHILD LABOR

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Extent and Character of Child Labor

THE only comprehensive figures regarding the extent and occupational character of child labor in the United States are those of the United States census of 1920, many of which have been analyzed in publications of the Federal Children's Bureau. These figures show that at the time of the census there was a total of 1,060,858 children 10 to 15 years of age, inclusive, gainfully employed in the United States. This total was distributed by occupation and sex as shown in Table 1:

TABLE 1.—OCCUPATIONS OF CHILDREN 10 TO 15 YEARS OF AGE, INCLUSIVE, BY SEX [1]

Occupation	Boys		Girls		Total	
	Number	Per cent	Number	Per cent	Number	Per cent
Agricultural pursuits, forestry, and animal husbandry	459,238	64.3	188,071	54.3	647,309	61.0
Farm labor (home farm)	396,191	55.5	173,633	50.1	569,824	53.7
Farm labor (away from home)	51,000	7.1	12,990	3.7	63,990	6.0
Other pursuits	12,047	1.7	1,448	.4	13,495	1.3
Nonagricultural pursuits	255,010	35.7	158,539	45.7	413,549	39.0
Manufacturing and mechanical industries	104,335	14.6	81,002	23.4	185,337	17.5
Clerical occupations	59,633	8.3	20,507	5.9	80,140	7.6
Trade	49,234	6.9	14,134	4.1	63,368	6.0
Domestic and personal service	16,082	2.3	37,924	10.9	54,006	5.1
Transportation	15,617	2.2	3,295	1.0	18,912	1.8
Extraction of minerals	7,045	1.0	146	(2)	7,191	.7
Professional service	1,979	.3	1,486	.4	3,465	.3
Public service (not elsewhere classified)	1,085	.2	45	(2)	1,130	.1
Total	714,248	100.0	346,610	100.0	1,060,858	100.0

[1] Fourteenth Census of the United States, Population: 1920. Occupations of Children.
[2] Less than one-tenth of 1 per cent.

It will be seen that by far the largest numbers both of boys and of girls are found in agriculture, with manufacturing and mechanical industries standing second for both sexes. Among boys, clerical occupations, and among girls, personal and domestic service take third place. Agriculture and most forms of personal and domestic service are exempt from the restrictions of child labor legislation, and it is significant to note that 66.5 per cent of the boys and 65.5 per cent of the girls are found in these two unregulated industries. The probability is that the number in agriculture is really larger than shown, since the census figures were taken in January, at which time there is little farm work available for children, yet even so, the table shows that child labor laws affect little more than one-third of either the boys or the girls gainfully employed. Not far from one-sixth of the boys and over one-fifth of the girls are in manufacturing and mechanical pursuits, which are usually the first to be brought under legal control.

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The statement below gives in more detail the occupational distribution of the children 10 to 15 years of age who were engaged in nonagricultural pursuits in 1920:

	Number	Per cent
Messenger, bundle, and office boys and girls [1]	48, 028	11. 6
Servants and waiters	41, 586	10. 1
Salesmen and saleswomen (stores) [2]	30, 370	7. 3
Clerks (except clerks in stores)	22, 521	5. 4
Cotton-mill operatives	21, 875	5. 3
Newsboys	20, 706	5. 0
Iron and steel industry operatives	12, 904	3. 1
Clothing-industry operatives	11, 757	2. 8
Lumber and furniture industry operatives	10, 585	2. 6
Silk-mill operatives	10, 023	2. 4
Shoe-factory operatives	7, 545	1. 8
Woolen and worsted mill operatives	7, 077	1. 7
Coal-mine operatives	5, 850	1. 4
All other occupations	162, 722	39. 3
All nonagricultural pursuits	413, 549	100. 0

This shows that over one-fifth (21.1 per cent) of the total group are operatives in some variety of mill, factory, or mine; 5 per cent, as newsboys, work under rather indefinite regulation; 10 per cent, as servants and waiters, may or may not be under legal supervision, according to whether their work is in hotels, restaurants, and similar places, or in private homes.

Geographical Distribution

GEOGRAPHICALLY the working children are widely distributed. In 1920 the proportion of children 10 to 15 years of age, inclusive, who were gainfully employed ranged from 3 per cent in the three Pacific Coast States to 17 per cent in the east South Central States, comprising Kentucky, Tennessee, Alabama, and Mississippi. When all occupations are taken into account, the proportion of children at work was much larger in the South than in any other section of the country; but when nonagricultural occupations alone are considered, the proportion was considerably larger for New England and for the Middle Atlantic States, and slightly larger for the east North Central States—Ohio, Indiana, Illinois, Michigan, Wisconsin—than for any of the three southern geographic divisions.

[1] Except telegraph messengers. [2] Includes clerks in stores.

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TABLE 2.—PER CENT OF CHILDREN ENGAGED IN GAINFUL OCCUPATIONS, BY STATES, 1920 [1]

Division and State	Children 10 to 15 years of age, inclusive						
	Total	Engaged in gainful occupations					
		Number	Per cent	Agricultural		All other	
				Number	Per cent	Number	Per cent
New England	768,131	59,239	7.7	3,053	0.4	56,186	7.3
Maine	82,829	2,585	3.1	823	1.0	1,762	2.1
New Hampshire	45,691	1,526	3.3	215	.5	1,311	2.9
Vermont	38,579	1,277	3.3	510	1.3	767	2.0
Massachusetts	394,026	33,723	8.6	831	.2	32,892	8.3
Rhode Island	63,739	8,569	13.4	119	.2	8,450	13.3
Connecticut	143,267	11,559	8.1	555	.4	11,004	7.7
Middle Atlantic	2,397,736	131,541	5.5	8,922	.4	122,619	5.1
New York	1,059,635	49,846	4.7	2,401	.2	47,445	4.5
New Jersey	341,185	26,024	7.6	998	.3	25,026	7.3
Pennsylvania	996,916	55,671	5.6	5,523	.6	50,148	5.0
East North Central	2,312,711	100,801	4.4	23,425	1.0	77,376	3.3
Ohio	596,741	18,119	3.0	3,721	.6	14,398	2.4
Indiana	323,979	16,911	5.2	4,844	1.5	12,067	3.7
Illinois	699,310	36,933	5.3	5,801	.8	31,132	4.5
Michigan	384,213	13,154	3.4	3,588	.9	9,566	2.5
Wisconsin	308,468	15,684	5.1	5,471	1.8	10,213	3.3
West North Central	1,477,363	57,906	3.9	29,722	2.0	28,184	1.9
Minnesota	277,528	8,271	3.0	4,698	1.7	3,573	1.3
Iowa	270,217	9,121	3.4	4,184	1.5	4,937	1.8
Missouri	395,682	22,587	5.7	9,622	2.4	12,965	3.3
North Dakota	87,883	2,816	3.2	2,364	2.7	452	.5
South Dakota	78,427	2,555	3.3	1,928	2.5	627	.8
Nebraska	155,920	5,286	3.4	3,171	2.0	2,115	1.4
Kansas	211,706	7,270	3.4	3,755	1.8	3,515	1.7
South Atlantic	1,911,574	273,981	14.3	214,906	11.2	59,075	3.1
Delaware	23,809	1,406	5.9	393	1.7	1,013	4.3
Maryland	164,546	12,300	7.5	3,168	1.9	9,132	5.5
District of Columbia	35,230	1,871	5.3	5	(2)	1,866	5.3
Virginia	311,915	25,493	8.2	15,501	5.0	9,992	3.2
West Virginia	191,299	7,431	3.9	4,112	2.1	3,319	1.7
North Carolina	373,484	62,162	16.6	50,582	13.5	11,580	3.1
South Carolina	260,204	63,520	24.4	56,920	21.9	6,600	2.5
Georgia	427,235	88,934	20.8	77,105	18.0	11,829	2.8
Florida	123,852	10,864	8.8	7,120	5.7	3,744	3.0
East South Central	1,267,275	221,342	17.5	196,620	15.5	24,722	2.0
Kentucky	318,408	26,754	8.4	21,036	6.6	5,718	1.8
Tennessee	323,548	39,837	12.3	32,326	10.0	7,511	2.3
Alabama	349,537	84,397	24.1	77,395	22.1	7,002	2.0
Mississippi	275,782	70,354	25.5	65,863	23.9	4,491	1.6
West South Central	1,449,764	184,267	12.7	158,187	10.9	26,080	1.8
Arkansas	259,593	48,140	18.5	45,686	17.6	2,454	.9
Louisiana	258,052	32,274	12.5	23,718	9.2	8,556	3.3
Oklahoma	289,533	22,981	7.9	19,752	6.8	3,229	1.1
Texas	642,586	80,872	12.6	69,031	10.7	11,841	1.8
Mountain	393,563	15,612	4.0	8,950	2.3	6,662	1.7
Montana	60,045	1,402	2.3	678	1.1	724	1.2
Idaho	54,641	1,608	2.9	1,092	2.0	516	.9
Wyoming	20,387	608	3.0	307	1.5	301	1.5
Colorado	104,790	4,558	4.3	1,955	1.9	2,603	2.5
New Mexico	48,032	2,195	4.6	1,418	3.0	777	1.6
Arizona	38,278	2,711	7.1	1,981	5.2	730	1.9
Utah	60,675	2,361	3.9	1,477	2.4	884	1.5
Nevada	6,715	169	2.5	42	.6	127	1.9
Pacific	524,465	16,169	3.1	3,524	.7	12,645	2.4
Washington	138,645	4,650	3.4	1,024	.7	3,626	2.6
Oregon	81,500	2,462	3.0	668	.8	1,794	2.2
California	304,320	9,057	3.0	1,832	.6	7,225	2.4
United States	12,502,582	1,060,858	8.5	647,309	5.2	413,549	3.3

[1] Compiled from Fourteenth Census of the United States, Population, 1920: Children in Gainful Occupations, p. 13.
[2] Less than one-tenth of 1 per cent.

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Changes in Extent of Child Labor from 1910 to 1920

THE 1920 census showed a considerable decrease in the number of children gainfully employed as compared with the figures for 1910. The following table gives the percentage changes:

TABLE 3.—RELATIVE CHANGE IN NUMBERS OF CHILDREN AND OF ALL PERSONS 10 YEARS OF AGE AND OVER GAINFULLY EMPLOYED, 1910 TO 1920, BY OCCUPATION AND AGE [1]

Occupation	Per cent of increase or decrease, 1910–1920		
	All persons 10 years of age and over	Children 10 to 15 years of age	Children 10 to 13 years of age
Total population	+15.6	+15.5	+18.4
Total gainfully employed	+9.0	−46.7	−57.8
Agriculture, forestry, and animal husbandry	−13.5	−54.8	−58.9
Farm laborers (home farm)	−44.1	−50.8	−55.1
Farm laborers (working out)	−22.1	−75.4	−81.1
Nonagricultural pursuits	+20.2	−25.9	−48.8
Extraction of minerals	+13.0	−60.2	−72.6
Manufacturing and mechanical industries	+20.6	−29.0	−71.1
Transportation	+16.2	−9.1	−29.1
Trade	+17.4	−10.4	−1.7
Public service (not elsewhere classified)	+67.8	+110.4	+142.9
Professional service	+26.6	−2.8	+7.4
Domestic and personal service	−9.7	−51.9	−62.7
Clerical occupations	+80.0	+12.9	−4.6

[1] Compiled from Fourteenth Census of the United States, 1920: Children in Gainful Occupations, pp. 65, 68; Occupations, Age of Occupied Persons, p. 378; Thirteenth Census of the United States, Vol. IV, Population, 1910, Occupation Statistics, p. 302.

According to the United States Census Bureau, a large part of the decrease in the number of children reported in 1920 as employed is apparent rather than real. This is due primarily to a change in the census date from April 15 in 1910 to January 1 in 1920, a circumstance which largely explains the smaller number of children reported in 1920 as engaged in farm work and other seasonal occupations in which fewer children are employed in January than in the spring. Since by far the greater part (84.5 per cent) of the decline in the number of children reported at work in all occupations is due to the large decrease (54.8 per cent) in the number reported as employed in agricultural pursuits, clearly much of the total decrease reported in 1920 can not be regarded as an actual reduction in the total numbers of children gainfully employed. In the nonagricultural occupations, however, much of the decline in the numbers of children reported as employed represents a real decrease, which may safely be attributed to conditions affecting directly and especially the labor of children. Chief among these are the enactment and strengthening of legal regulations.

Restrictions on Industrial Employment of Children

CHILD labor has always existed in this country, and in view of the modern position there is a certain irony in the fact that the earliest legislation on the subject in the colonies was passed to enforce the productive employment of children, especially in cotton spinning. With the industrial revolution, however, and the

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growth of the factory system, the conditions of child labor changed entirely, and protective measures began to appear on the statute books of the various States. At first these laws were intended only to secure for the working child some chance for an education, and as early as 1813 Connecticut passed a law "providing for the education of working children by the proprietors of manufacturing establishments in which children were employed."[3] Next came regulation of hours of work for minors, and then prohibition of employment of children under specified ages. Little effective legislation, however, was passed before 1860, and what might be called modern standards did not appear until near the end of the century.

By the beginning of the twentieth century child labor had become an exceedingly live issue, and a number of States were taking active steps to control and regulate it. There was a strong conviction, however, that a problem of such dimensions required coordinated treatment by an organization of national scope, and in 1904 the National Child Labor Committee was formed. With other organizations it was instrumental in securing the passage of a resolution by Congress in 1907 authorizing the Commissioner of Labor to conduct an investigation into the whole subject of woman and child wage earners, with special reference to the physical and moral effects of their employment, the safeguards provided for them, their wages, cost of living, and the like. The investigation thus authorized was the first general inquiry into the conditions of child labor throughout the Union, and its published results played a part in bringing about the establishment of the Federal Children's Bureau in 1912. This bureau was not intended to supersede in any way the work of the separate State bureaus, but to supplement their efforts, covering a wider field, aiding to establish national standards, and dealing with questions—such as the employment of migratory child workers or the varying conditions under which children are employed in a given industry in different parts of the country—which do not fall within the province of any individual State. Also, it deals with matters of child welfare apart from industrial employment.

Age and Hours of Labor

EVERY State in the Union regulates by law the employment of children. All but Wyoming prescribe a minimum age for entrance on employment, and this State has a compulsory school-attendance law, effective during the time that the public schools are in session.

The following table presents the standards fixed for employment in factories and workshops so far as age and hours are concerned; also the minimum age for employment in mines. As a rule the same standard applies to mercantile establishments and to factories, though there are some exceptions. In some States the same standards also apply to all gainful occupations; but inasmuch as interest centers on the subject of factory employment, the table presents this topic with the fewest possible notes.

[3] U. S. Department of Labor. Children's Bureau. Publication No. 93. Washington, 1926, p. 4.

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MINIMUM AGE AND MAXIMUM HOURS FOR THE EMPLOYMENT OF CHILDREN

State	Factories and workshops						Mines, minimum age
	Minimum age	Work time limited to—			Night work prohibited		
		Age	Hours per—		To age	Between	
			Day	Week			
						p.m. a.m.	
Alabama	14	16	8	48	16	7 6	16
Arizona	14	[1] 16	8	48	[1] 16	7 7	18
Arkansas	14	16	8	48	16	7 6	16
California	16	18	8	48	18	10 5	16
Colorado	14	16	8	48	16	8	16
Connecticut	14	16	8	[2] 6	16	6 6	16
Delaware	14	16	8	48	16	7 6	16
District of Columbia	14	16	8	48	16	7 6	--------
Florida	14	16	9	54	16	8 5	--------
Georgia	14	([3])	--------	60	16	7 6	16
Idaho	14	16	9	54	16	9 6	14
Illinois	14	16	8	[2] 6	16	7 7	16
Indiana	14	[1] 16	8	48	[1] 16	7 6	16
Iowa	14	16	8	48	16	6 7	14
Kansas	14	16	8	48	16	6 7	16
Kentucky	14	16	8	48	16	6 7	16
Louisiana	14	16	8	48	[1] 16	7 6	14
Maine	15	16	8	--------	16	6 6.30	15
Maryland	14	16	8	48	16	7 7	16
Massachusetts	14	16	8	48	16	6 6.30	--------
Michigan	15	18	10	54	[1] 16	6 6	15
Minnesota	14	16	8	48	16	7 7	14
Mississippi	14	16	8	44	16	7 6	--------
Missouri	14	16	8	48	16	7 7	16
Montana	16	([4])	8	--------	--------	--------	16
Nebraska	14	16	8	48	16	8 6	--------
Nevada	14	[1] 16	8	48	--------	--------	16
New Hampshire	14	[1] 16	10¼	54	16	7 6.30	14
New Jersey	14	16	8	48	16	7 7	18
New Mexico	14	16	8	44	16	7 7	14
New York	14	16	8	44	16	5 8	16
North Carolina	14	([5])	11	60	16	9 6	16
North Dakota	14	16	8	48	16	7 7	16
Ohio	16	[1] 16	8	48	[1] 16	6 7	16
Oklahoma	14	16	8	48	[1] 16	6 7	16
Oregon [6]	14	16	8	[2] 6	16	6 7	--------
Pennsylvania	14	16	9	51	16	8 6	16
Rhode Island	15	16	10	54	16	8 6	--------
South Carolina	14	([2])	10	55	16	8 6	14
South Dakota	14	16	10	54	--------	--------	14
Tennessee	14	16	8	[2] 6	16	7 6	16
Texas	15	15	8	48	15	10 5	17
Utah	14	[7] 14	8	48	--------	--------	16
Vermont	14	16	8	[2] 6	16	7 6	16
Virginia	14	16	8	44	16	6 7	16
Washington [6]	14	18	8	[3] 6	18	7 6	16
West Virginia	14	16	8	48	16	7 6	16
Wisconsin	14	16	8	48	16	6 7	18
Wyoming	--------	16	8	48	16	7 7	16

[1] 18 for females.
[2] Days.
[3] Employees in cotton and woolen mills; no age limit.
[4] Females; no age limit.
[5] Factories; no age limit.
[6] Work time and night work fixed by order of commission.
[7] 16 for females.

Educational and Other Restrictions

AGE and hour limitations are the most obvious methods of regulating child labor, but other methods have been adopted in recent years, the most general being the requirement of educational qualifications, the establishment of minimum conditions of health and physical development, and prohibition of employment in dan-

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gerous or unhealthful occupations. According to a summary issued by the Children's Bureau in 1924 (its Publication No. 93), an educational qualification for children wishing to enter employment is required by 38 States, 30 of which require the completion of a specified school grade. In 29 States physical requirements have been established, and in 22 of these an examination by a physician is compulsory before an employment certificate may be issued. The earlier legislation as to prohibited occupations usually forbade the employment of children in "vocations injurious to health or dangerous to life or limb."

"While the language of these early provisions was so broad that it would seem to have included the employment of children under the prohibited age in occupations in which they were exposed to dangerous gases, poisons, and other health hazards, it was generally narrowly interpreted so as to include only immoral exhibitions, acrobatic performances, and other occupations usually described as vicious in themselves. About 1900 the policy of including in the child-labor laws a list of machines and of certain unhealthful occupations was begun."

Trend and Difficulties of Regulation

THE standards of child-labor regulation have been fairly well worked out by this time. It is rather generally agreed that before a child begins industrial work he should have the time and opportunity to secure the beginning of a sound physical development and at least the rudiments of an education; that when employed he should be guarded against the strain of overlong hours, and overheavy work, and night work; that since a child is naturally and inevitably more heedless than adults, he should be excluded from the more hazardous pursuits; that he should not be allowed to work under unhealthful or demoralizing conditions; and in some parts of the country it is agreed that he should have opportunities while employed for carrying on his education, especially along vocational lines, at least until he reaches the age of 18. These aims have not all been attained, but public opinion has been aroused to their desirability, and progress is being made toward them. A number of problems, however, still demand attention, some rising from the difficulty of enforcing the laws, and some due to the fact that certain industries or occupations are exempt from regulation. Sometimes one industry presents problems of both kinds, owing to differences in State laws. An illustration of this is found in the canning industry, in which children are numerously employed. (See article below.)

Child Labor in Fruit and Vegetable Canneries

IN THE year ending June 30, 1926, the Children's Bureau made an investigation into the extent and conditions of child labor in the fruit and vegetable canneries of six States, covering "the special problems of the migratory child worker in the canning industry, including housing, sanitation and the methods of recruiting

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such labor." The results of the study are summarized in the annual report of the chief of the bureau for the year, as follows:

"Inspections were made in 536 canneries in six States (Delaware, Indiana, Maryland, Michigan, New York, Wisconsin). These establishments together employed approximately 52,000 persons, of whom 3,276, employed in 473 establishments, were under 16 years of age, 1,120, or more than one-third of these, being less than 14, or under the legal age for employment in canneries in all but one of the States included in the inquiry. In this State, in which children of 12 years of age could legally be employed in canneries during school vacations, 114 children under this age were at work, many of them after the opening of school in the fall. In all, 302 of the children were less than 12 years of age, 57 of these being under 10. A number of children, including some too young for legal employment in canneries under the child labor laws of their States, were working in hazardous occupations or under conditions detrimental to their health or safety.

"Hours of work were long for the majority of the children, reliable information obtained from time records or other sources showing that at least 2,771, or more than four-fifths of the working children under 16 (including 966 children under 14), had worked over eight hours a day. In the canning industry long work days at the peak of the season are customary, and in a number of States this industry is exempt from the legal hour restrictions applicable to women and minors in other factory work. In all six of the States included in this inquiry the hours of labor of children in factory work were regulated by law, but in three of these States canneries were specifically exempted. In the other three the maximum 8-hour day and 48-hour week for factory work covered work in canneries; but though the proportion of workers under 16 employed more than eight hours a day was less in these States than in those in which there was no legal regulation as to hours (59 per cent as compared with 92 per cent) their number (476) was not inconsiderable. Moreover, a large proportion of the children under 16 years of age (2,174, or about three-fifths of the total) worked 10 hours or more; one-fifth (684) worked 12 hours or more; 246 (87 of whom were girls) worked 14 hours or more, and 62 (including 9 girls) worked from 16 up to 20 hours. Weekly hours also were in many cases excessive.

"A considerable number of children worked at night. Almost two-fifths (1,241, or 38 per cent) of those under 16, including 421 under 14 years of age, were found to have been employed between the hours of 7 p. m. and 6 a. m., contrary to the provisions of the former Federal child labor laws and of the laws regulating the work of children in factories in 34 States at the present time. Night work is not regulated in canneries in the three States included in this study which do not regulate the maximum daily and weekly hours of employment, although prohibited in other kinds of factory employment. In the three States in which legal prohibition exists 265, or 33 per cent, of the child workers under 16 were employed between 7 p. m. and 6 a. m., as compared with 976, or 39 per cent, of the children in the three States in which no such legal regulation exists."

The study shows in general that children under 16 are very generally employed in the canning industry; that in some States, because

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of the exemption of canneries from the laws regulating the work of children in other manufacturing industries, many children are employed without adequate legal protection; and that even in States where laws exist for their protection a very considerable number of children are employed in violation of these laws.

Children in Agriculture—Migratory Workers

THERE are few regulations applying to the work of children in agricultural occupations. Agricultural employment for children, as the layman often thinks of it, consists in a child's doing chores suited to his strength around his father's place, gradually taking up one occupation after another, and learning farming in a natural, practical, and healthful way. Unfortunately the development of agriculture into a large-scale industry has led to the employment of children, sometimes on their parents' place, but more often among strangers, under conditions of long hours, unsuitable work, and sometimes hazardous occupations, almost as undesirable as are found in unregulated factory industries. For several years the Children's Bureau carried on special studies along this line. Some of its findings are brought together in a report on migratory child workers made to the Association of Governmental Labor Officials at a convention held in June, 1926. The following is an abstract of that report:

"During the period 1920–1924, the industrial division of the Children's Bureau made a series of studies of children engaged in agricultural work, selecting typical farming areas in different sections of the country with the idea of giving a fairly representative picture of the work of children on farms. By personal interviews detailed information was obtained regarding approximately 13,500 children under 16 years of age engaged in agricultural labor full time, though usually seasonal, in 14 States, including sugar-beet growing sections in Michigan and Colorado, cotton-growing counties in Texas, truck and small-fruit areas in southern New Jersey and in Maryland, Virginia, Illinois, Washington, and Oregon, wheat, potato raising, and grazing sections in North Dakota, a section in the Illinois corn belt, and tobacco-growing districts in Kentucky, South Carolina, Virginia, Massachusetts, and Connecticut."

The most undesirable conditions found during these investigations were those affecting migratory children, of whom the number was unexpectedly large.

"Approximately 3,000 migratory child workers were included in the Children's Bureau studies, regarding as migratory workers those who were not living at home during the period in which they worked on the farms. These children were found in the greatest numbers working in the beet fields of Colorado and Michigan and on the truck farms of Maryland and New Jersey and the fruit and the hop ranches of the Northern Pacific States, but a few of them worked in the cotton fields in Texas and on truck farms in the vicinity of Chicago.

"The migratory children included in the Children's Bureau studies by no means represent the total number of such child workers, even

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in the sections where the studies were made. For example, in parts of Weld and Larimer Counties in the Colorado sugar-beet raising districts the Children's Bureau study included 1,073 children who were beet field workers, of whom 774, or 72 per cent, were contract laborers' children, almost all of whom were migratory workers; whereas it was estimated by the judge of the Weld County court that about 2,500 children were at work in the beet fields of Weld County and if the proportion of migratory laborers' children in the Children's Bureau study holds good for these there were almost 1,800 migratory child workers on the beets in this one county. In the study of children working on the hop ranches and in the fruit orchards of Washington and Oregon some of the largest ranches even in the districts surveyed were not visited, so that the 1,000 migratory child workers interviewed were only a small proportion of the number at work. Conditions as found by the Children's Bureau do not, therefore, give a complete picture of children throughout the country who migrate to the farms for seasonal work, but it is believed to be a representative one."

The most objectionable conditions found in connection with the employment of migratory child workers, in these investigations, were the housing situation, the long hours worked, and the interference with school attendance. Each of these topics is discussed at some length.

Housing and Sanitation

"ALTHOUGH farmers were beginning to realize that they could not attract and hold the better class of laborers unless they provided comfortable quarters, only too often the living arrangements for migratory workers were the veriest makeshift, violating every standard of decency as well as comfort.

"Laborers' families in both Colorado and Michigan occupied any kind of shelter that was available for temporary use—abandoned farm houses, rude frame or tar-paper shacks, and even tents and caravan wagons—though some of the sugar companies in Michigan had provided one or two room portable cottages for their laborers. The dwellings were in many cases in bad repair, dark, ill ventilated, and far from weatherproof. Overcrowding was extreme. In Colorado 77 per cent and in Michigan 60 per cent of the laborers' families lived with two or more persons per room. Sanitation was poor, and the water supply especially in the irrigated districts of Colorado, was often neither plentiful nor protected against contamination. Most of the laborers occupied their 'beet shacks' for five or six months a year.

"In Anne Arundel County, near Baltimore, Md., individual farmers maintained camps for the migratory workers. Most of them contained but one building, known as a shanty, which served as sleeping quarters for all workers, a weather-beaten or unpainted structure the windows of which usually lacked either glass or shutters or both. As a rule there was but one room on each floor, with stairs on the outside leading into the upper room. On each side of a narrow aisle down the center the floor was divided into sections or pens by boards 10 or 12 inches in height, each being about 6 feet long and from 4 to 6 feet wide and covered with straw for a mattress. Each family was

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allotted one of these pens. At night men, women, and children, partially clad, one family separated from the next by the plank, lay side by side. One such shanty in one of the camps housed 95 persons. More than one-half the families had no toilet facilities, 12 of the 25 camps visited had no privy, only one had adequate toilet arrangements, and most of the camps were located dangerously near the water supply. 'Here we are like fish in a barrel' many families declared, describing the way in which they lived as 'like hogs,' 'like sheep,' and 'like cattle beasts.'

"In southern New Jersey the workers were generally housed in labor camps on the grower's premises, varying in size from a rude building or two, housing half a dozen families, to large, well-organized settlements, villages in themselves, housing 300 to 400 pickers. The living quarters were either one or two room row buildings or large two-story barnlike structures divided into small rooms upstairs and down and housing many families. Some of the camp buildings were in good repair, but even in the best camps congestion was very great; 55 per cent had three or more persons per room, 27 per cent at least four. The amount of cubic air space was very inadequate. No provision was made for disposal of garbage or of waste water, and the privies were often insanitary. In connection with the housing provided for migratory families in New Jersey it is interesting to note that the Mothers' Assistance Fund of Philadelphia would not grant mothers' pensions to families migrating to the truck farms, on the ground that the crowded conditions in the country were bad for the children."

Conditions of Work

"THE child workers in industrialized agriculture—employed, as they usually are, for harvesting when speed is essential, working at piece rates, at monotonous and repetitive operations, and under the eye of the row boss—work under conditions not very different from those of factory hands, except that their hours are often much longer than factory hours.

"The Children's Bureau found that on New Jersey truck farms 41 per cent of the migratory child workers of all ages worked at least 9 hours a day and 12 per cent worked 10 or more hours. The 9 or 10 hour day for children was even more common in the hopyards and fruit orchards of Washington and Oregon; in the hopyards and prune orchards of the Willamette Valley district studied in Oregon 33 per cent of the migratory child workers worked at least 10 hours a day, and in the Yakima Valley district in Washington, where the children were employed chiefly in picking hops, 87 per cent worked 10 hours or more a day. The migratory children who picked cotton in Texas worked at least 8 hours a day, and 68 per cent had a working-day of at least 10 hours. Perhaps the longest hours of all were those reported by beet-field workers; from 50 to 75 per cent of the contract laborers' children in the Colorado and Michigan districts (the proportion varying with the different operations) worked 10 hours or more a day, the working-day in some cases running to 13 or 14 hours.

"Almost no attempt has been made to restrict the hours of agricultural work for children nor to fix a minimum age for farm work, so

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that children under 10 years of age, and even under 8, work these excessive hours in many different parts of the country."

Schooling

"ONE of the most serious effects of migratory farm work on children is its interference with their education. The children leave school in the spring to go out to the farms, and it is often November or later before they return; where the families have no settled home even in the winter, but follow the crops the year round, as do many of the migratory workers in the Pacific Coast States, the children are never long enough in one place to enter school, or else they are enrolled in so many different schools during the year that they are unable to make any progress.

"The beet-field workers are likely to be withdrawn from school for the exodus to the beet fields in March, April, or May, not to return until November or December, and sometimes even January. In the Colorado district studied the contract laborers' children who lived a few miles from the beet fields lost on an average one-fourth of the school term, and a study of the school attendance of Colorado beet-field workers attending school in Denver and Lincoln showed that these migratory children had attended school only from 42 to 56 per cent of the term. From 47 to 78 per cent of the various groups of migratory beet-field workers in Michigan and Colorado were retarded in school. Comparison of the children working in the beet fields with nonworking children, based upon the school records of several thousand children, showed that the percentage of retarded children was 20 to 30 per cent higher among the employed than among the nonemployed children.

"The bean pickers and other migratory child workers on the truck farms of Anne Arundel County, Md., had lost from four to six weeks of the school term in Baltimore because they had withdrawn from school to go to the country, and 69 per cent of these workers were below the grades which they should have been in.

"In Washington and Oregon the beginning of the hop harvest in September coincided with the opening of schools in many places from which the migratory workers came and the strawberry season in June in some sections of Washington and Oregon began before all the schools were closed. Children in families who follow the crops suffer most from irregular attendance, as they either do not go to school at all in the districts where their parents find work or else go irregularly to several schools in one year. Although county attendance officers and local school boards in the Yakima Valley and Williamette Valley districts studied made unusual efforts to get the migratory children to go to school, in families which move from county to county and from State to State the children's schooling was at the mercy of the parents' standards. Fifty-three per cent of the migratory workers in these districts had missed at least one school month, twice as many in proportion as local workers who had lost as much time as that from school, and from 31 to 59 per cent of the migratory workers were retarded.

"Although the actual time worked by the migratory children in southern New Jersey was seldom more than three months, the work

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extended over a period beginning sometimes as early as March and lasting until after the cranberry harvest in October or November. As a rule no effort was made to send the children to school during their residence in New Jersey. The local school authorities assumed no responsibility, on the ground that the children were not residents of the State. The farmers were not usually interested in getting the children in school, as they felt that they needed the children's work in order to get their crops to market. Parents were for the most part primarily intent upon the money that the children's labor added to the family income, which would be considerably diminished if the children of the family were compelled to spend part of the day in school. Half the children included in the study in New Jersey had lost 8 weeks or more from school and about 29 per cent had lost at least 12 weeks. The average absence for farm work was 43 days. Almost three-fourths (74 per cent) of the children were retarded in school. A special supplementary study of about 800 Philadelphia school children leaving school to work on farms, principally in New Jersey, showed that the average school attendance of these children was only between 70 and 75 per cent of the term, and 18 per cent of them had attended school less than 60 per cent of the term. The average absence for farm work was between 15 and 20 per cent of the school year. Among these children also it was found that almost three-fourths (71 per cent) were below the standard grades for their ages."

Industrial Home Work of Children

THE home work of children is hard to regulate because of the difficulty of supervising it. Hours may be overlong or work unsuitable or conditions unhealthful, but no inspection force can visit sufficiently often to see that the child is protected.

Philadelphia Study

IN 1924 a study of the industrial home work of children was made in five counties in the Philadelphia region, the results of which were recently issued by the Bureau of Women and Children of the Pennsylvania Department of Labor and Industry. The following summary gives some of its findings:

Under the Pennsylvania law, minors under 14 may not be employed in any industrial process, and those between 14 and 16 must have employment certificates before they may be legally employed. The investigation covered 1,526 families, of which 1,243 had children in the home. In half (621) of the families of this latter group, children to the number of 1,239 were illegally employed at industrial home work. The largest number, 455, were working on men's clothing, 104 were employed on women's and children's clothing, 100 worked on knit goods, 427 worked at stringing tags, and 153 were engaged in miscellaneous forms of work. By age, the 1,235 children whose age was reported showed the grouping which follows.

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	Number	Per cent
Under 6 years	68	5.5
6 and under 8 years	114	9.2
8 and under 10 years	229	18.5
10 and under 12 years	307	24.9
12 and under 14 years	295	23.9
14 and under 16 years	222	18.0
Total	1,235	100.0

The great majority, it will be seen, were under the age at which they might legally be employed at any kind of industrial occupation; the comparatively small group aged 14 but under 16 were old enough to be employed, but had no employment certificates.

Stringing tags employed the largest group of very young children, the next largest group being employed on men's clothing, pulling out bastings and picking off ravelings. Girls were employed more numerously than boys, three out of every five of the employed children being girls. Ninety-three per cent of the group were native born, but 67 per cent had foreign-born fathers. In 90 per cent of the families the father was living and at home with the family; 4 per cent of the fathers were reported as out of work. The median earnings of the fathers in families having children illegally employed were between $25 and $35 a week, while for the families in which no children were working they were between $15 and $25.

Nearly twice as many of the fathers in families where children did not work as in families where the children were working illegally fell in the lowest-paid group. The economic status of the father seems, therefore, comparatively unimportant as a deciding factor in the illegal employment of children at home work.

It was difficult to get accurate information as to the time the children spent at work, but data were secured as to the time at which they worked. "Nearly 40 per cent of the children reported afternoon work only, but 61 children, or 5 per cent, were reported as working morning, afternoon, and evening. More than one-half of this latter group were stringing tags. Although no minor under 16 may be legally employed after 8 o'clock at night, 387, or 32 per cent, of the children were reported as working after 8 o'clock at night." These figures relate to the time of working on school days, but in addition 367 worked on Saturday, 4 on Sunday but not on Saturday, and 46 worked on both Saturday and Sunday.

It was impossible to secure the earnings of individuals, but for 599 families in which children were illegally employed, the earnings at home work for the week preceding the inquiry were learned. Three-fifths (61.9 per cent) had earned less than $6 during the week, 16 per cent had earned $6 but under $8, and only 13.9 per cent had earned $10 or over.

The findings of the inquiry furnished a basis for new regulations affecting industrial home work, which were adopted by the Pennsylvania Department of Labor and Industry in June, 1925. At the time this report was prepared these regulations had been in force for six months, and the great majority of the employers affected had shown themselves ready and willing to cooperate in working out plans for insuring their observance.

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New Jersey Study

MORE recently the Federal Children's Bureau conducted an investigation into industrial home work of children in New Jersey. Its report on the subject has not yet been issued, but an advance summary in the annual report of the Chief of the Children's Bureau for 1926 shows some of the conditions existing:

> Though the State department during the last few years has given special attention to the enforcement of the laws relating to home work, children as young as 5 were found to have been engaged in such work for at least a month's time during the year. Almost one-fourth of the children who had done industrial home work in these families were under 10 years of age and almost four-fifths were under 14, the legal age for factory employment under the New Jersey child labor law.
>
> "Speeding up" was common, particularly in the highly seasonal industries. Although the children as a rule work irregularly they may be kept at their tasks for long hours during the season when employers are giving out large quantities of work. Even while school was in session one-eighth (13 per cent) of the children worked four, five, and six hours a day, which meant night work for many of them.

Work Accidents to Minors

THE Federal Children's Bureau published in 1926 a report (its Publication No. 152) bringing together the results of investigations of work accidents to minors in three States, Massachusetts, Wisconsin, and New Jersey. All three of these States make special efforts to protect young workers. All set 14 as the minimum age for industrial employment, and each forbids the employment of those under 16 in specified dangerous occupations. Massachusetts and Wisconsin go further and forbid employment under 18 in certain occupations considered especially hazardous. Yet the number of accidents was large: "Within 12 months 7,478 industrial injuries occurred to employed minors under 21 years of age in three States, 38 resulting fatally, 920 in partial disability for life, and the remaining in disability lasting for more than a week (for more than 10 days in case of injuries occurring in two of the States)."

The accidents differed considerably in severity in the three States, as shown in the following table:

NUMBER OF ACCIDENTS BY RESULT AND STATE

State	Accidents resulting in—			Total accidents
	Death	Permanent partial disability	Temporary disability	
Massachusetts	12	159	3,006	3,177
New Jersey	14	502	1,503	2,019
Wisconsin	12	259	2,011	2,282
Total	38	920	6,520	7,478

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Classified as to cause, the industrial injuries to minors in the three States show the following grouping:

Cause of injury	Number of injuries	Per cent of total
Machinery	2,706	36.2
Handling objects	1,643	22.0
Falls of persons	779	10.4
Vehicles	543	7.3
Hand tools	469	6.3
Stepping on or striking against objects	415	5.5
Falling objects	288	3.9
Hot and corrosive substances	262	3.5
All other and not reported	373	5.0
Total	7,478	100.0

It will be noticed that more accidents were due to machinery than to any other cause. Most of the machines causing injury, according to the report, were power driven.

"The types of power-driven machines on which most of the injuries occurred were in each State those used in its chief industries. In Wisconsin metal-working, woodworking, and paper and paper products making; in Massachusetts textile, metal-working, and leather-working; and in New Jersey metal-working, rubber and composition working, and textile machines were the most frequent cause of the machine injuries.

"Operation of certain dangerous power-driven machines is forbidden to children under 16 years of age in all three of the States in which the study was made; and the prohibition of these occupations to minors under 18 years would materially decrease the number of injuries to young workers. There were proportionately more accidents from power-driven machinery to minors 16 and 17 years of age than to those under 16, who were more adequately protected by the law; or to those of 18 years or over, who had more experience, more nearly mature judgment, and better powers of muscular coordination. Moreover, minors 16 and 17 years old suffered proportionately more severe injuries than either the younger or the older workers. Death or permanent partial disability resulted from 13.4 per cent of all the injuries to workers 16 and 17 years of age; for workers under 16 the corresponding percentage was 10.7, and for workers of 18, 19, and 20 years it was 12.7.

"The necessity of providing legal safeguards for young workers is indicated by the severity of the injuries to Wisconsin minors employed under illegal conditions.[4] One-third of the injuries occurring to minors at work in illegal occupations, and one-half of the injuries caused by violation of safety orders (as compared with only one-tenth of the injuries to minors employed under legal conditions) resulted in death or permanent partial disability."

The matter of accidents to minors who are illegally employed is beginning to attract considerable attention, Pennsylvania being one of the first States to make a special investigation of the subject.

[4] Wisconsin is the only State of the three covered by the study where statistics are available on this point.

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Injuries to Illegally Employed Minors in Pennsylvania

IN WISCONSIN if a child is injured in an industrial accident while illegally employed, he is entitled to three times the compensation which would be due if his employment were legal, a plan which is said to be very effective in discouraging the illegal employment of minors. (See Labor Review, April, 1923, p. 128.) In Pennsylvania, under the same circumstances, the child is expressly excluded from benefit under the workmen's compensation law. No information concerning accidents to this class of young workers is available, therefore, on the records of the compensation commission, and it has never been known how many are injured in the course of illegal employment.

With a view to gaining some light on this question, the Pennsylvania Bureau of Inspection made an investigation of all accidents reported as occurring to minors under 18 during the months of June and July, 1925, and published a summary of its findings in Labor and Industry for February, 1926. Thirty-seven minors, or 8.5 per cent of the group investigated, had been, it was found, illegally employed, and of these, 25 were under 16 years of age. In several instances there had been more than one illegality in connection with the employment of the injured minor. Twenty-two had no employment certificates, 16 were in prohibited occupations, 4 were employed for more than the legal maximum of hours, 2 were in night work, 2 had a 7-day week, and 1 was under 14 years of age.

As the sufferers were not under the operation of the compensation law, no record was available of the loss of time through the injuries received, but some of the accidents had been serious. One boy of 16 had been killed while driving a truck, an occupation prohibited to minors under 18 years of age. Seven had had broken arms or legs, 3 had fingers or parts of fingers amputated, 10 had suffered severely strained or crushed limbs, while the remaining 16 had suffered less serious injuries. The results of the study show, it is held, the need for more study of noncompensable accidents to minors.

If the facts brought out for the sample investigated hold true for all minors under 18 years of age, and there is no reason to believe that they do not, 8.5 per cent of all minors injured at industrial accidents are debarred from compensation benefits.

This investigation emphasized, above all else, the fact that since with the utmost care in the enforcement of the law illegal employment of children probably can never be eliminated entirely, more information must be obtained regarding accidents occurring to minors not coming under the compensation law.

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Extent and Character of Convict Labor

IT is now generally conceded that a convict should be kept at work both for his own good and for the good of the State, but there is difference of opinion as to what the work should be and as to the system under which the work should be done and the disposal of the product. His idleness means higher taxes for his maintenance, deterioration of his physical and mental well-being, and greater unfitness for his reentrance into the social and industrial world. On the other hand, if the convict is put at productive work he produces some article that directly or indirectly comes into competition with a similar article made by the free citizen. If the convict makes an article even for his own use, free labor does not get the chance to make that article. If the convict makes an article that is sold in the open market, there is one article less that might be made by free labor and the market price for the article is affected by the competition. Further, convict labor may be so concentrated on one particular kind of article that the prison article dominates the market almost to the extinction of the free-labor article. Again, the convict has nothing to say about the price of his labor; his labor is not mobile, he can not strike, and he can not be discharged for incompetence.

There is frequent demand on the part of legislators, of prison boards, of manufacturers, and of the public in general for information concerning the industrial side of prison administration. To meet this call for information, the Bureau of Labor Statistics from time to time has made surveys of the industrial features of convict labor. The most recent of these surveys was made in the latter part of 1923, and the full report published in Bulletin No. 372. The data regarding the extent and character of convict labor contained in this report are summarized below. These findings, as noted, relate to conditions existing in 1923. Federal legislation regarding convict labor in effect January 1, 1927, is given in detail in Bulletin No. 434 of the Bureau of Labor Statistics, entitled "Labor Legislation, 1926."

The survey made by the Bureau of Labor Statistics covered State and Federal prisons for civilian adults only. It did not include juvenile reformatories, county or city institutions, or Federal military prisons. Institutions maintained strictly as juvenile reformatories seldom produce much that goes into the general market. It is understood that a few county and city penal institutions have shops producing commercial goods, but the funds available for the bureau's study would not permit the inclusion of such institutions. Their omission, however, is of no great importance.

A total of 104 institutions were canvassed, 101 being State institutions and 3 Federal. All States, and the District of Columbia, were covered. The institutions bear various titles, as prison, penitentiary, reformatory, house of correction, workhouse, farm, camp, etc.

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The report for each institution covers all of the operations during one full year. It was not possible to get reports from the institutions for a year common to all, because of the different times of ending of the fiscal year in the several institutions. It was necessary to take the report for the last fiscal year for which figures were available. In most cases the reports were for the fiscal year ending in the latter part of 1923. Special agents of the bureau visited each institution, and practically all of the data were obtained from the several institutions, or from contractors having work done therein under the contract or piece-price system.

The average number of convicts in the institutions during the year reported was 84,761, of which 79,350 were in State prisons and 5,411 in Federal prisons. Of these 84,761 convicts, 51,799, or 61 per cent, were employed at productive labor. This number does not include 25,127 convicts, or 30 per cent, engaged in domestic prison duties such as cooking, washing, cleaning, etc. The sick averaged 2,602, or 3 per cent, and the idle 5,233, or 6 per cent. Of the 51,799 convicts employed at productive labor, 6,083, or 12 per cent, were working under the contract system, 3,577, or 7 per cent, under the piece-price system, 13,526, or 26 per cent, under the public-account system, 18,850, or 36 per cent, under the State-use system, and 9,763, or 19 per cent, under the public works and ways system.

The total number of convicts employed in the contract and piece-price systems combined was 9,660 and the amount paid the institutions for their hire was $3,290,777, or slightly more than $340 per annum per convict. This amount does not, however, include some money paid the convicts for extraordinary service by way of overtask bonuses.

The lease system, so frequently found in operation years ago, was not reported as in effect in any institution canvassed.

The relative importance of the several systems is further indicated by the value of the goods produced.

In the year covered the value of the goods produced under the several systems was as follows:

Contract system	$18,249,350
Piece-price system	12,340,986
Public-account system	16,421,878
State-use system	13,753,201
Public works and ways system	15,331,545
Total	76,096,960

The value of the products in the three Federal penitentiaries, which is included in the above statement, was $2,428,081.

All goods produced under the contract, piece-price, and public-account systems enter into the general competitive market. The total for the three systems was $47,012,214. Thus 62 per cent of all goods produced were destined for direct competition on the open market.

Systems of Employment

THE several systems under which convicts are employed, together with that of the lease system now obsolete so far as State and Federal institutions are concerned, are as follows:

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Contract system.—Under this system the State feeds, clothes, houses, and guards the convict. To do this the State maintains an institution and a force of guards and other employees. A contractor engages with the State for the labor of the convicts, which is performed within or near the institution. The contractor pays the State a stipulated amount per capita for the services of the convict, supplies his own raw material, and superintends the work.

Piece-price system.—This system differs from the contract system mainly in method of payment for the labor of convicts. The State maintains the institution and feeds, clothes, and guards the convicts. The contractor supplies the raw material and pays the State an agreed amount for the work done on each *piece* or article manufactured by the convicts. The supervision of the work is generally performed by a prison official, although sometimes by the contractors. The officials of the prison not only maintain discipline but also dictate the daily quantity of work required.

Public-account system.—So far as the convict is concerned, this system does not differ from the piece-price system, but for the institution it is entirely different. In the piece-price system the contractor finances the business and assumes all the chances of profit and loss. In the public-account system the State enters the field of manufacturing on its own account. It buys the raw material, manufactures and puts the product on the market, and assumes all the risk of conducting a manufacturing business. The State has the entire care and control of the convicts and with them conducts an ordinary factory. The institution may sell the product direct or through an agent.

State-use system.—Under this system the State conducts a business of manufacture or production, as in the public-account system, but the use or sale of the goods produced is limited to the same institution or to other State institutions. The principle of the system is that the State shall produce articles of merchandise for its own consumption alone and shall not compete directly with the business of manufacturers employing free labor.

Public works and ways system.—This system is very similar to the State-use system. Under this system the labor is applied not to the manufacture of articles of consumption, but to the construction and repair of the prison or of other public buildings, roads, parks, breakwaters, and permanent public structures.

Lease system.—Under this system the State enters into a contract with a lessee, who agrees to receive the convict, to feed, clothe, house, and guard him, to keep him at work, and to pay the State a specified amount for his labor. The State reserves the right to make rules for the care of the convict and to inspect the convict's quarters and place of work. No institution is maintained by the State other than a place of detention, where the convicts can be held until placed in the hands of the lessee and in which to confine convicts who are unable to work.

Conditions are not always so clearly defined as the above definitions would indicate. This is particularly true with respect to the contract and piece-price systems; for example, a firm may have an agreement with a penitentiary whereby a stipulated amount per man

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per day is to be paid, thus making the agreement fall under the contract system. But the agreement may further provide that a certain minimum task or amount of work must be performed in a day, making the agreement, while classed under the contract system, partake to some extent of the piece-price system.

Again, the major quantity of an article produced in an institution may fall under one system, with a minor surplus classed under another system. For example, an article may be produced primarily for State use, yet some of the commodity may be placed on the general market, making the minor part fall under the public-account system.

Table 1 shows, by States, the average number of convicts during the year, and the number employed at productive labor by systems of work. Only 20 States, or two-fifths of all, have the contract or piece-price system of employing their convicts. The public-account system was found in all States, except Ohio, New Hampshire, and the District of Columbia, but it was inconsequential in several States. The State-use system appears in all States and the public works and ways system in 28 States and in the District of Columbia.

TABLE 1.—NUMBER OF CONVICTS EMPLOYED AT PRODUCTIVE LABOR IN STATE AND FEDERAL PRISONS

State	Average number of convicts during year		Average number of convicts at productive labor, by system under which employed				
	Total	Employed at productive labor	State use	Public works and ways	Public account	Piece price	Contract
Alabama	2,988	2,553	534	264	276	----------	1,479
Arizona	383	56	19	34	3	----------	----------
Arkansas	1,295	1,053	156	----------	897	----------	----------
California	3,841	2,541	1,095	613	833	----------	----------
Colorado	1,003	795	346	379	70	----------	----------
Connecticut	916	528	102	----------	73	353	----------
Delaware	350	245	28	----------	12	----------	205
District of Columbia	539	220	156	64	----------	----------	----------
Florida	1,426	1,028	209	763	56	----------	----------
Georgia	3,822	3,698	340	3,258	100	----------	----------
Idaho	280	42	27	----------	15	----------	----------
Illinois	4,450	2,531	816	677	1,038	----------	----------
Indiana	2,946	1,369	452	28	588	301	----------
Iowa	1,851	1,400	538	100	224	538	----------
Kansas	1,225	881	618	63	200	----------	----------
Kentucky	2,043	1,695	155	----------	2	----------	1,538
Louisiana	1,596	1,110	22	455	633	----------	----------
Maine	338	278	18	12	161	----------	87
Maryland	1,495	1,212	60	9	6	----------	1,137
Massachusetts	1,964	966	638	----------	322	6	----------
Michigan	3,381	2,110	443	497	1,170	----------	----------
Minnesota	1,488	875	282	9	584	----------	----------
Mississippi	1,572	1,252	251	----------	1,001	----------	----------
Missouri	2,828	1,813	556	4	1,253	----------	----------
Montana	340	119	74	44	1	----------	----------
Nebraska	805	627	220	----------	107	300	----------
Nevada	147	30	26	----------	4	----------	----------
New Hampshire	138	100	2	----------	----------	----------	98
New Jersey	1,850	503	502	----------	(1)	----------	1
New Mexico	399	193	----------	13	180	----------	----------
New York	6,512	2,395	2,243	152	(1)	----------	----------
North Carolina	1,102	935	255	559	121	----------	----------
North Dakota	220	122	33	----------	89	----------	----------
Ohio	4,128	1,751	1,751	----------	----------	----------	----------
Oklahoma	2,051	1,271	340	82	419	430	----------
Oregon	424	163	79	----------	84	----------	----------
Pennsylvania	4,336	987	783	191	13	----------	----------
Rhode Island	570	329	82	----------	6	241	----------

[1] Less than 1.

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TABLE 1.—NUMBER OF CONVICTS EMPLOYED AT PRODUCTIVE LABOR IN STATE AND FEDERAL PRISONS—Continued

State	Average number of convicts during year		Average number of convicts at productive labor, by system under which employed				
	Total	Employed at productive labor	State use	Public works and ways	Public account	Piece price	Contract
South Carolina	537	452	144		308		
South Dakota	309	232	122		110		
Tennessee	1,691	1,359	254		220	885	
Texas	3,474	2,749	740		2,009		
Utah	188	39	29	7	3		
Vermont	344	243	10	30	27	176	
Virginia	1,439	857	21	550	116		170
Washington	1,094	302	286	7	9		
West Virginia	1,645	1,281	86	130	17		1,048
Wisconsin	1,188	782	170	7	150	135	320
Wyoming	399	264	52			212	
Total	79,350	48,336	16,165	9,001	13,510	3,577	6,083
Federa							
Georgia	2,479	2,066	2,050		16		
Kansas	2,454	1,270	541	729			
Washington	478	127	94	33			
Total	5,411	3,463	2,685	762	16		
Grand total	84,761	51,799	18,850	9,763	13,526	3,577	6,083

In the collection of data the bureau sought to ascertain the quantity and value of goods produced during the year, and the value of the goods disposed of.

These two items might or might not be the same, depending on whether or not everything produced was disposed of during the year. In some instances it was not possible to get both items. Figures relating to goods disposed of were generally more readily obtainable than production figures. Separate tables relating to each of these two classes of data are included in this report, but in some instances it has been necessary to accept and use disposal figures in lieu of production figures, and vice versa. In other words, in certain cases the same figures relating either to production or disposal appear in both tables. Value is interpreted as wholesale market valuation.

Table 2 applies to production. It states the kind and, as nearly thereto as figures were available, the market value of goods produced, subdivided under system of production.

The grand total value of all things produced in the year in the institutions was in round numbers $76,000,000.

Under the State-use system, the principal articles produced in State institutions and Federal penitentiaries, as shown in Table 2 measured by value, are farm, garden, dairy, and livestock products, $3,484,736; clothing (all kinds), $1,264,561; auto tags, $1,117,903; and textiles, $2,375,138.

Under the public-account, piece-price, and contract systems combined, all goods produced go into the competitive market. The principal articles produced were: Shirts, $12,340,230; binder twine and rope, $5,585,036; shoes, $4,961,470; coal, $3,860,616; pants,

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$3,344,206; farm and garden products, etc., $2,312,332; overalls, etc., $1,820,032; brooms, $1,743,552; reed chairs, $1,412,466; children's play suits, $1,149,030; hosiery, $1,063,519; bungalow aprons, $854,970.

Some of the articles listed, though large in value of production, have but little effect in the competitive market, while certain other articles of less value, but of a particular kind, have a very appreciable effect on general market conditions.

Under the public works and ways system, buildings were constructed to the value of $3,503,831 and roads to the value of $11,827,714. Of the 48 States only 15 had convicts on road work.

It was necessary in most instances to accept estimates of the value of road work accomplished during the periods scheduled. The total for all institutions reporting was $11,858,954; Florida showed something over $2,000,000; Georgia, $5,000,000; North Carolina, almost $1,500,000; and Virginia, nearly $2,000,000.

TABLE 2.—KIND AND VALUE OF ARTICLES PRODUCED, BY SYSTEM UNDER WHICH PRODUCED

State institutions

Articles produced	Average number of convicts employed	Value of articles produced under specified system					
		State use	Public works	Public account	Piece price	Contract	Total
Bags, etc. (jute)	788	$214		$350,716			$350,930
Bakery products	4	15,454					15,454
Baskets	100	7,015		12,780		$16,439	36,234
Box shooks (knocked down)	96	11,828		124,685			136,513
Brick	806	351,759		252,743			604,502
Brooms and brushes	575	72,637		489,065		1,254,487	1,816,189
Building	3,041		[1]$3,373,830	7,000		55,292	[13]3,436,122
Clothing:							
Aprons	252				[2]$329,365		[2]329,365
Aprons, bungalow	312				[2]854,970		[2]854,970
Auto suits	14			51,051			51,051
Children's play suits	135				1,149,030		1,149,030
Garments, miscellaneous	325	269,219		8,523			277,742
Overalls and jumpers	771	155,547		1,748,820		[3]71,212	[3]1,975,579
Pants (work)	1,205	5,597				[4]3,344,206	[4]3,349,803
Shirts (chambray)	259			450,279			450,279
Shirts (flannel)	57			172,447			172,447
Shirts (work)	3,395	39,491		121,815	[5]8,072,602	[6]3,523,087	[7]11,756,995
Tailored	798	687,142		453,120			1,140,262
Coal	1,965	244,808		234,303		3,626,313	4,105,424
Coffee, roasted	2	29,040					29,040
Coke	23			42,125			42,125
Farm, garden, dairy and livestock	11,823	[8]3,346,797		2,308,096		[9]4,236	[10]5,659,129
Farm implements	163	1,146		235,619			236,765
Flags	15	5,866		10,331			16,197
Flax	35	322		34,179			34,501
Furniture:							
Chairs, reed or fiber	1,405	10,305		787,510	121,206	503,750	1,422,771
Chairs, wood	713	123,735		506,958		[11]308,000	[11]938,693
Chiffoniers, cabinets, and cases, wood	42	24,623		3,058			27,681
Desks, wood or fiber	142	108,374		[12]6,239			[12]114,613

[1] Including $515,000 estimated.
[2] Estimated.
[3] Including $71,212 estimated.
[4] Including $285,028 estimated.
[5] Including $7,266,239 estimated.
[6] Including $3,523,087 estimated.
[7] Including $10,789,326 estimated.
[8] Not including value of garden truck produced by 2 inmates.
[9] Amount paid for labor of convicts.
[10] See notes under systems for details.
[11] Including $90,000 estimated.
[12] Includes 10 fiber desks; value, $53.

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TABLE 2.—KIND AND VALUE OF ARTICLES PRODUCED, BY SYSTEM UNDER WHICH PRODUCED—Continued

State institutions—Continued

Articles produced	Average number of convicts employed	Value of articles produced under specified system					
		State use	Public works	Public account	Piece price	Contract	Total
Furniture—Continued							
Furniture, other, reed or fiber	149	$68		$111,664			$111,732
Furniture, other, wood	518	143,446		48,713			192,159
Rockers, settees, and benches, reed or fiber	26			42,061			42,061
Rockers, settees, and benches, wood	61	29,969		947			30,916
Tables, wood or fiber	67	20,696		[13] 11,435			[13] 32,131
Chairs, caned	6				$1,036		1,036
Handkerchiefs	12					[2] $15,000	[2] 15,000
Harness:							
Collars, horse	93					213,210	213,210
Sets	235			91,000	225,940		316,940
Hollow ware	290	2,510		121,504		228,752	352,766
Knit goods:							
Hosiery	705	131,208		7,467	374,606	681,446	1,194,727
Mittens	7	746		296			1,042
Underwear	324	[14] 373,848		9,380			383,228
Laundry	32	17,900		9,667			27,567
Leather findings	10			17,000			17,000
Lime	37	13,870		1,835			15,705
Linens, etc	1,164	791,025		66,887			857,912
Lumber	225	70,745		24,419		[2] 636,048	[15] 731,212
Mats:							
Automobile	2			1,915			1,915
Coir and chain	60	6,662					6,662
Mattresses and upholstering	85	65,614		51,725			117,339
Metal and aluminum ware	34	9,891		21,253			31,144
Monuments	84			112,766	59,288		172,054
Printing:							
Books, blank	16	4,407					4,407
Books, bulletins, etc	21	12,283		7,963			20,246
Forms, circulars, pamphlets, etc	407	224,925		20,515			245,440
Printing, other	77	54,035		126			54,161
Quarried and crushed stone	1,394	[16] 558,915		[17] 176,612			[10] 735,527
Repair and shop work	839	423,964		9,118			433,082
Roads	6,036		[18] $11,827,714			[19] 31,240	[10] 11,858,954
Road signs	54	103,466					103,466
Rugs and art work	3			431			431
Sheet metal (ash cans, etc.)	74	47,958					47,958
Shoes	1,898	756,351		790,518	588,765	3,582,187	5,717,821
Shoes repaired	187	150,273		525			150,798
Soap	58	115,601					115,601
Stoves	184				564,178		564,178
Tags, auto	514	1,117,903		865			1,118,768
Tags, license	[20]			171			171
Textiles, cotton	1,448	695,566		588,678			1,284,244
Tobacco, chewing and smoking	13	13,714					13,714
Toys	22			14,069			14,069
Traps, wire	17					31,245	31,245
Tubs, butter	27			47,162			47,162
Twine and rope	1,375	3,336		5,585,036			5,588,372
Whips	83					63,200	63,200
Wood pulp	12					[21] 60,000	[21] 60,000
Total		11,471,814	15,201,544	16,405,185	12,340,986	18,249,350	73,668,879

[2] Estimated.
[10] See notes under systems for details.
[13] Includes 788 fiber tables; value, $3,847.
[14] Including value of 33,605 dozen pieces undershirts, mittens, and hosiery not reported separately.
[15] Including $636,048 estimated.
[16] Including lime and pulverized limestone valued at $929, and sand and gravel at $400.
[17] Including lime and pulverized limestone valued at $1,208.
[18] Including $6,832,150 estimated.
[19] Amount paid by contractor or State to institution and inmates.
[20] Less than 1.
[21] Estimated; for labor only.

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TABLE 2.—KIND AND VALUE OF ARTICLES PRODUCED, BY SYSTEM UNDER WHICH PRODUCED—Continued

Federal penitentiaries

Articles produced	Average number of convicts employed	Value of articles produced under specified system					
		State use	Public works	Public account	Piece price	Contract	Total
Brick	45	$9,372					$9,372
Brooms and brushes	6	2,396					2,396
Building	762		$130,001				130,001
Clothing:							
Garments, miscellaneous	8	9,433					9,433
Overalls and jumpers	17	13,401					13,401
Shirts, work	8	3,905					3,905
Tailored	112	80,826					80,826
Farm, garden, dairy, and livestock	298	137,939					137,939
Furniture, wood:							
Chairs	5	2,747					2,747
Chiffoniers, cabinets, and cases	(20)	26					26
Rockers, settees, and benches	1	270					270
Tables	3	640					640
Other furniture	7	4,249					4,249
Knit goods: Underwear, dozen	12	12,881					12,881
Linens, etc	36	22,039					22,039
Printing:							
Blank books	4	720					720
Books, bulletins, etc	12	2,270					2,270
Forms, circulars, pamphlets, etc	12	2,302					2,302
Other printing	5	1,077					1,077
Repair and shop work	338	204,515					204,515
Sand and gravel unloaded	(20)	495					495
Shoes	57	41,319					41,319
Shoes repaired	40	24,671					24,671
Textiles:							
Duck, cotton	1,631	1,679,572					1,679,572
Duck, remnants and waste	16			$16,693			16,693
Wood, unloaded and cut	28	24,322					24,322
Total	3,463	2,281,387	130,001	16,693			2,428,081

[20] Less than 1.

Table 3 shows by industry or article the value of goods *sold* under the public-account, piece-price, and contract systems and a total of the three systems, by States and for the United States. In contrast to these figures, the table also sets forth the value of goods *used* within the State by its own institutions.

This table refers only to consumption goods, that is, goods that are consumed in their using. It does not include permanent buildings and roads constructed under the public works and ways system, the data for which will be found in Table 2.

The goods sold in the market under the public-account system, including the Federal prisons, total $14,196,493 in value, under the piece-price system $12,381,254, and under the contract system $18,265,608, making a total valuation of goods placed on the general market of $44,843,355. The value of the goods disposed of under the State-use system, including the Federal prisons, total $13,645,225.

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TABLE 3.—VALUE OF GOODS USED OR SOLD THAT WERE PRODUCED UNDER THE STATE-USE, PUBLIC-ACCOUNT, PIECE-PRICE, AND CONTRACT SYSTEMS, AND AMOUNT RECEIVED FOR HIRE OF CONVICTS, BY INDUSTRY

State institutions

Industry	Average number of convicts employed	Value of goods used produced under State-use system	Value of goods or produce sold, by system under which produced				Amount paid institution for hire of convicts
			Public account	Piece price	Contract	Total	
Bags, etc. (jute)	788	$241	$293,083			$293,083	
Baking, commercial	4	15,454					
Baskets	100	7,015	12,780		$16,439	29,219	$9,456
Box shooks (knocked down)	96	11,828	124,685			124,685	
Brick	896	329,750	256,800			256,800	
Brooms and brushes	575	76,301	271,994		1,255,745	1,527,739	81,618
Building construction	7		7,000		[1] 55,292	62,292	1,191
Clothing:							
Aprons	252			$329,365		329,365	52,080
Aprons, bungalow	312			854,970		854,970	65,983
Childrens' play suits	135			1,149,030		1,149,030	61,229
Garment making, unclassified	325	261,655	8,330			8,330	
Overalls and jumpers	771	156,347	759,038		71,212	830,250	9,792
Pants (work)	1,205	4,846			3,344,206	3,344,206	292,380
Shirts (work)	3,711	38,415	337,763	8,072,602	3,523,087	11,933,452	881,765
Tailoring [2]	798	658,046	117,083			117,083	
Coal mining	1,965	244,808	234,303		3,626,313	3,860,616	933,288
Coffee roasting	2	29,040					
Coke making	23		47,996			47,996	
Farm, garden, dairy, and livestock	11,824	3,356,057	2,178,905		[3] 4,236	2,183,141	4,236
Farm implements	163	1,146	322,045			322,045	
Flags	15	5,866	10,331			10,331	
Flax industry	35	322	30,487			30,487	
Furniture	3,129	459,972	1,427,588	[4] 122,242	826,750	2,376,580	120,999
Granite and stonecutting, monumental	84		112,766	59,288		172,054	11,857
Handkerchiefs	12				15,000	15,000	2,701
Harness	328		91,000	190,660	213,210	494,870	69,565
Hollow ware	324	13,819	142,757		228,752	371,509	54,615
Hosiery and underwear	1,036	493,714	17,143	374,606	681,446	1,073,195	203,065
Laundry	32	17,900	9,667			9,667	
Leather findings	10		14,500			14,500	
Lime	39	14,799	3,043			3,043	
Linens, etc., making and mending	1,164	782,148	66,587			66,587	
Lumber	224	68,345	24,397		636,048	660,445	87,848
Mats, automobile	2		2,393			2,393	
Mattresses (cotton) and upholstering	85	62,288	51,725			51,725	
Printing	521	295,650	28,604			28,604	
Quarrying granite and stone, and rock crushing	1,392	[5] 557,986	[6] 175,404			175,404	
Repair and shop work, miscellaneous	839	424,842	9,118			9,118	
Road building	69				[7] 31,240	31,240	21,505
Rug and mat weaving	63	6,662	304			304	
Sheet-metal work	74	47,958					
Shoemaking	1,898	707,370	409,225	664,313	3,582,187	4,655,725	213,857
Shoe repairing	187	150,273	525			525	
Soap making	58	114,577					
Stoves	184			564,178		564,178	89,198
Sugar			[8] 128,085			[8] 128,085	
Tags, plates, signs, etc	568	1,221,369	[9] 1,036			1,036	
Textiles:							
Cloth, cotton and wool	1,188	663,973	19,236			19,236	
Duck, cotton	260	20,347	828,552			828,552	
Tobacco manufacturing, chewing and smoking	13	13,714					
Toys	22		13,200			13,200	
Traps, wire	17				31,245	31,245	4,981
Tubs, butter	27		47,162			47,162	
Twine and rope	1,375	3,173	5,543,160			5,543,160	
Whips	83				63,200	63,200	17,568
Wood pulp	12				60,000	60,000	
Total	[10] 39,321	11,337,989	14,179,800	12,381,254	18,265,608	44,826,662	3,290,777

[1] Working for private contractors erecting prison buildings.
[2] Coats, pants, vests, and overcoats.
[3] Value of labor only.
[4] Chair caning.
[5] Including sand and gravel, $1,060.
[6] Including pulverized stone for fertilizer, $21,346.
[7] Value of labor working for private contractor.
[8] Sold from previous year's production.
[9] Including $865 sales to another State under competitive conditions.
[10] Not including 14 convicts making auto suits not sold.

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TABLE 3.—VALUE OF GOODS USED OR SOLD THAT WERE PRODUCED UNDER THE STATE-USE, PUBLIC-ACCOUNT, PIECE-PRICE, AND CONTRACT SYSTEMS, AND AMOUNT RECEIVED FOR HIRE OF CONVICTS, BY INDUSTRY—Continued

Federal institutions

Industry	Average number of convicts employed	Value of goods used produced under State-use system	Value of goods or produce sold, by system under which produced				Amount paid institution for hire of convicts
			Public account	Piece price	Contract	Total	
Brick	45	$9,372					
Brooms and brushes	6	2,396					
Clothing:							
Garment making, unclassified	8	9,164					
Overalls and jumpers	17	13,401					
Tailoring	112	80,651					
Work shirts	8	3,905					
Farm, garden, dairy, and livestock	298	133,957					
Furniture	16	7,932					
Linens, etc., making and mending	36	21,449					
Printing	33	6,369					
Repair and shop work, miscellaneous	338	204,515					
Sand and gravel, unloaded	(11)	495					
Shoemaking	57	41,319					
Shoe repairing	40	24,671					
Textiles:							
Duck	1,631	1,710,437					
Duck remnants and waste	16		$16,693			$16,693	
Underwear	12	12,881					
Wood, unloaded	28	24,322					
Total	2,701	2,307,236	16,693			16,693	

[11] Less than 1.

Sale Within and Without the State

IN THE collection of data an effort was made to obtain figures that would show the proportion of goods sold within and without the State where produced. The total of all sales on the market was $44,843,355, of which 42 per cent represented goods sold within the State in which produced, and 58 per cent those sold outside of the State.

In 25 States the products were disposed of entirely within the State, while in 22 States some products were sold outside the State. Ohio and the District of Columbia sold no products. Eighty to ninety-nine per cent of all goods produced in 11 States—Delaware, Iowa, Kentucky, Maryland, Nebraska, New Hampshire, Oklahoma, Rhode Island, Vermont, Wisconsin, and Wyoming—were sold outside the State; 50 to 79 per cent of all goods produced in 5 States—Connecticut, Indiana, Tennessee, Virginia, and West Virginia—were sold outside the State; and 6 to 42 per cent of all goods produced in 6 States—Maine, Michigan, Oregon, Minnesota, Illinois, and Massachusetts—were sold outside the State. It is interesting to note that these 21 States produced 77 per cent of the total convict-made product placed on the open market.

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Sex of Convicts

OF THE total number of convicts in the institutions studied (averaging 84,761 during the year), 81,704 were males and 3,057, or 4 per cent, were females. In 7 States males and females were confined in separate institutions, while in 37 States and in the District of Columbia both sexes were confined in the same institutions. Four States show no females confined within the institutions reported. The three Federal penitentiaries report only male convicts.

Compensation

WHILE primarily the bureau's objective in this study was to show the kind, quantity, and market value of goods produced, and their disposition, whether on the open market or within the State's own institutions, other features of interest and of economic value were observed. Probably the most interesting of these features is the compensation to prisoners.

The fact that institutions generally keep no specific account of the amount of daily earnings received by inmates makes it impossible to give this information any very definite character. However, facts of a generally comprehensive nature are available, and an attempt has been made to assemble them in a few statements which may prove instructive.

It was found that in 53 of the 104 institutions reporting, the convicts received no kind of compensation, while in 51 institutions some sort of compensation was paid.

Considering the minimum compensation as a basis, convicts in 31 institutions were paid 10 cents or less per day. In 7 institutions, including 1 Federal prison, in which only those engaged in manufacture were paid, convicts were paid over 10 cents and under 20 cents per day, while in 11 institutions the convicts received 20 cents and over per day. In 1 institution convicts received the free labor wage rate after the completion of a task, and in 1 a bonus was paid for overtask work. In most instances where contractors were concerned overtask work was compensated at the same rate paid to the institution for the hire of inmates.

Certain institutions reported rates as high as follows: 20 cents to 50 cents, 25 cents to 50 cents, 25 cents to 70 cents, 25 cents to 80 cents, and 25 cents to $1.50 per day. Higher compensations than these are sometimes made through overtask work.

The compensation of convicts while incarcerated is a problem which prison boards and State authorities are coming to view with great seriousness. To some extent compensation is a matter of incentive to the convict toward good work and better behavior, but the far greater question is the condition of the convict's family. A convict with a conscience wants to care for his family, and a convict without a conscience should be compelled to care for his family. As stated, many States now pay a small wage to convicts and some require a part of the wages to be sent to the convict's family. Some States go further in the relief of destitution by looking after and caring for dependents left in want by the loss of earnings of the imprisoned head of the family.

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Hours of Work

THE hours of labor required of convicts is another matter of interest. This feature was difficult to summarize properly, since within the same institution varying hours might be found. This condition was reported in 16 of the 104 institutions reporting. In some cases this variation is due to school work, while in others it is simply a variation because of the line of work performed, the work on the farm usually requiring longer hours than that within the shops or factories.

Considering the minimum hours of labor required, 37 institutions reported under 8 hours as a day's work; 36 reported 8 hours; 26 reported over 8 and under 10 hours; and 5 reported 10 hours and over, the highest number of hours worked being a range of 10 to 12 hours.

Each institution reporting observes some holidays. Forty-six per cent of all institutions reporting observe 6 to 8 holidays. Fifteen per cent observe 10 holidays. In only 1 institution is so small a number as 2 holidays observed, while in 3 institutions 11 are observed.

No work is done on Saturday afternoon in 29 of the 104 institutions covered.

Historical Comparison

THE bureau had made four surveys of convict labor prior to the survey of 1923. These surveys have differed to some extent in their scope. The present survey applies only to State and Federal penal institutions maintained primarily for adults, while some of the other surveys, particularly the survey of 1905, included county and city institutions.

Table 4 shows the change that has taken place in the relative importance of the several convict-labor systems since 1885.

Data for noncomparable institutions have been eliminated, and the figures of the table relate to the same institutions, or at least to the same kind of institutions as covered by the 1923 survey.

TABLE 4.—PER CENT OF CONVICTS EMPLOYED AT PRODUCTIVE LABOR UNDER DIFFERENT SYSTEMS IN DIFFERENT YEARS AS SHOWN BY REPORTS OF THIS BUREAU

System	Year				
	1885	1895	1905	1914	1923
Lease	26	19	9	4	
Contract	40	34	36	26	12
Piece price	8	14	8	6	7
Public account	[1] 26	[1] 33	21	31	26
State use			18	22	36
Public works and ways			8	11	19
Total	100	100	100	100	100
Per cent of all convicts employed at productive labor	75	72	65	(2)	61

[1] Public account, State use, and public works and ways were inseparably combined.
[2] Not reported.

In 1885, 26 per cent of all the convicts employed at productive labor were employed under the lease system. Each succeeding sur-

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vey shows a drop in the percentage employed under the lease system, until in 1923 the system, so far as the State and Federal institutions are concerned, had entirely disappeared. The lease system is now looked back upon as little more than legalized and ofttimes barbaric slavery, and even when in operation it was excused only by a plea that the State was too poor to build, equip, and maintain prisons and prison workshops.

Table 4 also shows a steady reduction in the extent of the contract system from 40 per cent of all convicts employed in 1885 to 12 per cent in 1923. The piece-price system has not changed so materially and has been of rather small importance so far as numbers are concerned. Combining the figures for the contract system and the piece-price system, which do not differ very materially in effect, it is seen that 48 per cent of all convicts at work came under these two systems in 1885, while the two systems together totaled but 19 per cent of all convicts employed in 1923.

During the period covered extended growth is seen in the State-use and public works and ways systems. Unfortunately, segregation can not be made in the figures for 1885 and 1895. Collectively, the public-account, State-use, and public works and ways systems increased from 26 per cent of all convicts employed at productive labor in 1885 to 81 per cent in 1923.

In this connection attention is drawn to the line at the end of the table which shows that 75 per cent of all the convicts in the several institutions were employed at productive labor in 1885, while in 1923 only 61 per cent of all the convicts were so employed.

Competition of Prison-made Goods

WITH labor conditions so materially different in prison factories as compared with factories employing free labor it is evident that conflicts must arise when the products of these two types of factories meet in competition in the open market.

A study of the industrial side of convict labor would be incomplete without a consideration of this competition and, therefore, in the 1923 survey an opportunity was given free-labor employers meeting competition with convict-labor goods to present such evidence as they desired to give concerning the effect of competition on their sales. This evidence is given in detail in Bulletin No. 372.

An outside manufacturer selling his goods in competition with the goods of other outside manufacturers, and with convict-made goods as well, may see his business shrinking and he may realize that convict goods are underselling his goods. A mathematical measure of his loss actually due to competition with convict goods is, however, difficult of measurement because of the other factors that may affect the market, including possibly his own lack of management or his own business judgment. The evidence given by free-labor employers, however, is worthy of careful consideration by legislators and boards and wardens responsible for the administration of prison labor.

The great cause of complaint was that prison contractors get their labor cheaper than free-labor employers do and because of this lower item of production cost the prison contractors can and do undersell

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them. Further, it was charged that contractors get shop room, power, heat, and light free or at a nominal cost.

No inquiry was made as to whether prison boards and wardens asked for competitive bids for the labor of convicts or whether the contract made with a contractor was one of more or less private noncompetitive negotiations. A rather peculiar thing in this connection was that certain prisons contracting the labor of their convicts neither stated clearly or frankly in their published reports the fact that there was a contract nor showed the number of convicts under contract or the day rate or the piece rate.

Another complaint was that the State itself under the public-account system may produce goods and sell them under terms of ruinous competition. The State has the prisoners, and if the prison industries do not support the prisoners then the taxpayers must. The prison can thus make and sell goods without having to pay a free labor wage and the prison must do business regardless of selling price, for the convicts must be kept at work. Some taxpayers become incensed when they see the State using their taxes to maintain a penal institution with a manufacturing plant therein that demoralizes or destroys the taxpayers' trade. On the other hand, some industries, as, for instance, the manufacture of binder twines, are conducted by prisons because of the insistent demand of large groups of taxpayers.

A third complaint was that convict labor may be concentrated, not only on a particular article but on a particular kind of article, to such an extent that the prison article completely dominates the market. Were convict labor limited to the production of articles in which prices are governed by a world market, like wheat or cotton, there undoubtedly would be no complaint of convict-labor competition. It is not the matter of volume that counts so much in competition as the specialization of the particular type of article.

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COOPERATION

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Cooperative Societies in the United States

THE Bureau of Labor Statistics made a statistical study of the cooperative movement in the United States in 1920. That study covered only consumers' societies and the collective buying activities of the farmers' marketing organizations. In 1925 another, but more inclusive, survey was made, covering not only consumers' societies proper but also credit, housing, and workers' productive societies. Except where otherwise noted, the data below are taken from the report of that study (Bul. No. 437).

The cooperative movement in this country is little developed as compared with European countries. Nevertheless, on the basis of the societies which have furnished reports to the Bureau of Labor Statistics for 1925, the total cooperative membership may be placed at over 700,000 and the cooperative business for 1925 at considerably in excess of $300,000,000. It may safely be said that the cooperative movement in the United States (not including agricultural organizations) reaches several million people.

During the early part of this century a slight revival of interest in consumers' cooperation took place. This gradually increased in strength, reaching its crest during the war years of high prices, when nearly two-fifths of the consumers' societies were formed. The year 1920 marked a turning point in the tide of consumers' cooperation; since 1921 few new societies have been formed and the societies in existence have had a hard struggle. The year 1920 also marks the beginning of a rapid development of the cooperative credit movement. Since that year, with the passage of enabling legislation in State after State, the idea of cooperative credit has spread widely and rapidly.

The greatest development of the consumers' movement has taken place in the Middle West, while the great majority of credit societies are at present on the Atlantic coast. As, however, it has been only within the past few years that cooperative credit societies have had legal status in other parts of the country, the indications are that the next few years will see a change in the geographical distribution of the credit union movement. The housing societies are almost entirely confined to New York City.

In the majority of cases the cooperative "leaven" among the population is too small to be of any particular influence on the community as a whole. A small proportion of the associations, on the other hand, are in places where the cooperative membership includes a very large per cent of the people, and in these cases the cooperative society can be a real influence in insuring fair wages, conditions, and hours of labor, in training the members both in business principles and in the give and take of practical democracy, and in raising the general cultural level in the locality.

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Consumers' Cooperative Enterprises

THE consumers' societies have come through a period of hard times, but seem now to have rallied and to be on the upward trend. They are more than holding their own in point of membership, "real sales," capital, and reserves. They have entered many lines of business and are making good.

Data are at hand from 479 consumers' societies, distributed according to type, as follows:

Retail store societies dealing in—	Number	Per cent
General merchandise	324	67.6
Groceries	49	10.2
Groceries and meats	38	7.9
Students' supplies	11	2.3
Other commodities	9	1.9
Total	431	90.0
Wholesale societies	3	.6
Gasoline filling stations	10	2.1
Bakeries	9	1.9
Laundries	2	.4
Boarding houses	12	2.5
Restaurants	5	1.0
Water-supply societies	2	.4
Miscellaneous societies	5	1.0
Grand total	479	100.0

The societies, listed above dealing in "other commodities" include 2 organizations handling coal only, 1 art supplies, 1 dry goods and furniture, 1 men's clothing, and 4 miscellaneous articles. The "miscellaneous" societies include 1 milk-distributing society, 1 garage, 1 light and power society, 1 printing office, and 1 undertaking establishment.

The term "general merchandise" covers a variety of goods, such as groceries, meats, light hardware, shoes, various articles of clothing, etc. The farmers' societies usually handle also farm supplies, feed, lumber, and even farm machinery and in Illinois the general cooperative store is likely to carry also miners' supplies and equipment. Several of the general-store societies of Michigan and Wisconsin also deal in forest products.

Considerable versatility in branching out into new lines is shown by the societies studied. Nine societies, in addition to their regular business, also handle coal; one of these sells ice as well, and another also operates a milk route. One store society also deals in gasoline, another in automobile tires, another in oil and tires, and two others in gasoline and oil. One of the gasoline filling stations also carries tires and accessories. A milk station as well as a grocery and meat business is operated by one organization, three others run bakeries in connection with the store, and still another has both a milk station and bakery. One of the Finnish societies supplements its store business with a bakery and restaurant, and another with a milk station, coal yard, restaurant, and bakery. An Italian general-store society also has a pool-room and assembly hall for its members. A northern society which has a general store also does a public dock and ship chandlery business, and one of the older stu-

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dents' societies, in addition to the textbooks, etc., can supply its members with clothing, tailor service, kitchen utensils and paints. But perhaps the most varied activities are found in a New York society which has four cafeterias, a bakery, food shop, lending library, and credit union; the policy of this society is to add to the services offered rather than to "spread thin" a single service over one new group of members after another.

Five of the societies are buying clubs which have no store but simply pool the orders of their members.

The cooperative gasoline and oil stations are a very recent development in the cooperative movement.

The cooperative boarding houses represent an interesting phase of the cooperative idea. These are mainly Scandinavian and Finnish societies composed of unmarried men who band together to supply themselves with board and lodging without profit. Many of these organizations also accommodate transients. In some cases the building is owned by the society. Many of these societies are operated at cost, each man paying in advance the amount estimated as needed to cover the week's expenses. The boarding houses reporting have housing accommodations for 312 roomers and serve meals to an average of 1,513 persons per day. The number of persons served varies considerably from season to season. One northern society reports that in the summer when the ore docks in the locality are active the number of boarders runs up to as high as 80 but in the winter the number may fall as low as 10.

The four restaurants which reported on the point average 4,490 meals per day.

A total of 534 establishments is operated by 456 societies and 447 of these societies give employment to 3,409 full-time and 49 part-time workers.

Membership and Business

THE table below shows by States the number of members and the business done in 1925 by all the consumers' societies combined.

TABLE 1.—MEMBERSHIP AND BUSINESS OF CONSUMERS' COOPERATIVE SOCIETIES IN 1925, BY STATES

State	Number of members	Amount of business	State	Number of members	Amount of business
Alabama	150	$72,000	New Jersey	4,732	$1,063,221
Alaska	309	223,037	New York	6,577	1,560,626
Arkansas	235	121,090	North Carolina	124	60,900
California	9,044	699,604	North Dakota	1,400	1,169,252
Colorado	160	75,502	Ohio	13,494	1,941,472
Connecticut	3,176	473,401	Oklahoma	727	820,737
Idaho	274	207,934	Oregon	3,030	66,942
Illinois	9,559	2,883,864	Pennsylvania	1,498	698,620
Indiana	643	305,549	Rhode Island	264	146,000
Iowa	3,051	1,245,849	South Dakota	1,166	759,193
Kansas	5,245	2,021,266	Tennessee	46	26,331
Kentucky	461	116,345	Texas	857	134,112
Maine	1,204	507,324	Virginia	215	95,419
Massachusetts	21,676	3,710,376	Washington	3,551	2,547,950
Michigan	8,873	3,485,681	West Virginia	1,049	449,081
Minnesota	23,889	11,239,067	Wisconsin	8,116	6,653,421
Missouri	458	148,175	Wyoming	540	181,000
Montana	195	85,155			
Nebraska	3,028	3,488,736	Total	139,301	49,710,788
New Hampshire	285	136,556			

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The same data as above are given by types of society in the following table, averages per society and per member being also shown:

TABLE 2.—MEMBERSHIP AND BUSINESS OF CONSUMERS' SOCIETIES IN 1925, BY TYPE OF SOCIETY

Type of society	Membership			Business			
	Number of societies reporting	Total	Average per society	Number of societies reporting	Amount	Average per society	Average per member [1]
Retail store societies dealing in—							
General merchandise	310	55,431	179	322	$29,610,246	$91,957	$528
Groceries	47	11,129	237	49	3,487,979	71,183	305
Groceries and meats	38	21,399	563	36	4,346,690	120,741	198
Students' supplies	9	30,848	3,428	11	2,899,626	263,602	87
Other commodities	5	953	191	8	401,069	50,134	372
Total	409	119,760	293	426	40,745,610	95,647	334
Wholesale societies				3	2,459,521	819,840	[2]
Gasoline filling stations	7	3,615	516	9	742,473	82,497	195
Bakeries	9	4,834	537	9	1,189,737	132,193	246
Laundries	2	263	132	2	37,786	18,893	144
Boarding houses	11	1,578	143	10	150,853	15,085	99
Restaurants	5	2,733	547	5	679,110	135,822	248
Water-supply societies	2	76	38	2	1,559	780	21
Miscellaneous societies	5	6,442	1,288	5	3,704,139	740,828	572
Grand total	450	139,301	310	471	49,710,788	105,543	352

[1] Based on societies reporting both membership and business. [2] Insufficient data.

The above table shows a somewhat greater average membership than was disclosed by the 1920 study—269 members—but it is open to the objection that it does not cover identical societies for both years. Therefore, in order to test the accuracy of this indication of the growth of consumers' cooperative societies, the 214 societies which furnished membership data in both studies were taken for comparison. These societies showed an increase in membership of 39 per cent from 1920 to 1925. In other words, the cooperative societies which survived the depression period have more than held their own in point of membership. The combined membership of the societies handling general merchandise increased from 29,413 in 1920 to 30,291 in 1925, or 3 per cent, but the membership of all other types of consumers' societies combined increased from 37,983 to 63,394, or 66.9 per cent. The grocery societies alone showed an increase in membership of nearly 50 per cent. The consumers' societies which reported in both years had an average membership per society in 1925 of 438 persons, nearly two-fifths larger than in 1920, when it was 315.

Six-Year Trend of Cooperative Business

EACH society was requested to report as to its sales for each year from 1920 to 1925, and reports for all six years were received from 204 societies. The data are shown in Table 3.

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TABLE 3.—AMOUNT OF BUSINESS OF IDENTICAL CONSUMERS' SOCIETIES EACH YEAR, 1920 TO 1925, BY TYPE OF SOCIETY

Type of society	Societies reporting for all years	Amount of business					
		1920	1921	1922	1923	1924	1925
Retail store societies dealing in—							
General merchandise	135	$18,022,554	$14,566,079	$13,370,295	$14,357,262	$14,709,591	$16,090,343
Groceries	23	1,763,258	1,455,156	1,413,145	1,582,427	1,581,495	1,691,073
Groceries and meats	19	2,040,233	1,793,358	1,813,493	2,140,294	2,440,938	2,702,242
Students' supplies	5	575,982	681,100	755,944	814,370	830,797	819,434
Other commodities	3	288,044	316,188	251,019	300,871	276,374	274,221
Total	185	22,690,071	18,811,881	17,603,896	19,195,224	19,839,195	21,577,313
Wholesale societies	3	3,333,132	1,824,734	1,641,822	1,974,999	2,206,915	2,459,521
Bakeries	5	396,434	394,093	323,983	329,551	340,087	464,993
Laundries	1	16,042	13,990	13,208	15,877	21,063	25,306
Boarding houses	3	145,050	99,380	95,623	117,184	92,490	86,479
Restaurants	3	112,707	96,165	112,298	131,257	225,187	230,296
Water-supply societies	1	589	616	690	798	775	729
Miscellaneous	3	309,710	994,681	1,800,559	3,256,346	3,466,370	3,699,828
Grand total	204	27,003,735	22,235,540	21,592,077	25,021,236	26,192,082	28,544,465

As would be expected, 1920 was a year of very high sales for cooperative societies, as it was also the year of highest prices. That year was followed by a decided drop in 1921 and a still further decline in 1922. Business improved in the following year and still more in 1924, and in 1925 had even exceeded the 1920 mark by 5.1 per cent. In 18 States, also, the sales for 1925 surpassed those of 1920.

The sales have been affected by a number of factors—the rise and fall of prices during the six-year period, the fluctuations in employment in the trades of the members with the consequent effect upon their purchasing power, strikes (especially in cases where the members were largely of one trade, such as miners, railroad men, etc.), and general economic conditions.

In 1920, the general stores were doing the largest annual business of all the retail store societies, while among all types, the wholesale societies held the lead. In 1925, however, the wholesales still ranked highest in average sales, but the general stores had been outdistanced by grocery and meat societies and those handling students' supplies. Of all types of consumers' societies the wholesale societies suffered most from the depression, their business falling in 1922 to less than half their 1920 sales. By 1925 the sales of all societies combined had more than overcome the depression, and five of the group had sales in that year more than 25 per cent in excess of their 1920 business.

Net Trading Profit or Loss

ALTHOUGH a few societies still operate on the cost-plus plan (i. e., they set their selling prices only high enough to cover the cost of the goods plus estimated expense of operation), this practice seems to be on the decrease, and all but 15 of the societies reporting sell at current prices. Sale at current prices not only avoids arousing

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the antagonism of private competitors because of the "price cutting" involved in the cost-plus plan, but it obviates the necessity of guessing what the overhead expense will be.

The difference or margin, then, between the cost of goods plus the overhead expense and the selling price, constitutes the ordinary dealer's profit, or the cooperative societies' "saving" (it is not profit in the ordinary sense in the case of the cooperative society but represents what the member lends the society above the cost of his goods).

Unfortunately only incomplete returns are available as to the net trading profit or loss and dividends paid by consumers' societies on the 1925 business. Only 441 societies replied definitely to the question of whether a profit was made on the 1925 business. Of these, 317 had a profit, 87 were able only to make ends meet, 15 operate on the cost-plus plan and so showed no profit, and 22 lost money. The profit for the 71.9 per cent of the societies which had a profit aggregated more than a million and a half dollars, as shown below:

TABLE 4.—AMOUNT OF NET TRADING PROFIT OR LOSS ON 1925 BUSINESS, BY TYPE OF SOCIETY

Type of society	Net trading loss		Net trading profit			
	Number of societies reporting	Amount	Number of societies reporting	Amount	Average per society	Average rate (per cent) of profit on 1925 sales
Retail store societies dealing in—						
General merchandise	12	[1] $19,265	219	$918,630	$4,195	4.0
Groceries	3	[2] 3,740	30	73,128	2,438	3.7
Groceries and meats	1	200	25	141,949	5,678	4.3
Students' supplies			8	170,732	21,342	7.0
Other commodities			5	10,075	2,015	3.0
Total	16	[3] 23,205	287	1,314,514	4,580	4.0
Wholesale societies			2	45,503	22,752	1.9
Gasoline filling stations			9	98,892	10,988	12.9
Bakeries			7	18,823	2,689	2.3
Laundries			1	1,079	1,079	[4] 4.3
Boarding houses	1	572	6	3,026	504	3.6
Restaurants			2	23,976	11,988	4.2
Water-supply societies			1	527	527	2.9
Miscellaneous	1	2,822	2	102,359	51,180	
Grand total	18	[3] 26,599	317	1,608,699	5,075	3.0

[1] Not including 3 societies which reported a loss but did not state amount.
[2] Not including 1 society which reported a loss but did not state amount.
[3] Not including 4 societies which reported a loss but did not state amount.
[4] 1 society only.

Patronage Rebates

FROM the trading surplus made by the business a fixed rate of interest is paid on the share capital, after which a certain percentage is usually set aside for a reserve to meet unexpected losses. Depreciation is taken care of by writing off a certain percentage of the value of buildings, furniture, fixtures, etc. Some societies also set aside money for educational work along cooperative lines. Finally, after provision has been made for all the above purposes, the re-

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mainder of the profits is returned to the members in proportion to their patronage. The return of purchase dividends proportioned to the amount of the member's business with the society is peculiar to the cooperative movement. This insures that the member who does the most trading at the store shall receive the highest trade rebate, and the member whose business with the store is small shall receive a proportionally small return. In other words, the system was designed to reward the loyalty of the members in the exact degree of their loyalty.

Data are at hand as regards purchase dividends returned for 425 societies. Of these only 172 of 317 which reported a profit on the year's business also returned a dividend. The 15 cost-plus societies should also be regarded as returning purchase dividends, which the member obtained at the time of purchase, in the form of a lower (cost) price.

The statement below shows for 165 societies the amount returned in patronage dividends. Seven others not included in the table reported that they also paid dividends but failed to state the amount so returned.

Retail store societies dealing in—	Number of societies	Amount
General merchandise	[1] 111	$402,391
Groceries	[2] 14	22,952
Groceries and meats	[3] 17	94,251
Students' supplies	10	160,339
Other commodities	2	3,793
Total	154	683,726
Wholesale societies	2	19,048
Gasoline filling stations	[4] 5	44,826
Laundries	1	510
Restaurants	1	4,955
Water-supply societies	1	400
Miscellaneous	1	326
Grand total	[5] 165	753,791

Many of the societies return to nonmembers one-half the rate of patronage dividends paid to the members. In some cases, however, the nonmember's rebate is not paid in cash but is applied on the purchase of a share of stock, so that in time the customer automatically becomes a member and, as such, entitled to the full rate of dividend. One of the most successful societies fixes the rate of nonmember dividend at 2 per cent, irrespective of the rate paid to members. Another returns no dividend to nonmembers; earnings from their patronage are put into a permanent reserve to insure "the safety and extension of the business as a consumers' cooperative." Fourteen societies reported that all the profits for 1925 were applied on deficits

[1] Not including 1 society which paid a dividend in stock but did not state amount so paid, 1 which paid a 2¼ per cent dividend but did not state amount so paid, and 1 which gives a discount of 10 per cent at time of purchase on cash purchases.
[2] Not including 1 society which paid a 1 per cent and 1 which paid a 7 per cent dividend but did not state amount so paid.
[3] Not including 1 society which allows a discount of 3 per cent on all bills paid every 30 days.
[4] Not including 1 society which allows a discount of 2 cents a gallon on gasoline and 5 cents a gallon on oil.
[5] Not including 7 societies which returned a dividend but did not state amount so returned.

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of previous years, four societies that all the profits were placed in the reserve or surplus fund (and one of these adds that no dividends will be paid until the surplus equals $5,000), three societies are applying their profits on the purchase of a building to house the society, seven put all the profits back into the business as share capital, one society uses its profits for various social measures for the benefit of the membership as a whole, and another is doing so this year. It is sound business policy to use part at least of the profits to build up the reserves, and doubtless many of the societies which did not explain the failure to pay dividends were making the same disposition of profits as were the societies which reported definitely on this point. A fourth society, a boarding house, provides that any profits shall go to build up a surplus to the amount of $1,000; nothing is said as to the disposal of profits after the reserve reaches the amount so set.

Three societies illustrate a policy not so commendable. These societies sustained a loss on the year's business; nevertheless all returned purchase dividends (presumably from reserves) amounting in one case to nearly $7.50 per member, in the second to about $10, and in the third to nearly $9.

In the majority of cases, the bakeries return no patronage dividends but use any profits made for various social causes, following the Belgian practice. Three other societies which sell at current prices do not practice the return of patronage rebates. One uses the savings to further a certain social cause and to enlarge the business; the second uses all surplus not needed in the business to "advance the cause of labor"; and the third provides that "should this society, through its activities, yield any profits, same shall be transferred undivided to the reserve fund, which may also be used for enlarging and improving the enterprise or its aims."

As already seen, more than $750,000 was returned in patronage dividends on the 1925 sales. What this means to the individual cooperator is shown in the table below. This table gives, for the societies which had a profit, the average amount of this profit per society, and for those societies which returned purchase dividends, the average dividend per society and per member and the rate (per cent) of dividend on the basis of sales and of share capital. In cooperative practice the dividend is never spoken of in terms of capital, for a fixed rate of interest is paid on capital. It has, however, been considered worth while here to calculate the dividend on the basis of capital as well as of sales, so as to afford a clearer comparison between private enterprises, in which it is customary to figure dividends in terms of stock, and cooperative societies. In reading the table, moreover, it should be remembered that the rate of dividend shown as being returned on capital is in addition to the interest paid on stock, so that if the interest (figures for which are not available) were included the rate would be considerably higher.

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TABLE 5.—AVERAGE PATRONAGE DIVIDEND PER SOCIETY AND PER MEMBER AND RATE OF DIVIDEND ON SALES AND ON CAPITAL, BY TYPE OF SOCIETY, 1925

Type of society	Average dividend—		Rate (per cent) of dividend on—	
	Per society	Per member	Sales	Capital
Retail store societies dealing in—				
General merchandise	$3,625	$17.13	3.3	25.7
Groceries	1,639	14.71	2.2	30.9
Groceries and meats	5,544	18.08	4.0	52.8
Miscellaneous commodities (including students' supplies)	13,678	4.85	5.4	(1)
Total	4,440	10.66	3.4	[2] 28.5
Gasoline filling stations	8,965	17.55	9.4	90.6
Laundries	510	2.12	2.0	6.0
Boarding houses				
Restaurants	4,955	2.24	1.2	13.9
Water-supply societies	400	8.70	54.9	1.7
Miscellaneous	326	12.54	13.1	5.0
Grand total	4,568	10.62	3.8	29.3

[1] Impossible to compute, as half of the societies are nonstock associations.
[2] All types except those grouped under miscellaneous commodities.

Although the dividend returned by cooperative societies averaged only 3.8 per cent on sales, the rebate if calculated on the basis of the stock investment averaged nearly 30 per cent—no mean return. Here, again, gasoline filling stations took the lead. The water-supply societies, though having a high dividend on sales, fell very low in point of capital return, since the price of water sold is very small as compared with the amount invested in the plant.

Capital and Reserves

IN PREVIOUS years high dividends have been emphasized as one of the things to be striven for by the successful society, and many a failure of a supposedly strong cooperative organization has been due to the fact that all the earnings were returned to members in dividends, leaving no reserves for emergencies. Cooperative societies are more and more recognizing the value of establishing, first of all, from the earnings of the prosperous years, adequate reserves to meet the exigencies of the lean years. That this is so is evidenced by the fact that the reserves of the societies reporting average more than half the amount of paid-in share capital and that, as seen, although over 70 per cent of the societies here studied earned a profit, only a little over 40 per cent returned patronage rebates.

The following table shows the paid-in share capital and reserve of the consumers' societies at the end of 1925, and the averages per society and per member:

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TABLE 6.—AVERAGE SHARE CAPITAL AND RESERVE PER SOCIETY AND AVERAGE CAPITAL PER MEMBER, DECEMBER 31, 1925

Type of society	Paid-in share capital				Reserve fund		
	Number of societies reporting	Amount	Average per society	Average per member [1]	Number of societies reporting	Amount	Average per society
Retail store societies dealing in—							
General merchandise	[2] 275	$4,485,758	$16,312	$110	180	$1,356,308	$7,535
Groceries	[3] 46	377,222	8,200	35	29	148,913	5,135
Groceries and meats	[3] 31	302,320	9,752	190	19	214,458	11,287
Students' supplies	[4] 4	54,005	13,501	4	3	420,062	140,021
Miscellaneous commodities	[5] 6	36,229	6,038	27	3	28,449	9,483
Total	[6] 362	5,255,534	14,518	63	234	2,168,190	9,266
Wholesale societies	3	371,656	123,885	------	2	27,502	13,751
Gasoline filling stations	7	79,225	11,318	23	6	21,316	3,553
Bakeries	9	67,919	7,547	15	5	21,843	4,369
Laundries	1	8,540	8,540	35	------	------	------
Boarding houses	[5] 9	24,210	2,690	16	5	7,768	1,554
Restaurants	[5] 2	37,296	18,648	16	3	106,106	35,369
Water-supply societies	2	27,850	13,925	366	------	------	------
Miscellaneous societies	[3] 3	999,000	333,000	187	2	82,453	41,227
Grand total	[7] 398	6,871,230	17,264	68	257	2,435,178	9,475

[1] On basis of societies reporting both capital and membership.
[2] Not including 5 nonstock associations.
[3] Not including 1 nonstock association.
[4] Not including 7 nonstock associations.
[5] Not including 2 nonstock associations.
[6] Not including 16 nonstock associations.
[7] Not including 21 nonstock associations.

The reserves per society average more than one-half of the amount of share capital—a very favorable situation. The 1920 study disclosed an average capital per society of $17,056, and per member of $59, and an average reserve per society of $5,142. Thus the 1925 figures show a gain on all three points, especially as regards reserves.

Cooperative Federations

THE cooperative wholesale movement which appeared so promising early in 1920 has been largely abandoned. One by one these societies have been discontinued or have failed, in some cases because of lack of support by the retail societies, in some cases because of inexperience, difficulties in transportation, etc. Now only a few wholesales remain and most of these are joint consumers' and farmers' organizations. A new start is being made by at least two of the district federations, with the inauguration of joint purchasing of certain staple commodities, in the hope of building a wholesale business eventually.

The development of the cooperative movement throughout the country is "spotty," many societies being isolated and out of touch with fellow cooperators. Even in the regions where cooperative societies are relatively numerous, difficulty is experienced in overcoming the apathy of isolated stores toward the general movement and in bringing them into closer touch with the other organizations of the region, so that all may benefit from the accumulated experience of the whole body of societies.

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A determined move toward the spread of the cooperative idea and in the closer linking of the local cooperative societies appears in the formation of district cooperative leagues, four of which are already in existence. These are primarily educational and propagandist bodies, but are in certain instances actively forwarding joint buying by the societies in their districts.

Workers' Productive Societies

THE "ideal" workers' productive society is composed of workers in the shop who have contributed all the capital of the enterprise and do all the work, the business being managed by men elected by and from the members. The worker-owners work on a wage basis, but receive in addition any profits made from the business, these being divided among the members by various methods.

The workers' productive movement is the least developed of all the branches of cooperation and shows the least possibilities of future expansion. This type of society is subject to the special handicaps that (1) the groups forming them are usually small, and to start a business generally requires more capital per member than the average workingman has at his disposal;[6] (2) even though the worker-members be skilled in their line of work, they are usually inexperienced in the sale of their product and must often resort to hiring outside assistance for marketing the output; (3) the manager is as a rule chosen from among the workers themselves, a feature which, while democratic, may lead to difficulties in discipline, as the member-worker is apt to feel that he is as good as the manager (who holds office only by the members' pleasure) and to resent taking orders from him; and (4) if the business is financially successful there is the temptation to restrict the number of members who must share in the profits of the business and if additional labor is needed to secure this by hiring workers instead of taking in new members. The impetus to such an attitude is also all the greater in a workers' productive organization, inasmuch as the society represents the members' livelihood; and as the matter is a serious one to them, an exclusive membership policy is understandable and excusable. In direct proportion as this occurs, however, the society loses its cooperative character.

Some unavoidable limitation upon membership is, of course, imposed by the nature of the business or work carried on and this becomes greater with the degree of skill required. If the principle that all the members are to be workers in the business is lived up to, then obviously in a highly specialized undertaking, such, for instance, as the manufacture of hand-blown window glass, only persons skilled in the various trades can be admitted to the society as members.

Some of these cooperative companies are in reality more of the nature of trade-union or even joint-stock enterprises than of cooperative workshops and this fact is recognized by the companies themselves. Often the greater part of the capital has been furnished by the local trade-union of the members' craft and in a number of cases only unionists are eligible for membership in the company. One of the most successful fish cannery societies has reached the point of

[6] This difficulty is sometimes met, where the workshop is being sponsored by a trade-union, by the union's furnishing a portion of the capital needed.

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being more nearly a profit-sharing than a cooperative society, as only a small proportion of the workers are stockholders and of the employees only the actual producers—the fishermen—share in the profits.

Of the 39 societies of this type, the bureau has data for 21. These societies have been in business, on an average, just under 10 years.

The desire of the workers to better their wages or working conditions was the main motivating factor in the establishment of these factories, although several also were started as a result of a strike or lockout in the industry.

Employment and Wage Policies

HOW far these societies have attained the state in which the working force and the owners are one and the same is shown by Table 7:

TABLE 7.—NUMBER OF MEMBERS AND EMPLOYEES OF WORKERS' PRODUCTIVE SOCIETIES, 1925

Society	Shareholders		Non-shareholder employees	Society	Shareholders		Non-shareholder employees
	Number	Number employed in factory			Number	Number employed in factory	
Society No. 1	200	[1]	[2]	Society No. 13	382	13	63
Society No. 2	650	70	30	Society No. 14	21	10	8
Society No. 3	8	4	4	Society No. 15	22	16	15
Society No. 4	69	14	----	Society No. 16	200	20	180
Society No. 5	110	17	----	Society No. 17	9	9	----
Society No. 6	150	23	2	Society No. 18	16	16	22
Society No. 7	203	25	250	Society No. 19	89	86	45
Society No. 8	25	25	----	Society No. 20	40	40	----
Society No. 9	80	[3]	[3]	Society No. 21	92	15	150
Society No. 10	45	38	3				
Society No. 11	16	13	14	Total	2,438	465	807
Society No. 12	11	11	21				

[1] Not reported. [2] 10 per cent of working force. [3] This society has not yet started operation.

It is seen that in only three societies are the shareholders identical with the workers. One of these is not a workshop, but an aggregation of fishermen who have combined to market their catch. Two other societies employ no workers outside their own membership, but the business is unable to give employment to all the members. Society No. 10 comes very near the standard, while Societies Nos. 7, 16, and 21 show the most pronounced trend toward the joint-stock practice. Society No. 10 follows recognized cooperative practice quite closely in most respects, ranking high among the societies studied. The besetting temptation of the workers' productive society already mentioned—restriction of membership for profit's sake—has evidently had little or no effect upon it. A special effort is made to induce employees to become members. "So far as possible, all the employees of the company shall be stockholders, holding one share each of the capital stock."

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Capitalization and Business

TABLE 8 shows the paid-in share capital, the amount of surplus and reserve, and the 1925 business of the societies reporting:

TABLE 8.—PAID-IN SHARE CAPITAL, SURPLUS AND RESERVE, AND 1925 BUSINESS OF WORKERS' PRODUCTIVE SOCIETIES, BY KIND OF BUSINESS DONE

Kind of business done	Number of societies	Paid-in share capital	Surplus and reserve	Amount of business
Cigar factories	4	$53,952	[1] $900	$141,824
Fish canning and sales societies	3	208,074	[1] 445,677	[2] 764,192
Glass (window) factories	2	[1] 75,000	----------	295,679
Laundries	2	53,283	[1] 4,700	175,585
Potteries	1	71,000	([3])	([3])
Shingle mills	6	158,500	[4] 75,435	992,906
Shoe factories	2	140,700	52,956	1,419,608
Veneer factories	1	265,000	73,922	743,535
Total	21	[5] 1,025,509	[6] 653,590	[7] 4,533,329

[1] 1 society. [2] 2 societies. [3] Not reported. [4] 3 societies. [5] 20 societies. [6] 9 societies. [7] 19 societies.

Amount and Division of Profits

IN ADDITION to the wages received, the stockholder employees are also entitled to a share of any profits made by the business. In all but two cases the societies studied divide the profits on the basis, not of wages, but of stock, just as in a joint-stock company; in one of the two exceptions profits are divided according to the output of each worker-owner, while in the other they are divided equally. In 1925, however, though profits aggregating $248,804 were reported by 12 societies, in only 4 were any returns from profits received by the shareholders. These societies divided the sum of $109,470. The other 8 societies retained all of the net earnings for use in the business. Some of the societies, even though now on a profit-making basis, are in debt, due to deficits in previous years, to losses from fire, etc. The shingle mills also lost money when their marketing organization, and later a logging asssociation, failed.

The statement below shows the profits reported for 1925 by the 12 societies which were able to make a profit that year:

	Societies reporting profit or loss	Amount of profit reported
Cigar factories	2	[7] $861
Fish canning and sales societies	1	27,017
Glass (window) factories	1	[8] 9,198
Laundries	2	4,858
Shingle mills	6	[9] 18,331
Shoe factories	2	143,346
Veneer factories	1	54,391
Total	15	[10] 248,804

[7] 1 society; the other reported a loss of $10,148.
[8] Loss.
[9] 5 societies; 1 other society reported a loss but did not state the amount.
[10] 12 societies.

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Pilots' Associations

IN 1924, the Bureau of Labor Statistics made a study of the pilots' associations in eight representative ports of the United States.[11] It was found that, apparently with no idea of so doing, the pilots had formed what are almost perfect examples of cooperative skilled-labor associations.

These pilots are the men who have charge of sea-going vessels as they enter and leave the port. The work to be done is divided among all the members, the ships being taken out by the men in regular turn. A pilot taking a ship to sea conducts her to a given point outside the port, where he leaves her and proceeds in a small boat to the pilot ship. Quarters are provided on the pilot ship for a certain number of men, and the pilot stays aboard, with the men who have preceded him, until one by one they leave to conduct arriving vessels into port, and his turn comes again.

Few landsmen appreciate just how interesting, hazardous, and necessary the work of the pilot is, and probably few ships' passengers even suspect the identity of the man who boards the ship outside the entrance to the harbor, often in storm at risk of life and limb, to bring her safe into her berth in port.

Pilotage is everywhere under public regulation. New pilots are nearly everywhere recruited through the apprenticeship system, the period of training varying, in the different ports, from six months to six years. In order to obtain his license as a pilot, the apprentice must pass a rigid examination both as to his practical knowledge and as to his morals and trustworthiness.

The associations are capital-stock organizations, in which each member holds a share of stock, varying in amount from $2,000 in Boston to $10,000 at New Orleans. None except members are allowed to hold stock in the association, and if a member resigns he must sell his share back to the association at its par value. (In Savannah he may hold it until death.)

Pilots do not, in most cases, set their own fees. In practically all ports pilotage is regarded as a public service and, as such, subject to public control and regulation of rates. The fees are usually fixed on the basis of the draft of the vessel piloted, or the net registered tonnage, or both.

In all the ports studied, all earnings of individual pilots are turned in to the association, which pays from the amounts so received all expenses of operation. The remainder is then divided equally each month among the working pilots in Baltimore, Philadelphia, and Houston. In Boston, New York, New Orleans, and Galveston the earnings are pro rated among the men according to the number of days worked, a man being considered as on duty and working every day that he reports to the central office, even though he is not actually engaged in handling a boat.

The table following gives comparative data for the various ports, as of the summer of 1924.

[11] Boston, New York, Philadelphia, Baltimore, Savannah, New Orleans, Houston, and Galveston. The situation at Seattle, Astoria (Oreg.), and San Francisco was also studied, but as the pilots at those ports were not organized, they are not included here. For a detailed account of the pilots' organizations, see Labor Review, November, 1925, pp. 16–36.

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TABLE 9.—ASSETS, MEMBERSHIP, AND EARNINGS OF PILOTS' ASSOCIATIONS

Association	Year of organization	Present worth	Membership				Approximate average annual earnings of active pilots
			Number of active members	Number of apprentices	Retired members		
					Number	Amount of monthly pension	
Boston	1901	$40,000	25	[1] 8	2	[2] $400	$8,000
New York	1895	200,000	87	5	15	125	5,000
Philadelphia	1896	275,000	58	13	8	100	5,000
Baltimore	1852	([3])	48	12	3	75	4,000
Savannah:							
Pilots' association	[4] 1894		20		2	([3])	3,000
Bar pilots	1921	50,000	19				
New Orleans:							
River pilots	1918	25,000	41		4	75	3,500
Bar pilots	[6] 1878	([3])	33	3	2	100	([3])
Houston	1922	([3])	8	4			([3])
Galveston	1854	([3])	19				([3])

[1] Boat keepers.
[2] Per year; widows receive $480 per year.
[3] Information not available.
[4] Reorganized about 1921.
[5] Two-thirds pay.
[6] Reorganized about 1900.

Credit and Banking Organizations

Credit Unions

ALTHOUGH credit societies have existed in this country since about 1909, it is only during the past few years that any widespread development has taken place, for not until recently has enabling legislation been enacted. Up to 1921, less than a dozen States had enacted laws authorizing the formation of cooperative credit societies; at the end of 1925, 24 States had done so. The credit union movement has now taken root in at least 30 States, although in some places there is as yet no law under which to incorporate.

The credit union is primarily for that small borrower whose need is greatest. Its purpose, as declared in many of the societies' by-laws, is "to promote thrift among its members by giving them an opportunity to save money in small amounts and to obtain loans at moderate rates for purposes which promise to be of benefit to the borrower."

Generally, any person of good character and habits can join the credit union; $1 or less will admit him to membership. Only a member of the society can be a borrower, but once a member he can apply for a loan of whatever sum he needs, secure it at a low rate of interest, and use it to get a fresh start. As a borrower in the credit union, he is neither an exploited victim nor an object of charity, but is on a strictly business footing, which restores his self-respect.

Within the credit union all are on the same level, and with equal power and rights in the society.

The cooperative credit society is thus absolutely democratic. It is filling a real need, through a simple machinery, and is doing this at very little cost (expense of operation during 1925 averaged 1.8 per cent of total loans granted).

Practice as to security for loans differs, but as a rule "character" loans may be obtained in amounts up to $50; larger loans must be

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secured, but the security may be in the form of a note indorsed by one or more fellow members. The loans granted by the credit unions studied in 1925 averaged $381 per borrower.

The credit union member not only has the right to credit, but also receives interest on his capital and deposits with the society and his share of any earnings made by it.

The study indicates that credit societies are generally successful, and that losses from failure of members to repay loans are extremely small.

The effectiveness of these societies as "poor men's banks" is indicated by the growth of the movement. As part of the bureau's general cooperative study, data have been collected which show that although the greater part of the credit unions have been formed within the past five years, already the membership of the 176 organizations reporting numbers 107,799, their share capital amounts to nearly $11,000,000, their reserves to nearly $1,000,000, and their loans in the single year, 1925, to more than $20,000,000.

The following table shows, for the societies reporting, the amounts of their capital, reserves, and deposits at the end of 1925:

TABLE 10.—SHARE CAPITAL, RESERVES, AND DEPOSITS OF CREDIT UNIONS, 1925, BY STATES

State	Number of unions reporting	Membership	Paid-in share capital	Reserve funds	Number of depositors	Amount of deposits
Arkansas	1	390	$10,460	----------	260	$24,865
California	1	117	2,579	$100	----------	----------
Florida	1	215	12,500	92	----------	----------
Georgia	1	214	1,783	24	----------	----------
Indiana	7	841	17,373	[1] 708	[2] 278	[2] 2,491
Iowa	1	47	424	16	2	10
Kansas	1	61	5,000	----------	----------	----------
Kentucky	2	480	16,327	451	54	2,738
Louisiana	1	265	4,012	26	----------	----------
Maryland	1	173	3,878	29	----------	----------
Massachusetts [3]	58	45,672	3,630,717	[4] 386,890	[5] 21,565	[6] 2,860,375
Minnesota	1	395	6,700	80	28	1,200
New Jersey	4	1,659	(7)	712	1,473	84,197
New York	67	47,783	[8] 6,522,982	[9] 522,789	[10] 4,468	[10] 393,293
North Carolina	10	561	14,016	[11] 6,189	[12] 327	[12] 47,978
Oklahoma	2	240	4,352	[13] 405	----------	----------
Pennsylvania	1	350	89,800	3,909	----------	----------
Rhode Island	4	6,510	299,340	[14] 49,093	6,239	1,279,307
South Carolina	1	96	5,000	97	3	5
Tennessee	3	269	4,897	[15] 119	[13] 5	[13] 22
Texas	1	41	1,295	----------	----------	----------
Virginia	4	608	16,581	[14] 1,428	[14] 125	[14] 4,287
Washington	1	235	6,659	----------	----------	----------
West Virginia	1	62	730	----------	----------	----------
Wisconsin	1	495	28,694	716	----------	----------
Total	176	107,779	[16] 10,706,099	[17] 973,873	[18] 34,827	[19] 4,700,768

[1] 4 societies.
[2] 6 societies.
[3] Data are as of Oct. 31.
[4] 56 societies.
[5] 52 societies.
[6] 51 societies.
[7] Nonstock societies.
[8] Not including 1 nonstock society.
[9] 63 societies.
[10] 29 societies.
[11] 7 societies.
[12] 9 societies.
[13] 1 society.
[14] 3 societies.
[15] 2 societies.
[16] 171 societies.
[17] 155 societies.
[18] 114 societies.
[19] 113 societies.

Besides the resources shown above, 98 societies which furnished financial reports show an aggregate surplus and undivided profits of $420,910.

The following table shows that during 1925 the 173 credit unions which reported made loans amounting to more than $20,000,000,

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nearly nineteen millions in Massachusetts and New York alone. The small amounts of business in the other States are of course due to the fact that the credit-union movement has just begun there, and the societies in those States are as yet very new and small.

TABLE 11.—LOANS GRANTED, AVERAGE LOAN PER BORROWER, AND LOANS OUTSTANDING, BY STATES

State	Number of unions reporting	Number of borrowers in 1925	Loans granted in 1925		Loans outstanding at end of year
			Amount	Average per borrower	
Arkansas	1	220	$19,314	$88	$19,314
California	1	66	4,520	69	2,502
Florida	1	258	24,805	96	11,521
Georgia	1	33	2,381	72	2,294
Indiana	7	251	29,085	116	15,588
Iowa	1	3	450	150	404
Kansas	1	[1]	5,947	[2]	2,750
Kentucky	2	185	33,748	182	19,180
Louisiana	1	64	6,320	99	4,060
Maryland	1	60	3,586	60	3,586
Massachusetts [3]	58	19,289	[4] 5,931,418	308	5,608,836
Minnesota	1	95	122	1	6,900
New Jersey	4	1,327	53,691	40	19,619
New York	67	[5] 27,148	[5] 12,986,626	478	6,054,894
North Carolina	10	291	25,133	86	64,896
Oklahoma	2	136	9,680	71	4,041
Pennsylvania	1	1,000	177,572	178	144,257
Rhode Island	4	1,545	680,842	441	1,350,624
South Carolina	1	28	3,845	137	2,098
Tennessee	3	114	12,249	107	4,959
Texas	1	82	[1]	[2]	1,400
Virginia	4	339	45,304	134	23,835
Washington	1	97	7,280	75	7,280
West Virginia	1	9	658	73	658
Wisconsin	1	196	35,780	183	14,927
Total	176	[6] 52,836	[7] 20,100,356	381	13,390,422

[1] Not reported.
[2] Impossible to compute.
[3] Data are for year ending Oct. 31.
[4] 57 societies.
[5] 66 societies.
[6] 174 societies.
[7] 173 societies.

Interest on loans.—The interest that may be charged on loans is quite often limited by the credit union law. A very common provision in both legislation and by-laws is that such interest may not exceed 1 per cent per month on the unpaid balances. One society studied limits the interest to 8 per cent per year and this may not be deducted in advance. Other societies require the "legal rate," or have set specific rates such as 6 per cent, 8 per cent, and one, 5.9 per cent.

Dividends.—After provision is made for reserve or "guaranty fund," or both, and for interest on deposits, the remainder of the profit is divided among the members in proportion to the stock held by them. One society stands alone in providing that the remaining profits are to be divided among the depositors and borrowers "upon their deposits and loans to the bank and upon their loans obtained from the bank."

Only 135 of the 176 societies reporting paid dividends on the 1925 business. The amount returned by these aggregated $458,184, or 5.1 per cent, divided as follows:

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TABLE 12.—AMOUNT AND RATE OF DIVIDENDS RETURNED BY CREDIT UNIONS ON 1925 BUSINESS, BY STATES

State	Number of societies returning dividends	Dividends returned		State	Number of societies returning dividends	Dividends returned	
		Amount	Rate (per cent)			Amount	Rate (per cent)
California	1	$80	3.1	North Carolina	3	$846	9.4
Florida	1	678	5.3	Oklahoma	2	250	5.7
Indiana	3	376	2.7	Rhode Island	3	12,451	4.2
Kansas	1	300	6.0	South Carolina	1	95	1.9
Kentucky	2	965	5.9	Tennessee	2	418	9.6
Louisiana	1	60	1.5	Texas	1	126	9.7
Maryland	1	94	2.4	Virginia	4	1,309	7.9
Massachusetts	55	213,390	6.2	Wisconsin	1	1,457	5.1
New Jersey	3	2,175	(1)				
New York	50	223,113	4.3	Total	135	458,183	5.1

[1] Less than one-tenth of 1 per cent.

Losses from bad debts.—Reports as to losses from bad debts by the societies included in the present study show that members are generally honest and anxious to meet their obligations. One society which has been in operation for nearly 10 years and has made loans to its members aggregating $5,855,528, has in that time had only one borrower default on his loan, the loss being $40. Another has during its term of existence paid out $3,209,977 in loans and has had bad debts of $8,046, or one-fourth of 1 per cent of its loans.

Of the 176 credit unions which have reported in the present study, losses through failure of borrowers to repay loans have been sustained by 58 societies. The losses sustained by 54 of these, for the whole period of their operation, have amounted to only $63,122, or an average of $1,169 per society having such losses. The sums so lost by the individual associations range from $9 to $15,000. On the basis of the total number of societies covered (including those which have lost no money in this way) the sums so lost average $359 per society. Data as to the total amount of loans granted by all the societies during their entire period of operation, necessary for an accurate basis for computing the per cent of such loss, are not available. The losses of these societies, however, form only three-tenths of 1 per cent of the loans made in the single year 1925, and would form a much smaller proportion of the total loans made throughout the societies' existence.

The bright side of the picture is still further emphasized by the experience of the societies which extend loans without security. Although some credit societies require security of some kind on practically all loans, others do a large proportion of the business in unsecured loans. One organization, which at the end of 1925 had outstanding in loans the sum of $95,692, of which $39,106, or 41 per cent, was in unsecured loans, has been in operation 7¼ years and has never had a borrower who failed to repay his loan. Another, a small society in operation for three years, has also lost no money through bad loans; of $815 in outstanding loans at the end of 1925, $497, or 61 per cent, was unsecured. A third had outstanding loans of $120,123, of which $88,165, or 73 per cent, was unsecured; this association reported that it has had some losses through this practice, but

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did not state the amount of the loss. A fourth society had outstanding at the end of the year $14,163, all unsecured. This organization has been lending money to its members for nearly six years and has never lost a cent.

Labor Banks

THE research department of the Amalgamated Clothing Workers of America has furnished the following data showing the condition of the various labor banks on December 31, 1926. The number of banks remained at 36 throughout 1926. The Amalgamated Bank of Philadelphia was closed in March, 1926, the Brotherhood of Locomotive Engineers Cooperative Trust Co. of New York City was sold to private interests in August, 1926, and the Brotherhood Savings & Trust Co. of Pittsburgh was closed in October, 1926. The loss of these was offset by three new banks—the Labor National Bank of Jersey City, the Gary Labor Bank, and the Brotherhood National Bank of San Francisco.

During the last half of 1926 the surplus and profits of all the banks combined increased 0.4 per cent, the deposits 1 per cent, and the total resources 0.4 per cent.

TABLE 13.—CONDITION OF LABOR BANKS AS OF DECEMBER 31, 1926

Name of bank and location	Surplus and profits	Total deposits	Total resources
Mount Vernon Savings Bank, Washington, D. C [1]	$144,208	$4,237,408	$4,825,216
Brotherhood of Locomotive Engineers Cooperative National Bank, Cleveland, Ohio	398,274	23,174,453	25,483,728
United Bank & Trust Co., Tucson, Ariz	2,102	528,182	600,284
Peoples Cooperative State Bank, Hammond, Ind	36,922	1,716,757	1,901,777
Nottingham Savings & Banking Co., Cleveland, Ohio	11,119	751,908	845,527
San Bernardino Valley Bank, San Bernardino, Calif	29,240	1,860,163	2,065,427
Amalgamated Trust & Savings Bank, Chicago, Ill	159,645	2,837,297	3,230,895
Transportation Brotherhoods National Bank, Minneapolis, Minn	68,612	2,241,884	2,611,000
Amalgamated Bank of New York	230,426	7,824,520	8,642,113
Labor National Bank of Montana, Three Forks, Mont	9,727	166,745	201,471
Federation Bank & Trust Co. of New York	948,165	16,551,141	19,081,983
Telegraphers National Bank, St. Louis, Mo	192,368	6,266,662	7,217,467
Brotherhoods Cooperative National Bank, Spokane, Wash	65,919	2,823,186	3,293,820
Brotherhood of Railway Clerks National Bank, Cincinnati, Ohio	52,183	3,788,101	4,254,937
United Labor Bank & Trust Co., Indianapolis, Ind	7,815	875,323	1,117,126
International Union Bank, New York City	209,274	3,512,437	4,005,226
First National Bank in Bakersfield, Calif	25,384	1,508,115	1,637,095
Labor National Bank, Great Falls, Mont	18,755	549,397	668,152
Farmers & Workingmen's Savings Bank, Jackson, Mich	18,827	792,858	911,948
The Peoples National Bank of Los Angeles, Calif	54,363	3,520,701	4,206,603
Brotherhood of Locomotive Engineers National Bank, Boston, Mass	76,108	3,550,176	4,388,631
Labor Cooperative National Bank, Paterson, N. J	104,845	3,790,956	4,414,147
Brotherhood State Bank, Kansas City, Kans	21,786	669,998	791,785
Brotherhood Cooperative National Bank of Portland, Oreg	54,583	2,211,478	2,667,409
Brotherhood of Locomotive Engineers Bank & Trust Co., Birmingham, Ala	67,351	1,261,803	2,114,092
Brotherhood State Bank, Hillyard, Spokane, Wash	5,875	192,642	224,428
Brotherhood of Locomotive Engineers Title & Trust Co., Philadelphia	257,495	1,247,002	2,051,612
Labor Cooperative National Bank, Newark, N. J [2]	125,000	2,407,170	2,853,995
Brotherhood Cooperative National Bank, Tacoma, Wash	43,114	2,803,376	3,252,215
The American Bank, Toledo, Ohio	50,000	629,831	882,952
Brotherhood Bank & Trust Co., Seattle, Wash	41,411	905,020	1,196,431
Gary Labor Bank, Gary, Ind	11,346	480,445	577,430
Labor Bank & Trust Co., Houston, Tex	19,843	338,069	460,111
Hawkins County Bank, Rogersville, Tenn [3]	62,963	588,651	701,614
Labor National Bank of Jersey City, Jersey City, N. J	65,807	1,183,637	1,525,652
Brotherhood National Bank of San Francisco	115,288	1,837,289	2,452,879
Total (36 banks)	3,806,143	109,624,781	127,357,178

[1] Statement as of June 30, 1926. [2] Statement as of Dec. 1, 1926. [3] Statement as of Nov. 22, 1926.

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Other Banks

OTHER workers' banks for which the bureau has data are the Workers' Mutual Savings Bank of Superior, Wis., and the Commonwealth Mutual Savings Bank of Milwaukee.

The Workers' Mutual Savings Bank is a nonstock association, organized in October, 1917. It has 52 members. The bank accepts savings deposits only. No commercial deposits are accepted and no commercial loans are made, the funds being used to finance the construction of homes for working people and to assist cooperative societies. The bank is on a strictly cooperative basis, each member having one vote only, and no proxy voting is allowed. The treasurer is the only paid officer.

The patrons profit in two ways—by the low rate (6 per cent) charged on loans and by the comparatively high rate (4 per cent) paid on deposits.

Below are given certain of the more important data taken from the financial report of the bank as of December 31, 1926:

Number of members	52
Number of depositors	360
Amount of savings deposits	$202,025
Surplus and reserve	$6,114
Loans outstanding	$187,202
Cash on hand	$13,660

The Commonwealth Mutual Savings Bank is five years older than the Superior bank, having been organized July 1, 1912. This also is a nonstock organization, and is owned by its 2,500 depositors. Its funds are used to finance loans on working-class houses at 5 per cent. Dividend on deposits is paid at the rate of 4 per cent. Other data as of December 31, 1926, are given in the statement below:

Amount of savings deposits	$1,222,851
Guaranty fund	35,585
Undivided profits	779
Housing loans outstanding	853,348
Cash on hand	122,373

Building and Loan Associations

THE following table was taken from the report of the secretary of the United States League of Local Building and Loan Associations to the thirty-fourth meeting of the league, held at Minneapolis, July 20–22, 1926. It shows the number of associations, membership, and assets of the local building and loan associations in the United States and, of the assets, the total outstanding in mortgage loans:

TABLE 14.—STATUS OF BUILDING AND LOAN ASSOCIATIONS, 1924–25, BY STATES

State	Number of associations	Total membership	Total assets	Mortgage loans
Arizona	6	5,530	$2,371,970	$2,060,659
Arkansas	63	46,286	27,551,264	[1]
California	152	156,388	140,657,891	130,883,648
Colorado	56	72,183	30,458,600	27,815,445
Connecticut	37	35,574	16,197,954	[1]

[1] Included with "other States."

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TABLE 14.—STATUS OF BUILDING AND LOAN ASSOCIATIONS, 1924–25, BY STATES—Continued

State	Number of associations	Total membership	Total assets	Mortgage loans
Delaware	40	14,500	$7,412,252	$6,486,716
District of Columbia	23	57,239	46,020,000	44,321,000
Florida	47	25,365	33,616,550	(1)
Illinois	852	783,888	317,403,747	301,325,212
Indiana [2]	397	349,879	218,479,623	199,982,657
Iowa	74	71,800	37,380,525	35,377,861
Kansas	148	172,272	93,267,836	81,255,584
Kentucky	145	125,200	64,192,658	(1)
Louisiana	94	162,148	129,924,059	(1)
Maine	39	25,787	16,631,015	(1)
Massachusetts	220	439,553	369,273,095	348,503,053
Michigan	90	177,883	96,302,277	88,636,859
Minnesota	83	66,429	25,212,662	21,995,587
Missouri	242	182,550	117,007,732	107,651,544
Montana	30	36,900	13,109,462	(1)
Nebraska	84	202,100	141,435,904	126,752,579
New Hampshire	28	14,773	8,145,484	7,788,965
New Jersey [3]	1,410	1,008,092	645,539,550	614,083,318
New Mexico	[4] 12	[4] 6,300	[4] 2,950,000	(1)
New York	305	447,721	258,089,817	240,359,492
North Carolina	246	92,007	81,188,546	73,014,392
North Dakota	17	13,960	6,965,555	6,014,163
Ohio	865	2,098,733	847,570,701	766,256,091
Oklahoma	88	146,210	93,061,767	84,612,070
Oregon	37	34,200	14,871,323	12,647,854
Pennsylvania	[4] 4,440	[4] 1,700,000	[4] 990,000,000	910,000,000
Rhode Island	7	29,248	17,075,323	16,223,294
South Carolina	[4] 150	[4] 25,000	[4] 20,000,000	(1)
South Dakota	27	7,950	4,951,443	(1)
Tennessee	21	8,775	5,212,066	4,989,527
Texas	119	83,562	51,971,859	(1)
Utah	24	51,000	24,458,736	21,840,942
Vermont	9	3,533	1,798,039	1,690,984
Washington	71	217,440	76,145,600	62,934,356
West Virginia	59	54,500	25,000,000	(1)
Wisconsin	167	200,939	149,648,269	144,999,013
Other States	[4] 1,379	[4] 433,600	[4] 239,625,000	594,506,774
Total	12,403	9,886,997	5,509,176,154	5,085,009,639

[1] Included with "other States."
[2] As of Dec. 31, 1925.
[3] As of May 31, 1925.
[4] Estimated.

As the table shows, more than 90 per cent of the assets are invested in mortgage loans on dwellings. The extent of the work of these associations in the financing of homes during the past three years is shown in the table following, which was taken from the January, 1926, issue of the American Building Association News (Cincinnati):

TABLE 15.—NUMBER OF HOMES FINANCED, AMOUNT SPENT THEREFOR, AND PERSONS HOUSED BY BUILDING AND LOAN ASSOCIATIONS, 1923 TO 1925

Year	Number of homes financed	Amount expended	Estimated number of persons housed [1]
1923	360,000	$1,206,000,000	1,800,000
1924	425,000	1,460,000,000	2,125,000
1925	[2] 510,000	[2] 1,760,000,000	2,550,000
Total	1,295,000	4,426,000,000	6,475,000

[1] Evidently computed on the basis of 5 persons per house financed.
[2] Estimated.

Housing Societies

THE bureau has knowledge of the existence of 40 cooperative societies, all but 2 of which are in Brooklyn or New York City; and data are at hand for 32. Of these reporting societies, 22 are in

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Brooklyn (within a radius of seven or eight blocks), 9 in New York City, and 1 in Wisconsin. Especial care was taken to include only those which are genuinely cooperative in the main particulars. Many apartments are being sold on the so-called "cooperative plan" by private builders who construct them, for sale, just as they do single houses, and sell them outright to individual buyers. The buyers are allowed to resell at a profit, as well as to rent their apartment or apartments for as large a rent as they can secure. Voting is on the basis of stock ownership, and one person may own several apartments and thus have a number of votes. This is not true of genuine cooperative societies, for in such societies each member has but one vote, regardless of his capital holdings in the society. If any surplus is earned by the society this is rebated, in the truly cooperative society, on the basis of patronage (i. e., the amount of the monthly payment) and not on stock held. The affairs of the society are managed by a board of directors of varying number, elected by the members. The actual management of the apartment house is quite often in the hands of one person chosen for the work.

Most of these societies have been started in the past five years. One was started in each of the years 1916 and 1919; 2 each in 1922 and 1925; 5 each in 1921 and 1923; 7 in 1924; and 8 in 1920.

Types of Dwellings Provided

IN BOTH Brooklyn and New York the dwellings provided by all of the societies are apartments exclusively, usually those of the four-story, walk-up type, the 16-dwelling building having four apartments per floor. Another, and more attractive type, is the court building with a simple archway leading from the street to a grassy court, from which one or more entrances (according to the size of the building) lead into the various wings.

The dwellings provided by the Wisconsin society are individual houses, 105 of which have been built on a tract of 28 acres. The settlement includes a parked playground 250 by 600 feet. This was partly a cooperative and partly a city project.

Cost of Cooperative Dwellings

WHEN the individual becomes a member of a housing society he subscribes for a certain amount of capital stock in the society estimated as covering the cost of the apartment or dwelling he will occupy. This total cost is arrived at after consideration of a number of factors; the total cost of land, building, and other expenses connected therewith are taken as a basis and the cost of each dwelling is determined according to the number of rooms, floor space, location, and other points of advantage or disadvantage. The cost figure so arrived at for each individual apartment is the price which the prospective tenant must pay, and the amount for which he must subscribe stock in the society. (No profit is made in the genuine cooperative society.) This stock may be paid for either as a whole or in installments, according to the requirements of the by-laws. The share capital paid in by the members in the 18 societies for which data on this point were secured aggregated $827,850, or about $612 per member.

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Housing projects, however, especially in large cities, require considerable amounts of money. The buildings owned by the societies studied ranged in cost from $16,000 to $152,000 (average, $59,500) for old apartment buildings mainly of the 4-story, 16-dwelling type, and from $75,000 to $425,000 for the land and construction of new buildings. The wage earners who form the great majority of the members of cooperative housing societies are therefore forced to obtain money from outside sources. This is usually secured through mortgages or "comrade loans" from fellow cooperators, or both.

The average cost of apartments in the buildings for which data were secured ranged in the old buildings from $2,000 to $4,313 (average $3,190), and in the new buildings from $3,094 to $6,750 (average, $5,614). The apartments were generally those of 3, 4, and 5 rooms.

The initial payment required varied in certain of the societies covered from $100 to $2,000; 2 societies require only $100 down, 4 societies from $300 to $500, 5 societies from $600 to $1,000, and 1 society from $1,200 to $2,000, according to the size of the apartment. In those organizations in which the initial payment varies with the number of rooms, the sum per room ranges from $125 to $400. In 2 societies the payment is as low as $125 a room; 2 societies require $200 a room, 1 society $200 a room plus $50 for the kitchenette, 2 societies $250, 3 societies $300, and 3 societies $400 a room.

After the member takes possession of his dwelling he pays as "rent" each month a certain amount, which is calculated to cover his proportionate share of such items as taxes, insurance, the general upkeep of the building (repairs, improvements, janitor service), fuel, payments on the mortgage or mortgages, etc. In some cases the members adopt the policy of making these monthly payments large enough to cover unexpected expenses, building up a little surplus for this and other purposes. In others, such expenses are met as they arise through a pro rata assessment on all the tenants.

The monthly amounts paid by the owner-tenants are shown below. In reading the table it should be borne in mind that these payments take no account of interest on principal already paid.

TABLE 16.—AVERAGE MONTHLY PAYMENTS ON COOPERATIVE APARTMENTS OF 3, 4, AND 5 ROOMS

[Interest on principal already paid not included]

Society and location	Average monthly payment on cooperative apartments of—			Society and location	Average monthly payment on cooperative apartments of—		
	3 rooms	4 rooms	5 rooms		3 rooms	4 rooms	5 rooms
Brooklyn:				Brooklyn—Con.			
No. 1	$24.00	$32.00	$40.00	No. 16	----------	----------	$65.00
No. 3	20.70	27.60	34.50	No. 17	----------	----------	[1]42.00–43.50
No. 4	12.00	16.00	20.00	No. 18	$35.00	$46.00	59.00
No. 5	24.00	32.00	40.00	No. 19	19.40	----------	32.50
No. 6	15.00	20.00	25.00	No. 20	38.00	50.00	55.00
No. 7	[1]24.00–39.00	[1]32.00–52.00	[1]40.00–65.00	No. 21	----------	----------	[1]44.00–54.00
No. 8	----------	25.00	----------	New York:			
No. 9	[1]24.00–27.00	[1]32.00–36.00	[1]40.00–45.00	No. 1	[1]18.00–21.00	[1]24.00–28.00	[1]30.00–35.00
No. 10	21.00	28.00	35.00	No. 2	33.00	44.00	55.00
No. 11	----------	[1]30.00–36.50	----------	No. 3	[1]45.00–54.00	[1]60.00–72.00	[1]75.00–90.00
No. 12	46.50	[1]58.88–62.00	----------	No. 4	[1]36.00–39.00	[1]48.00–52.00	[1]60.00–65.00
No. 13	[1]21.00–27.00	[1]28.00–36.00	[1]35.00–45.00	No. 5	45.00	60.00	75.00
No. 14	----------	35.00	45.00	No. 6	39.00	52.00	65.00
No. 15	32.00	44.00	54.00				

[1] According to location.

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As part of the monthly payment goes to pay off the indebtedness, this is gradually reduced, and as a consequence not only is the amount of the tenant's equity in the building increased but his monthly payments decrease. When the building or buildings finally become the property of the society, the only expense is that of maintenance.

Ownership

IN THE genuine cooperative society the tenant never receives a title to his dwelling. Legal ownership remains in the society as a whole. The member merely owns stock in the organization to the value of his apartment or dwelling and receives a permanent lease which he may pass on to his heirs. Should he desire to give up his membership his stock must first be offered to the society, and if the latter is unable to redeem it at its par value he is allowed to sell it, at cost, to any person who he considers would be a desirable tenant. Transfers of stock must be made on the books of the society. In this way speculative profit by the members at the expense of the prospective member is prevented. "It is not the purpose of cooperative building societies to enable tenants to obtain homes at bottom prices by building collectively and then to allow the individuals to own and sell them to others for profit. The purpose of cooperative building societies is to provide permanent homes for the people without private profit or speculation in land and buildings, collectively controlled and administered by the tenant members." [12]

It is to be regretted that not all the cooperative housing societies studied follow this practice. In most instances the member does not receive title to his dwelling; in three societies, however, the reverse is true. As regards the principle of selling at cost, not so favorable a situation was found. Eight societies allow the member to sell his holdings for whatever he can get, though in none of these societies has any of the original members attempted to do so.

Cost of Property Owned

THE 32 societies included in the present study control property costing more than $4,000,000, distributed among the three localities as follows:

TABLE 17.—COST OF PROPERTY CONTROLLED BY COOPERATIVE HOUSING SOCIETIES

Location of society	Number of societies reporting	Number of families housed	Cost of building and land
Brooklyn	22	534	[a] $2,176,000
New York City	9	1,166	1,422,600
Wisconsin	1	105	504,000
Total	32	1,805	4,102,600

[a] 21 societies.

[12] Report of housing committee to third cooperative congress, Chicago, Oct. 26–28, 1922.

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It should be emphasized that the above figures represent the actual cost, not the present value. In many, if not all, instances, the value of the property has increased since the society has been holding it. In one organization in Brooklyn, apartments for which the original members paid $600 are now worth $1,000 and $1,100. Such an increase, however, is an asset of the society as a whole, and not of the individual members.

Cooperative Insurance

COOPERATIVE insurance is a field not as yet entered upon to any considerable extent, except by the farmers' organizations, especially in the Middle West, and this has been mainly in the form of mutual insurance. There are, however, two consumers' cooperative insurance societies, the Workmen's Furniture Fire Insurance Society, New York City, and the New Era Association, Grand Rapids, Mich.

The Workmen's Furniture Fire Insurance Society was organized in December, 1872. As its name implies, it writes insurance only on household goods. It is a nonstock, fraternal organization, doing business on the assessment plan. It issues no policies. The member desiring to insure his furniture makes a guaranty deposit of $1 for every $100 of insurance desired. The "premium" (assessment) has for many years amounted to 10 cents per $100 annually. No member can take out more than $2,000 worth of insurance.

The society had, at the end of 1926, a membership of 47,032, and insurance in force amounting to $43,140,025. The amount received in assessments during the year was $39,196.25.

The New Era Association is a nonstock, fraternal organization, chartered October 1, 1897. Its policy is that of service at cost, as far as possible. Its rates are reported to be from one-half to two-thirds those charged by the old-line companies.[13] This lower charge, it is stated, is possible because of the fact that "only 10 per cent of all policies ever are paid either as death claims or as matured endowment policies. The remaining 90 per cent, for some reason or other, never materialize."[14] The 90 per cent, therefore, mean pure profit for the companies and go to swell their resources. The New Era Association, however, not being a profit organization, gives the policyholders the benefit, in the form of reduced premiums.

The association is democratically controlled. Each member has one vote only, and no proxy voting is allowed. Ten per cent of the members can demand a referendum on any measure taken by the officers,[15] and no increase in rates can be made except by vote of the members.

Data furnished by the association, as of March, 1927, show that the organization has 34,698 members (policyholders) and the total insurance in force amounts to $41,850,500. It has reserves of $224,467. During the entire period of its operation the association has paid in claims $4,800,865.

Organized labor has established two companies to write life insurance for members and others. Although primarily trade-union

[13] Cooperation (New York), August, 1925, p. 154.
[14] Northern States Cooperative League. Yearbook, 1926. Minneapolis, 1926, p. 130.
[15] Proceedings of fifth cooperative congress, held at Minneapolis, Nov. 4–16, 1926.

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enterprises, the companies have certain cooperative features. An account of these companies is given in the section "Insurance and benefit plans," page 340.

Farmers' Property Insurance

THE Farmers' Educational and Cooperative Union has been active in promoting the writing of cooperative insurance on life, crops, etc., and at present seven States are reported to have State-wide farmers' union property insurance societies.

The following statement, taken from the December 30, 1926, issue of the Kansas Union Farmer (Salina, Kans.), shows the date of organization of the insurance societies and the total amount of insurance in force in these seven States:

	Date of organization	Insurance now in force
Kansas	July, 1914	$55,000,000
Colorado	January, 1910	16,000,000
Nebraska	October, 1918	33,000,000
Oklahoma	January, 1922	13,000,000
Iowa	May, 1925	11,000,000
South Dakota	April, 1925	8,000,000
Washington	January, 1917	1,750,000
Total		137,750,000

The report states that the above represents a total saving of $525,500 to the insured.

In Washington State the National Grange in 1894 organized a fire-insurance association, membership in which is restricted to members of the grange. It has about 3,500 policyholders and some $9,000,000 of insurance outstanding. It is stated [16] that the costs have been less than 30 cents per $100 of insurance per year.

Five fire insurance companies have been organized by farmers in New York State since 1913. At the end of 1925–26 these five companies had insurance in force 3,439 policies amounting to $12,643,505. Losses paid during the year amounted to $198,120.[17]

The United States Department of Agriculture in 1924 [18] estimated that there were at that time about 2,000 farmers' mutual fire insurance companies, located mainly in the East and Middle West, carrying risks amounting to over $8,000,000,000. The cost of insurance by these companies during the period 1917 to 1921 ranged from 6 to 51 cents per $100, with an average of 26 cents for the country as a whole.

[16] Cooperation, New York, September, 1926.
[17] Cooperation, New York, February, 1927.
[18] U. S. Department of Agriculture Yearbook, 1924, Washington, 1925, pp. 239–256.

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COST OF LIVING

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Trend in Cost of Living in the United States

THE United States Bureau of Labor Statistics publishes periodically the results of surveys showing changes in the cost of living in 32 cities and also in the United States as a whole. Since 1924 these surveys have been made twice a year, in June and December. Immediately upon compilation, the results of each survey are issued in pamphlet form and are also published in the succeeding issue of the Labor Review.

The original price information used in compiling the cost-of-living figures is secured from merchants and other dealers in each of the 32 cities. The prices of food and of fuel and light (which include coal, wood, gas, electricity, and kerosene) are furnished the bureau by correspondence in accordance with previous arrangements made with establishments through personal visits of the bureau's agents. In each city food prices are secured from 15 to 25 merchants and dealers and fuel and light prices from 10 to 15 firms, including public utilities. All other data are secured by representatives of the bureau, who visit the various merchants, dealers, and agents and secure the figures in person. Four quotations are secured in each city (except in Greater New York, where five are obtained) on each of a large number of articles of clothing, furniture, and miscellaneous items. Rental figures are secured from 400 to 2,200 houses and apartments in each city, according to its population.

The average price of each article and item is weighted according to its importance in the average family budget.

The various groups forming the components of the cost of living are then weighted according to their relative importance as shown in Table 6. These "weights" are derived from the comprehensive cost-of-living and budgetary survey made by the bureau in 1918–19. This survey covered 12,096 families in 92 localities. The results of this 1918–19 survey were published in Bulletin No. 357. It is extremely desirable that a new budget survey should be made, as there probably may have been important changes in the character of family expenditures since 1918–19; but the very heavy expense involved has thus far prevented the bureau from undertaking this task.

Changes for Country as a Whole, 1913 to 1926

AS ALREADY noted, the bureau's studies of changes in cost of living cover 32 cities. In the case of 19 of these cities the studies began in December, 1914, and for the 13 other cities, in December, 1917.

From the figures for these 32 cities a combined index number has been computed, and this combination is assumed to be fairly representative for the United States as a whole. It should be noted that this index number for the United States has been based on the year 1913, inasmuch as that year has been used as a basis for many of the bureau's index numbers. To bridge the gap between 1913 and December, 1914, use has been made of the data regarding retail prices of certain articles and the wholesale prices of other articles. As the price changes during this period were relatively small, the results are believed to be substantially accurate.

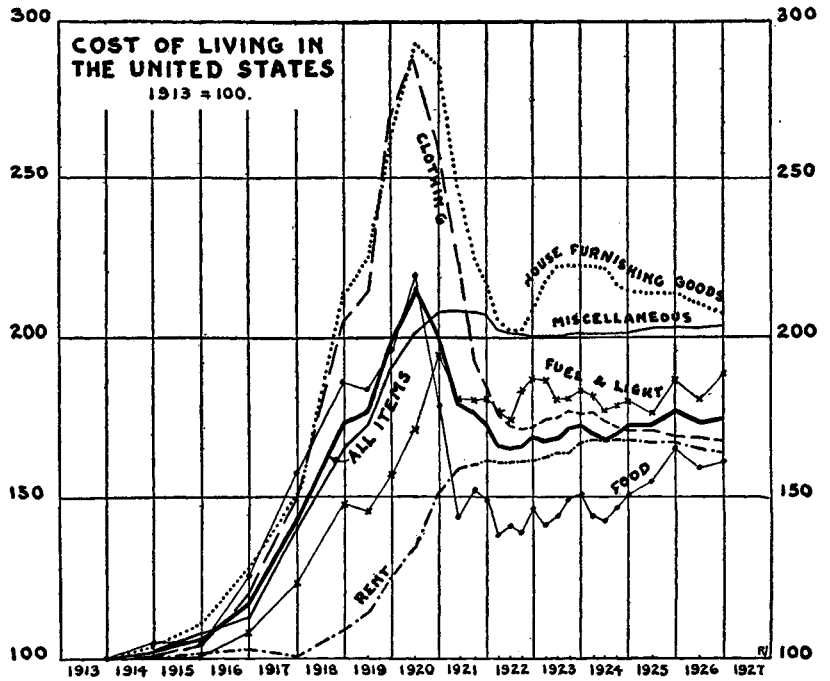
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Table 1 gives the index numbers for changes in the cost of living for the United States as a whole, for all of the periods for which surveys are made by the bureau. These figures are also presented in graphic form in the accompanying chart.

TABLE 1.—INDEX NUMBERS OF COST OF LIVING IN THE UNITED STATES FROM 1913 TO DECEMBER, 1926

[Average for 1913=100.0]

Month and year	Food	Clothing	Rent	Fuel and light	House furnishing goods	Miscellaneous	All items
1913 average	100.0	100.0	100.0	100.0	100.0	100.0	100.0
December, 1914	105.0	101.0	100.0	101.0	104.0	103.0	103.0
December, 1915	105.0	104.7	101.5	101.0	110.6	107.4	105.1
December, 1916	126.0	120.0	102.3	108.4	127.8	113.3	118.3
December, 1917	157.0	149.1	100.1	124.1	150.6	140.5	142.4
December, 1918	187.0	205.3	109.2	147.9	213.6	165.8	174.4
June, 1919	184.0	214.5	114.2	145.6	225.1	173.2	177.3
December, 1919	197.0	268.7	125.3	156.8	263.5	190.2	199.3
June, 1920	219.0	287.5	134.9	171.9	292.7	201.4	216.5
December, 1920	178.0	258.5	151.1	194.9	285.4	208.2	200.4
May, 1921	144.7	222.6	159.0	181.6	247.7	208.8	180.4
September, 1921	153.1	192.1	160.0	180.7	224.7	207.8	177.3
December, 1921	149.9	184.4	161.4	181.1	218.0	206.8	174.3
March, 1922	138.7	175.5	160.9	175.8	206.2	203.3	166.9
June, 1922	140.7	172.3	160.9	174.2	202.9	201.5	166.6
September, 1922	139.7	171.3	161.1	183.6	202.9	201.1	166.3
December, 1922	146.6	171.5	161.9	186.4	208.2	200.5	169.5
March, 1923	141.9	174.4	162.4	186.2	217.6	200.3	168.8
June, 1923	144.3	174.9	163.4	180.6	222.2	200.3	169.7
September, 1923	149.3	176.5	164.4	181.3	222.4	201.1	172.1
December, 1923	150.3	176.3	166.5	184.0	222.4	201.7	173.2
March, 1924	143.7	175.8	167.0	182.2	221.3	201.1	170.4
June, 1924	142.4	174.2	168.0	177.3	216.0	201.1	169.1
September, 1924	146.8	172.3	168.0	179.1	214.9	201.1	170.6
December, 1924	151.5	171.3	168.2	180.5	216.0	201.7	172.5
June, 1925	155.0	170.6	167.4	176.5	214.3	202.7	173.5
December, 1925	165.5	169.4	167.1	186.9	214.3	203.5	177.9
June, 1926	159.7	168.2	165.4	180.5	210.4	203.3	174.8
December, 1926	161.8	166.7	164.2	188.3	207.7	203.9	175.6



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Changes in Individual Cities

TABLE 2 shows index numbers for changes in the cost of living as a whole (i. e., all items combined), for 19 cities, from December, 1914, to December, 1926. The figures are given for December of each year up to 1919, and thereafter semiannually.' The index numbers are computed on December, 1914, as the base or 100.

TABLE 2.—INDEX NUMBERS OF COST OF LIVING IN 19 CITIES FROM DECEMBER, 1914, TO DECEMBER, 1926

[December, 1914=100.0]

Month and year	Baltimore, Md.	Boston, Mass.	Buffalo, N.Y.	Chicago, Ill.	Cleveland, Ohio	Detroit, Mich.	Houston, Tex.	Jacksonville, Fla.	Los Angeles, Calif.	Mobile, Ala.
December, 1914	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
December, 1915	98.6	101.6	103.5	103.0	101.4	103.5	99.7	101.3	98.1	99.6
December, 1916	118.5	115.7	124.4	119.5	119.1	122.3	116.4	114.7	107.7	113.8
December, 1917	151.3	138.1	151.1	141.8	142.9	149.9	144.9	141.6	128.9	143.2
December, 1918	184.7	170.6	180.9	172.2	171.4	178.0	175.7	171.5	158.0	171.4
June, 1919	184.0	172.8	184.2	174.5	177.2	184.4	180.2	177.5	165.1	176.6
December, 1919	198.4	192.3	202.7	200.6	198.2	207.9	201.7	201.5	185.3	194.5
June, 1920	214.3	210.7	221.5	214.6	220.3	236.0	212.2	216.5	201.7	207.0
December, 1920	196.8	197.4	201.7	193.3	207.3	218.6	204.0	206.2	196.7	193.3
May, 1921	177.4	174.4	180.3	178.4	187.5	193.3	179.7	185.8	178.7	170.8
December, 1921	173.2	170.2	176.8	172.3	178.8	182.4	173.6	175.1	176.4	163.6
June, 1922	167.6	159.6	168.6	165.0	168.9	175.3	165.9	165.7	172.5	155.3
December, 1922	170.9	165.1	173.9	168.0	172.9	179.4	168.4	167.8	174.5	158.8
June, 1923	172.0	163.5	174.1	169.6	177.1	181.7	167.2	167.7	175.1	158.6
December, 1923	174.8	169.4	178.6	183.7	179.6	184.7	170.6	171.9	178.8	162.6
June, 1924	171.9	163.2	173.9	172.6	175.9	182.8	165.0	167.3	175.1	158.0
December, 1924	174.8	167.3	177.8	175.3	178.1	182.2	170.5	170.4	175.4	163.9
June, 1925	177.3	165.8	179.7	177.1	180.4	184.5	171.1	170.9	176.9	163.9
December, 1925	181.2	174.7	184.8	180.6	182.7	187.8	174.3	181.7	177.4	168.5
June, 1926	178.4	169.4	182.8	177.8	181.9	184.7	169.2	181.8	171.2	166.2
December, 1926	178.6	171.9	183.6	179.0	181.5	184.1	170.6	181.3	172.2	168.1

Month and year	New York, N. Y.	Norfolk, Va.	Philadelphia, Pa.	Portland, Me.	Portland, Oreg.	San Francisco, and Oakland, Calif.	Savannah, Ga.	Seattle, Wash.	Washington, D. C.	
December, 1914	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	----
December, 1915	102.0	100.6	101.2	99.6	96.9	98.3	99.8	99.0	101.0	----
December, 1916	114.9	114.7	114.7	113.8	106.1	108.3	114.6	107.4	114.6	----
December, 1917	144.7	145.2	143.8	138.0	131.2	128.6	142.5	131.1	147.3	----
December, 1918	177.3	180.7	173.9	172.2	164.2	157.8	175.0	169.9	173.8	----
June, 1919	179.2	187.1	176.2	174.3	169.2	165.6	179.8	176.9	[1] 171.2	----
December, 1919	203.8	207.0	196.5	191.6	183.7	187.8	198.7	197.7	[2] 187.6	----
June, 1920	219.2	222.2	213.5	207.6	200.4	196.0	209.4	210.5	201.3	----
December, 1920	201.4	209.0	200.7	193.1	180.3	185.1	198.7	194.1	187.8	----
May, 1921	181.7	188.1	179.8	172.1	162.2	166.7	177.6	180.2	167.1	----
December, 1921	179.3	179.2	174.3	169.2	158.3	163.6	166.2	171.5	163.0	----
June, 1922	170.7	169.5	168.2	159.7	152.1	156.8	156.8	167.0	157.6	----
December, 1922	174.2	169.9	170.7	164.1	156.1	158.8	159.2	166.7	159.5	----
June, 1923	172.6	171.1	172.1	163.3	154.6	157.6	157.9	166.4	160.9	----
December, 1923	177.3	172.4	174.7	166.9	157.8	162.1	158.2	168.5	163.2	----
June, 1924	172.5	168.4	171.5	162.4	152.8	157.3	154.8	166.7	159.2	----
December, 1924	176.5	172.1	176.1	166.0	155.8	160.1	156.3	167.8	163.1	----
June, 1925	175.8	171.9	177.6	165.3	155.8	162.2	157.9	170.5	164.0	----
December, 1925	183.2	176.4	182.6	170.3	156.9	164.7	162.9	171.7	167.3	----
June, 1926	178.6	173.1	180.6	167.3	154.6	160.7	160.6	169.4	165.5	----
December, 1926	180.0	174.6	182.3	169.2	155.1	161.7	160.5	169.1	166.0	----

[1] For April, 1919. [2] For November, 1919.

Table 3 gives similar information for the 13 cities for which reports were begun in December, 1917, this date, therefore, being used as the base, or 100, in computing the index numbers.

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TABLE 3.—INDEX NUMBERS OF COST OF LIVING IN 13 CITIES FROM DECEMBER, 1917, TO DECEMBER, 1926

[December, 1917=100.0]

Month and year	Atlanta, Ga.	Birmingham, Ala.	Cincinnati, Ohio	Denver, Colo.	Indianapolis, Ind.	Kansas City, Mo.	Memphis, Tenn.
December, 1917	100.0	100.0	100.0	100.0	100.0	100.0	100.0
December, 1918	119.7	117.0	117.3	120.7	119.1	119.6	118.3
June, 1919	123.3	119.8	121.1	125.3	121.1	120.6	123.3
December, 1919	137.9	134.3	135.2	138.2	136.5	138.2	135.2
June, 1920	146.7	141.9	147.1	150.3	150.2	151.0	146.4
December, 1920	138.5	133.3	134.7	138.7	137.6	139.5	139.3
May, 1921	125.2	122.1	121.7	126.9	123.9	127.3	126.7
December, 1921	118.7	116.2	115.3	124.5	119.3	122.5	123.2
June, 1922	113.7	110.7	112.7	118.8	116.4	115.0	118.2
December, 1922	115.1	113.2	113.8	121.6	118.8	116.2	118.6
June, 1923	114.2	113.6	115.5	119.9	119.4	115.3	119.9
December, 1923	116.0	116.0	117.7	122.1	120.6	117.2	121.0
June, 1924	113.6	113.1	116.3	117.8	119.3	114.3	118.2
December, 1924	114.9	116.8	117.6	120.2	121.4	115.3	120.4
June, 1925	116.2	116.9	122.1	121.1	121.5	116.3	120.5
December, 1925	119.0	119.2	123.0	122.5	124.2	118.0	122.0
June, 1926	117.3	117.5	122.6	119.7	121.9	116.6	119.9
December, 1926	117.4	117.8	123.8	120.4	122.3	115.2	119.9

Month and year	Minneapolis, Minn.	New Orleans, La.	Pittsburgh, Pa.	Richmond, Va.	St. Louis, Mo.	Scranton, Pa.
December, 1917	100.0	100.0	100.0	100.0	100.0	100.0
December, 1918	115.8	117.9	119.8	117.9	116.7	121.9
June, 1919	118.8	120.7	121.8	120.6	117.9	125.0
December, 1919	132.7	133.9	136.2	132.0	134.2	137.1
June, 1920	143.4	141.9	149.1	143.8	148.9	151.5
December, 1920	135.7	136.7	139.3	133.3	135.4	139.1
May, 1921	123.7	123.8	127.7	120.2	123.1	128.2
December, 1921	120.7	122.7	122.8	118.3	118.5	126.3
June, 1922	117.3	118.9	117.8	113.2	115.1	120.9
December, 1922	118.0	118.6	120.1	114.4	117.0	122.4
June, 1923	117.4	117.7	121.3	114.9	117.7	122.4
December, 1923	118.8	120.2	122.9	117.1	120.6	125.8
June, 1924	116.2	116.8	122.4	113.5	118.8	122.4
December, 1924	117.3	120.6	124.9	116.5	120.7	125.8
June, 1925	117.6	120.2	126.0	116.7	122.4	127.0
December, 1925	120.3	122.7	128.5	120.8	125.0	132.0
June, 1926	119.6	120.1	126.2	119.7	124.1	129.0
December, 1926	118.2	121.7	127.2	119.3	124.5	129.8

Cost of Living in the United States and in Foreign Countries

THE trend of cost of living in the United States and in various foreign countries since 1913 is shown by the index numbers in the following tables, in so far as data are available from official sources for the several countries. Only those countries are presented for which the index numbers include all or most of the items usually combined under the term "Cost of living." Some countries publish index numbers for a few items only, such as food and rent. These are not included here, but are included in the detailed tables published in the Labor Review for February, 1927.

Caution should be observed in the use of these figures, since not only are there differences in the base periods and in the number and kind of articles included and the number of markets represented, but also there are radical differences of method in the construction of the index numbers. Moreover, monetary inflations in certain countries seriously affect, of course, the index numbers.

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INDEX NUMBERS OF COST OF LIVING IN THE UNITED STATES AND IN FOREIGN COUNTRIES, 1913 TO 1926

Country	United States	Canada	Belgium	Czecho-slovakia	Den-mark	Finland	France	Ger-many	Ireland	Italy
Number of localities	32	60	59	Prague	200	21	Paris	71	200	Milan
Commodities included	Food, clothing, fuel and light, rent, house-furnishings, etc.	Food, clothing, fuel and light, rent, sundries	Food, clothing, fuel and light, rent, sundries	Food, clothing, fuel and light, rent, sundries	Food, clothing, fuel and light, rent, taxes, etc.	Food, clothing, fuel, rent, taxes, etc.	Food, clothing, fuel and light, rent, sundries	Food, clothing, fuel and light, rent, sundries	Food, clothing, fuel and light, rent, sundries	Food, clothing, fuel and light, rent, sundries
Computing agency	Bureau of Labor Statistics	Department of Labor [a]	Ministry of Labor and Industry	Office of Statistics	Department of Statistics	Central Statistical Office	Commission for Study of Cost of Living	Federal Statistical Bureau	Department of Industry and Commerce	Municipal Administration
Base period	1913	1913	1921	July, 1914	July, 1914	January-June, 1914	1914	1913-14	July, 1914	January-June, 1914
Year and month										
1913	100	100								
1914	[1] 103	[1] 103		[2] 100	[2] 100	[3] 100	100	[4] 100	[2] 100	[3] 100
1915	[1] 105	[1] 107			[2] 116					114
1916	[1] 118	[1] 124			[2] 136					146
1917	[1] 142	[1] 143			[2] 155					197
1918	[1] 174	[1] 162			[2] 182					285
1919	[1] 199	[1] 176			[2] 211		[3] 238			327
1920	[1] 200	[1] 191			[2] 262		[5] 341			442
1921	[1] 174	[1] 162	100		[2] 237	[1] 1172	[5] 307			541
1922	[1] 170	[1] 158	[2] 90		[2] 199	[1] 1157	[5] 302		[2] 185	501
1923	[1] 173	[1] 159	[2] 109	690	[2] 204	1147	[5] 334	[1] 142	[2] 180	494
1924				692		1170				527
Jan			124	688	209	1155	[6] 365	126	188	510
Feb			128	691		1143		120		517
Mar	170		130	687		1141		122		521
Apr			124	678		1121	[6] 366	125	178	522
May			119	681		1121		127		518
June	169	153	123	697		1147		124		518
July			125	689	214	1154	[6] 367	126	183	512
Aug			127	684		1198		127		512
Sept	171		128	691		1199		129		516
Oct			134	703		1219	[6] 377	135	193	546
Nov			137	705		1222		135		563
Dec	173	156	137	707		1217		135		573
1925				721		1212				
Jan			139	716	221	1199	[6] 386	136	195	580
Feb			137	730		1191		136		592
Mar			136	728		1210		136		602
Apr			131	730		1201	[6] 390	137	188	600
May			128	728		1176		136		591
June	174	155	131	731		1191		138		596
July			133	741	219	1218	[6] 401	143	188	598
Aug			136	726		1266		145		610
Sept			139	711		1242		145		624
Oct			141	703		1228	[6] 421	144	188	643
Nov			141	700		1227		141		643
Dec	178	160	143	703		1197		141		649
1926										
Jan			139	707	194	1166	[6] 451	140	188	665
Feb			140	699		1175		139		661
Mar			137	687		1172		138		647
Apr			140	685		1163	[6] 485	140	180	642
May			147	692		1159		140		652
June	175	157	155	693		1175		141		650
July			174	718	184	1183	[6] 539	142	182	649
Aug			182	723		1213		143		652
Sept			179	723		1203		142		647
Oct			188	726		1197		142	189	672
Nov			196	734		1193	[6] 545	144		657
Dec	176	157	199	735		1197		144		657

[a] Data used in the Labor Review for February, 1927, p. 183, were compiled by the Dominion Bureau of Statistics.

[1] December.
[2] July.
[3] January-June.
[4] October, 1913, January, April, and June, 1914.
[5] April-June.
[6] Quarter beginning with month.

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INDEX NUMBERS OF COST OF LIVING IN THE UNITED STATES AND IN FOREIGN COUNTRIES, 1913 TO 1926—Continued

Country	Netherlands	Norway	Poland	Sweden	Switzerland	United Kingdom	South Africa	India	Australia	New Zealand
Number of localities	The Hague	30	Warsaw	49	33	630	9	Bombay	30	25
Commodities included	Food, all commodities	Food, clothing, fuel and light, rent, sundries	Food, clothing, fuel and light, rent, sundries	Food, clothing, fuel and light, rent, sundries	Food, clothing, fuel and light, rent	Food, clothing, fuel and light, rent, sundries	Food, fuel, light, rent, sundries	Food, clothing, fuel and light, rent	Food, groceries, rent	Food, clothing, fuel and light, rent, sundries
Computing agency	Municipal Administration	Central Statistical Office	Central Statistical Office	Board of Social Welfare	Federal Labor Office	Ministry of Labor	Office of Census and Statistics	Labor Office	Bureau of Census and Statistics	Census and Statistics Office
Base period	1921	July, 1914	January, 1914	July, 1914	June, 1914	July, 1914	1914	July, 1914	1911	July, 1914
Year and month										
1913									108	
1914		[7] 100	100	[2] 100	[2] 100	[2] 100	100	[2] 100	111	[2] 100
1915		[7] 117				[2] 125	105		126	107
1916		[7] 146		[1] 139		[2] 148	112		130	116
1917		[7] 190				[2] 180	122		129	129
1918		[7] 253		[2] 219	204	[2] 203	131	154	134	143
1919		[7] 275		[2] 257	222	[2] 208	145	175	148	157
1920		[7] 302		[2] 270	224	[2] 252	179	183	175	178
1921	100	[7] 302		[2] 236	200	[2] 219	162	173	167	177
1922	[1] 83	[7] 255		[2] 190	164	[2] 184	135	164	156	160
1923	[1] 82	[7] 239		[2] 174	164	[2] 169	131	154	168	158
1924				[2] 171	169	[2] 170	133	157	166	160
Jan.				176		177	133	159	[6] 167	
Feb.						179	134	156		162
Mar.	85	249				178	134	154		
Apr.				173		173	134	150	[6] 166	
May						171	134	150		
June	84	251				169	133	153		
July				171		170	132	157	[6] 165	
Aug.						171	132	161		160
Sept.	84	260				172	132	161		
Oct.				174		176	133	161	[6] 165	
Nov.						180	134	161		
Dec.	84	267				181	133	160		
1925					168		133	155	170	162
Jan.			145	178	170	180	133	157	[6] 167	
Feb.			146		170	179	133	157		160
Mar.	83	273	147		169	179	133	159		
Apr.			146	177	168	175	134	158	[6] 170	
May			143		168	173	134	156		
June	86	261	144		168	172	134	154		
July			146	176	168	173	133	157	[6] 171	
Aug.			149		168	173	132	152		163
Sept.	83	249	149		168	174	132	151		
Oct.			152	175	167	176	132	153	[6] 172	
Nov.			157		167	176	131	153		164
Dec.	82	237	173		167	177	131	155		
1926										
Jan.			170	174	166	175	131	155	[6] 175	
Feb.			171		164	173	131	154		162
Mar.	80	227	169		163	172	131	155		
Apr.			176	173	162	168	131	153	[6] 180	
May			183		162	167	132	153		163
June	82	221	183		162	168	131	155		
July			177	172	162	170	130	157	[6] 176	
Aug.			181		161	170	130	155		163
Sept.	79	221	188		161	172	130	155		
Oct.			190	171	161	174	131	155		
Nov.			195		161	179	131	154		162
Dec.	80	216	197		161	179	129	156		

[1] December. [2] July. [6] Quarter beginning with month. [7] June.

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Income and Expenditures of Workingmen's Families

FAMILY-BUDGET studies, covering the income and expenditures of workingmen's families are of much interest in themselves. In addition, however, detailed knowledge of the distribution of family expenditures among the various items purchased is absolutely essential to a proper determination of changes in the cost of living. The total family outlay covers many objects and items, some of which, such as house rent, constitute a large element of the budget. Others, such as matches or salt, constitute very small elements of expenditure. In compiling figures to show comparative cost of living at different times or in different places, it is necessary to know not only the prices of the several commodities, but also the approximate consumption of each commodity in order that each item may be "weighted" according to its importance.

Data of this character can only be obtained by family-budget studies covering a sufficiently large number of families to be representative. The Bureau of Labor Statistics has made three general surveys of family incomes and expenditures. The results of the first survey, covering 8,544 families, were published in the sixth and seventh annual reports of the Commissioner of Labor in 1890 and 1891, respectively. The second study, covering 25,440 workingmen's families, was made in 1901 and published as the Eighteenth Annual Report of the Commissioner of Labor.

The third and latest study was made in 1918–19 in cooperation with the National War Labor Board. It covered 12,096 families in 92 cities or localities in 42 States. For each of these families a detailed schedule was obtained regarding income, expenditures, and other significant factors during the period of a year.

Table 1 shows for these 12,096 families the sources and amounts of family incomes for one year, by income groups. Table 2 shows, in similar fashion, the amount and per cent of expenditures by principal groups. Table 3 shows the number and per cent of families having a surplus or deficit or neither and the average amount of the surplus or deficit per family and income group. Detailed tables showing expenditures for the various articles and items in the budget are given in Bulletin 357 of the Bureau of Labor Statistics.

In examining these tables it is important to note that, owing to wage and price changes since 1918–19, the actual amounts of income and expenditures do not necessarily represent present conditions. The significant figures are those showing the percentage distribution of income and expenditures by sources. These are less affected by wage and price changes and may be used for weighting purposes over a considerable length of time, and are so used now by the bureau in computing changes in cost of living. As elsewhere pointed out, however, it would be highly desirable to have a new family-budget survey made.

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TABLE 1.—SOURCES AND AMOUNTS OF FAMILY INCOMES IN ONE YEAR, BY INCOME GROUPS, 1918–19

Amount

Income group	Number of families	Family income derived from earnings of—				
		Husband	Wife	Children	Dependents	Total
Under $900	332	$765.60	$9.39	$6.92		$781.91
$900 and under $1,200	2,423	1,013.69	11.39	11.83	$0.51	1,037.42
$1,200 and under $1,500	3,959	1,252.45	13.93	26.33	1.29	1,294.00
$1,500 and under $1,800	2,730	1,487.92	15.36	61.77	1.37	1,566.42
$1,800 and under $2,100	1,594	1,691.07	14.30	143.55	5.06	1,853.97
$2,100 and under $2,500	705	1,785.96	26.77	342.71	5.69	2,161.12
$2,500 and over	353	1,795.56	11.62	872.33	4.54	2,684.05
All incomes	12,096	1,349.15	14.35	89.47	1.96	1,454.93

Income group	Average income from—					Total average income other than from earnings	Total average income per family
	Lodgers	Garden, poultry, etc.	Gifts	Rents and investments	Other sources		
Under $900	$1.41	$6.57	$18.12	$0.64	$4.24	$30.98	$812.89
$900 and under $1,200	2.37	8.12	20.52	1.89	5.06	37.96	1,075.38
$1,200 and under $1,500	4.25	10.62	24.29	5.51	5.12	49.80	1,343.80
$1,500 and under $1,800	6.49	13.56	29.10	8.99	6.99	65.12	1,631.54
$1,800 and under $2,100	8.13	14.64	28.94	11.67	7.51	70.90	1,924.87
$2,100 and under $2,500	13.69	15.18	45.69	22.67	13.83	111.06	2,272.18
$2,500 and over	10.87	13.76	37.85	21.71	22.01	106.20	2,790.25
All incomes	5.56	11.56	26.71	7.72	6.82	58.36	1,513.29

Per cent

Income group	Per cent of family income derived from earnings of—				
	Husband	Wife	Children	Dependents	Total
Under $900	94.2	1.2	0.9		96.2
$900 and under $1,200	94.3	1.1	1.1	(1)	96.5
$1,200 and under $1,500	93.2	1.0	2.0	0.1	96.3
$1,500 and under $1,800	91.2	.9	3.8	.1	96.0
$1,800 and under $2,100	87.9	.7	7.5	.3	96.3
$2,100 and under $2,500	78.6	1.2	15.1	.3	95.1
$2,500 and over	64.4	.4	31.3	.2	96.2
All incomes	89.2	.9	5.9	.1	96.1

Income group	Per cent of income derived from—						Grand total
	Lodgers	Garden, poultry, etc.	Gifts	Rents and investments	Other sources	Total	
Under $900	0.2	0.8	2.2	0.1	0.5	3.8	100.0
$900 and under $1,200	.2	.8	1.9	.2	.5	3.5	100.0
$1,200 and under $1,500	.3	.8	1.8	.4	.4	3.7	100.0
$1,500 and under $1,800	.4	.8	1.8	.6	.4	4.0	100.0
$1,800 and under $2,100	.4	.8	1.5	.6	.4	3.7	100.0
$2,100 and under $2,500	.6	.7	2.0	1.0	.6	4.9	100.0
$2,500 and over	.4	.5	1.4	.8	.8	3.8	100.0
All incomes	.4	.8	1.8	.5	.5	3.9	100.0

[1] Less than one-tenth of 1 per cent.

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TABLE 2.—AMOUNT AND PER CENT OF EXPENDITURES IN ONE YEAR FOR THE PRINCIPAL GROUPS OF ITEMS OF COST OF LIVING OF FAMILIES IN 92 INDUSTRIAL CENTERS, BY INCOME GROUPS

Amount

Income group	Number of families	Average persons in family		Average yearly expenses per family for—						Total average yearly expenses per family
		Total	Equivalent adult males	Food	Clothing	Rent	Fuel and light	House furnishings	Miscellaneous	
Under $900	332	4.3	2.89	$371.61	$111.63	[1] $121.65	[1] $57.19	$30.31	$149.81	$842.91
$900 and under $1,200	2,423	4.5	2.98	456.16	156.45	[2] 149.63	[2] 64.15	47.85	201.06	1,076.12
$1,200 and under $1,500	3,959	4.7	3.16	515.56	206.50	[3] 179.73	[3] 73.33	61.95	262.40	1,300.71
$1,500 and under $1,800	2,730	5.0	3.36	571.75	257.38	[4] 207.13	[4] 79.36	84.31	335.28	1,536.68
$1,800 and under $2,100	1,594	5.1	3.59	626.52	306.94	[5] 231.92	[5] 87.27	97.20	404.27	1,755.74
$2,100 and under $2,500	705	5.7	4.09	711.86	384.20	[6] 248.35	[6] 92.97	116.74	500.08	2,054.97
$2,500 and over	353	6.4	4.95	859.98	503.03	[7] 260.21	[7] 102.03	133.06	608.23	2,466.91
All incomes	12,096	4.9	3.32	548.51	237.60	[8] 191.36	[8] 76.17	73.22	306.11	1,434.37

Per cent

Under $900	2.7	------	------	44.1	13.2	[1] 14.5	[1] 6.8	3.6	17.8	100.0
$900 and under $1,200	20.0	------	------	42.4	14.5	[2] 13.9	[2] 6.0	4.4	18.7	100.0
$1,200 and under $1,500	32.7	------	------	39.6	15.9	[3] 13.8	[3] 5.6	4.8	20.2	100.0
$1,500 and under $1,800	22.6	------	------	37.2	16.7	[4] 13.5	[4] 5.2	5.5	21.8	100.0
$1,800 and under $2,100	13.2	------	------	35.7	17.5	[5] 13.2	[5] 5.0	5.5	23.0	100.0
$2,100 and under $2,500	5.8	------	------	34.6	18.7	[6] 12.1	[6] 4.5	5.7	24.3	100.0
$2,500 and over	2.9	------	------	34.9	20.4	[7] 10.6	[7] 4.1	5.4	24.7	100.0
All incomes	100.0	------	------	38.2	16.6	[8] 13.4	[8] 5.4	5.1	21.3	100.0

[1] Not including 1 family in which rent is combined with fuel and light.
[2] Not including 43 families in which rent is combined with fuel and light.
[3] Not including 91 families in which rent is combined with fuel and light.
[4] Not including 80 families in which rent is combined with fuel and light.
[5] Not including 56 families in which rent is combined with fuel and light.
[6] Not including 21 families in which rent is combined with fuel and light.
[7] Not including 9 families in which rent is combined with fuel and light.
[8] Not including 301 families in which rent is combined with fuel and light.

TABLE 3.—NUMBER AND PER CENT OF FAMILIES HAVING SURPLUS OR DEFICIT OR NEITHER AND AVERAGE AMOUNT OF SURPLUS OR DEFICIT PER FAMILY AND INCOME GROUP

Income group	Families having—						Per cent of families having—		
	Surplus		Deficit		Neither surplus nor deficit	Average surplus (+) or deficit (−) for group	Surplus	Deficit	Neither surplus nor deficit
	Number	Average amount	Number	Average amount					
Under $900	137	$47.59	144	$114.48	51	−$30.02	41.3	43.4	15.4
$900 and under $1,200	1,306	67.62	838	107.39	279	−.70	53.9	34.6	11.5
$1,200 and under $1,500	2,731	106.27	977	122.48	251	+43.08	69.0	24.7	6.3
$1,500 and under $1,800	2,112	157.74	525	141.32	93	+94.86	77.4	19.2	3.4
$1,800 and under $2,100	1,315	233.41	240	155.57	39	+169.13	82.5	15.1	2.4
$2,100 and under $2,500	585	290.65	102	165.68	18	+217.21	83.0	14.5	2.6
$2,500 and over	306	404.45	45	213.81	2	+323.34	86.7	12.7	.6
All incomes	8,492	155.31	2,871	126.85	733	+78.93	70.2	23.7	6.1

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Cost of Bringing Up a Child

AN ATTEMPT to arrive at the average expenditure required to bring a child through the period of infancy and adolescence when he is being fitted to take his place in the world has been made by the Metropolitan Life Insurance Co.[1] This appraisal of the cost of bringing up a child is based on the cost-of-living studies of the United Statees Bureau of Labor Statistics and on studies of the Federal Children's Bureau and other agencies. In such a study interest centers naturally in the family of moderate or average circumstances; a family of five, consisting of father, mother, and three children, having an annual expenditure of $2,500, has been taken, therefore, as the basis upon which the estimates have been made.

In a consideration of the expense involved in the rearing of a child, the first item to be considered is the cost of being born. This first cost varies greatly according to the economic status of the parents, and even among people of the same class, particularly those in moderate or poor circumstances, there is much difference as a result of racial customs or the degree of intelligence exercised in apportioning expenses among the different items of the family budget. Numerical estimates of the cost of childbirth, therefore, represent only a rough average about which the cost in individual cases will range.

The minimum cost of maternity care given by a general practitioner, either in the patient's home or in a hospital ward, is said to be around $150, while better care, including a semiprivate room, can be obtained for about $100 more. The service of a specialist increases this minimum to between $400 and $500. Treatment by midwives and the outdoor hospital service cost considerably less than the minimum hospital care. In 1924, 80 per cent of the births in New York City were attended by physicians and half of these took place in hospitals. In round figures, therefore, it is estimated that the average cost of being born ranges from $200 to $300. Although this is not a large outlay when considered in relation to the mean length of life, which is about 55 years, it is an item which has to be met at one point of time and does impose, therefore, a considerable burden upon families of moderate means.

The cost of food is the next most important item in building the human machine. Here, also, conditions vary according to the economic and social status of the parents. In computing the average expenditure, the study of William F. Ogburn which was based on the scale of relative food consumption for persons of different ages prepared by the Bureau of Labor Statistics, has been used. Computed on the basis of a family (of three children and father and mother) having an annual expenditure of $2,500, it is estimated that the total cost of food for a boy from birth to age 18 would be approximately $2,400, and of a girl $2,330. Making allowance, however, for a somewhat higher consumption of food per adult male unit established by a similar study by Raymond Pearl, the total cost of feeding a child from birth to the eighteenth birthday is placed at $2,500, or one year's total expenditure for the family as a whole.

[1] Metropolitan Life Insurance Co., Statistical Bulletin, November, December, 1925, and February-April, 1926.

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The next item in the account is the cost of clothing and shelter. The expenditure for clothing is an individual concern, while that for shelter (including such elements as housing, fuel, light, household furnishings and upkeep) covers joint expenses which have to be considered as a whole. Estimates of expenditures for these items are based on the cost-of-living study published in 1924 by the Bureau of Labor Statistics. The cost of clothing for the boy up to the age of 18 is placed at $912 after deducting $20 for clothing during the first months of life which was included in the estimate of the average cost of being born; the clothing expenditure for the girl, after making the same deduction, is estimated to be $1,002.

The amount spent annually for shelter depends to a large extent upon the locality in which the family lives. The estimate, however, is based on present conditions in large cities where rents are notoriously high and where persons of small incomes are forced either to live in homes that seem inadequate to persons living in small towns or on farms, or spend too large a proportion of their income on rent. The choice between these two evils will depend largely upon the social habits of the individual concerned. It is probable that the man with the white-collar job will choose the more expensive place to live, while the artisan and skilled laborer will be more inclined to seek a cheaper dwelling. As the second of these social classes is the larger it is given greater weight in estimating the expenditures for shelter. It is assumed, therefore, that out of an expenditure of $2,500 a year, from $40 to $50 per month is spent for a 4-room apartment or fixing an average of $45, the rent bill would amount to $540. For this amount spent for rent there would be two bedrooms, combined living and dining room, which might also contain a folding bed, and in some cases a bathroom. Apportionment of this and similar items on a satisfactory basis among the different members of the family is difficult, but for want of a better method the cost has been distributed so that in the course of 18 years each child is charged with about one-sixth of the family expense for shelter. The total rent for this period would be $9,720 and the share for one child $1,620. This figure does not allow for fuel and light, the family cost of which is placed at $100 per annum, or $300 for each child during the 18-year period. On the same basis of a one-sixth share in the expenses for each child, the cost of furniture, household equipment and upkeep during the 18 years is estimated to be $351. The total cost of the various items included under clothing and shelter during the 18 years is $3,327 for a boy and, because of the somewhat greater expense for clothing, $3,417 for a girl, or an average of about $3,400 for both sexes.

The remaining items to be considered on the cost side of the account during the formative years of the individual are the expenditures for health, recreation, and sundries, and for education.

The annual cost of putting a child through the elementary schools in New York State has been shown in a study by the American Council of Education to be $107 and through the secondary schools $200. Including $100 for a year's attendance at kindergarten, the total cost of a complete grammar and high school education is $1,750. These figures are somewhat higher than for the country as a whole, however, owing to the lower standards in some sections. All children

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do not complete both grammar and high school, but the minimum time for school is in almost all cases seven years, so that the average cost of schooling is considered to be approximately $1,100. This item, of course, does not appear explicitly in the family budget, and the parents may not even pay direct taxes, but indirectly they share in the tax burdens through the sums paid for rent and in the prices paid for other necessaries. While the cost of education directly borne by the parents amounts to only about $50 in the course of the school years for such items as books, stationery, and incidentals, the whole cost of education is of interest because of the great importance of this element in the making of the citizen.

The cost of health items, such as the services of physicians, dental care, medicines, and hospital and nursing care, is estimated to be $284. Recreation costs for the period are fixed at $130, insurance at $54, and sundries at $570.

The following statement brings together the cost of all these items and shows the average cost of rearing a child to the age of 18 years:

Cost of being born	$250
Food	2,500
Clothing and shelter	3,400
Education, minor items met by the individual family purse	50
Education, major items, cost of schooling provided by the community—$1,100.	
Health	284
Recreation	130
Insurance	54
Sundries	570
Total (exclusive of item 5)	7,238

The difference in the amounts spent for boys and girls is considered to be so small that no distinction for sex has been made in this summary, and the sum arrived at—approximately $7,200—is believed to be a fair representation of the money expended by a family of the $2,500-income class during the years when the child is being prepared to take his place in the world and become a contributor economically to the family and the community.

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EMPLOYMENT STATISTICS

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Sources and Character of Existing Employment Statistics

THE present status of employment statistics in this country is described in detail in the recent report of the committe on governmental labor statistics of the American Statistical Association (published by the Russell Sage Foundation under the title of "Employment statistics for the United States," New York, 1926). This committee was composed principally of representatives of State, Federal, and other agencies concerned in the collection of employment statistics, including Canadian representatives. The following brief account of the sources and general character of existing employment statistics in the United States is taken from that report:

Statistical measurements of employment are obtained from three main sources: (1) Counts or estimates of the number unemployed; (2) statistics of demand for labor and applications for work as registered in employment bureaus; and (3) periodic counts of the number of persons employed as shown by pay rolls.

1. Data on Unemployment

UNEMPLOYMENT data may be obtained (*a*) by general estimates of the number unemployed in various localities; (*b*) by estimates or counts of the number unemployed among members of trade-unions; (*c*) by actual enumeration of the unemployed in a house-to-house canvass; or (*d*) through registration of unemployed persons.

(a) Estimates of Numbers of Unemployed

Serious attempts to determine the number of unemployed persons have sometimes been made by responsible authorities from estimates collected at large from social workers, clergymen, poor-relief administrators, employers, labor leaders, and others. As an example, the two special inquiries made by the United States Employment Service in 1921 through its correspondents in numerous cities of the United States may be cited.

(b) Trade-Union Statistics

Unemployment statistics obtained from trade-union sources are monthly or sometimes quarterly figures, commonly reported by the secretaries of various local unions, and usually expressed in the form of "percentage of members unemployed." In this country New York and Massachusetts are the only States which have had extended experience with trade-union reports of unemployment. In both New York and Massachusetts their collection was discontinued soon after the current collection of employment statistics from representative manufacturing establishments was begun.

Trade-union statistics are not representative of all classes of wage earners, and for this reason they fall short of affording a compre-

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hensive measure of unemployment. Unskilled workers and clerical workers, for example, are very inadequately represented by union figures. The representativeness of these figures differs also in different parts of the country. For sections and for industries in which labor is strongly organized, however, this objection does not hold.

(c) Enumeration of the Unemployed by Canvass

No nation-wide enumeration of the unemployed has been undertaken recently in this country. At three of the United States censuses of population (1880, 1890, 1900)[1] efforts were made to carry out such an enumeration as part of the regular canvass, but these experiments have not been repeated in recent years, partly because of the expense involved and partly because of lack of confidence in the results on the part even of those who planned and organized the investigation. Local enumerations of this character have been made occasionally, as those made by the Metropolitan Life Insurance Co. and the United States Bureau of Labor Statistics in 1915,[2] and by the department of economics of Ohio State University in 1921 at the request of the mayor's emergency unemployment committee of Columbus, Ohio. This latter study has been continued annually since.[3] In the studies made by the Metropolitan Life Insurance Co. the families of industrial policyholders of the company were canvassed, first in New York and later in certain other cities, on the assumption (which appears to have been correct) that they constituted representative portions of the wage-earning population in the cities studied. In the two studies made by the United States Bureau of Labor Statistics in New York City in 1915[4] a complete canvass was made of the population of representative blocks. In the more recent Columbus study a complete canvass was made of carefully selected sections of the city.

(d) Registration of the Unemployed

Another method of obtaining data on unemployment has been the voluntary registration of unemployed persons. Such registration has been attempted in several cities, but nowhere has experience proved the method one to be recommended. Without a compelling motive for persons out of work to register, and without adequate means of preventing fraudulent registration if the incentive is expectation of relief, data so obtained are certain to be grossly inaccurate.

The unemployment statistics of Great Britain, although derived from actual registration of the unemployed, are of quite different quality. They are obtained through the administration of the law that provides compulsory unemployment insurance for manual workers and lower-paid nonmanual workers in most of the divisions of industry. The insurance benefit here provides the incentive for regis-

[1] U. S. Bureau of the Census. Twelfth Census of the United States, 1900—Occupations. Washington, 1904, p. ccxxv.

[2] U. S. Bureau of Labor Statistics Bul. No. 172: Unemployment in New York City, N. Y., 1915; and Bul. No. 195: Unemployment in the United States. Washington, 1916.

[3] A report of the five successive surveys prepared by Frederick E. Croxton has been published as Bulletin No. 409 of the U. S. Bureau of Labor Statistics under the title, "Unemployment in Columbus, Ohio, 1921 to 1925."

[4] The police department of New York City cooperated in the first of these by making a count of the unemployed among the homeless who were found in various temporary lodgings on one night in January, 1915.

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tration; and the labor exchange machinery, established to prevent the fraudulent receipt of benefits, largely excludes from the count persons who are not actually unemployed.

In this country, of course, no such data are available, because employment exchanges lack the kind of machinery for registration upon which they depend.

2. Statistics of Employment Offices

EMPLOYMENT offices register workers out of employment and positions vacant, and keep more or less accurate records of placements made. They show to a certain extent the demand for labor and the supply of workers, and thus reflect the activity of business and the intensity of changes in opportunities for employment.

Employment offices as a source of reliable statistics in the United States are of minor importance, because of the inadequacy of the national provision for an employment service and because of variations in statistical methods in the employment agencies of the different States. Practically all public employment offices in the States in this country are now cooperating with the United States Employment Service, which assembles and publishes monthly statistics of their operations.[5]

3. Employment Statistics from Pay Rolls

THE most feasible source of statistics relating to employment in the United States is a pay roll, which shows the number of persons employed. Although the "volume of employment" might be measured more precisely in terms of total hours of work of all employees in a specified period, statistically known as "man-hours" or "employee-hours," these more significant figures can not at present be obtained promptly and accurately on a comprehensive scale. Fortunately, for many of the purposes for which employment statistics are used, data on the number of workers employed approach in value those on employee-hours.

Every pay roll contains at least some mark of identification of each employee of the concern, and the wages received by him within a specified pay period. It is a timely and accurate record, available in almost every industrial organization of appreciable size. The required figures of total number employed and total wages paid can be transcribed to a report form with very little effort and with comparatively small chance of clerical error. It is practicable, therefore, to obtain these data at frequent intervals and by means of inquiries sent through the mail.

In some instances the bureaus now collecting pay-roll statistics obtain only the number of persons employed. More frequently both the number of employees and the total amount of wages shown on the pay roll are recorded, and the statistics are thus commonly referred to as statistics of employment and earnings. The figures for total earnings are valuable as a check on those showing the number employed. They are valuable also for what they show directly con-

[5] U. S. Employment Service. Report of Activities of State and Municipal Employment Services. Washington. Published monthly.

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cerning purchasing power, and when divided by the total number of persons at work they give average earnings per employee, a figure which is worth obtaining for rough indication of changes in the rate of wages.

Development of Pay-Roll Employment Statistics

Although the current publication of employment figures from pay rolls is a development of the last 10 years only, statistics of this sort are not new. The United States Bureau of the Census has obtained statistics of the numbers employed monthly in manufacturing establishments for the years in which the national censuses of manufactures have been taken—every five years from 1899 to 1919, and subsequently every two years. In Massachusetts, in 1886, the office which was then known as the Bureau of Statistics of Labor inaugurated an annual census of manufactures, in which similar monthly employment figures were collected. This State census of manufactures has been continued each year since, thus giving Massachusetts the longest record of employment fluctuation which is anywhere available. Monthly employment figures were also gathered in an annual census of manufactures in New Jersey from 1893 to 1918. In Ohio monthly figures for employment in manufacturing industries were assembled each year from 1892 to 1906, and since 1914 a comprehensive canvass of employment and wages by months has been made annually, covering agriculture, construction, service, trade, transportation, and public utilities, as well as manufacturing.[6] In all of these records, however, the monthly data for each year were compiled after the completion of the calendar year to which they referred, and were tabulated and made public only after an interval ranging from several months to a year or more.

The earliest current collection of such data in this country was made by the New York State Department of Labor. The reporting establishments were selected to represent the manufacturing industry as a whole. The first data were collected in June, 1915, but during the first year employers were requested to furnish figures for both the current month and the corresponding month in the preceding year; thus, in effect, the New York series of pay-roll statistics for manufacturing industries dates from June, 1914.

The United States Bureau of Labor Statistics began to collect pay-roll statistics shortly after the New York bureau, but confined itself to fewer industries. Beginning with October, 1915, reports were obtained from employers in four industries—boots and shoes, cotton, cotton finishing, and hosiery and underwear. The list was extended, however, so that by the end of 1916, 13 manufacturing industries had been included. Several of these series were carried back to December, 1914. In July, 1922, the scope of the inquiry was further enlarged; establishments engaged in additional manufacturing industries were then added, and since 1922 the reports have covered about 50[7] industries and have been fairly representative of manufacturing as a whole.

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[6] While these later data have been collected and tabulated annually, they have been published only for the years 1914, 1915, and 1923. The U. S. Women's Bureau, however, is now making a study of employment fluctuations as it has affected woman workers in Ohio industries, and this report will contain full series of Ohio data since 1914 for the more important industries.

[7] Fifty-four since April, 1926.

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Number and Activities of Existing Agencies

The table here presented gives a list of the leading agencies in the United States and Canada engaged in the collection of current monthly pay-roll statistics, and indicates the general scope and character of the information collected. It shows that pay-roll statistics are now being collected from month to month in the United States by three Federal bureaus and by nine State bureaus. In addition, employment statistics are being collected by three Federal reserve banks and privately by a number of employers' associations.

The United States Bureau of Labor Statistics covers the widest field. In 1926, its current figures covered more than 10,000 establishments in 54 manufacturing industries employing approximately 3,000,000 wage earners, whose total earnings per week ran from $75,099,594 to $84,673,846. In collecting these figures the Bureau of Labor Statistics cooperates with the State labor departments in seven States, thus avoiding duplication of work.

The Federal bureau's figures are now published in a special section of the Labor Review, which is also issued as an advance pamphlet, news releases being sent out earlier as data are available. The data are given for the main industries and their subdivisions, and a recapitulation by the nine geographical divisions used by the United States Census Bureau is also given. It has not yet proved feasible for the Federal bureau to publish the data for each State, or for Federal reserve districts, which it has been suggested, would make the data directly useful to the 12 Federal reserve banks. All the cooperating State bureaus, however, now publish their own data currently for local use.

Extension of these national employment statistics beyond manufacturing has not yet proceeded far. The Federal bureau is experimenting in the collection of data in the building trades, in metalliferous mines, and in coal mines. Summary figures for the railroads, furnished by the Interstate Commerce Commission, are included in the monthly report issued by the Bureau of Labor Statistics, but they are for earlier dates than the manufacturing statistics. The Department of Agriculture has continued experiments begun by the Wisconsin Industrial Commission on the difficult problem of collecting employment figures for farms, but the statistics are not yet currently available. Data on employment in wholesale and retail trade are not yet collected for the country as a whole, though they are being obtained by certain State bureaus, including Wisconsin and Illinois, and also by the Federal Reserve Bank of Philadelphia.

Thus, in 1926, despite encouraging progress, the great majority of States have no information regarding employment within their own boundaries, although manufacturing plants therein may contribute to the data collected by the United States Bureau of Labor Statistics for the country as a whole. The more rapid extension of initial collection by the State and the inclusion of a larger number of industries are the two major needs in the effort to secure adequate statistics of employment in the United States.

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LEADING AGENCIES IN THE UNITED STATES AND CANADA WHICH COLLECT CURRENT MONTHLY PAY-ROLL STATISTICS

Agency	Date with which series begins [1]	Period in month to which figures refer	Information collected	Industries now being covered	Name of report
United States					
Federal bureaus:					
U. S. Bureau of Labor Statistics	December, 1914.	Middle	Employment and earnings	Manufacturing	Monthly Labor Review; also Employment in Selected Manufacturing Industries.
Interstate Commerce Commission	July, 1921	do	do.[2]	Railroads	Wage Statistics, Class I Steam Railroads.
Department of Agriculture	October, 1923	First	Employment and wage rates	Agriculture	No publication yet made.
State bureaus:					
New York Department of Labor	June, 1914	Middle	Employment and earnings, by sex, office, and shop employees.	Manufacturing	Industrial Bulletin.
Wisconsin Industrial Commission	July, 1920	do	Employment and earnings; manual and nonmanual employees.	Manufacturing, mining, communication, transportation, construction, trade, logging, agriculture, etc.	Wisconsin Labor Market.
Illinois Department of Labor	August, 1921	do	Employment and earnings, by sex.	Manufacturing, mining, communication, transportation, construction, trade.	Labor Bulletin.
Iowa Bureau of Labor	January, 1922.	End	Employment, by sex	Manufacturing, trade, etc	Iowa Employment Survey.
Massachusetts Department of Labor and Industries.	September, 1922.	Middle	Employment and earnings, by sex.	Manufacturing	Employment and Earnings (mimeographed).
Maryland Department of Labor and Statistics.	January, 1923.	do	Employment and earnings	do	Printed table only.[3]
Pennsylvania Department of Labor and Industry.[4]	do	do	do	do	Labor and Industry.
Oklahoma Department of Labor	January, 1924.	do	do	Manufacturing, mining, street railways.	Oklahoma Labor Market.
California Bureau of Labor Statistics	May, 1924	do	do	Manufacturing	California Labor Market Bulletin (mimeographed).
Federal reserve banks:					
Philadelphia [5]	January, 1923.	do	do	Manufacturing trade	Business Review.
Chicago [6]	May, 1920	do	do	Manufacturing	Business Conditions.
San Francisco [7]	June, 1924	do	do	do	Monthly Review of Business Conditions.

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Private bureaus:					
National Industrial Conference Board	June, 1920	do	Employment, earnings, and hours, by sex, skilled and unskilled employees.	do	Occasional reports on wages, hours, and employment.
Cleveland Chamber of Commerce	January, 1921.	End	Employment, hours, wage rates.	do	Cleveland Business Statistics.[8]
Detroit Employers' Association	February, 1920.	Weekly	Employment	do	Industrial Barometer.
Bridgeport Manufacturers' Association	February, 1921.	do	Employment, hours, man-hours.	do	Bulletin of Manufacturers' Association.
Canada					
Dominion Bureau of Statistics [9]	January, 1920.	First	Employment	Manufacturing, mining, communication, transportation, construction, trade, logging, etc.	The Employment Situation (mimeographed).[10]

[1] In a number of instances data for all of the industries now being covered do not extend back to this date.
[2] In connection with detailed reports of "employees, service, and compensation" for all Class I railroads.
[3] The monthly data for Maryland are published also in the annual report of the Commissioner of Labor and Statistics.
[4] In cooperation with the Federal Reserve Bank of Philadelphia.
[5] Collects data for Pennsylvania, New Jersey, and Delaware. Data for each State are published separately in mimeographed reports.
[6] Data represent the Seventh Federal Reserve District; in Illinois and Wisconsin they are obtained from State bureaus.
[7] Collects directly from employers in Oregon; uses figures of State bureau in California.
[8] Contains diagrams only.
[9] Collection taken over from Canadian Employment Service. Experimental collection was begun early in 1919.
[10] Also published in the Labor Gazette of the Canadian Department of Labor.

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Trend of Employment in Manufacturing Industries

THE United States Bureau of Labor Statistics' indexes of employment and pay-roll totals in manufacturing industries are based on monthly returns from more than 10,000 establishments in 54 of the principal manufacturing industries of the United States. These establishments employ over 3,000,000 wage earners, or about one-third of all the wage earners in manufacturing establishments of the United States, and 45 per cent of the total number employed in the 54 selected industries.

The employment indexes derived from these data show the amount of employment for the average worker in his regular field of work, and permit a comparison of the fluctuating conditions prevailing in each of the industries surveyed, making possible a study of the underlying trend of employment as well as the purely seasonal variations.

Trend of Employment in 1926

THE trend of employment in manufacturing industries in 1926, month by month, until November, followed very closely the trend of employment in 1925, although from January to October employment was on a considerably higher level than in 1925. In both November and December, 1926, however, the index fell below 1925.

Employment in 1925 reached its highest point in December, while in 1926 the highest point was reached in March. The lowest point in both years was reached in July. Pay-roll totals each month followed the same general trend as employment, although the improvement in pay-roll totals during each month from January to October, 1926, as compared with the same month of 1925, was noticeably greater than the improvement in employment, and likewise the decreases in pay-roll totals in November and December, 1926, from those months in 1925, were less pronounced than the decreases in employment in the same period.

On the whole, although the levels of employment may and do vary considerably, the seasonal trend of employment is much the same from year to year. This fact is illustrated by Table 1 and Chart 1. In each of the last four years there has been a quick recovery in February from the regular January depression caused by inventories and repairs. This has been followed by a few months of wavering, with a rather sharp decline in July, another stock-taking month. In the last half of 1923 there was a practically uninterrupted decline, but in each of the years, 1924, 1925, and 1926, there was a well-defined upward movement, beginning in August, with an uncertain month or two at the close of the year.

Both employment and pay rolls fluctuated on higher levels during 1926 than in any year since 1923. Considering the monthly average of employment for 1923 as 100, the monthly average for 1924 dropped to 90.3, with a rise to 91.2 in 1925 and a further increase to 91.9 in 1926. Pay-roll totals, which dropped from an average of 100 in 1923 to 90.6 in 1924, or to almost the same level as employment, have

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shown more spectacular increases than employment in both 1925 and 1926, the monthly averages being 93.6, and 95.8, respectively.

Table 1 shows by months the general index of employment in manufacturing industries and the general index of pay-roll totals from January, 1923, to December, 1926:

TABLE 1.—GENERAL INDEX OF EMPLOYMENT AND PAY-ROLL TOTALS IN MANUFACTURING INDUSTRIES, JANUARY, 1923, TO DECEMBER, 1926

[Monthly average, 1923=100]

Month	Employment				Pay-roll totals			
	1923	1924	1925	1926	1923	1924	1925	1926
January	98.0	95.4	90.0	92.3	91.8	94.5	90.0	93.9
February	99.6	96.6	91.6	93.3	95.2	99.4	95.1	97.9
March	101.8	96.4	92.3	93.7	100.3	99.0	96.6	99.1
April	101.8	94.5	92.1	92.8	101.3	96.9	94.2	97.2
May	101.8	90.8	90.9	91.7	104.8	92.4	94.4	95.6
June	101.9	87.9	90.1	91.3	104.7	87.0	91.7	95.5
July	100.4	84.8	89.3	89.8	99.9	80.8	89.6	91.2
August	99.7	85.0	89.9	90.7	99.3	83.5	91.4	94.6
September	99.8	86.7	90.9	92.2	100.0	86.0	90.4	95.1
October	99.3	87.9	92.3	92.5	102.3	88.5	96.2	98.6
November	98.7	87.8	92.5	91.4	101.0	87.6	96.2	95.4
December	96.9	89.4	92.6	90.9	98.9	91.7	97.3	95.6
Average	**100.0**	**90.3**	**91.2**	**91.9**	**100.0**	**90.6**	**93.6**	**95.8**

Chart 1, made from the index numbers of Table 1, shows clearly the trend of employment and pay-roll totals during the period January, 1923, to December, 1926.

Charts 2 to 8 show the course of employment in each of the 54 separate industries for each month of 1926 as compared with the corresponding month of 1925. These charts are made from index numbers published in the Labor Review for August, 1925, and February, 1927.

Employment by Industries, 1923 to 1926

IN Table 2 (p. 142) are presented for 1924, 1925, and 1926 (based on the yearly average for 1923) the general index, the group indexes, and the indexes for each of the component industries. The relatives from which these indexes are made were published in the August, 1925, and February, 1927, issues of the Labor Review.

The weights used in combining the various relatives for individual industries into the 12 group indexes and the final general index are representative of the importance of the several industries to the country as a whole.

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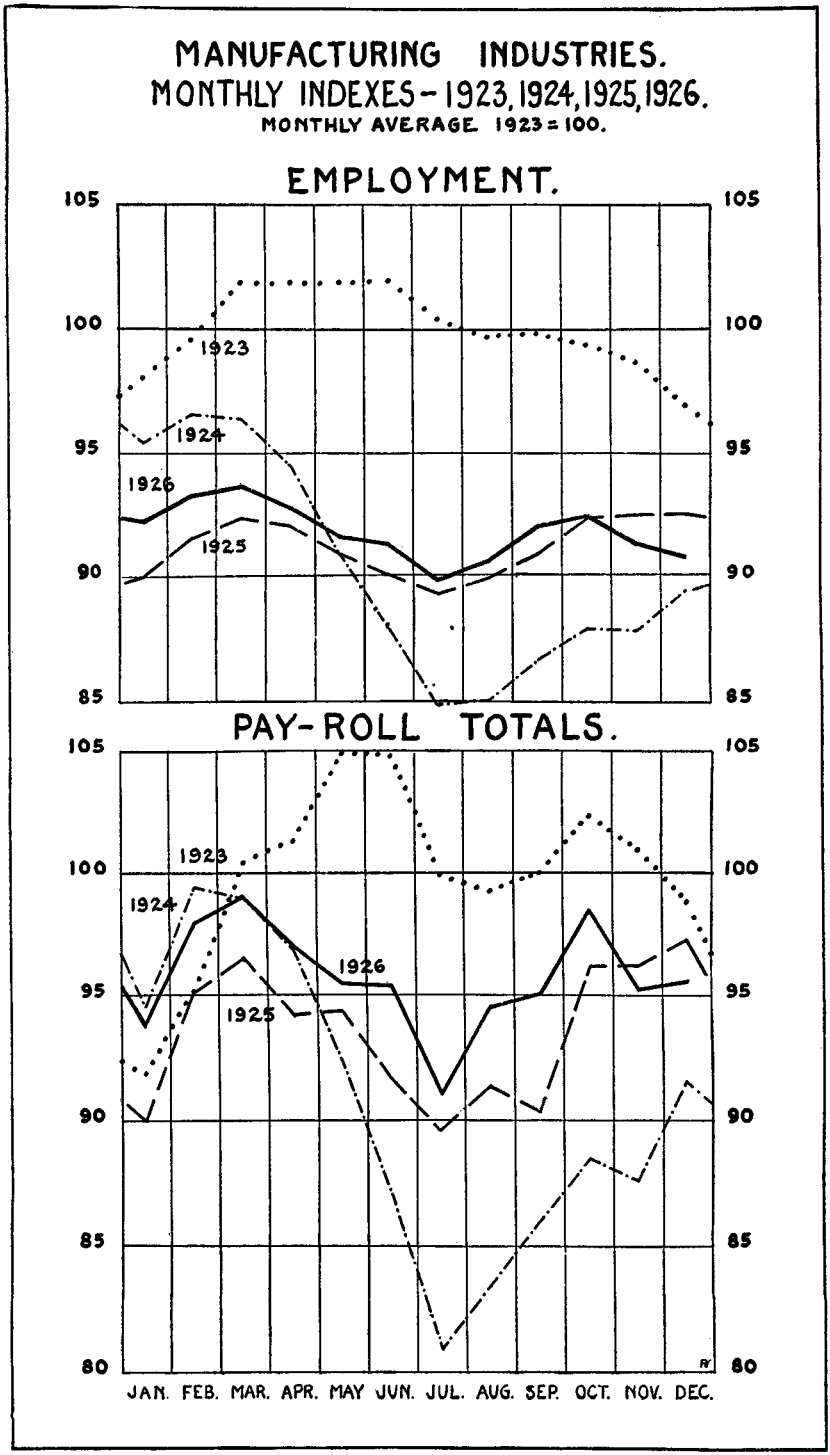


CHART 1

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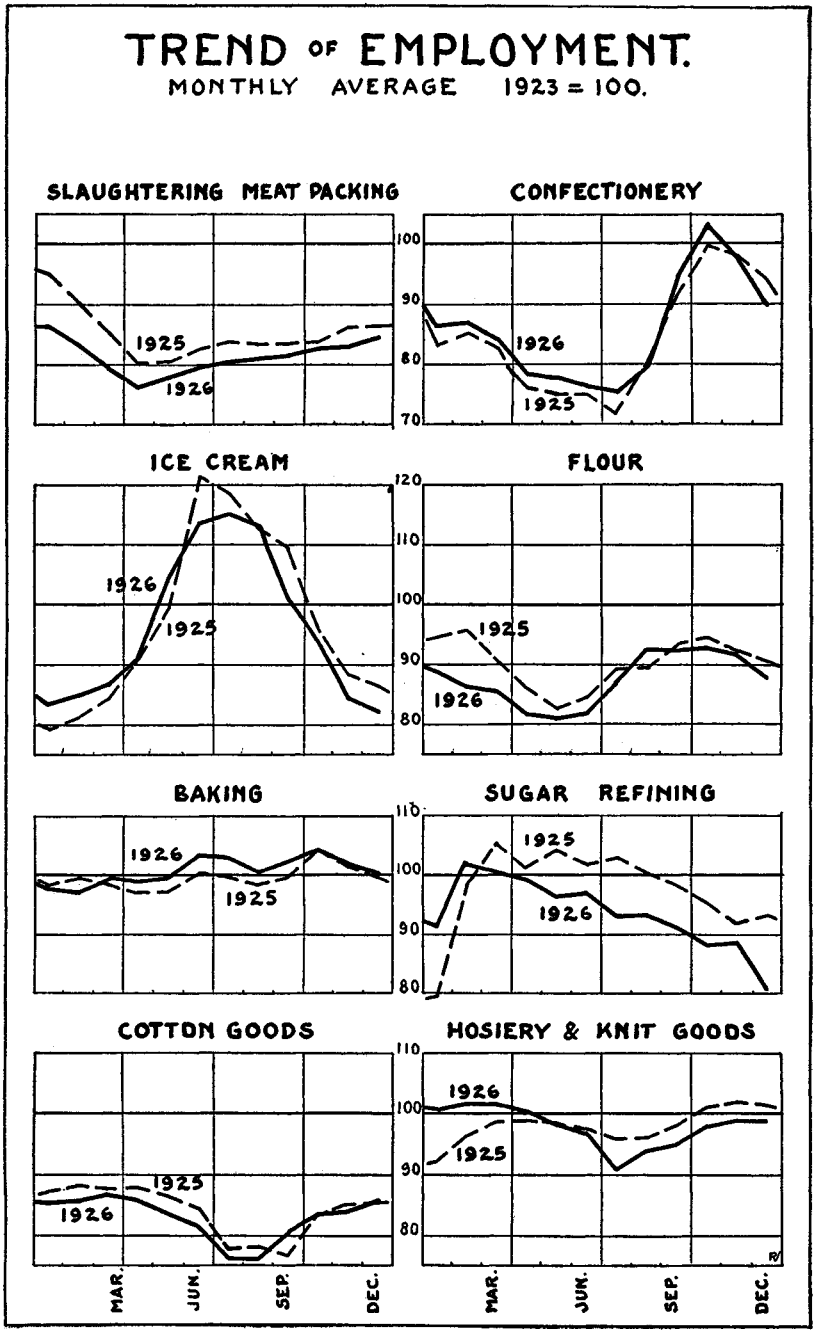


CHART 2

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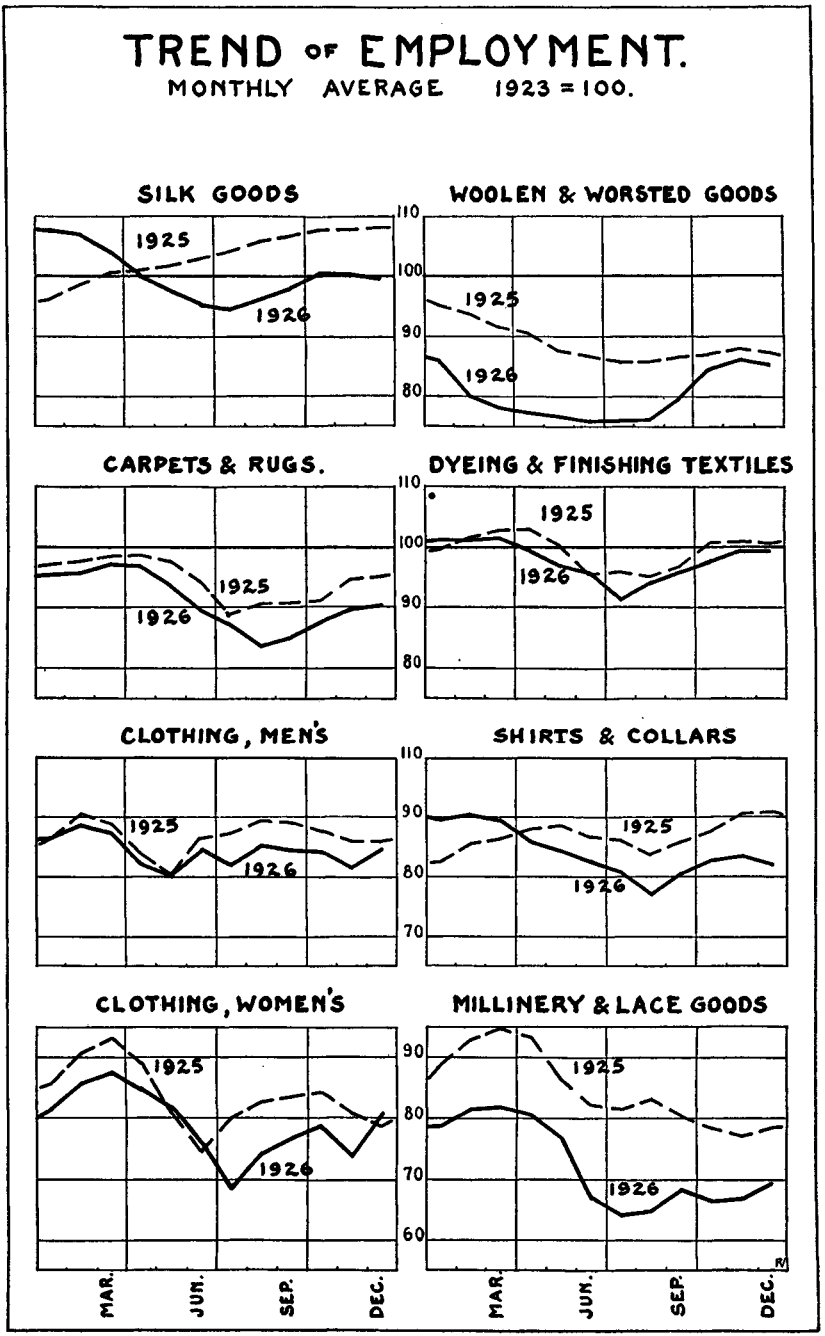


CHART 3

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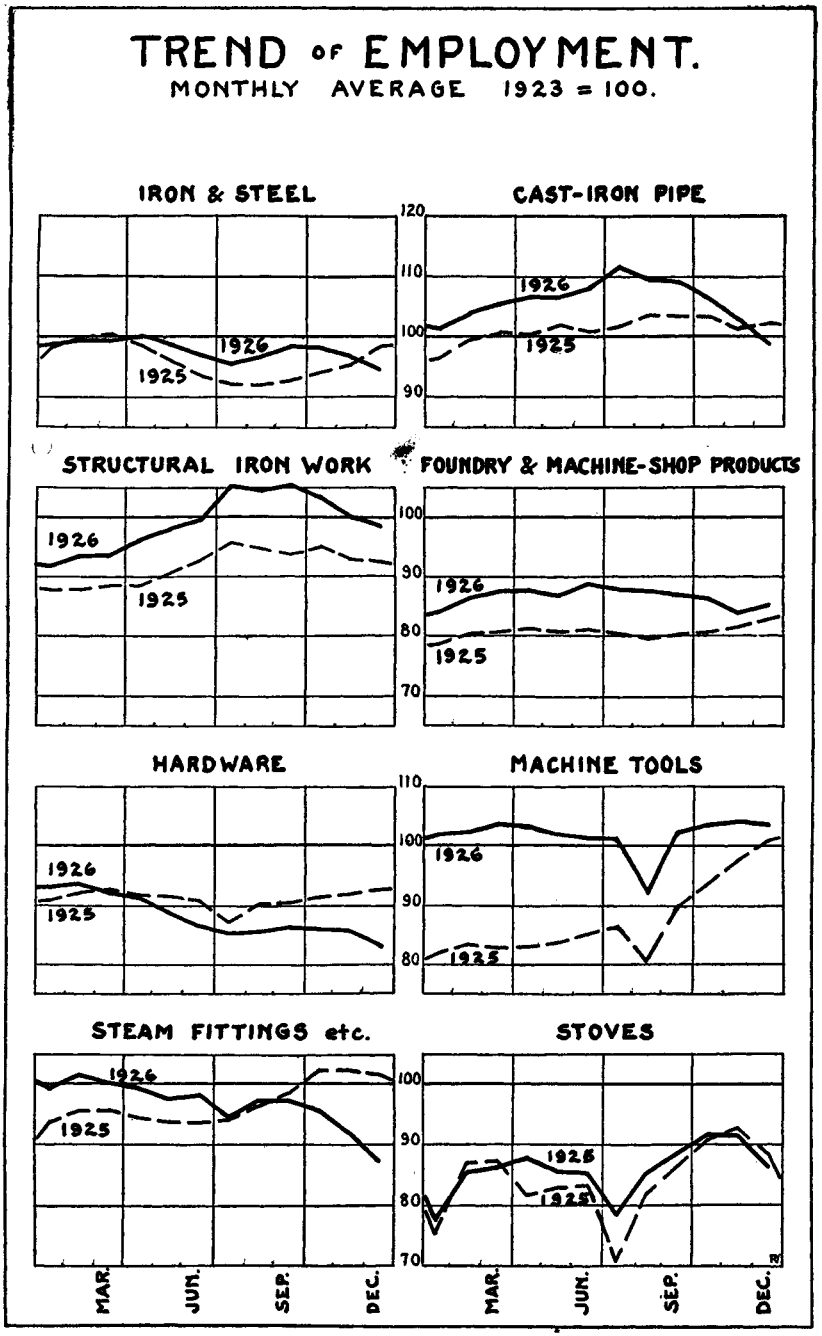


CHART 4

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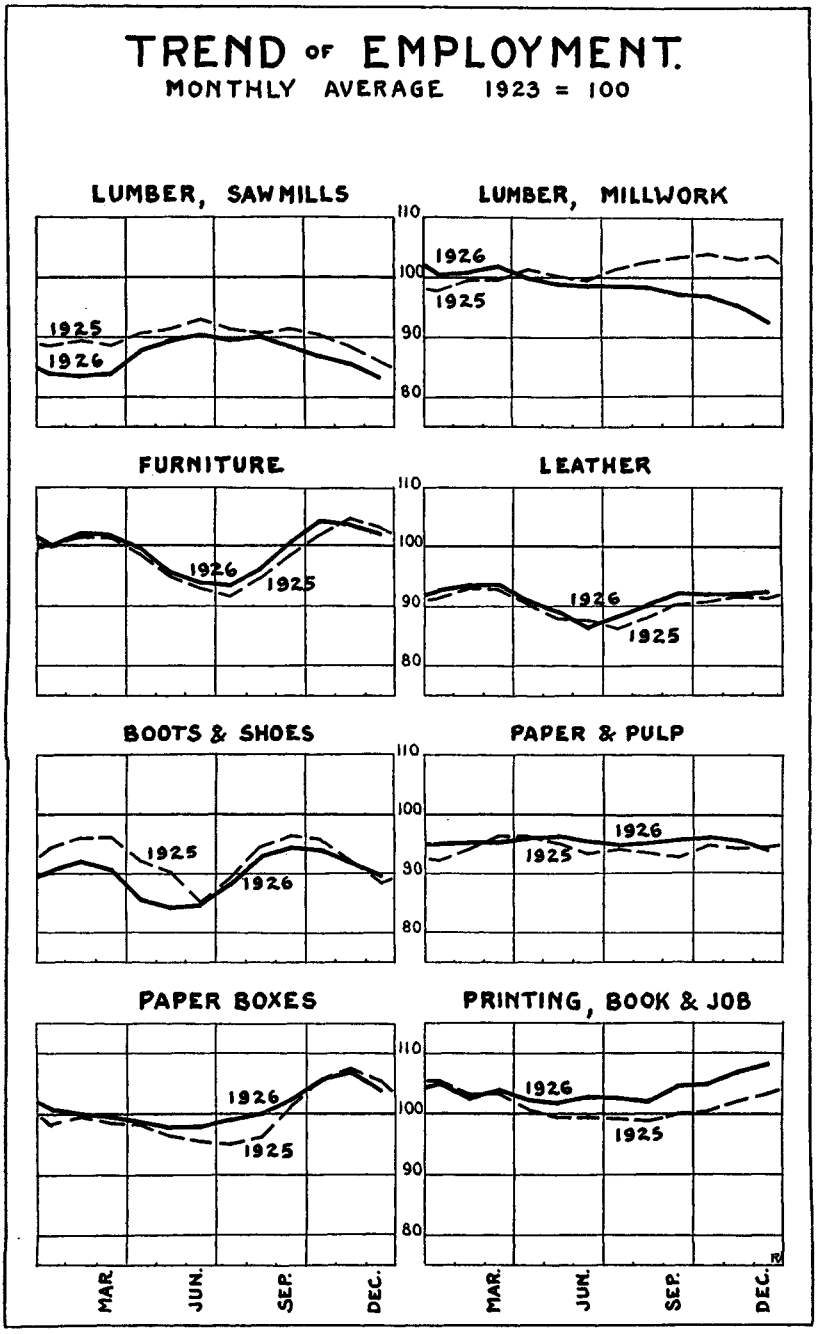


CHART 5

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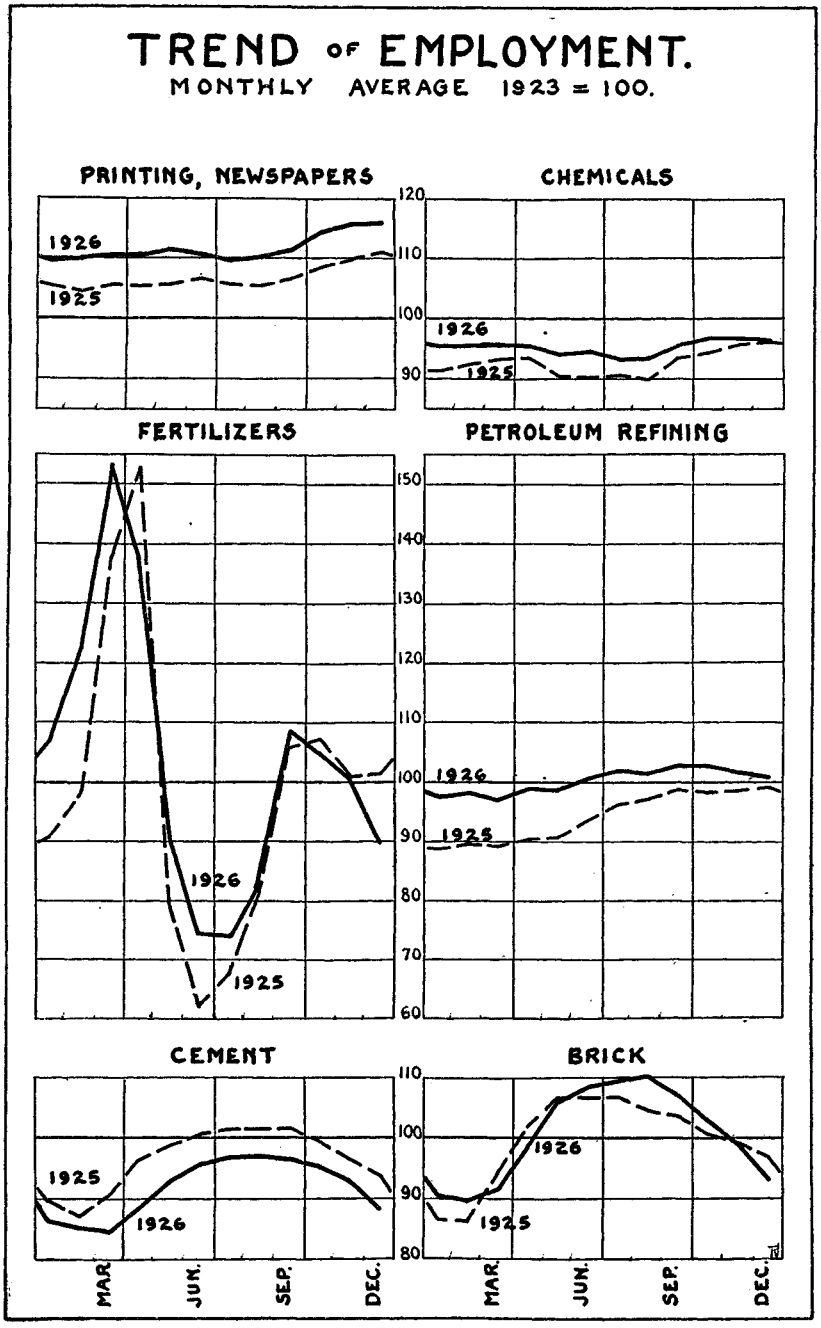


CHART 6

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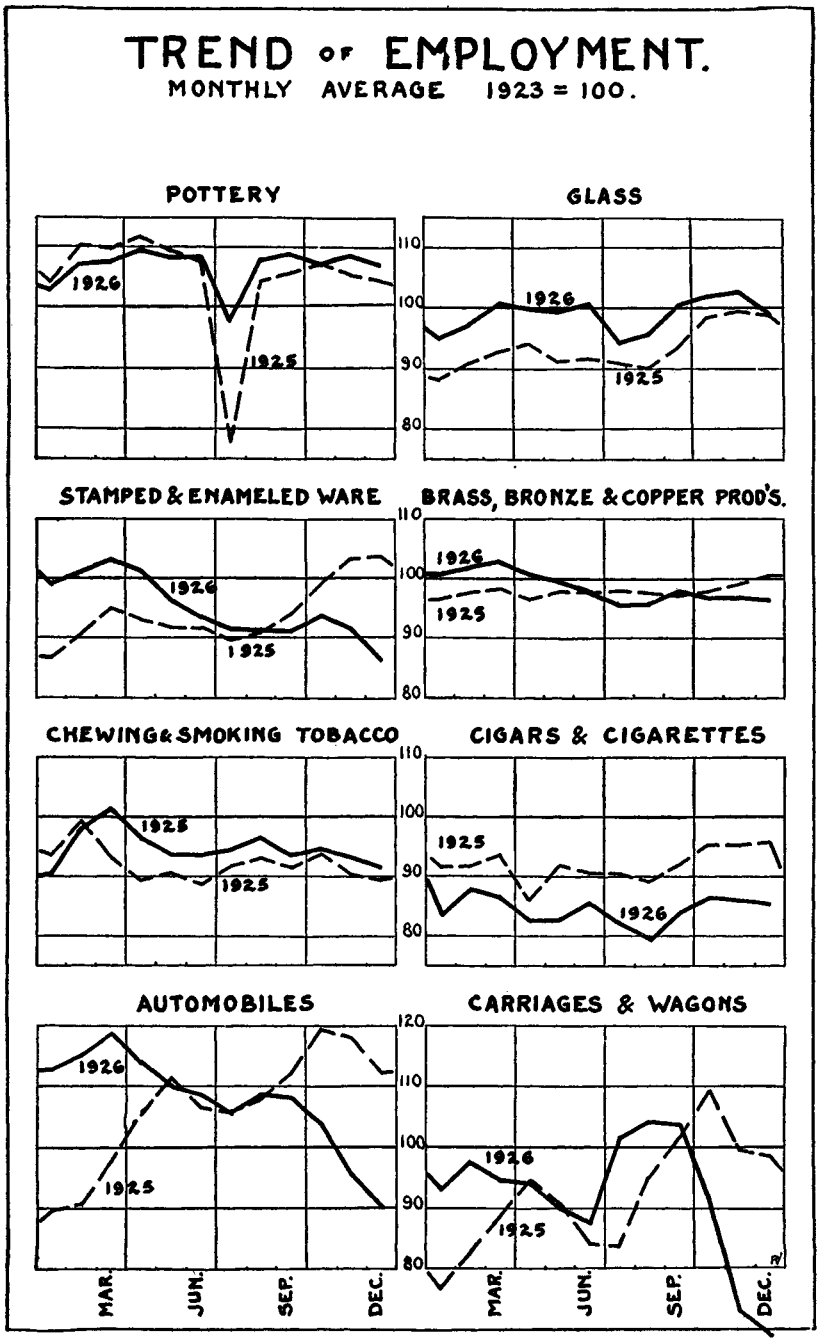


CHART 7

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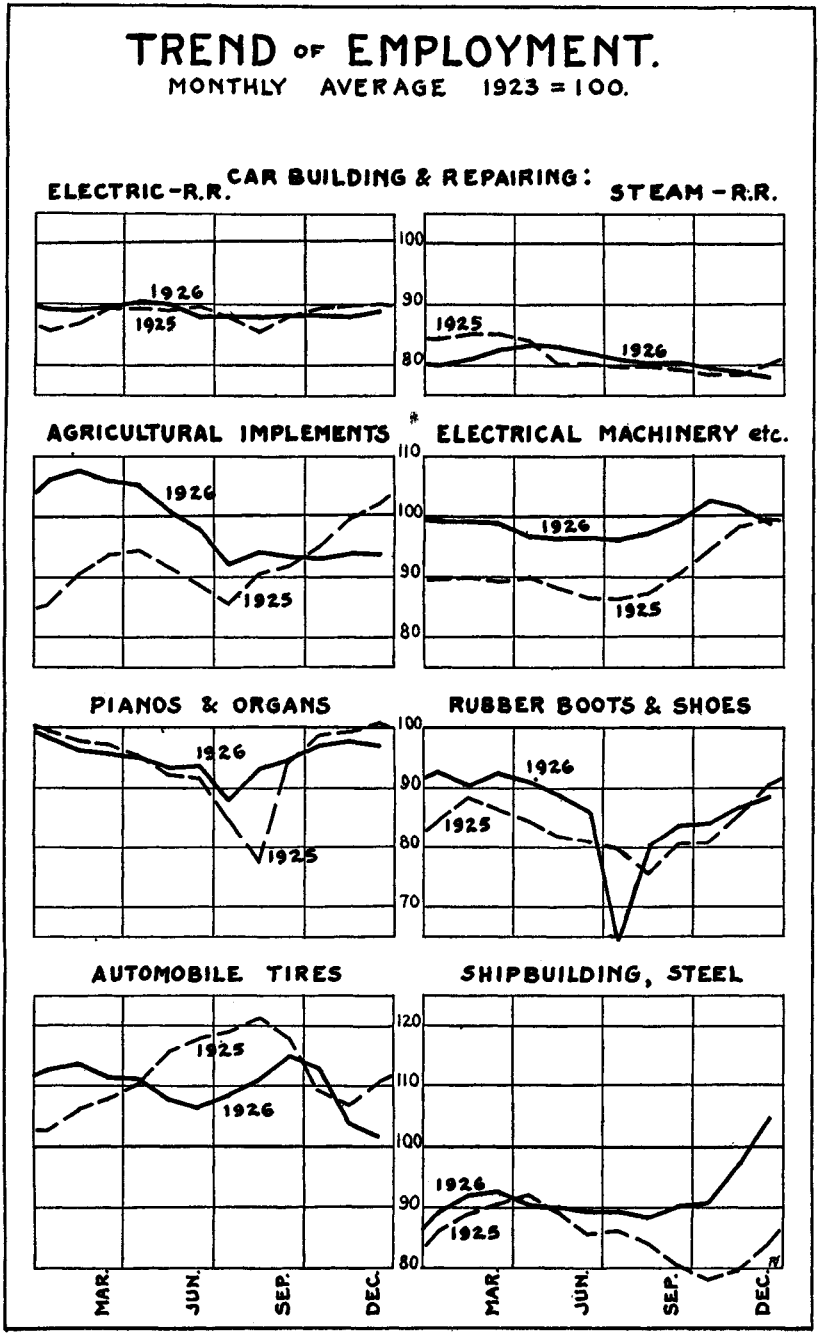


CHART 8

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TABLE 2.—INDEXES OF EMPLOYMENT AND PAY-ROLL TOTALS IN MANUFACTURING INDUSTRIES—1924, 1925, AND 1926

[Yearly average, 1923=100]

Industry	Employment			Pay-roll totals		
	1924	1925	1926	1924	1925	1926
General index	90.3	91.2	91.9	90.6	93.6	95.8
Food and kindred products	95.6	90.9	89.8	97.9	93.7	93.8
Slaughtering and meat packing	93.7	85.0	81.4	94.4	86.7	84.5
Confectionery	88.7	84.4	86.0	93.4	90.1	93.5
Ice cream	96.5	97.5	96.2	97.2	102.6	104.4
Flour	94.7	90.4	87.6	97.6	92.5	90.2
Baking	101.3	99.5	100.8	103.8	102.4	105.5
Sugar refining, cane	97.9	97.8	93.6	100.8	100.0	95.6
Textiles and their products	88.2	89.3	86.1	86.8	89.5	85.9
Cotton goods	83.0	84.0	83.1	80.7	81.9	81.0
Hosiery and knit goods	90.7	98.1	97.9	90.9	105.6	109.6
Silk goods	94.3	103.3	100.2	94.3	109.4	106.5
Woolen and worsted goods	91.0	88.9	80.3	90.1	87.2	78.9
Carpets and rugs	92.1	94.6	91.0	86.4	91.8	88.4
Dyeing and finishing textiles	92.1	99.5	97.9	91.9	102.4	100.1
Clothing, men's	90.1	86.9	84.3	86.4	82.4	77.9
Shirts and collars	84.6	86.9	84.1	83.3	88.2	85.4
Clothing, women's	88.7	83.6	79.2	87.3	87.9	80.4
Millinery and lace goods	87.1	84.8	72.4	87.9	87.0	75.1
Iron and steel and their products	86.3	87.3	92.0	86.6	90.6	97.2
Iron and steel	93.5	95.9	97.9	93.9	99.1	102.8
Cast-iron pipe	104.1	101.3	106.0	105.4	103.6	107.7
Structural-iron work	91.0	91.8	99.2	91.9	97.4	106.5
Foundry and machine-shop products	80.6	80.7	86.7	78.8	81.8	90.3
Hardware	91.9	91.4	88.2	93.9	96.6	98.1
Machine tools	83.6	87.5	101.9	84.7	94.4	113.1
Steam fittings and steam and hot-water heating apparatus	95.4	96.8	96.8	97.3	99.3	102.0
Stoves	86.3	84.1	86.0	88.7	85.9	87.8
Lumber and its products	94.8	93.1	90.8	97.3	98.1	97.7
Lumber, sawmills	93.9	90.0	86.9	96.5	95.5	93.9
Lumber, millwork	99.7	101.5	98.5	102.7	106.6	104.7
Furniture	94.8	98.7	99.6	96.3	101.5	106.2
Leather and its products	90.6	92.0	90.3	88.3	89.4	87.8
Leather	88.4	90.0	91.2	89.5	91.2	93.5
Boots and shoes	91.4	92.6	90.0	87.9	88.6	85.5
Paper and printing	100.2	100.8	103.6	102.2	102.9	111.5
Paper and pulp	94.3	94.4	95.6	96.8	99.2	102.5
Paper boxes	99.3	99.9	101.1	102.2	104.7	109.5
Printing, book and job	102.0	101.5	104.1	103.5	106.0	113.9
Printing, newspapers	104.1	106.7	111.8	106.1	110.1	118.3
Chemicals and allied products	91.6	94.2	98.4	92.7	95.9	101.8
Chemicals	91.7	92.7	95.3	95.8	97.6	103.5
Fertilizers	90.3	98.8	103.9	91.0	98.6	108.9
Petroleum refining	92.1	94.3	100.3	89.8	93.2	97.9
Stone, clay, and glass products	96.7	97.6	99.7	101.3	103.5	106.4
Cement	99.9	96.6	91.7	103.6	100.7	96.0
Brick, tile, and terra cotta	98.1	99.6	100.7	103.6	104.2	105.2
Pottery	107.5	104.9	106.8	110.9	112.2	116.6
Glass	90.4	93.4	99.0	95.2	100.9	108.0
Metal products, other than iron and steel	92.7	96.7	97.5	91.6	89.8	98.5
Stamped and enameled ware	90.1	94.2	95.1	85.3	91.7	91.5
Brass, bronze, and copper products	94.0	97.9	98.7	93.9	100.2	101.1
Tobacco products	94.0	92.0	85.6	95.6	92.7	87.7
Chewing and smoking tobacco and snuff	99.9	92.0	94.9	101.1	98.2	99.9
Cigars and cigarettes	93.3	92.1	84.5	94.9	92.0	86.3
Vehicles for land transportation	88.6	91.0	91.2	87.5	93.5	92.8
Automobiles	93.6	106.5	107.6	91.1	111.3	108.7
Carriages and wagons	83.5	92.1	91.9	87.7	92.6	92.3
Car building and repairing, electric-railroad	88.7	88.4	88.7	88.8	91.3	90.8
Car building and repairing, steam-railroad	85.5	81.3	80.8	85.0	82.2	82.7
Miscellaneous industries	87.8	91.6	96.8	90.6	94.6	101.9
Agricultural implements	80.1	92.4	98.7	83.8	101.1	111.4
Electrical machinery, apparatus, and supplies	93.8	90.9	98.7	97.7	95.0	103.1
Pianos and organs	94.9	94.0	95.0	101.8	103.1	105.4
Rubber boots and shoes	70.9	83.3	85.7	71.5	91.2	93.3
Automobile tires	97.3	112.2	109.8	99.9	113.9	113.4
Shipbuilding, steel	83.1	85.3	92.1	86.2	87.7	97.1

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Proportion of Time Worked and of Force Employed

THE Bureau of Labor Statistics has collected data as to operating time in factories, in connection with employment statistics, since July, 1922. The earliest published report, made in January, 1923, was based on returns from about 3,000 establishments, and showed 81 per cent of the establishments operating on a full-time schedule, 17 per cent on a part-time schedule, and 2 per cent idle. The December, 1926, report, based on returns from over 7,500 establishments, or two and one-half times as many as in the first report, showed 83 per cent operating on a full-time schedule, 16 per cent on a part-time schedule, and 1 per cent idle.

The first tabulation of the *average* per cent of full time worked by the operating establishments was in March, 1924, when the average for 5,000 establishments stood at 94 per cent. In June, 1924, the average had fallen to 87, but by the end of 1924 it had risen to 92. The variation during 1925 was slight, although for the most part there was an upward trend, and by July, 1926, the average per cent of full time operated had reached 96. During the remaining 5 months of 1926 the average stood at 97, 98, 98, 97, and 97, about 7,500 establishments being concerned in the reports for these months.

Since March, 1924, the *average* per cent of normal full force employed by operating establishments has also been computed and published. Starting with 82 in March, 1924, for 5,000 establishments, the average fell to 75 in July, 1924, rose to 82 in January, 1925, and 85 in December, 1925. The highest average appearing was 88, reached in both September and October, 1926. The last two months of 1926, however, fell to 87.

While no direct comparison of these averages is made between months, the monthly computations are almost entirely made on reports from identical plants, the number varying slightly from month to month, and as a rule increasing each month, so that, with such a large number of establishments, it is likely the monthly returns are strictly comparable.

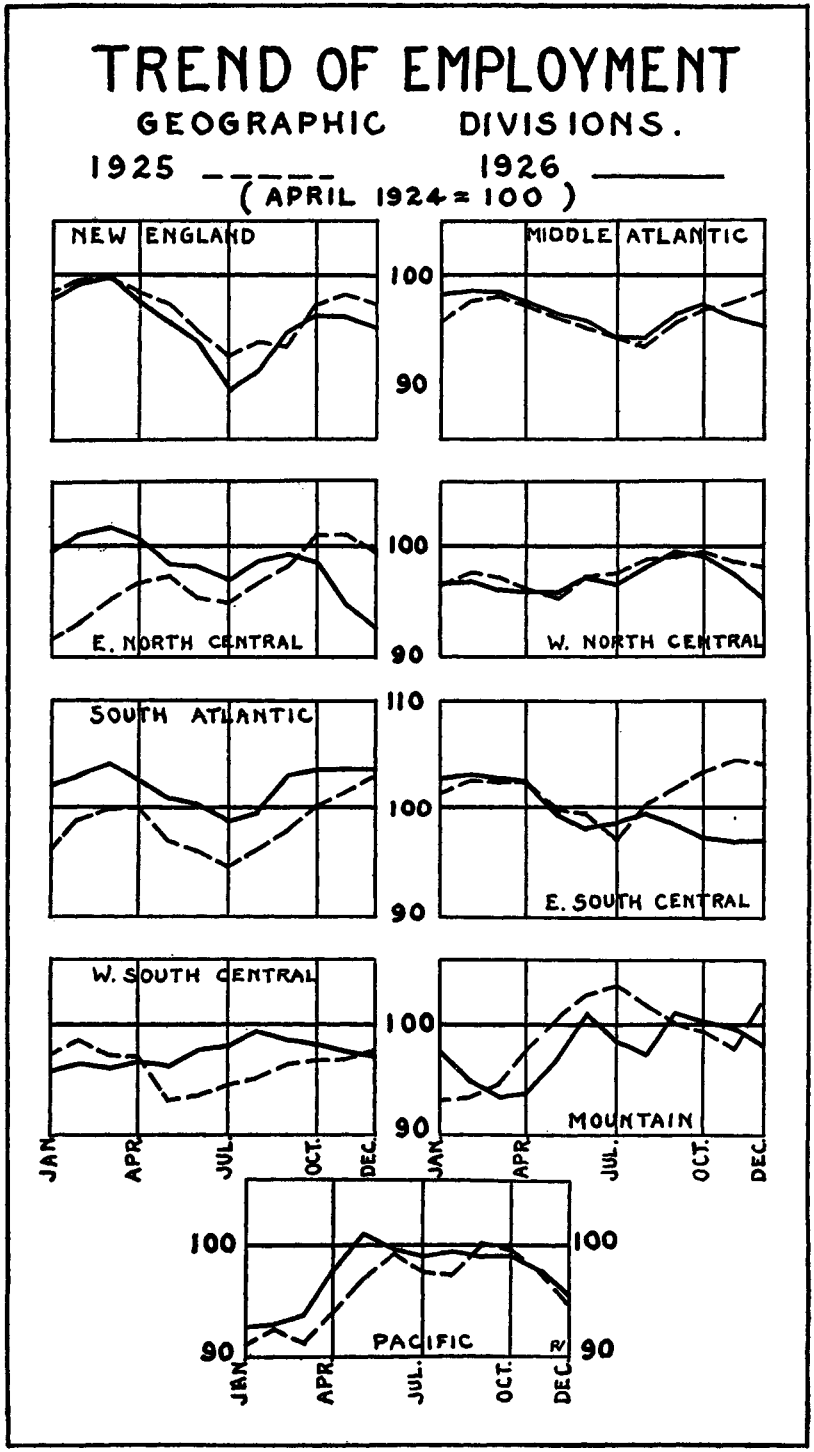
These reports are made for each of the 54 industries separately and for the same industries combined in 12 groups.

These explanatory data form an important addition to the regular presentation of statistics of employment and pay-roll totals, and aid in their interpretation.

Employment by Geographic Divisions

THE general trend of employment and the fluctuations from month to month, differ widely between the several geographic divisions of the United States. To illustrate these differences a chart is presented showing for each of the nine divisions the course of employment during the years 1925 and 1926. The chart is based on index numbers computed for each division, using the data for April, 1924, as 100, no computation of sectional employment having been made by the bureau previous to that month. These index numbers are presented in Table 3 (p. 145).

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TABLE 3.—INDEXES OF EMPLOYMENT IN MANUFACTURING INDUSTRIES IN EACH GEOGRAPHIC DIVISION IN 1925 AND 1926, BY MONTHS

[April, 1924=100]

Month and year	Geographic division								
	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific
1925:									
January	98.6	95.7	91.5	96.5	96.1	101.2	97.1	93.0	91.0
February	99.6	97.5	92.9	97.8	98.6	102.5	98.5	93.3	92.4
March	99.9	97.9	95.2	97.3	99.9	102.3	97.3	94.4	91.3
April	98.7	97.1	96.5	96.1	100.0	102.3	97.2	97.6	93.9
May	97.3	95.9	97.3	95.4	97.1	99 9	93.1	100.6	97.0
June	94.9	95.1	95.4	97.2	96.1	99.7	93.6	102.8	99.3
July	92.5	94.0	95.0	97.7	94.5	97.2	94.3	103.6	97.7
August	93.8	93.4	96.5	98.9	96.1	100.5	95.0	101.8	97.4
September	93.6	95.5	98.1	99.0	97.9	101.8	96.3	100.0	100.2
October	97.3	96.9	101.0	99.6	100.0	103.3	96.4	99.4	99.7
November	98.0	97.4	101.0	98.5	101.4	104.4	96.7	97.9	97.7
December	97.3	98.6	99.6	98.1	102.9	104.0	97.6	101.9	94.6
1926:									
January	98.0	98.2	99.6	96.6	102.1	102.5	95.9	97.5	92.6
February	99.3	98.7	101.1	96.8	103.0	103.1	96.6	94.9	92.7
March	99.9	98.5	101.9	96.1	104.3	102.5	96.2	93.4	93.9
April	97.8	97.4	100.5	96.0	102.6	102.3	96.8	93.9	97.6
May	95.8	96.3	98.5	95.9	100.8	99.8	96.4	97.0	100.8
June	94.2	95.7	98.3	97.2	100.3	98.3	97.9	100.7	99.7
July	89.6	94.0	96.9	96.7	99.1	98.6	98.0	98.2	99.2
August	91.3	94.2	98.7	98.3	99.8	99.5	99.5	97.4	99.5
September	94.8	96.2	99.3	99.0	102.8	98.4	98.6	101.0	99.1
October	96.3	97.0	98.5	99.5	103.7	97.2	98.3	100.4	99.3
November	96.2	96.2	94.8	97.5	103.7	96.9	97.5	99.9	97.9
December	95.2	95.4	92.6	95.4	103.6	96.9	97.2	98.1	95.2

Industries Covered

THE 54 industries surveyed by the Bureau of Labor Statistics include very nearly all of the most important manufacturing industries of the United States. The industries included are the old-established industries, and a large part of the reporting establishments are likewise old established ones.

In this connection, however, it should be borne in mind that a new industry is not of necessity maintained entirely as a separate and distinct affair. Invariably when a new industry or product comes into prominence old-established concerns, engaged in turning out a kindred article—either near or remote—the value or sale of which may be affected by the newer production, are likely to turn over a part of their plant to the making of the new product. This may be an experimental plan only, although not infrequently the entire policy of the concern may be changed, at least in part, by the success of the new industry; for example, phonograph cabinets are made to a considerable extent by furniture manufacturers; rayon goods are reported as a product of cotton goods plants; and a large amount of radio equipment is turned out by establishments classified under electrical machinery, apparatus, and supplies, and still largely engaged in such production. Thus it is clear that while the 54 industries selected by the bureau for these employment statistics are per se old-established industries it must not be inferred that the indexes of employment are altogether unaffected by the influence of the spectacular newer industries of to-day.

As this study is designed primarily to show conditions in the more important manufacturing lines in the United States as a whole, some industries of considerable weight to their respective local communi-

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ties may, in the aggregate of employment, fall too far below the total which warrants giving them a place in this compilation.

The magnitude of the bureau's report on "Employment in selected manufacturing industries" is shown in Table 4, in which the data for December, 1926, are presented, to illustrate the distribution of establishments, employees, and pay-roll totals among the various industries and classified groups of industries, with a recapitulation by geographic divisions:

TABLE 4.—EMPLOYMENT AND PAY-ROLL TOTALS, BY INDUSTRIES AND GEOGRAPHIC DIVISIONS

Industry	Establishments	Number on pay roll December, 1926	Amount of pay roll December, 1926
Food and kindred products	**1,461**	**212,157**	**$5,428,741**
Slaughtering and meat packing	194	87,778	2,298,255
Confectionery	252	34,227	649,700
Ice cream	194	8,045	262,819
Flour	331	15,642	400,410
Baking	476	58,378	1,567,795
Sugar refining, cane	14	8,087	249,762
Textiles and their products	**1,829**	**599,157**	**11,970,657**
Cotton goods	470	231,497	3,813,007
Hosiery and knit goods	245	81,955	1,578,845
Silk goods	195	56,171	1,197,182
Woolen and worsted goods	191	65,280	1,502,885
Carpets and rugs	29	24,369	674,840
Dyeing and finishing textiles	92	30,448	749,348
Clothing, men's	272	60,619	1,450,749
Shirts and collars	90	20,787	336,606
Clothing, women's	176	17,342	423,771
Millinery and lace goods	69	10,689	243,424
Iron and steel and their products	**1,772**	**669,352**	**20,164,631**
Iron and steel	212	277,885	8,637,530
Cast-iron pipe	45	14,109	331,274
Structural ironwork	145	22,910	684,190
Foundry and machine-shop products	946	235,079	7,094,884
Hardware	67	33,428	851,791
Machine tools	153	31,516	993,555
Steam fittings and steam and hot-water heating apparatus	115	38,406	1,112,548
Stoves	89	16,019	458,859
Lumber and its products	**1,042**	**210,655**	**4,682,943**
Lumber, sawmills	445	121,462	2,459,281
Lumber, millwork	234	30,176	751,464
Furniture	363	59,017	1,472,198
Leather and its products	**352**	**120,233**	**2,710 517**
Leather	138	28,829	732,505
Boots and shoes	214	91,404	1,978,012
Paper and printing	**892**	**175,497**	**5,760,626**
Paper and pulp	217	56,635	1,540,340
Paper boxes	178	20,550	461,047
Printing, book and job	289	48,295	1,711,367
Printing, newspapers	208	50,017	2,047,872
Chemicals and allied products	**283**	**90,128**	**2 702,755**
Chemicals	118	29,458	826,226
Fertilizers	107	7,811	161,113
Petroleum refining	58	52,859	1,715,416
Stone, clay, and glass products	**672**	**106,973**	**2,878,312**
Cement	99	25,620	744,730
Brick, tile, and terra cotta	410	31,913	829,972
Pottery	57	13,366	358,746
Glass	106	36,074	944,864
Metal products, other than iron and steel	**207**	**49,237**	**1,340,812**
Stamped and enameled ware	65	17,443	429,213
Brass, bronze, and copper products	142	31,794	911,599
Tobacco products	**186**	**44,230**	**796,457**
Chewing and smoking tobacco and snuff	29	8,475	130,129
Cigars and cigarettes	157	35,755	666,328

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TABLE 4.—EMPLOYMENT AND PAY-ROLL TOTALS, BY INDUSTRIES AND GEOGRAPHIC DIVISIONS—Continued

Industry	Establishments	Number on pay roll December, 1926	Amount of pay roll December, 1926
Vehicles for land transportation	**1,024**	**439,323**	**$12,890,098**
Automobiles	196	275,102	7,904,235
Carriages and wagons	62	1,433	32,170
Car building and repairing, electric-railroad	293	22,074	695,372
Car building and repairing, steam-railroad	473	140,714	4,258,321
Miscellaneous industries	**397**	**257,059**	**7,595,973**
Agricultural implements	89	25,561	745,613
Electrical machinery, apparatus and supplies	159	120,657	3,561,050
Pianos and organs	40	8,585	270,992
Rubber boots and shoes	10	17,931	464,798
Automobile tires	62	52,257	1,589,864
Shipbuilding, steel	37	32,068	963,656
All industries	**10,117**	**2,974,001**	**78,922,523**

Recapitulation by geographic divisions

GEOGRAPHIC DIVISION			
New England	1,316	422,981	$10,336,979
Middle Atlantic	2,452	857,339	24,615,780
East North Central	2,699	939,303	27,236,930
West North Central	973	152,304	3,770,011
South Atlantic	1,064	276,276	5,346,078
East South Central	466	107,776	2,144,256
West South Central	444	90,563	1,945,225
Mountain	164	26,334	735,715
Pacific	539	101,125	2,791,548
All divisions	**10,117**	**2,974,001**	**78,922,523**

Method of Computing Employment Index Numbers

THE basic material for these indexes is obtained from reports furnished by manufacturers in every State of the Union, the great majority of the reports coming direct to the bureau, although seven States collect employment data for their own use and furnish the bureau with the data in detail for each establishment.

Questionnaires are mailed to each establishment on the 15th of each month requesting information as to the pay-roll period ending nearest the 15th day of the month. The questionnaire asks for an enumeration of the concern's principal products, the date of the ending of the pay roll, the period covered (one week, two weeks, half-month, month), the amount of the pay roll, and the total number of persons who worked any part of the period. Also, for verification purposes, a request is made for the reason for any marked increase or decrease in total pay roll or number of employees, and for a statement showing normal working time, current operating time, per cent of normal full force employed, and any change made in rates of wages.

Each report is inspected upon its arrival, and if the pay-roll total is for a period longer than one week the equivalent pay roll for one week is computed. Where necessary reports are returned to the senders for correction or amendment.

The bureau's aim has been to secure in each industry a sufficiently large number of reporting establishments to guarantee for each report approximately 40 per cent of the employees in the industry in

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each State, as recorded by the Census of Manufactures. The consummation of this design brings the geographical distribution of employees in the several industries reported to an equitable basis.

In selecting establishments to represent each industry great care has been exercised to secure in each geographic division a proportionate number of concerns with large, small, and medium numbers of employees; and if there are two or more branches of an industry, the same care has been exercised to maintain the ratio of representation from each branch.

The number of employees and the pay-roll total for each establishment are entered on a separate recording card, which has space for the 12 months of each of three years. From these recording cards totals for each industry are made of the employees and pay-roll amounts in all establishments for both the current month and the month immediately preceding. Percentages of changes between the totals for the two months are then computed, and with the per cent of change the link chain index for each industry for the current month is built up from the index of the previous month. The index for each of the 12 classified groups of industries is reached by weighting the relatives for each industry in the group according to the importance of the industry, and the general index is obtained from the 12 group indexes.

Percentages of change in the separate industries and groups between a current month and the same month of the previous year are arrived at by comparing the monthly indexes of the two years.

Changes in per capita earnings are computed and tabulated by industries, comparisons being made between the current month and the preceding month and between the current month and the corresponding month of the previous year; wage changes also are brought together and tabulated by industries.

From the normal time and the current operating time reported the per cent of full-time operation is computed for each concern, together with an average of these percentages for each industry, for each group, and for all industries combined; percentages of normal full force are computed on the same plan.

The monthly reports are presented with the industries arranged in 12 groups: Food; textiles; iron, and steel; lumber; leather; paper; chemicals; stone, clay, and glass; metal, other than iron and steel; tobacco; vehicles; and miscellaneous industries. Index numbers for each industry are computed monthly, and from these relatives group indexes are constructed, as well as a general index, which is a weighted average of relatives for the 54 separate industries.

Employment on Steam Railroads

MONTHLY statistics as to the employment on Class I railroads—that is, all roads having operating revenues of $1,000,000 or over—are published by the Interstate Commerce Commission and presented in summarized form in the Labor Review. Table 1 and the accompanying chart show the movement of employment for all classes of employees over the year 1926, in

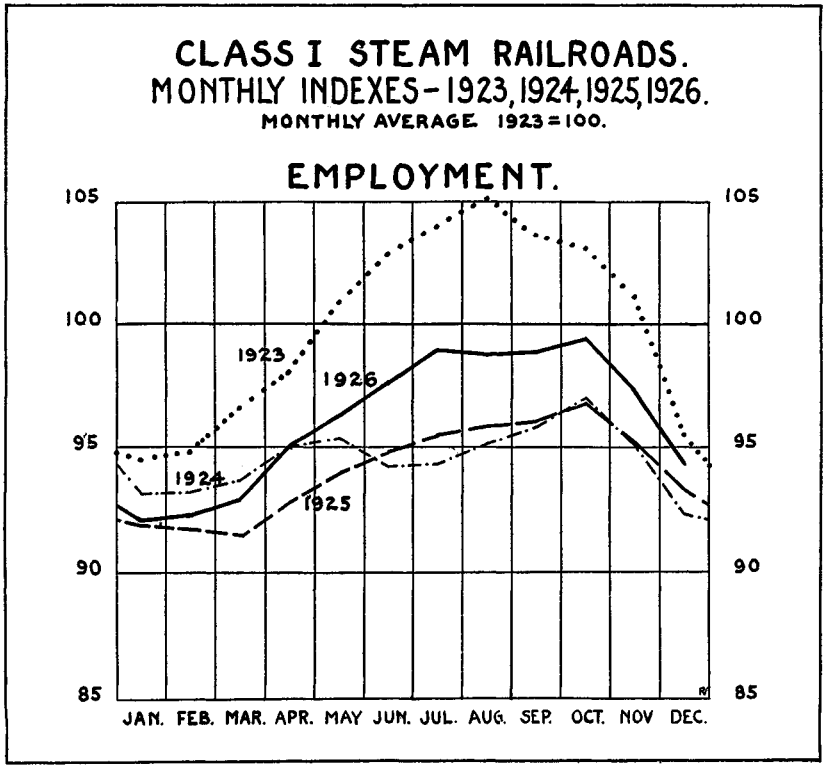
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comparison with the three preceding years, the year 1923 being taken as a base or 100. Table 2 gives these data, by principal occupational groups and by months, for the year 1926. In these tabulations the data for the occupational group reported by the Interstate Commerce Commission as "executives, officials, and staff assistants" are omitted.

TABLE 1.—INDEX OF EMPLOYMENT ON CLASS I STEAM RAILROADS IN THE UNITED STATES

[Monthly average, 1923=100]

Month	1923	1924	1925	1926
January	94.6	93.1	91.9	92.1
February	94.8	93.2	91.7	92.3
March	96.6	93.6	91.5	92.9
April	98.0	95.0	92.8	95.0
May	100.9	95.3	94.0	96.3
June	102.9	94.2	94.8	97.6
July	104.0	94.3	95.5	98.9
August	105.1	95.1	95.8	98.7
September	103.6	95.8	96.0	98.8
October	103.1	96.9	96.8	99.4
November	101.1	95.1	95.2	97.3
December	95.5	92.3	93.3	94.4
Average	100.0	94.5	94.1	96.1



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TABLE 2.—EMPLOYMENT ON CLASS I STEAM RAILROADS IN THE UNITED STATES, BY MONTHS, 1926

[From monthly reports of Interstate Commerce Commission. As data for only the more important occupations are shown separately, the group totals are not the sum of the items under the respective groups]

Occupation	Number of employees at middle of month					
	January	February	March	April	May	June
Professional, clerical, and general	282,001	282,444	283,132	283,631	284,083	285,376
Clerks	166,030	166,097	166,466	166,606	166,790	167,554
Stenographers and typists	25,151	25,238	25,295	25,359	25,422	25,482
Maintenance of way and structures	347,362	351,713	359,751	403,858	436,542	458,306
Laborers, extra gang and work train	43,723	45,840	48,885	62,383	73,169	80,843
Laborers, track and roadway section	176,157	179,380	183,068	208,451	225,937	235,624
Maintenance of equipment and stores	526,639	524,702	525,554	522,613	516,302	516,753
Carmen	115,052	113,567	113,878	113,178	111,985	112,092
Machinists	61,482	61,525	61,679	61,523	60,694	60,723
Skilled trades helpers	115,493	115,456	115,680	114,876	113,600	113,791
Laborers (shops, engine houses, power plants, and stores)	44,391	44,186	44,249	43,342	42,450	42,196
Common laborers (shops, engine houses, power plants, and stores)	60,973	60,784	60,509	60,804	60,085	60,565
Transportation, other than train, engine and yard	204,172	206,442	207,808	207,308	207,414	209,525
Station agents	30,817	30,742	30,702	30,697	30,675	30,655
Telegraphers, telephoners, and towermen	25,729	25,756	25,869	25,799	25,615	25,479
Truckers (stations, warehouses, and platforms)	37,138	38,967	39,507	39,105	38,559	38,878
Crossing and bridge flagmen and gatemen	22,317	22,279	22,237	22,371	22,340	22,485
Transportation (yardmasters, switch tenders, and hostlers)	24,209	24,262	24,287	24,045	24,014	24,028
Transportation, train and engine	328,949	326,645	328,107	325,160	323,567	322,830
Road conductors	36,881	36,700	36,635	36,474	36,757	36,751
Road brakemen and flagmen	74,316	73,855	74,416	73,944	73,998	73,777
Yard brakemen and yard helpers	55,312	54,787	55,139	54,407	53,979	53,447
Road engineers and motormen	43,866	43,577	43,557	43,495	43,504	43,639
Road firemen and helpers	45,473	45,317	45,332	45,214	45,003	44,829
Total number of employees	1,713,332	1,716,208	1,728,639	1,766,615	1,791,922	1,816,818

Occupation	Number of employees at middle of month					
	July	August	September	October	November	December
Professional, clerical, and general	286,771	287,427	287,373	287,916	287,625	286,120
Clerks	168,281	168,770	168,840	169,370	169,049	167,711
Stenographers and typists	25,463	25,513	25,587	25,609	25,598	25,533
Maintenance of way and structures	473,517	469,246	458,067	457,808	423,616	377,689
Laborers, extra gang and work train	86,635	85,978	79,908	79,127	69,099	54,611
Laborers, track and roadway section	242,737	238,728	233,986	233,988	213,913	188,295
Maintenance of equipment and stores	517,189	514,351	517,578	519,506	519,706	516,850
Carmen	112,328	112,081	113,893	114,151	113,718	111,430
Machinists	60,353	59,776	60,332	60,747	60,880	60,742
Skilled trades helpers	113,824	113,301	113,916	114,872	115,277	114,664
Laborers (shops, engine houses, power plants, and stores)	42,736	42,393	42,451	42,829	42,926	43,594
Common laborers (shops, engine houses, power plants, and stores)	60,589	60,511	60,401	60,267	60,210	59,712
Transportation, other than train, engine, and yard	210,666	210,208	213,434	214,136	212,743	209,641
Station agents	30,691	30,677	30,683	30,597	30,599	30,587
Telegraphers, telephoners, and towermen	25,481	25,574	25,649	25,714	25,628	25,514
Truckers (stations, warehouses, and platforms)	38,389	37,995	40,216	41,526	41,040	39,745
Crossing and bridge flagmen and gatemen	22,528	22,433	22,419	22,256	22,085	22,016
Transportation (yard masters, switch tenders, and hostlers)	24,233	24,399	24,204	24,347	24,409	24,393
Transportation, train and engine	327,995	330,540	337,648	345,496	342,917	342,240
Road conductors	37,412	37,943	38,430	38,920	38,288	38,066
Road brakemen and flagmen	75,140	75,801	77,568	79,215	78,052	77,607
Yard brakemen and yard helpers	53,956	54,033	55,537	57,742	57,800	57,852
Road engineers and motormen	44,596	44,940	45,808	46,402	45,841	45,790
Road firemen and helpers	45,933	46,300	47,031	47,507	47,124	47,341
Total number of employees	1,840,371	1,836,171	1,838,304	1,849,209	1,811,016	1,756,933

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Unemployment Survey of Columbus, Ohio

A REPORT on unemployment in Columbus, Ohio, from 1921 to 1925, was published in 1926 as Bulletin No. 409 of the United States Bureau of Labor Statistics. Aside from the local interest of the report, the study is of special value because there have been so few investigations made of actual unemployment.

Columbus has large areas of native white population and only a few negro districts. Immigrant populations predominate in a comparatively small number of districts. The study aimed to include a fair sample of the wage-earning populations of the city, but in drawing deductions from these statistics it must be remembered that the findings for each year represent only a particular period—approximately the last week in October. The 1921 survey covered slightly over 10 per cent of the employed persons 18 years of age and over in Columbus. The numbers included in the succeeding four years varied somewhat.

Approximately 50 per cent of the persons enumerated were in the manufacturing and mechanical industries, over 25 per cent in the trade and transportation group, 10 per cent in domestic and personal service, slightly over 7 per cent were self-employed, and the remainder were included in other general industrial groups.

In the individual industries the heaviest percentages of enumerated persons were found in iron and steel and their products, railway and express, building trades, and wholesale and retail trade.

Whether the number of persons working full time, part time, or idle be considered, or whether the proportion of employment and idleness in the population enumerated be taken as a criterion, the greatest amount of employment was present in 1923, which was followed in order by 1922, 1925, 1924, and 1921, and the largest amount of unemployment existed in 1921, with 1924, 1925, 1922, and 1923, each showing, respectively, somewhat less. If only that idleness reported as due to slack work be considered the order of importance of the years becomes 1921, 1924, 1925, 1923, and 1922.

Employment Status

IN EACH of the five years for the districts included in the survey the effort was made to ascertain whether each person (male or female) 18 years of age or over was "(1) working full time; (2) working part time, and if so what fraction of the usual full time for the industry in which the individual was engaged; or (3) idle, and if so how long continuously at the time of the visit and for what reason."

The following table shows the percentage of those of both sexes on full time, part time, or who were idle for the five years under review:

TABLE 1.—EMPLOYMENT STATUS OF ALL PERSONS ENUMERATED, 1921 TO 1925

Employment status	1921	1922	1923	1924	1925
Employed:					
Full time	76.5	86.2	87.5	79.3	82.4
Part time—					
Two-thirds but less than full time	2.5	2.2	2.6	5.0	4.3
One-half but less than two-thirds time	5.8	3.2	2.9	4.9	3.9
One-third but less than one-half time	1.2	.7	.6	1.7	1.0
Less than one-third time	.6	.5	.1	.5	.5
Total, part time	10.1	6.6	6.2	12.1	9.7
Idle	13.4	7.1	6.3	8.7	7.9
Total, both sexes	100.0	100.0	100.0	100.0	100.0

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The table below shows the percentages of those unemployed from different causes, slack work being the predominant cause in all the periods covered except 1922. In that year 34.1 per cent of the unemployment was due to sickness and 28.2 per cent to slack work. Even in 1923, however, those unemployed because of sickness constituted 33.8 per cent of the total idle—only slightly below the 37.4 per cent idle in that year because of slack work. Referring to the low percentage of unemployment in 1921 because of old age or retirement, it is thought probable that during the acute industrial situation in that year a number of elderly persons took temporary work because the regular wage earners in the family were unemployed.

TABLE 2.—CAUSE OF UNEMPLOYMENT OF PERSONS ENUMERATED, BOTH SEXES, 1921 TO 1925

[Includes only persons reporting as to cause of unemployment]

Cause of unemployment	Per cent of total unemployed				
	1921	1922	1923	1924	1925
Strike		18.1	0.4	0.2	
Slack work	76.9	28.2	37.4	54.3	42.2
Sickness	14.4	34.1	33.8	24.1	31.1
Old age or retirement	8.5	18.3	23.5	15.9	21.5
Miscellaneous	.2	1.3	4.9	5.4	5.1
Total	100.0	100.0	100.0	100.0	100.0

Full-time employment, part-time employment, and idleness for the five-year period covered varied more for all males than for all females enumerated. This is partly attributable to the fact that the males were not so largely engaged in salaried occupations as were the females. For male heads of households, however, the fluctuations over the five years in the percentages of those employed part time and those who were unemployed are greater than for females.

The average employment status for all males enumerated for the five periods was as follows: "82.3 per cent employed full time; 3.4 per cent employed two-thirds but less than full time; 3.8 per cent employed half but less than two-thirds time; 0.8 per cent employed one-third but less than half time; 0.3 per cent employed less than one-third time; 9.4 per cent idle." The greatest divergences from these averages of full-time employment occurred in 1921, when 75.1 per cent were fully employed, and in 1923, when 87.4 were on full time. The record for unemployment in 1921 was 14.6 per cent, while in 1923 only 6.8 per cent were idle, which, it will be noted, is considerably lower than the percentage for the five-year period.

The average status of employment for all enumerated females was: "83.8 per cent employed full time; 3.1 per cent employed two-thirds but less than full time; 5.3 per cent employed half but less than two-thirds time; 1.9 per cent employed one-third but less than half time; 0.9 per cent employed less than one-third time; 5 per cent idle." The percentage of females employed on full time for the separate years differed most from the average for the five years in 1924 and 1923, being, respectively, 81.3 and 87.6 per cent, while the unemployed females in the individual years ranged from 3 per cent in 1922 to 7.9 per cent in 1921.

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Employment Fluctuations in Certain Industries

NOT one of the five more important industry groups exhibits throughout the five years the highest proportion of employment or the greatest amount of idleness, although retail and wholesale trade was in the lead in full-time employment for the first four of the five years, the percentages of persons so employed being more than 89 per cent in 1921, just under 93 per cent in 1922, 94.7 per cent in 1923, and 92.7 per cent in 1924. Of these five groups, the industries showing the largest proportion of idle persons were, in 1921, iron and steel, 26.8 per cent; in 1922, railway and express, 13.2 per cent; in 1923, iron and steel, slightly over 8 per cent; and in 1924 and 1925, the building trades, with 11.8 per cent and 12.3 per cent, respectively.

Considering all the industry groups, paper, printing, and publishing, which in 1922 and 1923 nearly equaled retail and wholesale trade in the percentage of persons on full time, was in this respect ahead of all industry groups except professional service in 1925, with a record of 92.8 per cent of the persons in that industry on full-time employment. In the same year, except for agriculture, the building trades (wage earners and contractors) were reported as having the greatest relative number of idle persons, 12.3 per cent.

In the matter of full-time employment the trade and transportation group was more stable for the five-year period than the manufacturing and mechanical group of industries, the percentage of persons on full time in trade and transportation ranging from 88.3 per cent in 1921 to 93.4 per cent in 1923, and in the manufacturing and mechanical industries group, from 72.2 per cent in 1921 to 88.8 per cent in 1922. The unemployed in trade and transportation constituted 3.5 per cent in 1923 and 7.4 per cent in 1922, and in the manufacturing and mechanical group, 4.6 per cent in 1922 and 13.9 per cent in the previous year.

Trend Toward Stabilization of Employment

THE variety in the industries of Columbus has a tendency to level employment conditions affecting the city as a whole. The fact also that these industries are to a great extent owned locally makes for a very definite sense of responsibility among employers and has resulted in the adoption by several important establishments of progressive methods for regularizing employment. This policy is reflected in the notable amount of part-time employment in 1924, a number of establishments having held a large percentage of their working force on a part-time basis rather than a smaller percentage on full-time work.

Value of Definite Unemployment Statistics

WHILE it is evident that not all of the unemployment disclosed in a survey of this kind represents actual need, yet the continuing study of conditions from year to year, especially when the data include the causes and duration of idleness, is a genuine social service. Through such service, as already suggested, communities, particu-

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larly cities like Columbus with highly coordinated social activities, may outline more intelligently their economic programs and estimate more closely for their coming requirements.

Work of United States Employment Service

THE expense of establishing and maintaining the public employment services of the several States and municipalities is borne largely by them. The Federal Government, however, makes a small financial allotment, provides the forms, and extends the use of the Government frank. The United States Employment Service acts as a clearing house, and is able through its cooperative service to clear labor from States with an oversupply of labor to other States where a shortage exists.

The following table shows the placement work of the United States Employment Service, and of the States cooperating with it, during 1926:[8]

PLACEMENT WORK OF THE UNITED STATES EMPLOYMENT SERVICE AND COOPERATING STATES, 1926

Month	Registrations	Applications for help	Persons referred to employment	Persons placed
January	203,036	118,470	121,125	102,679
February	186,073	122,211	122,807	105,270
March	239,667	176,890	176,110	150,096
April	224,986	179,286	178,218	153,888
May	234,099	204,173	202,466	177,020
June	239,524	183,563	182,047	159,377
July	230,080	192,108	190,047	166,468
August	198,303	185,604	176,546	153,209
September	221,550	221,728	205,208	179,432
October	247,890	241,363	221,018	195,048
November	192,002	161,148	157,060	137,944
December	190,909	142,005	140,209	122,282

Farm Labor Division[9]

THE farm labor division is charged with the responsibility of recruiting and distributing men for the seasonal harvesting of all crops throughout the country.

During the year ending December 31, 1926, seasonal farm laborers and general farm hands were directed to employment as follows:

	Number of men
Cotton picking	217,000
Cotton chopping	7,325
Wheat and small-grain harvesting	101,596
Land clearing (mesquite grubbing)	6,760
Berry picking	52,290
Fruit picking	11,730
Other seasonal labor	10,518
Total, seasonal laborers	407,219
General farm workers	15,893
Grand total	423,112

[8] U. S. Department of Labor. Employment Service. Monthly report of activities, June and December, 1926.

[9] Data from U. S. Department of Labor. Employment Service. Summary of activities of farm labor division, 1926. Washington, 1927.

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Junior Division [10]

IN COOPERATION with the regular local employment services the junior division of the Employment Service undertakes to direct and place in employment boys and girls who are entering business life for the first time. There are now 26 cities in 14 States in which the division is assisting in this work.

The work of this division during the fiscal year 1925–26 is shown below:

Registrations	53,021
Referred to employment	36,257
Placements	24,734
Jobs registered (calls for help)	28,097
Office interviews	154,782
Collateral activities:	
Cases of follow-up	18,797
Visits to employers	5,460

[10] Data from annual report of the Secretary of Labor for fiscal year ended June 30, 1926, p. 37.

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FAMILY ALLOWANCES AND CHILD ENDOWMENT

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Family Allowances and Child Endowment

THE term "family allowances" refers to the practice developed in various European countries of supplementing the basic wages by special allowances in the case of married workers, thus providing for the greater need of those having dependents. Such allowances are usually paid either directly by the employer or from an equalization fund maintained by a group of employers in an industry. In certain countries, however, allowances to families having more than a certain number of children are made directly by the State out of public funds. In such cases, the system might more properly be referred to as child endowment.

(1) Family Allowances in Foreign Countries

AT present the interest in the subject of family allowances in the United States is mainly academic, but the development in the foreign countries of the practice of making such grants seemed important enough to warrant a survey by the United States Bureau of Labor Statistics. The results of this investigation were published in 1926 in Bulletin No. 401 of the Bureau of Labor Statistics.

In general, the study covers conditions existing in 1924 but includes developments in 1925 in a few cases where authoritative data were available at the time the bulletin was prepared. A summary of the findings in this report are given below:

Beginning of the Movement

WHILE in certain industries and public services in some countries family allowances had been instituted before 1914, the movement gained its impetus during and immediately following the war. This was due to the unprecedented rise in the prices of the necessaries of life followed by reiterated demands of the workers for a "living wage."

Closely allied with the "living-wage" doctrine is the "standard-family" theory; namely, that the normal male adult should receive a wage sufficient to enable him to support a wife and two or three dependent children. Under the economic strain of war and postwar conditions many foreign governments and industries felt that such a wage was an impossibility. On the other hand, the result of cost-of-living investigations emphasized the fact that the wages of adult males were utterly inadequate to meet even minimum standards of living for a "standard family." The fact that many families having more than the average number of dependents were subject to special hardship was also realized.

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Because of these facts, recourse was often had to the practice of supplementing the basic wage by allowances to workers with dependents.

Family Allowances in Public Employment

THE study disclosed that family allowances were being paid more or less extensively in the civil service of the following 22 countries: Australia, Austria, Belgium, Bulgaria, Czechoslovakia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxemburg, the Netherlands, Poland, Rumania, Sweden, Switzerland, and Yugoslavia.

At the time of the investigation family allowances were not being granted to employees of the national Government in England, New Zealand, Norway, Spain, and Portugal. During the war, however, England had applied the family-allowance principle in certain kinds of national and local Government employment and Norway had made these supplementary grants in 1923.

Family Allowances in Private Industry

IN PRIVATE industry family allowances have been or are being paid in at least 18 countries. In a number of these the system rests upon collective agreements between the employers and the workers.

Of the countries covered in the study, Germany, Czechoslovakia, Netherlands, Poland, and Sweden have been the most conspicuous in the regulation of family allowances through collective agreements. Although in Germany the family-allowance system had a considerable setback in 1923, in 1924 family allowances were provided for in collective agreements covering from 3,000,000 to 3,200,000 workers. The total number of workers employed under collective contracts in Germany in January, 1924, was 13,135,384. In the Netherlands in June, 1923, there were included under collective contracts granting family allowances 62,624 wage earners, or 26 per cent of the total wage earners under collective agreements.

Family allowances were included in the various collective agreements of Czechoslovakia in 1919 and 1920, but in 1921 the system was largely abandoned in private industry in that country, although these grants are still being paid in greatly reduced degree in agriculture, the metal and machine industries, sugar mills, the chemical industry, and banking.

After family allowances were introduced into Poland in private industry in 1919, they were for a short period provided for in various collective agreements, but when economic conditions became more normal many establishments discontinued the practice. They are still being granted in certain coal-mining districts, in some potash mines, and in the sugar industry. In Great Poland in the last-mentioned industry workers with two children receive a supplement of 1 grosz per hour of work, while in other sections of the country family responsibilities are taken into consideration by allowances in kind.

Of 1,250 agreements in force in Sweden in 1921, affecting 219,984 workers and providing cost-of-living bonuses, 443 covering 109,009

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workers, granted family allowances. At present, however, family allowances have been almost eliminated in private industry in that country.

Number of Persons Employed Under Family-Allowance Systems

NOT quite 50 per cent of the countries reported in regard to the number of persons employed under family-allowance systems, and the statistics on this subject which were received were not complete. The number of persons employed under such systems in Belgium, France, Germany, and Italy in 1924 and in the Netherlands in 1923 combined was more than 7,500,000.

Methods of Granting Family Allowances

METHODS of granting family allowances are very diversified. For example, there are allowances for married men regardless of number of children; for both wives and children; for children only, but frequently including illegitimate, adopted, and foster children, and stepchildren; for a certain number of children only, or for all children below a specified age, or for all but the first or the first two children; and for children in the higher age group (even up to 24 years), usually under certain circumstances. Moreover, allowances are sometimes granted for aged parents, sisters, and brothers.

The amounts of allowances vary greatly in different countries and in different industries or employments and frequently according to the salary grade or wage group of the beneficiaries.

Family-Allowance Funds

ONE of the most important developments of the family-allowance movement is the institution of family-allowance funds for the pooling of the costs of family allowances among groups of employers and the prevention of discrimination in employment against workers with family responsibilities. This development has been most marked in France, where the first fund was established in 1918 and where there were in June, 1925, 176 such funds, having a membership of 11,200 establishments, employing more than 1,200,000 persons.

The first Belgian fund was organized in March, 1921, and in the middle of 1924 there were 12 funds in existence, one of these being set up by the Christian Federation of Trade-Unions.

In Germany the number of funds has been very restricted. The mining industry, the heavy-metal industries, and most of the chemical industries have had no family-allowance funds, and to the employers the necessity for the establishment of such funds did not seem great. In 1922 there were 11 funds in Germany, most of which have now ceased to function.

Both Austria and the Netherlands have funds. In the former country these funds are established under the law of December 21, 1921. In June, 1922, the procedure for pooling the costs of allowances for agricultural and certain other workers was abolished. The "cumbersome" fund machinery is reported as being out of all proportion to the negligible amounts of allowances for children.

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The municipal government of Arnhem in the Netherlands has instituted a children-allowance fund for municipal employees and for private employees in so far as private enterprises may be able to arrange with this fund for such grants. Funds have also been created in the boot and shoe, baking, and cigar industries in the Netherlands.

A cost-of-living fund was established in the printing industry of Copenhagen, Denmark, in January, 1917, which paid family allowances, but it was abolished in July, 1921.

While these funds have been created to equalize the distribution of expenses arising from the payment of family allowances and to protect the workers with family responsibilities from being thrown out of employment or from not being hired at all, the methods of preventing such discrimination are not the same in all funds. The three principal plans of determining the employers' contributions to the French funds are based on (1) the number of days worked, (2) the total number of workers employed during the month by the members of the fund, and (3) the total wages bill.

As an outcome of the experience of French and Belgian family-allowance funds, hygiene services have been organized by them for the benefit of the families of the workers. At the fourth annual congress of the French funds 20 of these funds were reported as having such services, some of the schemes being quite elaborate.

Family Allowances in Agriculture

THE family-allowance principle is followed in agriculture in various countries, particularly through payments in kind.

In France there is a growing movement for the creation of family-allowance funds in agriculture. In February, 1925, there were 15 of these funds. One of the bases of computing assessments for members in some of these funds is the amount of land cultivated.

In Austria the procedure for pooling the cost of family allowances for agricultural workers, provided for under the law of December 21, 1921, was abolished in June, 1922.

In Germany family allowances are paid in agriculture to both permanent and independent workers.

Relation to the Population Problem

NOT the least interesting aspect of the family-allowance system is its alleged relation to the problem of the future labor supply and, in the eyes of some militarists, to the problem of future man power for the respective nations in the event of war. In the case of France particularly this relation is more conspicuous than in any other country because of its grave concern over depopulation.

Conclusions

A GREAT variety of mental attitudes with reference to family allowances is revealed in the sections of the survey which give the viewpoints of ministers of finance, ministers of labor, members of industrial arbitration courts, and officials of national federations of employers' organizations and of federated trade-unions. Pro-

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nouncements on the system range from drastic criticism to the most sanguine indorsement.

Indeed, so many matters concerning the family-allowance systems in their present tentative existence are debatable that the drawing of definite conclusions is difficult and frequently impossible. For example, it would be futile to attempt any deduction as to the actual influence of these systems on the birth rate. Even in France, where some investigations have been made along these lines, the findings are of doubtful value. It is perfectly obvious, however, that the depopulation crisis is very much to the fore in the minds of the leaders of the family-allowance movement in that country.

Another moot question is the effect of family allowances upon industrial production. The elements influencing production are so numerous, however, that any sound conclusions as to what extent family allowances are to be taken into account in this connection should be the result of intensive scientific investigation, and particularly so under the abnormal industrial conditions following the war.

While reports from several countries state that family allowances affect production adversely, certain employers in other countries hope by such grants to reduce strikes and to lessen labor turnover, and consequently to stabilize production.

Varying replies were made to the inquiry as to the reaction of family allowances on the basic wage. This question, it is realized, could not properly be answered in many cases unless special individual studies had been made on the subject with due regard to the intricacies of wage adjustments. Such studies would, of course, be rendered especially difficult by the extraordinary fluctuations in currencies, rapidly changing price levels, and war-devised methods of payment running parallel with family-allowance systems. It is safe to say, however, that in the civil services in various countries and to a considerable extent in industry, family allowances have without doubt constituted a breakwater against demands for higher wages.

While family allowances were being paid in 1924 in the civil services of 22 of the 27 countries covered in this report, the practice of making these grants in private industry has declined in almost all of the countries in which it has been tried out. This decline is especially marked in Czechoslovakia, Germany, Switzerland, and the Scandinavian countries.

On the other hand, there has been a recent vigorous development of the family-allowance system in France and Belgium under the enthusiastic leadership of private employers, and a renewed interest in the question of family endowment is being manifested in England and Australia.

Any attempt to evaluate the various experiments with family allowances is baffling not only because of the conflicting testimony of those closely associated with such experiments and of the short period over which they have been made but also because of the confusion of thought as to the nature and character of family allowances and the varying plans for putting them into effect.

On the one hand, family allowances are regarded as closely tied up with wages, and the newer system of payment is, as it were, put

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in juxtaposition with the standard family wage and is declared to be more just and more economical because it takes into consideration actual instead of hypothetical family responsibilities.

On the other hand, there are schemes for mother or child endowment or insurance for family responsibilities apart from the competitive wage of the father. Between these extremes there is the combination, to a greater or less degree, of the family allowance system with the standard family theory; for example, the paying of a wage which will support a man and his wife with supplementary grants for each dependent child, or the payment of a standard wage and the exclusion of the first child or of the first two children from such grants.

There are evidences, however, of a trend, in certain countries which are more vitally interested in the subject, away from concept of the family allowance as a supplementary wage and toward proposals for State family endowment or some form of national social insurance for family responsibilities.

It may also be said that the experience under family allowance systems adds weight to the demand of women for equal pay for equal work and calls for a more logical response than is frequently made to that contention.

Furthermore the establishment of family allowance funds, at least in France and Belgium, has resulted in a growing solicitude on the part of employers for child welfare and a keener realization of its bearing on future citizenship.

(2) Recent Developments Regarding Family Allowances in Foreign Countries

SINCE the making of the survey, summarized above, certain developments of interest as regards family allowances in foreign countries have come to the attention of the bureau. These are briefly described below:

Belgium [1]

AT THE second congress of Belgian family allowance funds, which met in Brussels November 3, 1925, the committee for study of family allowances reported that the combined personnel of the 773 establishments affiliated with 12 industrial compensation funds (one created since last year's congress)[2] was 152,603, and that the sums distributed by these various funds since their foundation up to dates ranging from June 30 to October 1, 1925, aggregated approximately 28,000,000 francs. If the industries which accord family allowances but are not affiliated with funds are included, the total personnel under the family allowance system is estimated in the committee's report at from 300,000 to 350,000 workers and the disbursements at 60,000,000 francs. These figures do not include family allowance statistics for the public administration. The congress was informed that a new industrial compensation fund of the

[1] Comité Central Industriel de Belgique. Bulletin, Brussels, Nov. 11, 1925, p. 850; Nov. 18, 1925, pp. 886–892; and Nov. 25, 1925, pp. 910–913.

[2] Compensation fund for family allowances of the National Federation of the Textile Industry, with 145 affiliated firms having a combined personnel of 15,500.

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central region was in process of formation and that two agricultural funds have made their appearance within the last year.

The secretary of the committee for the study of family allowances declared that despite the grave industrial depression in Belgium in the last months, no firm affiliated with the 12 compensation funds above cited had discontinued the practice of paying family allowances. Indeed, the majority of the funds have made "important progress" in the face of adverse conditions.

Germany

A RECENT very marked decrease in Germany of the number of collective agreements providing family allowances is reported in an article by Dr. Fr. Busze in the Reichsarbeitsblatt, of Berlin, January 24, 1926. Of 1,496 agreements for manual workers for 1922–23 in various important industries and services, 595, or 39.8 per cent, carried provisions for family allowances, while of 1,352 agreements for 1924–25 for the same class of workers in the same industries and services only 98, or 7.2 per cent, included such provisions.

In 1924–25 the mining, chemical, and paper industries were the only industries having a very large proportion of collective agreements which included family allowances, and even for the chemical and paper industries such proportion is less than half as great as it was in 1922–23.

In various industries in which the system of family allowances was never adopted to any great extent, the practice of making these grants has been almost completely abolished for manual workers.

France [3]

AT THE Sixth National Annual Congress of the family-allowance funds of France which met in the Mediterranean region May 10–13, 1926, various reports indicated that within the preceding year the family-allowance movement in France had further expanded. Among the statistics presented were the following:

	As reported June, 1925	As reported May, 1926
Number of funds	176	195
Number of establishments	11,200	14,000
Number of workers	1,210,000	1,300,000
Annual amount disbursed—francs [4]	160,000,000	200,000,000

The secretary estimates that if the disbursements of private employers who are not members of family-allowance funds are added to the above totals for May, 1926, they would be increased to 700,000,000 francs among 2,600,000 workers. It is also estimated that the inclusion of the allowances paid to the personnel of public administrations would augment the annual distribution to 1,152,000,000 francs over a population of 3,600,000 persons. This expansion is said to be due not only to the "spontaneous attraction of the funds" but also to the legal obligation to pay family allowances to those employed on public works.

[3] La Journée Industrielle, Paris, May 12 (p. 1), May 15 (p. 1), and May 16–17 (pp. 1 and 5), 1926.

[4] Franc at par=19.3 cents; exchange value on May 15, 1926=3.02 cents.

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It was reported to the congress that the number of agricultural funds had increased from 16 to 27 and also that the National Association of the Notaries of France was studying, with the purpose of adoption, a general scheme of social insurance. The first step has already been taken in the institution of family allowances by the Seine Chamber of Notaries.

The attention of the congress was drawn to the notable and increasing activities of the funds for prenatal and postnatal hygiene, the medical supervision of infants and adolescents, and the extension of fresh-air work.

At the general meeting of the French national committee on family allowance on December 17, 1926, [5] it was reported that the number of family-allowance funds then functioning was 203, and that allowance rates in certain centers had been advanced as much as 100 per cent.

One of the most significant developments in the social services of the funds is the growing provision for sicknesss allowances. At the beginning of the summer of 1926 there were a dozen sick-benefit funds in operation. Less than six months later there were 22 such funds. In December, 1926, 2,000 establishments, representing 300,000 wage earners, were under this new sick-benefit scheme, which is expected to expand rapidly in 1927.

(3) Child Endowment by the State

New Zealand

IN New Zealand in 1926 a family allowance bill was enacted into law.[6] The law provides that upon application by the father of three or more children an allowance of 2 shillings a week is to be payable in respect of each child of his in excess of two, but that the average weekly income of the family from all sources (excluding the allowance) shall not exceed £4. Allowances will be paid for children up to 15 years of age and for older children under certain circumstances.

These allowances are to be paid to the wives of the applicants except under unusual circumstances.

Aliens and Asiatics (even though naturalized citizens or British subjects by birth) are excluded from the benefits of this legislation. Bad character or dishonest action for the purpose of benefiting by the allowance may be considered as a basis for refusal to make such grants. In order to receive allowances the parents of the children must have been residents of New Zealand for not less than one year.

France [7]

ON July 22, 1923, a law was passed providing an annual allowance of 90 francs [8] from the State for each child under 13 years of

[5] La Journée Industrielle, Paris, Dec. 19–20, 1926, p. 7.
[6] New Zealand. Official Yearbook, 1927, p. 656.
[7] France. Ministère du Travail, de l'Hygiène, de l'Assistance et de la Prévoyance Sociales. Bulletin de la Statistique générale de la France, Paris, July, 1926, pp. 433–443. "L'encouragement national aux familles nombreuses en 1924 dans quatre-vingt-six Départments."
[8] Franc at par=19.3 cents; average exchange value for August, 1926=2.8 cents.

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age in excess of 3 in French families. In addition, children up to the age of 16 are included, provided they have a written contract of apprenticeship or are pursuing their studies, as well as those who are crippled or are afflicted with an incurable disease, unless they are being cared for in hospitals at the expense of the State, the department, or the commune. Those persons are excluded from the benefits of the law who are subject to the income tax after the deductions on account of the family have been made.

The national allowances shall not be paid in addition to family allowances allotted to their personnel by different public services, but the departments and communes may increase, out of their own resources and to any extent they choose, the allowances paid by the State.

The allowances, which were payable each half year, amounted to 90 francs per year for each child who was a beneficiary.

An amendment to the financial law of July 13, 1925, provides that payments shall begin with the second child when the mother is left as the head of the family and with the third child when the father is in sole charge. A further amendment in the financial law of April 29, 1926, increases the amount of the annual allowance to 360 francs beginning January 1, 1927.

Spain [9]

LARGE families are to be subsidized by the Spanish Government in accordance with a royal decree published in The Gaceta, Madrid, of June 22, 1926. The bonus to laborers is to begin with the eighth legitimate or legitimized child dependent upon the head of the family, and is payable as follows:

	Pesetas [10] per year		Pesetas [10] per year
For 8 children	100	For 13 children	375
9 children	150	14 children	500
10 children	200	16 children	700
11 children	250	17 children	850
12 children	300	18 or more children	1,000

Employees who have 10 legitimate or legitimized children are to be exempted from the rent and income taxes and are to have the right to pay a "sixteenth-class first tariff" and the privilege of "free matriculation in all official educational establishments."

Cash bonuses are also to be accorded civil or military officials on the pay roll of the State, the royal house, or the legislative bodies when such officials have more than 10 children, under conditions set forth in the decree. The bonus payable to such officials is 5 per cent of the salary, for 11 children, plus 5 per cent for each additional child up to and including 20, the bonus for 20 or more children being 50 per cent of the salary. These allowances are to be computed on the basic salary the official receives "by reason of his rank," and not on extra compensation for expenses, etc.

Attention is called to the fact that families of eight children are not unusual in Spain and that to pay these bonuses to smaller families would be a heavy burden on the State exchequer.

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[9] Report from the consulate general at Barcelona, July 1, 1926.
[10] Peseta at par=19.3 cents; exchange rate about 16 cents.

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The decree granting these subsidies has received favorable press comment. There has been some public discussion over the administrative problems, particularly matters of proof and the question as to which classes of persons may or may not have the right to these subsidies.

Attention has been called to the probable hardship worked by the exclusion of shopkeepers and small landholders, as many persons in these classes are as much in need of assistance as those covered by the decree.

Basel, Switzerland [11]

THE Legislature of the Canton of Basel, Switzerland, passed a law November 4, 1926, providing that all families having less than a specified income and four or more minor children "living together in the same household, who have resided uninterruptedly for not less than five years in the Canton of Basel, shall be paid by the Government sums ranging from 10 to 30 per cent of their annual rental as a contribution toward the payment of house rent, the amount of payment to be contingent upon their annual incomes." Foreign residents in Basel do not receive such allowances unless they are able to show that Swiss families who reside in the native countries of such foreigners receive rental allowances from public funds.

The contributions to be paid under the law to families with specified incomes and four or more children are as follows:

Income of—	Proportion of allowance to annual rental (per cent)	Maximum rental allowance (francs)
Not more than 2,500 francs	30	350
2,500 to 3,000 francs	20	200
3,000 to 4,500 francs	10	100

In computing annual income, a deduction of 500 francs is to be made for each minor child. For example, a family with an annual income of 4,500 francs and four minor children would be allowed a deduction of 2,000 francs and a grant of 30 per cent of the annual amount paid for house rent.

Families who live in their own homes or in dwellings furnished by their employers receive a contribution based on the "taxable rental value of the house."

The law stipulates that "these contributions are not to be considered as charity." Moreover, such allowances can be neither seized nor attached and can only be assigned or transferred by the Government's consent.

It is estimated that these benefits will cost the Cantonal Government 100,000 francs a year.

According to the latest official findings, 3,544 families in the Canton have four or more minor children. Many of these families, however, will receive no rental contribution as their incomes are in excess of the maximum at which the grants are allowed.

[11] Report of American Consul, Calvin M. Hitch, at Basel, Switzerland, Nov. 12, 1926.

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HAWAII—LABOR CONDITIONS

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Labor Conditions in Hawaii

RECENT official information regarding labor conditions in Hawaii is very limited. The organic law of Hawaii requires that the United States Commissioner of Labor Statistics[1] shall make a survey of labor conditions in the Territory once in five years. The fifth investigation of the islands was made by that official in 1915 and the results published in 1916. (S. Doc. No. 432, 64th Cong., 1st. sess.) Since that date, however, the funds of the United States Bureau of Labor Statistics have not been sufficient to make such surveys. In his annual report for 1925–26 the Secretary of Labor said:

> While I do not believe that an investigation of Hawaii at set periods five years apart is necessary, I have been convinced from various sources within the last 18 months that the time has come when another survey of labor conditions in the Islands of Hawaii by the Bureau of Labor Statistics should be made.

The Territorial Board of Immigration, Labor, and Statistics, although still in existence, has not functioned for a number of years and has issued no reports since that for 1915–16.[2]

Occupational Distribution

TABLE 1 shows the occupational distribution for Hawaii of persons 10 years of age and over, as reported in the United States Census of 1920.

TABLE 1.—OCCUPIED PERSONS IN HAWAII, 10 YEARS OF AGE AND OVER, BY SEX, 1920[1]

General division of occupations	Males		Females		Both sexes	
	Number	Percent	Number	Percent	Number	Percent
Agriculture, forestry, and animal industry	49,829	51.0	6,415	45.0	56,244	50.3
Extraction of minerals	169	.2			169	.2
Manufacturing and mechanical industry	17,137	17.6	1,057	7.4	18,194	16.3
Transportation	7,628	7.8	153	1.1	7,781	7.0
Trade	6,635	6.8	708	5.0	7,343	6.6
Public service (not elsewhere classified)	6,262	6.4	20	.1	6,282	5.6
Professional service	2,199	2.3	1,918	13.4	4,117	3.7
Domestic and personal service	5,047	5.2	3,419	24.0	8,466	7.6
Clerical occupations	2,713	2.8	573	4.0	3,286	2.9
All occupations	97,619	100.0	14,263	100.0	111,882	100.0

[1] U. S. Department of Commerce, Bureau of the Census, Fourteenth Census of the United States, 1920. Vol. IV. Population: Occupations. Washington, 1923, p. 1270.

It will be noted from this table that almost exactly one-half of the occupied population was engaged in agricultural pursuits. Over

[1] Title previous to Mar. 4, 1913, was United States Commissioner of Labor.
[2] Letter of June 17, 1925, from the board to the United States Department of Labor library.

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16.3 per cent were employed in manufacturing and mechanical industries.

The total estimated population of the Territory in 1926 was 328,444, as compared with 255,912 in 1920.

Filipino Laborers in Hawaii

IN 1925 the director of labor of the Philippine Islands made an investigation of the operation of the contract system under which Filipino laborers are employed in Hawaii, and of the living conditions of such workers. The report deals primarily with Filipino laborers on the sugar plantations, but inasmuch as some 70 per cent of the agricultural workers in Hawaii are Filipinos, the results of this investigation are of very general interest.[3] A summary of this report is given below.

Procedure of Labor Recruiting

THE recruiting of Filipino laborers to work outside the Philippine Islands is regulated by an act of 1915 (Act No. 2486, as amended by Act No. 3148). This act provides that persons or corporations doing such recruiting shall be licensed by the Government; that laborers recruited shall be guaranteed their return passage, provided they comply with the terms of their contract or become physically incapacitated; and that all contracts shall be supervised by the director of labor, who shall not permit the contracting of minors under 15 years or of minors under 18 years without the consent of their parents or guardians. In addition, the Governor General is to appoint a commissioner for service in Hawaii, whose duty is to hear and adjust complaints of Filipino laborers, to see that the contracts are lived up to, and in general to look after the interests of such laborers.

The labor recruiting is done primarily through an agency established and maintained by the Hawaiian Sugar Planters' Association. This agency has its central office in the city of Manila and subagencies in various other parts of the islands. The recruiting agents do not receive any salary, but they receive what the director of labor calls "tempting" commissions, as follows: For each unmarried laborer from Manila, 5 pesos;[4] from other Provinces, 7 pesos; for each laborer with a family, 20 pesos.

Each labor applicant is submitted to a physical examination before final acceptance, by doctors representing the recruiting agency.

Upon the acceptance of a laborer by the recruiting agency the laborer signs a general contract with the Hawaiian Sugar Planters' Association. Through this contract the laborer is guaranteed—

1. Free transportation, subsistence, and clothing for himself (and also his family, if any) from his home to the plantation in Hawaii to which he has been assigned.
2. Bonus of 10 pesos to unmarried laborers, and 20 pesos to married laborers.
3. Free rent, water, fuel, and medical attendance during his stay on the plantation.

[3] Philippine Islands. Department of Commerce and Communications. Bureau of Labor. Labor, Manila, March, 1926.
[4] Peso at par=50 cents.

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4. Free return transportation to his home in the Philippines, provided he has worked 720 days during three consecutive years.

5. A minimum wage of 40 pesos per month of 26 days, a day's work to consist of 10 hours in the field or of 12 hours in the factory. Wives doing laboring work are to receive 28 pesos per month, and children are to be paid according to the amount of work they perform.

The laborer thus contracts himself for a three-year period, but there is no penalty for violation other than the forfeiture of the guaranties, including free return transportation to the Philippines.

A central labor office, with a statistical division, is maintained by the Hawaiian Sugar Planters' Association in Honolulu. This office centralizes the recruiting work and keeps all the data relative to the recruited laborers.

Supervision by Philippine Government

THE Philippine Bureau of Labor does not intervene directly in the recruiting of laborers for Hawaii. It is, however, that bureau's duty to inspect all contracts signed by emigrant laborers, and to investigate to see that they are acting voluntarily and with full understanding of the terms of the contract. The bureau also keeps a list of all contracts, records the name, residence, and other details regarding emigrants, and makes periodical reports as to the number of outgoing and returning laborers.

The resident labor commissioner appointed to watch over the interests of Filipino laborers in Hawaii has his office in Honolulu. His duty in general is to protect the Filipino laborer from any form of exploitation. His specific duties are:

1. To receive and hear complaints of Filipino laborers and to defend their interests in the settlement of such complaints. These complaints may concern the interpretation of the contracts; questions regarding free transportation home to physically incapacitated laborers; and disputes over salaries and wages.

2. To inspect the plantations where Filipino laborers are employed.

3. To secure employment for Filipinos in Hawaii who for any reason are out of work.

4. To make a semiannual report to the Governor General of the Philippine Islands relative to the condition of Filipino laborers in Hawaii.

Emigrants Remaining in Hawaii

ACCORDING to the records of the bureau of labor, Filipino laborers emigrating to Hawaii from 1909 to 1925, inclusive, numbered 74,242, including nearly 10,000 women and children. The total number returning from Hawaii during the same period was only 15,601. The details are shown in the table following.

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TABLE 2.—FILIPINO LABORERS EMIGRATING TO AND RETURNING FROM HAWAII

Year	Emigrating to Hawaii				Returning from Hawaii			
	Males	Females	Children	Total	Males	Females	Children	Total
1909 to 1914	18,630			18,630	159			159
1915	1,777	180	193	2,150	260	40	47	347
1916	1,877	157	180	2,214	342	64	59	465
1917	2,191	178	229	2,598	568	72	93	733
1918	2,030	284	447	2,761	645	65	131	841
1919	3,181	319	297	3,797	677	104	167	948
1920	3,042	225	187	3,454	1,093	75	113	1,281
1921	5,748	628	438	6,814	1,953	249	503	2,705
1922	7,291	530	362	8,183	1,309	81	203	1,593
1923	4,516	1,800	945	7,261	1,226	112	158	1,496
1924	8,171	1,116	582	9,869	1,730	204	261	2,195
1925	6,099	256	156	6,511	2,255	267	316	2,838
Total	64,553	5,673	4,016	74,242	12,217	1,333	2,051	15,601

Occupations of Filipinos in Hawaii

THE Filipino laborers in Hawaii are chiefly engaged in the sugar fields, but a considerable number are city workers. The director of labor, in his report, estimates the number of Filipinos in Hawaii at about 40,000, of whom about 5,000, including women and children, are city dwellers. The remainder are engaged in agricultural labor, about 25,000, not including members of their families, being on the plantations of the Hawaiian Sugar Planters' Association.

Living Conditions of City Workers

AS REGARDS living conditions, the director finds that, in general, the city Filipinos are in a deplorable situation. Most of them originally came to Hawaii as contract sugar laborers, but for one reason or another drifted to Honolulu and the other cities of the Territory. Most of the work they are engaged in—such as stevedoring—is very irregular. Commenting on the way of life of these city laborers, the director says:

> The conditions of life of the Filipino living in the cities, excepting those who have permanent work, may be said to be difficult and miserable because of their irregular periods of employment. They find hardly enough to sustain themselves, and I can affirm that a great number of them lack the necessities of life. Often they live by securing shelter and aid from their compatriots who are at work and earning their living. These people then become a veritable charge on those who do work and shelter them.

Living Conditions and Wages on Plantations

CONTRASTED with the living conditions of the Filipino laborers in the city, the director found conditions of the plantation laborers to be, in general, very good, except among time-workers with families with the minimum wage of not over $1 per day. However, he states that most of the laborers are employed on a contract basis and earn, with certain bonuses, an average of about $2.40 per day. Under this contract the laborer, himself acting as a contractor, agrees to cultivate, harvest, etc., a certain parcel of land and to receive an agreed amount per ton for all the clean cane harvested.

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Details are also entered into regarding the allocation of bonuses, advances, etc., and the contractor is authorized to hire laborers of his own under certain conditions.

A comparison of the wages of Filipino sugar laborers in Hawaii with the wages paid in the sugar fields of the Philippines, according to the director, is extremely favorable to Hawaii. In other words, the Filipino laborer benefits himself financially by emigrating to Hawaii. The following table compares the wage rates in the two countries for certain selected occupations in the sugar industry. The cost of living in Hawaii is estimated by the director as about 25 per cent higher than in the Philippines, but even allowing for this difference, all the comparisons are very favorable to the Hawaiian laborer.

TABLE 3.—DAILY WAGES IN MILLS AND FIELDS OF HAWAII AND PHILIPPINE ISLANDS

Nature of work	Hawaii[1]	Philippine Islands	Nature of work	Hawaii[1]	Philippine Islands
Cane carrier:			Boiling-house samplers—Contd.		
Unloading machines—season	$2.09	$0.50	Sewing machine	$1.38	$0.60
Other men	1.79	.50	Loading sugar—off season	1.65	.60
Unloading machines—off season	1.93	.50	Milling department:		
Other men	1.65	.50	Engine tenders	2.23	.60
Fireroom:			Oilers	1.80	.60
Firemen	1.76	.65	Cane feeders	1.65	.60
Trashmen	1.53		Mill tenders	1.52	.60
Water tenders	2.89		Mill repair gangs	2.03	.60
Boiling-house samplers	2.29	.50	Carpenter shop:		
Juice heaters and scales	1.93	.65	Car-repairing gang	2.66	.625
Settling tanks	1.65	.60	Painters	1.90	
Evaporators	2.09	.50	Carpenters	2.72	
Lime kiln	1.93	.50	Electricians—helpers, etc	2.67	1.125
Filter presses, lunas	1.53	.50	Machine shop—helpers, etc	2.89	
Filter presses, others	2.62		Loading cane (27 cents per ton in Hawaii)—average daily	2.89	[2] 1.50
Vacuum pans	1.53	.50	Cutting cane (21 cents per ton in Hawaii)—average daily	2.46	[2] 1.50
Crystallizers, mixers, sweepers	1.98		Donkey engine		.50
Engine and pump tenders	1.83	.60			
Centrifugal No. 2	1.87	.50			
Centrifugal No. 1—during season	2.75	.75			

[1] Including 10 per cent bonus.
[2] In the Philippines cutting and loading cane is usually paid for to the contractor, not to the laborers; and the contractor pays the workmen 2.50 pesos per week with rice and 0.10 pesos per day for food. In the foregoing table 1 peso per day is used as average wage.

The plantation worker, according to the director's report, in addition to his salary receives a so-called "turnout bonus" of 10 per cent of his salary, plus a profit-sharing bonus which varies with the price of sugar. When the price of sugar reaches 5 cents a pound a profit-sharing bonus of 5 per cent is paid, when it is selling at 6 cents a bonus of 15 per cent, when the price is 7 cents a bonus of 25 per cent, etc.

It must be remembered also that in Hawaii food costs are lessened in many cases by laborers having a home garden in which they raise some of their vegetables. Also they have no house rent to pay and they have free fuel furnished them.

Cost-of-Living Budget of Filipino Laborer

ACCORDING to the director's estimate, an unmarried Filipino laborer can live on $18 per month, the items being distributed as follows: Food, $11.10; cigarettes, $1.50; incidentals, $1.80; washing,

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$2; soap, 10 cents; clothing, etc., $1.50. In the case of a married laborer this estimate is increased 50 per cent for the wife and 15 per cent for each child. Thus the minimum for a family with three children is $35.10, which would necessitate a daily wage of $1.35 for 26 working days per month. Moreover, the above estimates include nothing for recreation, nor for a local tax of $5 per year on each adult worker.

As a matter of fact, the great number of Filipino laborers in Hawaii are either unmarried or have left their families at home. Indeed, the great excess of unattached men and the scarcity of women is believed by the director to be a serious evil which needs to be remedied.

Housing Conditions

HOUSING, supplied free by the sugar plantations, includes "a house (valued from $900 to $1,000) with modern hygienic and sanitary conveniences, including kitchen, bath, washhouse, odorless toilets with running water, wood and other fuels for cooking of their food, and water. The great majority of the houses are lighted with electricity at the cost of the occupant."

The plantations also furnish free medical service and free schools.

Financial Status of Departing and Returning Laborers

A SUPPLEMENTARY investigation was made by the Philippine Bureau of Labor of 1,000 laborers who left the Philippines for Hawaii in 1925 and of 500 Filipino laborers who returned from Hawaii to the Philippines during 1925.

Of the emigrants 996 were males, of whom two-thirds were married but had left their families at home. Almost all were between 21 and 35 years of age. About one-half owned real property of an average value of 312 pesos, the other half owning no property of any kind.

Of the 500 returning Filipinos, 346, or 69 per cent, were married, and 312, or 62 per cent, had been in Hawaii for at least three years. About 20 per cent of the returning laborers took no savings back with them, but the remaining 80 per cent averaged 433 pesos each. Moreover, the investigation showed that, while employed in Hawaii, almost 90 per cent of the laborers had sent money averaging 734 pesos each to relatives in the Philippines.

Complaints of Laborers

DURING the course of his investigation, the director of labor received many complaints from individual laborers regarding working and living conditions. The director states that he was unable to verify the complaints and is thus unable to say whether they were justified. What appear to be the principal complaints, as reported by him, were as follows:

1. That the payment of the work for "long-term contract," for which the worker earns more than $1 per day, is made tardily, and the workmen are unable to check up on the amount of work done and expenditures made under the contract system.

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2. That many workers who participated in the recent strike are discriminated against.

3. That the labor commissioner does not inspect the majority of the plantations more than once a year, and that there is often delay in handling complaints sent to the commissioner.

As regards the complaint that the resident commissioner of labor is tardy in inspecting and following up complaints, the commissioner states that he has no assistants and some delay is therefore inevitable. The director also reports that the commissioner, the plantation managers, and himself agreed on a plan by which any important complaints by the laborers will be presented by the commissioner to the convention of the Hawaiian Sugar Planters' Association.

The plantation managers also made various complaints to the director regarding the Filipino laborers. Thus, while the general sentiment was that the Filipinos were satisfactory workers, certain managers complained of the instability of many of them, that they frequently pass from one plantation to another, thus confusing the records, especially as regards free return transportation to laborers fulfilling the terms of their contract, and also making it difficult to train Filipinos for the more responsible positions, such as camp bosses and overseers.

Conclusions

THE conclusions of the report may be briefly summarized as follows:

1. Some method is necessary to keep the Filipino from leaving plantation work, but without any sacrifice of his liberty.

2. The daily wage of $1 paid to certain laborers is too low for men with families.

3. Free return passage to the Philippines should be given to laborers who were contracted for prior to 1915, when the act of the Philippine Legislature made this provision obligatory. Such free passage for men arriving prior to 1915 was not furnished by the Hawaiian Sugar Planters' Association, as the act did not apply on the plantations of the said company when these laborers were taken to Hawaii. These laborers are not given free return passages by the Hawaiian Sugar Planters' Association on the ground that they do not work for the plantations belonging to the association at the time they apply for same.

4. A considerable number of Filipino laborers who were discharged from the navy yard and the public works department for not being citizens of the United States should be reinstated, and, if necessary, the law should be amended so " as not to exclude Filipinos from said work."

Work of Hawaiian Homes Commission [5]

ON JULY 9, 1921, President Harding approved the Hawaiian Homes Commission act.

On September 16, 1921, the commission held its first meeting. Since that time, under the commission's direction, " former pasture and algeroba forest areas in Molokai have been settled and divided

[5] U. S. Department of the Interior. Annual report of the Governor of Hawaii for the fiscal year ended June 30, 1926. Washington, 1926, p. 56.

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into 22 farms and 17 house lots in the Kalanianole settlement, 74 farms in Palaau and Hoolahua, and 2 farms in Kapaakea, adding a new population to that section of nearly 700 persons." More than 60 homes for workers have been set up in the Kuhio settlement of the Hawaiian home lands in the neighborhood of Hilo. "The majority of the homesteaders are well settled and making good headway. Theirs is the old story of success resulting from enthusiastic hard work and doubtful results where indifference rules."

The commission's receipts from all sources have aggregated $658,963, its expenditures for permanent improvement $251,372, and its loans to homesteaders for the development of their tracts, buildings, farm equipment, and livestock, $213,393. In addition a disbursement of $156,225 covered the purchase of certain equipment, the general expenses of the commission, the carrying on of certain experimental work, and the development of natural resources. The net cash balance on hand June 30, 1926, was approximately $38,000.

The original Hawaiian homes act was first approved by the legislature of the Territory and afterwards submitted to the United States Congress for action. Similar procedure would seem proper in connection with a request for the extension of the law beyond the five-year period. The governor recommends that the Territorial legislature should come to agreement on the request to be presented in this connection to the Seventieth Congress, which will meet in December, 1927.

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HOUSING

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Building Permits in Principal Cities of the United States in 1926[1]

Introduction and Summary

SHORTLY after January 1, 1927, the Bureau of Labor Statistics mailed a questionnaire to each of the 319 cities in the United States which had a population of 25,000 or over, according to the estimate of the Census Bureau as of July 1, 1926. The questionnaire called for the number and the cost of each of the different kinds of new buildings and for the number and the cost of additions, alterations, and repairs to old buildings. The figures here presented apply only to buildings and do not include the cost of the ground on which the building is erected. Further, the figures are restricted to official city limits and do not take into consideration suburban development outside of the corporate limits.

Prior to 1926 forms were sent annually to the 287 cities which had a population of 25,000 or over, according to the 1920 census. The scope of the inquiry was extended this year to include 32 other cities which, according to the estimate of the Census Bureau, have reached a population of 25,000 or over since the last census.

Full reports were received from 294 cities, including 19 of the cities which have reached a population of 25,000 since 1920. Nearly 90 per cent of these cities sent in their reports by mail, either direct to this bureau or to cooperating State bureaus. The latter forwarded the reports obtained by them to the Bureau of Labor Statistics. The States of Illinois, Massachusetts, New Jersey, New York, and Pennsylvania are now cooperating with the Federal bureau in this work. A little over 10 per cent of the reports were obtained by sending agents to compile the data from local records.

Table 1 shows the total number of new buildings and the estimated cost of each of the different kinds of new buildings for which permits were issued in the 294 cities from which schedules were received for the year 1926, the per cent each kind forms of the total number, the per cent that the cost of each kind forms of the total cost, and the average cost per building.

[1] Earlier reports concerning building permits issued in the United States are published in Bulletins Nos. 295, 318, 347, 368, 397, and 424 of the Bureau of Labor Statistics, and in the Monthly Labor Review for July, 1921; April, 1922; July, 1923; October, 1923; June, 1924; October, 1924; June, 1925; September, 1925; October, 1925; June, 1926; July, 1926; and October, 1926. Data in detail for each city from which reports were received for the calendar year 1927 will appear in Bulletin No. 449.

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TABLE 1.—NUMBER AND COST OF NEW BUILDINGS AS STATED BY PERMITS ISSUED IN 294 CITIES DURING THE CALENDAR YEAR 1926, BY KIND OF BUILDING

Kind of building	New buildings for which permits were issued				
	Number of buildings	Per cent of total	Estimated cost		
			Amount	Per cent of total	Average per building
Residential buildings					
One-family dwellings	200,531	39.5	$939,272,815	25.9	$4,684
Two-family dwellings	29,862	5.9	250,811,978	6.9	8,399
One-family and two-family dwellings with stores combined	4,203	.8	45,960,410	1.3	10,935
Multi-family dwellings	14,994	3.0	793,509,118	21.9	52,922
Multi-family dwellings with stores combined	1,470	.3	79,321,374	2.2	53,960
Hotels	306	.1	145,278,045	4.0	474,765
Lodging houses	60	(1)	808,020	(1)	13,467
All other	233	(1)	38,354,493	1.1	164,612
Total	251,659	49.6	2,293,316,253	63.3	9,113
Nonresidential buildings					
Amusement buildings	967	.2	135,640,162	3.7	140,269
Churches	1,191	.2	66,738,198	1.8	56,035
Factories and workshops	4,871	1.0	179,910,768	5.0	36,935
Public garages	4,644	.9	75,556,070	2.1	16,270
Private garages	197,103	38.9	78,098,960	2.2	396
Service stations	4,264	.8	15,328,494	.4	3,595
Institutions	290	.1	49,630,473	1.4	171,140
Office buildings	1,711	.3	262,563,433	7.2	153,456
Public buildings	277	.1	31,681,285	.9	114,373
Public works and utilities	779	.2	43,828,750	1.2	56,263
Schools and libraries	890	.2	152,901,630	4.2	171,800
Sheds	16,546	3.3	7,458,705	.2	451
Stables and barns	508	.1	845,308	(1)	1,664
Stores and warehouses	15,709	3.1	216,481,212	6.0	13,781
All other	5,870	1.2	15,346,245	.4	2,614
Total	255,620	50.4	1,332,009,693	36.7	5,211
Grand total	507,279	100.0	3,625,325,946	100.0	7,147

[1] Less than one-tenth of 1 per cent.

A total of $3,625,325,946 was spent for new buildings in 1926 in the 294 cities from which reports were obtained. Of this amount $2,293,316,253, or 63.3 per cent, was spent for residential buildings and $1,332,009,693, or 36.7 per cent, for nonresidential buildings. In 1925 reports were received from 272 cities having a population of 25,000 and over, and in these cities 64.7 per cent of the total amount expended was for residential buildings and 35.3 per cent for nonresidential buildings.

It should be borne in mind that the costs shown in these tables are estimated costs declared in most cities by the prospective builder at the time of applying for his permit to build. Frequently the figures are under the real cost of the building. Many cities charge fees according to the cost of the building, and this may cause the builder to underestimate the cost. Another cause of underestimation is that builders think that a low estimate may make their tax assessment lower. On the other hand, a builder may overestimate the cost in order to impress prospective buyers.

In some cities the building commissioner checks over the cost reported and requires the builder to correct his figures. In most

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cities, however, the estimate given is accepted if it is apparently reasonable.

It should also be remembered that the data show the number of buildings for which permits were issued and that there is often some delay before work starts on the building and considerable time often elapses before the building is ready for occupancy.

More money was spent for the erection of one-family dwellings than for any other class of building, 25.9 per cent of all money spent for the erection of buildings in these 294 cities being spent for one-family dwellings. The next highest expenditure of money was for multi-family dwellings (apartment houses), their cost comprising 21.9 per cent of the total cost of all buildings.

In the nonresidential group more money was spent for office buildings than for any other class in this group. Stores and warehouses were the next in rank in cost in the nonresidential group.

In the number of buildings for which permits were issued, one-family dwellings also assumed the lead, with 39.5 per cent of all buildings. Private garages were the next most numerous class of buildings in these 294 cities, comprising 38.9 of all new buildings.

The average cost of all one-family dwellings in these 294 cities was $4,684, as compared with $4,567 in 1925 and $4,314 in 1924.

Hotels cost more per building than any other class of building, the average cost of new hostelries in 1926 being $474,765. In the nonresidential group, schools and libraries were the most expensive type, the average cost per building of the educational edifices being $171,800. The average cost of churches was only $56,035 while that of amusement buildings was $140,269.

The average cost of private garages was $396, the lowest cost per building of any class of building shown.

In these 294 cities there were 279,857 permits issued for alterations, additions, and repairs to old buildings, and the amount expended on these repairs was $359,555,470. For all buildings, new and repairs to old, there were a grand total of 787,136 permits issued and a total expenditure of $3,984,881,516. A total of 480,773 families were provided for in new buildings in these 294 cities during 1926.

Families Provided For

TABLE 2 shows the number and per cent of families provided for by each of the different kinds of dwellings for which permits were issued in 272 identical cities in 1925 and 1926.

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TABLE 2.—NUMBER AND PER CENT OF FAMILIES TO BE HOUSED IN NEW DWELLINGS FOR WHICH PERMITS WERE ISSUED IN 272 IDENTICAL CITIES DURING THE CALENDAR YEARS 1925 AND 1926, BY KIND OF DWELLING

Kind of dwelling	Number of new buildings for which permits were issued		Families provided for			
			Number		Per cent	
	1925	1926	1925	1926	1925	1926
One-family dwellings	234,899	195,973	234,899	195,973	46.2	41.5
Two-family dwellings	38,756	29,039	77,512	58,078	15.3	12.3
One-family and two-family dwellings with stores combined	5,784	4,168	9,619	6,985	1.9	1.5
Multi-family dwellings	15,109	14,770	171,314	195,474	33.7	41.4
Multi-family dwellings with stores combined	1,771	1,440	14,803	16,076	2.9	3.4
Total	296,320	245,390	508,147	472,586	100.0	100.0

There were 472,586 families provided for by all classes of new dwellings in these 272 cities in 1926 as compared with 508,147 in 1925, a decrease of 7 per cent in housing units.

One-family dwellings, which provided for 234,899 families, or 46.2 per cent of all families provided for in 1925, housed only 195,973, or 41.5 per cent in 1926. In contrast, apartment houses, which provided for 171,314 families in 1925, provided for 195,474 in 1926, this being 41.4 per cent of all families provided for in 1926 as against 33.7 per cent the previous year. Two-family dwellings provided for 77,512 families in 1925 and only 58,078 families in 1926.

Table 3 shows the number and percentage distribution of families provided for in the different kinds of dwellings in the 257 identical cities from which reports were received in each of the six years 1921, 1922, 1923, 1924, 1925, and 1926. For convenience, one-family and two-family dwellings with stores combined are grouped with two-family dwellings, and multi-family dwellings with stores combined are grouped with multi-family dwellings.

TABLE 3.—NUMBER AND PER CENT OF FAMILIES PROVIDED FOR IN THE DIFFERENT KINDS OF DWELLINGS IN 257 IDENTICAL CITIES IN 1921, 1922, 1923, 1924, 1925, AND 1926

Year	Number of families provided for in—				Per cent of families provided for in—		
	One-family dwellings	Two-family dwellings [1]	Multi-family dwellings [2]	All classes of dwellings	One-family dwellings	Two-family dwellings [1]	Multi-family dwellings [2]
1921	130,873	38,858	54,814	224,545	58.3	17.3	24.4
1922	179,364	80,252	117,689	377,305	47.5	21.3	31.2
1923	207,632	96,344	149,697	453,673	45.8	21.2	33.0
1924	210,818	95,019	137,082	442,919	47.6	21.5	30.9
1925	226,159	86,145	178,918	491,222	46.0	17.5	36.4
1926	188,074	64,298	209,742	462,114	40.7	13.9	45.4

[1] Includes one-family and two-family dwellings with stores combined.
[2] Includes multi-family dwellings with stores combined.

The total number of families provided for in all classes of dwellings during 1926 in the 257 cities was 462,114. This is a reduction of 6 per cent as compared with 1925, the peak year, but is the second highest number shown in the six-year period and is more than twice as many housing units as were provided in 1921.

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The figures in this table would tend to show that we are becoming a race of cliff dwellers, for in the year 1926 accommodations were provided in apartment houses for 209,742 families, or 45.4 per cent of all the families provided for during that year, while one-family dwellings provided for only 188,074 families, or but 40.7 per cent of all families provided for. This is the first year that apartment houses have provided more new family accommodations than have one-family dwellings in these 257 identical cities.

Since 1921 there has been an increase of 105.8 per cent in the number of families provided for in all classes of dwellings. During this same period, however, the number of families accommodated in apartment houses increased 282.6 per cent, while the number provided for in one-family dwellings increased only 43.7 per cent. The number of family units provided for by two-family dwellings increased 65.5 per cent between 1921 and 1926.

Building Trend, 1925 and 1926

TABLE 4 shows the number and cost of the different kinds of buildings for the 272 identical cities from which reports were received in 1925 and 1926 and the per cent of increase or decrease in the number and in the cost in 1926 as compared with 1925.

TABLE 4.—NUMBER AND COST OF NEW BUILDINGS FOR WHICH PERMITS WERE ISSUED IN 272 IDENTICAL CITIES DURING THE CALENDAR YEARS 1925 AND 1926, BY KIND OF BUILDING

Kind of building	New buildings for which permits were issued				Per cent of increase (+) or decrease (−) in the year 1926 compared with the year 1925	
	1925		1926			
	Number	Cost	Number	Cost	Number	Cost
Residential buildings						
One-family dwellings	234,899	$1,073,123,621	195,973	$920,439,498	−16.6	−14.3
Two-family dwellings	38,756	324,480,169	29,039	244,713,969	−25.1	−24.6
One-family and two-family dwellings with stores combined	5,784	58,855,118	4,168	45,473,010	−27.9	−22.7
Multi-family dwellings	15,109	709,421,414	14,770	786,886,218	−2.2	+10.9
Multi-family dwellings with stores combined	1,771	76,564,025	1,440	78,072,374	−18.7	+2.0
Hotels	342	171,798,215	297	142,318,045	−13.2	−17.2
Lodging houses	120	1,137,750	46	723,020	−61.7	−36.5
Other	204	49,000,002	228	37,368,493	+11.8	−23.7
Total	296,985	2,464,380,314	245,961	2,255,994,627	−17.2	−8.5
Nonresidential buildings						
Amusement buildings	1,047	116,283,961	943	133,429,662	−9.9	+14.7
Churches	1,242	63,363,306	1,137	64,492,748	−8.5	+1.8
Factories and workshops	4,986	173,288,004	4,715	169,816,848	−5.4	−2.0
Public garages	4,960	83,111,989	4,561	73,551,895	−8.0	−11.5
Private garages	209,086	88,221,064	192,608	76,576,041	−7.9	−13.2
Service stations	4,095	12,981,742	4,070	14,863,858	−.6	+14.5
Institutions	254	53,429,157	287	49,382,473	+13.0	−7.6
Office buildings	1,876	263,894,589	1,666	260,000,433	−11.2	−1.5
Public buildings	300	23,570,409	266	30,564,285	−11.3	+29.7
Public works and utilities	615	43,890,487	764	42,853,250	+24.2	−2.4
Schools and libraries	1,038	163,027,827	861	149,490,295	−17.1	−8.3
Sheds	17,243	7,475,088	16,299	7,379,405	−5.5	−1.3
Stables and barns	565	1,300,890	487	804,908	−13.8	−38.1
Stores and warehouses	15,732	243,090,793	15,222	212,320,705	−3.2	−12.7
All other	2,603	8,897,366	5,856	15,314,070	+125.0	+72.1
Total	265,642	1,345,826,672	249,742	1,300,840,876	−6.0	−3.3
Grand total	562,627	3,810,206,986	495,703	3,556,835,503	−11.9	−6.6

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There was a decrease of 11.9 per cent in the number of buildings for which permits were issued in these 272 cities in 1926 as compared with 1925, and a decrease of 6.6 per cent in the amount expended for their erection. In these cities residential buildings decreased 17.2 per cent in number and 8.5 per cent in estimated cost, while non-residential buildings decreased only 6 per cent in number and 3.3 per cent in cost.

While there was an increase in the amounts spent for churches and amusement buildings in 1926 as compared with 1925, the increase in expenditures for amusement buildings was at a much higher rate than that for churches. The amount expended for theaters, etc., increased 14.7 per cent while the amount spent for places of worship increased only 1.8 per cent.

The only two classes of residential buildings to show an increase in the amount expended were apartment houses and apartment houses with stores combined.

There was a notable increase in the amount expended for service stations and for public buildings. The former increased 14.5 per cent in the amount expended and the latter 29.7 per cent.

Per Capita Expenditure for Buildings—Housing in Relation to Population

IN the paragraphs following are given the total and the per capita expenditures for new buildings, new housekeeping dwellings, repairs and additions, and for all kinds of buildings in the 294 cities for which reports were received for the calendar year 1926; and the total expenditure for all classes of buildings for 272 cities in 1925.

These 294 cities spent for new buildings of all kinds $3,625,325,946, and of this amount $2,108,875,695 was for housekeeping dwellings. The amount expended for repairs, etc., was $359,555,470, and the total expenditure for all classes of new buildings and repairs to old buildings was $3,984,881,416. In 1925 the 272 cities from which reports were received spent $4,156,605,144 for all classes of new buildings and repairs.

These 294 cities had a population of 42,700,350 on July 1, 1926, according to the estimate of the Census Bureau. The per capita expenditure for new buildings was $84.90, of which $49.39 was for housekeeping dwellings. The per capita expenditure for repairs was $8.42 and the total per capita expenditure was $93.32.

The highest per capita expenditure for all classes of buildings was in White Plains, N. Y., where the per capita expenditure was $493.10. Another suburb of New York City (Mount Vernon) ranked second, with a total per capita expenditure of $478.37. The third city was St. Petersburg, Fla., where $379.81 per capita was expended.

Following is a list of the five leading cities in expenditure of money for building operations from 1920 to 1926, inclusive:

1920		1921	
New York	$277, 695, 337	New York	$442, 285, 248
Chicago	84, 602, 650	Chicago	133, 027, 910
Detroit	77, 737, 215	Cleveland	86, 680, 023
Cleveland	64, 198, 600	Los Angeles	82, 761, 386
Los Angeles	60, 023, 600	Detroit	58, 086, 053

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1922		1924	
New York	$645, 176, 481	New York	$836, 043, 604
Chicago	229, 853, 125	Chicago	308, 911, 159
Los Angeles	121, 206, 787	Detroit	160, 547, 723
Philadelphia	114, 190, 525	Los Angeles	150, 147, 516
Detroit	93, 614, 593	Philadelphia	141, 402, 655
1923		**1925**	
New York	789, 265, 335	New York	1, 020, 604, 713
Chicago	334, 164, 404	Chicago	373, 803, 571
Los Angeles	200, 133, 181	Detroit	180, 132, 528
Detroit	129, 719, 831	Philadelphia	171, 034, 280
Philadelphia	128, 227, 405	Los Angeles	152, 646, 436

1926

New York	$1, 039, 670, 572
Chicago	376, 808, 480
Detroit	183, 721, 443
Philadelphia	140, 093, 075
Los Angeles	123, 006, 215

In these 294 cities housing accommodations were provided in new buildings for 480,773 families, or at the rate of 112.6 families to each 10,000 of population. St. Petersburg, Fla., provided for more families according to its population than any other city in the country with a population of 25,000 or over, the ratio there being 700.3 families accommodated by new dwellings to each 10,000 of the city's population.

Living Conditions of Small-Wage Earners in Chicago

THE Chicago Department of Public Welfare in 1924–25 made a study of the conditions, especially as to housing, which affect the small-wage earner of that city.[2] The study was undertaken especially to learn the conditions offered the negroes and the Mexicans who have come in to fill the gap made by cutting off immigration from Europe. The field work, which was carried on from November, 1924, to April, 1925, covered 1,526 households, divided as to the race or nativity of their heads into 668 colored, 266 foreign-born Mexicans, 590 of different white nationalities, and 2 American Indians. The neighborhoods studied were in 11 wards, distributed through the sections of the city in which the colored population is most concentrated.

For comparative purposes, especially in the matter of rentals, in each neighborhood sampled an endeavor was made to secure a sufficient number of homes which were neither negro nor Mexican, so that conclusions might be possible relative to any special hardship in finding shelter to which either negroes or Mexicans were being subjected.

Negroes and Mexicans in Chicago

THE negro population of Chicago has increased with abnormal rapidity since the outbreak of the war, and it is estimated that in September, 1925, it amounted to 147,599. The Mexicans are

[2] Chicago. Department of Public Welfare. Living conditions for small-wage earners in Chicago, by Elizabeth A. Hughes. Chicago, 1925.

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even newer comers, and are less important numerically. In 1920, according to the census, there were 1,141 Mexicans resident in the city, but in 1925 it was estimated that the number had risen to about 8,000. As the latest comers to Chicago, both negroes and Mexicans have been obliged to find shelter in the oldest, most outworn and derelict housing which the city still keeps. The localities in which they are concentrated are also run down and unattractive. "In short, the neighborhood conditions are not such that they offset poor housing conditions and lack within the dwellings."

Composition of Households

THE households visited showed some variations in composition, according to race and nationality. In the homes of the negroes children under 14 formed 20 per cent of the occupants, in the homes of Mexicans they were 30 per cent, among the native-born whites 26 per cent, and among the foreign-born whites 42 per cent. Among the newcomers it was not uncommon for two or more families to combine and form one household. Thirty per cent of the negro and 26 per cent of the Mexican households consisted of more than one family, while among the native-born whites this was the case in only 13 per cent. The size of the households likewise varied.

Among the native-white homes visited, 68 per cent had five or less persons per household; among negroes 64 per cent; among foreign born other than Mexican 54 per cent; and among Mexicans 44 per cent. The household of median size among native whites numbered 4; among negroes and foreign born, exclusive of Mexicans, 5; among Mexicans, 6.

Housing Conditions

THE study of the homes showed that they were very largely in buildings which fell far below the standards the community has approved.

About 8 per cent of the 770 buildings in which the families included in this study dwelt occupied the rear of the lots and had another building in front of them. Almost 6 out of every 10 buildings (59 per cent) had not more than two floors. Fifty-six per cent had only one or two dwellings in them. Fully half were of frame construction, though within the fire limits.

Ninety per cent of the total number of buildings studied had no vacancies and the percentage of vacancies in the whole group was only 3.7. "It has been estimated that 5 per cent represents the minimum surplus of vacant apartments which will permit a sufficient equality in bargaining power between landlord and tenant." About one-twelfth (8 per cent) of the homes were situated in basements. For all races the apartment most frequently found was one of four rooms. Rooms having no opening to the outer air were found to the number of 177. Seventy-one of these were being used as bedrooms. If it is to be considered that an apartment is overcrowded when there are two or more persons to each room, 6 per cent of the negro and the native-white households, 28 per cent of the Mexican, and 9 per cent of the other foreign-born households were overcrowded. Instances of extreme overcrowding were found.

In South Chicago one large basement room, the equivalent in size of three rooms on the first floor of the house, was the home of 13 persons making up three related families. Each family had children in it. One end of the room

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had been separated from the rest by a board partition extending only part way to the ceiling. No windows were in this section of the room partitioned off and used as a bedroom for one family. The larger portion of the room served as kitchen for all and bedroom for the rest of the household.

Other examples were two Mexican families, consisting of 8 persons, living in a two-room shack, a Mexican household of 15 living in six rooms, and a negro household of 11 persons in three rooms and a closet. Often other conditions were extremely bad. "In a rear basement on Milton Avenue was a family of six occupying two rooms for $10 a month. The toilet was under the sidewalk; light at night was from oil lamps; both rooms served as bedrooms."

A number of the dwellings were badly off in regard to conveniences. Many of the houses were old, and where such modern improvements as running water, bathrooms, toilets, and the like were provided, they were often of an objectionable type or their location was inconvenient and sometimes detrimental to the family health and decency. Of the 1,312 rented apartments, 85 per cent were "cold-water flats," with no means of heating other than stoves and no provision for a hot-water supply. "Many bathtubs were not used because there was nothing but a cold-water tap in them. Hall, porch, and basement toilets outside apartments in these unheated flats were sometimes useless for long periods in cold weather because frozen."

Tenure and Rentals

OF THE 1,526 households studied, 214 owned or were purchasing the homes in which they dwelt. No Mexicans were among these. Of the native white families, 17 per cent, and of the negro families 11 per cent, were home owners. The difficulty of finding a place to rent at a figure which they could pay was instrumental in making a number of these families buy. Unfortunately the same causes which made it possible to raise rents to such a figure increased the price of houses too, and in some cases buying meant a long struggle ahead before the family would own their homes free of debt.

In the discussion of the rents, attention is again called to the "age of the majority of the buildings, their almost uniformly poor state of repair, the frequent evils due to originally poor construction and plan which have been aggravated by the years, and the wretchedly inadequate plumbing." The great majority of the rented homes (1,111) had no heat furnished and were warmed by stoves at the tenants' expense. This was the strongest factor affecting rent.

Among apartments with heat furnished rentals ranged from $22.50 for two rooms to $120 for eight rooms, with a median monthly rental of $65 to $70. Thirty-eight per cent of the heated apartments cost $70 or more per month. Three per cent of the unheated apartments rented for less than $10 a month; 5 per cent cost $50 or more each month. The median rental in unheated flats was $20 to $25 for native whites; $15 to $20 for foreign born; and $25 to $30 for negroes. * * * As a group, negroes are paying much more for shelter than other classes in the community.

The question of what rent a family may reasonably pay depends on the family income. Budgetary studies are quoted as showing that generally one-fifth of the income is looked upon as the proper proportion to spend for rent. From 886 of the households data were

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secured as to both the total income during the month preceding the visit of inquiry and the rent paid.

The report calls attention to the fact that over two-fifths of these families are paying less for rent than they could reasonably afford.

The families paying out less than 20 per cent of their earnings in rent could afford to live in better houses if any were available for them. The fact that they could afford to pay more in rent alters not one whit this other fact that the old and insanitary houses they occupy are too costly at any rental, however small the sum. The significant thing for the community is that apparently it is compelling a goodly proportion of its small-wage families to dwell in houses less good than they can afford to rent. A rental market for better homes for wage earners exists in Chicago to-day.

However, exclusive of the native whites, well over one-half of the families and over three-fourths among the negroes were paying in rent a larger proportion of their earnings than they should. In addition, a study of the family earnings showed that a large number of the families really could not afford to pay much.

Paying high rentals is clearly out of the question for the majority of these families. Only one family in 10 should afford a rental of $40 or more for an unheated apartment. One in three ought not to spend as much as $16 for rent without heat. While it is a hazard to these families to have to live in the outworn houses and tenements they occupy, it will nevertheless be a misfortune for them to have the old buildings pass unless newer and better ones are made available at rentals which are within their economic grasp.

Of the 1,244 families reporting the total income for a month, the father was the sole breadwinner in 43 per cent, in 24 per cent he earned nothing at all, and in 47 per cent mothers and wives were gainfully employed.

Women's earnings were not large as a rule. More than one-fourth of the woman earners (28 per cent) added less than $20 to the family income in the month; 60 per cent made less than $50, while only one woman in five (20 per cent) earned $80 or more. Yet in about one-fifth of the families on the basis of the amount of their earnings, mothers were the chief breadwinners in the month reported upon.

The month's earnings were secured for 1,115 male breadwinners. Of these, two-thirds of the Mexicans and a trifle over one-half of the other foreign born and of the negroes had earned less than $100, and 91 per cent of the whole group had earned less than $150.

The pursuits in which the men of the families were engaged varied widely.

Those in business for themselves varied from 15 per cent among other foreign born to 2 per cent among Mexicans. Seven per cent of the negroes were working on their own account, not for wages. Of the Mexican wage earners, 23 per cent were employed at the stockyards, 20 per cent were in the employ of the railroads and 27 per cent labored at the steel mills. Among negroes 15 per cent were employed on the railroads, more of them as porters or waiters than in any other occupations; 12 per cent worked in the stockyards; 8 per cent were in city or Government employ; 7 per cent in the building trades; a like number in foundries; 6 per cent in the steel mills; 4 per cent worked on automobiles; 3 per cent were waiters, cooks, etc.; 3 per cent were employed in laundries; and 2 per cent in tanneries.

The three industries, stockyards, railroads, and steel mills, which together employed 70 per cent of the Mexican men and 33 per cent of the negro, had 25 per cent of the rest of the men on their pay rolls. Industries and occupations were most diversified among the native or European born white, least varied among the Mexicans, with the negroes occupying a mid-position between the other two groups.

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As a result of the study, it is strongly urged that the city should adopt some plan for housing small-wage earners. The demand is great for homes at a rent of $40 or less a month, and private enterprise is not meeting the need. The time is opportune for improving the situation. Under the zoning plan the city is turning over to industry and commerce some of the oldest tenement districts where conditions are worst. With this movement there should be correlated some comprehensive plan for supplying suitable houses, at rents which the small-wage earner can pay, in sufficient numbers to meet the needs of the situation. With this should be worked out a program for determining when houses are really too old, to dilapidated, and too insanitary to be fit for habitation and for retiring them when this stage has been reached. Particular attention should be given to providing for the negroes and Mexicans who have come in to meet the labor shortage due to the restriction of immigration.

New York Housing Law

THE 1926 session of the New York Legislature passed a bill intended to facilitate the provision of low-rental housing, which was signed by Governor Smith on May 10 of that year. The law provides for a State board of housing and for the formation of public limited-dividend corporations, the former to plan and supervise and the latter to undertake actual building projects. The State board is to consist of five members, appointed by the governor and serving without salary though receiving actual expenses. They are to study housing needs throughout the State, investigate alleged monopolies of building materials, prepare plans for housing projects, supervise the activities of limited-dividend corporations, appoint one member of the board of every such corporation, and exercise other supervisory and consultative functions.

The public limited-dividend corporations must consist of at least three members. The rents for housing erected by them must not exceed, in New York City, $12.50 a room per month, the bathroom not being counted as a room. Outside of the city the maximum is less, running down to as low a figure as $9 per room per month. Their dividends are not to exceed 6 per cent per annum. Should returns reach a figure which, after proper allowance for maintenance, depreciation, etc., would justify a higher dividend, the rents are to be lowered proportionately.

In order that these corporations may secure the land needed for the large-scale operations necessary in order to reduce costs, they are given the right of eminent domain. This power is not to be exercised except upon the specific authorization of the State board, which is not to give the authorization unless, after public hearings on the plan proposed by the corporation, it is apparent that there is urgent need for the accommodations which the corporation intends to provide and that the condemnation is in the public interest.

Public limited-dividend corporations are required to furnish, through the actual sale of stock for cash, one-third of the total cost of any project undertaken, the remainder being secured through

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bonds bearing 5 per cent interest on first mortgage and 5½ per cent on debenture bonds. No project may be undertaken without the approval of the housing board.

The corporations are to be exempt from the payment "of any and all franchise, organization, income, mortgage, recording, and other taxes to the State, and also from all fees to the State or its officers." The bonds and mortgages of such corporations, together with the interest thereon and the dividends on the stock, are exempt from State taxation. The State can not exempt the corporations from local taxes on the buildings and improvements, but it empowers municipalities to do so and provides that whenever a municipality takes advantage of this permission the buildings and improvements shall be to the same extent exempt from State taxation.

Provision is also made for the formation of private limited-dividend housing corporations, which are not to have the power of eminent domain, but whose buildings and improvements are to be tax free so long as they remain in the hands of the corporation.

Public limited-dividend corporations are not permitted to dispose of property once acquired nor to make any real estate transfers. Private corporations organized under this law will, however, have this privilege.

Under date of December 15, 1926, the State board of housing provided for in this act handed in a preliminary report containing the results of a survey of land values in Manhattan and Brooklyn, and a study of various types of buildings covering different proportions of the ground sites. In the most congested parts of the city the board found about 950 assessment blocks, or about 1,250 ordinary blocks suitable for housing of the kind contemplated. Including all costs of condemnation proceedings, compensation, and the like, the costs of these blocks range from less than $6 up to $14 a square foot. With land costing $6 a square foot it is estimated that the various types of tenements could be erected to rent at from $9.25 to $12.29 per room per month, the bathroom not being counted as a room in fixing the rent. With land at $14 a square foot, the range of rentals would be from $12.09 to $16.91. Considerable reductions from these rents might be made possible by letting the ground floors for stores.

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IMMIGRATION AND EMIGRATION

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Immigration Movement in 1926

THE immigration laws of the United States are administered by the Bureau of Immigration of the United States Department of Labor. Data regarding the immigration movement are compiled monthly by the Bureau of Immigration and published currently in the Labor Review of the Bureau of Labor Statistics. The annual reports of the Commissioner General of Immigration give similar data in more expanded form and for a period of years. The figures and text in this section are summarized from the above-mentioned sources.

In the fiscal year ending June 30, 1926, 304,488 immigrant and 191,618 nonimmigrant aliens were admitted, a total of 496,106. Aliens who departed this year numbered 76,992 emigrants and 150,763 nonemigrants, a total of 227,755. The increase of admissions over departures for the past year was 268,351, as compared to 232,945 for the previous fiscal year.

About three-fourths of the present-day immigrant aliens are in the prime of life—16 to 44 years old. In the fiscal year 1925–26 only 16 per cent were under 16 years of age and less than 10 per cent 45 years and over. While the immigrant aliens coming during this period numbered 170,567 males and 133,921 females, the present outward movement of emigrant aliens is very largely one of males, the men exceeding the women by nearly 2½ to 1 (54,989, as compared with only 22,003 females). Of the 76,992 emigrants departed this year, about 75 per cent were from 16 to 44 years of age and 20 per cent were 45 years and over, while less than 5 per cent were children under 16 years old. These data show that the outward movement is essentially one of individuals rather than families, and that the individuals are for the most part of the working age.

That the alien emigration movement from the United States during the year considered was composed for the most part of recent immigrants is shown by the fact that of the 76,992 leaving, 66 per cent, or 50,701, of the total reporting length of residence had been here not over five years, and 77 per cent, or 59,046, had resided here not over 10 years. Common laborers predominate among the outgoing aliens. Fifty-eight per cent, or 33,107, of the total emigrants leaving the country during the fiscal year 1926 and reporting occupations, were of this class. Skilled workers, numbering 9,680, rank second among those having an occupational status, and servants, 4,446, are third in number.

Less than one-third of the 496,106 aliens admitted during the fiscal year 1926 were immigrants charged to the quota under the immigration act of 1924. The number so charged was 157,432, or about 95 per cent of the annual quota of 164,667, an increase over the previous year when 145,971 quota immigrants, or 89 per cent of the annual quota were admitted. With few exceptions most of the

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European countries exhausted their quotas during the past year, but those with the largest quotas did not reach their maximum until the latter part of June.

Natives of nonquota countries, principally Canada and Mexico, admitted during the fiscal year 1925–26 numbered 150,299; returning residents of the United States, 83,754; visitors on business or pleasure, 56,614; and persons passing through the country, 25,574. Other classes admitted this year included 5,666 Government officials, their families, attendants, servants, and employees; 11,154 wives and children of United States citizens; 1,920 students; 1,551 ministers and professors and their wives and children; 1,155 wives and children (born in quota countries) of natives of nonquota countries; and 904 aliens to carry on trade under existing treaty. There were also admitted during the past fiscal year 83 veterans of the World War and their wives and children, 67 of these being natives of Italy, 7 of England, 3 of France, 2 of Russia, and 1 each of Canada, Poland, Germany, and Syria.

Of the 496,106 aliens admitted in the fiscal year 1925–26, 289,589 were born in European countries, Germany leading the list from that continent with 62,980 and followed by England with 37,175, Irish Free State with 32,737, Italy with 31,739, and Scotland with 23,100, the other countries in Europe sending less than 20,000 each. Natives of Canada numbered 91,894; Mexico, 60,620; other America, 30,297; Asia, 18,284; Africa, 1,025; and Australia and the Pacific islands, 4,397.

Mexican Immigration

THE total Mexican immigration to the United States during the fiscal year ending June 30, 1926, was 59,785, comprising 42,638 immigrant aliens, or newcomers for permanent residence in this country, and 17,147 nonimmigrants, aliens of the temporary class, either coming for a visit of less than a year or returning after a short absence from the United States. During the same period, 5,337 Mexican aliens left the United States, practically all going to Mexico, 3,158 being of the emigrant class and 2,179 of the nonemigrant class. The net increase contributed by Mexico to the alien population of the United States in the year just ended was 54,448. This is 9,430 more than for the preceding fiscal year when the excess of the Mexican aliens admitted over departed was 45,018.

While the real immigration of Mexicans—immigrant aliens—during the last fiscal year exceeded that of the preceding fiscal year by 10,260, or nearly 32 per cent, it was less than one-half the number of the same class admitted in the fiscal year 1924 and about two-thirds of that for the year 1923. The number of Mexican immigrant aliens admitted during these four years was 42,638 in 1926, 32,378 in 1925, 87,648 in 1924, and 62,709 in 1923.

The fundamental reason for the flow of Mexican immigrants to the United States is the same one which for nearly a century has attracted European aliens to our country—higher wages, better living conditions, and greater opportunity. The immigration act of 1924 has curtailed the supply of common laborers, thereby increasing the demand, and the Mexican laborer, favored by the nonquota provisions of the act, is profiting by the situation thus created. An-

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other potent factor inducing Mexican immigration is the proximity of the United States, a circumstance which makes for an especially large movement from the border States of Mexico to the United States.

The immigration statistics also show that approximately two-thirds of the Mexican immigrants admitted during the past year were over 21 years of age, and that more than four-fifths of these were males. The ratio of all minors and adult females to adult males is approximately 4 to 5. Only one person out of every four was going to join his immediate family or other relatives already established in the United States, and in addition the male married were over three times the number of female married. These facts indicate that many of the Mexican wage earners are coming alone, leaving their families in Mexico.

Of the 42,638 Mexican immigrant aliens admitted in the year 1925–26, the unskilled workers predominate; 26,199 being classed as common laborers, 367 as farm laborers, and 564 as servants. The professional class numbered only 408, while 2,785 were skilled, 840 miscellaneous; and 11,475 had no occupation, including women and children. As to the sex, age, and conjugal condition of these Mexican immigrants, 33,304 were male and 9,334 female; 4,856 were under 16 years of age; 9,694 were from 16 to 21 years old, and 28,088 were adults. The male single numbered 17,974 and the female single 4,326; the male married, 14,828, and the female married, 3,948; the male widowed, 497, and female 1,049. There were 5 male and 11 female divorced.

The 59,785 Mexicans recorded in the immigration statistics as admitted during the past fiscal year do not by any means represent the alien movement over the southern land border, as during the year 6,300,000, in round numbers, or an average of over one-half million aliens a month, went back and forth over the Mexican border.

The census report shows that in 1890 the foreign-born population of the United States included 77,853 persons born in Mexico. Based on this figure, at 2 per cent the annual quota for Mexico would be 1,557, if Mexico were to be limited by quota as European countries are under the present law.

During the fiscal year 1926 a total of 60,620 natives of Mexico was admitted to the United States. Practically all (98 per cent) of these were Mexicans. Approximately 96 per cent of this total were admitted as nonquota immigrants under section 4(c) (natives of Mexico).

A total of 1,480 (915 male and 565 female) aliens of the Mexican race was debarred from entering the United States. The principal causes for these rejections were: Without immigration visa (726), likely to become a public charge (395), mentally or physically defective (131), unable to read (86), and criminal and immoral classes (63). In the same year, the number of Mexican aliens deported from the United States after entering was 2,567.

According to the Fourteenth Census of the United States the number of persons born in Mexico, who resided in the United States in 1920, was 486,418. Since then the net increase of Mexicans through immigration was 369,480, making a grand total of 855,898 Mexicans

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now in the United States. In view of the very considerable number of Mexican aliens presumed to be illegally in this country, it is safe to say that over a million Mexicans are in the United States at the present time and, under present laws, this number may be added to practically without limit.

Oriental Immigration

THE number of Japanese aliens admitted for the year 1926 was 5,778. While this figure is greater than the number of Japanese entering the country in the year 1925, there were 84 fewer newcomers for permanent residence, or immigrant aliens, than were admitted in the previous year. The excess admissions of this race during the past year over the preceding one were largely returning residents, 3,254 Japanese of this class having been admitted in 1926 compared with 2,010 in 1925.

Aliens of the classes "ineligible to citizenship" admitted during the fiscal year ended June 30, 1926, are shown by classes under the immigration act of 1924, as follows:

TABLE 1.—ALIENS INELIGIBLE TO CITIZENSHIP ADMITTED UNDER THE IMMIGRATION ACT OF 1924, BY CLASSES, YEAR ENDING JUNE 30, 1926

Class	Chinese	East Indian	Japanese	Korean	Pacific Islander
Government officials, their families, attendants, servants, and employees	120	16	516	----------	1
Temporary visitors	393	142	952	13	44
In continuous passage through the United States	5,583	8	656	----------	1
To carry on trade under existing treaty	424	----------	221	1	----------
Total nonimmigrants	6,520	166	2,345	14	46
Residents of the United States returning from a visit abroad	1,757	21	3,254	21	2
Ministers and professors and their wives and children	18	2	72	2	----------
Students	327	53	107	45	2
Total nonquota immigrants	2,102	76	3,433	68	4
Grand total admitted	8,622	242	5,778	82	50

With special reference to Chinese cases the situation has somewhat clarified during the past year. During the fiscal year 1925–26 there was admitted to the United States a total of 8,622 Chinese aliens, as against a total of 9,551 admitted during the fiscal year 1924–25. These figures include 5,583 persons passing through the country, 393 temporary visitors, and 1,757 resident Chinese returning from temporary visits abroad during the year 1926, as against 6,336 persons passing through, 422 temporary visitors, and 1,975 returning resident Chinese, during the year 1925.

The largest class of Chinese admitted to this country consists of citizens of the United States, 2,396 having been admitted in the fiscal year 1925–26 as against 3,023 in 1925. This is a surprising condition, in view of the fact that Chinese can not be naturalized and the number of Chinese women in this country is small, so that it is physically impossible for any considerable number of Chinese to have been born here.

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Although it is probable that many Chinese succeed in gaining admission on fraudulent claims, the Chinese population of the United States is decreasing and the number who secure admission is negligible compared to the number who would undoubtedly arrive if the present restrictions were removed. The smuggling of Chinese over the land boundaries, which was a vexatious problem in the past, has been greatly reduced through the vigorous and effective campaign of the border patrol.

The problem now presented is the detection of the fraudulent cases among the applicants for admission at the ports of entry. In the cases of sons of citizens and the minor children of merchants, the question of relationship may be determined only through long, involved examinations covering family history, relationship, village life, and other matters which should be of common knowledge to the applicant and his witnesses.

Immigration and Emigration, by Months

TABLE 2 shows the inward and outward passenger movement by months for the fiscal year ending June 30, 1926, and also for the last six months of 1926.

In considering this and later tables it is important to note the distinction between the terms "immigrant" and "nonimmigrant" and similarly between "emigrant" and "nonemigrant." In general the term immigrant refers to persons who come to the United States with the declared intention of staying here a year or more. When such persons later leave the United States without having become naturalized citizens they are classed as "emigrant" aliens departed. The terms nonimmigrant and nonemigrant refer to persons who come to the United States for business, education, or other purposes, but who do not intend becoming permanent residents. Practically all discussion of immigration as a "problem" and of restrictive legislation on the subject, is concerned with the "immigrant" alien.

TABLE 2.—INWARD AND OUTWARD PASSENGER MOVEMENT, JULY 1, 1925, TO DECEMBER 31, 1926

Period	Inward					Aliens debarred from entering [1]	Outward					Aliens deported after landing [2]
	Aliens admitted			United States citizens arrived	Total		Aliens departed			United States citizens departed	Total	
	Immigrant	Nonimmigrant	Total				Emigrant	Nonemigrant	Total			
1925												
July	18,590	14,177	32,767	26,326	59,093	2,000	8,784	17,715	26,499	66,136	92,635	919
August	22,421	17,052	39,473	49,922	89,395	1,774	7,539	12,978	20,517	37,185	57,702	940
September	26,721	23,081	49,802	68,500	118,302	1,429	7,200	12,485	19,685	24,369	44,054	855
October	28,685	19,427	48,112	35,413	83,525	1,965	7,674	13,264	20,938	24,227	45,165	909
November	26,642	14,860	41,502	23,118	64,620	1,951	6,555	11,915	18,470	18,039	36,509	835
December	21,089	11,216	32,305	18,027	50,332	1,932	8,840	12,663	21,503	19,274	40,777	595

[1] These aliens are not included among arrivals, as they were not permitted to enter the United States.
[2] These aliens are included among aliens deported, they having entered the United States, legally or illegally, and later being deported.

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TABLE 2.—INWARD AND OUTWARD PASSENGER MOVEMENT, JULY 1, 1925, TO DECEMBER 31, 1926—Continued

Period	Inward						Outward					
	Aliens admitted			United States citizens arrived	Total	Aliens debarred from entering	Aliens departed			United States citizens departed	Total	Aliens deported after landing
	Immigrant	Nonimmigrant	Total				Emigrant	Nonemigrant	Total			
1926												
January	19,072	10,661	29,733	19,695	49,428	1,662	5,286	9,795	15,081	25,987	41,068	532
February	20,041	10,632	30,673	23,687	54,360	1,453	3,232	8,451	11,683	29,108	40,791	342
March	29,504	15,182	44,686	29,987	74,673	1,404	3,457	8,982	12,439	25,215	37,654	938
April	33,400	17,557	50,957	28,931	79,888	1,470	4,989	10,780	15,769	26,312	42,081	1,052
May	33,533	19,244	52,777	22,719	75,496	1,731	5,861	13,660	19,521	28,913	48,434	1,063
June	24,790	18,529	43,319	24,432	67,751	1,779	7,575	18,075	25,650	47,715	73,365	1,924
Total, fiscal year 1926	304,488	191,618	496,106	370,757	866,863	20,550	76,992	150,763	227,755	372,480	600,235	10,904
1926												
July	22,283	16,096	38,379	25,981	64,360	1,746	7,052	17,970	25,022	60,223	85,245	816
August	29,286	20,467	49,753	52,683	102,436	1,601	7,376	15,410	22,786	42,248	65,034	1,121
September	35,297	25,680	60,977	71,268	132,245	1,817	6,634	16,392	23,026	26,268	49,294	885
October	34,528	22,059	56,587	34,176	90,763	1,566	5,377	13,803	19,180	18,150	37,330	1,100
November	30,756	16,185	46,941	21,844	68,785	1,713	6,859	13,078	19,937	17,992	37,929	1,085
December	23,805	11,803	35,608	16,777	52,385	1,915	9,481	16,875	26,356	19,608	45,964	1,241
Total	175,955	112,290	288,245	222,729	510,974	10,358	42,779	93,528	136,307	184,489	320,796	6,248

Country of Birth, Race, Sex, and Age of Immigrants and Emigrants, 1926

TABLE 3 gives the net increase or decrease of population by admission and departure of aliens, for the fiscal year 1925–26, according to race or people, sex, and age periods. Table 4 gives similar information, by country of last residence in the case of immigrants and of future residence in the case of emigrants.

TABLE 3.—NET INCREASE OR DECREASE OF POPULATION BY ADMISSION AND DEPARTURE OF ALIENS, FISCAL YEAR ENDING JUNE 30, 1926, BY RACE OR PEOPLE. SEX, AND AGE PERIOD

Race or people	Admitted			Departed			Increase (+) or decrease (−)
	Immigrant	Nonimmigrant	Total	Emigrant	Nonemigrant	Total	
African (black)	894	2,491	3,385	865	1,871	2,736	+649
Armenian	741	293	1,034	90	159	249	+785
Bohemian and Moravian	2,494	1,636	4,130	1,468	1,598	3,066	+1,064
Bulgarian, Serbian, and Montenegrin	532	837	1,369	1,681	1,069	2,750	−1,381
Chinese	1,375	7,247	8,622	2,873	6,142	9,015	−393
Croatian and Slovenian	692	995	1,687	592	180	772	+915
Cuban	1,476	7,511	8,987	1,287	7,980	9,267	−280
Dalmatian, Bosnian, and Herzegovinian	75	200	275	545	676	1,221	−946
Dutch and Flemish	3,156	3,660	6,816	993	3,682	4,675	+2,141
East Indian	50	192	242	69	45	114	+128
English	44,206	37,357	81,563	6,935	40,011	46,946	+34,617
Finnish	674	1,099	1,773	560	1,752	2,312	−539
French	22,237	8,860	31,097	1,277	7,527	8,804	+22,293
German	58,675	15,741	74,416	4,509	12,377	16,886	+57,530
Greek	1,385	2,852	4,237	5,188	1,457	6,645	−2,408
Hebrew	10,267	3,622	13,889	341	925	1,266	+12,623
Irish	42,475	6,786	49,261	1,225	4,328	5,553	+43,708

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TABLE 3.—NET INCREASE OR DECREASE OF POPULATION BY ADMISSION AND DEPARTURE OF ALIENS, FISCAL YEAR ENDING JUNE 30, 1926, BY RACE OR PEOPLE, SEX, AND AGE PERIOD—Continued

Race or people	Admitted			Departed			Increase (+) or decrease (−)
	Immigrant	Nonimmigrant	Total	Emigrant	Nonemigrant	Total	
Italian (north)	1,486	4,355	5,841	3,036	3,344	6,380	−539
Italian (south)	7,888	20,351	28,239	16,968	10,361	27,329	+910
Japanese	598	5,180	5,778	1,201	9,190	10,391	−4,613
Korean	52	30	82	27	55	82	
Lithuanian	393	369	762	439	479	918	−156
Magyar	1,076	1,345	2,421	1,063	891	1,954	+467
Mexican	42,638	17,147	59,785	3,158	2,179	5,337	+54,448
Pacific Islander	2	48	50	1	35	36	+14
Polish	3,175	2,109	5,284	2,823	2,268	5,091	+193
Portuguese	793	2,781	3,574	2,989	1,761	4,750	−1,176
Rumanian	319	520	839	1,302	857	2,159	−1,320
Russian	938	1,411	2,349	581	950	1,531	+818
Ruthenian (Russniak)	505	283	788	65	178	243	+545
Scandinavian (Norwegians, Danes, and Swedes)	19,418	9,456	28,874	4,188	8,942	13,130	+15,744
Scotch	27,298	10,158	37,456	1,912	5,693	7,605	+29,851
Slovak	534	209	743	850	519	1,369	−626
Spanish	699	6,065	6,764	2,972	4,111	7,083	−319
Spanish American	2,519	4,541	7,060	1,404	3,988	5,392	+1,668
Syrian	488	805	1,293	260	435	695	+598
Turkish	97	141	238	201	123	324	−86
Welsh	1,414	709	2,123	76	290	366	+1,757
West Indian (except Cuban)	373	1,501	1,874	660	1,863	2,523	−649
Other peoples	381	725	1,106	318	472	790	+316
Total	304,488	191,618	496,106	76,992	150,763	227,755	+268,351
Sex							
Male	170,567	122,249	292,816	54,989	93,430	148,419	+144,397
Female	133,921	69,369	203,290	22,003	57,333	79,336	+123,954
Age							
Under 16 years	47,347	10,651	57,998	3,347	8,789	12,136	+45,862
16 to 44 years	228,527	137,139	365,666	57,986	110,750	168,736	+196,930
45 years and over	28,614	43,828	72,442	15,659	31,224	46,883	+25,559

TABLE 4.—NET INCREASE OR DECREASE OF POPULATION BY ADMISSION AND DEPARTURE OF ALIENS, FISCAL YEAR ENDING JUNE 30, 1926, BY COUNTRY

Country of last or intended future permanent residence	Aliens admitted			Aliens departed			Increase (+) or decrease (−)
	Immigrant	Nonimmigrant	Total	Emigrant	Nonemigrant	Total	
Albania	158	10	168	314	15	329	−161
Austria	1,102	559	1,661	487	298	785	+876
Belgium	718	537	1,255	491	463	954	+301
Bulgaria	175	34	209	88	22	110	+99
Czechoslovakia	2,953	344	3,297	2,301	645	2,946	+351
Danzig, Free City of	210	23	233	1	1	2	+231
Denmark	2,549	605	3,154	691	625	1,316	+1,838
Estonia	132	26	158	15	15	30	+128
Finland	491	148	639	519	203	722	−83
France, including Corsica	4,181	3,850	8,031	1,011	2,467	3,478	+4,553
Germany	50,421	5,096	55,517	3,908	5,264	9,172	+46,345
Great Britain and Northern Ireland:							
England	10,599	13,342	23,941	4,921	12,929	17,850	+6,091
Northern Ireland	419	132	551	208	160	368	+183
Scotland	13,661	1,921	15,582	1,332	1,255	2,587	+12,995
Wales	1,268	298	1,566	37	91	128	+1,438
Greece	1,121	183	1,304	5,164	317	5,481	−4,177
Hungary	906	234	1,140	871	217	1,088	+52
Irish Free State	24,478	822	25,300	851	658	1,509	+23,791
Italy, including Sicily and Sardinia	8,253	2,451	10,704	19,980	3,042	23,022	−12,318
Latvia	298	32	330	58	32	90	+240
Lithuania	636	87	723	408	89	497	+226
Luxemburg	127	33	160	7	31	38	+122

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TABLE 4.—NET INCREASE OR DECREASE OF POPULATION BY ADMISSION AND DEPARTURE OF ALIENS, FISCAL YEAR ENDING JUNE 30, 1926, BY COUNTRY—Con.

Country of last or intended future permanent residence	Aliens admitted			Aliens departed			Increase (+) or decrease (−)
	Immigrant	Nonimmigrant	Total	Emigrant	Nonemigrant	Total	
Netherlands	1,753	1,014	2,767	379	851	1,230	+1,537
Norway	5,756	1,283	7,039	2,087	1,006	3,093	+3,946
Poland	7,126	366	7,492	2,881	433	3,314	+4,178
Portugal, including Azores, Cape Verde, and Madeira Islands	666	131	797	2,926	965	3,891	−3,094
Rumania	1,211	124	1,335	1,404	200	1,604	−269
Russia	1,766	313	2,079	181	233	414	+1,665
Spain, including Canary and Balearic Islands	326	790	1,116	2,465	844	3,309	−2,193
Sweden	8,513	896	9,409	1,150	871	2,021	+7,388
Switzerland	1,994	831	2,825	486	601	1,087	+1,738
Turkey in Europe	210	42	252	30	9	39	+213
Yugoslavia	1,059	286	1,345	2,342	240	2,582	−1,237
Other Europe [1]	326	47	373	46	24	70	+303
Total Europe	155,562	36,890	192,452	60,040	35,116	95,156	+97,296
Armenia	16	5	21	43	9	52	−31
China	1,751	4,281	6,032	2,989	3,488	6,477	−445
India	93	351	444	113	196	309	+135
Japan	654	1,911	2,565	1,208	1,733	2,941	−376
Palestine	250	103	353	173	111	284	+69
Persia	56	18	74	27	26	53	+21
Syria	429	104	533	208	62	270	+263
Turkey in Asia	21	8	29	126	48	174	−145
Other Asia [2]	143	180	323	44	79	123	+200
Total Asia	3,413	6,961	10,374	4,931	5,752	10,683	−309
Canada	91,019	16,635	107,654	2,173	17,458	19,631	+88,023
Newfoundland	2,349	377	2,726	283	466	749	+1,977
Mexico	43,316	4,590	47,906	3,198	3,104	6,302	+41,604
Cuba	2,821	10,507	12,788	1,922	12,619	14,541	−1,753
Other West Indies	941	4,012	4,953	1,917	3,587	5,504	−551
British Honduras	39	117	156	45	98	143	+13
Other Central America	1,335	2,139	3,474	521	1,854	2,375	+1,099
Brazil	877	501	1,378	210	412	622	+756
Other South America	2,230	3,563	5,793	1,215	2,904	4,119	+1,674
United States [3]	----------	100,413	100,413	----------	63,378	63,378	+37,035
Other America [4]	6	21	27	1	2	3	+24
Total America	144,393	142,875	287,268	11,485	105,882	117,367	+169,901
Egypt	314	107	321	38	41	79	+242
Other Africa	315	501	816	88	183	271	+545
Australia, including Papua, Tasmania, and appertaining islands	376	2,936	3,312	257	2,069	2,866	+446
New Zealand, including appertaining islands	180	1,167	1,347	134	1,102	1,236	+111
Other Pacific islands [5]	35	181	216	19	78	97	+119
All countries	304,488	191,618	496,106	76,992	150,763	227,755	+268,351

[1] Comprises Andorra, Gibraltar, Iceland, Diechtenstein, Malta, Monaco, and San Marino.
[2] Includes Afghanistan, Arabia, Bhutan, Iraq (Mesopotamia), Muscat, Nepal, Siam, Siberia, and "Asia, not specified."
[3] "United States" under nonimmigrants covers aliens returning to this country to resume residence therein after a temporary stay abroad; and under nonemigrants covers aliens departing for a visit abroad with the intention of returning within one year to renew permanent residence in this country.
[4] Comprises Greenland and the islands of St. Pierre and Miquelon.
[5] Comprises Nauru, New Guinea, Samoa, Yap, and "Pacific islands, not specified."

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Occupations of Immigrants and Emigrants, 1926

TABLE 5 gives in detail the occupations of aliens admitted and departed in the fiscal year 1925–26.

TABLE 5.—OCCUPATIONS OF ALIENS ADMITTED AND DEPARTED, FISCAL YEAR ENDING JUNE 30, 1926, BY CLASS

Occupation	Admitted			Departed		
	Immigrant	Nonimmigrant	Total	Emigrant	Nonemigrant	Total
Actors	150	1,666	1,816	190	756	946
Architects	378	497	875	86	301	387
Clergy	976	2,170	3,146	286	1,177	1,463
Editors	55	102	157	10	68	78
Electricians	1,442	428	1,870	117	231	348
Engineers (professional)	2,166	3,723	5,889	93	641	734
Lawyers	157	741	898	71	608	679
Literary and scientific persons	321	1,171	1,492	83	612	695
Musicians	560	888	1,448	103	462	565
Officials (Government)	385	3,073	3,458	113	1,037	1,150
Physicians	487	1,132	1,619	156	1,061	1,217
Sculptors and artists	151	581	732	90	292	382
Teachers	1,994	2,373	4,367	235	1,410	1,645
Other professional	1,639	1,930	3,569	187	747	934
Total professional	10,861	20,475	31,336	1,820	9,403	11,223
Bakers	1,357	737	2,094	289	392	681
Barbers and hairdressers	1,039	709	1,748	274	301	575
Blacksmiths	799	339	1,138	99	125	224
Bookbinders	109	25	134	14	18	32
Brewers	17	34	51		3	3
Butchers	1,002	429	1,431	170	197	367
Cabinetmakers	191	84	275	74	112	186
Carpenters and joiners	4,943	2,493	7,436	1,118	1,418	2,536
Cigarette makers	30	11	41	4	4	8
Cigar makers	160	608	768	311	490	801
Cigar packers	44	18	62	1	12	13
Clerks and accountants	17,272	6,481	23,753	1,326	4,230	5,556
Dressmakers	1,836	631	2,467	175	281	456
Engineers (locomotive, marine, and stationary)	1,068	530	1,598	355	1,955	2,310
Furriers and fur workers	152	126	278	67	97	164
Gardeners	584	360	944	115	200	315
Hat and cap makers	73	43	116	5	4	9
Iron and steel workers	1,469	511	1,980	120	192	312
Jewelers	219	164	383	46	85	131
Locksmiths	2,019	148	2,167	6	9	15
Machinists	2,038	984	3,022	557	901	1,458
Mariners	983	2,411	3,394	568	1,549	2,117
Masons	1,267	1,285	2,552	261	465	726
Mechanics (not specified)	3,514	1,315	4,829	458	687	1,145
Metal workers (other than iron, steel, and tin)	432	142	574	58	77	135
Millers	198	47	245	105	88	193
Milliners	375	135	510	46	83	129
Miners	2,102	1,330	3,432	855	859	1,714
Painters and glaziers	1,506	729	2,235	282	454	736
Pattern makers	100	35	135	14	22	36
Photographers	169	123	292	32	75	107
Plasterers	255	131	386	34	85	119
Plumbers	624	194	818	49	126	175
Printers	690	240	930	55	115	170
Saddlers and harness makers	152	45	197	3	10	13
Seamstresses	843	285	1,128	89	129	218
Shoemakers	981	837	1,818	348	218	566
Stokers	414	215	629	66	118	184
Stonecutters	170	119	289	47	55	102
Tailors	1,553	890	2,443	412	403	815
Tanners and curriers	53	36	89	1	9	10
Textile workers (not specified)	272	100	372	155	100	255
Tinners	224	49	273	24	31	55
Tobacco workers	20	31	51	1	3	4
Upholsterers	110	42	152	33	38	71
Watch and clock makers	163	73	236	16	32	48
Weavers and spinners	949	312	1,261	248	246	494
Wheelwrights	17	2	19	5	3	8
Woodworkers (not specified)	140	27	167	23	53	76
Other skilled	2,130	1,182	3,312	266	402	668
Total skilled	56,827	27,827	84,654	9,680	17,561	27,241

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TABLE 5.—OCCUPATIONS OF ALIENS ADMITTED AND DEPARTED, FISCAL YEAR ENDING JUNE 30, 1926, BY CLASS—Continued

Occupation	Admitted			Departed		
	Immigrant	Nonimmigrant	Total	Emigrant	Nonemigrant	Total
Agents	1,814	3,140	4,954	120	1,204	1,324
Bankers	143	1,097	1,240	101	935	1,036
Draymen, hackmen, and teamsters	479	140	619	8	95	103
Farmers	9,720	4,762	14,482	1,381	3,070	4,451
Farm laborers	17,390	4,461	21,851	131	509	640
Fishermen	1,072	379	1,451	190	302	492
Hotel keepers	143	483	626	22	111	133
Laborers	43,543	24,174	67,717	33,107	21,182	54,289
Manufacturers	205	1,436	1,641	62	889	951
Merchants and dealers	3,496	17,554	21,050	1,996	15,617	17,613
Servants	30,587	12,007	42,594	4,446	8,294	12,740
Other miscellaneous	13,301	14,127	27,428	3,765	17,948	21,713
Total miscellaneous	121,893	83,760	205,653	45,329	70,156	115,485
No occupation (including women and children)	114,907	*59,556	174,463	20,163	53,643	73,806
All occupations	304,488	191,618	496,106	76,992	150,763	227,755

Immigration Quotas of 1924 and Number of Aliens Admitted Thereunder

UNDER the immigration act of 1924, the total immigration of aliens from quota countries is limited to 164,667. Tables 6 and 7 show the quota allotments by individual countries and also the number admitted from each country in the fiscal years 1924–25 and 1925–26, respectively.

TABLE 6.—IMMIGRATION QUOTAS ACCORDING TO NATIONALITY PROCLAIMED IN PURSUANCE OF THE IMMIGRATION ACT OF 1924, AND NUMBER OF ALIENS ADMITTED AND CHARGED AGAINST SUCH QUOTAS, FISCAL YEARS ENDING JUNE 30, 1925 AND 1926

Country or area	Annual quota	Number admitted		Country or area	Annual quota	Number admitted	
		Fiscal year 1925	Fiscal year 1926			Fiscal year 1925	Fiscal year 1926
Albania	100	67	98	Iraq (Mesopotamia)	100	21	41
Arabian Peninsula	100	1	1	Irish Free State	28,567	27,112	27,590
Armenia	124	47	68	Italy, including Rhodes, Dodekanesia, and Castellorizzo	3,845	2,662	3,808
Australia, including Papua, Tasmania, and islands appertaining to Australia	121	118	103	Japan	100	5	20
Austria	785	761	763	Latvia	142	127	137
Belgium	512	505	503	Liberia	100	----------	6
Bulgaria	100	89	97	Liechtenstein	100	12	20
Cameroon (French)	100	----------	3	Lithuania	344	332	341
China	100	99	96	Luxemburg	100	98	95
Czechoslovakia	3,073	2,556	3,159	Monaco	100	3	6
Danzig, Free City of	228	212	223	Morocco	100	15	17
Denmark	2,789	2,523	2,712	Netherlands	1,648	1,500	1,640
Egypt	100	77	98	New Zealand (including appertaining island)	100	94	99
Estonia	124	113	116	Norway	6,453	6,118	6,291
Finland	471	466	468	Palestine (with Trans-Jordan)	100	61	93
France	3,954	3,481	3,836	Persia	100	76	97
Germany	51,227	45,760	51,032	Poland	5,982	4,873	6,386
Great Britain and Northern Ireland	34,007	30,461	31,186	Portugal	503	474	493
Greece	100	95	98	Rumania	603	595	601
Hungary	473	357	471	Russia, European and Asiatic	2,248	2,141	2,158
Iceland	100	64	61				
India	100	58	98				

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TABLE 6.—IMMIGRATION QUOTAS ACCORDING TO NATIONALITY PROCLAIMED IN PURSUANCE OF THE IMMIGRATION ACT OF 1924, AND NUMBER OF ALIENS ADMITTED AND CHARGED AGAINST SUCH QUOTAS, FISCAL YEARS ENDING JUNE 30, 1925 AND 1926—Continued

Country or area	Annual quota	Number admitted		Conntry or area	Annual quota	Number admitted	
		Fiscal year 1925	Fiscal year 1926			Fiscal year 1925	Fiscal year 1926
Samoa, western	100	4	---	Syria and the Lebanon	100	83	96
San Marino	100	18	78	Turkey	100	96	86
South Africa, Union of	100	94	83	Yugoslavia	671	489	589
Southwest Africa	100	1	2	All others [1]	1,500	---	---
Spain	131	127	126	Total	164,667	145,971	157,432
Sweden	9,561	8,961	9,233				
Switzerland	2,081	1,869	1,910				

[1] Includes Afghanistan, Andorra, Bhutan, Cameroon (British), Ethiopia (Abyssinia), Muscat (Oman), Nauru (British), Nepal, New Guinea, Ruanda and Urundi, Siam, Tanganyika (British), Togoland (British), Togoland (French), and Yap and other Pacific islands (under Japanese mandate), with an annual quota of 100 each.

TABLE 7.—IMMIGRATION QUOTAS ALLOTTED TO SPECIFIED AREAS, AND THE NUMBER OF ALIENS ADMITTED AND CHARGED AGAINST SUCH QUOTA ALLOTMENTS, FISCAL YEARS ENDING JUNE 30, 1925 AND 1926

Area	Annual quota		Aliens admitted			
	Number allotted	Per cent of total	Number		Per cent of allotment	
			1925	1926	1925	1926
Northwestern Europe	140,999	85.6	128,452	134,960	91.1	95.7
Southern and eastern Europe and Asia	21,847	13.3	17,116	21,857	78.3	100.0
Africa, Australia, and New Zealand and other Pacific islands	1,821	1.1	403	615	22.1	33.8
Total	164,667	100.0	145,971	157,432	88.8	95.6

Immigration into United States, 1820 to 1926

RECORDS of immigration into the United States began with the year 1820. Table 1 shows the immigration, by periods, from 1820 to 1927, and by certain important geographical divisions and countries. Over the whole period of 127 years the total immigration was 36,598,204, of which approximately one-half came from northern and western Europe. The great influx from southern and eastern Europe came in the years 1901 and 1921, since which time the immigration from southern and eastern Europe has been greatly reduced.

Table 1, just referred to, deals solely with immigration. Corresponding data for emigration and net increase of population is not available for years earlier than 1908. Table 2 and the accompanying chart gives this information, by years, from 1908 to 1926.

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TABLE 1.—IMMIGRATION TO THE UNITED STATES FROM NOTHERN AND WESTERN EUROPE, SOUTHERN AND EASTERN EUROPE, ASIA, CANADA, AND NEWFOUNDLAND, MEXICO, WEST INDIES, AND OTHER COUNTRIES, BY SPECIFIED PERIODS

Period or year	Total number of immigrants	Number from—							
		Europe			Asia	Canada and Newfoundland [2]	Mexico	West Indies	Other countries [3]
		Northern and western [1]	Southern and eastern [1]	Total					
1820–1830	151,824	103,119	3,389	106,508	15	2,486	4,818	3,998	33,999
1831–1840	599,125	489,739	5,949	495,688	48	13,624	6,599	12,301	70,865
1841–1850	1,713,251	1,592,062	5,439	1,597,501	82	41,723	3,271	13,528	57,146
1851–1860	2,598,214	2,431,336	21,324	2,452,660	41,455	59,309	3,078	10,660	31,052
1861–1870	2,314,824	2,031,642	33,628	2,065,270	64,630	153,878	2,191	9,046	19,809
1871–1880	2,812,191	2,070,373	201,889	2,272,262	123,823	383,640	5,162	13,957	13,347
1881–1890	5,246,613	3,778,633	958,413	4,737,046	68,380	393,304	1,913	29,042	16,928
1891–1900	3,687,564	1,643,492	1,915,486	3,558,978	71,236	3,311	971	33,066	20,002
1901–1910	8,795,386	1,910,035	6,225,981	8,136,016	243,567	179,226	49,642	107,548	79,387
1911–1915	4,459,831	789,900	3,005,897	3,795,797	123,719	354,976	82,007	64,377	38,955
1916–1920	1,275,980	207,538	373,229	580,767	68,840	387,209	136,997	59,047	43,120
1921	805,228	138,551	513,813	652,364	25,034	72,317	30,758	13,774	10,981
1922	309,556	79,437	136,948	216,385	14,263	46,810	19,551	7,449	5,098
1923	522,919	156,429	151,491	307,920	13,705	117,011	63,768	13,181	7,334
1924	706,896	203,346	160,993	364,339	22,065	200,690	89,336	17,559	12,907
1925	294,314	125,248	23,118	148,366	3,578	102,753	32,964	2,106	4,547
Total	2,638,913	703,011	986,363	1,689,374	78,645	539,581	236,377	54,069	40,867
1926	304,488	126,437	29,125	155,562	3,413	93,368	43,316	3,222	5,607
Grand total	36,598,204	17,877,317	13,766,112	31,643,429	887,853	2,605,635	576,342	413,861	471,084

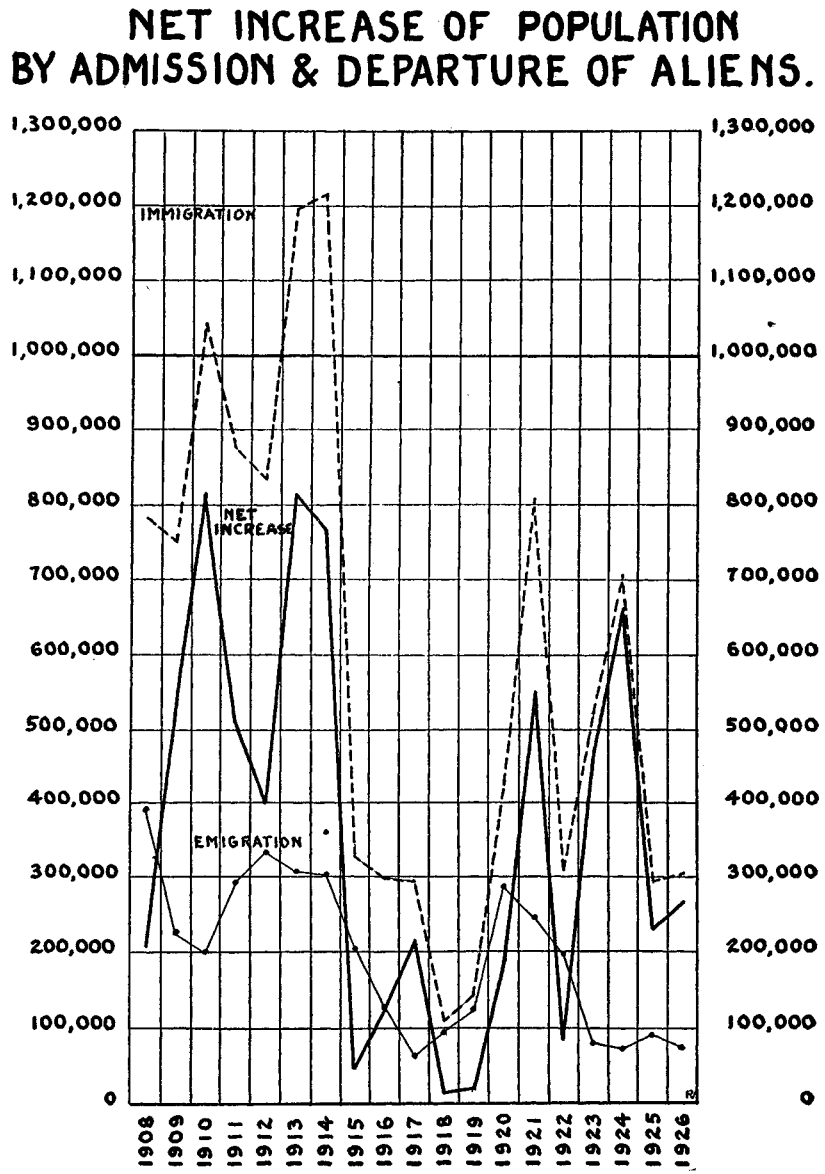
Period or year	Per cent from—							
	Europe			Asia	Canada and Newfoundland [2]	Mexico	West Indies	Other countries [3]
	Northern and western [1]	Southern and eastern [1]	Total					
1820–1830	68.0	2.2	70.2	----------	1.6	3.2	2.6	22.4
1831–1840	81.8	1.0	82.8	----------	2.2	1.1	2.1	11.8
1841–1850	93.0	.3	93.3	----------	2.4	.2	.8	3.3
1851–1860	93.6	.8	94.4	1.6	2.3	.1	.4	1.2
1861–1870	87.8	1.4	89.2	2.8	6.6	.1	.4	.9
1871–1880	73.6	7.2	80.8	4.4	13.6	.2	.5	.5
1881–1890	72.0	18.3	90.3	1.3	7.5	----------	.6	.3
1891–1900	44.6	51.9	96.5	1.9	.1	----------	.9	.6
1901–1910	21.7	70.8	92.5	2.8	2.0	.6	1.2	.9
1911–1915	17.7	67.4	85.1	2.8	8.0	1.8	1.4	.9
1916–1920	16.3	29.3	45.6	5.4	30.3	10.7	4.6	3.4
1921	17.2	63.8	81.0	3.1	9.0	3.8	1.7	1.4
1922	25.7	44.2	69.9	4.6	15.1	6.3	2.4	1.7
1923	29.9	29.0	58.9	2.6	22.4	12.2	2.5	1.4
1924	28.8	22.8	51.6	3.1	28.4	12.6	2.5	1.5
1925	42.6	7.9	50.5	1.2	34.9	11.2	.7	1.8
Total	26.6	37.4	64.0	3.0	20.5	8.9	2.1	1.5
1926	41.5	9.6	51.1	1.1	30.7	14.2	1.1	1.8
Grand total	48.9	37.6	86.5	2.4	7.1	1.6	1.1	1.3

[1] Northern and western Europe comprises Belgium, Denmark, France, Germany, Luxemburg in 1925 and 1926, Netherlands, Norway, Sweden, Switzerland, and United Kingdom (England, Ireland, Scotland, Wales, and United Kingdom not specified). Southern and eastern Europe comprises the other countries on that continent.

[2] From 1820 to 1898 includes all British North American possessions.

[3] Prior to 1925 includes countries not specified.

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TABLE 2.—NET INCREASE OF POPULATION, BY ADMISSION AND DEPARTURE OF ALIENS, FISCAL YEARS ENDING JUNE 30, 1908 TO 1926

Period or year	Admitted			Departed			Increase
	Immigrant	Nonimmigrant	Total	Emigrant	Nonemigrant	Total	
1908	782,870	141,825	924,695	395,073	319,755	714,828	209,867
1909	751,786	192,449	944,235	225,802	174,590	400,392	543,843
1910	1,041,570	156,467	1,198,037	202,436	177,982	380,418	817,619
1911	878,587	151,713	1,030,300	295,666	222,549	518,215	512,085
1912	838,172	178,983	1,017,155	333,262	282,030	615,292	401,863
1913	1,197,892	229,335	1,427,227	308,190	303,734	611,924	815,303
1914	1,218,480	184,601	1,403,081	303,338	330,467	633,805	769,276
1915	326,700	107,544	434,244	204,074	180,100	384,174	50,070
1916	298,826	67,922	366,748	129,765	111,042	240,807	125,941
1917	295,403	67,474	362,877	66,277	80,102	146,379	216,498
1918	110,618	101,235	211,853	94,585	98,683	193,268	18,585
1919	141,132	95,889	237,021	123,522	92,709	216,231	20,790
1920	430,001	191,575	621,576	288,315	139,747	428,062	193,514
Total, 1911–1920	5,735,811	1,376,271	7,112,082	2,146,994	1,841,163	3,988,157	3,123,925
1921	805,228	172,935	978,163	247,718	178,313	426,031	552,132
1922	309,556	122,949	432,505	198,712	146,672	345,384	87,121
1923	522,919	150,487	673,406	81,450	119,136	200,586	472,820
1924	706,896	172,406	879,302	76,789	139,956	216,745	662,557
1925	294,314	164,121	458,435	92,728	132,762	225,490	232,945
Total, 1921–1925	2,638,913	782,898	3,421,811	697,397	716,839	1,414,236	2,007,575
1926	304,488	191,618	496,106	76,992	150,763	227,755	268,351
Grand total	11,255,438	2,841,528	14,096,966	3,744,694	3,381,092	7,125,786	6,971,180

Quota Restriction Laws

THE quota laws restricting the number of immigrants entering the United States from any designated locality are the most recent stage of legislative control on the subject of immigration. The development toward restriction has been a gradual one. In the Colonial and early national period there was absolute freedom of entry into the United States. Then followed State regulations for some 50 years (1830–1882), during which, however, some Federal laws affecting the transportation of immigrants were passed. Later certain restraints were imposed, based on conditions of health, morals (or at least criminal records), mental capacity, and economic condition. The act of 1917 adopted the literacy test, while the subject of the importation of labor under contract had received attention at a considerably earlier date.

In 1921 the system of a prescribed quota was adopted (act of May 19, 1921, 42 Stat. 5), fixing the rate for aliens of any nationality at "3 per cent of the number of foreign-born persons of such nationality resident in the United States as determined by the United States census of 1910." By its terms this act was to continue in force from 15 days after its enactment until June 30, 1922. On May 11, 1922, this act was extended to the end of the fiscal year, June 30, 1924 (42 Stat. 540). On May 26, 1924, the present law was enacted (43 Stat. 153), reducing the ratio to 2 per cent and adopting the census period of 1890 as the basis, but fixing a minimum of 100 for any nationality.

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Beginning with July 1, 1927,[1] this basis may be still further modified by a provision that the annual quota for any nationality for that and each succeeding year "shall be a number which bears the same ratio to 150,000 as the number of inhabitants in continental United States in 1920 having that national origin (ascertained as hereinafter provided in this section) bears to the number of inhabitants in continental United States in 1920, but the minimum quota of any nationality shall be 100."

Provision was made for the immediate determination of the number of inhabitants to which each nationality was entitled, the act directing a determination by the Secretaries of State, Commerce, and Labor, acting jointly, the result to be proclaimed by the President. The committee acted with great promptness as regards the inauguration of the law, beginning work through the designated committee on May 31, 1924. The report of the committee thus constituted was made to the respective Secretaries June 19, 1924, and on June 30, the Secretaries transmitted their report to the President, who on the same day issued a proclamation establishing the determined quotas for the various nationalities.

As regards the quotas to be admitted under the terms of the clause effective July 1, 1927,[1] the same officials are directed to make a joint report announcing the quotas determined upon, the same to be proclaimed by the President on or before April 1, 1927.

Various exemptions exist as to the application of the law, provision being made for relatives, students, travelers, etc. Furthermore, nearly all of the American hemisphere is not subject to the quota law. The naturalization law applies only "to aliens being free white persons, and to aliens of African nationality and to persons of African descent." Aliens of other races are not eligible to citizenship therefore, and are, with certain exceptions, debarred from admission to the United States as immigrants. The normal quota of 100 for certain countries consequently applies only to such persons as are eligible for naturalization.

[1] Senate Joint Resolution No. 152, approved Mar. 4, 1927, postpones these dates one year.

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INDUSTRIAL ACCIDENTS

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Present Status of Accident Statistics

THE United States Bureau of Labor Statistics has issued four bulletins bringing together as far as possible the important records of industrial accidents on a national scale.[1] Two of these were prepared by Dr. Frederick L. Hoffman and were issued in 1908 and 1914. The third, prepared by the bureau staff, was published in 1923 and brought the data for the most part up to the year 1920. The latest one was issued in January, 1927, and covers the period up to 1925.

In the introduction to the second bulletin the following comment was made: "At the present time there are no entirely complete and trustworthy industrial accident statistics for even a single important industry in the United States. The most reliable data are for the iron and steel industries, mining, and the railways." As time has gone on, the three Federal agencies concerning themselves with accident statistics, namely, the Interstate Commerce Commission, the Bureau of Mines, and the Bureau of Labor Statistics, have so improved their methods of collecting and handling accident data that what they offer may fairly claim to be "trustworthy" though in the nature of the case it would be beyond reasonable expectation that they should be "entirely complete."

As compensation legislation spread rapidly over the several States there rose necessarily a new and insistent demand for accident statistics which would shed light on the various problems of compensation administration. In response to this demand there has been immense accumulation of the raw material of statistics. It would appear to be a rather simple matter to combine the records of the several States and so produce a national compilation of much interest and utility. Unfortunately the States have adopted procedures sufficiently different to make it difficult and in many cases impossible to combine these records in a general exhibit. The primary reason for this is that the State agencies have found themselves so involved in the multiplied problems of compensation that they have been quite unable to give adequate attention to the really more important problems of accident prevention. Ultimately it will be necessary for all States to do what some have already done, namely, to grapple with the matter of accident prevention.

In addition to the above-mentioned public agencies, a number of private agencies have also concerned themselves with the work of accident prevention and accident reporting. Among these the National Safety Council occupies an outstanding place, having been active in fostering all kinds of safety work over a period of years and assembling and publishing accident records of very great value.

[1] U. S. Bureau of Labor Statistics Buls. Nos. 78, 157, 339, and 425.

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Importance of Accident Rates

THE purpose of accident statistics is the very practical one of finding out where and why accidents occur, and whether they are increasing or decreasing. To do this, the statistics must show clearly not only the number but also the rate of accidents. Present-day practice is to show two kinds of rates—frequency rates, and severity rates. The steps by which such rates are determined, as well as certain other factors which it is essential to know about accidents in order to make accident statistics of practical value, are briefly described below:[2]

(1) *Exposure to hazard.*—A very large part of the statistical effort regarding accidents has been devoted to the mere sorting and recording of cases. That this gives little information which can be utilized for the purpose now under consideration may be established by a few illustrations. When the accidents for a six-year period in Pennsylvania are grouped by industries it appears that coal mining has 300,524 accidents while metals and metal products have 343,163. A hasty inference from this result would be that the production of metals and metal products is more dangerous than coal mining. A little reflection will show the inaccuracy of that conclusion. While metals and metal products have more accident cases it may be that there are many more people employed therein than in coal mining. In other words, exposure to hazard in metals and metal products may be much greater both because more people are employed and because they work longer hours. Clearly, to understand the relation of these two groups something more is necessary than merely to know the number of accidents occurring in each.

This raises the question of an appropriate method of expressing this element of exposure to hazard. The Germans were the first to attack the problem. Their solution was to note the number of days during which each workman was employed. The sum of the days worked by all the workmen was then divided by 300 on the supposition that the usual working year was one of 300 days of 10 hours each. The quotient thus derived gave the number of 300-day or full-year workers. The number of accidents was then divided by this base and the quotient multiplied by 1,000 to avoid small decimals. The use of this theoretical 300-day worker as a base for calculating accident rates was adopted by the Bureau of Labor Statistics when it began its accident studies.

There were, however, troublesome difficulties in the use of this base and the International Association of Industrial Accident Boards and Commissions finally determined, at the instance of its committee on statistics and accident insurance cost, to cut loose from the idea of the number of workers and use instead the hours of employment. It was agreed that accident frequency rates should be expressed as number of cases per 1,000,000 hours of exposure while accident severity rates should be expressed as number of days lost per 1,000 hours of exposure. The method of determining severity rates and days lost is discussed in a succeeding paragraph.

[2] For full account of standard method of computing frequency and severity rates, see U. S. Bureau of Labor Statistics Bul. No. 276, p. 68.

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The importance of exposure as an element in the study of industrial accidents has become more and more recognized with the passage of time. The Bureau of Labor Statistics was the first to utilize it on an extended scale. For some years now the Bureau of Mines and the Interstate Commerce Commission have presented their facts on this basis and many sections of the National Safety Council develop their accident data in this way.

(2) *Number of accidents.*—Having secured information regarding exposure to hazard the next step is to secure a record of the number of cases of injury. A serious difficulty presents itself at once in the fact that the definition of an accident varies in the different States. The most widely used definition is that of a "tabulatable accident." This definition is "an accident causing death, permanent disability, or temporary disability beyond the day or turn in which the accident occurred." The differences between the State definitions arise in respect to temporary disabilities. Some States exclude cases of one day's duration, others of two days' duration, still others of seven days' duration. This lack of uniformity impairs the value of the record as an index of the changes taking place. It is not greatly important what definition is used, but until a uniform definition is established it will remain impossible to compile satisfactory national statistics from the State records.

(3) *Severity of accident.*—When items 1 and 2 (exposure and number of accidents) are known, it is possible to compute accurate frequency rates; i. e., the number of accidents per 1,000,000 hours of exposure. It is evident, however, that in frequency rates a death influences the accident rate to the same extent as does temporary disability for one day, and thus a true and complete picture of conditions is not presented.

The first effort to meet this difficulty was the separation of the accidents into three groups, according to their results; namely, death, permanent disability, and temporary disability. This did make possible a separate comparison of fatalities in different industries but still did not afford comparability of the permanent and the temporary disabilities with each other and with the fatalities. What was needed was to translate the different casualties into common terms. This was accomplished by means of a schedule of fixed time allowances [3] for death and for permanent disabilities, beginning with 6,000 days for death, the loss of an arm being given 4,000 days, the loss of an eye 1,800 days, and so on through the list. The application of these constants gives for each sort of casualty a value in terms of days somewhat proportional to its economic importance. The temporary disabilities are evaluated by the actual days of recorded disability.

The value of the severity rate is evident. In considering frequency rates alone it is hardly possible to avoid the impression that the numerically larger figure of temporary disability is important in proportion to its size. As a corrective to this impression we need the severity rates in which all injuries, including death, are weighted according to their severity. The frequency rate fails to tell the whole story, because in it units are combined which are not comparable.

[3] See U. S. Bureau of Labor Statistics Bul. No. 276, p. 77.

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The severity rate corrects this condition through the use of a procedure which reduces these units to approximately common terms.

(4) *Classification by industries.*—In order to have information useful for accident prevention the classification of the injuries must extend to industries and if possible to departments and occupations. Departmental and occupational rates, however, present a difficulty in that such detailed analysis is likely to render the numbers in the groups so small that they lose statistical significance.

(5) *Causes of accident.*—An industrial classification indicates *where* remedial effort is called for but does not suggest *what* needs to be done. This information must come, so far as statistical treatment can give it, from a study of accident causes. Here, as in the case of occupations, there is constant danger of subdividing the material until the portions are too small to have any meaning. This, however, is a risk well worth taking, since here, if anywhere, the statistician can be of real service to the cause of safety.

In addition to the five items listed above as essential, a certain value attaches to information regarding nature of injury and location of injury, though these items are of much less practical importance than are accident causes.

State Accident Records

THE extent to which most of the existing accident statistics fall short of meeting the requirements as to good reporting, set forth in the preceding section, is indicated by Table 1, which gives the nature of information as to accidents reported by all reporting States in 1924. The table shows: Number of States recording number of accidents, 39; number classifying by industries, 16; number classifying by cause of injury, 14; number classifying by nature of injury, 8; number classifying by location of injury, 7; and number determining exposure, 1.

TABLE 1.—NATURE OF INFORMATION AS TO ACCIDENTS IN 1924 SECURED FROM THE SEVERAL STATES

States reporting accidents by—						Source of information
Number (39)	Industry (16)	Cause of injury (14)	Nature of injury (8)	Location of injury (7)	Exposure (1)	
Ariz.[1]		Ariz.	Ariz.	Ariz.		Report of State Mine Inspector for 1924.
Calif.	Calif.[2]	Calif.[2]	Calif.[2]	Calif.[2]		Response to special request.
Colo.						Report of Industrial Commission for 1923–24.
Conn.						Response to special request.
Del.						Do.
Ga.						Do.
Idaho	Idaho					Do.
Ill.						Do.
Ind.						Report of Industrial Commission for 1924.
Iowa						Response to special request.
Kans.	Kans.	Kans.				Report of Court of Industrial Relations for 1924.
Ky.	Ky.	Ky.	Ky.	Ky.		Report of Workmen's Compensation Board for 1924.
Me.						Response to special request.
Md.	Md.	Md.				Report of State Industrial Accident Commission for 1924.

[1] Mines only. [2] Six months.

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TABLE 1.—NATURE OF INFORMATION AS TO ACCIDENTS IN 1924 SECURED FROM THE SEVERAL STATES—Continued

States reporting accidents by—						Source of information
Number (39)	Industry (16)	Cause of injury (14)	Nature of injury (8)	Location of injury (7)	Exposure (1)	
Mass.						Response to special request.
Mich.						Do.
Minn.	Minn.	Minn.	Minn.	Minn.		Report of Industrial Commission for 1923–24.
Mont.						Report of Industrial Accident Board for 1924.
Nebr.						Report of Labor and Compensation Commissioner for 1924.
Nev.	Nev.				Nev.	Report of Industrial Commission for 1922–1924.
N. H.	N. H.	N. H.				State report of Bureau of Labor for 1924.
N. J.	N. J.	N. J.				Report of Department of Labor for 1924.
N. Y.						Response to special request.
N. Dak.		N. Dak.				Report of Workmen's Compensation Bureau for 1924–25.
Ohio.						Report of Department of Industrial Relations for 1924.
Okla.[3]	Okla.			Okla.		Report of State Industrial Commission for 1924.
Oreg.						Response to special request.
Pa.	Pa.			Pa.		Report of Bureau of Workmen's Compensation for 1924.
R. I.						Response to special request.
S. Dak.						Report of Industrial Commissioner for 1924.
Tenn.	Tenn.	Tenn.	Tenn.			Report of Department of Labor for 1924.
Tex.						Report of Industrial Board for 1924.
Utah.	Utah.	Utah.				Bulletin No. 3 of Industrial Commission for 1924.
Vt.		Vt.	Vt.			Report of Commissioner of Industries for 1922–1924.
Va.						Response to special request.
Wash.	Wash.	Wash.	Wash.			Summary of Accidents, 1924, Department of Labor and Industries (sheet).
W. Va.	W. Va.	W. Va.	W. Va.	W. Va.		Report of State Compensation Commissioner for 1924.
Wis.	Wis.					Report of Industrial Commission of Wisconsin, 1924; and Wisconsin Labor Statistics, November, 1925.
Wyo.						Report of Workmen's Compensation Department for 1924.

[3] Fatal and nonfatal combined.

Table 2 gives the available record of fatal and nonfatal accidents in the respective States from 1921 to 1925. It is not complete, since some industries are not covered by the compensation law and some States do not record cases of less than seven days' disability.

TABLE 2.—NUMBER OF FATAL AND NONFATAL ACCIDENTS AS REPORTED BY THE STATES, 1921 TO 1925, BY YEARS

State	1921		1922		1923		1924		1925	
	Fatal	Nonfatal	Fatal	Nonfatal	Fatal	Nonfatal	Fatal	Nonfatal	Fatal	Nonfatal
Alabama [1]	144	4,155	231	5,538					235	6,453
Arizona [2]	22	509	30	374	54	717	40	887	40	724
California	453	61,814		84,028	716	92,744	645	101,633	307	104,361
Colorado	151	13,753	708	12,704	168	15,194	140	17,373	50	18,093
Connecticut	96	22,800	155	[3] 20,407		[3] 37,000		[3] 35,350		
Delaware	18	3,882		4,997	12	6,611	22	4,827	15	4,637
Georgia	82	[4] 11,696	19	17,429	109	22,319	109	26,770	125	28,655
Idaho [1]	63	4,564	92	2,232	57	3,237	83	3,523	59	7,019
Illinois [1]	498	43,024	44	46,238	675	61,135	646	53,000		
Indiana	263	34,133	534	38,406	268	54,582	274	48,730	328	45,648
Iowa	113	14,839	198	11,410	112	13,834	119	13,610	69	13,266
Kansas	71	6,240	77		72	9,999	84	10,890	87	11,027

[1] Compensable cases. [2] Mines only. [3] Estimated. [4] March to December.

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TABLE 2.—NUMBER OF FATAL AND NONFATAL ACCIDENTS AS REPORTED BY THE STATES, 1921 TO 1925, BY YEARS—Continued

State	1921		1922		1923		1924		1925	
	Fatal	Nonfatal	Fatal	Nonfatal	Fatal	Nonfatal	Fatal	Nonfatal	Fatal	Nonfatal
Kentucky	120	16,789	62	18,549	108	23,892	97	28,036	193	26,490
Maine	49	12,778	62	14,731	64	16,311	38	14,168	59	13,844
Maryland	116	36,896	123	33,493	126	40,913	139	38,833	160	39,069
Massachusetts	296	53,017	306	50,799	330	64,560	336	61,640	309	58,771
Michigan	266	100,176	360	[1] 30,831	326	[1] 29,953	[1] 276	[1] 27,451	280	28,015
Minnesota	134	34,447	113	31,571	204	40,245	123	36,123	150	45,181
Montana	83	3,421	51	3,317	81	5,048	87	5,702	79	5,739
Nebraska	30	11,326	32	13,900	30	16,162	35	15,000	36	16,964
Nevada	20	1,247	24	1,377	31	1,113	31	1,346	36	1,494
New Hampshire	[5] 10	[5] 1,523	22	1,835	13	1,434	19	2,442	16	2,249
New Jersey	282	27,754	246	33,483	290	49,002	283	47,958	525	44,976
New Mexico	[6] 16		[6] 11	[6] 369					21	400
New York	1,177	293,292	1,421	292,423	1,665	345,180	1,927	369,781	1,828	414,702
North Dakota	9	1,296	7	1,192	11	1,654	13	1,809	10	2,100
Ohio	649	111,626	676	108,824	803	176,427	933	180,677	931	199,271
Oklahoma	85	22,779	[7]	25,636	[7]	34,908	[7]	46,517		52,000
Oregon [1]	138	20,318	124	21,721	178	30,013	142	25,811	150	27,596
Pennsylvania	1,924	138,273	1,890	144,365	2,412	198,023	2,209	175,330	2,011	174,370
Rhode Island [1]	24	2,952	26	3,482	31	4,098	31	3,758	38	28,357
South Dakota	23	2,701	25	3,282	18	3,455	17	4,518	22	4,394
Tennessee	96	17,093	67	18,557	90	25,008	142	21,222	161	25,408
Texas	308	94,256	214	95,109	253	86,482	299	92,613	357	91,065
Utah	91	9,932	69	8,388	84	13,137	281	13,919	112	14,203
Vermont	29	7,724	24	6,564	35	9,356	43	10,507	32	9,497
Virginia	133	5,327	144	6,498	145	6,518	180	7,899	198	7,606
Washington	287	19,729	227	18,453	398	31,081	385	39,270	384	42,003
West Virginia	429	20,398	443	21,855	501	28,269	751	30,608	586	31,045
Wisconsin	181	18,806	191	20,750	168	22,099	134	25,062	246	20,891
Wyoming	51	2,042	33	1,198	82	1,719	88	1,669		
U. S. Compensation Commission	362	18,042	353	17,905	279	17,713	278	20,260	314	20,374
Total	9,392	1,327,369	9,434	1,294,220	10,947	1,641,145	11,479	1,666,522	10,537	1,687,957

[1] Compensable cases. [5] Covers 10 months only. [6] Coal mines only. [7] Not reported.

Classification by Industries

IN TABLES 3 and 4 an effort has been made to compare the State accident data, by principal classification groups and by individual States, for the years 1920 and 1924. In those cases where 1924 data were lacking the latest available data have been used. As already noted, some of the States make no accident reports, and very few classify their data at all completely.

Table 3 gives for the years 1920 and 1924, respectively, the number of accidents for the States which classify their accidents according to industry. An attempt has been made, with a fair degree of success, to use a uniform classification.

The 1920 compilation records 602,053 accident cases and the 1924 compilation 696,369. The States covered, however, are not absolutely the same. The 1920 compilation relates to 21 States, while the 1924 compilation covers only 20 States and includes the important State of New York which was not included in 1920. Therefore, no inference can be drawn that the increase in accident cases represents an increasing hazard. On the whole, indeed, this table gives no definite answer to the question, "Is accident hazard increasing?" Nor can an answer be expected until the factor of employee exposure is more exactly known than is at present the case.

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TABLE 3.—NUMBER OF ACCIDENTS IN SPECIFIED STATES IN 1920 AND 1924,[1] BY INDUSTRIES

Industry	Alabama, 1922 [2]	Arkansas, 1920	California		Idaho [4]		Illinois [2]		Indiana		Kansas	
			1920	Jan.–June, 1924 [3]	1920	1924	1920	1923	1920	1921	1920	1924
Agriculture	2	------	4,286	2,300	120	143	281	292	189	148	------	------
Chemicals	62	------	2,018	1,058	------	------	1,324	1,104	156	91	------	------
Clay, glass, and stone	52	3	735	1,057	------	------	916	1,457	1,614	1,253	103	192
Clothing	7	------	233	------	------	------	581	746	135	196	------	------
Construction	340	------	8,327	8,313	713	1,724	3,713	5,251	2,731	3,056	------	------
Food products (including beverages)	42	23	5,274	2,443	------	------	3,190	4,637	2,452	2,112	994	1,343
Leather and rubber	7	------	477	229	------	------	506	696	454	427	------	------
Lumber and its remanufacture	563	1,160	4,977	3,549	1,592	3,579	1,982	2,636	3,355	2,274	47	163
Lumber: Logging	------	------	------	------	------	------	------	------	------	------	------	------
Lumber: Logging, railways	------	------	------	------	------	------	------	------	------	------	------	------
Mercantile	118	5	------	------	491	1,259	965	2,166	1,176	1,272	------	------
Metals and metal products	1,040	13	7,181	3,452	------	------	13,881	12,807	17,101	9,683	978	1,814
Mines, coal	2,115	------	------	------	------	------	13,249	14,599	4,222	4,851	873	904
Mines (not coal) and quarries	113	65	4,721	3,789	1,210	2,875	437	168	477	698	235	77
Municipal	------	------	------	------	------	------	231	550	32	31	------	------
Oil and gas	------	------	------	------	------	------	------	327	------	------	1,242	1,338
Paper and products	6	------	419	49	------	------	618	609	682	589	------	------
Printing and publishing	8	6	447	305	------	------	705	825	248	175	------	------
Public service	886	13	9,132	2,088	------	791	2,671	3,277	4,843	4,248	1,944	2,353
Shipbuilding	------	------	4,288	554	------	------	------	------	------	------	------	------
Textiles	207	2	137	273	------	------	299	330	154	136	------	------
Unclassified	201	130	17,753	14,938	960	1,590	5,036	9,333	2,973	3,156	593	2,790
Total	5,769	1,420	70,405	44,397	5,086	11,961	50,585	61,810	42,994	34,396	7,009	10,974

Industry	Kentucky		Maryland		Massachusetts		Minnesota [4]		Montana, 1915–1920	Nevada, 1920
	1920	1924	1920 [4]	1924 [5]	1920	1923	1920	1922		
Agriculture	------	6	------	19	196	339	45	98	------	------
Chemicals	88	100	72	586	781	631	138	128	------	------
Clay, glass, and stone	490	841	444	345	406	431	285	267	68	------
Clothing	79	85	41	335	316	335	38	51	------	------
Construction	878	4,145	[6] 2,494	[6] 2,541	5,032	6,518	1,589	1,306	2,136	18
Food products (including beverages)	1,428	770	284	1,436	2,079	2,014	1,611	1,308	1,211	33
Leather and rubber	179	216	210	262	4,664	3,631	134	57	1	------
Lumber and its remanufacture	1,294	2,147	102	865	2,174	2,294	1,471	1,050	1,747	54
Lumber: Logging	------	------	------	------	------	------	------	------	------	------
Lumber: Logging, railways	------	------	------	------	------	------	------	------	------	------
Mercantile	810	228	------	508	6,115	7,819	714	1,398	315	------
Metals and metal products	2,511	1,300	1,218	2,584	13,651	9,555	1,638	611	3,135	130
Mines, coal	5,968	11,573	------	409	------	------	------	------	1,969	------
Mines (not coal) and quarries	169	422	------	224	184	196	2,193	841	18,710	769
Municipal	------	------	------	------	------	------	206	------	109	58

[1] Where 1924 data were not available, the latest available data are given.
[2] Compensable cases.
[3] Tabulatable accidents.
[4] Compensation claims allowed.
[5] Claims filed.
[6] Includes shipbuilding.

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TABLE 3.—NUMBER OF ACCIDENTS IN SPECIFIED STATES IN 1920 AND 1924, BY INDUSTRIES—Continued

Industry	Kentucky		Maryland		Massachusetts		Minnesota		Montana, 1915–1920	Nevada, 1920
	1920	1924	1920	1924	1920	1923	1920	1922		
Oil and gas		576								
Paper and products	34	112	208	168	2,041	2,072	246	265		
Printing and publishing	102	88	204	159	718	762	133	130	131	
Public service	309	348	530	1,731	8,322	3,535	469	499	820	41
Shipbuilding										
Textiles	211	167	126	130	11,246	10,054	115	64	7	
Unclassified	1,605	5,009	761	1,617	7,563	14,704	1,713	2,584	955	73
Total	16,155	28,133	6,694	13,919	65,488	64,890	12,738	10,657	31,314	1,176

Industry	Nevada, 1924	New Hampshire, 1924	New Jersey		New York, 1923 [2]	Oklahoma		Oregon, 1920	Pennsylvania		South Dakota, 1921
			1920	1924		1920	1924		1920	1924	
Agriculture					353			135			102
Chemicals			1,755	1,962	1,081			28	2,633	2,623	
Clay, glass, and stone		44	420	1,019	1,003	617	959	64	5,736	5,999	
Clothing		15	95	1,324	1,970		18	22	1,211	1,440	
Construction		107	5,996	11,559	10,230	1,620	5,039	1,798	12,920	16,260	501
Food products		26	397	1,823	3,029	613	589	772	3,795	4,375	630
Leather and rubber		91	598	280	1,679		1	29	1,930	1,452	
Lumber and its remanufacture		408		995	2,699	1,095	725	4,191	3,593	4,216	47
Lumber: Logging								2,189			
Lumber: Logging, railways								297			
Mercantile		56			4,750	1,348	1,356	95	3,854	4,482	59
Metals and metal products	41	91	7,269	9,307	9,110	1,852	2,103	1,069	49,793	47,488	45
Mines, coal						1,112	1,216	24	47,787	54,449	
Mines (not coal) and quarries	940		84	446	618	3,934	6,300	237	1,589	2,169	688
Municipal								22	1,173	2,576	
Oil and gas						7,821	22,187				
Paper and products		311	86	419	1,585		1				
Printing and publishing		14	65	91	1,027	113	168	418	2,369	2,504	40
Public service	31	20			10,973	746	1,427	151	28,916	18,272	137
Shipbuilding			2,817	379				1,062			
Textiles		387	277	1,685	1,475			120	2,344	2,709	
Unclassified	365	891	8,982	16,932	6,496	1,843	4,368	666	5,336	6,525	475
Total	1,377	2,461	28,841	48,241	58,078	22,714	46,517	13,389	174,979	177,539	2,724

Industry	Tennessee, 1921	Washington		West Virginia, 1924	Wisconsin [7]		Wyoming [4]		Total	
		1921	1924		1920	1924	1920	1924	1920 [8] compilation	1924 [9] compilation
Agriculture						400			5,354	4,100
Chemicals	375	22		379		209			9,390	10,034
Clay, glass, and stone	504	34		2,505		266	4	6	12,443	17,696
Clothing	67								2,818	6,522
Construction	1,366	717	1,532	2,371	1,714	3,734	74	149	54,337	84,175

[2] Compensable cases.
[4] Compensation claims allowed.
[7] Compensable cases closed.
[8] Includes also data for Montana for 1915 to 1920 and for South Dakota, Tennessee, and Washington for 1921.
[9] Includes also data for Indiana for 1921, for Alabama and Minnesota for 1922, for Illinois, Massachusetts, and New York for 1923, and for California for first six months of 1924.

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TABLE 3.—NUMBER OF ACCIDENTS IN SPECIFIED STATES IN 1920 AND 1924, BY INDUSTRIES—Continued

Industry	Tennessee, 1921	Washington		West Virginia, 1924	Wisconsin		Wyoming		Total	
		1921	1924		1920	1924	1920	1924	1920 compilation	1924 compilation
Food products	1,481	594		396		1,450	20	34	26,881	27,827
Leather and rubber	295					596			9,477	9,624
Lumber and its remanufacture	3,005	5,193	4,061	1,720	2,887	4,584	13	74	39,979	38,602
Lumber: Logging		2,322	5,416						4,511	5,416
Lumber: Logging, railways									297	
Mercantile	1,229	56				1,526	13		17,245	26,938
Metals and metal products	2,885	712		7,143	4,559	2,447	8	2	129,629	120,578
Mines, coal	1,256	445	667	12,745			467	675	77,372	104,203
Mines (not coal) and quarries	211	107		472	334	515	6	24	36,360	20,947
Municipal		440					1		2,272	3,157
Oil and gas							153	491	9,216	24,919
Paper and products	306	128		316	1,026	1,183			5,794	7,685
Printing and publishing	183	59					3		5,944	6,256
Public service	442	181		1,475		2,049	15	21	59,682	54,024
Shipbuilding		349							8,516	933
Textiles	641	75		343		258			15,754	18,218
Unclassified	2,943	459	7,715	1,471	7,921	3,549	42	281	68,782	104,515
Total	17,189	11,893	19,391	31,336	18,441	22,766	819	1,757	602,053	696,369

Cause of Injury

IN THE 1920 compilation there were 18 States whose accidents were recorded according to a cause classification. The number of the accidents so classified was 714,023.

For 1924 such a classification could be made for 17 States and four others were available for the years 1922 and 1923. The total accident cases for 1924 so classified are 647,495 and for 1922 and 1923 are 190,547, making a grand total of 838,042 for the later period.

The handling of tools and objects gives rise to the greatest number of accidents, shown in Table 4, there being a total of 472,805 cases in the two periods. Machinery comes next, with a total of 294,951. In this table hoisting apparatus is considered as a form of machinery. Not giving cranes and other hoisting and carrying apparatus a separate classification tends to obscure the continued importance of machinery as a cause of accident. If it were possible to show these cases on a severity basis the high importance of machinery as an industrial hazard would be still more strikingly evident.

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TABLE 4.—NUMBER OF ACCIDENTS IN THE SPECIFIED STATES, 1920 AND 1924, BY CAUSE OF INJURY

State	Accidents due to—							
	Machinery	Hot substances	Falling objects	Falls of persons	Handling tools or objects	Vehicles	Unclassified	Total
1920								
California	8,410	4,283	5,688	9,465	24,445	6,867	11,247	70,405
Idaho [1]	495	116	1,471	752	1,313	222	588	4,957
Illinois [2]	7,240	2,928	8,204	5,799	12,276	4,683	9,455	50,585
Indiana	1,101	1,856	6,187	5,384	9,304	1,772	8,792	34,396
Kentucky [3]	1,232	842	3,820	625	5,733	----	3,903	16,155
Maryland [1]	1,036	395	1,150	1,087	1,284	588	1,154	6,694
Massachusetts	15,307	3,029	2,412	9,176	23,931	4,149	7,484	65,488
Minnesota [1]	2,475	603	1,088	1,769	4,282	1,351	1,170	12,738
New Jersey [3]	2,986	1,014	6,446	2,424	7,652	2,905	4,609	28,036
North Dakota	173	74	114	148	498	147	177	1,331
Ohio	79,043	12,442	6,404	8,417	58,551	4,391	13,722	182,970
Oregon	2,979	431	1,335	1,888	4,755	769	1,232	13,389
Pennsylvania	21,935	8,721	22,378	20,187	65,398	18,369	17,991	174,979
Tennessee [4]	675	1,302	2,877	3,009	2,666	465	6,195	17,189
Vermont	971	200	2,057	669	2,613	26	1,544	8,080
Washington [3]	1,615	278	1,865	1,588	2,824	558	843	9,571
Wisconsin	3,986	986	1,063	1,826	5,245	577	2,565	16,248
Wyoming [1]	91	53	273	95	156	74	70	812
Total	151,750	39,553	74,832	74,308	232,926	47,913	92,741	714,023
1924								
Alabama [5]	764	792	894	427	1,452	909	531	5,769
Arizona [6]	88	52	355	86	154	77	115	927
California [7]	7,216	3,170	3,259	5,896	15,057	5,098	4,701	44,397
Illinois [8]	5,598	3,652	11,940	7,568	14,486	3,791	14,775	61,810
Kansas	1,292	650	1,568	893	3,272	727	2,572	10,974
Kentucky	132	671	13,068	1,274	7,631	1,567	3,790	28,133
Maryland [9]	2,147	647	1,215	1,191	2,614	1,551	4,554	13,919
Massachusetts [8]	11,306	2,926	3,651	9,219	24,304	4,548	8,936	64,890
Minnesota	1,915	649	1,184	2,778	5,774	1,324	2,057	15,681
New Hampshire	604	55	92	260	404	72	974	2,461
New Jersey	8,708	1,393	11,413	3,096	12,263	2,750	8,595	48,218
New York [10]	11,286	2,646	3,881	9,217	18,785	4,653	7,610	58,078
North Dakota [11]	198	94	137	215	630	213	322	1,809
Ohio [12]	57,744	8,794	9,838	8,221	54,141	6,626	16,680	162,044
Oklahoma	1,340	1,852	6,762	2,577	6,198	2,395	25,393	46,517
Pennsylvania	22,151	7,720	22,613	17,614	53,969	34,480	18,992	177,539
Tennessee	2,077	1,066	5,317	3,070	3,099	963	5,772	21,364
Utah	1,510	1,001	2,753	1,396	4,353	1,856	1,331	14,200
Vermont [13]	1,379	339	3,001	799	3,258	----	1,731	10,507
West Virginia [1]	1,408	1,985	6,564	1,433	----	3,994	10,655	26,039
Wisconsin [14]	4,338	1,018	1,628	2,975	8,035	1,690	3,082	22,766
Total	143,201	41,172	111,133	80,205	239,879	79,284	143,168	838,042

[1] Compensation claims allowed.
[2] Compensable cases only.
[3] Data for year ending June 30, 1921.
[4] Data for 1921.
[5] Data for 1922—compensable cases only.
[6] Data for mines only.
[7] Data for first six months of 1924.
[8] Data for 1923—compensable cases.
[9] Compensation claims filed—data does not include 13 fatal cases.
[10] Data for 1923—compensable cases only.
[11] Compensation claims filed.
[12] Data does not include self-insured.
[13] Data does not include 43 fatal cases.
[14] Compensable cases closed.

Accident Rates from State Reports

THE State records presented above deal solely with numbers of accidents. Such records have an informative value but fail entirely to afford any hint regarding relative hazard, and consequently give no suggestion regarding the place where accident prevention methods may be profitably applied. For example, the fact

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that Indiana had 506 casualties in the manufacture of agricultural implements in the year 1925 while Ohio had 194 may mean simply that the production of such implements is on a larger scale in Indiana than in Ohio, or it may mean that danger of casualty is much greater in Indiana. It is entirely impossible to determine the significance of the facts without further investigation as to rates based on actual man-hours of exposure.

In view of the fact that rates have been so little used in accident studies, outside of railways, mines, and the iron and steel industry, the United States Bureau of Labor Statistics has sought to encourage the development of accident rates and has published such as were available from time to time. Recently the bureau has sought to utilize the information contained in the State accident reports by relating such data for selected establishments to data regarding the number of man-hours worked by such establishments. The accident data were obtained through the cooperation of the various State agencies. The employment data were obtained directly from the establishments.

The selection of the establishments was as follows: For some time the bureau has obtained monthly reports of volume of employment from some 10,000 concerns. This list had been carefully chosen to cover adequately the various important industries and to include plants of both large and small size. Fifty-two industrial groups are covered by the employment studies. From these 24 were selected as having the greatest significance from the standpoint of accident study. A small amount of additional information from each concern made possible the determination of a close approximation to the man-hours of exposure. The combination of these items—namely exposure and accidents—gave the rates presented in Tables 5 and 6.

Table 5 records both the number of cases and the frequency and severity rates, for the years 1924 and 1925, for the only States for which the necessary data were available for the two years—Ohio, Illinois, and Minnesota.

TABLE 5.—ACCIDENT FREQUENCY AND SEVERITY RATES FOR SPECIFIED INDUSTRIES IN OHIO, ILLINOIS, AND MINNESOTA, 1924 AND 1925

Industry	Full-year workers	Number of cases				Accident frequency rates (per 1,000,000 hours' exposure)				Accident severity rates (per 1,000 hours' exposure)			
		Death	Permanent disability	Temporary disability	Total	Death	Permanent disability	Temporary disability	Total	Death	Permanent disability	Temporary disability	Total
1924													
Agricultural implements	3,142	-------	19	361	380	-------	2.02	38.32	40.34	-------	1.62	0.68	2.30
Automobiles	5,648	-------	17	495	512	-------	1.00	29.21	30.21	-------	1.00	.55	1.55
Automobile tires	5,772	1	25	1,741	1,767	0.06	1.40	97.18	98.64	0.33	1.60	1.18	3.11
Boots and shoes	1,614	-------	1	23	24	-------	.21	4.75	4.96	-------	.06	.11	.17
Brick	3,514	2	13	522	537	.19	1.23	49.52	50.94	1.14	.68	.97	2.79
Electrical machinery	4,626	1	46	364	411	.07	3.31	26.23	29.61	.43	2.99	.34	3.76
Flour	2,921	1	6	113	120	.11	.68	12.89	13.68	.68	.85	.18	1.71
Foundry and machine shops	17,774	9	79	1,928	2,016	.15	1.32	32.14	33.61	.90	1.08	.45	2.43
Furniture	5,333	1	21	204	226	.06	1.31	12.75	14.12	.38	.91	.26	1.55
Glass	1,283	1	5	289	295	.26	1.30	75.07	76.63	1.56	1.36	.83	2.75
Lumber—planing mills	1,852	2	15	128	145	.36	2.70	23.04	26.10	2.16	5.17	.71	8.04

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TABLE 5.—ACCIDENT FREQUENCY AND SEVERITY RATES FOR SPECIFIED INDUSTRIES IN OHIO, ILLINOIS, AND MINNESOTA, 1924 AND 1925—Continued

Industry	Full-year workers	Number of cases				Accident frequency rates (per 1,000,000 hours' exposure)				Accident severity rates (per 1,000 hours' exposure)			
		Death	Permanent disability	Temporary disability	Total	Death	Permanent disability	Temporary disability	Total	Death	Permanent disability	Temporary disability	Total
1924—Continued													
Machine tools	3,635	1	9	322	332	0.09	0.83	29.53	30.45	0.55	0.55	0.31	1.41
Paper and pulp	1,171	1	13	148	162	.28	3.70	42.14	46.12	1.71	2.83	.67	5.21
Pottery	953		2	60	62		.70	21.00	21.70		.84	.47	1.31
Slaughtering and meat packing	19,911	11	98	1,311	1,420	.18	1.64	21.95	23.77	1.10	1.21	.70	3.01
Steam fittings, apparatus, and supplies	1,424		3	272	275		.70	63.68	64.38		.49	.79	1.28
Stoves	3,278	3	3	325	331	.31	.31	33.05	33.67	1.83	.24	.31	2.38
Structural-iron work	1,187	1	6	303	310	.28	1.68	85.06	87.02	1.68	.94	1.04	3.67
1925													
Agricultural implements	4,771	6	20	266	292	.42	1.40	18.58	20.40	2.51	1.18	.31	4.00
Automobiles	5,193	2	12	182	196	.13	.77	11.68	12.58	.77	.79	.21	1.77
Automobile tires	14,882	3	52	2,962	3,017	.07	1.16	66.32	67.55	.40	1.06	.74	2.20
Boots and shoes	3,336			124	124			12.39	12.39			.19	.19
Brick	6,402	3	9	629	641	.16	.47	32.75	33.38	.94	1.00	.51	2.45
Electrical machinery	8,512	1	21	360	382	.04	.82	14.10	14.96	.23	.65	.13	1.01
Flour	3,443	4	6	191	201	.39	.58	18.49	19.46	2.32	.52	.25	3.09
Foundry and machine shops	19,205	4	47	1,635	1,686	.07	.82	28.38	29.27	.42	.69	.34	1.45
Furniture	5,289		26	212	238		1.64	13.37	15.01		1.15	.28	1.43
Glass	1,552		2	414	416		.43	88.93	89.36		.77	.75	1.52
Lumber—planing mills	1,563	3	6	57	66	.64	1.28	12.15	14.07	3.84	1.66	.30	5.80
Machine tools	2,960		5	258	263		.56	29.05	29.61		.39	.29	.68
Paper and pulp	1,510	2	7	163	172	.44	1.55	35.99	37.98	2.65	1.59	.64	4.88
Pottery	1,206		1	80	81		.28	22.12	22.40		.50	.31	.81
Slaughtering and meat packing	19,648	15	63	1,300	1,378	.25	1.07	22.06	23.38	1.53	.90	.43	2.86
Steam fittings, apparatus, and supplies	692		2	122	124		.96	58.80	59.76		.51	.81	1.32
Stoves	1,753		2	275	277		.38	52.30	52.68		.48	.49	.97
Structural-iron work	2,069	4	14	459	477	.64	2.26	73.94	76.84	3.87	2.38	.99	7.24

According to this table the frequency rates range in 1924 from 4.96 for boots and shoes to 98.64 for automobile tires. In 1925 the range is from 12.39 for boots and shoes to 89.36 for glass. In 12 industries there is a decline in the rate from 1924 to 1925 while 6 industries show a rising rate.

Two cautions are pertinent regarding conclusions to be drawn from these figures:

1. In several of the industrial groups the exposure is not large enough to be as authoritative as could be desired.

2. Percentages of increase and decrease are not comparable with each other. Increases can be compared with increases and declines with declines, but a per cent of increase is not comparable with a per cent of decline.

In the case of the three States from which data have been secured for the years 1924 and 1925 it was possible to compute severity rates and these are also shown in the table. They are expressed in terms of days lost per 1,000 man-hours of exposure; death and permanent disabilities are given a fixed time allowance in terms of days.

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When these severity rates are examined it appears that in 12 industries there was a decline in severity and in 6 a rising severity rate.

The relation of the two rates to each other is indicated by the following: In 8 industries both frequency and severity declined, in 2 industries both rose, in 4 industries frequency declined and severity rose, and in 4 industries frequency rose and severity declined.

Table 6 summarizes the information for 1925 regarding 24 industries located in the 11 States for which the necessary data were available. It is interesting to note that the rates of the three States shown in Table 5 are closely similar to those for the 11 States for 1925 in which the three are included. It is not under present circumstances possible to consider securing information regarding the industries with the same completeness that has been done in iron and steel, but it is hoped that a sufficiently large sample can be secured so that it may be regarded as fairly typical. It is thought that an exposure of 10,000 full-year workers for each industry will afford such a sample.

TABLE 6.—ACCIDENT FREQUENCY AND SEVERITY RATES FOR SPECIFIED INDUSTRIES IN 11 STATES, 1925

Industry and State	Number	Number of establishments	Full-year workers	Number of cases			
				Death	Permanent disability	Temporary disability	Total
Industry							
	States						
Agricultural implements	8	55	16,295	9	78	1,050	1,137
Automobiles	8	73	189,385	56	704	4,247	5,007
Automobile tires	3	25	20,097	4	62	3,068	3,134
Boots and shoes	5	31	11,200		6	252	258
Brick	9	94	15,595	8	29	1,050	1,087
Carpets	3	19	10,999	5	33	94	132
Chemicals	4	31	11,609	3	35	192	230
Electrical machinery	8	71	60,653	13	229	1,170	1,412
Flour	3	27	3,616	4	7	203	214
Foundry and machine shops	11	256	75,404	18	324	3,421	3,763
Furniture	10	165	24,519		80	903	983
Glass	4	40	12,138	1	18	529	548
Leather	5	26	9,301	2	30	182	215
Lumber—planing mills	10	64	9,852	6	58	541	602
Lumber—sawmills	4	22	10,223	11	24	567	600
Machine tools	7	48	6,033	1	17	332	355
Paper and pulp	8	34	11,142	5	80	590	670
Pottery	2	13	3,148	1	3	156	161
Slaughtering and meat packing	3	13	23,900	15	81	1,645	1,748
Stamped and enameled ware	3	7	1,473		3	75	74
Steam fittings, apparatus, and supplies	6	44	6,212	1	38	335	374
Stoves	4	29	3,988	1	3	352	356
Structural-iron work	10	60	6,524	6	42	559	607
Woolen goods	2	25	12,682	1	13	33	47
State	*Industries*						
Illinois	13	120	51,330	21	134	1,737	1,892
Indiana	13	122	20,585	1	51	2,219	2,271
Iowa	9	54	11,074	2	40	880	922
Maryland	12	52	7,199	1	12	478	491
Michigan	7	44	165,918	48	580	3,624	4,252
Minnesota	12	60	13,744	14	55	1,141	1,210
New Jersey	14	113	46,066	7	223	1,010	1,240
New York	15	131	70,053	26	511	1,733	2,270
Ohio	15	161	43,213	13	120	7,043	7,176
Pennsylvania	19	342	98,733	26	226		252
Wisconsin	11	73	28,083	12	95	1,631	1,738
Total		1,272	555,988				

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TABLE 6.—ACCIDENT FREQUENCY AND SEVERITY RATES FOR SPECIFIED INDUSTRIES IN 11 STATES, 1925—Continued

Industry and State	Accident frequency rates (per 1,000,000 hours' exposure)				Accident severity rates (per 1,000 hours' exposure)			
	Death	Permanent disability	Temporary disability	Total	Death	Permanent disability	Temporary disability	Total
Industry								
Agricultural implements	0.18	1.60	23.31	25.09	1.10	1.26	0.42	2.78
Automobiles	.10	1.24	[1] 7.80	9.14	.59	1.02	.16	1.77
Automobile tires	.07	1.03	57.98	59.08	.40	1.06	.84	2.30
Boots and shoes		.18	9.88	10.06		.13	.19	.32
Brick	.17	.62	30.46	31.25	1.03	.73	.55	2.31
Carpets	.15	1.00	4.87	6.02	.91	1.45	.15	2.51
Chemicals	.09	1.00	5.63	6.72	.52	1.49	.18	2.19
Electrical machinery	.07	1.26	9.46	10.79	.43	1.12	.24	1.79
Flour	.37	.65	18.71	19.73	2.21	.57	.27	3.05
Foundry and machine shops	.08	1.43	23.62	25.13	.48	1.24	.43	2.15
Furniture		1.09	14.96	16.05		.79	.25	1.04
Glass	.03	.49	24.37	24.89	.16	.65	.27	1.08
Leather	.07	1.08	11.17	12.32	.43	.82	.29	1.54
Lumber—planing mills	.20	1.96	19.78	21.94	1.22	2.62	.49	4.33
Lumber—sawmills	.36	.78	18.49	19.63	2.15	.66	.48	3.29
Machine tools	.06	.94	21.09	22.09	.33	.77	.27	1.37
Paper and pulp	.15	2.39	20.47	23.01	.90	3.20	.75	4.85
Pottery	.11	.32	16.52	16.95	.64	.87	.37	1.88
Slaughtering and meat packing	.21	1.13	22.94	24.28	1.26	.94	.42	2.62
Stamped and enameled ware		.68	16.97	17.65		.54	.19	.73
Steam fittings, apparatus, and supplies	.05	2.04	31.52	33.61	.32	1.89	.74	2.95
Stoves	.08	.25	43.08	43.41	.50	.24	.45	1.19
Structural-iron work	.31	2.15	48.49	50.95	1.84	1.95	.75	4.54
Woolen goods	.03	.34	1.59	1.96	.16	.24	.05	.45
State								
Illinois	.14	.87	[2] 11.28	12.29	.82	.69	.27	1.78
Indiana	.02	.83	35.93	36.78	.10	.46	.50	1.06
Iowa	.06	1.20	26.49	27.75	.36	1.01	.40	1.77
Maryland	.05	.56	22.13	22.74	.28	.84	.45	1.57
Michigan	.10	1.17	[2] 7.28	8.55	.58	.90	.16	1.64
Minnesota	.34	1.33	27.67	29.34	2.04	1.46	.49	3.99
New Jersey	.03	1.03	[2] 4.65	5.71	.30	1.57	.21	2.09
New York	.12	2.43	[2] 8.25	10.80	.74	2.79	.37	3.90
Ohio	.10	.93	54.32	55.35	.60	.93	.56	2.09
Pennsylvania	.26	2.23	[3]	2.48	1.54	1.66	[3]	3.20
Wisconsin	.14	1.13	19.36	20.63	.85	.55	.41	1.81
Total								

[1] This rate is too low, since the industry is located so largely in Michigan, which does not report temporary disabilities terminating in the first week.
[2] Does not include temporary disabilities terminating in the first week.
[3] Data for temporary disabilities not available.

Accidents in the Federal Government Service

THE table below gives accident frequency rates in the various departments of the Federal Government. The tabulation was made by the United States Employees' Compensation Commission.

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NUMBER OF ACCIDENTS AND ACCIDENT FREQUENCY RATES IN THE GOVERNMENT SERVICE, 1921 TO 1925, BY DEPARTMENTS AND YEARS

[Based on number of employees shown by the Civil Service Commission's yearly reports and on number of accidents reported to the United States Employees' Compensation Commission]

Year	Number of employees	Number of accidents			Frequency rates (per 1,000,000 hours' exposure)		
		Fatal	Nonfatal	Total	Fatal accidents	Nonfatal accidents	Total
	All Government services						
1921	560,673	362	18,042	18,404	0.25	12.88	13.13
1922	535,185	353	17,905	18,258	.26	13.38	13.64
1923	535,781	279	17,713	17,992	.20	13.22	13.43
1924	546,981	278	20,260	20,538	.20	14.82	15.02
1925	538,290	314	20,374	20,688	.23	15.14	15.37
Total	2,716,910	1,586	94,294	95,880	.23	13.88	14.11
	Department of Agriculture						
1921	18,722	10	638	648	0.22	13.63	13.85
1922	19,773	11	919	930	.22	18.59	18.82
1923	20,078	17	971	988	.34	19.34	19.68
1924	20,385	25	1,287	1,312	.49	25.25	25.74
1925	20,098	26	1,291	1,317	.52	25.69	26.21
Total	99,056	89	5,106	5,195	.36	20.62	20.98
	Department of Commerce						
1921	11,743	9	246	255	0.31	8.38	8.69
1922	11,267	15	272	287	.53	9.66	10.19
1923	11,199	11	332	343	.40	11.86	12.25
1924	12,119	8	319	327	.26	10.52	10.79
1925	14,631	11	348	359	.30	9.52	9.82
Total	60,964	54	1,517	1,571	.35	9.95	10.31
	Government Printing Office						
1921	4,403	2	89	91	0.18	8.09	8.27
1922	4,024	1	63	64	.10	6.26	6.36
1923	3,989	----	42	42	----	4.21	4.21
1924	4,269	----	44	44	----	4.13	4.13
1925	3,984	----	27	27	----	2.71	2.71
Total	20,669	3	265	268	.06	5.12	5.18
	Department of the Interior						
1921	19,735	14	957	971	0.29	19.39	19.68
1922	17,834	18	1,041	1,059	.41	23.35	23.75
1923	17,092	16	1,415	1,431	.37	33.12	33.49
1924	16,679	19	1,676	1,695	.46	40.20	40.64
1925	13,125	11	1,019	1,030	.34	31.06	31.39
Total	84,465	78	6,108	6,186	.37	28.93	29.29
	Department of Labor						
1921	3,768	1	112	113	0.11	11.89	11.99
1922	3,744	2	100	102	.22	10.68	10.90
1923	3,821	----	112	112	----	11.72	11.72
1924	3,876	1	111	112	.11	11.46	11.56
1925	3,614	5	107	112	.55	11.84	12.40
Total	18,823	9	542	551	.19	11.52	11.71

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NUMBER OF ACCIDENTS AND ACCIDENT FREQUENCY RATES IN THE GOVERNMENT SERVICE, 1921 TO 1925, BY DEPARTMENTS AND YEARS—Continued

Year	Number of employees	Number of accidents			Frequency rates (per 1,000,000 hours' exposure)		
		Fatal	Nonfatal	Total	Fatal accidents	Nonfatal accidents	Total
	Department of the Navy						
1921	60,653	36	2,918	2,954	0.24	19.25	19.48
1922	42,515	27	1,516	1,543	.25	14.27	14.52
1923	40,557	30	1,423	1,453	.30	14.04	14.33
1924	42,686	28	1,882	1,910	.26	17.64	17.90
1925	42,842	24	1,662	1,686	.23	15.52	15.74
Total	229,253	145	9,401	9,546	.25	16.40	16.66
	Post Office Department						
1921	281,658	62	5,218	5,280	0.08	7.42	7.50
1922	284,207	64	6,196	6,260	.10	8.72	8.81
1923	294,226	50	6,559	6,609	.07	8.92	8.99
1924	301,000	42	7,395	7,437	.06	9.83	9.89
1925	304,092	47	7,488	7,535	.06	9.85	9.91
Total	1,465,183	265	32,856	33,121	.07	8.96	9.04
	Department of the Treasury						
1921	68,648	30	1,157	1,187	0.18	6.74	6.91
1922	56,392	44	1,203	1,247	.31	8.53	8.84
1923	53,604	17	938	955	.13	7.00	7.13
1924	53,121	16	1,013	1,029	.12	7.63	7.75
1925	52,607	22	1,037	1,059	.17	7.88	8.05
Total	284,372	129	5,348	5,477	.18	7.52	7.70
	Department of War						
1921	53,553	124	6,125	6,249	0.92	45.74	46.68
1922	46,840	104	5,648	5,752	.89	48.23	49.12
1923	44,842	96	4,913	5,009	.85	43.82	44.68
1924	45,906	102	5,295	5,397	.89	46.14	47.03
1925	38,975	115	5,793	5,908	1.18	59.45	60.64
Total	230,116	541	27,774	28,315	.94	48.28	49.22
	All other Government services						
1921	37,785	74	582	656	0.78	6.16	6.95
1922	48,589	67	947	1,014	.55	7.80	8.34
1923	46,373	42	1,008	1,050	.36	8.70	9.06
1924	46,940	37	1,238	1,275	.31	10.55	10.86
1925	44,322	53	1,602	1,655	.48	14.46	14.94
Total	224,009	273	5,377	5,650	.49	9.60	10.09

Accident Record by Industry

Building Construction

TABLE 1 presents several interesting phases of hazard in building construction. The rates for Group A illustrate the effect of accident-prevention effort directed primarily toward severe accidents. In this group there was marked improvement in the sever-

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ity rates while frequency rates were practically at a standstill. The rates for Group B show what can be accomplished by intensive effort applied to the reduction of both frequency and severity of accidents. Data for Groups C1 and C2 illustrate the fluctuating and very high rates which thus far have appeared in every record of experience in fabrication and erection.

TABLE 1.—NUMBER OF FULL-YEAR WORKERS, NUMBER OF ACCIDENTS, AND ACCIDENT FREQUENCY AND SEVERITY RATES IN BUILDING CONSTRUCTION, 1919 TO 1925, BY YEARS

Year	Hours of exposure (thousands)	Full-year workers	Number of accidents	Frequency rates (per 1,000,000 hours' exposure)	Severity rates (per 1,000 hours' exposure)
Group A (general contractors):					
1919	4,140	1,380	216	52.2	6.1
1920	7,635	2,545	300	39.3	10.1
1921	3,695	1,232	184	49.8	3.4
1922 [1]	17,527	5,842	1,268	72.4	5.8
1923 [2]	22,633	7,544	1,226	54.2	4.8
1924 [3]	19,009	6,337	1,118	58.8	4.6
Group B (general contractors): [4]					
1919	14,788	4,929	247	16.7	3.1
1920	11,362	3,787	177	15.6	1.2
Group C1 (fabricators and erectors):					
1922 [1]	3,949	1,316	564	142.8	5.4
1923 [2]	533	178	122	228.9	65.6
Group C2 (fabricators and erectors): [5]					
1923	2,043	681	213	104.0	8.3
1924	2,546	849	251	97.0	22.6
1925	2,592	864	196	76.0	10.0

[1] National Safety News, July, 1923, p. 48.
[2] Idem, July, 1924, p. 42.
[3] Idem, July, 1925, p. 40.
[4] Idem, August, 1921, p. 23.
[5] Idem, May, 1926, p. 10.

Coal Mines

THE data presented below regarding accidents in coal mines are derived from the publications of the United States Bureau of Mines.

Rates in these tables are given in terms of 1,000,000 hours' exposure. This is an approximation, since it was impossible from the data available to determine exactly the number of hours worked. The relations of these rates among themselves are correct, but they are not perfectly comparable with similar rates found in other portions of this bulletin.

It will be noticed that in Table 2 there are two methods of presenting the facts; namely, the rate per 1,000,000 hours' exposure and the rate per 1,000,000 tons mined. It is desirable to consider both of these rates. That based on hours of exposure gives a measure of the hazard of fatal injury encountered by the men. The rate by quantity mined measures the cost of coal in terms of fatal accidents. It may be regarded as a satisfactory condition when both these rates are declining with reasonable rapidity.

From 1907 to 1924 fatalities per 1,000,000 hours' exposure declined 23.6 per cent, while fatalities per 1,000,000 tons mined declined 38.5 per cent. This more rapid decline of cost as compared with hazard is undoubtedly related to the introduction of machinery and improved methods. While a more rapid decline might fairly be expected, it is gratifying that the movement is in the right direction.

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TABLE 2.—MEN EMPLOYED, AVERAGE PRODUCTION PER MAN, MEN KILLED, AND FATALITY RATES IN COAL MINES IN THE UNITED STATES, 1907 TO 1925, BY YEARS

Year	Tons mined (short tons)	Men employed		Average production per man (tons)		Men killed	Fatality rate per 1,000,000 hours' exposure	Production per death (short tons)	Fatalities per 1,000,000 tons mined
		Actual number	Full-year workers	Per year	Per day				
1907	477,892,536	674,613	519,452	708	3.07	3,242	2.08	147,407	6.78
1908	409,309,857	678,873	441,267	603	3.09	2,445	1.85	167,407	5.97
1909	460,807,263	666,535	----------	691	------	2,642	----------	174,416	5.73
1910	501,596,378	725,030	531,689	692	3.14	2,821	1.77	177,808	5.62
1911	496,371,126	728,348	534,122	682	3.10	2,656	1.66	186,887	5.35
1912	534,466,580	722,662	541,997	740	3.29	2,419	1.49	220,945	4.53
1913	570,048,125	747,644	593,131	762	3.20	2,785	1.57	204,685	4.89
1914	513,525,477	763,185	526,598	673	3.25	2,454	1.55	209,261	4.78
1915	531,619,487	734,008	511,598	724	3.46	2,269	1.48	234,297	4.27
1916	590,098,175	720,971	565,766	818	3.48	2,226	1.31	265,094	3.77
1917	651,402,374	757,317	634,666	860	3.42	2,696	1.42	241,618	4.14
1918	678,211,904	762,426	654,973	890	3.45	2,580	1.31	262,873	3.80
1919	553,952,259	776,569	542,217	713	3.41	2,317	1.42	239,082	4.18
1920	658,264,932	784,621	601,283	839	3.65	2,271	1.26	289,857	3.45
1921	506,395,401	823,253	474,529	615	3.56	1,987	1.40	254,854	3.92
1922	476,951,121	848,932	405,056	565	3.92	1,979	1.63	233,576	4.15
1923	657,903,671	860,560	560,000	764	3.91	2,458	1.46	267,492	3.74
1924	571,613,400	779,613	499,894	733	3.81	2,381	1.59	240,072	4.17
1925	585,083,000	----------	----------	------	------	2,230	----------	----------	----------

Table 3 summarizes the facts regarding the place of occurence and the cause of accidents in coal mines from 1916 to 1924. The underground occupations have much the larger share of fatalities, and nearly or quite half of the underground fatalities result from falls of material from roof or face. Attention has perhaps been too much directed to those startling "major casualties" in which by explosion of gas or dust many hundreds of lives may be suddenly brought to a close. Inspection of the rates in Table 2 will show that such explosions stand third in order of importance.

It would be advantageous if the underground and surface exposure could be separated. The underground rates would doubtless be higher and surface rates lower than those of the table, which are based upon the entire exposure, it not being possible from the data at hand to make this separation.

TABLE 3.—FATALITIES IN COAL MINES IN THE UNITED STATES, 1916 TO 1925, BY YEAR, PLACE OF OCCURRENCE, AND CAUSE

Place and cause	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925
	Number of fatalities									
Underground:										
Falls of roof or face	962	1,218	1,294	1,100	1,132	1,024	905	1,162	1,062	1,078
Cars and locomotives	390	482	506	381	408	341	341	415	350	360
Explosions, gas or dust	170	362	129	191	164	116	311	372	536	345
Explosives	146	111	135	206	128	152	92	114	100	102
Electricity	90	79	88	69	76	80	74	75	81	84
Miscellaneous	269	127	129	130	112	118	77	117	100	100
Total underground	2,027	2,379	2,281	2,077	2,020	1,831	1,800	2,255	2,229	2,069
Shaft	49	52	52	53	56	36	41	46	29	34
Surface:										
Haulage	75	114	118	93	78	45	54	59	70	40
Machinery	26	51	47	28	29	17	23	26	8	9
Miscellaneous	49	100	82	66	88	58	61	72	60	78
Total surface	150	265	247	187	195	120	138	157	138	127
Grand total	2,226	2,696	2,580	2,317	2,271	1,987	1,979	2,458	2,396	2,230

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TABLE 3.—FATALITIES IN COAL MINES IN THE UNITED STATES, 1916 TO 1925, BY YEAR, PLACE OF OCCURRENCE, AND CAUSE—Continued

Place and cause	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925
	Fatality rates (per 1,000,000 hours' exposure)									
Underground:										
Falls of roof or face	0.57	0.64	0.66	0.68	0.63	0.72	0.74	0.69	0.70	------
Cars and locomotives	.23	.25	.26	.23	.23	.24	.28	.25	.23	------
Explosions, gas or dust	.10	.19	.07	.12	.09	.08	.26	.22	.36	------
Explosives	.09	.06	.07	.13	.07	.11	.08	.07	.07	------
Electricity	.05	.04	.04	.04	.04	.06	.06	.04	.05	------
Miscellaneous	.16	.07	.06	.08	.06	.08	.06	.07	.07	------
Total underground	1.19	1.25	1.16	1.28	1.12	1.29	1.48	1.34	1.48	------
Shaft	.03	.03	.03	.03	.03	.03	.03	.03	.02	------
Surface:										
Haulage	.05	.06	.06	.06	.04	.03	.05	.04	.05	------
Machinery	.02	.03	.02	.02	.02	.01	.02	.01	.01	------
Miscellaneous	.03	.05	.04	.04	.05	.04	.05	.04	.03	------
Total surface	.09	.14	.12	.11	.11	.08	.12	.09	.09	------
Grand total	1.31	1.42	1.31	1.42	1.26	1.40	1.63	1.46	1.59	------

Coke Ovens

ACCIDENT rates in coke ovens, as compiled from data published by the United States Bureau of Mines, are shown in Table 4. A striking feature of the table is the very great falling off in the number employed in the beehive ovens, the number employed in 1925 amounting to only about 40 per cent of the number of employees in 1916. This, of course, means the discarding of a wasteful and inefficient method, but apparently the increased use of machinery gives accident rates rather higher in by-product ovens than in beehive ovens. The rates in both the beehive ovens and the by-product ovens show a reduction for both fatalities and injuries in 1924 and 1925, although the average for the years 1921 to 1925 in beehive ovens is higher than in the preceding five-year period.

TABLE 4.—NUMBER OF MEN EMPLOYED AND ACCIDENTS AND ACCIDENT RATES IN BEEHIVE AND BY-PRODUCT COKE OVENS, 1916 TO 1924, BY YEARS

Year	Men employed		Men killed	Men injured	Frequency rates (per 1,000,000 hours' exposure)	
	Actual number	Full-year workers			Men killed	Men injured
Beehive ovens:						
1916	18,570	18,591	24	1,866	0.43	33.46
1917	18,820	19,295	25	1,822	.43	31.48
1918	16,442	16,436	19	2,155	.39	43.70
1919	13,333	10,829	10	1,364	.31	41.99
1920	10,955	10,094	11	1,035	.36	34.18
Average, 5 years	15,624	15,049	18	1,649	.40	33.53
1921	6,011	2,835	5	336	.59	39.51
1922	7,871	4,823	8	474	.55	32.76
1923	8,515	7,144	12	875	.56	40.83
1924	6,450	4,025	3	457	.25	37.85
1925	7,246	5,140	4	498	.26	32.30
Average, 5 years	7,219	4,793	7	528	.49	36.70

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TABLE 4.—NUMBER OF MEN EMPLOYED AND ACCIDENTS AND ACCIDENT RATES IN BEEHIVE AND BY-PRODUCT COKE OVENS, 1916 TO 1924, BY YEARS—Continued

Year	Men employed		Men killed	Men injured	Frequency rates (per 1,000,000 hours' exposure)	
	Actual number	Full-year workers			Men killed	Men injured
By-product ovens:						
1916	13,033	15,528	21	3,371	0.45	72.36
1917	13,597	16,300	51	4,891	1.04	100.02
1918	15,947	19,040	54	5,637	.95	98.69
1919	15,408	16,845	43	2,667	.85	52.78
1920	17,184	19,827	38	2,380	.64	40.01
Average, 5 years	15,034	17,508	41	3,789	.78	72.14
1921	10,193	11,033	12	1,517	.36	45.83
1922	11,407	13,413	21	1,236	.52	30.72
1923	15,214	18,483	33	1,718	.60	30.98
1924	14,001	16,656	21	1,188	.42	23.78
1925	16,008	18,914	24	1,198	.42	21.11
Average, 5 years	13,365	15,700	22	1,371	.47	29.11
All coke ovens:						
1916	31,603	34,119	45	5,237	.44	51.16
1917	32,417	35,595	76	6,713	.71	62.86
1918	32,389	35,476	73	7,792	.69	73.21
1919	28,741	27,674	53	4,031	.64	48.55
1920	28,139	29,921	49	3,415	.55	38.04
Average, 5 years	30,658	32,557	59	5,438	.60	55.68
1921	16,204	13,868	17	1,853	.41	44.54
1922	19,278	18,236	29	1,710	.53	31.26
1923	23,729	25,627	45	2,593	.59	33.73
1924	20,451	20,681	24	1,645	.39	26.51
1925	23,254	24,054	28	1,696	.39	23.50
Average, 5 years	20,583	20,493	29	1,899	.47	30.89

Explosives, Dyes, and Chemicals Industry

THE first part of Table 5 records the experience to and including the year 1920 of one large company engaged in the manufacture of explosives, dyes, and chemicals. The second part covers the experience of several companies which are members of the chemical section of the National Safety Council. The table is not extended enough in some particulars to warrant conclusions, but the general impression is of a very decided declining tendency both in frequency and severity.

TABLE 5.—NUMBER OF FULL-YEAR WORKERS, NUMBER OF ACCIDENTS, AND ACCIDENT FREQUENCY AND SEVERITY RATES IN THE MANUFACTURE OF EXPLOSIVES, DYES, AND CHEMICALS, 1908 TO 1924, BY YEARS[1]

Year	Hours of exposure	Full-year workers	Frequency rates (per 1,000,000 hours' exposure)		
			Fatal accidents	Nonfatal accidents	Total
1908	9,963,000	3,321	3.50	----------	----------
1909	12,129,000	4,043	2.06	----------	----------
1910	14,070,000	4,690	2.20	----------	----------
1911	14,184,000	4,728	1.20	----------	----------
1912	13,719,000	4,573	.80	----------	----------
1913	12,873,000	4,291	1.71	----------	----------
1914	12,399,000	4,133	.57	----------	----------
1915	160,398,000	53,466	.59	25.87	26.46
1916	112,581,000	37,527	1.07	36.05	37.12
1917	119,202,000	39,734	.43	35.33	35.76
1918	195,405,000	65,135	.46	25.69	26.15
1919	51,624,000	17,208	.41	18.22	18.63
1920	48,396,000	16,132	.50	16.30	16.80

[1] National Safety News, Feb. 21, 1921, p. 4.

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TABLE 5.—NUMBER OF FULL-YEAR WORKERS, NUMBER OF ACCIDENTS, AND ACCIDENT FREQUENCY AND SEVERITY RATES IN THE MANUFACTURE OF EXPLOSIVES, DYES, AND CHEMICALS, 1908 TO 1924, BY YEARS—Continued

Year	Hours of exposure	Full-year workers	Number of accidents	Frequency rates (per 1,000,000 hours' exposure)	Severity rates (per 1,000 hours' exposure)
1910	14,070,000	4,690	430	30.57	14.43
1920	48,396,000	16,132	813	16.80	3.67
	Explosives				
1924 [2]	4,330,000	1,443	22	5.08	2.80
	Dye manufacture				
1924 [2]	5,450,000	1,817	96	17.61	6.14
	Chemicals				
1923 [2]	18,044,000	6,015	422	24.55	4.78
1924 [2]	48,450,000	16,150	1,187	26.13	3.07

[2] Idem, June, 1925, p. 31.

Iron and Steel Industry

THE Bureau of Labor Statistics' annual study of accidents in the iron and steel industry for the year 1925 showed a decline in accident rates as compared with 1924. This decline has been almost constant during the whole period of 16 years during which the bureau has been compiling such statistics.

There is, however, a marked difference between the experience of those plants in which energetic and continuous safety work has been carried on and those in which safety work has not been given such prominence. In the former group the reduction in accident frequency since 1913 has been approximately 86 per cent, while the reduction in the case of those plants in which safety work has not been so stressed has been only about 15 per cent.

The records of the Bureau of Labor Statistics now cover the experience of the iron and steel industry for the period from 1910 to 1925. To illustrate what has happened in this interval, and also to show the results obtained by intensive accident-prevention effort, Tables 6 and 7 are presented.

Table 6 shows the accident experience of a group of plants in the iron and steel industry which produce approximately 50 per cent of the output, and which were not only among the first to undertake accident prevention, but have continued a safety campaign with great energy and persistence. Table 7 shows the accident experience of all the plants covered by the study, including the plants of Table 6 as well as another group in which safety work has been less emphasized.

The two tables are not identical in form but in a general way they are comparable. Table 6 is on an annual basis, while Table 7 is for periods of five years.

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If the rates in the total column of Table 6 for the year ending with December, 1913, be compared with the rates for all departments in Table 7 for the 5-year period ending with 1913 it will be noted that the frequency rates are 60.3 for Table 6 and 62.1 for Table 7. That is to say, up to the time indicated the results in the section represented by the selected plants in Table 6 were but slightly more satisfactory than in the industry at large, including those special plants. Computing the rate for that half of the industry not included in Table 6 it is found to be 63.9. This compared with 60.3, the rate for plants grouped in Table 6, gives an idea of the progress made at that time by concerns most actively engaged in accident prevention as compared with those which had more recently, and in some cases not yet, undertaken an effort for safety.

If the figures for the year ending December, 1925, and the 5-year period ending with 1925 are compared it will be found that Table 6 shows a frequency of 8.2 while a computation for the portion not included in Table 6 gives a frequency of 54.4. In other words, the portion of the industry which has devoted most attention to accident prevention has made an 86 per cent reduction while the portion of the industry not included in Table 6 has made a 15 per cent reduction.

The fact that one table is on an annual and the other on a 5-year basis makes this comparison somewhat unfair to the plants shown only on the 5-year basis. It is safe to say, however, that in the companies which have undertaken the task of accident prevention most seriously the results have been the most striking. The important thing is that a similar result is possible to any plant which is willing to make a corresponding effort.

TABLE 6.—ACCIDENT FREQUENCY RATES (PER 1,000,000 HOURS' EXPOSURE) FOR A GROUP OF IRON AND STEEL PLANTS IN WHICH SAFETY WORK HAS BEEN STRESSED, BY PRODUCTS AND BY YEARS, 1913 TO 1925

Year ending—	Fabrication	Sheets	Wire	Tubes	Miscellaneous steel products		Total
					Group A	Group B	
December, 1913	100.3	61.6	59.3	27.2	70.9	41.3	60.3
June, 1914	75.5	53.7	51.0	19.1	62.8	33.3	51.6
December, 1914	59.0	47.2	46.2	12.5	50.7	27.6	43.5
June, 1915	51.2	41.8	44.3	8.7	42.7	23.3	38.0
December, 1915	53.5	37.3	52.4	10.8	51.9	23.0	41.5
June, 1916	54.5	36.5	52.2	12.2	62.7	27.0	44.7
December, 1916	52.1	34.0	48.2	12.4	67.6	28.2	44.4
June, 1917	53.3	32.3	42.6	11.5	62.2	24.5	40.5
December, 1917	51.3	33.9	32.5	10.2	51.3	20.5	34.5
June, 1918	45.7	31.3	24.6	9.9	45.2	24.3	31.1
December, 1918	38.2	25.9	18.8	9.1	42.0	31.4	28.8
June, 1919	33.6	24.4	15.4	8.7	40.7	28.4	27.1
December, 1919	32.8	25.8	12.5	9.1	39.7	23.0	26.1
June, 1920	35.3	25.0	12.2	9.2	38.0	21.2	25.0
December, 1920	35.3	22.7	12.0	8.9	35.3	18.6	22.9
June, 1921	32.4	20.2	9.3	7.3	27.6	15.5	18.7
December, 1921	28.4	17.5	7.5	6.1	15.8	12.1	13.2
June, 1922	29.7	16.8	7.9	6.4	13.1	10.9	12.3
December, 1922	38.8	16.9	7.9	7.1	14.5	10.8	13.0
June, 1923	33.2	19.0	7.9	7.7	14.3	10.3	13.3
December, 1923	32.6	17.2	7.9	7.0	13.9	9.8	12.7
June, 1924	34.7	12.9	7.4	6.0	13.5	9.1	11.6
December, 1924	33.4	10.3	6.2	5.1	11.8	7.9	10.2
June, 1925	28.8	10.6	4.4	4.4	10.3	5.2	8.7
December, 1925	27.4	11.4	4.2	4.0	9.8	3.7	8.2

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TABLE 7.—ACCIDENT RATES IN THE IRON AND STEEL INDUSTRY, BY DEPARTMENTS AND BY 5-YEAR PERIODS

Period	All departments	Blast furnaces	Bessemer converters	Open hearth	Foundries	Heavy rolling mills	Plate mills	Sheet mills
	Frequency rates (per 1,000,000 hours' exposure)							
1907 to 1911	69.2	76.1	101.5	84.2	60.1	61.0	69.4	44.1
1908 to 1912	65.1	67.7	79.5	79.5	61.5	57.0	60.8	47.9
1909 to 1913	62.1	62.4	92.3	78.6	65.1	51.7	55.9	49.1
1910 to 1914	59.2	62.3	89.8	75.0	63.6	46.1	49.9	51.1
1911 to 1915	53.3	50.3	65.0	67.6	59.3	39.4	44.7	48.1
1912 to 1916	51.3	47.8	76.1	64.8	57.8	37.3	41.5	47.4
1913 to 1917	48.2	41.4	68.3	58.4	60.4	32 1	36.6	41.3
1914 to 1918	43.6	40.5	60.7	53.5	57.0	31.1	39.8	35.8
1915 to 1919	41.6	39.0	57.7	50.5	61.0	32.4	39.2	32.7
1916 to 1920	41.1	38.0	53.1	50.2	61.0	31.4	38.4	33.7
1917 to 1921	39.5	36.3	47.0	44.8	63.1	29.9	37.6	33.4
1918 to 1922	36.5	34.0	39.9	41.3	60.4	27.6	36.7	35.2
1919 to 1923	34.9	32.9	30.5	33.0	61.7	23.8	31.4	37.2
1920 to 1924	33.6	30.7	24.9	32.9	62.7	21.2	29.4	35.1
1921 to 1925	31.3	29.0	17.0	29.9	63.1	18.1	26.8	33.2
	Severity rates (per 1,000 hours' exposure)							
1907 to 1911	5.0	10.6	7.6	7.5	2.7	4.4	5.1	3.1
1908 to 1912	4.3	8.8	7.4	6.6	3.1	4.2	4.1	2.8
1909 to 1913	4.4	8.3	6.7	6.8	3.5	4.0	3.8	3.0
1910 to 1914	4.1	7.0	6.4	6.6	3.6	3.6	3.9	2.6
1911 to 1915	3.6	6.2	5.3	5.8	3.3	3.4	3.1	2.2
1912 to 1916	3.7	5.8	6.1	5.5	3.1	3.5	2.8	2.3
1913 to 1917	3.7	5.6	7.1	5.1	3.3	3.6	2.6	2.1
1914 to 1918	3.5	5.4	7.3	5.8	3.2	3.4	2.6	1.8
1915 to 1919	3.6	5.8	6.9	6.5	3.4	3.9	2.5	1.5
1916 to 1920	3.5	5.7	6.3	6.3	3.2	3.5	2.6	1.8
1917 to 1921	3.4	5.7	5.4	5.8	3.2	3.3	2.5	1.7
1918 to 1922	3.1	5.5	4.2	5.3	2.7	2.9	2.5	1.8
1919 to 1923	3.0	5.0	3.2	4.2	2.7	2.4	2.4	1.9
1920 to 1924	2.8	4.5	2.6	4.2	2.8	2.3	2.4	2.1
1921 to 1925	2.7	4.6	3.2	4.0	3.1	2.6	2.6	1.9

Table 8 is derived from information regarding the group of iron and steel plants included in Table 6 and gives accident frequency rates (per 1,000,000 hours' exposure), by causes, from 1913 to 1925. There is not a single case in which the rate for 1925 is not lower than that for 1913, usually very much lower. The important rôle still played by machinery in accident experience is indicated by the first line of the table. In every such compilation the frequency of accidents due to handling is in excess of that from any other cause. The percentages of decrease from 1913 to 1925 for the main groups of the cause classification are as follows: Machinery, 78 per cent; vehicles, 87 per cent; hot substances, 89 per cent; falls of persons, 76 per cent; handling, 87 per cent; unclassified, 91 per cent.

TABLE 8.—ACCIDENT FREQUENCY RATES (PER 1,000,000 HOURS' EXPOSURE) IN A PORTION OF THE IRON AND STEEL INDUSTRY, 1913 TO 1925, BY YEARS AND CAUSES

Accident cause	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1913 to 1925
Machinery	7.3	5.0	4.9	5.4	4.5	4.0	3.3	3.4	1.8	2.2	2.3	2.0	1.6	3.7
Working machines	3.8	2.7	2.6	2.6	2.0	1.8	1.4	1.5	.8	1.1	1.0	.8	.7	1.7
Caught in	2.5	1.8	1.7	1.7	1.2	1.1	.9	1.0	.6	.8	.7	.6	.5	1.2
Breakage	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	(1)	(1)	(1)	.1
Moving material in	1.2	.8	.8	.8	.7	.6	.4	.4	.1	.3	.2	.2	.2	.4

[1] Less than one-tenth of 1 per cent.

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TABLE 8.—ACCIDENT FREQUENCY RATES (PER 1,000,000 HOURS' EXPOSURE) IN A PORTION OF THE IRON AND STEEL INDUSTRY, 1913 TO 1925, BY YEARS AND CAUSES—Continued

Accident cause	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1913 to 1925
Machinery—Continued														
Cranes, etc	3.5	2.3	2.3	2.8	2.5	2.2	1.9	1.9	1.0	1.2	1.3	1.2	0.9	2.0
Overhead	2.8	1.9	2.0	2.5	2.2	1.9	1.6	1.5	.8	1.0	1.1	.9	.7	1.6
Locomotive	.3	.2	.2	.2	.2	.2	.2	.2	.2	.1	.1	.1	.1	.2
Other hoisting apparatus	.4	.2	.1	.1	.1	.1	.1	.2	.1	.1	.1	.1	.1	.2
Vehicles	2.3	1.9	1.6	1.7	1.7	1.3	1.2	.1	.5	.4	.6	.5	.3	1.1
Hot substances	5.4	3.6	3.7	4.5	3.6	3.0	2.8	2.5	1.2	1.1	1.2	.9	.6	2.6
Electricity	.5	.4	.2	.4	.3	.3	.2	.3	.1	.1	(1)	.1	(1)	.2
Hot metal	3.6	2.1	2.3	3.0	2.5	2.1	2.0	1.8	.8	.7	.9	.6	.4	1.8
Hot water, etc	1.3	1.1	1.2	1.1	.8	.6	.6	.4	.2	.3	.2	.2	.1	.6
Falls of persons	4.5	4.1	3.5	3.7	3.2	2.8	2.8	2.5	1.7	1.5	1.4	1.4	1.1	2.6
From ladders	.3	.1	.1	.1	.1	.2	.1	.1	.1	.1	.1	.1	(1)	.1
From scaffolds	.2	.2	.2	.2	.3	.2	.2	.2	.1	.1	.1	.1	.1	.2
Into openings	.2	.1	.1	.3	.2	.1	.1	.1	.1	(1)	.1	(1)	(1)	.1
Due to insecure footing	3.8	3.7	3.1	3.1	2.6	2.3	2.3	2.1	1.4	1.3	1.1	1.1	.9	2.2
Falling material, not otherwise specified	1.2	.7	.7	.6	.4	.3	.4	-----	.1	.1	.1	.1	.1	.4
Handling	26.7	19.4	20.6	21.5	15.7	12.8	11.7	10.4	6.5	5.8	5.5	3.9	3.4	12.5
Dropped in handling	11.2	7.3	7.6	8.4	6.1	5.5	5.0	4.4	2.6	2.6	2.3	1.9	1.5	5.1
Caught between	3.4	2.6	2.6	3.1	2.1	1.7	1.7	1.3	.7	.7	.7	.5	.4	1.6
Trucks	1.9	1.0	1.4	1.4	1.2	.9	.7	.6	.5	.4	.4	.2	.2	.8
Lifting	2.5	2.3	2.5	2.5	2.0	1.4	1.4	1.1	.8	.8	.5	.3	.3	1.4
Flying from tools	.2	.2	.1	.1	.1	.1	.1	.1	.1	.1	.1	(1)	(1)	.1
Sharp points and edges	3.8	3.4	3.8	3.1	2.2	1.5	1.3	1.5	1.1	.6	.6	.3	.4	1.8
Tools	3.7	2.6	2.6	2.9	2.0	1.7	1.4	1.4	.8	.7	.8	.6	.5	1.6
Miscellaneous	12.9	8.8	6.5	7.0	5.4	4.6	4.1	3.1	1.3	1.9	1.8	1.6	1.1	4.3
Asphyxiating gas	.3	.2	.1	.1	.1	.1	.2	.1	.5	(1)	.1	(1)	(1)	.1
Flying, not striking eye	.8	.6	.6	.5	.4	.5	.3	.3	.2	.1	.3	.2	.1	.4
Flying, striking eye	2.9	2.1	1.7	1.9	1.6	1.6	1.3	1.1	.5	.4	.2	.3	.2	1.2
Heat	.9	.8	.4	.4	.1	.2	.1	.1	.1	.1	(1)	.1	(1)	.2
Other	8.0	5.1	3.7	4.1	3.2	2.2	2.2	1.5	.6	1.3	1.1	1.0	.8	2.4
Grand total	60.3	43.5	41.5	44.4	34.5	28.8	26.3	22.0	13.3	13.0	12.8	10.2	8.2	27.2

[1] Less than one-tenth of 1 per cent.

The causes of accidents in the iron and steel industry for three selected departments, by years, are shown in Table 9, on the basis of both frequency rates and severity rates.

In both frequency and severity rates there are examples of remarkable declines over the period shown. The severity rates are rather irregular, as should be expected, as the exposure is not large enough to smooth out these irregularities.

TABLE 9.—ACCIDENT FREQUENCY AND SEVERITY RATES IN SELECTED DEPARTMENTS, 1910 TO 1914 AND 1920 TO 1924, BY YEARS AND ACCIDENT CAUSES

Blast furnaces

Accident cause	1910	1911	1912	1913	1914	1920	1921	1922	1923	1924
	Accident frequency rates (per 10,000,000 hours' exposure)									
Machinery	21.6	38.3	23.0	28.0	8.7	17.6	7.2	10.1	12.2	15.2
Vehicles	19.7	2.3	6.0	4.0	-----	13.7	8.7	8.1	9.1	6.8
Hot substances	113.2	132.7	89.3	86.6	57.4	50.0	30.2	32.6	34.5	30.2
Falls of persons	78.7	33.7	53.0	26.0	43.0	23.1	17.9	12.7	14.7	15.8
Falling objects	143.0	55.3	66.7	62.3	31.7	21.9	14.3	16.6	15.6	18.7
Handling	108.3	94.3	74.3	56.3	43.0	61.2	41.4	27.9	37.1	35.3
Unclassified	138.0	65.0	103.0	40.3	65.7	41.7	26.5	27.9	20.9	20.5
Total	622.5	421.6	415.3	303.5	249.5	229.2	146.2	135.9	144.1	142.5

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TABLE 9.—ACCIDENT FREQUENCY AND SEVERITY RATES IN SELECTED DEPARTMENTS, 1910 TO 1914 AND 1920 TO 1924, BY YEARS AND ACCIDENT CAUSES—Con.

Blast furnaces—Continued

Accident cause	1910	1911	1912	1913	1914	1920	1921	1922	1923	1924
	Accident severity rates (per 10,000 hours' exposure)									
Machinery	1.3	0.6	2.0	14.0	0.3	3.31	1.10	7.11	7.60	8.04
Vehicles	5.3	16.0	------	------	------	2.12	.11	4.55	7.14	2.05
Hot substances	2.0	20.3	.6	4.3	4.6	11.87	18.08	9.41	4.76	19.73
Falls of persons	34.3	1.0	.7	14.0	1.0	.31	13.38	2.80	3.79	2.32
Falling objects	1.7	.7	.7	.3	.7	1.08	.28	.37	.43	4.35
Handling	3.3	1.3	1.3	2.3	2.3	1.56	.88	.83	1.14	2.82
Unclassified	20.3	16.7	14.3	14.0	39.0	3.00	5.68	2.81	7.01	7.76
Total	68.2	56.6	19.6	48.9	47.9	23.25	39.51	27.88	31.87	47.07

Open hearth furnaces

	Accident frequency rates (per 10,000,000 hours' exposure)									
Machinery	86.0	70.0	61.0	44.0	47.0	49.6	26.0	25.9	33.5	23.2
Vehicles	28.0	27.0	42.0	49.0	8.0	28.0	15.0	13.3	13.6	10.1
Hot substances	122.0	133.0	127.0	110.0	83.0	72.1	50.2	39.8	47.1	43.4
Falls of persons	(1)	(1)	(1)	(1)	(1)	27.8	28.1	21.4	21.7	23.2
Falling objects	(1)	(1)	(1)	(1)	(1)	41.0	42.7	37.5	29.7	33.1
Handling	111.0	82.0	84.0	77.0	75.0	99.0	87.9	57.8	47.6	59.8
Unclassified	292.0	198.0	209.0	225.0	169.0	51.7	43.2	30.5	26.7	21.4
Total	639.0	510.0	523.0	505.0	382.0	369.2	293.1	226.2	219.9	214.2
	Accident severity rates (per 10,000 hours' exposure)									
Machinery	19.3	10.0	2.0	1.0	1.0	15.37	3.40	6.62	13.28	10.87
Vehicles	11.0	10.0	12.0	17.0	4.0	11.15	2.90	2.41	11.08	5.24
Hot substances	3.0	3.0	9.0	18.0	23.0	8.62	5.62	7.56	9.49	6.48
Falls of persons	(1)	(1)	(1)	(1)	(1)	1.75	.50	.38	5.03	4.59
Falling objects	(1)	(1)	(1)	(1)	(1)	5.66	.73	2.59	4.07	2.63
Handling	3.0	1.0	1.0	1.0	2.0	3.76	5.43	1.30	2.21	3.05
Unclassified	13.7	3.0	10.0	44.0	3.0	3.55	5.11	.90	3.89	.26
Total	50.0	27.0	34.0	81.0	33.0	49.86	23.69	21.76	49.05	33.12

Plate mills

	Accident frequency rates (per 10,000,000 hours' exposure)									
Machinery	164.0	120.0	135.0	93.0	49.0	49.3	31.9	35.4	27.5	32.0
Vehicles	18.0	12.0	18.0	17.0	2.0	1.6	2.2	1.6	3.4	------
Hot substances	53.0	47.0	55.0	55.0	24.0	23.0	15.4	24.4	11.0	12.0
Falls of persons	(1)	(1)	(1)	(1)	(1)	16.1	11.0	15.0	8.9	17.6
Falling objects	(1)	(1)	(1)	(1)	(1)	40.8	27.5	53.5	33.7	38.4
Handling	(1)	(1)	(1)	(1)	(1)	101.0	87.6	62.1	41.2	34.4
Unclassified	491.0	450.0	552.0	434.0	220.0	68.4	39.5	40.1	9.6	28.8
Total	726.0	629.0	760.0	599.0	295.0	300.2	215.1	232.1	135.3	163.2
	Accident severity rates (per 10,000 hours' exposure)									
Machinery	34.0	2.0	8.0	17.0	1.3	18.83	1.52	1.66	5.35	8.08
Vehicles	15.0	.3	.3	14.0	------	.01	.02	.20	.16	------
Hot substances	1.0	1.0	1.0	1.0	.3	3.77	.19	.54	.20	.39
Falls of persons	(1)	(1)	(1)	(1)	(1)	.21	.11	.33	4.72	.42
Falling objects	(1)	(1)	(1)	(1)	(1)	.56	6.82	.82	.64	5.57
Handling	(1)	(1)	(1)	(1)	(1)	1.12	3.77	2.36	3.58	2.49
Unclassified	11.0	10.7	21.7	6.0	5.4	3.76	.70	.44	.23	.68
Total	61.0	14.0	31.0	38.0	7.0	28.26	13.13	6.35	14.88	17.63

[1] Not separately shown; included in "Unclassified."

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Metal Mines

TABLE 10 shows the accident rates for all metal mines from 1911 to 1924, as published by the United States Bureau of Mines.

The rate for injuries tends to rise. This is due, in considerable measure, to better reporting rather than to increased hazard. This appears when the fatality rates are considered. These decline for underground workers from 1.83 in 1911 to 1.62 in 1924 (12 per cent). Since fatalities are always more completely reported than are minor injuries, this change may fairly be taken as an index of the shift in hazard during this period. Inspection of the items of the table will convince that there has been a real, though not very great, downward tendency in fatality frequency.

TABLE 10.—NUMBER OF FULL-YEAR WORKERS AND ACCIDENT FREQUENCY RATES FOR METAL MINES IN THE UNITED STATES (PER 1,000,000 HOURS' EXPOSURE), 1911 TO 1924, BY YEARS

Year	Full-year workers			Accident frequency rates (per 1,000,000 hours' exposure)					
				Men killed			Men injured		
	Underground	Surface	Total	Underground	Surface	Total	Underground	Surface	Total
1911	98,389	57,700	156,089	1.83	0.88	1.48	72.43	30.03	56.76
1912	105,153	56,509	161,662	1.65	.82	1.36	78.81	34.65	63.37
1913	121,293	62,300	183,593	1.51	.72	1.24	70.15	39.84	59.86
1914	91,659	50,960	142,619	1.70	.61	1.31	87.27	40.68	70.62
1915	89,821	52,176	141,997	1.67	.65	1.30	106.62	41.95	82.85
1916	125,601	66,854	192,455	1.52	.61	1.21	102.04	48.80	83.55
1917	126,815	65,270	192,085	1.91	.64	1.48	96.61	48.67	80.32
1918	113,441	67,565	181,006	1.51	.66	1.19	96.87	49.08	79.03
1919	85,769	50,513	136,282	1.51	.53	1.14	96.39	44.25	77.06
1920	80,215	54,325	134,540	1.39	.56	1.05	103.66	46.73	80.67
1921	45,199	29,311	74,510	1.34	.55	1.03	104.28	50.76	83.23
1922	59,454	37,684	97,138	1.67	.41	1.18	116.24	47.30	89.49
1923	73,669	48,197	121,866	1.31	.54	1.00	120.85	47.40	91.80
1924	72,631	46,482	119,113	1.62	.46	1.17	122.27	46.43	92.68

Metallurgical Works

TABLE 11 records the accident experience from 1913 to 1924 in metallurgical plants, as compiled by the United States Bureau of Mines. Neither fatal nor nonfatal rates show any regular trend.

TABLE 11.—ACCIDENTS AND ACCIDENT RATES IN METALLURGICAL PLANTS IN THE UNITED STATES, 1913 TO 1924, BY YEARS

Kind of plant and year	Men employed		Men killed	Men injured	Frequency rates (per 1,000,000 hours' exposure)	
	Actual number	Full-year workers			Men killed	Men injured
Ore-dressing plants:						
1913	14,985	16,154	16	1,977	0.33	40.79
1914	15,128	15,225	23	1,434	.50	31.40
1915	18,564	19,107	30	2,095	.52	36.55
1916 [1]	22,470	23,470	33	3,184	.47	45.22
1917 [1]	24,111	24,372	47	2,952	.64	40.37
1918 [1]	21,809	22,517	35	3,142	.55	46.51

[1] Not including auxiliary works such as shops, yards, etc.

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TABLE 11.—ACCIDENTS AND ACCIDENT RATES IN METALLURGICAL PLANTS IN THE UNITED STATES, 1913 TO 1924, BY YEARS—Continued

Kind of plant and year	Men employed		Men killed	Men injured	Frequency rates (per 1,000,000 hours' exposure)	
	Actual number	Full-year workers			Men killed	Men injured
Ore-dressing plants—Continued.						
1919 [1]	17,262	16,862	25	2,057	0.49	40.74
1920 [1]	16,827	16,813	21	2,624	.44	54.75
1921 [1]	10,047	8,037	4	1,214	.17	50.35
1922 [1]	11,676	11,052	12	1,984	.36	59.84
1923 [1]	14,899	14,782	24	2,549	.54	57.48
1924 [1]	15,735	16,093	20	2,511	.41	52.01
Smelting plants: [2]						
1913	20,564	24,309	47	4,247	.64	58.24
1914	27,879	32,336	33	5,673	.34	58.48
1915	31,327	36,262	38	5,718	.35	52,56
1916 [1]	43,829	49,363	36	9,656	.24	65.20
1917 [1]	44,376	50,659	53	7,745	.35	50.96
1918 [1]	39,899	45,439	42	6,743	.31	49.47
1919 [1]	28,777	31,324	34	4,431	.36	47.15
1920 [1]	26,099	30,411	20	4,147	.23	47,44
1921 [1]	14,621	14,204	14	2,129	.33	49.96
1922 [1]	19,495	20,887	16	3,002	.26	47.90
1923 [1]	22,439	26,677	17	3,487	.21	43.57
1924 [1]	24,941	29,231	16	3,293	.18	37.55
Auxiliary works:						
1913, 1914, 1915 [3]						
1916	14,007	15,763	14	2,240	.30	47.37
1917	15,555	17,014	16	2,881	.31	56.44
1918	18,044	20,111	17	2,808	.28	46.54
1919	15,081	16,172	5	1,638	.10	33.76
1920	16,306	18,363	20	2,092	.37	38.73
1921	8,762	8,308	9	1,151	.36	46.18
1922	12,829	14,069	17	1,692	.40	40.09
1923	16,533	18,040	17	2,388	.31	44.12
1924	15,520	17,624	19	2,422	.36	45.81

[1] Not including auxiliary works, such as shops, yards, etc.
[2] Not including iron blast furnaces.
[3] Included under ore dressing and smelting plants.

Paper Mills

THE figures in Table 12 show the experience of the firms that are members of the paper section of the National Safety Council. In the interval from 1920 to 1924 frequency declines from 46.34 to 41.58, or 10 per cent, and severity from 2.60 to 2.07, or 20 per cent.

TABLE 12.—NUMBER OF FULL-YEAR WORKERS, NUMBER OF ACCIDENTS, AND ACCIDENT FREQUENCY AND SEVERITY RATES, IN PAPER MILLS, 1920 TO 1924, BY YEARS [1]

Year	Hours of exposure (thousands)	Full-year workers	Number of accidents	Frequency rates (per 1,000,000 hours' exposure)	Severity rates (per 1,000 hours' exposure)
1920	79,574	26,525	3,684	46.34	2.60
1921	81,196	27,065	3,380	41.68	2.83
1922	106,830	35,610	5,106	47.77	2.36
1923	115,902	38,634	5,042	43.50	2.73
1924	100,300	33,433	4,171	41.58	2.07

[1] National Safety News, June, 1925, p. 30.

Portland Cement Industry

TABLE 13 is drawn from the publications of the Portland Cement Association. This organization was among the first to compile statistics on a satisfactory basis and their annual studies are models of statistical presentation.

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The table shows a very steady decline in both frequency and severity.

TABLE 13.—NUMBER OF FULL-YEAR WORKERS, NUMBER OF ACCIDENTS, AND ACCIDENT FREQUENCY AND SEVERITY RATES IN THE MANUFACTURE OF PORTLAND CEMENT, 1918 TO 1925, BY YEARS [1]

Year	Hours of exposure (thousands)	Full-year workers	Number of accidents	Number of deaths	Frequency rates (per 1,000,000 hours' exposure)	Severity rates (per 1,000 hours' exposure)
1918	55,215	18,405	2,401	38	43.50	6.05
1919	48,743	16,248	2,225	39	45.65	7.15
1920	59,586	19,862	2,750	53	46.16	7.60
1921	62,247	20,749	2,727	44	43.81	6.18
1922	63,527	21,176	2,597	52	41.00	6.50
1923	76,641	25,547	3,190	43	41.62	5.48
1924	87,767	29,256	3,098	60	35.30	5.87
1925	97,415	32,472	2,541	61	26.08	5.00

[1] Portland Cement Association: Study of accidents, 1918; Accident Prevention Bulletin, September-October, 1920; July-August, 1921; May-June, 1922; May-June, 1923; March-April, 1924; July-August, 1925; and May-June, 1926.

Quarries

TABLE 14 records the facts regarding quarry accidents from 1911 to 1924, as published by the United States Bureau of Mines. Fatality rates show a slight decline, especially noticeable in the last four years. The nonfatal injuries have a rising rate.

TABLE 14.—NUMBER OF MEN EMPLOYED, NUMBER OF MEN KILLED AND INJURED, AND ACCIDENT FREQUENCY RATES FOR QUARRIES IN THE UNITED STATES, 1911 TO 1920, BY YEARS

Year	Men employed		Men killed	Men injured	Frequency rates (per 1,000,000 hours' exposure)	
	Actual number	Full-year workers			Men killed	Men injured
1911	110,954	84,417	188	5,390	0.74	21.28
1912	113,105	93,837	213	6,552	.76	23.67
1913	106,278	87,141	183	7,739	.70	29.60
1914	87,936	68,187	180	7,836	.88	38.31
1915	100,740	82,447	148	9,671	.60	39.10
Average, 5 years	103,803	83,206	182	7,437	.73	29.80
1916	90,707	76,457	173	13,427	.75	58.54
1917	82,290	71,525	131	13,242	.61	61.71
1918	68,332	59,285	125	8,719	.70	49.02
1919	75,505	63,794	123	9,199	.64	48.07
1920	86,488	77,089	178	11,217	.77	48.50
Average, 5 years	80,682	69,630	146	11,161	.70	53.43
Average, 10 years	92,243	76,418	164	9,299	.72	40.56
1921	77,185	59,958	120	10,465	.67	58.18
1922	79,081	68,861	132	11,839	.64	57.31
1923	92,455	85,153	143	14,990	.56	58.68
1924	94,242	84,246	138	14,777	.54	58.34

Railways, Electric

THE American Electric Railway Association has published figures regarding accidents on electric railways for the years 1923 and 1924. There were 105 companies which reported fully on the items included in the inquiry. Table 15 presents the results.

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It will be noted that in nearly every comparison possible to make, the year 1924 was more satisfactory than 1923. This is particularly true in cases of injury per 1,000,000 passengers carried, the figures being 6.48 for 1923 and 5.53 for 1924.

TABLE 15.—ACCIDENT EXPERIENCE OF 105 AMERICAN ELECTRIC RAILWAYS IN 1923 AND 1924

Item	1923	1924	Item	1923	1924
Car-miles operated	448,489,978	445,200,730	Accidents per 1,000,000 car-miles—Continued.		
Passengers carried	3,051,621,122	3,239,039,582	By collision with cars	9.65	8.08
Number of accidents to—					
Employees	4,875	4,627	To employees	10.87	10.39
Passengers	19,784	17,935	To passengers	44.11	40.29
Other persons	9,691	9,758	To other persons	21.61	21.91
Total	34,350	32,320	Total	76.59	72.59
Number of fatalities	337	338	Accidents to passengers per 1,000,000 passengers carried	6.48	5.53
Accidents per 1,000,000 car-miles:					
By collision with motor vehicles	195.87	194.35			

Railways, Steam

THE available records for American railways cover a longer period and are more inclusive than those of any other industry. The Interstate Commerce Commission publishes accident bulletins containing very detailed information. The data in the tables which follow are derived from these bulletins.

Table 16 presents summary figures showing the number killed and injured during the period from 1888 to 1925. The greatly lessened hazard is shown very conclusively by the figures for passenger casualty. The peak of passenger fatality was in 1907 when 610 were killed. The high year for passenger injuries was 1913 with 15,130 cases. From this point there has been an irregular decline until 1925 when 171 passengers were killed and 4,952 injured.

The data for employees show the peak of fatality (4,534) also in 1907, the peak of injury (176,923) being in 1916. By 1925 fatalities had declined to 1,594 and injuries to 118,874.

TABLE 16.—NUMBER OF PASSENGERS, EMPLOYEES, AND OTHER PERSONS KILLED OR INJURED IN REPORTABLE STEAM RAILWAY ACCIDENTS OF ALL KINDS IN THE UNITED STATES, 1888 TO 1924, BY YEARS[1]

Year ending—	Passengers		Employees		Other persons		Total	
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
June 30, 1888	315	2,138	2,070	20,148	2,897	3,602	5,282	25,888
June 30, 1889	310	2,146	1,972	20,028	3,541	4,135	6,823	26,309
June 30, 1890	286	2,425	2,451	22,396	3,598	4,206	6,335	29,027
June 30, 1891	293	2,972	2,660	26,140	4,076	4,769	7,029	33,881
June 30, 1892	276	3,227	2,554	28,267	4,217	5,158	7,147	36,652
June 30, 1893	299	3,229	2,727	31,729	4,320	5,435	7,346	40,393
June 30, 1894	324	3,034	1,823	23,422	4,300	5,433	6,447	31,889
June 30, 1895	170	2,375	1,811	25,696	4,155	5,677	6,136	33,748
June 30, 1896	181	2,873	1,861	29,969	4,406	5,845	6,448	38,687

[1] Figures for years 1911 to 1915 include industrial and other nontrain accidents to employees only; and for years 1908 to 1910 do not cover switching and terminal roads; otherwise, the statement covers all reportable accidents.

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TABLE 16.—NUMBER OF PASSENGERS, EMPLOYEES, AND OTHER PERSONS KILLED OR INJURED IN REPORTABLE STEAM RAILWAY ACCIDENTS OF ALL KINDS IN THE UNITED STATES, 1888 TO 1924, BY YEARS—Continued

Year ending—	Passengers		Employees		Other persons		Total	
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
June 30, 1897	222	2,795	1,693	27,667	4,522	6,269	6,437	36,731
June 30, 1898	221	2,945	1,958	31,761	4,680	6,176	6,859	40,882
June 30, 1899	239	3,442	2,210	34,923	4,674	6,255	7,123	44,620
June 30, 1900	249	4,128	2,550	39,643	5,066	6,549	7,865	50,320
June 30, 1901	282	4,988	2,675	41,142	5,498	7,209	8,455	53,339
June 30, 1902	345	6,683	2,969	50,524	5,274	7,455	8,588	64,662
June 30, 1903	355	8,231	3,606	60,481	5,879	7,841	9,840	76,553
June 30, 1904	441	9,111	3,632	67,067	5,973	7,977	10,046	81,155
June 30, 1905	537	10,457	3,361	66,833	5,805	8,718	9,703	86,008
June 30, 1906	359	10,764	3,929	76,701	6,330	10,241	10,618	97,706
June 30, 1907	610	13,041	4,534	87,644	6,695	10,331	11,839	111,016
June 30, 1908	381	11,556	3,405	82,487	6,402	10,187	10,188	104,230
June 30, 1909	253	10,311	2,610	75,006	5,859	10,309	8,722	95,626
June 30, 1910	324	12,451	3,382	95,671	5,976	11,385	9,682	119,507
June 30, 1911	299	12,042	3,602	126,039	6,495	12,078	10,396	150,159
June 30, 1912	283	14,938	3,635	142,442	6,667	12,158	10,585	169,538
June 30, 1913	350	15,130	3,715	171,417	6,899	13,761	10,964	200,308
June 30, 1914	232	13,887	3,259	165,212	6,811	13,563	10,302	192,662
June 30, 1915	199	10,914	2,152	138,092	6,270	13,034	8,621	162,040
June 30, 1916	239	7,488	2,687	160,663	6,438	12,224	9,364	180,375
Dec. 31, 1916	246	7,152	2,941	176,923	6,814	12,647	10,001	196,722
Dec. 31, 1917	301	7,582	3,199	174,247	6,587	12,976	10,087	194,805
Dec. 31, 1918	471	7,316	3,419	156,013	5,396	11,246	9,286	174,575
Dec. 31, 1919	273	7,456	2,138	131,018	4,567	10,579	6,978	149,053
Dec. 31, 1920	229	7,591	2,578	149,414	4,151	11,304	6,958	168,309
Dec. 31, 1921	205	5,584	1,446	104,530	4,345	10,571	5,996	120,685
Dec. 31, 1922	200	6,153	1,648	116,757	4,477	11,961	6,325	134,871
Dec. 31, 1923	138	5,847	2,022	152,218	5,225	13,647	7,385	171,712
Dec. 31, 1924	149	5,354	1,533	124,882	4,935	13,503	6,617	143,739
Dec. 31, 1925	171	4,952	1,594	118,874	5,001	13,603	6,766	137,435

Table 17 is drawn from Accident Bulletin Nos. 93 and 94 of the Interstate Commerce Commission (p. 114) and relates solely to trainmen on class I roads (i. e., roads whose annual operating revenues are above $1,000,000). The figures in the table have been rearranged to permit comparisons which are somewhat difficult to make in the original form. The rates have also been recalculated on the basis of 1,000,000 hours' exposure rather than of 1,000 men employed. This renders them fairly comparable with rates computed for other industries. It is an important step toward general comparability that the Interstate Commerce Commission has in recent years required exposure to be reported in terms of man-hours.

The table is of particular interest in view of recent discussion of the question, "Are accidents increasing?" In the course of such discussion it has become quite evident that our accident statistics are as yet neither sufficiently extended nor sufficiently precise to make possible a general answer to this question. There is a strong tendency to draw conclusions from current experiences, and if the present year shows higher rates or greater cost than the preceding year to suspect that this is an indication of a general tendency.

The showing of the railway accident statistics is accordingly important because they have been kept long enough and are of such a degree of accuracy as to justify regarding their indications as dependable. They afford an opportunity for testing the immediate impression by the trend disclosed by a longer interval.

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In this case, as always, the really informative figures are those of rates for fatality and for injury. If the number of trainmen, of fatalities, and of injuries be considered separately it will be difficult, if not impossible, to see clearly what the figures indicate. It is only when it is possible to unite the exposure with the number of cases or with the loss of time expressed in days and so to produce frequency or severity rates that the significance becomes evident. In this railway group it is not possible to determine severity rates.

The following observations regarding accident frequency on the railroads are suggested by inspection of the tables:

1. There was a marked drop from 1916 to 1925, this downward tendency being evident in each of the occupational groups. The fatality frequency for all trainmen declined 49 per cent and the injury frequency 40 per cent.

2. There are two years during the period—1920 and 1923—in which there was a decided upward tendency as compared with the preceding years. For all trainmen fatalities rose 19 per cent from 1919 to 1920 and 14 per cent from 1922 to 1923. Rates for injury rose 23 per cent from 1919 to 1920 and 9 per cent from 1922 to 1923.

3. As a rule there was a drop from 1916 to 1920 and a further drop from 1920 to 1923.

4. In fatalities the lowest rates are found in 1924, while the lowest year in injuries is 1921.

These figures are quite conclusive that whatever may be true of other industries, American railways have maintained a successful fight against conditions which tend toward increased accident rates.

TABLE 17.—FATALITIES AND INJURIES AND FREQUENCY RATES THEREFOR AMONG RAILROAD TRAINMEN, 1916 TO 1925, BY YEAR AND OCCUPATION

Number of trainmen

Occupation	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925
Yard service:										
Engineers	15,878	18,933	21,310	19,625	21,363	16,929	18,703	22,142	20,593	21,349
Firemen	16,190	19,516	21,979	20,031	21,549	17,343	19,249	22,664	21,106	21,804
Conductors	15,362	18,703	20,823	19,325	20,236	16,745	18,639	22,002	20,545	21,170
Brakemen	40,175	48,451	53,790	49,303	50,799	42,721	46,953	55,301	51,775	52,952
Total	87,605	105,603	117,902	108,284	113,947	93,738	103,544	122,109	114,019	117,275
Road freight service:										
Engineers	31,675	34,155	34,990	30,907	33,594	28,317	29,372	34,137	31,015	30,653
Firemen	33,637	36,828	38,102	32,938	35,756	30,317	31,507	36,504	33,346	32,714
Conductors	25,430	27,152	27,679	25,181	27,297	22,598	23,254	26,901	24,864	24,919
Brakemen	63,285	67,818	69,048	61,989	67,127	56,620	57,746	65,750	60,539	59,981
Total	154,027	165,953	169,819	151,015	163,774	137,852	141,879	163,292	149,764	148,267
Road passenger service:										
Engineers	13,429	13,297	12,709	12,442	12,930	12,924	12,710	13,042	12,977	12,930
Firemen	13,131	13,105	12,419	12,112	12,630	12,768	12,491	12,754	12,674	12,561
Conductors	10,633	10,655	10,444	10,382	10,788	10,546	11,380	11,756	11,730	11,726
Brakemen	14,800	14,854	14,423	14,904	15,849	15,315	14,350	14,558	14,369	14,218
Baggagemen	5,618	5,524	5,371	5,442	5,661	5,751	5,729	5,871	5,846	5,801
Total	57,611	57,435	55,366	55,282	57,858	57,304	56,660	57,981	57,596	57,236
All trainmen	299,243	328,991	343,087	314,581	335,579	288,894	302,083	343,382	321,379	322,778

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TABLE 17.—FATALITIES AND INJURIES AND FREQUENCY RATES THEREFOR AMONG RAILROAD TRAINMEN, 1916 TO 1925, BY YEAR AND OCCUPATION—Continued

Fatalities

Occupation	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925
	Number									
Yard service:										
Engineers	11	16	11	15	9	11	12	12	7	12
Firemen	22	23	27	14	18	7	5	17	5	9
Conductors	71	78	73	50	67	39	43	59	45	44
Brakemen	341	401	397	235	363	169	202	263	195	238
Total	445	518	508	314	457	226	262	351	252	303
Road freight service:										
Engineers	70	72	84	66	63	32	46	55	37	34
Firemen	107	122	132	70	84	36	44	59	43	30
Conductors	72	88	104	63	62	48	37	60	47	40
Brakemen	432	478	527	310	396	186	201	262	168	188
Total	681	760	847	509	605	302	328	436	295	292
Road passenger service:										
Engineers	45	56	59	50	69	37	40	44	32	44
Firemen	52	49	50	51	52	36	39	45	31	36
Conductors	6	5	11	6	6	9	3	7	4	5
Brakemen	8	18	25	17	16	10	9	10	13	7
Baggagemen	2	8	5	4	4	2	6	3	1	4
Total	113	136	150	128	147	94	97	109	81	96
All trainmen	1,239	1,414	1,505	951	1,209	622	687	896	628	691
	Frequency rates (per 1,000,000 hours' exposure)									
Yard service:										
Engineers	0.23	0.28	0.17	0.25	0.14	0.22	0.21	0.18	0.11	0.19
Firemen	.45	.39	.41	.23	.28	.13	.09	.25	.08	.14
Conductors	1.54	1.39	1.17	.86	1.10	.78	.77	.89	.73	.69
Brakemen	2.83	2.76	2.46	1.59	2.38	1.32	1.43	1.59	1.26	1.50
Total	1.69	1.64	1.44	.97	1.34	.80	.84	.96	.74	.86
Road freight service:										
Engineers	.74	.70	.80	.71	.63	.38	.52	.54	.40	.37
Firemen	1.06	1.10	1.15	.71	.78	.40	.47	.54	.43	.31
Conductors	.94	1.08	1.25	.83	.76	.71	.53	.74	.63	.54
Brakemen	2.28	2.35	2.54	1.67	1.97	1.09	1.16	1.33	.93	1.04
Total	1.47	1.53	1.66	1.12	1.23	.73	.77	.89	.66	.66
Road passenger service:										
Engineers	1.12	1.40	1.55	1.34	1.78	.95	1.05	1.12	.82	1.13
Firemen	1.32	1.25	1.34	1.40	1.37	.94	1.04	1.18	.82	.96
Conductors	.19	.16	.35	.19	.19	.28	.09	.20	.11	.14
Brakemen	.18	.40	.58	.38	.34	.22	.21	.23	.30	.16
Baggagemen	.12	.48	.31	.25	.24	.12	.35	.17	.06	.23
Total	.65	.79	.90	.77	.85	.55	.57	.63	.47	.56
All trainmen	1.38	1.43	1.46	1.01	1.20	.72	.76	.87	.65	.71

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TABLE 17.—FATALITIES AND INJURIES AND FREQUENCY RATES THEREFOR AMONG RAILROAD TRAINMEN, 1916 TO 1925, BY YEAR AND OCCUPATION—Continued

Injuries

Occupation	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925
	Number									
Yard service:										
Engineers	1,078	1,032	908	680	1,023	546	746	835	727	654
Firemen	1,644	1,905	1,708	1,171	1,691	854	1,082	1,561	1,104	1,123
Conductors	1,993	1,815	1,440	1,249	1,607	1,094	1,414	1,630	1,498	1,595
Brakemen	12,209	12,004	10,472	8,296	11,666	6,711	7,562	10,223	8,328	8,663
Total	16,924	16,756	14,528	11,396	15,987	9,205	10,804	14,249	11,657	12,035
Road freight service:										
Engineers	2,360	2,578	2,547	1,888	2,130	1,404	1,649	1,832	1,370	1,271
Firemen	5,145	6,232	5,706	3,945	5,085	2,791	3,274	4,036	2,747	2,584
Conductors	3,051	3,099	2,832	2,253	2,593	1,921	2,227	2,501	2,209	2,223
Brakemen	13,115	13,094	11,938	8,829	11,439	7,012	7,613	9,409	7,629	7,632
Total	23,671	25,003	23,023	16,915	21,347	13,128	14,763	17,778	13,955	13,710
Road passenger service:										
Engineers	714	738	777	660	804	602	715	761	617	532
Firemen	1,245	1,444	1,253	1,176	1,535	997	1,144	1,295	1,017	943
Conductors	298	327	304	263	274	209	282	304	302	241
Brakemen	718	699	674	579	688	570	570	639	587	533
Baggagemen	361	368	283	292	344	269	308	316	303	303
Total	3,336	3,576	3,291	2,970	3,645	2,647	3,019	3,315	2,826	2,552
All trainmen	43,921	45,335	40,842	31,281	40,979	24,980	28,586	35,342	28,438	28,297
	Frequency rates (per 1,000,000 hours' exposure)									
Yard service:										
Engineers	22.63	18.17	14.20	11.55	15.96	10.75	13.30	12.57	11.77	10.21
Firemen	33.85	32.54	25.90	19.49	26.16	13.41	18.74	22.97	17.44	17.17
Conductors	43.25	32.35	23.05	21.54	26.47	21.78	25.29	24.69	24.30	25.11
Brakemen	101.90	82.59	64.89	56.09	76.55	52.36	53.68	61.62	53.61	54.53
Total	64.40	52.89	41.07	35.08	46.77	32.73	34.78	38.90	34.08	34.21
Road freight service:										
Engineers	24.83	25.16	24.26	20.36	21.13	16.53	18.71	17.90	14.72	13.82
Firemen	50.99	56.41	49.91	39.92	47.40	30.69	34.64	36.85	27.46	26.33
Conductors	39.99	38.05	34.10	29.81	32.89	28.34	31.92	20.99	29.61	29.74
Brakemen	69.08	64.36	57.63	47.48	56.80	41.28	43.95	47.70	42.01	42.41
Total	51.23	50.22	45.19	37.34	43.45	31.74	34.68	36.29	31.06	27.49
Road passenger service:										
Engineers	17.72	18.50	20.38	17.68	20.73	15.53	18.75	19.45	15.85	13.71
Firemen	31.60	36.73	33.63	32.36	40.51	26.03	30.53	33.87	26.75	25.02
Conductors	9.34	10.23	9.70	8.44	8.47	6.61	8.26	8.62	8.58	6.85
Brakemen	16.17	15.69	15.58	12.95	14.47	12.41	13.24	14.63	13.62	12.50
Baggagemen	21.42	22.21	17.56	17.89	20.26	15.56	17.92	17.94	17.28	17.41
Total	19.30	20.75	19.81	17.91	21.00	15.40	17.43	19.06	16.36	14.86
All trainmen	48.94	45.93	39.68	33.15	40.70	28.82	31.54	34.31	29.50	29.22

Rubber Industry

THE rubber section of the National Safety Council has maintained a very carefully worked out statistical presentation of their experiences for the past five years. The rates are somewhat irregular, with no definite trend.

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TABLE 18.—NUMBER OF FULL-YEAR WORKERS, NUMBER OF ACCIDENTS, AND ACCIDENT FREQUENCY AND SEVERITY RATES IN RUBBER INDUSTRY, 1921 TO 1925,[1] BY YEARS

Year	Hours of exposure	Full-year workers	Number of accidents	Frequency rates (per 1,000,000 hours' exposure)	Severity rates (per 1,000 hours' exposure)
1921	83,101,000	27,700	2,196	26.42	0.94
1922	123,152,000	41,051	4,431	35.97	.87
1923	134,272,000	44,757	4,182	31.15	1.32
1924	125,594,000	41,865	3,449	27.46	1.00
1925	173,438,000	57,813	6,241	35.98	1.11

[1] National Safety News, March, 1923, p. 15; August, 1923, p. 39; November, 1923, p. 40; and February, 1925, p. 20.

Textile Industry

THE records of the textile section of the National Safety Council have not been maintained long enough to warrant any very positive conclusion beyond the confirmation of the idea that the textile industry is relatively of rather low hazard. When, however, accident frequency in such mills is greater than that in some of the best steel mills, it is obvious that there is opportunity for improvement. The intrinsic hazard of the steel and iron concerns is obviously much greater than that in textile establishments, and accident-prevention effort if undertaken with anything like the energy shown in the steel mills should markedly influence the rates.

TABLE 19.—NUMBER OF FULL-YEAR WORKERS, NUMBER OF ACCIDENTS, AND ACCIDENT FREQUENCY AND SEVERITY RATES IN TEXTILES, 1923 AND 1924

Year	Hours of exposure	Full-year workers	Number of accidents	Frequency rates (per 1,000,000 hours' exposure	Severity rates (per 1,000 hours' exposure
1923 [1]	46,343,000	15,448	604	13.03	0.67
1924 [2]	53,196,000	17,732	601	11.29	.89

[1] National Safety News, October, 1924. [2] Idem, August, 1925, p. 39.

Dust-Explosion Hazards in Industrial Plants

THE widespread extent of the dust-explosion hazard together with measures for preventing this type of accident were discussed by David J. Price in an address at the Industrial Accident Prevention Conference held at Washington, D. C., July 14–16, 1926, and by Hylton R. Brown in an article in the September, 1925, issue of Industrial and Engineering Chemistry. The following account is based on these two sources.

At least 28,000 industrial establishments in the United States, it is stated, are subject to the hazard of dust explosions and dust fires. These plants employ approximately 1,324,300 persons and manufacture products of an annual value in excess of $10,000,000,000. At

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least 281 explosions of this character have been reported to the Department of Agriculture. In 70 of these explosions 459 persons have been killed (an average of 8) and in 92 of them 760 have been injured (an average of over 8). The property loss in 144 cases amounted to more than $33,529,350, an average of nearly $240,000 for each explosion. These statistics of losses do not, of course, take into consideration the interruption to production, loss of time, and general disturbance of manufacturing operations as a result of explosions and fires of this character.

Investigations by the United States Bureau of Chemistry have shown that practically all combustible dusts and some dusts not generally considered combustible will explode with violence under favorable conditions, when mixed with the proper proportion of air and ignited by a flame, spark, or other source of ignition. Although there is much experimental work yet to be done to show the exact conditions under which various dusts will or will not explode, it is certain that dust from practically any material which will burn or be readily oxidized when fine enough and dry enough to form a cloud or be thrown into suspension in the air will explode if it comes in contact with a flame or spark sufficiently hot to ignite it. A temperature as low as 540° C. (1,004° F.), which is considerably below dull red heat, will ignite some dusts, while for some of the more explosive dusts an explosive mixture is formed by 7 milligrams of dust in a liter of air. There is no record of a spontaneous dust explosion, but a spark, flame, or other cause is necessary to ignite the dust.

The extent of the hazard of dust explosions it is said, is not yet recognized by manufacturers, since there is often a false feeling of safety caused by the fact that in their experience no dust explosions have ever occurred in their particular industry.

During 1924 dust explosions and the resulting fires caused the death of 45 persons, the injury of 28 others, and the destruction of about $3,000,000 worth of property. These explosions occurred in starch and woodworking plants, leather-grinding mills, feed-mixing plants, and grain elevators, and in 1923 explosions were reported of lignone, dye, aluminum bronze, dried wood pulp, spice dust, paper dust, wood flour, powdered milk, cork dust, and hard-rubber dust.

A flame of any kind, including sparks from static electricity and the breaking of lighted electric lamps, may start an explosion whenever enough dust to form an explosive mixture is in the air. The plants in which steps should be taken to eliminate the dust-explosion hazard are classified in three groups: Plants handling dusty or powdered material in package form, those in which it is handled in loose form, and plants manufacturing or producing explosive dust.

In all these classes of industries general cleanliness throughout the plant is a requisite in the prevention of dust explosions, and dust should not be allowed to accumulate overhead or where a jar or concussion would throw the dust into suspension. Cleanliness is the principal precaution necessary in warehouses or shipping rooms where the material is handled in packages or bulk lots, and the chief danger of dust in sufficient amounts to propagate a flame is from the accumulation of dust from packages which are accidentally broken

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open. In plants handling dust in loose form, as in packing, mixing, sifting, etc., there are more opportunities for dust clouds to be formed, as the machinery creates drafts which stir up the dust and tend to keep it in suspension. An electric spark or arc may occur in many places about an industrial plant, causing an explosion if there is sufficient dust present. In dusty places it is advisable to install electrical apparatus—motors, switches, etc.—in a separate dust-proof room. All electric lamps should be protected with heavy dust-proof globes and strong guards, and drop cords and extension lights should not be used. The danger from static electricity is shown by the large number of explosions and fires on threshing machines and in cotton gins. Charges of more than 50,000 volts of static electricity have been measured on threshing machines and on moving belts in industrial plants. Various methods of eliminating static electricity are used, but they are not always effective. If the charge is present on the machinery, grounding the frame may eliminate it, and if it is present on moving equipment, brushes, combs, and wipers resting on the moving parts may be effective, while maintaining a high humidity around the equipment may remove the hazard.

Mechanical causes of dust explosions which may be largely eliminated by care in the maintenance and use of machinery are metallic sparks, friction fires, and hot bearings. While the open flame for lighting industrial plants has been generally superseded by electric lights, lanterns are often used when the power goes off or the plant is shut down for repairs, and the use of blowtorches and metal-cutting or welding flame creates a hazard when used in making repairs.

In plants in which the dust or powdered material is produced or manufactured, plant cleanliness is of even more importance than in those in which it is handled in loose form, and dust-collecting and dust-removing equipment of the best type is an absolute necessity, while every attempt must be made to remove the various sources of ignition. The high-speed grinding equipment used in these plants is a frequent source of fires and explosions through the production of metallic sparks. The entrance of foreign material into the grinding machine, which may strike sparks and ignite the dust within the machine, is difficult to control. Screens and separators will partially remove it, but in plants where grinding is the major part of the process it may be necessary to introduce an inert gas into the grinding machines to prevent the formation of an explosive mixture of dust and air. It has been shown by tests that it is impossible to produce an explosion in most of the dust now considered explosive if the oxygen in the air in which the dust is carried in suspension has been reduced to 12 per cent. This requires replacing 21 per cent of the oxygen in the air with an inert gas such as nitrogen or carbon dioxide. A greater reduction is necessary in a few cases, as sulphur dust requires a reduction of the oxygen content to 8.5 per cent. A thorough study is, however, necessary in cases where the use of inert gas is considered essential to determine the amount of gas necessary to prevent explosions.

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Eye Conservation in Industry

THE importance of the use of goggles in the prevention of serious eye accidents is the subject of an article on "Saving eyes and eyesight," by Joshua E. Hannum in Industrial Psychology, October, 1926. Such accidents are among the most serious which can happen to industrial workers, as they entail not only suffering, loss of time, and expense, but also permanent disability and decrease or loss of earning power.

In the prevention of eye accidents cooperation between the management, the foreman, and the workman is necessary. It is generally accepted that it is the duty of managers to furnish protection to workmen, but in the matter of safeguarding the eyes the objection of the workmen to wearing goggles frequently has to be overcome, and this often requires great resourcefulness, patience, and perseverance.

One of the most important reasons for the reluctance of workers to wear goggles is defective vision, which is often unsuspected both by the management and by the individual himself. Goggles must, of course, be fitted so that they are comfortable to wear, but unless they correct defects of vision their function is only partially fulfilled. After the proper corrective lenses have been provided and the goggles properly fitted to the face the problem becomes primarily educational and calls for persistent and painstaking education of workman, gang boss, foreman, and executive. In order to carry on an effective eye-safety campaign it must be planned both for permanency and efficiency, as temporary drives are not so successful in accomplishing lasting results as persistent and unremitting efforts. Preventive measures include elimination of eye hazards at their source through the use of various types of mechanical safeguards, engineering revision (as, for example, changing a manufacturing process, redesigning a machine or tool, rearranging the physical equipment, changing the method of work, or replacing hand-operated with automatic machines), and education.

In organizing an eye-protection program it is necessary first to make a careful survey of operating conditions, noting the various hazards, after which mechanical safeguards should be installed or engineering changes made. Educating the worker in eye protection should include meetings by departments and mass meetings in which employees should be warned of the special hazards to which they are exposed, and the policy of the company in regard to the care of eyes should be stated. Intensive drives for a "No eye-accident week" should be made frequently, and it is important in such a campaign to see whether goggles are furnished for the various jobs where they are necessary, to examine each employee's goggles to see if they fit properly and give adequate protection, and in cases where employees object to wearing goggles to investigate each case promptly and carefully. One man in each safety organization should be instructed in the use and care of goggles and should be in charge of their distribution, repair, adjustment, and sterilization. The cooperation of the foreman in the effort to make the men wear the goggles should be secured, and it should be their constant duty to see that they are worn by the men.

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Each new employee, when employed on a job for which goggles are needed, should be given an eyesight test, and if correction is needed, the corrective lenses should be used in the goggles and the goggles should be fitted to give as much comfort as possible. Different styles of approved types of goggles should be provided by the company from which selections can be made. There are four different methods which may be followed in supplying goggles to the employees. They may be furnished to the men without charge; the workmen may be required to pay for them, either partially or entirely on the assumption that they will then be better appreciated; a deposit may be required when they are issued and returned when they are turned in; or a charge may be made if goggles are carelessly lost or broken.

Adjustment of the goggles to the face should include proper fitting of the nose piece, avoidance of tension in the adjustment of the headband, which should not be worn around the middle of the head, as it frequently causes headaches, and avoidance of pressure on the temples. Metal cases for the goggles should be provided and should be sterilized as well as the goggles before being given out. Employees should not be allowed to exchange goggles unless they have been sterilized, because of the danger of spreading infectious diseases. Frequent inspection of goggles is necessary in order to make sure that they are in good condition, in some plants a daily inspection being desirable.

If, after all such measures have been taken employees still refuse to be careful, the only alternative is discipline, the penalty for not wearing goggles in hazardous occupations or places being immediate discharge or a temporary lay-off without pay for a first offense.

Fatal Accidents in Various Countries

A COMPILATION of fatal accident rates in various countries including the United States, in 1911 and the latest years for which data are available, is contained in a report of the committee on public accident statistics of the National Safety Council, issued in 1926.[4]

The following statements are taken from this report:

During the year 1925 there occurred in the United States, according to the estimate of the committee, nearly 90,000 deaths from accidents of all kinds. The significance of this heavy toll may be seen clearly when comparison is made with the figures available for other countries of the world. The latest available figures for the United States which can be compared with data for other countries are those for 1924. In that year in the United States registration States there occurred 76.2 fatal accidents per 100,000 of population. In England and Wales during the same year the death rate for all accidents was only 34.1 per 100,000 of population. This means that fatal accidents in the United States occur nearly two and one-quarter times as frequently as they do in England. For Scotland the death rate for all accidents combined was 45.2 per 100,000 in 1924, and for Australia the rate in that year was 48.

The latest available data for other countries relate to the years 1922 and 1923. In New Zealand the rate for fatal accidents in 1923 was 46.1 per 100,000, and for Canada 56.5 per 100,000. In 1922 Belgium showed a fatal accident rate of

[4] National Safety Council. The toll of public accidents. Chicago, 1926.

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28.3 per 100,000, and Norway a rate of 39.6 per 100,000. These international figures show the tremendous margin which exists between the accident death rate in this country and the rates prevailing in other civilized countries of the world. A comparative review of the latest available facts for the several countries is shown in the accompanying table. We show also similar data for the year 1911.

An item of interest in this table is the substantial decline shown in the death rates for accidental falls, burns, drowning, steam railroad accidents, and accidents arising out of the operation of street cars. Safety campaigns in industry, for the protection of life on steam railways and in the operation of street cars, have shown substantial results in lowered death rates in the principal countries of the world. But for automobile accidents the death rate has risen, and this item in the accident record now assumes first importance. In the United States the death rate for automobile accidents and injuries in 1924 was more than seven times that which prevailed in 1911; in England and Wales the automobile accident death rate of 1924 was nearly four times that for 1911. While the automobile accident death rates for the year 1911 in both the United States and England and Wales were almost the same, there was a very wide divergence in 1924; in the United States the rate was 15.6 deaths per 100,000 and in England and Wales only 6.5 deaths per 100,000.

DEATH RATES PER 100,000 POPULATION FOR SPECIFIED ACCIDENTS IN CERTAIN COUNTRIES

Country and year	Total accidents	Accidents caused by—					
		Falls	Burns	Drownings	Steam railroads	Automobiles	Street cars
United States registration States:							
1924	76.2	13.1	6.9	6.6	6.5	15.6	1.6
1911	84.6	15.0	7.7	9.4	13.0	2.2	3.2
England and Wales:							
1924	34.1	7.1	4.0	4.0	1.5	6.5	.2
1911	45.5	7.8	6.8	7.3	2.3	1.8	.1
Scotland:							
1924	45.2	4.5	[1] 6.8	6.3	1.7	4.9	.4
1911	55.2	5.2	[2] 8.5	10.6	3.1	.8	.3
Belgium:							
1922	28.3	3.6	3.1	3.8	2.6	2.4	[3]
1911	34.7	6.6	4.4	9.5	3.6	[3]	[3]
New Zealand:							
1923	46.1	2.8	[2] 2.0	13.1	5.4	4.6	1.1
1911	46.4	2.2	[2] 6.8	16.0	[3]	[3]	[3]
Australia:							
1924	48.0	5.9	5.0	7.4	3.5	6.6	.9
1911	66.1	7.8	7.0	16.0	[3]	[3]	[3]
Canada:							
1923	56.5	6.7	4.2	9.9	4.3	5.4	.5
1911	[3]	[3]	[3]	[3]	[3]	[3]	[3]
Norway:							
1922	39.6	4.9	1.6	20.4	[3]	[3]	[3]
1911	47.1	3.8	1.8	30.2	[3]	[3]	[3]

[1] Includes conflagration. [2] Includes scalds. [3] Data not available.

Industrial Accident Experience of American Industry in 1925

THE National Safety Council in a report on industrial accident experience for 1925 (National Safety News, October, 1926) has, for the first time, attempted to compute accident rates for American industry as a whole. The computations are based on the statistical tabulations compiled by the industrial sections of the council, with the exception of the cement and the mining industries

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for which statistics furnished by the Portland Cement Association and the United States Bureau of Mines, respectively, have been used.

The reports, which cover 1,231 establishments or locations, show an average frequency rate of 30.60 per 1,000,000 hours worked and an average severity rate amounting to 2.02 days lost per 1,000 hours worked. Since the majority of the companies for which data were secured are more or less actively engaged in accident prevention, it can be assumed, however, that the rates for the United States as a whole are somewhat higher. It is impossible to make a fair comparison between the various industrial groups, because of varying occupational risks, but it is of interest to note that in the textile section 35,251 employees worked 77,924,601 hours with only 1 accidental death.

The detailed record sheets of the council show that accident frequency and severity rates have been reduced through the organized safety work in different industries. This reduction is considered to be due to a considerable extent to the fact that employees have been impressed with the importance of reporting minor injuries promptly, the installation of adequate first-aid facilities, and the cooperation of industrial physicians. The report stresses the importance of a uniform method of keeping plant records and also of making yearly reports in order that the statistics may more accurately represent the accident experience of each industry.

The following table shows the accident experience of companies in 13 principal industries throughout the country for the year 1925:

INDUSTRIAL ACCIDENT EXPERIENCE IN AMERICAN INDUSTRY IN 1925

Industry	Number of establishments or locations	Total number of employees	Total hours worked	Number of cases of—			
				Death	Permanent disability	Temporary disability	Total
Automotive	196	304,639	762,565,341	22	560	17,279	17,861
Cement	120	[1]	97,414,794	61	77	2,403	2,541
Chemical	65	50,128	124,148,274	38	86	2,473	2,597
Construction	36	12,777	25,462,441	24	18	1,736	1,778
Metals	280	250,511	661,189,970	86	545	18,915	[2] 21,492
Mining	210	[1]	68,518,787	68	62	6,721	6,851
Packers and tanners	17	14,642	35,485,110	1	41	1,383	1,425
Paper and pulp	99	41,813	104,623,437	21	57	3,943	4,021
Petroleum	18	[1]	214,054,563	49	206	5,600	5,855
Quarry	36	5,598	15,322,643	13	23	708	744
Rubber	22	85,730	173,438,000	10	70	4,974	5,054
Textile	32	35,251	77,924,601	1	31	1,029	1,061
Woodworking	100	26,939	69,836,087	11	128	2,948	3,087
Total	1,231	[3] 828,028	2,429,984,048	405	1,904	70,112	[2] 74,367

[1] Not available.
[2] This total is reported to be correct; figures for details were not given in every case.
[3] Not including 3 industries.

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INDUSTRIAL ACCIDENT EXPERIENCE IN AMERICAN INDUSTRY IN 1925—Continued

Industry	Number of days lost on account of—				Frequency rates (per 1,000,000 hours' exposure)	Severity rates (per 1,000 hours' exposure)
	Death	Permanent disability	Temporary disability	Total		
Automotive	132,000	245,262	405,730	[2] 810,610	23.42	1.06
Cement	366,000	[1]	[1]	487,189	26.08	5.00
Chemical	228,000	70,632	38,379	337,011	20.91	2.71
Construction	144,000	20,491	28,210	192,701	69.54	7.57
Metals	516,000	398,773	269,738	[2] 1,202,387	32.50	1.82
Mining	408,000	72,675	102,193	582,868	99.99	8.51
Packers and tanners	6,000	23,139	15,796	44,935	40.15	1.27
Paper and pulp	126,000	39,862	59,166	225,028	38.43	2.15
Petroleum	294,000	112,401	91,957	498,358	27.35	2.33
Quarry	78,000	27,317	11,775	117,092	48.56	7.64
Rubber	60,000	63,700	68,498	192,198	29.15	1.11
Textile	6,000	16,420	12,778	35,198	13.61	.45
Woodworking	66,000	67,374	58,901	192,275	44.20	2.75
Total	2,430,000	1,158,046	1,163,121	[2] 4,917,850	30.60	2.02

[1] Not available.
[2] This total is reported to be correct; figures for details were not given in every case.

Industrial Accident Prevention Conference, Washington, D. C.

THE industrial accident prevention conference held in Washington, D. C., July 14–16, was called by the United States Secretary of Labor for the purpose of developing more effective cooperation among different organizations interested in accident prevention. Approximately 270 delegates were present from 33 States, the District of Columbia, Canada, and Argentina, including State officials having to do with accident prevention and reporting and representatives of safety organizations, of the large casualty insurance companies, and of industrial enterprises which have led in the development of the safety movement. The general subject of the conference was the value of statistics for accident prevention and its purpose was the formulation of a program by which uniform and comparable accident statistics could be collected and compiled on a national scale.

The imperative need in any accident-prevention program, which was stressed by the Secretary of Labor in his address and by many of the other speakers, is a knowledge of the full extent of the accident problem. This he believes can be secured through the establishment of a safety division in the United States Bureau of Labor Statistics which would cooperate with other agencies in bringing together complete accident statistics regarding industries not now covered and which would provide for the prompt publication of accident data and the transmission of these data to American industry. The value of a national museum of safety to be located in Washington as an adjunct of the Bureau of Labor Statistics was also pointed out by the Secretary of Labor.

In summing up the purposes for which the conference was called, Ethelbert Stewart, United States Commissioner of Labor Statistics, stated that all the Bureau of Labor Statistics desires to do is to serve

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as a clearing house for the information the States are gathering, the most important consideration being the furnishing of these reports so that the accident rates can be computed on a man-hour or day basis.

Resolutions passed by the conference recommended a unified, standard system of reporting and distributing information, and the enactment by the different States of such legislation as shall be necessary to provide for reports by employers which will allow the compilation of accident frequency and severity rates.

Rock Dust as a Preventive of Coal-Dust Explosions

THE use of rock dust in coal mines to prevent or limit coal-dust explosions has been advocated by the United States Bureau of Mines since its establishment in 1910, although at first it was suggested only as an alternative to watering. Much experimental work has been necessary to determine the relative explosibility of different kinds of coal, the best kinds of rock to use for dusting, the amount of rock dust necessary to extinguish an explosion, and the best methods of dusting. A recent study [5] of the methods and costs of rock dusting coal mines, published by the Carnegie Institute of Technology, contains a summary of the principal facts regarding coal-dust explosions established by this and earlier investigations.

Prior to 1924, the report states, no companies had done any real rock dusting and only a few rock-dust barriers had been erected. The long series of tests conducted by the Bureau of Mines have determined, however, the best methods of application of rock dust to secure the greatest efficiency and considerable progress has been made in the past two years in rock dusting. In September, 1925, it was reported that 102 companies in 12 States had instituted rock dusting in 211 mines,[6] while the rock dusting of a number of mines by other companies was contemplated. These companies produced approximately 11 per cent of the tonnage reported by all bituminous mines in the United States in 1924.

In July, 1924, the State Industrial Commission of Utah adopted regulations making rock dusting compulsory, following the disastrous explosion at the Castlegate mine in that State. The movement has also been accelerated by the fact that in many States additional credit for rock dusting has been allowed by the compensation-rating bureaus.

The Bureau of Mines tests have shown that it is necessary to cover the ribs, roof, and floor with sufficient rock dust to render the coal dust inert to explosibility. As proof of the efficacy of rock dusting, one of the most recent cases in which an explosion was stopped when it reached the rock-dust barriers is cited in the report.

[5] Carnegie Institute of Technology. Methods and costs of rock dusting bituminous coal mines, by C. W. Owings and C. H. Dodge. Pittsburgh, 1925.

[6] The American Association for Labor Legislation has kept a record during the past three and a half years of coal companies using rock dust to prevent coal-dust explosions. It is reported in the American Labor Legislation Review, June, 1926 (p. 152), that on May 1, 1926, 150 companies in 16 States and in Canada had equipped one or more of their mines with the rock-dust safeguard or had begun to install it.

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This explosion occurred in a mine of the West Kentucky Coal Co. in June, 1925. A miner drilled into a strong gas feeder in an entry which had not yet been rock dusted. The gas was ignited by his open-flame cap lamp and an explosion followed which killed the 17 men in the entry. The explosion was stopped, however, when it reached the rock-dusted entries and the lives of about 130 men working in other parts of the mine were saved. There have been numerous other instances both in this country and in Europe in which explosions have been stopped or limited by rock dust, though this is one of the most recent and the most definite.

Coal-dust explosions are caused by the rapid burning of coal-dust particles suspended in air. The degree of explosibility is directly affected by the size and quantity of coal dust present and the ease with which the coal dust is raised in a dense cloud. Dry pulverized dust is the most explosive, as it is easily raised to form a cloud and contains a maximum amount of particles and surface. Tests at the Pittsburgh Experiment Station have shown that 0.0312 ounce of pure 200-mesh Pittsburgh coal dust per cubic foot of entry would propagate flame if ignited. There is usually a large excess of coal dust present in mines, but before an explosion can occur there must be an advance wave sufficiently strong to produce a dust cloud and the more thoroughly the dust and air are mixed the greater will be the force of the explosion. This factor is frequently overlooked, especially if an explosion originates in rooms or near an area where the pressure is reduced by passing into wide spaces. An explosion may die out, therefore, through failure of the dust to be thrown into the air in a sufficiently dense cloud to propagate the explosion. But this fact is often disregarded and credit given to the absence of coal dust or to efficient sprinkling when the absence of a dust cloud is the real cause of the explosion being stopped.

Limiting or preventing coal-dust explosions involves the prevention both of heat being carried from one particle of the combustible material to another and of the formation of a dense cloud. The most efficient means of preventing the first condition has been found to be the use of rock dust. The fine rock-dust particles blown into the air by the advance wave of an explosion surround the coal dust and insulate it, and also by cooling the mixture of air and dust below the ignition point of the coal extinguish the flame. This condition obtains if the rock dust is dry, which is usually the case during the winter months. During the summer, particularly in the shallow mines, both the coal dust and rock dust may become damp and in that case the dust will not rise into suspension so that an incipient explosion will be stopped by the lack of material upon which to feed.

The use of water at the face where the most coal dust is made is of great value as a measure supplementary to the use of rock dust and the use of water on the cutter bar of mining machines, which is being done by several companies, is advocated in the report. The coal shot down by the miner should also be wet thoroughly before loading and all loaded cars should be wet before leaving the working face. An automatic sprinkler installed at the parting to wet the top of loaded cars and another located near the tipple or shaft to wet the empty cars before they are returned into the mine further reduce the amount of coal dust usually carried through the mine.

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These precautionary measures, the report states, have been used successfully in Alabama and in several of the Western States.

In addition to the efficiency of rock dust in limiting explosions, it has the advantage that it readily reflects light and increases the illumination. As coal absorbs 90 per cent of the light, the reflected light given by rock dust reduces the number of accidents due to poor illumination and the number of haulage accidents will be decreased, especially where the roof has fallen on the track as the dark mass will show against the white background or where the roof is weak and cracks the rock dust immediately directs attention to the crack.

Rock dust, because of its incombustible character, may also be utilized in fighting mine fires, and one case is reported in which a fire was extinguished by it. In this fire, rock dust taken from the V-trough barriers was thrown toward the fire, the dust cloud effectively cooling the air so that the men steadily advanced until the fire was reached, when the rock dust was thrown on the burning coal. This smothered the flame and cooled the burning mass so that it could be loaded into mine cars and carried outside.

Development of National Safety Codes

ONE of the most significant accident-prevention developments of recent years has been the movement to formulate safety codes for various industries of such authority that they might be accepted as definitive by the various States as well as by the industries themselves.

The Bureau of Labor Statistics has contributed to this development in the following ways:

1. (*a*) The Commissioner of Labor Statistics has represented the Department of Labor on the American Engineering Standards Committee; and

(*b*) Has been a member of the safety code correlating committee on behalf of the International Association of Industrial Accident Boards and Commissions.

2. A member of the bureau staff has had a consulting relation to all the codes and has participated in the formulation of 12 codes which have been approved or are nearly ready for approval.

3. The bureau has printed and widely distributed the approved codes.

Before outlining the steps by which the safety code program reached its present status it is desirable to explain the origin and purposes of the American Engineering Standards Committee.

Five national engineering societies—namely, the American Society of Mechanical Engineers, the American Society of Civil Engineers, the American Institute of Mining Engineers, the American Institute of Electrical Engineers, and the American Society for Testing Material—had each been doing a considerable amount of standardizing in the interest of safety. A notable instance was the Boiler Code of the American Society of Mechanical Engineers. While most of this work was done by single societies in their own particular field, there

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were constant instances of overlapping and disagreement. To avoid this and bring to bear on the problems needing solution the combined knowledge of the entire group of societies, these five engineering societies agreed to form a body, the American Engineering Standards Committee, composed of representatives of each of the five societies, which should serve as a clearing house for standardization projects.

It was determined that this American Engineering Standards Committee should not itself undertake the production of standards, but should supervise the procedure and place the stamp of its approval on the standards when satisfactorily completed. The later modifications of the original plan made to accommodate the safety code program are indicated below.

When the United States entered the World War there was an immediate and intense speeding up of the manufacturing operations carried on in the navy yards and arsenals. This was accompanied by increased casualty. In view of the situation Mr. Lew R. Palmer, then president of the National Safety Council, suggested a survey of these establishments for the purpose of determining what could be done to safeguard the workers. The survey was conducted by some 40 safety men under the general supervision of Mr. Arthur H. Young. As a result a considerable number of changes were suggested and carried out. Safety directors were engaged for the several Government plants and a series of safety codes were prepared.

Much of the work of preparing these codes was done at the Bureau of Standards. Dr. E. B. Rosa, then chief physicist, became interested and was instrumental in bringing together, on January 15, 1919, at the Bureau of Standards, a representative conference. After full discussion it was decided to put the question of the plan to be followed to letter ballot. The plan apparently favored by the conference was that the codes should be developed under the procedure of the American Engineering Standards Committee, provided that committee would modify its constitution in such a way as to admit to membership other national organizations besides the five engineering societies which were the original members.

Later the constitution was amended and other organizations admitted, making the present membership 35 national bodies.

At a second conference in December, 1919, three organizations, namely, the International Association of Industrial Accident Boards and Commissions, the National Safety Council, and the United States Bureau of Standards, were empowered to designate the members of what was at first called the national safety code committee and later the safety code correlating committee.

This committee assembled immediately after the conference and drew up a list of codes thought to be of immediate importance. This list contained some 36 titles, but was subsequently enlarged to more than 40.

The steps in developing a national safety code may be summarized as follows:

1. A national conference or some national organization indorses the proposition as desirable and suggests a sponsor or sponsors.
2. The scope of the code is determined.
3. The sponsor organizes a sectional committee.

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4. Sponsor reports personnel of sectional committee to American Engineering Standards Committee.

5. American Engineering Standards Committee transmits report to special committee which considers the representative character of proposed sectional committee.

6. Special committee returns list of sectional committee with approval or suggestions for modification.

7. American Engineering Standards Committee approves sectional committee.

8. Sectional committee formulates code.

9. When completed the committee takes a letter ballot and reports results to sponsor.

10. Sponsor transmits code to American Engineering Standards Committee and asks approval as "Recommended American Practice" or as "American Standard."

11. American Engineering Standards Committee approves code.

This is a rather tedious process but is necessary to insure that all persons interested should have an opportunity to express themselves.

Of the upward of 40 codes projected some 17 have reached the point of approval. These codes, while not adopted unchanged in many States, have had a large influence in determining the form and content of the rules adopted by those States which have prepared codes.

At the present time there is under way a project closely connected with this program of safety codes. For a number of years the committee on statistics and insurance cost of the International Association of Industrial Accident Boards and Commissions devoted much time and energy to the preparation of directions for the treatment of statistical data regarding industrial accidents. The results of this labor were published as Bulletin 276 of the Bureau of Labor Statistics.

These standard methods have been employed by the bureau in its accident studies and have also been used by the sections of the National Safety Council. It now seems desirable to review the standards to determine whether they need modification to adapt them to present conditions and to fit them for more general use.

A sectional committee of American Engineering Standards Committee is now in process of formation and will proceed to the consideration of the statistical standards as promptly as possible.

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INDUSTRIAL DISEASES AND POISONS

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Recent Studies of Industrial Diseases and Poisons

THE work of the Bureau of Labor Statistics on the subject of industrial health has included a number of studies of special hazards connected with industrial processes and of the effects of poisonous substances used in different industries. These have been published as separate bulletins or in the Labor Review. During recent months four such bulletins have been issued—Hygienic conditions in the printing trades (Bul. No. 392), Phosphorus necrosis in the manufacture of fireworks and in the preparation of phosphorus (Bul. No. 405), Deaths from lead poisoning (Bul. No. 426), and Health survey of the printing trades, 1922 to 1925 (Bul. No. 427). In addition to these original studies, developments in the field of industrial health are followed in the Labor Review, in which are published, from month to month, digests of investigations by scientific organizations, such as the United States Public Health Service, and of articles appearing in the various medical and scientific journals. So many requests are received by the bureau for information on these subjects that summaries have been prepared and are given below of what appear to be the more important articles and bulletins thus published by the bureau of such recent date that their contents have not yet been incorporated in standard textbooks and publications.

Abrasive Industry: Dust Hazard in the Manufacture of Artificial Abrasive Wheels [1]

THE results of a study of the effect of the inhalation of dust from artificial abrasive wheels were given in the Journal of Industrial Hygiene for August, 1925.

The use of artificial abrasives in industry has increased to such an extent in the past 10 years that the natural sandstone wheel which is known to cause silicosis is now used only in the manufacture of cutlery and axes and even in these industries is being gradually replaced by the artificial abrasive wheel. The extent of the use of artificial abrasives is shown by the fact that in an average year about 60,000,000 pounds of artificial grinding wheels are produced in this country. The artificial abrasives most used are aluminium oxide and silicon carbide, each having hard tough crystals which, when divided, are wedge shaped in form and have a cutting power almost as great as that of a diamond.

Reference is made by the writers to a study of the dust hazard in the abrasive industry made in 1919 by Winslow, Greenburg, and Greenburg, in which it was found that the inorganic dust in the air of abrasive factories included coke, crude aluminium hydroxide,

[1] Journal of Industrial Hygiene, August, 1925. "The dust hazard in the abrasive industry," by W. Irving Clark, M. D., and Edward B. Simmons, M. D.

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a fused aluminium compound (aloxite or alundum), and carborundum (silicon carbide). The last two materials are extremely hard and both possess the property of fracturing in very irregular particles and there is every reason to suspect that such dusts would be very deleterious to health.

The present study, which is clinical in character, represents 14 years' experience in the largest single abrasive and grinding wheel factory in the world. The average number of employees during this period has been 2,100, about one-fifth of whom have been exposed to the inhalation of large quantities of dust.

The departments in which the processes are very dusty are the abrasive department, where the lumps of abrasive are crushed into grains and sized; the shaving department, where the dry wheels, still in clay form, are shaped on a special type of potter's wheel; the truing department, where the vitrified wheels are cut to exact size on specially constructed lathes; and the clay department, which is the dustiest of all, where the clays which make up the bond in the wheels are weighed and mixed. In all these departments very complete dust-removal systems have been in operation for years, the amount of dust so collected daily being at present 12,000 pounds.

Complete physical examinations are given all applicants for employment, and employees working in dusty departments are reexamined as frequently as seems necessary. After 10 years' exposure to the inhalation of dust, employees are examined annually. In addition the factory health department studies their working conditions and every effort is made to reduce the dust hazard. The majority of the employees in the dusty departments are of Swedish descent and the next largest group is Italian.

Physical examinations and X-ray pictures of the chests of 79 men employed 10 years or more in the dusty departments showed that there were signs of silicosis in only one case and this was in the incipient stage. This worker was employed in the clay plant where there was no artificial abrasive dust but where an analysis of the clay showed that it contained 9 per cent of pure silica in the form of feldspar, so that this was probably a case of true early silicosis.

The pictures of the lungs of the workers exposed to artificial abrasive dust did not show any typical signs of silicosis, although in four cases there was evidence that the lungs were working hard to keep themselves clear of dust. The specialist who examined the pictures considered that if these were the lungs of granite workers, they would represent a perfectly safe risk for an indefinite period, and it was also his opinion that none of the men, with the exception of the man exposed to clay dust, would develop active symptoms of pneumoconiosis.

X-ray pictures of the chests of seven men at two plants of the company where the crude artificial abrasive is made, who had been exposed to the dust for periods of from 5½ to 18 years, showed no evidence of the presence of dust disease.

An analysis of the causes of all the deaths reported by the benefit association since 1892 showed that 6½ per cent were due to pulmonary tuberculosis; the rate for the city as a whole was 5 per cent. As babies and very young children were included in the latter figure, however, it seems that there is probably little difference in the

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death rates for the two groups. During the past 10 years 31 cases of pulmonary tuberculosis had occurred among the employees. Twenty cases occurred in the nondusty departments, where there was an average of 1,868 employees, and 11 in the dusty departments, where the number of employees averaged 332. While the percentage of cases was slightly higher in the dusty departments, the risk does not seem to be great, as the percentage of the total force developing tuberculosis each year during the 10-year period was only 0.014 per cent.

The following conclusions are reached by the writers as a result of the 14 years' observation and of the data presented in the paper:

1. In factories which provide proper methods of dust removal, the continuous inhalation of artificial abrasive dust, extending over many years, does not produce the symptoms or present the X-ray findings of pneumoconiosis.
2. The number of cases of pulmonary tuberculosis occurring in the artificial abrasive industry does not greatly exceed the number normally present in the community.
3. Workers who habitually use grinding wheels will run but slight risk of developing pneumoconiosis if they use artificial abrasive rather than sandstone wheels for all grinding operations, and if the machines upon which the artificial abrasive wheels are mounted are properly hooded and excessive dust removed by suction fans.

Anthrax: Cases in Various Industries

STATISTICS on anthrax morbidity and mortality in the United States, compiled by a committee appointed by the American Public Health Association, were published in the American Journal of Public Health (New York City), January, 1926. The study shows that State reports in regard to the number of anthrax cases are, in many instances, very incomplete and very few States are able to give definite information as to source of infection.

More or less complete reports from 34 States show that during the period from 1919 to September 1, 1925, there were 632 anthrax cases with 177 deaths. Of these cases, 147 occurred in the leather industry, 17 in the wool industry, 40 in the hair and brush industry, 68 came from animal contact, 49 from shaving brushes, and for 311 the cause was not stated.

The reports indicate that anthrax is indigenous in a number of areas in the United States and that the time may come when we shall be obliged to consider as suspicious and needing disinfection all hides, skins, hair, and wool from certain districts in the United States as we do now from many foreign countries. Tannery anthrax appears to fluctuate with changes in industrial conditions but shows no indication of decreasing. At present practically all industrial anthrax is due to handling foreign raw materials.

Arsenic Trichloride: Effects of Exposure on Workers

THE results of a study of the conditions under which arsenic trichloride is manufactured and of the hazards to which the workmen are exposed were published in the Journal of Industrial Hygiene (Boston), December, 1922, and January, 1923. The study, which involved extensive laboratory research and factory investigation, dealt with the local caustic action of arsenic trichloride, the

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absorption of the poison through the skin, the results of inhaling its vapor, and measures for avoiding risks to the workers.

The particular circumstance leading to this study occurred in England during the war, when a workman employed upon the commercial production of arsenic trichloride died following the accidental spilling of some of this fluid over his right leg.

A post-mortem examination revealed a large amount of arsenic, indicating that a soluble form of it had been freely distributed through the body, probably by the blood and lymph. The presence of a considerable amount in the lungs, which can not be explained in the same way, indicates that shortly before death the patient had inhaled air laden with arsenic. It was impossible to determine how much was absorbed through the skin, although the patient's death was due to acute arsenicism. The general condition of the organs, however, indicated that those engaged in the same work were exposed to very material danger even in the absence of a similar accident.

Commercial arsenic trichloride, which is formed by distilling a mixture of arsenic trioxide with sulphuric acid and sodium chloride, is an oily, very mobile fluid, which emits fumes and evaporates very rapidly when exposed to air. It is highly poisonous and has well-known caustic properties.

Animal experiments proved that the arsenic is absorbed by the tissues and is widely distributed throughout the body in a very short time. When it is applied to the skin it kills the tissues very rapidly, this action being somewhat retarded by washing the part affected within one minute of the time of application, although the final result is not affected. Within a few hours after such application arsenic can be recovered from most of the tissues or organs of the body, there being a tendency to accumulation in such organs as the brain, liver, and kidneys. Inhalation of 1 part of arsenic trichloride to 40,000 parts of air killed mice in 5 minutes, while an air stream which distributed the mixture unequally affected the animals variously, some dying after a few hours while others appeared to recover completely. All the animals which died from the effects of the inhalation gave marked evidence of respiratory affection.

Experiments in regard to the evaporation of arsenic trichloride showed that it is very diffusible and enters readily into various combinations, forming visible particles where the air contains moisture. There is also evidence that when the air is unsaturated with water there are invisible vapors present.

The study of actual factory conditions was made in a plant in which the retorts and condensers were housed in a shed open on all sides. The openings through which the retorts were filled were located on a long upper platform and slightly below this was another platform on which arsenic trioxide and chloride of sodium were mixed. The retorts and furnaces were located below the upper platform, and a conduit leading from the bottom of each retort carried the residue from the retort to trucks. A large tank was used for storing the arsenic trichloride and close to this tank there were rows of iron drums filled with the arsenic trichloride which were ready for shipping.

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The salt and the arsenic trioxide were mixed just before being shoveled into the retorts, each of the men wearing a handkerchief over the mouth and nose to protect himself from the dust. Irritating fumes escaped in considerable amounts from various places about the retorts. Test plates were placed in different positions and at various distances from the retorts. The deposits on the plates showed that a material amount of arsenic could be obtained from the air near any of the retorts. Experiments as to protective measures showed that "special ventilating arrangements are needed to remove fumes which arise when arsenic trichloride is necessarily exposed to the air in the filling of drums or the sampling of their contents. Air containing fumes so removed could be purified by a fine water spray before being discharged in the atmosphere. All persons employed on this work should wear some impervious general clothing, and only experience can show whether they should not also wear suitable gas masks."

The persons conducting the experiments were subjected to accidental local and general exposure both in the laboratory and at the factory, and the following effects, which confirmed the conclusions arrived at from the experiments, were noted:

* * * On two occasions small necrotic lesions of the epidermis were experienced, which resembled those obtained experimentally with animals. Exposure to fumes was followed by pharyngeal and laryngeal irritation, headache, giddiness, nausea alternating with feelings of excessive hunger (gastric irritation), abdominal discomfort, pains in the thighs, legs, and feet, and edema of the feet. At the same time the urine, which normally contained as a maximum 5 mg. of arsenic trioxide per 100 c. c. was found to contain 20 mg.

Benzol Poisoning: Final Report of National Safety Council Committee [2]

THE final report of the special committee appointed by the 1922 National Safety Congress to study the benzol problem covers the chemistry and industrial uses of benzol, acute and chronic benzol poisoning, the physiological effect of benzol, the extent of the hazard in American industry, a study of conditions in selected industries with respect to the exposure to benzol, and the results of various tests showing the toxicity of benzol.[3]

Benzol or benzene (C_6H_6) is a colorless liquid obtained from the distillation of coal tar and from the strippings of coke-oven gas. Benzol was discovered in 1825, and in 1869 a process for recovering it from illuminating gas was patented. It did not play a really important part in industry, however, until it began to be produced from coke-oven gas between 1884 and 1887. The commercial uses of benzol grew steadily from 1890 to 1915, and the large production of benzol during the war in connection with the manufacture of explosives led to a rapid broadening of the field for the industrial uses of this substance.

Benzol is highly insoluble in water and slightly soluble in alcohol, but can be completely mixed with ether, acetic acid, carbon disul-

[2] National Safety Council. Chemical and Rubber Sections. Committee on Benzol. Final report. [Chicago], National Bureau of Casualty and Surety Underwriters, May, 1926.

[3] See Labor Review, May, 1924, for the first report of this committee.

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phide and a large number of organic substances. There are a number of substances known commercially as benzol, some of which contain benzene, while others do not. All, of course, should be clearly distinguished from benzine, which is a petroleum product.

There are two very distinct types of processes involved in the use of benzol in industry. In the first (which includes such industries as the production of benzol through the distillation of coal and coal tar, the blending of motor fuels, and the chemical industries including oil extraction, dye and dye intermediates, and the manufacture of paints, varnishes, and stains, and paint and varnish removers) benzol is used in large quantities, but because of the amounts used it is necessary that it be kept in a closed pipe-line system, since any openings represent a loss of valuable vapors and a corresponding financial loss. The second group of processes involves the use of benzol as a solvent or vehicle, and as a part of the process it must be removed so as to leave the originally dissolved substances in place. The industries in which it is used in this manner are the rubber industry, the artificial leather industry, manufacture of sanitary cans, in dry cleaning, and in the handling of paints, varnishes, and stains. The benzol is removed through evaporation, and in most cases this is done in the cold, but the compound may be warmed, in which case the benzol is naturally removed with greater rapidity.

Poisonous Effects of Benzol

BENZOL is ordinarily introduced into the body through the inhalation of its fumes. It exerts three more or less distinct toxic effects: It acts as an anesthetic or narcotic, leading to dizziness, faintness, and coma, or death; it acts as a nerve irritant, producing characteristic spasmodic movements, with actual damage to nerve tissue which may result in coma and death; and it possesses a definite and destructive power for the blood cells and the organs which produce them.

Like many other toxic substances used in industry, benzol may produce either acute or chronic poisoning, depending upon whether the exposure is brief and intense or moderate and prolonged.

Acute Benzol Poisoning

Acute poisoning is usually caused either by the sudden discharge of vapors through the failure to regulate a condensing apparatus or through a leak in the piping, or by the entrance of workmen into tanks or other confined places where benzol has been stored or used. The symptoms of acute poisoning are dizziness, faintness, and drowsiness, culminating in unconsciousness and coma; pallor of the face and blueness of the lips and finger tips; feeble and rapid pulse; breathlessness and a feeling of constriction in the chest which may end in immediate death from respiratory paralysis; visual disturbances, tremors, and convulsions and occasionally mania or delirium; hemorrhages into the tissues, causing red spots on the skin and internal surfaces, and if the substance has been swallowed, symptoms of acute gastrointestinal irritation. Death may result within a few minutes after the exposure or the patient may apparently recover

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and then die several days later. There seems to be decided variation in individual susceptibility and the effects of the fumes appear to be increased by vigorous muscular exertion, as a man rendered unconscious by benzol vapors may recover while those overcome while rescuing him may die. The treatment of acute benzol poisoning requires, first of all, prompt restoration of the respiratory function through artificial respiration.

Chronic Benzol Poisoning

Chronic benzol poisoning is most liable to occur in the group of industries in which benzol is used as a solvent and is evaporated into the air of the workroom, resulting in continuous or repeated exposure to the fumes.

As the fumes are in concentrations too low to produce marked narcotic effects, the condition is much more obscure and the cause is more likely to be overlooked. The more common symptoms of chronic poisoning are general systemic disturbance resulting in headache, dizziness, weakness, loss of appetite, and loss in weight; pallor which is shown by blood examination to be true anemia; marked reduction in white blood cells as shown by microscopical examination; bleeding from mucous membranes with purpuric spots caused by hemorrhages within the tissues; sore and spongy gums and burning sensation in eyes and throat; and shortness of breath and tightness in the chest. There may be, also, abdominal pains, nausea and vomiting, and sometimes slight tremors, visual disturbances, and abnormal sensitiveness to touch. Rarely, there are rashes and skin eruptions, or convulsions and delirium.

If chronic benzol poisoning is detected in its early stages and the person removed from exposure to the fumes, complete recovery usually takes place, but in severe cases of chronic poisoning part of these symptoms may persist for a long time after exposure has ceased; and about one in five of the cases reported in the literature has ended fatally.

The most universal and the most characteristic effect of chronic benzol poisoning is the destructive effect on the blood and the blood-forming centers, affecting first the white blood cells and later the red cells, and producing a pronounced anemia. The decrease in the number of white blood cells generally precedes any other symptoms, and with a history of exposure to benzol the diagnosis of benzol poisoning may be made on this basis with reasonable accuracy. The seriousness of this condition is also shown by the observations of a number of investigators that it greatly reduces the resistance to pneumonia and other bacterial infections.

Extent of the Hazard and Conditions in Factories Using Benzol

THE industries using the largest amounts of benzol were found to be the chemical industries, the can-seal industry, the rubber industries, and the manufacture of artificial leather. In the chemical industries, however, the number of employees exposed is small, as the material is usually used in inclosed processes. During the time the committee was carrying on the study, 22 fatalities and more than

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100 nonfatal cases of poisoning were reported in various types of industries, showing that the hazard is a serious one and forms one of the major problems of industrial hygiene.

A field study was made in 12 plants to show the extent of the benzol hazard under different working conditions. The majority of these were rubber factories manufacturing different kinds of articles, but dry cleaning, sanitary-can manufacture, and artificial leather factories were also included. The conditions under which the benzol was used and the type of exhaust ventilation were studied in the different plants visited and analyses made of the air under both summer and winter conditions. When small amounts of benzol were used without special ventilation the average concentrations were found to vary from 100 to 1,360 parts of benzol per million parts of air, while under similar conditions with large amounts of benzol in use the averages ranged from 220 to 1,800 parts per million. Plants using large amounts of benzol, but with inclosed systems or local exhaust ventilation, had averages of only between 70 and 500 parts per million, while the plant with the most efficient exhaust system had an average of only 70 parts in summer and 90 parts in winter. Some of the workrooms studied, however, had concentrations of benzol approximating the amounts which have been found to cause acute poisoning. In a compound mixing room the amount of benzol present in the air was 2,640 parts and in a dry-cleaning establishment 4,140 parts. It has been shown that 4,700 parts may produce confusion in an individual in half an hour, while 550 parts have been found to be associated with clinical poisoning. However, by the use of efficient local exhaust ventilation and the safeguarding of all the details of the processes, it has been shown to be possible to use benzol in coating and mixing rooms and in sanitary-can manufacture with a degree of air pollution of less than 100 parts of solvent vapors per million parts of air.

Extent of Early Benzol Poisoning Under Different Working Conditions

AN EXAMINATION was made of workers exposed to benzol under different conditions, the white blood cell count being taken as the index of early poisoning. Eighty-one workers were examined, the test showing clear evidence of blood-cell destruction in 26, or 32 per cent, as indicated by a white count of 5,500 or less. In 10 cases the number of white cells was below 4,000 and in 3 cases below 3,000. Examination of a control group of about 50 workers not exposed to benzol failed to show any abnormal blood condition among them. Complete medical examinations were obtained in only 9 instances, but of these, 5 gave a history suggestive of chronic benzol poisoning, with two or more of the characteristic symptoms.

The results of these examinations were regarded as decidedly disturbing, not only because about one-third gave evidence of chronic poisoning but also because the evidence of poisoning was clear in a number of cases where there was good exhaust ventilation and a small amount of air contamination. The results of the tests and examinations showed, therefore, that the control of the benzol

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hazard, in all except completely closed systems, is extremely difficult; that there were few systems of exhaust ventilation capable of keeping the concentration of benzol in the air of the workroom below 100 parts per million; and that even when this is done there is a decreased but nevertheless a real hazard of benzol poisoning.

Protective Measures

FROM the evidence obtained in the investigation it appears that in the type of industries in which benzol is used in inclosed systems with proper care in the construction, maintenance, and operation of these systems, the use of benzol can be made sufficiently safe to warrant its use. Serious accidents may occur, but the danger may be controlled by proper attention to safeguarding these processes. The principal methods of protection which should be enforced in this type of industry are regular and systematic inspection of apparatus to insure against breaks or leakage, thorough removal of all traces of benzol from tanks or other receptacles which have contained the substance before they are entered for cleaning or repairing, and the protection of persons entering inclosed spaces which may contain benzol fumes by the use of positive-pressure air helmets or hose masks, all such work to be done by two or more men who are familiar with the dangers involved.

The danger of chronic poisoning from benzol used as a solvent may be minimized by the installation of proper safeguards and examination of workers at regular intervals to detect incipient poisoning. In these processes exposure may be diminished by using inclosed systems wherever possible and effective local exhaust ventilation. In most instances where benzol is evaporated at room temperature local exhaust ventilation with down draft is recommended; but where localized heat is applied in the evaporation of the benzol the ventilation system should be provided with upward draft, which should be of sufficient intensity and applied so closely to the point of origin of the evaporation as to insure the complete removal of the benzol fumes.

A thorough physical examination before employment and reexamination, with systematic blood counts once a month thereafter, is considered a necessary precaution for all workers engaged in processes where there is exposure to benzol fumes. No worker should be employed on such a process who shows signs of organic disease of the heart, lungs, or kidneys, hemorrhagic tendencies, or anemia, or any unusual blood picture. Any worker should be removed from these processes who shows, upon reexamination, such symptoms of benzol exposure as hemorrhages from mucous membranes, decrease of more than 25 per cent in either white or red blood cells, or hemoglobin below 70 per cent.

An experimental study of the comparative toxicity of benzol and its higher homologues—toluol, xylol, and Hiflash naphtha—which was carried out on animals showed that although the narcotic effects of the latter group of solvents are greater than that of benzol they are almost without effect on the central nervous system or on the blood-forming organs, both of which are seriously damaged by benzol.

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As the boiling points of toluol and xylol are relatively high, they would never be present in concentrations of over 1,000 parts except as the result of some temporary accident, and in this case their irritant action would serve as an immediate and automatically effective danger signal. The laboratory investigations show, therefore, that the higher homologues of benzene are relatively harmless and the committee urges that manufacturers give serious attention to the possibility of substituting one of these substances in the place of benzol wherever the conditions of the manufacturing process make it possible to do so.

Brass Foundries: Health Hazards

A STUDY of the health hazards of the brass foundry trade by the United States Public Health Service included field investigations covering 22 foundries, both large and small establishments, and laboratory experiments of the effects upon animals of the inhalation and ingestion of zinc oxide.

The 22 plants visited in the course of the investigation employed approximately 340 men. The foundries were of both modern and old-fashioned construction and the working conditions were considered typical of the trade generally at the present time. The metals used in making brass castings are an alloy of copper and zinc in varying proportions, with sometimes other metals, such as phosphorus, copper, manganese, lead, tin, iron, aluminum, and antimony, depending upon the type of casting to be produced.

The principal hazards present were found to be exposure to dust, inadequate illumination and glare, poor ventilation, the presence of fumes, gases, smoke, heat, cold, and dampness, and in some instances unsatisfactory personal service facilities.

The dust hazard in the foundry rooms comes mainly from sand during its preparation for molding and in knocking out the castings, while a considerable quantity of dry sand accumulates on the floor and is stirred up by the men's feet. The metallic dusts present in the foundry rooms consist usually of cadmium oxide, copper, manganese, iron, antimony, tin, and lead, and are formed during the melting, casting, and cleaning processes. Zinc oxide, which is always present in the air of foundries, but is present in enormous quantities during the casting, is particularly important in its effect upon the workmen. There are also the "parting dusts," which are trade products and contain, either singly or in combination, such substances as ground bone, lycopodium, flour, sand, fuller's earth, graphite, and lampblack. These dusts are sifted over the surfaces of the molds and are inhaled to some extent by the workers during the sifting. It was the general impression among the workers that the parting dusts were harmful and it was claimed that they caused an irritation of the nose and throat, resulting in a hacking cough.

An analysis of the dust in air samples obtained from several foundries showed that, in the rooms in three foundries where there was an appreciable amount of zinc dust, from 33 to 64 per cent of

[4] United States Public Health Service. Public Health Bulletin No. 157: Health hazards of brass founders, by Dr. John A. Turner and Dr. L. R. Thompson. Washington, 1926.

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the men had been affected at various times by the zinc, while in one case all the men examined gave histories of frequent attacks of zinc intoxication.

During the melting and pouring of the alloy in the molding room of a foundry dense white clouds, composed chiefly of zinc oxide, escape from the crucibles and ladles. These fumes, which rise first to the ceiling, spread through the room unless sufficient exit is provided for them at the top of the room. In bad weather the increased water saturation of the air also interferes to some extent with the escape of the fumes from the room.

In the cleaning department, the dust to which the workers are exposed is chiefly siliceous in character. Sand blasting is an extremely dusty process and workers can not remain at this work for more than a year or two without serious detriment to health unless the work is done in an inclosed sand-blasting chamber. Chipping the rough and uneven surfaces of castings exposes the worker to injury from metallic particles which are too large to be classed as dust but which may be injurious, especially to the eyes, while in grinding, workers are exposed to both siliceous and metallic dust as well as to particles from the grinding wheels.

In the foundries studied, physical examinations were made of 212 workers, of whom 102 were exposed to zinc oxide during the melting and pouring of brass and had suffered from "brass-foundry men's ague," 68 had been exposed but were not affected, and 42 had not been exposed. The workers who gave histories of zinc oxide poisoning were shown to be in somewhat poorer physical condition than those who were exposed to the fumes but not affected by them, but on account of the small number of workers examined it was not possible definitely to relate these conditions to their exposure to zinc.

Of the 102 men giving a history of attacks of the ague, 26 per cent had an average of one attack a week, 11 per cent had two a week, and 2 per cent, three a week; while the frequency of the attacks varied in the remainder from an average of one per month to one or two a year. The majority stated that the attacks occurred only during the winter months, and that in inclement weather an attack was almost certain, while symptoms were generally said to be milder during the summer than during the winter months. An appreciable degree of toleration—that is, less severe symptoms—was said to have been developed by 18 per cent of the men. Of 84 men reporting on the length of employment before ill effects of the zinc oxide were produced, 25 per cent reported that the first symptoms occurred within periods varying from one day to less than one month; 25 per cent, from one month to less than three months; 6 per cent, from three months to less than six months; 5 per cent, from six months to one year; 14 per cent, from one to two years; and the remainder from two to five years. Those men who had been employed for years without experiencing any ill effects considered that their escape was due to the good ventilation in the shops in which they were employed, as well as to acquired immunity. Premonitory symptoms of the attacks were experienced by 75 per cent of the men, either in the middle of the afternoon, upon leaving work and coming in contact

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with the cold outside air, or later in the evening. In the majority of cases no disabling effects were present the day following the attack. The premonitory symptoms are a general feeling of illness, followed by a chilly sensation, and sometimes accompanied by a stiffening of the back and arms. Other symptoms frequently present are dull headache, metallic taste, irritation of the throat, coughing, burning of the eyes, and thirst. After the development of the premonitory symptoms the chilly sensation may develop into a severe chill, after which there is a fever with more or less profuse sweating, the other symptoms gradually subsiding. Sixty-six of the men reported that they felt no ill effects on the morning following the attack, while the remaining 36 stated that the effects lasted part or all of the following day.

Supplementing this study in brass foundries, 19 workers who were exposed to zinc oxide dust in a zinc oxide plant were examined. Twelve of these men gave a history of oxide chills, the similarity in the symptoms and the severity of the attacks being so constant in all stages that there seemed to be no question that the basic causative factor was the same in both industries. The symptoms among brass-foundry men, however, were present only in acute attacks, while among the oxide workers they were fairly constant, due to the fact that the oxide workers work in an atmosphere heavily laden with the oxide dust.

Carbon Monoxide: Physiological Effects of Low Concentrations

A CONTINUATION of the study by Dr. Yandell Henderson and his coworkers on the effect of low concentrations of carbon monoxide for short periods under normal air conditions, which was carried out for the New York and New Jersey Tunnel Commissions, was made by officials of the Public Health Service and the Bureau of Mines.[5] The correctness of the findings of Doctor Henderson, which resulted in the recommendation that the Hudson vehicular tunnel should be so ventilated that persons passing through should not be exposed for a longer period than 45 minutes to more than 4 parts of carbon monoxide in 10,000 parts of air, was confirmed by the subsequent study. In these latest experiments, which were carried out at the Pittsburgh Experiment Station in a specially constructed gas-tight room, the effect of long exposure, the effect of strenuous exercise, and the effect of high temperature and humidity in low concentrations of carbon monoxide were studied.

The tests showed that with the subject at rest, exposure for 6 hours to 2 parts of carbon monoxide in 10,000 parts of air caused saturation of 16 to 20 per cent of the hemoglobin of the blood, with very mild subjective symptoms and no noticeable aftereffects. Exposure to 3 parts of carbon monoxide caused saturation of 22 to 24 per cent in 4 hours and 26 to 27 per cent after 5 hours, while the symptoms and aftereffects were moderate after 5 hours' exposure. The exposure to 4 parts of carbon monoxide caused a saturation of 15 to 19 per cent of the hemoglobin with carbon monoxide at the end

[5] United States Public Health Service. Physiological effects of exposure to low concentrations of carbon monoxide, by R. R. Sayers, F. V. Meriwether, and W. P. Yant. Reprint No. 748 from Public Health Reports, May 12, 1922.

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of 1 hour and 21 to 28 per cent at the end of 2 hours, with moderate to marked aftereffects.

With the subject exercising strenuously for 1 hour, exposures with from 2½ to 4 parts of carbon monoxide showed mild to moderate symptoms of poisoning and aftereffects, while, with the subject at rest but with temperature and humidity high, exposure for one hour to 3.1 parts of carbon monoxide gave a 16 per cent saturation of the hemoglobin, mild symptoms of poisoning, and mild to moderate aftereffects.

The conclusions drawn from the study are summarized as follows:

1. The combination of CO with hemoglobin takes place slowly when the subject is exposed to low concentrations and remains at rest, many hours being required before equilibrium is reached.
2. The rate of combination of CO with hemoglobin takes place much more rapidly during the first hour of exposure than during any succeeding hour, with the subject remaining at rest.
3. Strenuous exercise causes much more rapid combination of CO with hemoglobin than when the subject remains at rest. The symptoms of CO poisoning are emphasized by exercise.
4. High temperature and humidity, with a given concentration of CO, cause more rapid combination of CO with hemoglobin than do normal conditions of temperature and humidity.

All symptoms and effects described in this paper are called acute in character. None of the subjects has shown any permanent deleterious effects from the exposure to CO.

Carbon Monoxide Poisoning: Diagnosis

A REPORT of the Bureau of Mines (Serial No. 2476), in addition to reviewing the results of much of the investigative work relating to carbon monoxide poisoning,[6] gives a list of symptoms caused by various percentages of carbon monoxide in the blood and announces the development by scientists of the bureau of a method and an apparatus for testing the blood for carbon monoxide hemoglobin.

The general symptoms of poisoning from carbon monoxide, which are divided into two stages, and the predominating symptoms which accompany the various percentages of blood saturation are given as follows:

STAGE 1.—Tightness across forehead, dilatation of cutaneous vessels, headache (frontal and basal), throbbing in temples, weariness, weakness, dizziness, nausea and vomiting, loss of strength and muscular control, increased pulse and respiration rates, collapse. All of these are greatly increased and accelerated with exercise on account of the additional need of oxygen in the tissues. Men at rest have often been exposed to carbon monoxide all day without noticing any marked ill effects, but on walking home or exercising have experienced severe symptoms, even to unconsciousness.

It is seldom that all of these symptoms are experienced by the same individual. Also in some cases the poisoning may proceed to the stage of syncope without the victim feeling any of these symptoms, this frequently occurring if the poisoning has been rapid.

STAGE 2.—Increased pulse and respiration, fall of blood pressure, loss of muscular control, especially sphincters, loss of reflexes, coma usually with intermittent convulsions, Cheyne-Stokes' respiration, slowing of pulse, respiration slow and shallow, cessation of respiration, death.

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[6] See Labor Review, August, 1917, pp. 76–78; February, 1919, pp. 219–221; November, 1919, pp. 263, 264; February, 1922, pp. 116, 117; March, 1922, pp. 147, 148; December, 1922, pp. 181–184.

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SYMPTOMS CAUSED BY VARIOUS PERCENTAGES OF CARBON MONOXIDE IN THE BLOOD

Percentage of blood saturation	
0–10	No symptoms.
0–20	Tightness across forehead, possibly slight headache, dilatation of cutaneous blood vessels.
20–30	Headache, throbbing temples.
30–40	Severe headache, weakness, dizziness, dimness of vision, nausea and vomiting, collapse.
40–50	Same as previous item, with more possibility of collapse and syncope, increased respiration and pulse.
50–60	Syncope, increased respiration and pulse, coma, with intermittent convulsions, Cheyne-Stokes' respiration.
60–70	Coma, with intermittent convulsions, depressed heart action and respiration, possibly death.
70–80	Weak pulse and slowed respiration, respiratory failure, and death.

The diagnosis of carbon monoxide poisoning is usually made from the symptoms and because of the fact of possible exposure. Since the symptoms produced are common to other causes, however, and since carbon monoxide is sometimes present in unexpected places, an accurate diagnosis on such a basis is not always possible. The only reliable test is an examination of the blood for carbon monoxide hemoglobin. An apparatus and method called the "Pyro-tannic acid method for the quantitative determination of carbon monoxide in blood and air" has been developed. By the use of this apparatus, which is pocket size and which permits even unskilled users to make an accurate diagnosis, a small amount of blood, which can be obtained from a puncture wound in the finger, can be quantitatively examined in a few minutes for carbon monoxide and an accurate diagnosis made.

Carbon Monoxide Poisoning: Treatment [7]

THE serious nature of carbon monoxide asphyxia and the possibility of poisoning from this gas in so many industries and under so many conditions has resulted in much experimentation among certain scientists for the purpose of determining the best treatment in these cases. The results of experiments made by Dr. Yandell Henderson and Dr. Howard W. Haggard, who were appointed a subcommittee of the Commission on Resuscitation from Carbon Monoxide Asphyxia to conduct both field and laboratory investigations in the treatment of carbon monoxide asphyxia, were given in the Journal of the American Medical Association (Chicago) for September 30, 1922.

It has been well established by this and previous investigations that carbon monoxide has no direct toxic action on the brain, other organs, or tissues of the body, but that it acts wholly through its combination with the hemoglobin or red coloring matter of the blood. By this combination the hemoglobin is for the time deprived of the power to carry oxygen from the lungs to the tissues of the body,

[7] See Labor Review, August, 1917, pp. 76–78; February, 1919, pp. 219–221; November, 1919, pp. 263, 264; February, 1922, pp. 116, 117; March, 1922, pp. 147, 148.

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developing a condition of asphyxia or oxygen deprivation. The investigation also confirmed previous findings that this combination is reversible; that is, that the oxygen-transporting power of the blood may be completely restored through displacing the carbon monoxide by mass action of oxygen.

The principal treatments advocated for carbon monoxide poisoning have been bleeding, transfusion, artificial respiration, and inhalation of oxygen. Bleeding is considered by the writers to tend still further to deplete the oxygen-carrying power of the blood, while transfusion to be effective must take place within one hour, or two at the most, and this is rarely possible. Artificial respiration, preferably by the prone pressure method, is frequently necessary to start spontaneous breathing, but plays a less important part than in resuscitation from drowning or electric shock, where the victim is practically saved when natural respiration has been restored.

While oxygen inhalation is theoretically the proper method for displacing carbon monoxide from the blood, in practice it has been found that it needs some auxiliary agent. The ineffectiveness of oxygen alone has been found to be due to several causes. Among them are the lack of efficient apparatus for administering oxygen and the delay which usually takes place before the application of treatment. Asphyxia does not terminate with the removal of the victim from the presence of the gas, as the carbon monoxide comes off from his blood so slowly in the first two or three hours that, although his lungs may be filled with fresh air, the brain continues to be asphyxiated. If, however, the carbon monoxide is not eliminated within four or five hours, it does very little good to administer oxygen after that time, as the brain probably becomes edematous (swollen) and degenerative processes set in. Continued coma, seen frequently in hospitals, is probably due, therefore, to the brain edema and not to the asphyxia. The third reason advanced for the relative ineffectiveness of oxygen inhalation, even when an efficient inhaler is used, is that in partial accidental asphyxiations or in those performed experimentally on investigators by themselves they have largely retained the ability of their circulation and respiration to eliminate the asphyxiant unaided, while in more profound asphyxia oxygen inhalation often fails, as it is not a respiratory stimulant.

Normal breathing is largely regulated by carbonic acid or carbon dioxide produced in the muscles and organs and carried to the respiratory center in the brain by the blood. Owing to the oxygen deficiency an abnormal and excessive action is produced on this center in asphyxia, so that the carbon dioxide is rapidly exhausted, leading to subsequent subnormal breathing or even to respiratory failure. Since an accessory factor seems to be necessary, it has seemed logical to supply enough carbon dioxide to stimulate the patient to vigorous breathing in order that he may draw the oxygen in and thus wash out the carbon monoxide.

An experiment carried out upon animals, in which all were asphyxiated almost to the point of death, showed by the blood tests an approximately complete elimination of carbon monoxide from the blood in from 20 to 25 minutes when oxygen containing 10 per cent of carbon dioxide was used, while treatment with inhalation with oxygen containing a small amount of carbon dioxide and with oxygen alone

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showed progressive increases in the time necessary for less complete elimination. Animals which were given no treatment showed a very slow rate of elimination, especially in the first hour. A similar experiment performed by the writers and some of their associates on themselves differed from the first in the use of higher concentrations of carbon monoxide but with shorter periods of exposure. The amount of carbon dioxide used in the treatment was reduced to 5 per cent, as this was found adequate to stimulate respiration and was free from the disadvantages, such as headache and labored breathing, which were felt with higher concentrations of the carbon dioxide. By the use of oxygen plus this amount of carbon dioxide breathing was increased from 300 to 500 per cent with a proportional acceleration in the removal of carbon monoxide, a blood saturation of from 40 to 50 per cent—a dangerous amount—being reduced in half an hour to only 10 or 12 per cent, an amount which is quite harmless.

Further investigations of actual cases of gas poisoning were carried out in New York City in cooperation with the Consolidated Gas Co. and the health department. The use of the inhalational treatment showed that all the patients except one made uncomplicated and complete recoveries within a few days, none of the patients developing pneumonia as a result of the gassing. In fact, in regard to pneumonia the results seem to indicate that the inhalational treatment may have a distinctly prophylactic effect.

For some years work has been under way on an improved inhaler and various improvements have been devised, including a siphon bellows reducing valve, said to be the most perfect device of its kind, which has been patented by the Government for general use. The authors warn against the use of the common artificial respiration devices such as the pulmotor in place of their special inhaler, as it is considered that the pulmotor may do serious harm to the patient.

The article concludes with the following summary:

1. Manual artificial respiration by the prone pressure method should be employed when respiration has stopped to start spontaneous breathing. This object may be assisted by administering oxygen + CO_2 simultaneously.

2. Inhalation of oxygen and 5 per cent carbon dioxide, by causing a very full ventilation of the lungs, rapidly eliminates carbon monoxide from the blood and thus terminates the condition of asphyxia. This treatment is highly effective, inducing rapid and complete recovery if applied early enough. It requires merely general medical supervision, and may be safely and efficiently carried out by intelligent men of the type composing the emergency crews of a city gas company.

3. Until more definite knowledge has been obtained regarding the conditions in the lungs, brain, and elsewhere, subsequent to gassing, and until treatment can be based on such knowledge and has been tested experimentally, it is inadvisable to apply any specific treatment in postasphyxial gassing cases. The evidence here reported indicates that oxygen + CO_2 inhalation and rapid elimination of carbon monoxide greatly decreases the liability to nervous and pulmonary asphyxial sequelæ.

Chemical Poisoning: Effects and Treatment

THE effects on workers of various poisonous chemicals were described in an article in the Boston Medical and Surgical Journal, October 22, 1925, by Dr. William F. Boos, the facts brought out being based on his experience as a consultant in the diagnosis and

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treatment of chemical and medical injuries sustained in a variety of industrial occupations. The cases referred to him include many in which the cause of the injury is not definitely known or in which there are certain possible causes but the symptoms are not sufficiently like those seen in the past to warrant a definite diagnosis, as well as cases which have not responded properly to the treatment used by the plant physician or the insurance-company doctor.

The lack of chemical training on the part of the physicians treating these cases is the principal reason for the failure to obtain satisfactory results. That is, the recognition of a chemical injury and the subsequent treatment of such an injury require a knowledge of the chemical behavior of the substance producing the injury. While it is probably impossible to secure for plant work physicians who are well-rounded chemists, still it is possible for the physician in charge in a given industrial plant to become familiar with the chemical agents with which he has to contend, as usually they are quite limited in scope. In a chemical manufacturing plant, however, in which a variety of corrosive and poisonous products are manufactured, it is important that the physician shall be really well trained in chemistry, or if the physician is not so trained, intelligent cooperation between the plant physician and the chemical expert of the plant will bring about satisfactory results.

In order to emphasize the importance of cooperation between doctor and chemist or engineer the writer gives his experience with a number of industrial poisonings which were referred to him largely as a result of the lack of such cooperation.

One example is that of repeated and serious chrome burns which had occurred among the employees of a chrome-tanning plant, where the plant doctor had, as is usual with practitioners in such cases, applied boric ointment, bandaged the parts, and sent the men home with instructions to report daily to have the dressings renewed. When chrome acid is spattered on the skin it penetrates very slowly and does not at first produce symptoms, but after about 24 hours there is a sensation of itching and burning, which grows steadily worse. When ointment is applied and the part bandaged, as was done in the plant in question, the removal of the chromic acid is effectually prevented, the latter continues to penetrate into the lower layers of the skin, and at the end of a week the employee is suffering agonies from multiple, deep chrome burns.

In a chrome-tanning plant the employees subject to these burns are those who remove the skins from the chrome bath (a mixture of dilute hydrochloric acid and bichromate of potash), placing them first in the washing machine and later in the "hypo" (sodium thiosulphate) bath. Replying to a question as to whether men who handled the skins after they had been through the hypo bath ever developed chrome burns, the superintendent of the plant answered in such a way as to indicate that he knew that the hypo solution immediately neutralizes the chromic acid, rendering it harmless. It had not occurred to him, however, to tell the doctor about it, and the hypo solution—the most efficient neutralizer known when the burns are in the early stages—was not used because chrome burns were thought to be a medical injury. In the later stages, however,

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when the burn is deep, painful, and very tender, other treatment is required.

Nitrous-fume poisoning in munitions plants was frequently met with during the war. The active principle of nitrous fumes is NO_2, an acid gas which when first inhaled causes coughing, choking, pain in the chest, and the expectoration of yellow-tinged sputum. These symptoms subside after the exposure stops, but after a short time there are sudden violent symptoms of respiratory disease followed by progressive edema of the lungs with a probable fatal outcome. In some instances there is recovery from the initial edema, but pneumonia develops within 24 to 36 hours. Many of the pneumonia cases die, the outcome being a matter of individual resistance, as there is practically nothing which can be done in the way of treatment after the edema begins. However, it is said that if the condition is recognized at the start and the person is made to inhale ammonia gas, recovery will take place in almost every instance. The present method of treatment with the inhalator and oxygen is said to be useless, as it is necessary to provide an agent which will stop at once the action of the nitric and nitrous acids which are formed in the mucous membrane of the respiratory tract, and ammonia gas is the only agent which will do this. This treatment should be used for poisoning from most acid gases and vapors, such as chlorine, bromine, iodine, and sulphur dioxide. It should not be used for poisoning from hydrocyanic acid, the effects of which are not due to any irritant acid properties but to specific action on the respiratory center, which causes paralysis of respiration. In case of poisoning from this chemical, artificial respiration should be used as long as the victim is still breathing. Removal to fresh air and artificial respiration should also be used in cases of benzol poisoning.

Turpentine poisoning is said to be an important form of industrial poisoning, because it is so frequently diagnosed as lead poisoning. Two cases of poisoning occurred in a plant manufacturing automobile bodies, the symptoms being extreme pallor, nausea, vomiting, abdominal cramps, and a form of neuritis. These men were employed in spraying a black varnish or finish on the automobile bodies and because of this fact their cases had been diagnosed as lead poisoning, although the most typical signs of lead poisoning were not present. Analysis of the materials used by the men in spraying showed that there was no lead in the spraying material, and it developed later that the superintendent knew that the spraying material was lead-free and had been much puzzled to know how the men came in contact with lead, although he had accepted the diagnosis without question.

The lack of a knowledge of chemistry is particularly serious in cases of acid and alkali burns as they grow steadily worse under the usual treatment of carron oil or boric ointment. Either of these preparations forms a coating which prevents the removal of corrosive poisons, with the result that the destructive penetration of the skin continues. In these cases questioning of the laborers is of little use, as they frequently work with both acids and alkalies and do not even know the names of the reagents. It is therefore necessary for the doctor to find out for himself what caused the burn, and this can be done by applying bits of moist litmus paper, both red and blue, to

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the wound. If the paper turns red the injured part should be bathed or soaked in a 5 per cent solution of bicarbonate of soda, and if it turns blue a 3 per cent solution of acetic acid is used. When the neutralizing wash has thoroughly penetrated the wound, the bandage and ointment should be used.

Alkali wounds are more apt to give trouble than acid wounds, because the natural alkilinity of the tissues tends to neutralize the action of an acid agent; then, too, the acid albuminate which is formed is soluble only with difficulty and, in time, checks the further progress of the acid into the tissues, while alkalies form very soluble alkali albuminates, which do not interfere with the continued penetrating action of the alkali into the defenseless tissues. For this reason alkali wounds must be bathed a very long time, and preferably with occasional change of the dilute acetic acid. When the latter is not available, equal parts of vinegar and water will do just as well.

Dermatitis in a very persistent form which resembles eczema is frequently found among polishers and finishers of leather shoes. This is due to alkaline agents which are present in the finish or dressing, the one used for patent leather shoes being the worst. A dilute solution of acetic acid should be used occasionally as a wash for the hands of such workers. Oxalic acid, which is often present in dressings and bleaching fluids, produces a dry, scaly dermatitis of a very persistent character. As it is practically as injurious for canvas and leather as for the human skin, the writer believes that its use should be discontinued altogether.

Cyanide solutions used in the jewelry and watchmaking trade and in silver plating cause localized burns, but more frequently an eczema-like eruption of the skin of the hands, arms, and even of the face. The involvement of the face is due to rubbing the face when the hands have been in the solution and it is likely to produce a very persistent dermatitis. This condition is usually diagnosed as eczema, and the usual method of treating the lesions with an alkaline wash tends to intensify the action of the cyanide. As in all cases of alkali burns, dilute solution of acetic acid should be used to neutralize the cyanide.

Phenol burns require prompt attention, but there is nothing which will neutralize the action of the phenol. Washing the affected parts with water has no effect on account of its slight solubility in water, but as it is very soluble in alcohol this can be used to advantage in removing the phenol. Phenol is absorbed readily by the skin, and if a large area has been covered death may result from its action on the central nervous system, though the local action on the skin in such cases may be very slight.

Trade anaphylaxis may develop in a variety of trades, the symptoms being similar to those of hay fever. The cause of this condition is the sensitiveness of certain workers to the proteids in the material with which they work. Millers and bakers may be sensitive to the dust from wheat or rye flour, leather workers to the dust from some special kind of leather, carpenters and cabinetmakers to the dust of various kinds of wood, mattress makers to the horse dandruff in the horsehair, and wool sorters to the sheep's dandruff in raw wool. In

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cases where such symptoms develop among workers in a dusty atmosphere, trade anaphylaxis should always be considered as a possible cause.

Dusts

See Abrasive industry: Dust hazard in the manufacture of artificial abrasive wheels; Brass foundries: Health hazards; Fur cutting and felt-hat manufacture: Occupational hazards; Lead poisoning: Report of cases among motor-car painters in New South Wales; Mercury poisoning; Manganese poisoning: Report of six cases; Mining industry; Tanning industry: Occupational disease hazards.

Eye Diseases: Symptomatology in Occupational Diseases [8]

THE eyes of a high percentage of industrial workers have proved from extensive investigation to be defective. The proportion thus involved has varied from 50 to 90 per cent as reported from widely different types of industry. As a result of publicity subsequent to these striking findings, a conception has become prevalent that industry itself has caused these defects. To those better acquainted with the problem it is patent that many persons in industry exhibiting poor eyes possessed the same defects, actual or potential, prior to their entry into industry, and a large portion of the responsibility for the causation of poor eyes may thus be shifted from the shoulders of industry.

But associated with industry there exist divers conditions of work conducive both to the initiation and the aggravation of eye defects. The types of work particularly linked with eyesight impairment or eye injuries are those involving: (1) Dust, abrasives, and flying particles; (2) splashing metals; (3) gases, fumes, and irritating chemicals; (4) glare; (5) radiant energy, chemical, and heat rays; (6) defective posture; (7) poor lighting. The items of this group are commonly regarded only as "eye injury hazards." These same conditions, however, may be considered the sources of many "eye occupational diseases," and any attempt to demarcate eye injuries from eye occupational diseases does nothing more than erect an artificial barrier between two similar sets of affections. It may with propriety be held that every eye impairment attributable to industry is in a sense an occupational disease.

Nystagmus may be found among those workers who year in and year out subject their eyes to abnormal and unaccustomed motions. The miner develops a nystagmus, due to constant imperfect fixation of his eyes on poorly illuminated objects; the chauffeur acquires nystagmus by the constant watching of traffic without complete fixation; the compositor by watching the type which he is setting; the paper hanger and painter by following their brushes, the position of the body often thrown out of a vertical position, thus causing more strain on the visual apparatus. For like reasons locomotive engineers, draftsmen, jewelers, typists, textile workers, and others may acquire a nystagmus.

[8] The Nation's Health, Chicago, October, 1922. "Eye symptomatology in occupational diseases," by Donald J. Lyle, M. D., and Carey P. McCord, M. D.

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Occupational Nystagmus

THE short, rapid, continuous involuntary movements of the eyeball characteristic of nystagmus may develop in a coal miner affected with carbon monoxide poisoning, the eyes responding to irritation or disease in the central nervous system. When, however, nystagmus in a coal miner is due to poor illumination or faulty visual fixation of objects on the black coal face, the effect is produced by direct action on the ocular apparatus.

A variety of occupations produce practically the same symptom complex. Miner's nystagmus, the best known and the most thoroughly investigated example of occupational nystagmus, occurs usually between the ages of 35 and 40 years among men who have engaged in mining for many years.

Predisposing factors in miner's nystagmus are: (1) Errors of refraction (the percentage of affected persons presenting errors of refraction is between 75 and 85; persons with astigmatic errors are more seriously affected); (2) unbalanced extrinsic ocular musculature; and (3) neurotic tendencies.

The factors which excite or produce the condition are: (1) Poor lighting; (2) working where an upright position can not be maintained; and (3) lowered physical state (including injuries).

The most severe and most common subjective symptoms are: Headaches and dizziness; dancing and dazzling of objects, especially lights; failure of sight, especially at night (if above ground); photophobia (intolerance of light); general fatigue. The objective symptoms include: (1) Rotatory, lateral indefinite, or mixed movements of the eyeball, their frequency being in the order mentioned and their severity and duration indicating the degree of lack of coordination; (2) general condition of depression; (3) increased nervous irritability; (4) blepharospasm (excessive winking); (5) spasms of brow, head, neck, and sometimes shoulders.

Treatment involves a discontinuance of work at coal face, rest, correction of refractive errors, general building up of patient both physically and mentally. Preventive measures need to include (1) correction of refractive errors and muscular instability; (2) adequate illumination, without glare; (3) whitewashing of extensive portions of mine (passageways, timbers, etc.); (4) arrangement of working hours so that there may be opportunity for recreation in daylight; (5) thorough medical supervision, and the maintenance of high physical standards among workers; (6) proper mine sanitation, particularly with reference to humidity, cooling power of air, absence of carbon monoxide, etc.

Carbon Monoxide Poisoning

CARBON monoxide poisoning is found as acute, chronic, or delayed poisoning. It is to be recognized that serious and lasting harm to various systems and organs of the body may follow exposure to carbon monoxide. A small percentage of persons thus poisoned present eye involvement. It is noteworthy that the eye changes show little constancy. The list of eye manifestations definitely associated with carbon monoxide poisoning includes the following: Color blindness, contracted visual fields, diplopia (double vision),

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scotoma (a dark spot on the visual field), hippus (spasmodic pupillary movement), impairment of pupillary light reflexes, irregular pupils, unequal pupils, diminished vision, engorgement of retinal vessels, retinal exudate, sectional blanching of optic discs, edema of optic discs, optic neuritis, optic nerve atrophy, and complete ophthalmoplegia (paralysis of the ocular muscles), with marked protrusion of the eyeballs.

Carbon bisulphide is commonly taken into the body through the lungs, after exposure to its vapors. In chronic cases the vision is gradually lessened beginning with a retino-bulbar neuritis and progressing slowly to nerve atrophy. The prognosis is never good. In advanced cases vision is seldom recovered.

Both soluble and insoluble arsenic preparations are capable of producing external and internal injury of the eyes. More frequently the manifestations are late, due to slow absorption of a small amount of arsenic which has entered the system through the alimentary and respiratory tracts. The chief complaints from the patient center about (1) pain in the eye, with itching, burning, and irritation; (2) painful vision, blepharospasm, lachrymation, and photophobia; and (3) loss of vision, as nerve becomes affected. Both eyes are usually affected, often unequally. In animal experiments a degeneration in the medullary sheaths of the optic nerve fibers has been found. The action of arsenic on the external eye leads to edema and pigmentation of the eyelids, chemosis (swelling of the conjunctiva), and sometimes hemorrhage of the conjunctiva. The conjunctivitis may arise either from direct or systemic poisoning.

Ocular Lead Poisoning

THE eyes are involved in about 1.2 per cent of all lead cases. Although the eyes may be the only source of complaint, careful examination will ordinarily lead to evidence of systemic lead poisoning. Ocular manifestations of lead poisoning vary widely. Usually the patient complains of headaches, vertigo, blurred vision, constriction of the visual field, central color scotoma, perverted color vision, or diplopia. The physical findings include any or all of the following symptoms: Ptosis (drooping of the upper eyelid), conjunctivitis, paralysis of the extrinsic ocular muscle, especially those enervated by the third nerve, retinal edema, neuro-retinitis, retinitis-saturnine, optic neuritis, and optic atrophy. The damage from lead may be transitory, due to an ischemia (local anemia), or permanent through the action on the optic tract or to perivasculitis (inflammation of the vessel walls). Since lead may induce a chronic nephritis, some difficulty may arise in differentiating between ocular lead poisoning and albuminuric retinitis.

No measures of prevention or treatment apply specifically to the eyes. If systemic lead poisoning is prevented no instance of ocular lead poisoning will appear.

Methyl Alcohol

ALTHOUGH the greater number of cases of wood-alcohol blindness has in the last few years developed from the use of this poison internally, a considerable number still arises as the result of

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intoxication following exposure to wood alcohol used for industrial purposes.

Methyl alcohol may act as an acute or chronic poison, the chronic form being most insidious and many times not easily diagnosed. In either case the ocular symptoms arise as a part of the general systemic poisoning. The affected worker complains of decreased vision and lessened visual fields. Upon examination there is found, in an early case, a retrobulbar neuritis (inflammation in the orbital part of the optic nerve), or pallor of the discs with constricted retinal vessels. Atrophy of the optic nerve is a later development. Opinion is that the chronic poisoning first destroys the axis-cylinders, later attacking and destroying the ganglion cells. Blindness is reported to develop in 6 per cent of all persons poisoned by methyl alcohol. The chances for restoration of vision are very poor. Most of those affected remain permanently blind.

To avoid wood alcohol poisoning, denatured ethyl alcohol should be employed wherever possible; where the substitution is not possible, wood alcohol should be utilized in " closed circuit," wherever compatible with the trade process. Adequate exhaust, together with good factory ventilation, is essential. At all times workers should be acquainted with the harmful properties of wood alcohol and the conditions under which poisoning may arise.

Anilin

ANILIN and many of its related chemical compounds are capable of inducing eye lesions. The eyes may be affected externally by anilin vapors, especially hot vapors. For the most part, however, the eyes are harmed by anilin which is absorbed through the skin or taken into the body through the respiratory or alimentary tracts. Acute anilin poisoning is likely to involve the eyes by external irritation with a temporary blurring of vision. On examination of workers long exposed to anilin, the external eye may be found to be uniformly pigmented. The corneal epithelium is roughened and pigmented. A conjunctivitis with ciliary injections is frequently encountered. In the more advanced case, scotoma and amblyopia are to be found. Retinoneuritis has been observed.

Prognosis in such cases is good provided the source of intoxication is removed.

Occupational Cataracts

SLOW-DEVELOPING cataracts frequently exist among workers whose occupations involve continual exposure to intense light and heat. These cataracts are especially associated with workers in molten glass; but are known to arise in such other industries as chain making, smelting, tin-plate making, welding, acetylene and oxyhydrogen cutting. Both heat and light are factors in causation of occupational cataracts. Intense light without pronounced heat will produce opacity of the lens in experimental animals. The period of cataract formation is long. For many years a progressive opacity of the lens, usually in both eyes, goes on without any knowledge of the victim. In the glass industry the left side of the blower's face

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is held closer to the oven and often the left eye is involved before the right.

Other than the gradual loss of vision, no subjective symptoms are complained of by exposed workers. Often the vision is reduced to one-tenth normal before medical advices are sought.

Provided no other lesions or complications interfere, the operative risks in occupational cataract are good. This is contrary to the usual posterior or cortical cataract. As a rule, on account of loss of all accommodation, operated employees can not resume their former work.

Protection against occupational cataract is to be found through the continuous use, during the exposed period, of goggles that absorb or disperse both the heat and chemical rays. Such goggles lend themselves to use containing a plain glass or a glass correcting the workman's refractive error. Great difficulty in securing protection from the development of occupational cataract arises from the disinclination of workers to wear these protective glasses continuously through the long period in which cataracts are insidiously developing.

The participation of the eyes in chronic occupational disease is by no means limited to the foregoing conditions. To this group may with propriety be added many such lesions as immobile pupils, nystagmus, corneal opacities, following long exposure to benzene; paralysis of ocular muscles resulting from picric acid; keratitis (inflammation of the cornea) found among harvesters; retinal and papillary edema followed by fatty degeneration presented by workers in phosphorus; divers chronic eye lesions arising among workers in pharmacy; and amblyopia occurring among tea tasters and tobacco workers.

Fireworks Manufacture: Phosphorus Necrosis

BECAUSE of the intense suffering and often shocking deformity resulting from chronic phosphorus poisoning, almost every civilized country has taken measures to abolish the use of poisonous phosphorus in the match industry where phosphorus necrosis was most prevalent. The present-day hazard of phosphorus poisoning occurs among bone-black makers, brass founders, fertilizer makers, fireworks makers, insecticide makers, phosphate-mill workers, phosphor-bronze workers, phosphorus-compound makers, and phosphorus extractors.

An investigation has been made by the Bureau of Labor Statistics, covering three industries which offer exposure to phosphorus poisoning—the manufacture of phosphorus fireworks and of vermin exterminator, and the phosphorus-extracting industry, the results of which were published in Bulletin No. 405. In the manufacture of rat paste, possibly because of the intermittent character of the industry, no case of phosphorus necrosis was found to have occurred. Of the two phosphorus extraction plants studied, one (which has been shut down for five years) had, over a long period of years, four cases of chronic phosphorus poisoning; the other plant had only one minor case in 20 years, having given special attention to the teeth of employees in furnishing free dental care and inspecting the teeth of all workers in phosphorus at frequent intervals.

The study demonstrates that there is a real industrial hazard from phosphorus in the phosphorus-fireworks factories, even though the

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number of workers exposed to the hazard is small. In the 3 plants manufacturing phosphorus fireworks, 366 people were employed—181 men and 185 women. The workers engaged in the phosphorus processes numbered 71, of whom 56 were women. Among the employees of these three factories, there had occurred 14 definite cases of phosphorus necrosis, 2 of which were fatal.

In addition to the paramount hazard of chronic poisoning, phosphorus fireworks presents two collateral hazards—that of explosion and that of acute poisoning. In the last 15 years, 18 fires or explosions due to phosphorus fireworks have been reported. The danger of acute phosphorus poisoning is not likely to be an industrial hazard, since the cases are mostly those of children who sometimes swallow the lozenges, thinking they are candy. Only passing attention was paid to it in the investigation, and no effort was made to secure the total number of such accidents. The American Museum of Safety reported the deaths of 9 children, with ages ranging from 2½ to 7 years, Fourth of July, 1925, as a result of eating phosphorus fireworks. One State, Louisiana, has prohibited the sale of such fireworks in the State, and a large distributer of fireworks has refused to handle the phosphorus type and has so notified its customers.

The hazards inherent in the manufacture of phosphorus fireworks are fully realized by the manufacturers themselves, and they have been experimenting for some time to find a less dangerous substitute for the poisonous phosphorus.

Since the investigation above was made, an agreement was reached with the manufacturers by the Department of Labor whereby the manufacture of all types of fireworks containing white (yellow) phosphorus was to be eliminated on or before August 15, 1926.

Fruit Canneries: Skin Disease Among Employees

EMPLOYEES engaged in preparing the fruit for canning in the fruit-packing plants of the Pacific Northwest have been subject for several years to a dermatosis which has been referred to by those affected as "fruit poisoning." A variety of remedies, chiefly antiseptics which are ordinarily used in treating bacterial infections, had been used without much success, but an examination of some of these cases showed that a yeastlike organism was the causative factor and that this organism was destroyed by certain volatile oils.[9]

An employee in one of the packing plants, who had had a lesion between the fingers which had persisted for several months in spite of the use of various prescribed antiseptics, was examined and scrapings from the lesion showed budding spore forms which were believed to be responsible for the inflammatory condition. Rapid improvement and healing followed the use of a 10 per cent alcoholic solution of the oil of cinnamon, the cinnamon being tried because it has been found efficacious against mold growth in certain medical preparations.

The canning plant in which the case of skin disease had originated was visited during the next pear-canning season, cases of fruit poisoning having been particularly severe at the time pears were

[9] Journal of the American Medical Association, Chicago, June 27, 1925. "The fungicidal activity of certain volatile oils and stearoptens," by Harold B. Myers, M. D., and Clinton H. Thienes, M. D.

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handled in previous years. Many similar cases of infection were found which healed rapidly with the use of spirit of cinnamon and the manager of the plant and the chemist reported that the use of cinnamon water as a prophylactic measure was found to be useful in preventing a greater number of infections.

The good results obtained by the use of the oil of cinnamon on these lesions led to a study of the comparative fungicidal power of certain volatile oils on the yeastlike organism which caused the so-called fruit poisoning. It was found that there was considerable variation in the effect of the various oils. Thymol destroyed the yeast in 60 seconds or less, while the most efficient volatile oils were found to be cinnamon and cloves, which required approximately 30 and 90 minutes, respectively, to kill the organism. The majority of the oils tested did not prevent the growth of the yeast in 100 minutes. As a result of the experiments, a mixed spirit of 5 per cent thymol and 2 per cent cinnamon was decided to be the best curative agent, and this solution, painted on sites of infection found on employees in the canning plant, resulted in the speedy relief of discomfort and the promotion of healing.

Fur Cutting and Felt-Hat Manufacture: Occupational Hazards

THE various hazards present in the manufacture of felt hats were studied by several investigators and the results published in a series of articles appearing in the August to December, 1922, issues of the Journal of Industrial Hygiene.[10]

The principal hazards incidental to the trades of hatter's furriers or fur cutters and of hat makers and finishers, as summed up in the first article of the series, are the use of mercuric nitrate in the preparation of the fur for felting and the presence of organic and inorganic dust.

The fine hairs of the skin of hares, muskrats, beavers, etc., used in the making of felt, which are smooth, resilient, and straight, are made rough and pliable for the felting process by the use of acid nitrate of mercury. This chemical is now used for carrotting the fur in all countries with the possible exception of Russia. In addition to the danger of mercurialism in most of the processes, there is much animal dust present. This dust, consisting of fine fur particles and harder hair particles, is present in large quantities in the earlier processes, and after the hat is formed and shaped, smaller quantities of fine silicon dust are produced by rubbing the hat with emery paper to smooth it.

In some of the processes there is direct contact with the mercury and in others the mercury is volatilized by heat, while excessive heat and moisture are present in most of the hat-making operations. In the process of hat finishing the hazards include volatilized mercury, naphtha fumes, silicon dust, and fine fur dust, with the minor hazard of carbon monoxide from gas jets.

[10] Journal of Industrial Hygiene, Boston, August, 1922, "The industrial hygiene of fur cutting and felt-hat manufacture," by Dr. Alice Hamilton; September, 1922, "Industrial diseases of fur cutters and hatters" by Dr. Alice Hamilton; October, 1922, "Estimations of mercury in hatters' fur and in felt," by Annie Stone Minot; November, 1922, "A clinical study of fur cutters and felt hatters," by Dr. Wade Wright; December, 1922, "The preparation of hatters' fur: A chemical study of the carrotting process," by John H. Johnson.

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Poisoning from mercury among hatters is slow in attack and in development. There is little salivation, but inflammation of the gums is common and there is blackening and erosion of the teeth, especially among carrotters. Tremor is the most typical symptom. Emery dust produced in finishing is a recognized occupational hazard, but the question of the harmfulness of the animal dust is still in dispute and can not be settled, it is stated, until there is a much more thorough examination of men and women employed in these processes.

Analyses of felt in different stages of hat manufacture to determine the processes in which the greatest amount of mercury is lost by vaporization or by treatment with hot water show that the greatest loss occurs in forming, blocking, shaping, and pressing with hot irons and that these operations may be regarded, therefore, as the most dangerous from the standpoint of mercurial poisoning.

A clinical study of 100 hatter's fur workers and felt hatters was made in Danbury, Conn., in 1921. Of the 100 men examined 43 had undoubted signs of mercurialism. Salivation was present in 17 of these cases, dryness of the throat in 8, pyorrhea or gingivitis in 21, a blue line on the gums in 2, tremor in 40, and psychic irritability in 37. Various other symptoms, such as abnormally high blood pressure, albuminuria, sore tongue, weakness of the muscles of the forearms, dizziness, and insomnia, were also noted. Five of these 43 men were considered to be severely affected, 14 moderately, and 24 only slightly, while there were 10 others who presented certain symptoms of poisoning, although their symptoms were not considered to be sufficiently defined to warrant their inclusion as cases of mercurialism.

The results of a chemical study of the carrotting process made in an effort to find a nonpoisonous compound which could be substituted for the acid nitrate of mercury forms the subject of the fifth paper of the series. The felt obtained by the substitution of lead for mercury, although of an inferior quality, was the best of the non-mercury carrotted specimens. The poisonous character of lead salts, however, prevents any attempt to perfect a lead carrot. Of the other solutions, copper dissolved in nitric acid and zinc oxide dissolved in nitric acid gave the best results in yellow and white carrot, and although these results were not equal to those obtained with ordinary mercurial carrot it was considered that they were promising enough to warrant further experimentation.

Fur-Dyeing Industry: Health Hazards in the Use of Intermediate Dyes

THE extent to which paraphenylene diamine [11] is used as a dye intermediate and the dangers attending its use are shown in an article by Carroll M. Salls in the Industrial Hygiene Bulletin, November, 1925, published by the New York State Department of Labor.

Paraphenylene diamine is known in the trade under the German name of "ursol black," the American-made product being sold as

[11] See Labor Review, February, 1919, p. 215; May, 1924, pp. 194, 195.

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"universol black." It is still widely used as a hair dye, although for the past 10 years it has been reported as being displaced by less poisonous substitutes. The total production of para per year in the United States for all uses is 350,000 pounds, valued at $425,000. In regard to the toxic properties of the substance the following is quoted from a statement of the United States Public Health Service: "Paraphenylene diamine is an aniline derivative which by oxidation becomes black or brown. The poisonous qualities of this chemical are well known."

The large number of cases of fur dermatitis which occurred in London in 1922–23 caused much agitation and many cases of dermatitis in furriers have been reported to the New York State Department of Labor. The processes of dyeing, dressing, cutting, making up into garments, and merchandising all bring the workers into contact with the dye or the dyed fur. According to one authority, asthma and eczema are the diseases found most frequently among fur and hide workers who come in contact with dyes containing paraphenylene diamine and there is an occasional case of acute dermatitis with swelling of the neck and head and loss of hair, followed in rare cases by death. After once having been poisoned there is a tendency to become hypersensitive to the poison so that even the finished products (dyed furs) can not be handled. The most hazardous working conditions occur during the drying of the dyed pelts and when they are removed from the drums in which they have been treated with sawdust or sand. In the latter case the operation is accompanied by clouds of dust containing paraphenylene diamine and its oxidation products.

Until satisfactory substitutes for paraphenylene diamine are found, the writer recommends that in the dyeing process as weak solutions as practicable should be used; that a mordant which helps to develop and fix the dye should be used first when the dip process is employed, and when the brush process is used the brushed skin should be given from 12 to 24 hours to develop the dye. The dyed skins should be washed thoroughly with running water, preferably in a paddle, and the washed and dried skins should be thoroughly drummed in a revolving drum containing sawdust or clean sand for several hours.

Gases and Fumes

See Arsenic trichloride: effects of exposure on workers; Benzol poisoning: final report of National Safety Council Committee; Brass foundries: health hazards; Carbon monoxide poisoning; Chemical poisoning: effect and treatment; Eye diseases: eye symptomatology in occupational diseases; Fireworks manufacture: phosphorus necrosis; Fur cutting and felt-hat manufacture: occupational hazards; Hydrofluoric acid: effect of fumes; Hydrogen sulphide gas poisoning; Irritant gases: action on respiratory tract; Mercury poisoning; Photo-engraving industry: health survey; Tetraethyl lead gasoline.

Heat and Humidity

See Steam laundries: effect of working conditions upon health of workers.

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Heart Disease: Industrial Aspects

THE importance of heart disease as a cause of death was emphasized in a paper on the statistical aspects of the problem of organic heart disease, read by Dr. Louis I. Dublin at the 1925 meeting of the Medical Society of the State of New York.

Heart disease in its various forms stands first in the order of causes of death and probably first also in the amount of damage it does through invalidity and invalidism. There are now nearly 200,000 deaths annually from this disease in this country, and if present conditions continue it is estimated that one in every five of the population living at the age of 10 will eventually die of organic heart disease.

The problem is not only a general one but is also industrial, as heart disease takes its toll from the ranks of the workers generally and particularly from the colored people, whose mortality rates from this disease during the main age period of life are twice that for whites at the corresponding ages. The death rates per 100,000 for organic diseases of the heart among industrial policyholders of the Metropolitan Life Insurance Co. in 1923 were 113.6 for white males, 122.1 for white females, 190.8 for colored males, and 217.4 for colored females for all ages, 1 year and over, while between the ages of 35 and 44 and 45 and 54 the rates were, respectively, for white males 86.6 and 253.3, for white females 70.7 and 184.9, for colored males 180.3 and 424.6, and for colored females 184.7 and 470.4 per 100,000 of the population.

That the situation is even more serious than this is shown by the fact that as yet only the merest beginnings have been made in the collection of information on the incidence of heart disease in the community, and it is only recently that through the work of the cardiac clinics there has been an effort to gather the information needed on the morbidity of heart disease. Study of the findings of the life insurance companies in their routine examinations of applicants for insurance shows that approximately 2 per cent of the total population are suffering from definite organic heart disease.

The importance of more systematic and complete study of cases of organic heart disease and a more general compilation and analysis of the records were stressed by Doctor Dublin.

Hydrofluoric Acid: Effect of Fumes

THE hazard from exposure to hydrofluoric-acid fumes was discussed in the Industrial Hygiene Bulletin, September, 1924, published by the New York State Department of Labor.

Anhydrous hydrogen fluoride is a clear liquid, boiling at 67° F., which fumes strongly in the air. It is highly poisonous, forming an ulcerated sore if a drop comes in contact with the skin, and accidental breathing of the concentrated vapor of the acid has caused death. Exposure to the fumes produces intense irritation of the eyelids and conjunctiva, coryza, bronchial catarrh with spasmodic cough; ulceration of the nostrils, gums, and oral mucous membrane; painful ulcers of the cuticle, erosion and formation of vesicles, and suppuration under the finger nails.

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Hydrofluoric acid is used to produce opaque and transparent etching on glass, and poisoning from it has occurred in chemical works where it is prepared, in glass factories, in laboratories of the pottery industry, in the extraction of fluorides of antimony (substitute for tartar emetic in dye works), in fertilizer factories (extraction of phosphorites for manufacture of phosphorus), in bleaching, and in the extraction of silicates. To produce opaque etching, the glass is dipped in a solution of hydrofluoric acid, an alkali fluoride, and other salts.

A case is cited of a plant manufacturing opaque glassware where such a high percentage of hydrofluoric acid was used in the solution that a dangerous amount of fume was given off. It was obvious that workers who stood constantly over the dipping bath must have been seriously affected, as all the windows of the large room containing the bath were deeply frosted, and the glass front of a large wall clock had been broken out in order to see the hands of the clock. It was admitted by the manufacturer that conditions were bad, but he could see no remedy. It was suggested that the desired degree of opacity might be obtained by decreasing the concentration of hydrofluoric acid in the solution and increasing the concentration of the neutral components. After some experimentation a neutral, water-soluble, viscous substance was discovered which practically eliminated the discharge of hydrofluoric-acid fumes into the room, and in addition to the improved health conditions thereby secured an opaque etching with a finer texture was produced.

Hydrogen Sulphide Gas: Poisoning

THE toxicity of hydrogen sulphide gas, the symptoms of poisoning, and the method of treatment in acute and subacute cases are dealt with in a report of the United States Bureau of Mines (Serial No. 2491). The gas, which is extremely poisonous, is sometimes present in mines, railroad tunnels, sewers, and marshes. It is also present at different stages of the manufacture of sulphuric acid and in the distillation of petroleum, particularly the oils known as "high-sulphur crudes," as well as about gas wells, gas plants, and smelters. In mines it may be present in the coal or rock strata as occluded gas, or it may be formed by decomposition of sulphides in the presence of moisture.

Hydrogen sulphide is a colorless gas somewhat heavier than air, and has the odor of rotten eggs. It burns with a bluish flame, and in seven parts of air a mixture is formed which explodes with violence when ignited.

The danger of poisoning is always present wherever hydrogen sulphide exists and its toxicity is similar to that of hydrocyanic acid gas (prussic acid). Cases of poisoning from the gas may be divided into two distinct types—acute, or asphyxiation, and subacute. In acute poisoning there is almost immediate unconsciousness and frequently death results before the victim can be rescued. In cases where rescue can be accomplished the victim usually recovers almost immediately with no permanent aftereffects, although headache and nausea may persist for a few hours. In subacute cases irritation of

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the eyes and respiratory tract occur, varying in degree according to the concentration of the gas present and the length of exposure.

Experiments conducted at the Pittsburgh Experiment Station of the Bureau of Mines on animals and in a few cases on men, using low percentages of hydrogen sulphide, showed that in animals both acute and subacute types of poisoning could be produced. Death in acute cases was found to be due to respiratory failure, followed by cardiac failure, and in subacute cases to irritation of the respiratory tract, followed by edema of the lungs.

The approximate concentration of hydrogen sulphide which will cause subacute symptoms in man was found to vary from 0.01 to 0.06 per cent, while in the production of acute symptoms it ranged from 0.06 to 0.1 per cent, the latter amount producing immediately fatal results. The aftereffects of severe subacute poisoning were found to be worse than those from acute poisoning. In subacute cases, when death did not occur, diabetes, nephritis, pneumonia, and degeneration of the nervous system were among the effects recorded.

It was found that many acute cases could be saved even when the respiration was completely paralyzed and there were signs of beginning cardiac failure. Removal to fresh air and the use of artificial respiration usually resulted in recovery, while the use of oxygen facilitated the return to consciousness and lessened the bad effects of the poisoning. The treatment of subacute cases depends upon the seat of irritation, and in most cases the patient should be under the care of a physician. These cases include conjunctivitis, pharyngitis, bronchitis, and pneumonia.

A general knowledge of the extreme toxicity of the gas, the report says, is necessary for the prevention of poisoning. Mechanical devices have been designed for care of these fumes in different industries, and the use of canister masks, hose masks, and oxygen-breathing apparatus have proved of value. The results of the study are summed up as follows:

1. Hydrogen sulphide is an industrial poison, the toxicity of which has not been fully realized. Cases of poisoning have occurred in relatively large numbers. Constant vigilance is required in order to prevent accidents.

2. The poisoning by hydrogen sulphide is of two types—namely, acute and subacute—causing asphyxiation and irritation (conjunctivitis, bronchitis, pharyngitis, and depression of the central nervous system), respectively. Death from asphyxia is caused by paralysis of the respiratory center, while death from subacute poisoning is associated with edema of the lungs. The exact low limit of hydrogen-sulphide concentration at which it ceases to act as a poison has not as yet been determined, but is evidently below 0.005 per cent.

3. Hydrogen sulphide in low concentrations produces symptoms of headache, sleeplessness, dullness, dizziness, and weariness. Pain in the eyes, followed by conjunctivitis, is fairly constant, while bronchitis and pains in the chest are frequent. Further poisoning produces depression, stupor, unconsciousness, and death. Spasms—clonic and tonic in character—are present, and death occurs following paralysis of the respiratory center.

Irritant Gases: Action on Respiratory Tract

AMONG the gases and vapors found in industrial processes there is a large group of the so-called "irritants" which produce symptoms which are due not so much to the difference in their

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chemical properties as to the difference in their physical properties. An account of the effect of these gases on different sections of the respiratory tract was given by Dr. Howard W. Haggard in an article in the Journal of Industrial Hygiene (Boston), February, 1924.

An irritant gas or vapor is one which produces inflammation in those tissues with which it comes in contact. This action is direct upon surface tissues, notably the mucous membrane of the eye and the respiratory membranes, and the effects are of the greatest severity on those surfaces which are most easily penetrated. The irritant gases act in such extreme dilution that gross chemical corrosion is not usually involved. If it is involved it causes almost instant death.

The different gases affect different sections of the respiratory tract. Ammonia produces intense congestion of the upper respiratory passages and immediate death from spasm or edema of the larynx, while phosgene and nitrogen peroxide have little effect on the upper respiratory tract but induce pneumonia or edema of the lungs. Chlorine is intermediary in its action between ammonia on the one hand and phosgene and nitrogen peroxide on the other.

The fact that the selective action of the various irritants is due to their physical rather than their chemical properties is especially true of solubility. A gas which is very soluble in water and is readily diffused in its solution is taken out of the inspired air by contact with the first moist tissue it touches. The result is that the upper respiratory passages are the parts most affected, the concentration of the irritant reaching the lungs being greatly reduced. In the case of a gas which has a very low solubility in water there is little of the gas absorbed in the upper respiratory passages and the principal damage is done deep in the lungs.

The degree of concentration of an irritant gas is of great importance. In the case of the volatile irritants the severity of the action does not vary according to the amount and duration of the application, but a high concentration, for even a short time, has an intense effect.

The inhalation of an irritant gas exercises an immediate effect on the nasal passages and the larynx, causing them to become acutely painful, and a series of reflexes is set in motion, such as coughing, constriction of the larynx and bronchi, closing of the glottis, and inhibition of respiration, which tend to prevent the penetration of the irritant to the deeper and more delicate parts of the respiratory tract.

Coughing is caused by even slight irritation, but this response to an irritant in the air varies in different individuals. Persons whose throats have been rendered sensitive by the use of tobacco or from infection cough more readily than normal persons, while those with chronic mild inflammatory or catarrhal conditions, because of decreased susceptibility, cough less readily. While coughing is, of course, no protection, it serves as a warning of the presence of these substances in the atmosphere.

The physiological efforts of the different parts of the respiratory tract for self-protection are of great importance, as the delicacy of

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the respiratory membranes and their susceptibility to injury increase in passing from the upper to the lower part of the tract. Although the nose and pharynx may be stripped raw they may receive little permanent damage, while the injury to the larynx and bronchi may result in the general systemic effects which are present in cases of acute laryngitis and bronchitis which develop from any cause. The lungs when directly acted upon by an irritant receive serious injury and edema or pneumonia may develop, with a possible fatal outcome.

If death is not an immediate result of lung edema, the usual symptoms of severe membranous bronchitis and tracheitis may last for several days, after which regeneration of the mucous membrane begins to take place, although there is almost always infection of the bronchi. In cases of severe inflammation of the upper respiratory tract there may be an edematous swelling of the larynx sufficient to close the opening of the trachea, in which case death may result from acute asphyxia. This is the common cause of fatalities occurring during or soon after severe exposure to the class of gases that affect this part of the respiratory tract. If death does not result at once from swelling of the larynx or spasm of the glottis, lung edema may develop, reaching the climax in from 12 to 24 hours, when if death does not occur inflammation tends to subside in from two to three days.

The effect of the action of the gas on the lungs is to interfere with the respiratory exchange of oxygen and carbon dioxide between the air and the blood and to obstruct the flow of blood through the lungs, thus placing a strain on the right side of the heart. Irritation of the lungs does not cause severe pain as does irritation of the upper air passages. The principal symptoms of lung edema are those of asphyxia which is not, however, associated with air hunger in its early stages. The patient may be an ashy gray color but with no difficulty in breathing, although he may be in danger of death, especially on making the least exertion. In the later stages the skin may be of a blue color and there may be intense air hunger.

In nonfatal cases of pulmonary edema no medicinal measures are effective in affording relief, with the exception of oxygen which, however, has no markedly beneficial effect on the progress of the disease. The mortality from the pneumonia following gassing is high, death occurring in from four days to two weeks. An exposure which is not sufficient to cause the acute symptoms of lung irritation may cause pneumonia, and "under industrial conditions the infections thus induced constitute a greater cause of death than primary pulmonary edema. Many observers feel that irritant gas or vapor even in extreme dilution is to be regarded as predisposing to the development of pneumonia. The only exception to this statement is afforded by chlorine which, in low concentrations, seems to exert a bactericidal action without appreciable irritation."

Severe irritation of the lower respiratory tract may result in a chronic inflammatory condition and cause a long period of ill health. In some cases there is little evidence upon physical examination of persistent changes in the lungs and the subject at rest may appear normal although he is in reality capable of only very moderate

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exertion. In such cases an individual may be unjustly suspected of malingering.

Prolonged exposure to gas in quantities insufficient to cause death may result in chronic poisoning evidenced by a moderate inflammation of the upper respiratory tract associated with a sharp cough. If the exposure is incidental to regular working conditions the inflammation passes into a catarrhal state and the coughing becomes less marked. While the worker appears then to have acquired a degree of tolerance for the gas this is not the case, the protective reflexes having simply become less active and the effect of the catarrh is to leave the deeper respiratory tract more exposed to the action of the gas. In addition, chronic poisoning affects the general health, causing loss in weight and increased liability to acute infection and to the development of tuberculosis.

Most of the irritant gases act in such a way upon the respiratory tract that they are destroyed or neutralized and therefore are not absorbed into the body in their original form. As a rule there is no systemic poisoning following absorption of these products. Hydrogen sulphide and nitrogen peroxide are exceptions to this rule, however. Hydrogen sulphide is absorbed and neutralized in the respiratory tract to sodium sulphide and the absorption of this alkaline sulphide into the blood stream produces a profound systemic poisoning. Nitrogen peroxide when inhaled forms sodium nitrite and may cause nitrite poisoning, although the symptoms may be obscured by the much more acute pulmonary irritation.

Organic substances such as alcohols, ethers, aldehydes, volatile petroleum, and coal-tar products, which are generally classed as irritants, are absorbed from the respiratory tract without change. Their systemic effects are in general more severe than their action as pulmonary irritants.

The local action of these substances differs from that of the more common irritants in two respects: (1) The mucous secretion which results from their action upon the respiratory passages does not serve to form a protective coating against their action; the secretion neither neutralizes nor alters these substances, but rapidly becomes saturated with the gas at the tension inhaled. (2) The greater part of the irritant action occurs in the upper respiratory passages, bronchi, and bronchiolea, while the lung alveoli and atria are relatively little affected. Such amounts of the gas as reach the lungs themselves are absorbed unchanged. This location of action is quite exceptional, for the solubility of these substances is usually quite low. The sparing of the deeper portion of the lungs is the result of the active absorption into the blood, which keeps the concentration of the irritant in the alveoli constantly at a low level.

The following table summarizes the effects of the different irritant gases, their solubility, and the concentrations which cause dangerous symptoms after exposure of one hour:

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RELATION BETWEEN THE PHYSICAL PROPERTIES OF IRRITANTS AND THEIR SITE OF ACTION IN THE RESPIRATORY TRACT AND SUBSEQUENT SYMPTOMATOLOGY

Irritant	Approximate solubility in water, by volume, at 40° C.[1]	Site of main action upon respiratory tract	Nature of local action	Concentration dangerous to breathe for 1 hour (parts per million of air) [2]	Symptomatology
Ammonia gas	444 (extrapolated).	Upper respiratory tract.	Alkaline caustic	2,000	Elicits immediate and violent respiratory reflexes; coughing and arrest of respiration.
Hydrochloric acid gas.	385	do	Acid action. Neutralizes alkali of tissues and alters the reaction.	1,500	Death from edema or spasm of larynx. Upper respiratory tract inflamed.
Formaldehyde	Very soluble.	do	Combines with proteins and alters them.		
Sulphuric acid	Encountered as droplets	do	Acid action		
Sulphurdioxide	18.7	Upper respiratory tract and bronchi.	Acid and oxidizing action.	400	Elicits respiratory reflexes. Rarely causes death from edema of the larynx. Trachea and bronchi inflamed. Lung edema rare.
Bromine	9.4	Both upper and lower respiratory tract.	Oxidizing action	60	Elicits respiratory reflexes. Inflammation of entire respiratory tract. Edema of lungs after severe exposure.
Chlorine	1.4	do	do	40	
Phosgene	Decomposes.	Lower respiratory tract.	Liberated HCl has acid action.	25	Does not elicit marked respiratory reflexes. May be fatal in concentrations which cause no reflexes at all. Upper respiratory tract inflamed only after very severe exposure. Usually no immediate symptoms. Delayed death from lung edema.
Nitrogen peroxide.	do	do	Liberated HNO_3 and HNO_2 have acid and oxidizing action.	[3] 117	

[1] Landolt-Börnstein: Physikalisch-Chemische Tabellen. Berlin, Julius Springer, 1905, p. 599. 40°C.= 104°F.
[2] Kobert, R.: Kompendium der praktischen Toxikologie. Stuttgart, F. Enke, 1912, p. 45.
[3] The toxicity of phosgene is greater than that of nitrogen peroxide for the reason that a portion of the peroxide is decomposed into the relatively weak nitrous acid.

Lead: Excretion by Normal Persons

THE fact that the excretion of lead in the urine and feces of apparently healthy, normal men is a matter of almost uniform occurrence has been established by a study by Dr. Robert A. Kehoe and his associates, the results of which were published in the Journal of the American Medical Association (Chicago), December 18, 1926. This fact is of great importance as the excretion of lead was formerly considered a reliable test in establishing a diagnosis of lead poisoning.

The persons examined were workmen taken at random as they appeared at an employment agency and included farmers, common laborers, skilled workers, sailors, chauffeurs, and clerks, most of whom were youths or in middle life, and all parts of the United States were represented in their former homes. Each subject received a careful physical examination, including an analysis of urine and a hemoglobin determination, and was given careful instructions and maintained under supervision during the hours of employment while the tests were being made. Sixty-five men were obtained for

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the experiment and each man was questioned carefully as to his occupation over at least the five preceding years. Part of these men had been employed in occupations in which there was exposure to lead occasionally or during some part of the five-year period, but 25 had no history of lead exposure.

The tests, details of which are given in the article, were carried out with every attention to accuracy and no other work than these analyses was done in the laboratory during the time they were being made. All subjects were found to be excreting lead either in the urine or feces and in most instances in both, although careful consideration of the subjective symptoms and the results of the physical examinations failed to show evidence of lead poisoning in any of the subjects.

The fact of the presence of lead in all the persons examined when coupled with the variation in occupation, mode of living, and the places in which they had lived over a considerable period of time suggests, the writer says, that there is an important source, or sources, of lead absorption as yet unknown but which may be concluded to be fairly general.

The question is raised as to whether such a general exposure could be the result of anything less widely distributed than food materials, as the drinking water in the average American community does not contain lead in sufficient quantity to produce this result and analysis of the water in the community in which these subjects were studied showed no lead was present.

In many of the cases studied there was no history of exposure to the usually recognized sources of lead absorption, and furthermore, the writer says, "there is no constant relationship to be found between quantity of exposure and rate of excretion. It is well to point out that the diagnostic value of qualitative determinations of lead excretion fails completely in face of the facts demonstrated herein. Nor will quantitative determinations avail anything until a quantitative significance is experimentally and clinically established."

Lead Poisoning: Deaths

THE results of a statistical study of deaths from lead poisoning by Dr. Frederick L. Hoffman are published in Bulletin No. 426 of the Bureau of Labor Statistics. The figures presented cover reports of chronic lead poisoning secured from various sources, including data from the division of vital statistics of the United States Bureau of the Census for the United States registration area, various State and city reports, and statistics secured from certain of the State industrial accident boards, as well as foreign reports.

The figures show that during the period 1910–1924 there was a progressive decrease in the number of deaths from this cause for the registration area, the death rate per million of the population being 2.5 in 1910 and 1.4 in 1924. These figures are confirmed by data covering a large group of insured wage earners, which show a corresponding decrease during the same period, and by the other records.

As a part of the study the death certificates in the division of vital statistics were examined in detail for the 11 years 1914–1924. There were 1,592 deaths from lead poisoning during this period and a

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classification of the cases by occupation brings out the startling fact that a considerable proportion of the deaths were nonindustrial or not directly connected with lead-using industries. Among such deaths were those of 48 women and 61 farmers, very few of whom had had any industrial exposure to lead, but who, it was shown, had been poisoned in a majority of the cases by drinking water which had been contaminated by passing through lead pipes. Among occupational groups painters led all others, with 841 deaths, or more than half the total number, while there were 67 deaths among printers, 85 among metal workers and lead workers, and 25 among plumbers.

Lead Poisoning: Report of Cases Among Motor-Car Painters in New South Wales [12]

AN INVESTIGATION of lead poisoning among employees in the motor-car painting trade in Sydney, Australia, in 1924, covered 100 of the 120 members of the coachmakers' union in that city.

Complete medical examinations were made of each man, including a record of the blood pressure, hemoglobin estimation, examination of the blood for punctate basophilia or stippling of the red cells, and chemical or microscopical examination of the urine. As a result of the examinations and the various tests, a positive diagnosis of lead poisoning was made in 14 of the 100 men examined, while 12 were considered to be slightly affected by lead poisoning and 17 had symptoms which were suspicious but not sufficient to justify a positive diagnosis of lead poisoning.

In the examination of these workers the lead line was found in 11 cases. Of these men a diagnosis of lead poisoning was made in 6, of slight lead poisoning in 4, and of no disability in 1. The significance to be attached to the blue line is the same as that of lead in urine, but it relates to the recent past while lead in the urine shows present absorption. The blue line shows that active transportation of lead has taken place in the body and that the tissues have been exposed to its harmful effects. A blue line therefore is an indication for examination for punctate basophilia to see if the blood-forming tissues have been poisoned and for granular casts to determine whether the kidneys have been affected. A blue line is a particularly suspicious symptom in the otherwise healthy gum.

A fatal case of lead poisoning in which a blue line on the gum was practically the only symptom came under the observation of the writer of the report. The case was that of a man engaged in repairing wine casks which had been painted with an exceedingly dangerous mixture of white lead and turpentine. In handling the casks this mixture came off as fine dust. The man, who was 33 years old, had been engaged at this work for two years. His only complaint of ill health was of muscular pains, but examination of the blood showed marked basophilia and anemic changes and examination of urine and feces showed a considerable elimination of lead. He was advised to change his work and did so, but died in a few weeks of rupture of a blood vessel in the brain.

[12] Australia (New South Wales). Director-General of Public Health. Annual report, 1924. Section I–C, Industrial Hygiene. Sydney, 1926.

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Only recently has the significance of finding lead in the urine of workers exposed to any form of this element received a satisfactory explanation. Recent researches have shown that the presence of lead in the urine or in the majority of the body tissues indicates that lead is being actively transported by the blood and therefore absorption has recently taken place or else considerable amounts have just been liberated from the bones. Therefore, if a person is engaged in a process in which there is a known exposure to lead or its compounds and lead is found in his urine, it is certain this is the result of recent absorption. There is no definite knowledge, however, of the amount of lead excreted daily by individuals either poisoned or not affected by the lead taken in, but it is considered probable that a large amount is more generally associated with severe cases of poisoning than a small amount. If through intensive study the amount excreted in the urine could be correlated with the intake it might help to do away with the term "lead absorption" which although it is used in its legitimate sense to mean merely the presence of lead in the body, is often used to cover up or belittle signs or symptoms of poisoning.

The tests showed that lead was being excreted by 62 of the men examined and lead in amounts of 0.05 milligram per liter or more was found in the urine of 9 of the 14 men diagnosed as affected by lead poisoning, in 6 of the 11 men diagnosed as having slight lead poisoning, and in 21 of the remaining painters. Three of the men whose cases were pronounced lead poisoning had been away from work for some time.

Although punctate basophilia are present in practically all cases of lead poisoning, they may be absent or present only intermittently. They were found to be present in 18 of the men examined, 6 of these were among those diagnosed as being affected by lead poisoning and 5 among those considered to be only slightly poisoned. Degenerative changes were indicated by granular casts in the urine and by increased blood pressure in a considerable number of the men examined. In summing up the study it is stated that the incidence of lead poisoning was sufficiently grave in this industry to call for the suppression of all processes creating lead dust, for periodical examination of employees, and for better ventilation of the paint shops, and that "to forbid the use of lead compounds in any painting process done indoors is an obvious remedy."

Manganese Poisoning: Report of Six Cases

A STUDY of six cases of poisoning among workers in a manganese grinding plant in Virginia was reported by R. Finley Gayle, jr., M. D., in the Journal of the American Medical Association (Chicago), December 26, 1925.

The first case which came to the attention of the writer was that of a man, who had been employed in the manganese plant, who was suffering with a disease obviously of the central nervous system but the symptoms of which did not fit any well-recognized symptom complex. Because of his employment, the possibility of manganese poisoning was considered, and the descriptions of the disease available agreed so well with the symptoms of the patient that this diagnosis was made.

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A review of the medical literature showed that remarkably few cases of manganese poisoning had been recorded and comparatively little had been written about the disease.[13] The first cases were reported in 1837, the poisoning having occurred among workmen who handled manganese dioxide in the manufacture of chlorine for bleaching powder. The symptoms in these cases and in those subsequently described in medical journals and other works were similar, and in all but nine of the cases reported at various times the cause of the poisoning was inhalation of the manganese dust in grinding plants or swallowing it with the saliva.

The six patients included in the present study had been employed for periods varying from 3 to 10 months in an atmosphere heavily laden with fine manganese dust. No attempt had been made to protect the workers from the dust until several cases of suspected poisoning had developed and then the workmen were provided with masks, but as they were uncomfortable they were seldom worn. The dust-collection system in the mill was entirely inadequate to collect the dust produced in grinding the ore.

The symptoms of chronic manganese poisoning are said to be so striking as to differentiate them from other diseases of the central nervous system, and the symptoms present in these cases, which are typical of the disease, are described by Doctor Gayle, as follows:

> The initial symptom in 3 of my 6 patients was disturbance of gait and in 2 of the remaining patients this was the second manifestation. In each of the patients the following symptoms were invariably found: Nervousness; weakness and fatigue; disturbed gait with retropulsion on arising and propulsion on walking, and causeless laughter with silly conduct and expression. Paresthesias[14] were noted as an early complaint in 4 cases; intention tremor of the hands, in 5; monotonous speech, in 5; awkward, clumsy movements of the extremities with loss of the finer movements of the hands, in 4; masked expression, in 4; a loose-hanging lower jaw, in 3; an infrequent, deep inspiratory sigh, in 3; and lethargy, in 2. Abnormal mental symptoms were observed in every patient, mostly of personality, and in only one case were intellectual aberrations observed. Irritability, lack of sociability, tearfulness, and mild exaltation were the outstanding changes. Two of the patients became suspicious, without cause, of their families and friends. The organic neurologic findings were almost uniform, the gait was altered in every case, the station was unsteady and the deep tendon reflexes were increased over the normal in the majority. Intention tremor of the hands and increased muscle tone were found together with masked expression and monotonous speech. None of the patients showed pathologic plantar reflexes, objective sensory changes, atrophy, or edema. The pupils were not altered in size, shape, or reaction. The fields of vision were normal as well as could be detected by a rough examination. Intraocular examination showed definite pallor in one case and a very reddened vascular retina in another. No involvement of the cranial nerves was noted except suspicious weakness of the facial nerve in one patient and the drooping lower jaw in 3.
>
> Peripheral neuritis is a frequent symptom of poisoning from various metals, and it is possible that there may be some neuritic involvement in these cases. This may be suspected in view of the fact that 4 of the patients examined complained of paresthesias of the extremities, and in 2 of them actual pain was described. Against this belief is the activity of the tendon reflexes, the absence of objective sensory changes and muscular atrophy, and the character of the pain.

The ages of these workers varied from 17 to 47 and all but one had been rather heavy drinkers. The operators of the plant and some

[13] See Labor Review, October, 1919, pp. 238–240.

[14] Morbid or perverted sensation such as numbness, crawling sensation, "pins-and-needles."

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others in the community were of the opinion that the symptoms were caused by the drinking of corn whisky and fermenting cider, but the symptoms of either acute or chronic alcoholism do not agree with those in these cases; and also the one patient who was not a drinker developed symptoms of poisoning in a shorter period of time (about three months) after being in contact with the manganese dust than any of the others.

There appears to be a gradual progression in the symptoms of persons susceptible to manganese poisoning as long as they are subjected to absorption of the manganese dust, the symptoms remaining at the maximum for varying lengths of time followed by improvement up to a certain point. Because of the well-grounded belief, however, that there is a destruction of cerebral tissue, the writer believes that in all but the mildest cases there will be permanent disability.

Preventive measures consist of the provision of face masks, the wearing of which should be rigidly enforced, and the installation of an efficient dust-collecting system. It is also considered essential that shower baths should be provided and that a bath and a change of clothing should be compulsory at the end of the day's work.

The treatment which has been suggested for the condition is massage, corrective exercises, warm baths, and various types of hydrotherapy, together with stimulation of the excretion of the poison by general elimination.

The results of the study are summarized as follows:

1. Manganese, more often than is recognized, causes symptoms in workmen handling this ore.
2. That certain persons are not susceptible to the poisoning effects of manganese is demonstrated by the fact that many workmen in this plant have been in contact with manganese dust for several years with no apparent ill effect.
3. Mental symptoms have been described by some investigators and denied by others. Mental changes were found in each of the patients of this series.
4. No record could be found of other investigators having detected manganese in the urine in clinical cases. Experimentally it has been found in minute amounts. In this series it was present in three of the five specimens of urine examined.

Mercury Poisoning

POISONING from mercury is a common occurrence both in the mining and the smelting of this metal, although by far the greater number of cases occur among the employees about the reduction works, according to a study of mercury poisoning by Dr. R. R. Sayers. (Bureau of Mines, Reports of Investigations, May, 1922, Serial No. 2354.) Modern methods of mining and recovery of the metal have greatly reduced the frequency and severity of cases, but further reduction is possible, the report states, and much can be done by both workmen and operators by taking proper precautions.

The cases of mercury poisoning occurring about mines and reduction works are usually chronic, although there is occasional development of acute symptoms when workers are exposed to excessive amounts of mercury vapors, dust, or soot. The chief symptoms of the disease are stomatitis (inflammation of the mouth), frequently with salivation, tremors, and a peculiar timidity. There are organic degenerative changes in the digestive system, the circulatory system, and the kidneys.

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The principal causes of poisoning are poor ventilation and failure to prevent the escape of mercury vapor from furnaces, condensers, and retorts, and uncleanliness on the part of the workmen. In addition to these causes there is a wide variation in the susceptibility of different persons. The use of alcohol and tobacco seem to increase both susceptibility and the severity of symptoms, while women and children and tuberculous individuals are considered to be most susceptible.

Mercury poisoning is caused by the absorption and retention of small quantities of the metal or its compounds over an extended period of time. It may enter the body through the skin, the gastro-intestinal tract, or the respiratory tract, and is more readily absorbed by the skin if the person is perspiring or if the mercury is impure or dirty. Metallic mercury vaporizes at low temperatures, being noticeable at 8.5° F., and the amount vaporized increases with the heat. The vapors, fumes, and dusts enter the body, therefore, through the skin, they are breathed into the lungs, or are swallowed with food or other substances taken into the mouth. While the effects of the mercury are cumulative, only a portion of the amount absorbed is retained in the body, elimination taking place slowly through the kidneys, large intestines, and the bile and saliva. Because there are usually only small amounts absorbed in any one day by a worker in a reduction plant, the development of symptoms is usually slow. The usual course of symptoms is first loss of appetite, stomatitis, and intestinal disturbances followed at varying lengths of time by the development of tremors which progress until the whole body is more or less involved. While this stage is not supposed to be dangerous to life, if exposure to mercury continues the brain may become affected, with death as the probable result.

Persons suffering from industrial mercurial poisoning usually recover, the report states, if they are removed from contact with the poison during the early stages or even after tremors develop, though recovery may take several months, but if paralysis, delirium, or insanity are present the recovery is doubtful.

Measures recommended in the report for the prevention of poisoning include adequate general and exhaust ventilation; provision of respirators; one shower bath for every 10 employees and one wash-basin for every 5 employees; individual lockers; lunch rooms; physical examination of applicants for employment, excluding drinkers, those having tuberculosis or those in poor physical condition, and persons under 18 years of age; periodic physical examination at least every six months; instruction of employees as to the dangers of mercury poisoning and methods of avoiding it. The necessity for strict personal cleanliness and for keeping in good physical condition is emphasized.

Mining Industry: Engineering-Hygienic Aspects of Dust Elimination in Mines

THE conclusions reached from an intensive study of the effect of mine dusts on health and safety made through the United States Bureau of Mines and the United States Public Health Service were reported by Daniel Harrington in the Journal of Industrial Hygiene (Boston), May, 1925.

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The study was carried on in more than 100 coal and metal mines and mining communities in 25 States, while a more limited amount of underground observation was made in about as many more mines and their camps. From this study and many other investigations it appears that any mine dust—either in coal or metal mines—which is insoluble or soluble with difficulty in the fluids and tissues of the respiratory organs will in time affect the health of underground workers if it is present in the air in minute form and in large quantities and is breathed during a large part of the working time. Some soluble dusts are also harmful. In general it appears that the quantity of dust breathed more or less continuously, together with its lack of solubility, determines the hygienic harmfulness much more than the specific physical or chemical qualities of the dust itself, although a large quantity of finely divided flint dust or similar hard, sharp, insoluble material is more harmful than a similar quantity of fine limestone, coal, or shale dust. The dust of free silica, which is probably the most harmful, is not always equally so, as some ores, such as siliceous schist, with a free silica content of 60 to 80 per cent, have dust which is much less sharp and probably more soluble than ores such as flint or chert, which have about the same percentage of silica but in which the dust is very hard and sharp.

In metal mines the sources of air dustiness, in the order of their importance, are: Dry drilling of holes for blasting, particularly those from about 70° to vertical; blasting; shoveling or "mucking" very fine dry material at the working face, where the ventilation is usually poor; loading cars from chutes; dumping loaded cars into chutes; and timbering. In metal-mine mills, dry crushing and other occupations are dangerously dusty.

The most dangerous occupation in coal mines from the point of view of the dust hazard is cutting dry coal by mining machines, more dust usually being produced by electric machines than by compressed-air machines. Enormous quantities of very fine dust are thrown into the air by both the undercutting machines and the shearing, center-cutting, or overcutting machines, this being particularly harmful when the cutting is done largely in dry clay or shale. In addition to the hazards of possible explosions and of poisonous fumes from blasting coal while the shift is in the mine, this practice has the very bad feature of throwing into the air large quantities of very fine dust to be breathed by workers. Shoveling or loading dry coal into cars is also a very dusty occupation, particularly when pillars are being extracted. Certain methods of drilling also are very dusty, resulting in very bad conditions, particularly if the air circulation is sluggish.

Although the quantity of dust breathed by the miner is of great importance, it is difficult to determine the safe limit in the air dustiness of working places. In South Africa a limit of 5 milligrams, or 300,000,000 particles per cubic meter of air, was set; but according to recent reports from that country, the average air dustiness of working places is only 1.3 milligrams per cubic meter of air. The writer states that there is not one dry coal or metal mine in the United States where the average air dustiness is as low as the South African standard or even as low as 10 milligrams, the standard set by Higgins and Lanza in their study of miner's consumption in the Joplin, Mo.,

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district in 1915. The average amount of dust in dry metal mines in this country is over 20 milligrams, while many are over 50 milligrams per cubic meter of air. Dry drilling of the upper holes sometimes results in as high as 7,000 milligrams of highly siliceous dust, or one thousand four hundred times the maximum allowed in South Africa. The average dust content of the air resulting from dry drilling the upper holes (those above 60°) is from 150 to 200 milligrams per cubic foot of air, those below 60° about 50 milligrams, while wet drilling produces from 5 to 20 milligrams.

The weight of dust in the air is usually not so high in coal mines owing to the lower specific gravity of coal, but in some cases the number of particles reaches an enormous figure. In one case in which coal was shoveled in a confined, poorly ventilated, very dry place there were approximately 8,000,000,000 particles per cubic meter of air, while in numerous other places in the same mine there were from one to five billion particles in each cubic meter of air. Similar conditions were found in another coal mine where an undercutting machine was being used without the use of water on the cutting chain, the air breathed by the workers having nearly 5,000,000,000 particles per cubic meter of air. Physical examination of these workers disclosed much miner's consumption among them.

The harmfulness of insoluble dust present in large quantities and in finely divided form in the air breathed by mine workers may be increased by other factors tending to depress the workers' vitality, such as high temperature or humidity and air depleted of oxygen or high in gases, such as carbon monoxide, carbon dioxide, etc. The writer believes that the dusts most harmful to the lungs are from 0.25 micron[15] (possibly as small as 0.1 micron) up to 10 microns in size. Dust particles which result in bronchitis are probably larger in size—up to 50 or even 100 microns. These larger particles, if they get to the lungs, do not seem to remain there, but cause considerable irritation and clogging of the respiratory passages.

Although the dust of free silica is probably the most harmful of the insoluble dusts, X-ray and other physical examinations of miners who have worked in the dust from coal and shale, as well as in the dust from ores such as iron oxide, limestone, and other essentially nonsiliceous material, show definite amounts of lung involvement. Examination of coal miners reveals the fallacy of the idea held by many that breathing of coal dust is harmless, as not only are throat or bronchial troubles found frequently but also the usual symptoms of miner's consumption, including extreme shortness of breath and hemorrhage. The harmful effects of the dust are intensified by local conditions, such as a high carbon dioxide or low oxygen content of the air, which cause more rapid respiration and therefore breathing in a maximum amount of dust, and by high temperature and humidity, especially when the dusty air is stagnant. The very fine dust (from 10 microns down) when once suspended in the air by any mining operation remains in suspension for long periods of time, and unless there are continuous currents of fresh air at all work places the miner is forced to breathe this dust-laden air.

[15] Micron=one-millionth of a meter.

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The following statement by the writer gives an idea of the prevalence of respiratory diseases due to dust among miners in the United States:

> In one metal-mining locality with siliceous ore formation an insurance company reports mortality as over 500 per cent of the expected mortality, the excess deaths being due chiefly to lung disease; in another metal-mining locality with limestone formation death expectancy was exceeded by 50 per cent, and again lung disease was held responsible for the excess. In another metal-mining district physical examination showed that at least 20 per cent of all mine workers had silicosis, and of the men who were examined physically and had worked only in that district less than 5 per cent were free from the effect of dust in the respiratory organs. In a metal mine in hematite ore with a very low silica content, about 60 per cent of those examined physically had dust involvement, although only a small number were so severely affected as to be incapacitated. In another hematite-ore region physical examination of miners was not permitted by the company, but a miner whose health broke down and who threatened suit, alleging miner's consumption, was given compensation in preference to fighting the suit. In a metal-mining district with ore in calcite (limestone) gangue, considerable miner's consumption was found, although the mining company alleged that it was brought in from other camps by those who were afflicted.
>
> Mortality statistics of the coal-mining counties of one State over a five-year period showed deaths of coal miners from respiratory disease as 36 per cent of the total deaths, if accidental deaths were excluded; farmers had 25 per cent and "all other males" about 30 per cent of deaths due to respiratory diseases. In another State the coal-mining mortality record (excluding accidental deaths) showed that 36 per cent of coal miners died of respiratory disease, against 20 per cent for farmers and 26 per cent for "all other males." In a large coal-mining locality about 25 per cent of the old-time miners were given physical examination; 25 per cent of those examined had definite lung trouble, and nearly 37 per cent additional had slight lung involvement. In another coal mine with totally different conditions and in a different part of the United States, about 25 per cent of the underground employees were given physical examination and about 40 per cent of these showed definite lung involvement. In a number of instances, especially in the western coal-mining States, machine runners have been so seriously affected by breathing coal dust that they had to leave the mines, and in several cases death ensued within a few years (in one case in less than one year after leaving the mine), the cause being lung and throat trouble; this trouble, due to dust in the lungs of machine runners in coal mines, has been known since about 1913 in Wyoming and Utah, and the remedy then applied and now largely used is the spraying of water on the cutting chain when the machines are working.

Exact figures as to the mortality and morbidity rates from respiratory diseases among miners are not available, but the writer states that there can be no doubt that dust diseases are directly responsible for the death of several hundred coal and metal miners annually in the United States and indirectly responsible for the death or disability of several thousand others. The lack of information on the subject is said to be due to incorrect diagnosis on the part of physicians, in some instances, but mainly to the fact that usually in the regions most afflicted there is a concerted effort to minimize the dangerous conditions. Opposition to measures for improving conditions is found among the workers themselves, who object to physical examinations and oppose the use of wet drills and ventilating systems, and among reactionary mine bosses and operators. State laws regulating working conditions in mines are either nonexistent, the writer states, or, if there are such laws, they are not well enforced and there is a general lack of knowledge of and interest in the situation. Specific remedial measures recommended for metal mines are: Adequate mechanical ventilation; use of water in drilling, and

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sprinkling of all places where dust collects; blasting to be done, when possible, after a shift, and where this can not be done, enforcement of strict regulations as to wetting the region of blasting before and after firing the shots and removal of all explosive fumes by adequate air current; and strict physical examination of mine workers before employment and at intervals of not more than six months during employment.

Mining Industry: Health Hazards

THE principal health hazards in the mining industry are listed by R. R. Sayers, chief surgeon of the United States Bureau of Mines, in a brochure published as serial No. 2660, as those due to abnormal conditions of the air, improper sewage disposal, bad drinking water, poor illumination, and local mechanical irritation. The last two hazards while important in England and on the continent are not of importance in this country. Miner's nystagmus (spasmodic movement of the eyes) resulting from poor illumination has not been reported in this country, due to the better illumination found in American coal mines, and beat knee, beat hand, and beat elbow caused by local mechanical irritation are of rare occurrence here owing to the fact that the coal seams are thicker and usually not inclined, and undercutting by machines instead of by hand is almost universal.

The effects of high temperatures and humidities in metal mines in this country have been studied recently by the Bureau of Mines. It was found that in temperatures above 90° F. with almost saturated air the ill effects are much less when the air is moving than when it is still. At temperatures of saturated air from 98.6° to 100°, however, moving the air even at high velocities had no good effect and there was apparently some disadvantage. It was further found that the exhaustion and weakness following exposure to a very high temperature and humidity for a short period is not so severe as that following exposure to a moderately high temperature and humidity for a longer period. There were changes in the blood pressure in high temperatures and humidities, the systolic blood pressure rising and thus increasing the pulse pressure. The pulse rate rather than the rise in body temperature seemed to determine the extent of the discomfort experienced. Persons on whom the experiments were made became very uncomfortable after the pulse rate exceeded 135 pulsations per minute and showed very severe symptoms of distress when the pulse exceeded 160 per minute.

The principal poisonous dusts met with in mining are those from lead, mercury, zinc, and arsenic ores, and the more soluble the dust the more dangerous it is. In mining carbonate or oxide ores of lead men are often badly poisoned, while in mining galena (lead sulphide) lead poisoning is of rare occurrence. In the mining and smelting of mercury, especially when the ore contains free mercury or the more soluble salts, there are some cases of poisoning, especially in poorly ventilated underground workings, but the number of cases is much greater among employees in reduction plants. Poisonous dusts are seldom if ever present in coal mines.

The various irritating dusts produce different forms of pneumoconiosis (fibrous inflammation of the lungs). When the disease is

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caused by breathing rock dust, especially fine silica, it is called "silicosis"; when it is caused by coal dust, "anthracosis"; and when caused by iron dust, "siderosis." Silicosis is present in most of the hard-rock mining districts of the world. It is found among the miners in the gold and lead-silver mines of Australia, the gold mines of New Zealand and South Africa, the tin mines of Great Britain, and in many of the mining districts of the United States.

Because of the growing use of rock dusting in coal mines to prevent explosions it is important to determine the suitability of different kinds of dust for this purpose. Tests have been carried out by the Bureau of Mines on the basic types of coal dust to which the men will necessarily be exposed and on quartz dust, as well as on limestone dust, shale, and kaolin dust (practically a pure silicate). It has been determined from these studies that limestone dust has no more effect than coal dust in the production of fibrous tissue in the lungs, but that the silicate dust has an effect similar to that of quartz dust. Although some experiments seem to show that shale dust, which contains from 50 to 55 per cent silica, may be inhaled in large quantities, the reaction of live animal tissue to shale dusts varies with different specimens of shale. As most of the specimens produce marked fibrous-tissue formation, however, it is considered by the bureau officials that they should be regarded as "definitely harmful." Dr. J. S. Haldane, in a study of the effects of dust inhalation in English mines, states that "the material for stone dusting ought to be most carefully selected in the light of existing knowledge, excluding any sort of dust which, when inhaled by itself, has a doubtful record or is likely to irritate the air passages or eyes by its grittiness. It is fortunate that suitable material is abundant and is also, as a rule, the easiest to disintegrate into dust." Dr. E. L. Collis said that if he were asked to name the dusts which are physiologically safe to use in dusting coal mines he would at present only be prepared to name dusts composed of calcium salts, such as limestones, his opinion in regard to shales being as yet undecided. The Bureau of Mines has listed in tentative specifications, as preferable for rock dusting, pure limestone, dolomite, gypsum, and anhydrite.

The presence of gases is another hazard of air conditions in mines. These gases include carbon dioxide, which causes deeper and more rapid respiration. The rapidity of respiration varies from a very slight increase when one-half of 1 per cent is present, up to 5 per cent, with which amount breathing is laborious. Ten per cent can be endured for only a very few minutes. Methane is of importance in coal mines, and it may also be present in metal mines. This gas has no harmful effects when breathed, but it may accumulate in sufficient quantities to make an explosive mixture with the oxygen in the air.

Hydrogen sulphide is usually found only in very small quantities and has a very repulsive odor which may serve as a warning. It is highly poisonous, 0.06 to 0.1 per cent being sufficient to cause serious symptoms within a few minutes.

Sulphur dioxide is very irritating to the eyes and respiratory passages and causes choking when breathed. It is occasionally present in the mine atmosphere in sufficient concentration to be dangerous, but it is easily recognized by its characteristic odor.

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Carbon monoxide, which is responsible for a great many deaths among miners and workers in the mineral industries, is without odor, color, or taste, and its effects are often unnoticed by the victim until it is too late. In regard to the hazard from the various gases the report states that—

> It can not be emphasized too strongly that efficiency, comfort, and good health depend to a large extent on pure air, and that ill effects or symptoms arising from variations in the composition of the air, either by lowering of the oxygen or by addition of gases such as hydrogen sulphide, carbon monoxide, or carbon dioxide are best treated by—
>
> 1. Getting the victim to pure fresh air in the quickest time possible;
> 2. Administering pure oxygen for at least 20 minutes;
> 3. Using the Schaefer method of artificial respiration when the victim has ceased to breathe or is breathing slowly irregularly, and shallowly;
> 4. Keeping the victim warm and at rest.

Nickel Refining: Control and Treatment of "Nickel Rash" [16]

THE methods of control and treatment of nickel rash have been studied in a nickel refinery in Canada. The refinery treats matte consisting of approximately 55 per cent nickel, 25 per cent copper, and 20 per cent sulphur, the matte being processed to fine nickel and copper in five different buildings in which the men are exposed to variable heat conditions and to varying quantities of nickel and nickel salts.

The rash appeared generally on exposed surfaces of the body, as the forearms, wrists, neck, forehead, and the upper part of the chest, but was of two distinct types depending on the character of the work. Among the men who worked around the furnaces, where it was very hot and dusty, the rash started as small papules which seemed to occur at the mouths of the pores and was accompanied by severe burning and itching. The irritability was increased by exposure to heat, especially if sweating occurred. In the milder cases the skin surrounding the eruption was apparently healthy, but in the severe cases the skin became greatly inflamed and swollen. In these cases the exudation was such that the condition resembled a severe, acute weeping eczema. The other cases occurred in the building in which the final refining took place by an electrolytic process where the employees were exposed to a hot, moist atmosphere. The rash started with the occurrence of reddened patches of skin which were characterized by burning and itching. Unless such cases received early treatment they developed the features of the first type and there was a marked tendency among these patients toward relapse after apparent cure.

Various animal experiments were carried out to determine the effect of handling the nickel or nickel salts and of the ingestion of the nickel; and the influence of various factors such as the diet, the severity of the work, personal cleanliness, and the heat of the work places were also studied.

It was determined that an insufficient cooling power in the atmosphere was the most important single factor in the incidence of the disease and that increased skin temperature allied with an alkaline sweat lowers the resistance of the exposed parts and increases their

[16] The Journal of Industrial Hygiene, Boston, December, 1926. "Studies in the control and treatment of 'nickel rash,'" by Frederic M. R. Bulmer and E. A. Mackenzie.

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susceptibility to irritation. Attention to ventilation and the maintenance of a suitable cooling power in the air may be expected, therefore, greatly to reduce the incidence of nickel rash, and its cure can be hastened by large doses of calcium chloride which counteract the tendency toward the elimination of the excess amount of alkali in the sweat which excessive heat produces. The writers suggest that other occupational skin diseases may be produced by conditions similar to those which are of importance in the causation of nickel rash.

Phosphorus Necrosis

See Fireworks manufacture: phosphorus necrosis.

Photo-Engraving Industry: Health Survey

THE variety of the hazards connected with the photo-engraving industry is shown in an article in the American Federationist[17] in which an account is also given of the health and the working conditions among the photo-engravers of New York City.

Practically one-third of all the photo-engravers in the United States and Canada are said to be located in about 100 establishments in New York, which is the center of the printing and publishing business of the country. Photo-engraving is the process of making the printing plates from which pictures and illustrations are printed in one or more colors, all matter except straight type being printed from these plates or engravings. A great many chemicals and acids for etching in various forms are used, and part of the photographic development has to be done in rooms absolutely dark, with the consequence that the provision of proper ventilation is a problem. The special hazards, aside from poor ventilation, result from the use of inflammable substances, high-speed machines, chemicals, acids, and various gases.

The trade is highly organized, and many questions relating to the welfare of the workers are dealt with by a joint industrial council composed of an equal number of representatives of the employers' and the workers' organizations. A sanitary survey of the industry has recently been made[18] and a sanitary code established by the Board of Health of the City of New York at the request of the council.

As a preliminary to the survey, a physical examination was given to all workers in the industry who would volunteer, and a detailed and uniform report was kept of all examinations. About two-thirds of the workers volunteered for the examinations, which were given at the various plants by the staff of four physicians assigned by the board of health for the purpose. The findings were confidential, but each individual was notified of any condition disclosed by the examination which needed attention and was urged to consult his family physician. It is expected that the results of the examination will be a guide in the future in the selection of applicants for apprenticeship. For the past five years records have been kept of the

[17] American Federationist, Washington, D. C., July, 1926. "Health in the photo-engraving industry," by E. J. Volz.

[18] A complete report of the survey was published in The American Photo-Engraver, St. Louis, Mo., June, 1926.

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physical examination of apprentices, as each applicant is examined prior to being indentured, and these records it is considered will be of increasing value in the future in determining whether any specific disease is of an occupational origin.

Photo-engraving is divided into a number of distinct processes—photography, etching, engraving, etc.—which are carried on under varying conditions and which supposedly involve special hazards. A classification of the results of the examinations by the occupation or the department in which it was carried on seemed to show, however, that the exposure to the various hazards was fairly general throughout the establishment.

As the photo-engraving process has been in use only about 40 years and has developed rapidly in recent years, the men employed are comparatively young. The average age of those examined was 34.5 years, although the range was from 16 to 74 years.

From the nature of the work it was expected that diseases of the nose, throat, teeth, eyes, and skin would predominate, and the findings did show a high percentage of such diseases. Sixty-four per cent of the workers were found to have throat affections, and a comparison of the death rate in the industry from various causes with the general death rates showed a higher rate from pulmonary diseases among these workers than among the general population.

Among the chemicals and acids used in the industry which constitute a hazard to the workers are glacial acetic acid, wood alcohol, ammonia, ammonium bromide, ammonium chloride, anilin, benzine, benzol, ammonium bichromate, sodium bichromate, copper bromide, cadmium bromide, potassium carbonate, carbolic acid, chloroform, potassium chloride, silver chloride, chrome alum, chromic acid, caustic potash, potassium cyanide, sulphuric ether, sodium fluoride, formalin, muriatic acid (hydrochloric acid) ammonium iodide, potassium iodide, lye, bichloride of mercury, mercuric oxalic acid, pyrogallic acid, ammonium sulphide, sodium sulphide, sulphuric acid, and verdigris collodion.

A sanitary survey of the plants showed that in addition to these hazards the men were exposed to glare from unshielded lights and to ultra-violet and infra-red rays from open arc lights; dust from grinding cylinders; carbon monoxide from gas stoves and gas driers, ovens, etc.; dust from dragon's-blood and other powders; excessive heat from rheostats; chips from filings and routings of metal on machines operated at a high speed; and hazards from unguarded machinery.

As a result of the survey about 40 general recommendations were made providing for the mechanical ventilation of all plants and all dark rooms; exhaust systems for all acid machines, etching tubs, chemical sinks, gas stoves, boiling pots, sensitizing pads, dragon's-blood cabinets, etc.; and the use of indirect or semi-indirect lighting and the inclosure of arc lights in glass to filter the dangerous light rays.

Printing Trades: Health Survey, 1922 to 1925

A SURVEY of the health conditions in the printing industry covering the years 1922 to 1925, made by Dr. Frederick L. Hoff-

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man at the instance of the representative organizations of the employers and the various printing-trades unions, and with the cooperation of the United States Bureau of Labor Statistics, has been published as Bulletin No. 427.

The purpose of the survey was to secure, as far as practicable, an impartial, up-to-date scientific appraisal of health conditions in the industry, with the object of correcting conditions which need to be improved.

The printing industry, which employs some 300,000 workers and is represented in practically every community, however small, is one in which the great variety of processes and plant conditions defy standardization. Such an industry, therefore, naturally presents many difficulties as to thoroughness and completeness in matters of detail in making a health survey. In general, the smaller printing plants were found to be typical of the past rather than the present and the labor conditions affecting the health and welfare of the workers differed greatly from those in the large and modern establishments. In many of these plants the mechanical equipment was such as to prevent satisfactory methods of lighting, ventilation, and use of floor space, although this type of plant is rapidly passing.

In addition to personal inspection of many plants questionnaires were sent to employers and to labor organizations. The returns received from 2,096 employers, with approximately 100,000 employees represented in their reports, showed a surprisingly low rate of sickness in general, while only 34 cases of lead poisoning, 78 cases of tuberculosis, and 67 cases of eye infections were reported. Inquiry as to the number of plant inspections showed that, broadly speaking, the printing plants throughout the country are subject to a reasonable measure of inspection by authorities more or less qualified for the purpose.

The replies to the questionnaire sent to labor organizations confirmed the reports by employers as to the low sickness rate in the industry as well as to the low incidence of lead poisoning, although they showed occasionally that sanitary conditions were in need of improvement.

The conditions of health of aged workers was one of the subjects of special inquiry and returns were secured concerning 728 men and women between the ages of 60 and 86, part of whom had retired from active work. The present health of these persons was reported to be good in the great majority of cases, only 3.4 per cent being reported to be in bad health, indicating, the report states, that the occupational hazards in the industry are at the present time of relatively minor effect in producing serious consequences traceable in prolonged sickness or incapacity in old age.

In summing up the results of the survey Doctor Hoffman states that in general health conditions in the printing trades were decidedly more satisfactory than had been anticipated, as shown by the low rate of sickness incidence reported by both employers' and labor organizations and confirmed by the vital statistics of these trades, and that, in a general way, the satisfactory state of health of the workers is "suggestive of very material progress in sanitary conditions in these trades and the control of conditions likely to give rise to objectionable features bearing upon health and longevity."

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Printing Trades: Hygienic Conditions

THE results of an investigation by the United States Bureau of Labor Statistics into the hygienic conditions in the printing trades are embodied in Bulletin No. 392 of this bureau. Approximately 1,000 plants in the printing industry in 21 cities of the United States were personally inspected and detailed reports were made on 536 establishments, having 81,314 workers.

There are 35,000 establishments in the printing industry and 600,000 workers. The six main subdivisions of this industry—composition, photo-engraving, stereotyping, electrotyping, presswork, and binding—cover altogether 50 skilled trades. Practically all of the hazards in these various trades can be prevented by sensible precautions and there need be no more menace to the health of workers in the printing trades than in any other indoor employment.

One of the most important matters in the hygiene of the printing industry is ventilation. The majority of the printing plants depend mainly upon window ventilation, yet each process in the industry has its own ventilation problems.

The larger and the very small establishments were usually kept very clean. The medium-sized plants, however, "presented the most insanitary appearance." Washing facilities were greatly neglected in many cases, and lunch-room provisions called for considerable improvement.

Filtering and cooling systems for drinking water and bubbling fountains were usually installed in the large modern plants, but the greater number of the other establishments had tank coolers, frequently with the ice placed in the water. The medical equipment in a few cases included a dental clinic. In some establishments the workers exposed to lead fumes were examined monthly.

The principal occupational diseases in the printing trades are tuberculosis and lead poisoning. Only 29 cases of tuberculosis in five years were reported for the 536 establishments covered, a surprisingly small number of cases, but doubtless due to the fact that other cases "were withheld or not known to the employers" because the disease did not result fatally. Of the 14 cases of lead poisoning recorded for the same period 12 were reported by employers of the 536 establishments. Two additional cases were found which evidently originated in one of the newspaper establishments studied, and these were therefore included in the summary. Fifteen other occupational diseases were found, including 4 cases of carbon monoxide poisoning, 9 cases of chromium poisoning, and 2 cases of eczema.

Radium: Effects of Use of Radioactive Substances on Health of Workers [19]

THE occurrence of an unusual number of cases of necrosis among young women who had been employed in a plant in New Jersey engaged in the manufacture of luminous watch dials prompted the investigation of these cases during 1924 and 1925 by a number of

[19] See Labor Review, May, 1926, pp. 18–31.

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different agencies. Early in 1925 a preliminary survey of radium-using establishments was made by the Bureau of Labor Statistics. It was intended at the time this survey was started to make a complete study of the plant conditions and of the effects of the use of the radioactive substances on the health of the workers. It developed, however, that properly to carry through such a study would require greater technical resources than were at the disposal of this bureau, and the study was therefore discontinued.

In the radium-using plant above referred to, six deaths from necrosis of the jaw and aplastic anemia occurred during 1924 and 1925 among the young women engaged in painting numerals on watch and clock dials, the latest death occurring December 26, 1925. The chief chemist of the company also died in 1925, the doctor who performed the autopsy giving the cause of death as aplastic anemia of the pernicious type. In addition to these deaths at least seven other cases of varying degrees of severity have been reported. The period of employment of the women affected by the poison ranged from one to seven years.

The luminous paint used in the New Jersey plant consisted of zinc sulphide rendered luminous by activation with a minute quantity of radioactive substance consisting of about 20 per cent radium and 80 per cent mesothorium. Although a number of dial-painting plants use this or a nearly identical luminous composition, cases of poisoning have been reported only from the New Jersey plant.

In addition to the survey by the bureau, studies of these cases and of conditions in the plant have been made by Dr. Cecil K. Drinker and his assistants of the Harvard School of Public Health, and by Dr. Frederick L. Hoffman, while the results of the observations of Doctors Martland, Conlon, and Knef, who attended some of these cases, and the results of various experiments conducted by them have also been made public.

All of the investigators have ascribed the necrosis of the jaw with which these young women were afflicted to the practice of pointing the brushes in their mouths, by which minute quantities of the substance were continually absorbed into the system. The physical examination by Doctor Drinker of 22 individuals from various parts of the plant, 13 of whom were employed in the painting room, showed that in no case was the blood entirely normal, while in many of the blood films examined the results characteristic of excessive exposure to radium or X-rays were present.

The investigation by Doctor Hoffman included visits to the plant and investigation of the facts connected with the sickness and death of several of these patients and as a result of his study Doctor Hoffman concluded that the radium necrosis occurred not from the fact of general exposure to radioactive substances or nearness thereto, but as the direct result of introducing such substances in minute quantities into the mouth through the insanitary habit of penciling the point of the brush with the lips.

From the experiments and the clinical studies of these cases by Doctor Martland and his associates, it was concluded that for the first time the anemias from which these patients suffered were actually proved to be due to the ingestion of radioactive elements

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and that the necrosis of the jaw, which forms an important lesion in this disease, is due to local irritative radiation caused by clinging particles of the radioactive substances on the gums, teeth, and roof of the mouth.

Skin Diseases: Defects Caused by Various Substances

A PAPER on skin diseases of an occupational origin, by Dr. R. Prosser White, which was read at the Fourth International Congress of Industrial Accidents and Diseases, Amsterdam, September, 1925, was published in the September, 1926, issue of the Journal of Industrial Hygiene (Boston). It is an interesting fact, the writer says, that the majority of industrial physicians do not realize that occupational skin diseases present a greater variety of lesions than those of syphilis and tuberculosis combined and that some of these diseases also have a longer latent, or incubation, period than those having a syphilitic origin.

In cases of occupational dermatosis it is said to be important to determine whether or not the patient has a normal skin because in the case of a hereditarily tender or weak skin the period of recovery will be prolonged; secondary infections which are common complications must be prevented in the treatment of these diseases; and consideration must be given to any tendency the irritant has to produce sensitization. A dermatitis or eczema is idiopathic if it is inborn in the individual or is acquired as a result of indiscretions in diet, through a hereditary peculiarity of the blood or tissues, or from numerous unknown reasons; while it is traumatic if it is a reaction due entirely to the agent used in the industrial process. On the other hand, there may be a biologic or chemical correlation between the skin and the agent, which will result in an excessive cutaneous reaction or other unusual features showing that the agent has caused sensitization. As sensitization can change the type and features of an eruption as well as alter the duration and severity of the disease, it is evident that in such a case it is not advisable for a person to follow work involving exposure to the sensitizing agent.

The symptoms of idiopathic and traumatic eczema are practically identical, but the former often runs a tedious and prolonged course while the latter, unless there are complications, has a definite limit. In making a differential diagnosis, therefore, the history and duration of the disease and the exact nature and kind of materials worked among must be considered. Individual tendencies and weaknesses often make it difficult to determine to what extent the condition is due to the unhealthy condition of the skin and how much to the material used. Many of these individual weaknesses or defects prolong the period of convalescence and complicate recovery and for this reason physical examination on entrance is important both for the industry and for the individual in eliminating those suffering from any skin complaint or physical disability which might disqualify them later. In a plant with which the writer is connected where there is a constant risk of exposure to noxious dust, 10 per cent of the applicants are rejected as a result of the physical examination, the majority because of some cutaneous disability.

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Substances Affecting the Skin

ALL materials which destroy the horny layer of the skin produce a prompt effect, examples of materials having an immediate solvent action being the alkalies and alkaline earths—lime, soda, and the sulphides. These substances produce sores which are superficial rather than deep and there is always risk in working with them if they are handled in sufficient strength. Other harmful substances such as chrome have little effect on the horny layer of the skin, but as soon as this is broken, oxidation or other chemical action starts. The time taken by a traumatic sore to heal depends upon the extent and depth of the lesion. There is no danger of malignancy from certain substances such as chrome, although the irritation from it may be lifelong, while other substances such as tar and soot may cause malignant growths. The malignancy can not be brought about solely by the irritation of acute or chronic inflammation, but depends upon specific peculiarities, one of which is special to the tissues and the other depends on the specific activity of the agent. It is not until recently that the latent effects of some of these cancer-producing substances have been realized, such materials as soot, tar, and spinning oils producing cancerous growths in many cases only after many years of exposure or long after the exposure has ceased.

Arsenic.—The fumes of arsenic were recognized as a cause of cancer among copper smelters as early as 1820. Following that discovery, malignant growths were found among workers in factories making Paris green and in "sheep dip" factories, and in recent years cancer has been produced experimentally from arsenic by external application alone. In industry the growths do not appear until after 20 to 30 years' contact with the arsenic. Although arsenic is not known to cause cancer in any of the tissues of the body except the skin, the writer questions whether, in industries where fine arsenical dust is diffused through the atmosphere and is absorbed by the lungs and stomach, this absorption is not likely to have a greater effect in causing cancer of the skin than the local irritative effects on the skin.

Petroleum and shale oils.—The danger to workers in the petroleum industry depends, aside from the length of exposure, on the kind of oils handled and the heat used in distilling them. Oils from certain sections are not important as a cause of new growths, but, in general, hazards connected with the use of bituminous coal and oil products are increased according to the temperature at which the products have been evolved, one investigator having turned a noncancer-producing oil into a cancer-producing one by submitting it to great heat. More than 500 cases of cancer occurring in the cotton-spinning industry have been reported by British investigators. These cancers have been shown to have been caused by the lubricants used. The spinning oils are supposed to consist of the more refined products and are carefully clarified, but the danger is probably due to adulteration or mixture with some of the cruder distillates. The petroleum oils are less likely than coal tars to produce cancer. The prospect of developing cancer among shale-oil workers has been found to be 0.5 per cent; and although shale oil is obtained at a temperature of 700° C., there is less danger from it than from tar and soot.

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Tar and pitch.—These substances are agents in the causation of cancerous growths in industry, an examination of men in one tar distillery showing that a serious proportion had evidences of some precancerous activity. Cancer has been produced experimentally in white mice after a four-month interval following a single painting with tar.

Primary Lesions

ALL of these substances have a practically identical action on the skin, any modifications depending on the dose and the length of contact. The earliest effect is a redness of the skin, as any repeated and continuous action of the irritant, whether arsenic, oil, or tar, must eventually cause a permanent dilatation of the skin capillaries so that in time the skin becomes dusky and congested. Another primary lesion is the scaly papule, which is often itchy at first until it is broken by scratching. The mouths of the hair follicles are closed in the oil and coal series by the materials handled which form black dots, while in arsenical dermatitis the follicles are blocked by horny plugs. These three types of lesions apparently precede all further troubles.

Cancerous skin growths, it is said, invariably follow exposure to "tar, arsenic, anilin (?), and certain petroleum and tar products," and to radiations if the exposure is sufficiently protracted or repeated. Experiments with sensitive animals have shown that exposure to these agents need be neither long nor frequent in order to induce cancer; and if this holds good for the human skin, it can reasonably be assumed, the writer says, that even a casual or occasional contact with these substances may have serious consequences.

Skin Diseases: Lime Dermatitis

CLINICAL reports of several cases of lime dermatitis (inflammation of the skin), four of which occurred among "tunnel miners," were given in an article by Dr. W. J. O'Donovan in the Lancet (London), March 21, 1925. These cases are cited as showing the influence of lime in causing serious dermatitis in various occupations in which the cause of the trouble might not be suspected.

The men working as tunnel miners are employed in digging tunnels with or without the aid of compressed-air shields. In one case in which the worker had had recurrent attacks of lime dermatitis over a period of 15 years, during which time he had been in a hospital with it three times, the dermatitis had been diagnosed as seborrhea (functional disease of the sebaceous glands) and the occupational cause of the dermatitis had not been suspected. It was discovered that in each case he had been employed at sealing the space between the iron shields and the brickwork of the tunnels with slaked "blue lias" lime—a lime containing so much silica that it would be regarded as a hydraulic cement. This lime, which was emptied from the sacks into receptacles by the worker and carried by him with a hand scoop to a tank of water, was forced into the place to be cemented under air pressure of from 12 to 27 pounds per square inch, the high pressure increasing the amount of dust. The three other tunnel workers, all of whom were suffering from lime

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dermatitis, had had severe disabling attacks of it, all but one case, however, having cleared up under treatment without the general health being affected. Several cases of dermatitis among building workers working in cement were also reported, and one case of housewife's lime dermatitis, caused by using chloride of lime in washing clothes.

In the editorial notes in the same issue of the Lancet the fact that new causes of dermatitis are constantly arising owing to the invention of new chemical processes is pointed out and the following comments on the difficulty of diagnosis are made:

> That a dermatitis is one of occupation may be easily missed in diagnosis, because many different agents produce a dermatitis superficially similar, or one resembling some common skin condition not regarded as due to an external irritant—witness the first case of lime dermatitis quoted in Doctor O'Donovan's article, where, in the original attack, the patient's trouble was diagnosed as seborrheic. Secondary infections with staphylococci or streptococci are frequently superimposed on a dermatitis originally due to occupation and still further confuse the issue. Some types of trade dermatitis are, however, well marked and easily recognizable when once known to the observer; such are "chrome sores," "lime holes," "pitch skin," "tar acne," and "mule-spinner's cancer," whose names suggest their origin. The agents causing trade or occupation dermatitis are numerous, and many attempts to classify them satisfactorily have been made by different authors. They may, for instance, be divided into physical, chemical, and parasitic groups. The physical would include such causes as mechanical injury, wind, light, X rays, extremes of heat and cold, of dryness and moisture. The chemical group is by far the largest and requires much subdivision; it includes both organic and inorganic chemicals and the toxins of certain plants and trees. The parasitic group includes infections due to bacteria and fungi, and the attacks of animal parasites, such as mites. Causes coming under two or more of these headings may act together. The points of attack of the chemical irritants are almost invariably, in the first instance, the mouths of the hair follicles, the sebaceous glands, and the sweat pores, with, in addition, the natural furrows on the skin and any accidental abrasions. The maceration of the epidermis by the action of alkali materially increases the danger of attack by chemicals.

Attention is also directed to the fact that certain workers seem to be naturally immune to such risks while others acquire immunity, although this immunity may break down under temporary ill-health or excessive exposure to the irritant. Treatment consists essentially of removal of patients from exposure to the irritant and protective and antiseptic treatment of the lesions, the possibility of the development of malignant disease being always kept in mind.

Skin Diseases

See also Fruit canneries: skin diseases among employees; Tanning industry: occupational disease hazards.

Steam Laundries: Effect of Working Conditions upon Health of Workers

WORKING conditions in the steam-laundry industry and their effects upon the health of workers were investigated by the division of industrial hygiene of the New York Department of Labor.[20] The study was carried on from October, 1923, to February,

[20] New York. Department of Labor. Special bulletin No. 130: A study of hygienic conditions in steam laundries and their effect upon the health of workers. Albany, 1924. 110 pp.

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1924, and included the 208 establishments in the boroughs of Manhattan and the Bronx, excluding 73 laundries located in and operated by hotels.

A large proportion of the workers in laundries are women, but men are employed in the wash rooms, as drivers, and as operators of the old-style gas-heated cylinder body-ironing machines, and occasionally as sorters and checkers. A surprising number of older women were found to be employed, and a large number of the women were married. The work is especially attractive to married women of the unskilled class who have home duties in addition to their work, as, while the hours of work are long, the work frequently starts as late as 11 o'clock on Monday morning, and there is often no work on Saturday and Sunday. Although no special study was made of wages, inquiries made in the course of the physical examinations showed that wages of girls range from about $9 per week for shakers to $24 per week for the more skilled type of work, although there is great variation between the different establishments in the wages paid. For piecework on various types of body-ironing machines and presses, $40 or more per week is paid, and men in the wash rooms are paid from $20 to $32 per week.

In the laundry industry the features which at once suggest probable harmful bodily effects are the high temperatures and humidities which prevail throughout the industry. Temperatures which are high under the best conditions tend to rise not only in the summer months but also in the very cold weather when doors and windows are kept tightly shut in order to keep out the drafts to which laundry workers are peculiarly sensitive because of the dampness of the rooms. The data secured by the study were considered to represent the minimum harmfulness of the industry, however, as the winter months included in the study were particularly mild and consequently temperatures in the workrooms were at their best. The temperatures in the workrooms were found to range from 65° F. and a relative humidity of 52 per cent to 105° F. and a relative humidity of 32 per cent. The average temperature in the wash rooms of 41 laundries was found to be 79.2° F., and the highest was 95° F. The highest relative humidity was 91 per cent. In the ironing rooms the average temperature was 83.6° F. In general the wash-room temperatures were not considered particularly high, but the prolonged strenuous work in combination with the heat was found to show its effect in evidence of cardiac overstrain.

The workers in the wash rooms are a "washer" who fills the machines with the soiled clothes and attends to washing them, a "puller" who goes from one machine to another all day transferring the clothes from the washing machines to the trucks in which he rolls them to the extracting machines, and an "extractor" who puts the clothes into the machines and superintends the process of wringing. It has been estimated that in an ordinary working-day a puller may tranfer 5 tons of clothes from the washing machines into the trucks. Work in the wash rooms of many of the laundries lasts from 13 to 14 hours a day on Monday, 12 to 13 hours on Tuesday, 9 to 10 hours on Wednesday, and a few hours on Thursday; there is usually no work for the rest of the week. In the better-class laundries the work is more evenly distributed and the men work usually 5½ instead

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of 3½ days. An examination of 110 men, working in the wash rooms, who formed a partially selective group in that those having certain diseases were excluded, showed that 52 had blood pressure above the limit regarded as within the normal range for the age, and 29 of these were more than 25 per cent above normal. The nature of the work and the working conditions showed, the report states, that "the work as at present organized constitutes without doubt a severe strain upon the hearts and cardio-vascular systems of the workmen employed in the wash rooms."

The public is said to be primarily to blame for these conditions, since there is a general demand that the work, especially from wet-wash laundries, shall be returned early in the week, but it is considered that laundries should be compelled to start and stop work at a reasonable hour, that washing machines which eliminate part of the heavy work should be more generally used, and that lockers and proper facilities for changing to street clothes should be provided.

The ironing department usually, though not always, occupies a separate floor and contains the "dry room" in addition to the various ironing machines. While more attention is usually given to working conditions in this department than in the wash room, there were few laundries visited in which the lighting could be regarded as in any sense adequate. In some cases there were too many unshaded lights, which produced a distinctly uncomfortable glare, but usually the rooms were dingy and dark and there was also a conspicuous lack of cleanliness.

The great problem in this department, however, is the ventilation. The large number and variety of heat-producing machines collected in a single room, and the proximity of the dry room, from which much heat escapes, make the question of proper ventilation a difficult one. Heat and vapor are constantly given off in different amounts by the different machines, so that numerous air currents are produced. The installation of hoods over the mangles and insulation of the dry room, while an improvement, do not solve the problem, which is one for the ventilating engineer of experience. It was found that a large percentage of the girls, even those at the mangles where temperatures rarely fall below 80 to 85 degrees, wear sweaters practically the year round to protect themselves from the drafts to which they are peculiarly sensitive because of the high temperatures and humidities.

The physical examination of 150 women in 23 laundries showed various diseased conditions, but correlation between these conditions and specific laundry processes was difficult to establish except in connection with the general environmental conditions, such as high temperature and humidity and long hours of standing. Seven operators—six men and one woman—on gas-heated body-ironing machines were specially examined for carbon monoxide poisoning, and in every case carbon monoxide was found in the blood, the amounts ranging from 10 to 25 per cent. While these amounts are theoretically sufficient to cause discomfort, no symptoms were found among the men, but the woman complained of such symptoms of the poisoning as indigestion, a metallic taste in the mouth, headache, and profuse sweating which lasted through the night.

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The general results of the complete examination of the 150 women and partial examinations of 253 others show that atmospheric conditions in the ironing department seem to predispose the workers to atrophic conditions of the nose and throat, conjunctivitis, due probably to drops of sweat falling into the eyes, and dizziness and headache due to the heat. The latter two conditions appear only with a temperature of 90° and over. The long hours of standing, working of treadle machines, and carrying heavy stacks of folded linens seem to be responsible to some extent for the number of cases of flatfoot and varicose veins. A slight rise in body temperature was present in many cases, which was not sufficient to indicate a pathological condition, but which was of interest because it was apparently due to the atmospheric conditions.

The industry as a whole was not found to present many accident hazards, as most mangles and presses were adequately provided with finger guards; collar-ironing machines and gas-heated body-ironing machines presented the greatest source of danger from burns, and the body-ironing machines presented the hazard of poisoning from carbon monoxide, as it was shown to be absorbed in injurious amounts. Fatigue so generally resulted from the different operations that the investigators recommended that for the industry in general hours of work should be reduced, the work should be better distributed throughout the week, rest periods should be introduced, and an adequate time allowed for lunch. It was also considered that proper equipment, including satisfactory seating arrangements, which were almost wholly lacking, rest rooms, drinking fountains, and general installation of more up-to-date mechanical equipment would result in greatly lessening the ill effects of the industry.

Tanning Industry: Occupational Disease Hazards

A LIST of the occupational disease hazards in the tanning industry, published in the Journal of Industrial Hygiene[21] suggests the extent of the hazards in the industry and also serves to demonstrate the probable presence of a similar number of hazards in other industries. Because of the lack of standardization in the industry no attempt was made to list the occupational disease hazards process by process, although a division of processes into stages of manufacture was made. While some of these hazards are only potential, many of the substances used have caused definite occupational disease.

The hazards met with in handling the hides include anthrax and poisoning from sulphureted hydrogen, cyanide, arsenic, mercury, and dermatitis or salt burns. The majority of cases of anthrax occur in the early processes of the industry, such as unloading, storing, and sorting; but cases from handling hides are less frequent than formerly owing to the regulations as to killing, curing, and importation. The decomposition of organic matter on green hides may form sulphureted hydrogen, and poisoning therefrom may occur among men unloading such hides from box cars or working

[21] The Journal of Industrial Hygiene, Boston, July, 1925. "Forty-two occupational disease hazards in one industry—The tanning industry, as an example of the multiple hazards in industry," by Dorothy K. Minster.

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where they are stored. Imported goat skins are generally arsenic-cured, and arsenic poisoning may result from handling them, while mercury dermatitis may follow the handling of hides soaked in bichloride of mercury. The almost universal method of curing hides now, however, is salt curing, and though the effects are not so severe as from the poisons mentioned above, workers handling salt-cured hides frequently develop either a dermatitis or salt burns.

The processes used in preparing the hides consist of soaking and dehairing. Caustic soda and sulphurous acid are used in soaking, but as they are in rather dilute form the hazard exists in the preparation of the soak waters rather than in the handling of the hides.

After soaking, the hides are dehaired either by sweating the hairs loose, so that they can be scraped off, or by soaking the hide in lime. In the latter process burns are frequent and there is a definite dermatitis called "rossignol" among the workers who have to keep their hands constantly in the caustic lime, which is characterized by "loss of substance and bright red, shining finger tips." Sulphide of soda, used either as a substitute or in addition to the lime, may cause a dermatitis or burns, and arsenic sulphide, which is frequently added to the lime to hasten the dehairing process, may cause a dermatitis as well as present the usual arsenic hazard.

The sweating method of dehairing, which is not used so much as formerly, depends largely upon bacterial action, and any slight injury to a worker exposes him to the risk of virulent infection. In this connection it is noted that there is an unusually large proportion of infections in the tanning industry. Parasitic fungi are also a hazard in the sweating process, particularly in the handling of sheepskins. Ammonium sulphide develops as a result of the high temperature in the sweat-chamber process. In the process of deliming there is again danger of lime burns, and the use of lactic acid in this process results in a mild dermatitis in some of the workers. Red arsenic, which is often used in deliming soft leathers, and the arsenious acid formed from it, present a very serious hazard.

Another process used in deliming is called "drenching." The bacteria in the drenching mixture, which is an infusion of bran in hot water, lead to the formation of lactic acid, sulphureted hydrogen, methane, and carbon dioxide. A case is cited of a man engaged in cleaning a vat who was found dead as a result of the excess of carbon dioxide.

Various substances are used in tanning, the vegetable tannins including parts of plants, such as sumac, oak bark, chestnut, quebracho, myrobalan, etc. Myrobalan causes deep sores on the hands of tanyard workers. Sumac used in tanning, in finishing sole leather, etc., causes a definite dermatitis and the sulphites with which quebracho is dissolved also cause a skin eruption. In the chrome tannage processes chromic acid, hydrochloric acid, and sulphuric acid all present hazards, and chrome sores result from the chromic acid liberated in this process or from direct contact with the chromates.

In the finishing processes the principal chemical substances used are sulphuric acid and caustic soda. Fish and mineral oils used to render the hides more pliable after bleaching, because of impurities chiefly of a bacterial origin, are a cause of furunculosis (boils). In

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the process known as "currying" workers are subjected to dust from the leather, which irritates the mucous membranes and also may cause a definite skin reaction, as certain workers become sensitized to proteins in the leather. Other dust hazards are those from hair and from tanbark.

If leather is dyed, japanned, or enameled, an entirely new set of hazards is introduced, including exposure to poisoning from a "lead bleach" and to anilin and mercury colors for which amyl acetate, butyl acetate, benzol, naphtha, turpentine, butyl alcohol, and ethyl alcohol are used as solvents. Potassium ferrocyanide is also used in the dyeing process to form Prussian blue in the skins, introducing the hazard attendant on all cyanides.

Tetraethyl Lead Gasoline: Report of Columbia University Laboratory

A SERIES of experiments to determine the health hazard presented by the use of ethyl gasoline was made at the laboratory of industrial hygiene of Columbia University at the request of the Ethyl Gasoline Corporation and the results were published in the Journal of Industrial Hygiene (Boston), February, 1926.

At the time the laboratory at Columbia University was asked to make the study the ethyl gasoline mixture contained 1 part of lead compound to 1,000 parts of gasoline. However, after the accident at Bayway, N. J.,[22] by which a number of men lost their lives, the Ethyl Gasoline Corporation decided to lessen the risks to the general public and to garage workers by delivering only a 1 to 1,300 mixture to the filling stations.

Because of the fact that the United States Bureau of Mines had been studying the possible hazard to the public from the lead in the exhaust gases of engines for some time, it was decided that the Columbia University study should be limited to the consideration of the possible hazards to those coming directly in contact with the material. The possible hazards considered were those to the tank or garage man or to anyone who might get a few drops of the concentrated mixture on his clothes or person; the possible hazard from splashing the ethyl gasoline (1 to 1,000 mixture) on the person, from the use of the gasoline by the mechanic or housewife to clean hands or clothing, or from contact with it while adjusting the automobile carburetor or cleaning out the tank; and the possible danger from inhaling the fumes when ethyl gasoline was spilled either in the garage or other place where evaporation might take place.

The tetraethyl lead used in the Columbia University experiments was furnished by the Ethyl Gasoline Corporation and the gasoline mixture was made up by the investigators.

Various experiments were made on different animals to show the extent of the absorption of lead through the skin, by ingestion, and by inhalation of fume. These experiments showed without doubt that animals exposed to skin application of ethyl gasoline will store lead and that the rate of excretion does not equal the rate of absorption, while absorption of lead was also proven in the experiments in

[22] See Labor Review, May, 1925, pp. 174, 175.

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which the animals were dosed with the lead and those in which they were exposed to the fumes. While it can not be concluded that all the animals that died during the experiments did so because of the lead, it was observed that if for any reason an animal which appeared sick was not exposed for several days there was a marked improvement in its condition. This agrees with medical experience in cases where patients have been exposed to lead. It is possible that this accounts for the fact that so far no cases of lead poisoning have been found at garages or filling stations, since the time between exposures may be long enough to prevent the development of symptoms although an individual may be storing lead in his system. In this case it might take years before there would be a sufficient accumulation to cause symptoms of lead poisoning.

In summing up the results of the study the writer states that while it is difficult to apply animal experiments to human beings owing to the fact that it is not possible to make the conditions of exposure exactly identical, the findings seem to indicate that there is a potential hazard in the use of ethyl gasoline by the public without some educational campaign.

Tetraethyl Lead Gasoline: Report of Committee Appointed by United States Public Health Service [23]

THE occurrence of a number of casualties in connection with the manufacture of tetraethyl lead for use in gasoline motor fuel led to the appointment of a committee by Dr. H. S. Cumming, Surgeon General of the United States Public Health Service, in May, 1925, to study the question of the health hazards involved in the retail distribution and general use of tetraethyl lead gasoline motor fuel. This committee, which consisted of seven members—scientists and physicians—reported the results of its investigation at a conference called by the Surgeon General January 19, 1926, at which Government officials, scientists, the manufacturing companies, and labor were represented.

The occurrence of a number of casualties in 1924 in chemical factories where tetraethyl lead was being manufactured [24] led to the calling of a conference by the Surgeon General May 20, 1925, at which time it was decided that an investigation of the hazards connected with its use should be made. The sale of ethyl gasoline was voluntarily discontinued May 5, 1925, and the corporation concerned in its manufacture and distribution agreed at this conference not to resume production and distribution until the further study of its effects had been made. Prior to the holding of the first conference experiments in regard to the substance had been made by the United States Bureau of Mines, by investigators at Columbia University, and by others, but it seemed that the crucial test of the situation must be derived from actual experience in the use of ethyl gasoline under practical conditions of operation.

The scope of the investigation was made as extensive as was possible in the time allowed, and was carried out in Ohio, as ethyl gaso-

[23] [United States Public Health Service. Report of committee on use of tetraethyl lead gasoline.] Washington, January 17, 1926. 15 pp. (Mimeographed.)
[24] See Labor Review, February, 1925, pp. 173, 174, and May, 1925, pp. 174, 175.

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line had been in constant use as a motor fuel in certain parts of the State for several years. In the region selected, a supply of ethyl fluid was in the hands of certain customers at the time its manufacture was discontinued and its continued use therefore offered the opportunity of studying a fairly large group of individuals who had been using and handling ethyl gasoline. The actual work of the investigation was carried out by a corps of workers under Dr. J. P. Leake, surgeon, United States Public Health Service.

The investigation covered 252 individuals, all adult males, who were divided into five groups. Group A, a control group, consisted of 36 men, employees of the city of Dayton, who drove cars during the working-day. The gasoline used in these cars contained no lead. Group B, a test group, consisted of 77 men, employees of a public-service corporation of the city, whose duties were similar to those of Group A, but in whose cars ethyl gasoline had been in constant use since July, 1923. Group C, a control group, consisted of 21 men, employed either as garage workers or as gasoline fillers at service stations or on trucks delivering gasoline where the gasoline used or handled did not contain lead. Group D, a test group, consisted of 57 men employed on work similar to that of Group C, except that ethyl gasoline was handled in the garages, stations, and trucks. Group E, a control group, consisted of 61 men employed in two industrial plants in which there was known to be a serious exposure to lead dust.

The industrial history was taken and careful clinical examinations were made of these men. The blood examinations were made by skilled persons and in each case were checked by several workers. The examination of the feces for lead was made by chemists who had been specially trained in the technique of the method. A number taken at random was assigned to each person at the first examination and none of those making the subsequent examinations or the laboratory tests knew whether or not the individual had been exposed to ethyl gasoline or to which group he belonged.

The clinical examinations failed to give any decisive indication of lead poisoning among either the chauffeurs or workers in garages in which ethyl gasoline was used as a motor fuel. The only injury noted was a few cases of acute irritation of the eyes due to getting gasoline in them. This occurred with ordinary gasoline and ethyl gasoline but was more severe in one case caused by the ethyl gasoline. The time of exposure of these men to the effects of the gasoline approximated two years. The workers in Group E, on the other hand, who were exposed to a serious lead hazard in an industrial plant showed definite clinical symptoms of lead poisoning although they had been exposed for a shorter period of time than the garage workers.

The laboratory tests showed that in both groups of drivers the excretion of lead was practically identical, showing that the exhaust gas from motors in which ethyl gasoline was used had caused no increased absorption of lead. The results of the examination for stippled cells in the blood showed no noticeable increase in stippling in Group B as compared with Group A.

Both the elimination of lead and stippling of cells was more marked in the two groups of garage workers, the percentages of those show-

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ing definite stippling being slightly greater among the workers in the garages in which ethyl gasoline was used. Over 90 per cent of the workers in Group E showed distinct stippling and in most of these cases it was relatively very abundant.

So far as the committee could discover, all the reported cases of fatalities and serious injuries from tetraethyl lead have occurred either during the manufacture or in the processes of blending and ethylizing. It seemed desirable, therefore, to find out whether any cases of poisoning had developed in this section of the country where ethyl gasoline had been in use as a motor fuel for the longest time. All the workers examined were questioned, as well as local health officers, physicians, public-health workers, and labor leaders, and the few clues obtained were investigated, but with negative results.

Some investigation was made also in regard to the dust in the air and in the garages and workrooms, and while this study was not so extensive as desired, owing to the shortness of time allowed, it showed that some lead was present both in the dust and in the air irrespective of whether the gasoline used contained lead. The amount of lead in the sweepings ranged from 0.82 mgs. to 22.31 mgs. per gram of dust. It seems probable, therefore, that in all garages in which automobiles are being handled and repaired the workers are constantly exposed to lead dust and the importance of adequate ventilation in such rooms and of keeping both the floors and benches as free as possible from the accumulation of dust is pointed out.

In view of these results the committee concluded that at present there are no good grounds for prohibiting the use of ethyl gasoline of the composition specified, as a motor fuel, provided that its distribution and use are controlled by proper regulations.

Although the conclusions reached were based on painstaking investigations the committee felt that they are subject to the criticism that the study covered a relatively small number of individuals who had been exposed to the effects of ethyl gasoline for a time comparatively short, considering the possibilities in connection with lead poisoning. It is considered possible that if the use of leaded gasoline becomes general, conditions very different from those studied may arise which would render its use more of a hazard than appears now to be the case.

The final report[25] of the investigation, which contains detailed accounts of the methods followed and of the results of the clinical examinations of the different groups studied, also gives the final recommendations of the committee which it is proposed should be adopted by the several States in order to secure uniformity of control of the hazard.

The proposed regulations provide that all workers shall be informed of the hazard and of the precautions to be taken to prevent poisoning; for periodic examination of workers for possible lead absorption; for separate ventilation systems for the manufacturing apparatus and for the rooms in plants where the product is manufactured, and daily inspection of such equipment; for labeling of all

[25] United States Public Health Service. Bulletin No. 163: The use of tetraethyl lead gasoline in its relation to public health. Washington, 1926. 123 pp.

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containers of ethyl fluid or tetraethyl lead as to the exact content and danger, containers to be closed tight after emptying and sent back to the plant without cleansing and all containers to be cleaned or filled by means of a closed system with air vent from the container to the outside air; and for the addition of a dye to ethyl fluid in sufficient amount to deter individuals from using it for cleaning or similar purposes. It is also recommended that monthly reports shall be made to the proper State official, giving the number of workers employed at the beginning and end of each month, the number of new workers, the number of workers separated from tetraethyl-lead work as a result of the physical examination, the number of definite cases of poisoning, and the condition of cases of poisoning previously reported, so far as known.

Watch and Clock Dial Painting Industry

See Radium: effects of use of radioactive substances on health of workers.

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INSURANCE AND BENEFIT PLANS

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Types of Insurance and Benefit Plans

IN A number of foreign countries very comprehensive insurance plans have been established or fostered by the Government for the protection of the working people against various industrial and physical hazards, such as sickness, accident, unemployment, old age, and death. In the United States such matters have been made a matter of State legislation in any important degree only in the case of industrial accidents. The protection of the workers against the other contingencies of life and employment, if taken care of at all, is left entirely to voluntary action, either through actual insurance or through benefit plans of various kinds. The following is a very brief summary of the present status of certain of the more important phases of this subject in the United States.

State Systems

AS ALREADY noted, the only social insurance systems established by State legislation in this country are those covering the subject of industrial accident insurance, usually referred to as workmen's compensation. Almost all of the States, as well as the Federal Government, have established comprehensive plans for compensation for injuries due to industrial accidents, including, in some cases, occupational diseases. These are described in detail in the section "Workmen's compensation," page 679.

In a few States, old-age pensions have been provided for by State legislation, this relief, however, being extended to the indigent aged without reference to industrial employment. This subject is covered in the section "Old-age pensions and relief," page 431.

Establishment Plans

A VERY large number of industrial establishments now make provision for their employees in case of death, sickness, or other misfortune. Sometimes this provision is made on an insurance basis, sometimes through benefit associations, welfare organizations, etc. The most interesting recent development along this line has been the extension of the group-insurance idea. At first, group insurance was limited to life insurance, but has since been extended to other forms of insurance.

The subject of establishment insurance and benefit plans including group insurance was included as part of the investigation of plant personnel activities recently made by the Bureau of Labor Statistics. The material on this part of the investigation had not been assembled in form for publication at the time this bulletin went to press, except the section on sick-leave practice, which is given on page 330.

In a limited number of cases, industrial establishments have made provision to assure a certain regularity of employment to their em-

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ployees. A description of these systems is given in the section, "Unemployment insurance and stabilization of employment," page 601.

Trade-Union Benefit Plans

VARIOUS trade-unions make provision for the payment of fixed benefits to their members in case of death, sickness, etc. In addition, the International Brotherhood of Electrical Workers two years ago started the Union Cooperative Insurance Association, and the American Federation of Labor has recently established a cooperative insurance company known as the Union Life Insurance Co. Descriptions of the trade-union benefit plans and insurance companies are given on page 334.

Collective Agreement Plans

IN A limited number of cases, collective agreements between employers and trade-unions provide for certain insurance or benefit features. In the clothing trades there are several instances in which this method has been used to provide a form of unemployment insurance. This practice is closely allied to the practice of guaranteed employment and is discussed in the section entitled "Unemployment insurance and stabilization of employment," page 596.

It is also interesting to note that certain recent street-railway agreements provide for the establishment of a sick-insurance plan. The practice is described in an article on page 341.

Sick Leave with Pay

A STUDY by the Bureau of Labor Statistics of the various personnel activities carried on by industrial establishments, the field work of which was finished in the summer of 1926, included the collection of information as to the extent to which sick leave with pay is granted to factory workers or other workers on hourly rates of pay by the companies visited in the course of the investigation.

Factory Workers

WHILE sick leave with pay is quite generally granted to office workers and often very generous provision is made in cases of protracted illness, it is not usual to pay other workers during incapacity because of sickness. In a large number of establishments provision is made through the benefit association, or in connection with the group-insurance plan, for payment for sickness and non-industrial accidents. In a number of cases, however, firms were found to have a definite plan covering allowances for sickness which was independent of the insurance or benefit plans.

Quite a number of employers report that cases are treated on their merits and that liberal compensation is paid in certain cases, but there were 14 companies which reported that a definite policy was followed in providing payment in case of sickness. These included seven

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manufacturing companies, five public utilities, one building operating company, and a marble quarry. The last company grants sick leave with pay to employees after three years' service, the proportion of the wages paid varying from 35 to 50 per cent according to length of service, with a maximum of $15 per week. The length of time for which payments are made was not reported.

A building operating company on the west coast allows six weeks' wages during the year to all employees, to begin after the third day of sickness. An establishment manufacturing pharmaceutical supplies pays average earnings for 200 hours after five years' service. A company manufacturing electrical supplies grants sick leave to piece or hourly workers in meritorious cases, but the payments may not exceed $100 in any 12-month period, and a large meat-packing plant gives employees with from 2 to 15 years' service one-fourth of their wages for four weeks, during which period they are carried on the plant pay roll; for the next 12 weeks the payments are made by the social service division, and after that if the case is meritorious it is referred to members of the company. After 15 years' service, sick employees of this company are kept on half pay, and in the case of employees who have been with the company 20 years or over full pay is given for an indefinite period.

A company manufacturing straw hats gives one-half pay for four weeks after the first week's sickness and one-third pay for four weeks longer after 5 years' employment, 10 weeks' pay at the same rate after 10 years' service, and one-half pay for 10 months after 30 years' service.

A canning company in the Middle West, which has a very progressive policy of industrial relations and in which all regular employees are on a salary basis, pays the salaries of all sick and injured employees in full until the employees' sickness committee or the nurse reports them able to return to work. In the case of chronic illness, full salary is paid for 8 weeks, half pay for 4 weeks, and quarter pay for another 4 weeks.

One company with many properties in different sections of the country has a general plan of annuities and benefits which is maintained entirely by the company. The company pays for sickness and accidents not incurred in the line of duty one-half wages varying from 6 weeks after 1 year's service to 52 weeks for employees whose term of service has been 10 years and over.

A machine shop in the South with a large number of colored employees pays for cases of sickness and injury of its employees which are not covered by the workmen's compensation law. Payments are made upon recommendation of the plant physician or of a physician approved by the company, amounting to half the wages with a maximum of $1.35 per day. The payments begin after 6 days and may not exceed 90 days for one illness nor more than 180 days in any calendar year. It is required that employees receiving these payments obtain proper medical and surgical attention.

A number of electric light and power companies in different sections of the country pay their hourly employees during absence from work because of sickness, the usual rate being half pay and the period varying according to the length of service. One of these companies pays 10 per cent of annual earnings to employees in the

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service of the company 1 year and less than 2 years, the amount paid increasing to 65 per cent of yearly earnings after 12 years' employment with the company. If an employee has received from the company during any 12-month period 65 per cent of his annual salary while absent from work on account of illness, his case may be referred to the pension committee for investigation and recommendation to the president of the company.

A general plan of sickness disability benefits covers the operations of another public utility company in its different branches throughout the country. According to the provisions of the plan, payments are made after two years' employment. The payments are based on the employee's rate of pay, exclusive of overtime, at the time the disability began and amount to full pay for 4 weeks and half pay for 9 weeks if the term of employment has been 2 to 5 years; full pay for 13 weeks and half pay for 13 weeks for employment of 5 to 10 years; and full pay for 13 weeks and half pay for 39 weeks if the term of employment has been 10 years and over.

New York Office Workers

A SURVEY of the practice in New York City in the treatment of office employees absent because of illness was made in 1925 by the Merchants' Association of New York.[1] Seventy-two representative concerns replied to the questionnaire—17 large insurance companies, 20 banks, and 35 large wholesale, manufacturing, engineering, advertising, and publishing offices.

In only 14 cases were there fixed rules as to the payment of salary for absence due to sickness, while 22 firms reported that each case is treated on its merits, 5 that the treatment depends on the length of service, 2 on the position held, and 11 on a combination of these and other factors.

Fourteen establishments reported that all employees are treated alike in cases of illness without regard to length of service, position, etc., while four others stated that all but the very new employees receive the same treatment, two of these firms stating that employees having a long period of service to their credit are given special consideration. In general these establishments reported payment in full for a "reasonable length of time" or except in cases of protracted illness. One firm requires a doctor's certificate after two days' absence, and three firms are planning to establish some restrictions as to the length of time for which full pay will be allowed, in one case to eliminate malingering, in another because the office force has become so large that some check on the amount of sick leave has become necessary, and in the third case because the employees insist on being paid for all overtime.

Usually employees are given full pay during sickness, but 13 firms reported that after full pay has been allowed for some time part wages are paid. Among these a bank reported that clerks who have given satisfactory service for a number of years are allowed full pay for from six months to a year and thereafter half pay for a reasonable time. Only a few firms make any deduction from the regular vacation period because of time lost on account of illness.

[1] The Merchants' Association of New York, "Greater New York," New York, June 22, 1925.

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Only one of the 14 firms which have established rules governing absence due to illness has made a rule of nonpayment of salary. This was a shoe factory in which many of the office workers are on a piecework basis. Even this company makes frequent exceptions to this rule in cases of the protracted illness of old employees, allowing not only full pay, but in some cases paying the physician. The plans of the other 13 firms in this group vary, but in general the amount of sick leave granted depends upon the period of service. One insurance company gives no salary for absence because of illness during the first year of employment except in special cases, but after 1 year's service 1 month's sick leave is allowed, increasing up to 6 months' full pay and 6 months' half pay after 15 years' service. Another insurance company pays during the first year, only when the sickness is of an acute nature, but thereafter allows the full salary and, in cases where the illness lasts for more than two weeks, an additional "sickness allowance" not to exceed 50 per cent of the salary or a maximum of $25 per week; certain allowances are also made for surgical operations. A cumulative plan is in force in another company by which employees are credited with accrued sick leave. Benefits previously allowed, therefore, are deducted from the total amount earned by reason of length of service. If an employee's absence exceeds the time for which full salary benefits are allowed, further payments are made at a "pension rate." This amounts to 20 per cent of the salary if the employee has worked for the company 5 years and increases 1 per cent annually until 15 years of service have been given and thereafter 2 per cent annually until, after 25 years' service, the maximum pension of 50 per cent of the salary rate is paid.

Experience With Group Life Insurance in the Metal Trades

THE department of industrial relations of the National Metal Trades Association in 1926 made a study of the extent to which group insurance plans are in force among its members.[2] The study was carried out by means of a series of questionnaires and by individual plant studies. From the returns received from the first questionnaire it was found that 135 companies belonging to this association had group insurance in force, while 17 companies had tried it, but had given it up. The field study covered 64 plants which had had experience with group insurance, 8 of these having abandoned it.

It is estimated that the total amount of group insurance carried by all companies in the United States in 1925 was in excess of $3,500,000,000, this protection being provided for approximately 2,500,000 employees and their dependents.

Under the group-insurance plan a master policy is issued to the employer, covering all the eligible employees, but the individual policy may be either a fixed amount for each employee, an amount based upon the annual wages of the employee, or an amount increasing with the employee's length of service up to a fixed maximum.

[2] National Metal Trades Association. Committee on industrial relations. Experience with group insurance. Chicago, 122 S. Michigan Avenue, 1926.

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This insurance may be paid for entirely by the employer or the employees may contribute a part of the cost.

The reasons for taking out group insurance as reported by 75 of the companies were either humanitarian motives or such economic reasons as the reduction of labor turnover or the general promotion of the employees' good will. The results of the plan were said to be satisfactory by 57 of the 82 companies reporting on this point, while 10 reported that it was only partially successful, and 15 declared that it had not produced the results hoped for at the time it was started. Only two of the companies which adopted group insurance for the purpose of reducing turnover reported that it had had the desired result, the general opinion seeming to be that there can be no very decided effect upon the turnover since the class of workmen known as "floaters" are usually not covered. In almost all cases employees are not eligible for group insurance until they have been on the pay roll for a stated period, usually six months, thus eliminating the most unstable part of the force from participation in the plan. The effects on production can not be measured with any exactness, but it is believed in some instances to exert some effect, while it is considered by some of the firms reporting to promote good will among the employees.

The attitude of employees toward group insurance in 60 plants having had it in force for five years was said at the end of that period to be more favorable in 22 cases and favorable in 24, while in 7 plants the employees were less in favor of it, in 1 plant they were indifferent, and 6 plants had given up the plan.

In general, it is said the cost of group life insurance may be estimated at slightly more than 1 per cent of the pay roll, varying, however, with the scale of benefits and the average age of the employees covered. The average net cost to 46 companies which had a noncontributory plan was $14.10 per year per employee covered, while of 22 companies having a contributory plan the average net yearly cost per employee was $7.36. In reply to the question as to the advantages of group insurance to the company, several firms stated that it helped to stabilize the working force and that it improved the general morale, and a few considered that its value lay in the opportunity it furnished to provide for the employees' dependents in a nonpaternalistic manner. The cost of the plan was mentioned most frequently by those firms replying as to the disadvantages of the plan, and a few companies stated that it led the men to neglect personal insurance, that the men would rather have the money in the pay envelope, and that the real effect was uncertain.

Trade-Union Benefits

THE report of an investigation of trade-union benefits, by George W. Perkins and Matthew Woll, published in 1925 by the American Federation of Labor, shows the varied services of this nature maintained by the unions and the amount spent for the protection of their members. The data cover only unions affiliated to the American Federation of Labor, and do not include, therefore, the independent unions, some of which, such as the railway brotherhoods, have a very large membership.

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Six classes of insurance are provided by the different unions included in the study—death, sickness, disability, old-age, strike and lockout, and unemployment—and a number of unions provide for assistance in various other contingencies, these special benefits including payment of insurance in case of the death of the wife of a member, weekly benefits to widows of relief members, tool insurance, and the payment of a definite sum to a member who has been victimized.

Death Benefits

DEATH benefits paid by 80 of the 107 national and international unions affiliated to the American Federation of Labor are shown in Table 1. In the majority of cases it appears that the funds are administered by the national or international unions, but in eight instances the payments are made from the funds of the locals.

TABLE 1.—TRADE-UNIONS PAYING DEATH BENEFITS AND AMOUNTS OF BENEFITS PAID IN 1925

Organization	Amount of benefit	Organization	Amount of benefit
Bakery workers	$50–$350	Lithographers	$100–$1,000
Barbers[1]	100–500	Machinists[7]	50–300
Blacksmiths	75–300	Maintenance of way	50–300
Boiler makers	50–300	Meat cutters	100–200
Bookbinders	100–500	Metal workers, sheet	100–300
Boot and shoe workers	100–200	Mine, mill, and smelter workers	(3)
Bricklayers, masons, and plasterers	50–300	Mine workers	(3)
Brick and clay workers	[1] 50–200	Molders	100–200
Bridge and structural-iron workers	100–400	Musicians	(3)
Broom and whisk makers	75–200	Oil field, gas well and refinery workers[2]	(4)
Railway carmen	50–250	Painters	50–400
Carpenters	50–300	Paper makers	50–300
Carvers, wood	50–150	Pattern makers	50–400
Cigarmakers	100–500	Paving cutters	50–150
Clerks, post office[2]	500	Piano and organ workers	50–300
Clerks, railway	100–1,500	Plasterers	100–400
Clerks, retail	25–200	Plumbers	150–500
Cloth hat, cap, and millinery workers	(3)	Polishers, metal	50–200
Conductors, sleeping-car	1,000	Potters, operative	50–300
Coopers	50–125	Printers, plate[8]	(4)
Diamond workers	400–750	Printing pressmen	100–600
Electrical workers[2]	300–1,000	Quarry workers	50–125
Engineers, steam and operating	(4)	Railway employees, street and electric	100–800
Engravers, photo	100–200	Railway mail association[2]	1,000–4,000
Firemen and oilers	100–600	Roofers	200
Foundry employees	100	Seamen	(3)
Fur workers	100	Signalmen, railroad	[9] 1,000
Garment Workers, United	50–300	Stage employees	[3] 150–1,200
Glass bottle blowers	500	Stereotypers	200
Glass workers, flint	(3)	Stonecutters	100–300
Glass workers, window	300	Stove mounters	150
Granite cutters	50–300	Switchmen[2]	[10] 375–2,250
Hatters	100–300	Tailors	20–100
Hod carriers	50–100	Teamsters	(3)
Hotel and restaurant employees	75	Telegraphers, railroad[2]	300–1,000
Iron, steel, and tin workers	100–500	Telegraphers, commercial	50–100
Jewelry workers	75–200	Textile workers	25–50
Lathers	50–400	Tobacco workers	50
Leather workers	[6] 50–[6] 200	Typographical union	75–500
Letter carriers[2]	500–3,000	Wall paper crafts	50–300

[1] Districts pay additional benefits ranging from $200 to $400.
[2] Life-insurance plan.
[3] Local.
[4] Not reported.
[5] Apprentices and female members one-half.
[6] Voluntary group insurance $250–$500 also in operation.
[7] Insurance for death and disability in sum of $500 provided.
[8] Assessment 50 cents per member.
[9] Maximum.
[10] Funeral benefits of $300 to members over age limit or unable to pass physical examination.

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Sick Benefits

BENEFITS in case of sickness are paid by 31 of the unions reporting in this study; in nearly half of the cases the local unions pay their own benefits, so that the amounts vary among the different branches. In addition to the unions which pay a definite benefit in case of sickness, the locals of the Roofers' Union pay benefits in case of accident, the Operative Potters pay $18 weekly for treatment in a sanitorium for tuberculosis, and members of the Paving Cutters' Union are exempt from dues during sickness. The bakery workers limit the amount which any member may receive during life to $600, and the tailors limit the amount to $200.

Table 2 shows for 1925 the unions reporting that sick benefits are paid, the amount of the benefits, and the number of weeks for which payments are made:

TABLE 2.—TRADE-UNIONS PAYING SICK BENEFITS, AMOUNT OF BENEFIT, AND PERIOD FOR WHICH BENEFIT IS PAID, IN 1925

Organization	Amount of benefit	Number of weeks for which benefits are paid	Organization	Amount of benefit	Number of weeks for which benefits are paid
Bakery workers	$10	16	Lithographers	[6]	10
Barbers	10	16	Machinists	[1]	
Boot and shoe workers	5	13	Maintenance of way	[1]	
Carpenters	[1]		Mine, mill, and smelter workers	[1]	
Cigarmakers	7	10	Mine workers	[1]	
Clerks, post office	[2] 10	13	Molders [5]	[6] 7	13
Cloth hat, cap, and millinery workers—			Musicians	[1]	
Male	7	7	Painters	[1]	
Female	5	7	Pattern makers	[6] 4	13
Engravers, photo	[1]		Piano and organ workers	5	10
Garment Workers, United—			Plumbers	5	13
Male	4	[3]	Railway employees, street and electric	[1]	
Female	3	[3]	Seamen	[1]	
Glass bottle blowers	[1]		Signalmen, railroad	[1]	
Glass workers, flint	[1]		Tailors	5	10
Iron, steel, and tin workers	5	13	Teamsters	[1]	
Leather workers	7	10	Tobacco workers	4	10
Letter carriers [4]	10	26			

[1] Local.
[2] $5 first week.
[3] Not reported.
[4] Under life-insurance plan.
[5] $5.20 per week to honorary beneficial members.
[6] Exempt from dues.

Disability Benefits

TWENTY-THREE unions pay either a lump sum or make weekly or monthly payments to disabled members, while one union exempts such members from regular dues, another pays death-benefit dues, and printing pressmen are taken care of in their home for the aged. Postal clerks and other organized Federal employees are provided for in case of disability under the Federal retirement law.

Table 3 shows for 1925 the unions reporting the payment of disability benefits and the amount of the payments:

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TABLE 3.—TRADE-UNIONS PAYING DISABILITY BENEFITS AND AMOUNT OF BENEFIT, 1925

Organization	Amount of benefit		Organization	Amount of benefit	
	Lump sum	Per week		Lump sum	Per week
Boiler makers	$200–$800	-------	Machinists	$500	-------
Boot and shoe workers	100	-------	Maintenance of way	50–300	-------
Bricklayers, masons, and plasterers	----------	$7	Mine workers	(7)	(7)
Bridge and structural-iron workers	----------	[1] 25	Molders	100–200	-------
Carmen, railway	50–250	-------	Painters	50–400	-------
Carpenters	50–400	-------	Pattern makers	50–400	-------
Cigar makers	[2] 100–400	-------	Railway employees, street and electric	100–800	-------
Cloth hat, cap, and millinery workers	[3] 75	-------	Seamen	(7)	(7)
Conductors, sleeping car	1,000	-------	Signalmen, railroad	[8] 1,000	-------
Engravers, photo	----------	[4] 15	Stage employees	----------	[7] $7–25
Granite cutters	[5] 125; [6] 750	-------	Switchmen	[9] 375–2,250	-------
			Typographical union	----------	[10] 8

[1] Per month.
[2] $100 funeral expenses to be withheld.
[3] For tuberculosis.
[4] For tuberculosis or sanitarium care.
[5] To be deducted from death benefits.
[6] Loss of eyes.
[7] Local.
[8] Maximum amount.
[9] Under life-insurance plan.
[10] Or care in home for the aged.

Old-Age Pensions

THE reports received from the various unions show that seven organizations have an old-age pension system, while one union which had tried two different systems has abandoned them.

The bridge and structural-iron workers pay pensions to those members who have reached the age of 60 and who have been members of the organization for 15 years. The pension amounts to $25 per month, but pensioners report each month to the financial secretaries of their locals, and any one whose total income exceeds $60 in any one month is not entitled to the pension for that period. The international union sets aside 15 per cent of the monthly revenue from dues for the maintenance of the pension fund.

The typographical union pays a pension to members who are 65 years of age and who have been members of the organization for at least 25 years, if they are totally disabled for work at the trade or are unable to secure sustaining employment in another occupation. The pension, which amounts to $8 per week, is not paid to members residing in the Printers' Home.

The Amalgamated Association of Street and Electric Railway Employees pays a lump sum of $800 to members 65 years of age who have been members of the union 20 years. The union formerly had a monthly plan, but substituted the plan of paying a lump sum in order to permit a member to take up some other line of business.

Pensions amounting to $7 per week are paid to members of the bricklayers' union who have reached the age of 60 and who have been in good standing in the union for 20 years, if they are unable to secure employment in any industry because of disability and have no other means of support. In 1924 there were 2,500 members receiving pensions, the expenditure for which amounted to $910,000.

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The printing pressmen's union pays a pension of $7 per week to members 60 years of age who have been in continuous good standing for 20 years. Members not working at their trade but employed in positions paying a sustaining salary are not eligible for pensions, and all members able to and who can obtain work are expected to do so. Each member of the union is required to pay 25 cents per month to the old-age pension fund.

The granite cutters' union pays $10 per month for six months in the year to any member 62 years of age or over who has been a member for 25 years without taking out a withdrawal card and who has been in good standing for 17 consecutive years prior to his receiving the pension. A member receiving this benefit is released from future payment of dues or assessments.

A sum of $50, which is deducted from the funeral benefits, is paid to members of the quarry workers' union who have reached the age of 60 years and who have been in good standing without taking out a withdrawal card during the preceding 10 years, while members of the paving cutters' union, upon reaching the age of 60, are, if they have been in good standing for three years, granted an old-age certificate which entitles them to full benefits and all privileges of the union by the payment of 25 cents per month.

Federal employees who are members of unions affiliated to the American Federation of Labor are pensioned in accordance with the terms of the Federal retirement law. These organizations include the National Federation of Federal Employees, the National Association of Letter Carriers, the National Federation of Rural Letter Carriers, the National Federation of Postal Clerks, and the Railway Mail Association.

TABLE 4.—TRADE-UNIONS PAYING OLD-AGE PENSIONS AND AMOUNT OF PENSION

Organization	Amount of pension or other provision for superannuated members
Bricklayers, masons, and plasters	$7 per week.
Bridge and structural-iron workers	$25 per month.
Carpenters	Home for aged.
Granite cutters	$60 per year.
Oil field, gas well, and refinery workers	Dues exempt.
Paving cutters	25 cents monthly maintains all benefits.
Printing pressmen	$7 per week, or home for aged.
Quarry workers	$50 taken from death benefits.
Railway employees, street and electric	$800 in lump sum.
Stage employees	Locals pay from $7 to $25 per week for total disability and old age.
Typographical union	$8 per week, or home for aged.

Strike and Lockout Benefits

STRIKE and lockout benefits are paid by 77 of the unions reporting on this subject. Very few report the length of time for which strike benefits are paid, but three unions report that the period during which members may receive such benefits is limited to 8 weeks and one union each limits the time to 10, 13, 15, and 16 weeks.

Table 5 shows the unions reporting strike benefits and the amount of benefits paid in 1925:

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TABLE 5.—TRADE-UNIONS PAYING STRIKE AND LOCKOUT BENEFITS AND AMOUNT OF BENEFIT, IN 1925

Organization	Benefits per week
Asbestos workers	[1]
Bakery workers	$6.00
Barbers	10.00
Blacksmiths	7.00
Boiler makers	10.00
Bookbinders:	
Married men	15.00
Single men	10.00
Women	8.00
Boot and shoe workers	5.00
Brewery, flour, etc	9.00
Bricklayers, masons, and plasterers:	
Married	10.00
Single	7.00
Brick and clay workers	[1]
Broom and whisk workers:	
Married	7.00
Single	5.00
Carpenters	[2] 1.50
Carvers, wood	12.00
Cigarmakers	[3] 8.00
Clerks, railway	15.00
Cloth hat, cap, and millinery workers:	
Married	7.00
Single	5.00
Coopers:	
Married	7.00
Single	5.00
Diamond workers	[2] 2.50
Draftsmen	[4]
Electrical workers	[2] 1.50
Elevator constructors	6.00
Engineers, steam and operating	7.00
Engravers, photo	[5] 15.00–25.00
Apprentices	4.00–6.00
Foundry employees	5.00
Fur workers:	
Married	6.00
Single	4.00
Garment Workers, United	[6]
Glass bottle blowers	[4]
Glass workers, flint	11.00
Glove workers	[1]
Granite cutters	9.00
Hatters:	
Married	10.00
Single	7.00
Women	5.00
Horseshoers	12.00
Hotel and restaurant employees	[4]
Iron, steel, and tin workers	4.00 [1] 5.00–20.00
Jewelry workers:	
Married	6.00
Single	4.00
Apprentices	2.00
Laundry workers	5.00
Leather workers:	
Married	10.00
Single	7.00
Women and apprentices	5.00
Lithographers	[7] $10.00–18.00
Longshoremen	[4]
Machinists	[4]
Maintenance of way	10.00
Marble, slate, and stone polishers	[7] 10.00–18.00
Meat cutters	[4]
Metal workers, sheet	9.00
Mine workers	[4]
Molders	[7] 9.00
Musicians	[8]
Oil field, gas well, and refinery workers:	
Married	15.00
Single	10.00
Painters	[4]
Pattern makers	8.50
Pavers:	
Married	7.00
Single	5.00
Paving cutters	[2] 1.00
Piano and organ makers:	
Married	[9] 7.00
Single	[9] 5.00
Plasterers	[4]
Plumbers	6.00
Polishers, metal	[6]
Potters, operative	10.00
Powder and high explosive workers	[4]
Printers, plate:	
Married	20.00
Single	15.00
Printing pressmen:	
Married	11.00
Single	9.00
Pulp, sulphite, and paper mill workers	[4]
Quarry workers	[2] 1.00
Railway employees, street and electric	[4]
Roofers	[4]
Seamen	5.00
Signalmen, railroad:	
Married	12.00
Single	8.00
Stereotypers:	
Journeymen	15.00
Apprentices	8.00
Stonecutters	11.00
Stove mounters	7.50
Tailors	[2] 1.00
Teamsters	10.00
Textile workers	[4]
Tobacco workers	3.00
Tunnel and subway constructors	[4]
Typographical union:	
Married	10.00
Single	7.00
Upholsterers:	
Journeymen	7.00
Apprentices and seamstresses	5.00
Wall paper crafts	7.00

[1] Assessment.
[2] Per day.
[3] For first 16 weeks; $4 for next 16 weeks.
[4] Determined by executive officers or emergency committee.
[5] $15 for 3 weeks, $20 for 3 weeks, $25 thereafter.
[6] Not reported.
[7] Exempt from dues.
[8] One-half minimum wages for 15 weeks.
[9] For 16 weeks; $3 a week thereafter.

Unemployment Benefits

THERE are comparatively few cases in which an unemployment fund is maintained or unemployment benefits are paid by the unions, the usual practice being to exempt the members from pay-

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ment of dues during unemployment because of strikes or from other causes. Unemployment benefits are paid as a result of collective agreements in three cases: The cloth hat and cap makers' union has an agreement by which an unemployment fund is maintained by the employers, the ladies' garment workers' union and the employers in the industry maintain a joint fund, and the United Wall Paper Crafts of North America has an agreement in 14 cities by which members of the union are guaranteed a certain minimum amount of employment.

Unemployment benefits are paid by two international unions, the diamond workers and siderographers, while some of the locals of five national organizations—bakery workers, wood carvers, photo-engravers, stereotypers, and lithographers—pay benefits to their unemployed members.

Details in regard to the various types of unemployment insurance plans and other measures of assistance in case of unemployment are given in the section on "Unemployment insurance and stabilization of employment," page 593.

Seventeen unions reported that their members are exempt from dues while unemployed. This exemption is important, as it often amounts to many thousands of dollars in the individual unions during the year.

Table 6 shows the unemployment provisions in effect in the different unions in 1925:

TABLE 6.—TRADE-UNION UNEMPLOYMENT PROVISIONS, 1925

Organization	Nature of provision
Blacksmiths	Dues exempt 3 months; 25 cents thereafter.
Boiler makers	Dues exempt.
Carmen, railway	Do.
Cigar makers	Do.
Cloth hat, cap, and millinery workers	$7-$10 per week agreement with manufacturers.
Coopers	Dues exempt after one month.
Diamond workers	$2 per day.
Draftsmen	Dues exempt.
Electrical workers	Do.
Engravers, photo	Exempt assessments. Local benefits
Garment workers, ladies	$10 a week for 12 weeks in year.
Granite cutters	One-half dues.
Leather workers	Dues exempt.
Machinists	Do.
Maintenance of way	Do.
Molders	Do.
Oil field, gas well, and refinery workers	Do.
Paper makers	Do.
Pattern makers	Do.
Piano and organ workers	Do.
Polishers, metal	Do.
Siderographers	$5 per week for 26 weeks; dues exempt.
Stove mounters	Dues exempt 13 weeks.
Textile workers	Dues exempt.

Insurance by Organized Labor

TRADE-UNIONISTS now have in operation two insurance companies—the Union Cooperative Insurance Association and the Union Labor Life Insurance Co.

The Union Cooperative Insurance Association was organized in November, 1924, by the International Brotherhood of Electrical Workers. The association has a paid-up capital and surplus, all of which is held by the international of the local unions affiliated to it.

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It writes participating and nonparticipating policies for individual and group life insurance and has in force policies aggregating $6,230,161. Probably the first group insurance issued to labor unions was written by the association; previously, such insurance was written only for employees of individual establishments. It also issues special home-protection policies to cover mortgages on policyholders' homes, which decrease in amount and premium as the mortgage is paid off.

At the forty-fourth annual convention of the American Federation of Labor, held at El Paso, Tex., November 17 to 25, 1924, the entrance of the trade-unions into the insurance field was strongly urged. It was stated that 39 unions were already paying some kind of death benefit or insurance, but as most of these were based on the assessment plan, the results were not altogether satisfactory.

Although no definite action appears to have been taken at the time, the subject was not allowed to drop and progress in the matter was reported at the 1925 meeting.

It was decided that while joint action by the various unions was desirable, it was preferable that the Federation itself should not undertake the work. Accordingly a separate company, the Union Labor Life Insurance Co., was organized in the fall of 1925, with an authorized capital of $1,000,000. Stock ownership in the company is limited to trade-unions and their members affiliated to the American Federation of Labor or approved by it. Unions are limited to $40,000 each and individuals to $250. The books were closed to stock subscriptions on January 31, 1927, with more than $700,000 paid in, and the company expects to begin writing policies in the very near future.

The company will write life insurance, specializing in group insurance. Dividends on stock are limited to 6 per cent, and the profits remaining after provision is made for the surplus are to be returned to the policyholders. All policies are to participate in the dividends.

Insurance Provisions of Chicago Street Railway Agreement

INSURANCE provisions were inserted in the agreement of September 3, 1926, beween the Chicago Rapid Transit Co. and the Amalgamated Association of Street and Electric Railway Employees as a result of the decision of the two arbitrators appointed to represent, respectively, the company and the union in their recent contract controversy. While group insurance has had a rapid development in recent years, both the contributory and noncontributory plans having been widely put into effect by employers, this is one of the few instances in which it has been made a part of a trade-union agreement. According to the Union Leader (Chicago) of September 18, 1926, only one other division of the Amalgamated Association of Street and Electric Railway Employees, a small one at Newburgh, N. Y., had up to that time been able to secure such a provision in a contract.

The award provides for the usual standard group-insurance policies given without medical examination, the entire cost to be borne

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by the company. The policies cover both sickness and death, service of one year with the company being required for eligibility for the sickness insurance and of three months for the life insurance. The payments for sickness amount to $20 per week for 26 weeks during the year and the amount of the life insurance policy is $1,000.

The employees, in submitting their contract provisions for the year, had asked for a general wage increase of 5 cents an hour and the provision of group insurance by the company. Failure to secure an agreement through conferences between the company and the trade-union officials resulted in the appointment of the arbitrators, with the result that the company conceded the demand for the establishment of the insurance provisions, but the demand for increased wages was denied.

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INVENTIONS BY EMPLOYEES

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Rights of Employees to Their Inventions [1]

IT IS a frequent occurrence that employees engaged on the general work of an employer, in immediate contact with the machinery and processes of the establishment, discover improvements that may be made in the process, the mechanical devices used, or in some other phase of the undertaking. In such cases the question arises as to the ownership of the invention or discovery, i. e., whether the employee is entitled to hold in his own name and for his own financial advantage the title to any patent that he may secure, or to retain for his own private use the process that he may have discovered; or, on the other hand, whether the employer in whose service he was, with whose instrumentalities he is in contact, and who pays him the wages that are his inducement for service, becomes the proprietor.

There readily occur to one's mind a variety of conditions, as where the employee is a mere general workman, who is engaged without any thought of his inventive capacity and from whom nothing is expected except what might be classed as routine service. A second group would be those employees who are engaged in view of their mechanical ability, and are under contract to use their best endeavor to make any improvements, general or special, that they may be able, by their skill or genius, to hit upon. A third class would include individuals to whom an inventor, having an idea which he is unable or disinclined to develop and reduce to a concrete form, imparts his general conception, and whom he employs to build the machine or to demonstrate the feasibility of his idea as a practical invention.

It is clear that the same rule could hardly apply to these three groups; also the groups have grades and variations, giving rise to the conclusion expressed in one case that the right of the employer to a license for the use of an invention of his employee is a mixed question of law and fact, so that each case must be decided on its own merits. Patents are, of course, governed by Federal law, but no legislation has been enacted in the United States specifically relating to patents by employees in private employments, though, as will appear, employees of the Government of the United States are affected by statutory provisions.

General Employees

IN THE first group indicated above may be found employees who, though deriving their wages from the contracts of their employment, develop the idea of an invention outside the establishment and the working hours of their employment. It is a general rule that unless the nature of one's employment or an express contract forbids outside work, the employee's time outside of his hours of service may be occupied with other work not incompatible with his duties to his

[1] Somewhat abridged from an article appearing in the Labor Review of June, 1926, where legal citations are given.

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employer; or as said by Mr. Justice Clifford in a case involving this question, "Persons employed, as much as employers, are entitled to their own independent inventions."

The general rule is subject to modification, however, by the facts in any particular case. Thus, the inventor of a stop valve useful in the construction of hydraulic elevators manufactured by his employer was held by his conduct to have licensed the employer to use the invention which had been made while employed by the company, using its tools and patterns. The employee had made numerous experiments in this direction, as was well known to his employers; but when the satisfactory invention was made it was immediately put into use by the company, with the knowledge of the inventor, such use continuing for several years with no suggestion that he should receive remuneration therefor, though he had taken out the patent in his own name.

The positive basis for denying the claim subsequently made for compensation was a presumption that a license had been granted, citing in this connection an opinion of the United States Supreme Court which seems to have been the first involving the making of an invention by a general employee, experimenting at the expense and in the factory of his employer, and permitting the employer to use the device without asking any return. There was said to be a presumption of a license granted the employer, although the employee obtained the patent by his own action, so that an assignee took the patent subject to the legal consequence of his conduct, amounting to "consent and allowance," granting a right to the employer to the continuous use of the invention.

It was further held that there was basis for a presumption that the inventor had recognized an obligation resulting from his employment by the partnership and its successor corporation, citing an earlier case in which the inventor was an employee of the Treasury Department of the United States, who conceived the idea of a useful invention of a self-canceling stamp. The necessary machinery was constructed by employees of the Bureau of Engraving and Printing, of which the inventor was chief, using Government property in the work. A patent was obtained by an assignee of the inventor, who thereupon notified the proper officer of his ownership of the patent, and sought an arrangement for compensation for the use of the patented stamp by the Government. In default of any reply, a claim was entered in the Court of Claims to recover the sum demanded in payment for the use of the stamp. The findings of the Court of Claims were adverse, whereupon the case was taken to the Supreme Court, where the findings of the Court of Claims were sustained. The fundamental right of the employee as inventor to the results of his invention was asserted, but qualifying circumstances modified the abstract rule. Mr. Justice Brewer, who delivered the opinion of the court, formulated certain statements which, while not in every aspect necessary to a decision, and in that degree classifiable as obiter, have nevertheless been adopted in subsequent decisions, so that they may be regarded as established law. Following are the essential portions of his opinion:

> An employee, performing all the duties assigned to him in his department of service, may exercise his inventive faculties in any direction he chooses, with

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the assurance that whatever invention he may thus conceive and perfect is his individual property. There is no difference between the Government and any other employer in this respect. But this general rule is subject to these limitations: If one is employed to devise or perfect an instrument, or a means for accomplishing a prescribed result, he can not, after successfully accomplishing the work for which he was employed, plead title thereto as against his employer. That which he has been employed and paid to accomplish becomes, when accomplished, the property of his employer. Whatever rights as an individual he may have had in and to his inventive powers, and that which they are able to accomplish, he has sold in advance to his employer. So, also, when one is in the employ of another in a certain line of work, and devises an improved method or instrument for doing that work, and uses the property of his employer and the services of other employees to develop and put in practicable form his invention, and explicitly assents to the use by his employer of such invention, a jury, or a court trying the facts, is warranted in finding that he has so far recognized the obligations of service flowing from his employment and the benefits resulting from his use of the property and the assistance of the coemployees of his employer as to have given to such employer an irrevocable license to use such invention.

Affirmation and application of the rule in the foregoing case are found in a somewhat later case, in which a machinist in Government employ conceived the idea of an improvement in the machine which he was operating and suggested it to his superior. The construction of a machine involving the proposed improvements was authorized, the work being at the cost of the United States, according to designs furnished by the inventor. It was satisfactory, and the construction of others was authorized, the work being done also under the immediate supervision of the inventor as a part of his routine service. A patent was then sought and subsequently another machine constructed under the immediate supervision of the patentee, with no suggestion of remuneration. The court held that since the invention was made while the inventor was drawing pay as an employee, since he had used materials and mechanical assistance furnished by the Government and had raised no objection to the use of the invention by the Government, there was no basis for a recovery of any sum as royalty for the use of the machines so invented, constructed, and used. Such license as was here presumed to exist does not, however, interfere with the right of the inventor and owner of the patent to grant to others similar rights for such compensation as may be agreed upon, and the employer's license is merely personal and is not transferable.

Effect of Formal License

Still more certainly would recovery be impossible where there was a formal licensing for the use of inventions patented by an employee, nor could a contract fully stated in writing, and subsequently carried out by both parties, be varied by alleged collateral oral agreement inconsistent with the terms of the written contract.

The license so granted continues as long as the employer remains in business, even though the employee-inventor has left the service. Similarly it was held in a recent case that the employer had an irrevocable license where the superintendent of his mill invented a device for use therein, using materials and employees of the employer in perfecting and procuring a patent, and the instrumentality was used in the mill as long as the inventor remained in service. However, where an employer ceases operations, as in a case of bank-

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ruptcy, the right to the invention remains with the former employee, the employer having had nothing but a shop right which would not pass under a sale of the assets.

Government Employees

Though it is repeatedly said that the status of an employee of the Government is the same as that of an employee of a private establishment, special legislation provides that any officer of the Government except officers and employees of the Patent Office may obtain a patent without the payment of any fee where the invention is used, or is to be used for the public service, a stipulation to be embodied in the application to the effect that such use shall be without payment of any royalty therefor. A later provision covers inventions generally, an act of 1910, amended 1918, providing a method for reimbursing patentees whose inventions have been "used or manufactured by or for the United States without license of the owner thereof or lawful right to use or manufacture the same." In such case the owner has a remedy by suit in the Court of Claims to recover a "reasonable and entire compensation for such use and manufacture." It was provided, however, "that the benefits of this act shall not inure to any patentee who, when he makes such claim, is in the employment or service of the Government of the United States, or the assignee of any such patentee; nor shall this act apply to any device discovered or invented by such employee during the time of his employment or service."

Employees Under Contract to Make Improvements

AN EXAMINATION of the cases in which employees are under contracts based on their mechanical skill and inventive ability rather than on their capacity to render routine service discloses two general forms of agreement: One in which the employer specifically reserves to himself the right to any inventions, improvements, or discoveries made by the employee hired to effect the same, and one in which the contract merely calls for the application of skill and inventive talent toward perfecting and improving the devices in use by the employer or the products in the manufacture of which he is engaged. Thus it is said that a manufacturing corporation which has employed a skilled workman to take charge of its works and devote himself to improvements in the articles to be produced is not entitled to an assignment of the patents obtained for his inventions, in the absence of an express agreement to that effect; while, in a similar case, the employer was held to have only an unassignable license.

However, an agreement providing for the vesting in the employer of all inventions made by his employee during the term of his contract of employment is held to be capable of specific performance, enforceable in proper proceedings, being not unreasonable or against the public interest; and if the essential principles of the invention were developed during the term of the contract, the contract governs even though the invention was perfected only at a later date, substantial completeness being sufficient to fix the date of the invention.

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Where a general manager retained his right to inventions generally, but contracted, "nevertheless," that any invention or device made or perfected by him on the request of his employer pertaining to instrumentalities then being used or manufactured should vest in the employer, the "nevertheless" provision was held valid; and though the drawings were made at night, the contract was held to cover an invention conceived in the time of the business of the employer, conferences taking place with officers of the corporation and work being done with the materials and men of the company. The inventor was here obligated to carry out his contract and take the necessary steps to vest the title to the patent in the company, even though the term of his employment had expired; but the company must do equity and pay the expenses incurred in procuring the patent. So where the contract calls for an assignment of all inventions and devices to be used in connection with the employer's business, the agreement was held to cover other devices, secretly worked on at home, not of the kind to be used in the manufacture of the articles desired to be marketed by the employer, but of the same character. The contract was said to call for the best endeavor of the employee in behalf of his employer, and its specific enforcement in line with the foregoing interpretation was held to be possible and not unconscionable.

The character of the improvements invented outside the immediate line of employment in the foregoing case seems to have been such as to lead the court to its conclusion of inclusiveness. However, a slightly earlier decision by a circuit court of appeals drew a line between devices applicable to the particular product of the employer and other instruments. Here an employee, hired as inventor by a manufacturer of organs, agreed to assign a half interest in all inventions made during the term of his contract in connection with the product of his employer; and an invention applicable also to pianos was held to be subject to the contract only so far as its use with organs was concerned, as the contract related only to the latter.

An important decision under this head is one recently handed down by the Supreme Court in which it is said that the invention of a specific thing can undoubtedly "be made the subject of a bargain, and pass in execution of it." Continuing, the opinion reads:

> By the contract Peck [the employee] engaged to "devote his time to the development of a process and machinery" and was to receive therefor a stated compensation. Whose property was the "process and machinery" to be when developed? The answer would seem to be inevitable and resistless—of him who engaged the services and paid for them, they being his inducement and compensation, they being not for temporary use but perpetual use, a provision for a business, a facility in it and an asset of it, therefore, contributing to it whether retained or sold.

This right vested so completely in the employer that it was transferable by sale to another corporation, free from any claim or contention of ownership on the part of the inventor. It may be noted that the final statement of the opinion was necessary to dispose of a contention of the inventor that the employer had only a shop right, not capable of assignment or transfer, so that the inventor retained a right to dispose of the same privilege of manufacture to others for use "in competition with the one who engaged him and paid him," a contention to which the court refused to give assent.

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Following this decision, a contract with a workman "to devote his entire time and attention to his duties as chief engineer" of the employer's establishment, and agreeing also "to assign [to the employer] any ideas, patents, or patentable features that he may develop or invent pertaining to their line of product" was held binding, though the employee claimed that he developed his invention at night. The court ruled this of no import, as the hiring was either by the month or by the year, and what time of day or night the idea might reach its development was of no significance, and the agreement to assign must be complied with.

Contract Covering Subsequent Inventions

A somewhat further development of the idea of ownership was found in a case in which a machine operator was compelled to sign a contract that if he made any improvements in the machinery "while in the employment of the said company, or at any time thereafter, the same shall be for the exclusive use of the said company." Here again was found a contract that was not unreasonable, unconscionable, or contrary to public policy. In this case the employee was sent abroad to sell machines, and there got a suggestion for an improvement of which he told the company, and was encouraged by it to undertake its development, the company furnishing a room, power, and materials, but no current compensation. On the perfecting of the invention the employee claimed it, but the court held that the contract gave it to the employer with the duty, however, of paying the expenses and such an amount as compensation as a master in chancery might determine.

Employment to Develop Employer's Suggestion

ONLY a brief statement need be made of the third general head of the subject of the inventor's rights, i. e., where a person lacking technical skill, or for other reason, desires the assistance of another to develop an invention which he has conceived. Indeed, ordinary good faith would seem to require a single answer to the question of ownership; but the cases are proof of contests on this point. In a fairly early case before the Supreme Court, while recognizing the right of employees to their own independent inventions, the court drew the following distinction:

> But where the employer has conceived the plan of an invention and is engaged in experiments to perfect it, no suggestions from an employee, not amounting to a new method or arrangement, which in itself is a complete invention, is sufficient to deprive the employer of the exclusive property in the perfected improvement. But where the suggestions go to make up a complete and perfect machine, embracing the substance of all that is embodied in the patent subsequently issued to the party to whom the suggestions were made, the patent is invalid, because the real invention or discovery belonged to another. * * * Common justice would forbid that any partial aid rendered under such circumstances, during the progress of experiments in perfecting the improvement, should enable the person rendering the aid to appropriate to himself the entire result of the ingenuity and toil of the originator.

This principle found application a few years later in a case in which both methods and materials were involved, and rival claims were submitted. The court held the rule to be that where the sug-

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gestion was fundamental and the employee simply works out and improves on the original plan, such ancillary discoveries as he may make become the property of the discoverer of the original principle and may be embodied in his patent as part of his invention. A recent application of this rule was in a case in which the court held that there was a relation between one disclosing an invention and employing another to work out its details; so that if the employee obtained a patent under cover of being the inventor, the court would look into the question of original invention and make the award on the basis of such priority, since the working out of the mechanical features by the employee must be held as merely ancillary and inuring to the benefit of the employer.

Summary

KEEPING in mind the statement that questions of law and of fact may both be involved in any particular case, so that the general principle might be subject to variation, it appears that the law secures to a general employee, not engaged for purposes of improvement or invention, the unqualified right to his inventions. If engaged for the accomplishment of the specific purpose of making improvements, with no further specification, the title to the patent would vest in the employee making the invention, but a shop right or license for use would be implied for the benefit of the employer. Such implication might also arise in the case of a general employee, if the circumstances of the improvement of his idea were such as to warrant it. Where an employee is hired to make improvements, and it is specifically provided that the right and title to discoveries, inventions, and patents therefor shall vest in the employer, such contract can be specifically enforced. And, finally, where an inventor discloses his idea to one more mechanically skilled, or whose assistance is desired for other reasons, the employee has no right in the results of the working out of mechanical details or the application of ancillary improvements, such accruing to the benefit of the original discoverer; but if the employee develops an entirely new agency, or hits upon an idea sufficiently distinct to amount to a new device, he may hold it as his own property.

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LABOR ORGANIZATIONS

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Organization and Membership of American Trade-Unions, 1926

THE basic data in this article are taken from Bureau of Labor Statistics Bulletin No. 420: Handbook of American trade-unions. This bulletin is a compendium of the organization, form of government, and jurisdictional boundaries of existing American trade-unions, and in addition gives, for each union, a brief account of its origin and history, an outline of its benevolent activities, and the most recent and accurate membership figures obtainable.

The study covers all bona fide labor organizations functioning nationally, a bona fide labor organization being defined as "a group of wage or salaried workers organized for the purpose of employing economic or political pressure to improve their material condition."

It is a settled policy of some unions not to divulge their membership. However, in the case of an organization affiliated to the American Federation of Labor approximate membership can be determined from its voting strength in the annual conventions of the federation, its voting strength being based upon the number of members in good standing for whom the union pays per capita tax to the federation. Where more definite figures have not been reported by the union itself, the figure recognized by the American Federation of Labor as representing the number in good standing is used in the bulletin as the total membership of the organization.

In the present study 156 organizations coming within the defined scope, which have national entity and significance, were found. Of these, 107 are affiliated to the American Federation of Labor and 49 function entirely outside the federation. Some of the unions which are independent of the American Federation of Labor have never been identified with it in any way, and the field in which they operate has never been entered to any appreciable extent by the American Federation of Labor unions. This is especially true of railroad operation, in which the "Big Four" brotherhoods have always maintained separate existence and exclusive control. Except for the railroad brotherhoods, some of the organizations in the United States Post Office, and the Loyal Legion of Loggers and Lumbermen, the unions not affiliated to the American Federation of Labor are seceders from, or "dual" to, some organization within the federation. These dual unions are found to some degree in all industries except the printing trades.

Building Trades

CRAFT lines are strictly drawn in the building-trades organizations, and subdivision into craft unions is carried to a fine point. The oldest organizations of building craftsmen are the Operative Plasterers and Cement Finishers' International Association, estab-

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lished in 1864, and the Bricklayers, Masons, and Plasterers' International Union, organized in 1865. The Operative Plasterers became part of the American Federation of Labor early in the history of that organization, while the Bricklayers and Masons remained outside of it for many years, affiliating as recently as 1916. The entrance of the Bricklayers, Masons, and Plasterers' International Union into the federation necessitated readjustments which affected the jurisdiction of several other American Federation of Labor unions. Marble setters who had been organized in the International Association of Marble Workers were transferred to the Bricklayers and Masons and the International Association of Marble Workers became an organization of marble, stone, and slate polishers and sawyers. Later this organization resumed some of its former jurisdiction in building operation by admitting to membership, at the request of the Bricklayers and Masons, the marble and tile setters' unskilled helpers.

At about the same time the American Brotherhood of Cement Workers was dissolved, the skilled men going to the Operative Plasterers' Union, which then became the Operative Plasterers' and Cement Finishers' International Association, and the cement mixers and unskilled workers being absorbed by the International Hod Carriers, Building, and Common Laborers' Union.

The history of the carpenters' union has been one of absorption rather than of division. The organization which grew into the present United Brotherhood of Carpenters and Joiners became a national one in 1881 by consolidation of scattered groups of organized house carpenters throughout the country. Shop carpenters had an older organization, the International Furniture Workers' Union, founded in 1873. In 1895 that organization joined with the Machine Wood Workers' International Union to form the Amalgamated Wood Workers' International Union, which affiliated with the American Federation of Labor. As the United Brotherhood of Carpenters and Joiners grew in numbers it extended its field to shop and mill work, a move which involved it in a jurisdictional conflict with the Amalgamated Wood Workers which lasted for nearly 20 years, and ended in 1912, by the absorption of the shopmen by the United Brotherhood and the dissolution of the Amalgamated Wood Workers.

A branch of the Amalgamated Society of Carpenters and Joiners of Great Britain was in existence in the United States when the United Brotherhood was founded, and for many years both organizations held membership in the American Federation of Labor. The United Brotherhood, however, was militant for the policy of "one trade, one union," and secured the suspension of the Amalgamated Society from the federation in 1912. While never arriving at any agreement with the Amalgamated Society looking toward a merger, the United Brotherhood has gradually absorbed its membership.

To provide for the unskilled building trades workers who were not eligible to membership in the craft unions, the American Federation of Labor organized the International Hod Carriers, Building and Common Laborers' Union in 1903. At first it was composed only of building-trades men, but later expanded its jurisdiction and its name to include common labor in any field. In 1918 the Compressed

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Air and Foundation Workers' International Union merged with the Hod Carriers.

The Brotherhood of Painters, Decorators, and Paperhangers of America originated in 1887 as an organization of house painters and decorators, later adding paper hanging to its jurisdiction. Its scope has been extended to all kinds of painting and decorative art work, absorbing in the process a number of craft unions, among them the National Paperhangers' Association, the National Union of Sign Painters, and the union of stained-glass workers, known as the Amalgamated Glass Workers' International Union.

The present organization holding jurisdiction over roofing, the United Slate, Tile, and Composition Roofers, Damp and Waterproof Workers' Association, is an amalgamation, effected in 1919, of two international unions—the International Slate and Tile Roofers' Union and the International Brotherhood of Composition Roofers, Damp and Waterproof Workers.

There is only one dual or "independent" organization in the building trades. That is the International Brotherhood of Steam Shovel and Dredge Men, which was organized in 1896 and in 1915 amalgamated with the Associated Union of Steam Shovelmen. The International Union of Steam and Operating Engineers claimed jurisdiction over the steam-shovel and dredge men, and in the resulting dispute the International Brotherhood of Steam Shovel and Dredge Men was expelled from the American Federation of Labor in 1918 for refusing to merge with the steam engineers. It has functioned independently since that time.

The membership of the building-trades organizations is distributed as follows:

Asbestos Workers, International Association of Heat and Frost Insulators and	[1] 2,400
Bricklayers, Masons and Plasterers' International Union of America	103,600
Bridge, Structural, and Ornamental Iron Workers, International Association of	18,350
Carpenters and Joiners of America, United Brotherhood of	376,400
Electrical Workers, International Brotherhood of	140,000
Elevator Constructors, International Union of	18,000
Engineers, International Union of Steam and Operating	33,000
Granite Cutters' International Association of America	8,500
Hod Carriers, Building and Common Laborers' Union of America, International	65,000
Lathers' International Union, Wood, Wire, and Metal	17,000
Marble, Stone, and Slate Polishers, Rubbers, and Sawyers, Tile and Marble Setters' Helpers, and Terrazo Workers' Helpers, International Association of	4,500
Painters, Decorators and Paperhangers of America, Brotherhood of	125,000
Plasterers and Cement Finishers' International Association of the United States and Canada, Operative	32,000
Plumbers and Steamfitters of the United States and Canada, United Association of Journeymen	60,000
Roofers, Damp and Waterproof Workers' Association, United Slate, Tile, and Composition	3,500
Steam Shovel and Dredge Men, International Brotherhood of	11,500
Stone Cutters' Association of North America, Journeymen	5,075
Total	1,023,825

[1] Voting strength.

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Metals and Machinery

MOST of the organizations in the metal trades date from the inception of the labor movement in the United States, one of them, the International Molders' Union, having been a pioneer in the movement. That organization has been in continuous existence since 1859, and was the first international union, extending its jurisdiction to Canada in 1861.

Structural changes within the metal-trades unions have been chiefly in line with developments within the industry and have not been important. The tendency is toward absorption of the smaller craft bodies by the larger unions. The International Molders' Union absorbed the Core Makers' International Union and the brass molders holding membership in the old Metal Polishers, Buffers, Platers, and Brass Workers' Union. Various jurisdictional readjustments limited the field of the latter organization to metal polishing and electroplating, and it became in 1917 the Metal Polishers' International Union. Metal engravers are organized separately.

One small craft union operates in the limited field of stove mounting, and unskilled and common labor in foundries is controlled by the International Brotherhood of Foundry Employees.

"Independent" organization in the metal and machinery industry tends toward industrial unionism. There are two independent unions, the Amalgamated Metal Workers and the United Automobile, Aircraft, and Vehicle Workers. The former is a secession movement of machinists from the International Association of Machinists. Shortly after it was organized a similar group of industrial unionists, organized as the Brotherhood of Metal Workers, merged with it. The Amalgamated Metal Workers did not report its membership, but it is known to be only a small organization. The United Automobile, Aircraft, and Vehicle Workers was originally the International Union of Carriage and Wagon Workers, affiliated to the American Federation of Labor. It was an industrial union from the first, its chartered jurisdiction extending to all kinds of work involved in the making of wagons and carriages. When the industry changed from carriage making to automobile manufacture, the union undertook to expand with it. However, the many craft organizations involved protested against encroachment on their various jurisdictions and the American Federation of Labor repeatedly upheld the principle of craft organization as applied to automobile manufacture. The International Union of Carriage, Wagon, and Automobile Workers was ordered to release its craft men to their respective organizations and to drop the word "automobile" from its title. It refused to do so and was expelled from the federation in 1918. It reorganized under its present title on a platform of industrial unionism. The membership of the metal-trades unions is as follows:

Automobile, Aircraft and Vehicle Workers of America, United	3,000
Blacksmiths, Drop Forgers, and Helpers, International Brotherhood of	15,000
Boilermakers, Iron Shipbuilders and Helpers of America, International Brotherhood of	23,000
Draftsmen's Unions, International Federation of Technical Engineers, Architects and	500
Engravers' Union, International Metal	140

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Firemen and Oilers, International Brotherhood of	17,000
Foundry Employees, International Brotherhood of	3,500
Iron, Steel, and Tin Workers of North America, Amalgamated Association of	12,500
Machinists, International Association of	130,000
Metal Workers of America, Amalgamated	[2]
Metal Workers' International Association, Sheet	25,000
Molders' Union of North America, International	30,000
Pattern Makers' League of America	8,985
Polishers' International Union, Metal	9,000
Stove Mounters' International Union of North America	1,600
Total	[3] 279,225

Transportation

OF THE many organizations of transportation workers, broadly speaking, those covering operation and administration are independent unions, while the American Federation of Labor unions cover maintenance and shopwork. In both the last-mentioned fields and in train dispatching, however, there are independent unions dual to the American Federation of Labor unions.

The American Brotherhood of Railway Track Foremen and Allied Brotherhood of Railway Track Laborers organized independently in 1916, and in 1919 amalgamated with the American Federation of Labor union holding that jurisdiction, the United Brotherhood of Maintenance of Way Employees. Five years later it withdrew and reorganized as an independent rival union.

The American Federation of Railroad Workers is a secession union, formerly the International Association of Car Workers. While it is avowedly an industrial union, its membership is chiefly among car-shop workers.

Jurisdiction of train dispatching is claimed by an affiliated union, the Order of Railroad Telegraphers, and by the independent American Train Dispatchers' Association.

Leaving out of consideration the "Big Four" brotherhoods, most of the independent railroad unions are small groups duplicating each other in the same field. There are three organizations of express workers, the largest of which, the Brotherhood of Railway and Steamship Clerks, Freight Handlers, Express and Station Employees, was, until January, 1926, affiliated to the American Federation of Labor. It was because the brotherhood was organizing express-wagon drivers over the protest of the International Brotherhood of Teamsters that its charter was revoked by the federation. Station employees have two organizations in addition to the clerks' brotherhood, to which they are eligible, and yardmasters have two, one of which split off from the other. Colored railroad workers have two general organizations and one union of sleeping-car porters. Most of the small railroad unions sprang up after the establishment of the United States Railroad Labor Board and functioned chiefly in hearings before that body.

The railroad brotherhoods are among the oldest organizations of labor in the country, the Brotherhood of Locomotive Engineers

[2] Not reported.
[3] Not including one union for which membership was not reported.

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dating from 1863 and the Order of Railway Conductors from 1868. Originally, both of these organizations and the Brotherhood of Locomotive Firemen and Enginemen, founded in 1873, were benevolent and temperance societies rather than labor unions. They fell into line with the general trend of the labor movement, however, and the youngest of the brotherhoods, the Brotherhood of Railroad Trainmen, organized in 1883, has been an economic organization from the first.

These organizations have always maintained their position independent of the American Federation of Labor, and have so thoroughly controlled their field that no question of jurisdiction or dual unionism has arisen.

In water transportation there are three affiliated and three independent unions. The International Longshoremen's Association and the International Seamen's Union, both affiliated to the American Federation of Labor, are the only unions in their jurisdictions. The third affiliated union, the National Organization of Masters, Mates, and Pilots, has a rival organization among the independents in the Neptune Association.

The other two independent unions, the National Marine Engineers' Beneficial Association and the Ocean Association of Marine Engineers, are dual organizations, the latter having seceded from the former. The National Marine Engineers' Beneficial Association was at one time affiliated to the American Federation of Labor, but withdrew because of lack of sympathy with the federation's opposition to ship subsidy. Thereafter the jurisdiction of the International Union of Steam and Operating Engineers was extended to cover marine engines.

Listed according to their relation to the American Federation of Labor, the transportation unions and their respective memberships are:

Affiliated:	
Carmen of America, Brotherhood of Railway	56,000
Conductors, Order of Sleeping Car	2,300
Longshoremen's Association, International	35,000
Maintenance of Way Employees, Brotherhood of	[1] 37,400
Masters, Mates, and Pilots of America, National Organization of	9,457
Seamen's Union of America, International	18,000
Signalmen of America, Brotherhood of Railroad	8,000
Street and Electric Railway Employees of America, Amalgamated Association of	100,000
Switchmen's Union of North America	9,000
Teamsters, Chauffeurs, Stablemen, and Helpers of America, International Brotherhood of	100,000
Telegraphers, Order of Railroad	75,400
Tunnel and Subway Constructors' International Union of North America	4,000
Total	454,557
Independent:	
Agents, American Railway	200
Clerks, Freight Handlers, Express and Station Employees, Brotherhood of Railway and Steamship	135,000
Conductors, Brotherhood of Dining Car	700
Conductors of America, Order of Railway	60,000

[1] Voting strength.

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Independent—Continued.	
Engineers' Beneficial Association of the United States of America, National Marine	10,000
Engineers, Grand International Brotherhood of Locomotive	88,200
Engineers, Ocean Association of Marine	1,500
Firemen and Enginemen, Brotherhood of Locomotive	106,800
Expressmen, Order of Railway	18,000
Express Workers, American Federation of	15,000
Neptune Association	2,500
Porters, Brakemen, and Switchmen, Association of Train [4]	1,100
Porters, Brotherhood of Sleeping Car [4]	([2])
Railroad Supervisors of Mechanics, International Association of	16,440
Railroad Workers, American Federation of	15,000
Station Employees and Clerks, Brotherhood of Railroad	([2])
Track Foremen and Allied Brotherhood of Railway Track Laborers, American Brotherhood of Railway	27,000
Train Dispatchers' Association, American	4,357
Trainmen, Brotherhood of Railroad	180,000
Trainmen, Association of Colored Railway [4]	4,800
Yardmasters of America, Railroad	4,000
Yardmasters of North America, Railroad	([2])
Total	[5] 690,597

Paper, Printing, and Bookbinding

Paper

THERE are three organizations in paper manufacture, all affiliated to the American Federation of Labor. One of these, the United Wall Paper Crafts of North America, is confined to wall-paper manufacture, the jurisdiction of the other two specifically excluding that product. The International Brotherhood of Pulp, Sulphite, and Paper Mill Workers originated by secession from the International Brotherhood of Paper Makers. For three years it was an independent, dual union, antagonistic to and drawing membership from the parent body, but in 1909 a jurisdictional adjustment, basing jurisdiction partly on skill and partly on processes, was arrived at which made it possible for both organizations to function amicably within the American Federation of Labor.

The membership of the unions in the paper industry is:

Paper Makers, International Brotherhood of	7,000
Pulp, Sulphite, and Paper Mill Workers, International Brotherhood of	10,000
Wall Paper Crafts of North America, United	800
Total	17,800

Printing and Bookbinding

While in most industries the highly specialized craft unions are passing, in the printing industry just the reverse has taken place. Organization has proceeded from the original comprehensive industrial union, established in 1852, to individual unions in the various crafts and even for special processes. The printing pressmen started the movement toward craft division by seceding from the International Typographical Union in 1889 and establishing the Inter-

[2] Not reported.
[4] Negro organization.
[5] Not including three unions for which membership was not reported.

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national Printing Pressmen's Union, later extending jurisdiction to the assistants and changing the name of the union accordingly. Their example was followed by the bookbinders, who organized separately in 1892, and thereafter by the remaining crafts in rapid succession, which by agreement with the International Typographical Union were chartered by the American Federation of Labor, with clearly defined jurisdictional divisions.

There are now eight unions in the printing industry. In 1925 a merger of the International Steel and Copper Plate Engravers' League with the International Plate Printers' and Die Stampers' Union of North America eliminated one of the process unions. Included among the eight printing unions is the International Association of Siderographers, a union covering one process in plate printing. The process is used almost exclusively in the printing of paper money, and all the operators engaged in the work are members of the union. Hence, while it is probably the smallest "international" union in the world, it is a 100 per cent organization.

The membership of the printing-trades unions is as follows:

Bookbinders, International Brotherhood of	14,000
Engravers' Union of North America, International Photo	7,402
Lithographers of America, Amalgamated	5,400
Pressmen and Assistants' Union of North America, International Printing	45,000
Printers, Die Stampers, and Engravers' Union of North America, International Plate	1,000
Siderographers, International Association of	80
Stereotypers and Electrotypers' Union of North America, International	7,000
Typographical Union of North America, International	75,000
Total	154,882

Textiles and Clothing

DUAL unionism reaches its greatest strength, both numerically and economically, in the textile and clothing industries. Secession movements as a rule are actuated by the philosophy of industrial unionism—the revolt of radical elements against the principle of craft organization. However, in the textile industry and in boot and shoe manufacture, organization is industrial in character and the unions affiliated to the American Federation of Labor holding jurisdiction over those fields are specifically chartered as industrial unions. In both fields secession has frequently been along craft lines, and while to a great extent the seceding craft unions have been reabsorbed into industrial unions, some of the dual textile unions are still craft unions.

Textiles

The United Textile Workers of America is the largest organization in the industry and is affiliated to the American Federation of Labor. It was organized in 1901 and was the second attempt to bring together into one body the scattered small craft unions in textile mills. While it is chartered as an industrial union, it is more accurately a federation of craft divisions within the industry, since its organization is subdivided into crafts and processes. One division within the

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United Textile Workers, the American Federation of Full Fashioned Hosiery Workers, is essentially a separate entity.

Two textile unions were in existence and affiliated to the American Federation of Labor at the time of the organization of the United Textile Workers—the International Mule Spinners' Union, which dates back to 1858, and the Chartered Society of Amalgamated Lace Operatives, founded in 1892. In 1919 the United Textile Workers sought to enforce its jurisdictional claim to the industry by absorbing the older unions. Both organizations refused to yield their autonomy and were in consequence expelled from the American Federation of Labor. They have continued since as independent bodies.

Secession movements from the United Textile Workers have been numerous and frequent. Sometimes a craft division, such as the loom fixers or carders, has withdrawn; at other times the workers in the industry in a certain locality, such as Lawrence, Mass., have seceded and started a new industrial union.

In 1916 these various scattered and somewhat sporadic groups came together and organized the American Federation of Textile Operatives, an organization identical in structure to the United Textile Workers—that is, a federation of craft unions which function more or less autonomously. More recently this organization has joined with the International Mule Spinners' Union, the Chartered Society of Amalgamated Lace Operatives, and a small local union of tapestry-carpet weavers in the city of Philadelphia, to form the Federated Textile Union.

The United Textile Workers does not permit public statements of its total membership. Its membership as represented by its voting strength in the American Federation of Labor is 30,000.

The membership of the Federated Textile Union is not definitely reported, but is approximately 21,000, of which 11,000 is in the American Federation of Textile Operatives, 8,000 in the International Mule Spinners' Union, and 1,600 in the Amalgamated Lace Operatives.

Boots and Shoes

Organization among shoe workers is almost as old as the country itself, and shoe workers' unions have had a marked influence upon the labor movement, particularly in connection with woman workers. A national organization of shoe workers known as the Knights of St. Crispin antedates the Knights of Labor. Shoemakers went from the former into the latter and became a strong factor there in forming their own national trade assembly in 1884. They followed the movement into the American Federation of Labor, but kept their entity as an industrial union.

Secession movements of craft groups began about 1900 and continued intermittently for 10 years. From time to time these seceding craft unions have come together to form industrial federations, each new one absorbing its predecessor in the field. In this wise the United Shoe Workers and the Amalgamated Shoe Workers of America have come and gone, both now being part of the Shoe Workers' Protective Union, which is the "independent" rival of the Boot and Shoe Workers' Union.

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A number of local craft unions exist in New England independent of both the national organizations, and an industrial union called the American Shoe Workers' Union operates in the shoe factories in New York, owning its headquarters and claiming a membership of 6,000.

The Boot and Shoe Workers' Union does not divulge its membership. Based on its voting strength it has 36,200 members in good standing. The Shoe Workers' Protective Union gives 16,000 as its total membership.

Garment Trades

In their early history, the structure of unions in the garment trades was determined largely by developments within the industry. Tailors had a substantial organization at the beginning of the nineteenth century and the Knights of Labor movement was inaugurated by garment cutters. The oldest of the present organizations is the Journeymen Tailors' Union, organized in 1883. It was a prime mover in organizing the American Federation of Labor, and is one of the few remaining strictly craft unions of skilled workers. As a matter of fact, the many organizations which succeeded the Journeymen Tailors' Union in the industry came into being largely because of the attitude of the tailors toward the factory system of production. Determined to keep their organization one of skilled workers in the custom trade, they refused to admit to membership the skilled and semiskilled factory operatives, even after factory production had begun seriously to threaten the custom trade.

The factory men organized separately into two unions, both of which held membership in the American Federation of Labor, as did the Journeymen Tailors' Union. Out of the various groups of craft workers who organized from time to time according to the kind of work performed or the product made, grew, in 1891, the United Garment Workers of America.

In 1900 an independent union in the women's garment industry called the United Brotherhood of Cloak Makers of New York and a number of local unions of the United Garment Workers, the members of which were making women's clothes, organized a third union in the industry, the International Ladies' Garment Workers' Union.

Secession from the United Garment Workers in 1914 produced the fourth union in the garment trades, the Amalgamated Clothing Workers of America. This is an industrial union, independent of the American Federation of Labor and is the largest and most powerful of the so-called dual unions. The three other garment-trades unions are affiliated to the American Federation of Labor.

The membership of the garment-trades unions is:

Clothing Workers of America, Amalgamated	150,000
Garment Workers' Union, International Ladies'	87,000
Garment Workers of America, United	80,000
Tailors' Union of America, Journeymen	9,200
Total	326,200

Other Clothing Trades

The hat-making trade has two organizations, the United Hatters of North America, and the Cloth Hat, Cap, and Millinery Workers' International Union, both affiliated to the American Federation of

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Labor. The jurisdictional boundaries are vague, but are based principally upon the kind of fabric used in manufacture. Jurisdictional disputes over millinery work (women's hats) resulted in 1918 in the expulsion from the federation of the Cloth Hat and Cap Makers. It continued to function successfully, however, and in 1924 was readmitted to the American Federation of Labor by agreement with the United Hatters. These organizations are practically equal in numerical strength, the United Hatters claiming 11,500 and the Cloth Hat, Cap, and Millinery Workers' International Union, 11,000.

Other unions in the clothing industry are the International Fur Workers' Union of the United States and Canada, with 12,000 members, and the International Glove Workers' Union of America, with a voting strength of 300.

Neckwear workers, while having no central organization, are organized into six local unions in direct affiliation to the American Federation of Labor, with an approximate membership of 1,000. Another needle trade, pocketbook making, is organized in the International Pocketbook Workers' Union, with a membership of 6,000.

Leather workers not connected with clothing trades are organized into two small unions, one of which, while calling itself an international, does not extend beyond Massachusetts. This is the International Union of United Leather Workers of America, composed of workers in the Massachusetts tanneries; it is unaffiliated and has a membership of about 2,000. The other organization in the leather industry, United Leather Workers' International Union of America, is the result of a merger, effected in 1917, of two unions in the industry, the United Brotherhood of Leather Workers on Horse Goods and the Travelers' Goods and Leather Novelty Workers' International Union. The United Leather Workers' International Union is affiliated to the American Federation of Labor and has 2,000 members.

Food, Liquor, and Tobacco

Food and liquor.—In this group classification are six organizations affiliated to the American Federation of Labor and two independent industrial unions. One of the affiliated unions, the Industrial Union of United Brewery, Flour, Cereal, and Soft Drink Workers, is definitely an industrial union, having waged a long and victorious struggle within the American Federation of Labor for control of the various craftsmen employed in the brewing industry. Prohibition resulted in structural changes within the organization, as well as in loss of membership. Although so far it has not met with much success, the union is trying to shift its field from brewing to certain branches of the food industry. Extension of jurisdiction to soft-drink and yeast manufacture was followed by an effort to secure control of flour and cereal mills and grain elevators.

The Bakery and Confectionery Workers' International Union is one of the old organizations. Starting in 1886 with journeymen bakers, it has extended its field to candy and ice-cream manufacture.

The German bakers of New York City withdrew from the Bakery and Confectionery Workers' Union, and after several years of independent activity they joined with another independent group, the Hotel, Restaurant, and Caterer Workers' Federation, in 1921 to form

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the Amalgamated Food Workers of America. This is an industrial union which aims at control not only of the manufacture and distribution of food, but of its service as well, a field which among the American Federation of Labor unions is covered by the Hotel and Restaurant Employees' International Alliance and Bartenders' International League. As at present organized, the Amalgamated Food Workers encroaches to a limited degree on the chartered jurisdictions of three American Federation of Labor unions—the Bakery and Confectionery Workers, the Hotel and Restaurant Employees' International Alliance, and the Amalgamated Meat Cutters and Butcher Workmen. The last mentioned is an organization of workers in slaughter and packing houses, which also claims jurisdiction over meat cutters and sausage makers in wholesale and retail shops.

The membership of these organizations is as follows:

Bakery and Confectionery Workers' International Union of America	24,600
Brewery, Flour, Cereal, and Soft Drink Workers of America, International Union of United	18,000
Food Workers of America, Amalgamated	12,000
Hotel and Restaurant Employees' International Alliance and Bartenders' International League of America	38,240
Meat Cutters and Butcher Workmen of North America, Amalgamated	12,200
Total	105,040

Tobacco.—The Cigar Makers' International Union has been in continuous existence since 1864 and was largely responsible for the establishment of the American Federation of Labor. It began as a strictly craft union of skilled hand workers, but the introduction of machinery into the industry has materially changed the make-up of the union, although it still limits its field to the manufacture of cigars and tobacco cigarettes.

There are two other small organizations in the tobacco industry, one inside and one outside the American Federation of Labor. The affiliated union, the Tobacco Workers' International Union, has jurisdiction over the manufacture of smoking and chewing tobacco and paper cigarettes. The Amalgamated Tobacco Workers is an industrial union organized in 1921, which so far is composed chiefly of machine workers in cigar factories. The Cigar Makers' International Union has 24,000 members, the Tobacco Workers' International Union about 2,000, and the Amalgamated Tobacco Workers, 1,200.

Mining, Oil, and Lumber

THE only organization in the field of coal mining is the United Mine Workers of America, the largest labor union in the United States. It was founded in 1890, and is an industrial union. It is affiliated to the American Federation of Labor.

In the field of metal mining, such organization as is in opposition to the affiliated union, the International Union of Mine, Mill, and Smelter Workers, comes from the mining branch of the Industrial Workers of the World. Like the United Mine Workers, the International Union of Mine, Mill, and Smelter Workers is an industrial union, covering all workers "in and about the mines." It was formerly the Western Federation of Miners, a radical organization

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which held various affiliations, having at one time withdrawn from the American Federation of Labor and identified itself with the Industrial Workers of the World. After a reorganization along conservative lines it returned to the American Federation of Labor and dropped its old title. With the adoption of the new name, it also extended its jurisdiction to smelters, refineries, and blast furnaces.

Timber workers are variously organized in branches of the Industrial Workers of the World, in local unions directly affiliated to the American Federation of Labor, and in the Loyal Legion of Loggers and Lumbermen. The last mentioned is an independent organization composed of both workers and employers in logging and lumber manufacture. It was organized in 1917 and confines its activities to Oregon, Washington, and Idaho. There was at one time an American Federation of Labor union in this jurisdiction, the International Union of Timber Workers. It collapsed as an international, however, and such of the field as is controlled by the American Federation of Labor is organized in local unions chartered by the federation.

A small organization of oil-well workers was founded in 1917 and affiliated to the American Federation of Labor as the International Association of Oil Field, Gas Well, and Refinery Workers of America.

The membership of the national organizations in this group is as follows:

Loggers and Lumbermen, Loyal Legion of	[6] 10,000
Mine, Mill, and Smelter Workers, International Union of	20,000
Mine Workers of America, United	500,000
Oil Field, Gas Well, and Refinery Workers of America, International Association of	[1] 1,200
Total	531,200

Quarry workers are organized in the Quarry Workers' International Union of North America, an affiliated union with a membership of 4,000.

Glass and Clay

THERE are six national organizations in the glass industry, four affiliated to the American Federation of Labor and two independent. One union covers bottle making, another flint-glass manufacture, and the remaining four cover window-glass factories. The window-glass organizations are dual so far as the craft is concerned, but there is a division of processes and of establishments which limits the activities of each. Two of them, the National Window Glass Workers and the Window Glass Cutters and Flatteners' Association, are affiliated to the American Federation of Labor, membership in the second organization being confined to machine operators. The two independent unions of glass cutters and flatteners, the Window Glass Cutters and Flatteners' Protective Association, and the Window Glass Cutters' League of America, restrict their respective activities to the plants of certain manufacturers.

[1] Voting strength. [6] Employee members.

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Union membership in the glass industry is as follows:

Glass Bottle Blowers' Association of the United States and Canada	6,000
Glass Cutters and Flatteners' Association of America (Inc.), Window	([2])
Glass Cutters and Flatteners' Protective Association of America, Window	600
Glass Cutters' League of America, Window	500
Glass Workers, National Window	2,000
Glass Workers' Union of North America, American Flint	6,900
Total	[3] 16,000

The United Brick and Clay Workers of America, formerly the International Alliance of Brick, Tile, and Terra Cotta Workers, holds jurisdiction over clay mining and the manufacture of brick, tile, and terra cotta for whatever purpose used. It is affiliated to the American Federation of Labor, in which its voting strength represents 5,000 members.

The National Brotherhood of Operative Potters holds jurisdiction over the pottery industry and is the only union in that industry. It is an affiliated body, with a membership of 7,900.

A small affiliated union with a membership of 2,400, the International Paving Cutters' Union of the United States of America and Canada, exercises jurisdiction over the cutting of all stone used for paving purposes.

Woodworking

WOODWORKING and kindred trades are covered by four organizations besides the United Brotherhood of Carpenters and Joiners, which controls cabinetmaking, and the Loyal Legion of Loggers and Lumbermen, which includes sash and door mills in its jurisdiction. These four organizations are small, and are affiliated to the American Federation of Labor. The International Wood Carvers' Association of North America is a craft organization of highly skilled artisans numbering 1,100. The Coopers' International Union of North America has suffered from loss of trade, due partly to prohibition and partly to the substitution of other material in the manufacture of barrels. It now has a membership of 1,215.

The International Union of Piano, Organ, and Musical Instrument Workers holds a charter for the entire industry, but the industry is practically unorganized. The union has 600 members.

The largest organization in the group is the Upholsterers' International Union of North America. Its jurisdiction is comprehensive and varied, including factory production of window and wall hangings and awnings and their installation; mattress and box-spring making; furniture and automobile upholstering, and laying floor coverings. The membership of the organization is 12,000.

Public Service and Amusements

SO FAR as organization of "white collar" workers and the professions exists at all, it is to be found chiefly in the theatrical field and in public service, in which 417,431 workers are organized in national bodies.

[2] Not reported.
[3] Not including one union for which membership was not reported.

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The theatrical profession is represented in the American Federation of Labor by the Associated Actors and Artistes of America, an organization embracing all public entertainers except musicians, with a membership of 14,000.

One of the most powerful and thoroughly organized unions in the federation is the American Federation of Musicians, the jurisdiction of which covers professional players of musical instruments. It has a membership of 125,000.

The third organization in the theatrical field is not professional. Stage hands and moving-picture-machine operators are organized in the International Alliance of Theatrical Stage Employees and Moving Picture Machine Operators of the United States and Canada, a union with 22,000 members, affiliated to the American Federation of Labor.

In the public service there are the American Federation of Teachers, an affiliated union with a membership of 3,500 public-school teachers; the International Association of Fire Fighters, also affiliated, with 20,000 members; the National Federation of Federal Employees, an American Federation of Labor union which includes Government clerks in the departmental service to the number of 37,000; and the many organizations in the United States Post Office, including three organizations of clerks, three of letter carriers, and five of postmasters and other executive and supervisory officials.

Four of the organizations in the Post Office are affiliated to the American Federation of Labor and nine are independent. The affiliated group contains one organization of railway mail clerks, the Railway Mail Association; one of the two unions of post-office clerks, the National Federation of Post Office Clerks; one of the two unions of rural letter carriers, the National Federation of Rural Letter Carriers; and the only organization of city carriers, the National Association of Letter Carriers.

Dual organizations in the ranks of the independents are the United National Association of Post Office Clerks, a rival of the National Federation of Post Office Clerks, and the National Rural Letter Carriers' Association, from which the affiliated union seceded in 1920.

A second organization in the Railway Mail Service is the National Alliance of Postal Employees, an independent union of colored railway mail clerks who are ineligible for membership in the Railway Mail Association because of their race.

The other postal organizations in the following list are either of postmasters of the different classes or supervisory officials, or are in the mechanical branch of the service.

The organizations in the United States Post Office are as follows:

Letter Carriers, National Association of	50,000
Mail Association, Railway	20,000
Mail Service, National Council of Supervisory Officials of the Railway	330
Postal Employees, National Alliance of	1,700
Postal Supervisors, National Association of	5,500
Postmasters of the United States, National Association of	1,763
Postmasters of the United States, National League of District	14,000
Postmasters' Association of the United States, Service	415
Post Office Clerks, National Federation of	[7] 35,000

[7] Membership reported as 35,000 to 40,000.

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Post Office Clerks of the United States, United National Association of	[7] 35,000
Post Office Laborers of the United States, National Association of	1,023
Rural Letter Carriers' Association, National	28,600
Rural Letter Carriers, National Federation of	[1] 300
Total	193,631

Two other organizations of public service employees may be listed, the International Union of Pavers, Rammermen, Flaggers, Bridge, and Stone Curb Setters, an affiliated union with a membership, based on its voting strength, of 2,000; and the International Association of Police Women, an independent organization established in 1915, embracing policewomen, jail matrons, and social service agents in public employ. It has 300 members.

There are 34 local unions of State, county, and city employees, library attendants, sanitary inspectors, etc., which are chartered directly by the American Federation of Labor and have no national organization.

Other "White-Collar" Unions

TO THE "white collar" list may be added the Retail Clerks' International Protective Association, an American Federation of Labor union covering the selling force of mercantile and mail-order establishments. It does not permit publication of its exact membership. As represented by its voting strength in the American Federation of Labor, it has about 10,000 members.

Another organization bordering on the professional class is the American Registered Pharmacists, an organization of drug clerks and licensed pharmacists founded in California in 1901. It is an independent union, and while it is national in scope so far as its aims and form of organization are concerned, it has not yet extended beyond California, where it has 2,500 members.

Organization of stenographers, typists, bookkeepers, and office clerks is confined to local unions chartered directly by the American Federation of Labor.

Miscellaneous

UNIONS in miscellaneous manufactures not subject to classifications in the foregoing industrial groups are:

Broom and Whisk Makers' Union, International	[1] 700
Diamond Workers' Protective Union of America	375
Jewelry Workers' Union, International	[1] 800
Powder and High Explosive Workers of America, United	[1] 200
Sawsmiths' Union of North America	100
Wire Weavers' Protective Association, American	380
Total	2,555

Of these the Sawsmiths' Union is the only one outside the American Federation of Labor. It was affiliated until 1924.

The American Wire Weavers' Association, though small numerically, is really a "closed" union embracing all journeymen in the trade, which is the manufacture of the Fourdrinier wire used in the

[1] Voting strength. [7] Membership reported as 35,000 to 40,000.

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paper-making industry. It has rigid regulations governing the admission of apprentices and a very high initiation fee for foreign workers.

Various unclassified occupations are represented by the following organizations, all of which are affiliated to the American Federation of Labor:

Barbers' International Union of America, Journeymen	50,282
Bill Posters and Billers of America, International Alliance of	6,000
Building Service Employees' International Union	6,200
Horseshoers of the United States and Canada, International Union of Journeymen	[1] 2,000
Laundry Workers' International Union	6,500
Telegraphers' Union of America, Commercial	5,000
Total	75,982

Industrial Workers of the World

THE Industrial Workers of the World, organized in 1905, now claim 30,000 members, with active branches in the following industries: Agriculture, lumber, metal mining, oil, general construction (roads, bridges, etc.), building construction, machinery, foodstuffs, marine transportation, and railroads; and a group classed as "small unions" which includes textile workers.

Knights of Labor

BECAUSE of the policy of secrecy still practiced by the Order of the Knights of Labor, accurate data are not obtainable. The best information which can be secured indicates that the only remaining organizations of the Knights of Labor which are actually functioning as labor unions are in various branches of the municipal service in Boston, Mass., and two locals in the shoe industry in Ohio. Information dealing with total membership is not given out by the order.

Aggregate Membership

THE aggregate membership of all organizations covered by the study is 4,443,523—3,383,997 in the American Federation of Labor and 1,059,526 in the independent organizations and the Industrial Workers of the World.[8]

These figures include the Canadian membership of the international unions. The Department of Labor of Canada gives the following figures of Canadian membership in international unions for the calendar year 1924: 134,424 in the American Federation of Labor unions, and 67,527 in independent unions, including 11,500 in the Industrial Workers of the World—a total of 201,951.

[1] Voting strength.

[8] The above figures regarding the aggregate membership of all trade organizations exceed the sum of the membership of the individual unions reporting membership. This is because the aggregate membership reported includes the membership of several organizations which reported confidentially, and also 50,400 workers organized into local trade and Federal labor unions chartered directly by the American Federation of Labor and having no connection with the international organizations.

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Collective Agreements

FROM the labor standpoint, the primary purpose of collective or trade agreements is to prevent competition between the individual workers in fixing the terms of employment. To this end the union as a whole makes agreements with employers of labor, either singly or in associations, stating what the wages, hours of labor, and other conditions of work shall be, requiring employers to employ union workers, and promising in so far as possible to furnish employers with first-class labor alone. Such agreements, however, are not always reduced to writing; many of them are unwritten and are observed simply as a matter of tradition or custom.

There is no requirement or practice in the United States regarding the filing of local agreements with a central agency. Therefore, there is no central depository where such agreements may be found. The Bureau of Labor Statistics attempts to secure copies of agreements as they are consummated, to note certain of the more important ones in the Labor Review, and to present a summary compilation each year in bulletin form. The most recent bulletin on the subject is No. 419, entitled "Trade agreements, 1925."

Because of the difficulty of locating, and also of securing copies of, all new agreements, the bureau's compilation is by no means complete. The fact, however, that about 2,000 agreements are secured annually indicates the wide extent of the field, and also the impossibility of summarizing such agreements in a brief space.

Collective agreements began to be common immediately after the Civil War with the increase in the number of unions. Since the opening of the present century, however, there has been a rapid increase in their number. At first most of the agreements were oral, but in order to prevent misunderstanding the practice is now to reduce the more important of them to writing.

The length of the written agreements varies greatly. Some of them contain barely 100 words, others occupy upward of 100 pages. Some are confined mainly to wages and hours of work. Others contain extended provisions relative to arbitration, apprenticeship, discharge, holidays, overtime rates, and the like.

The form of these agreements also varies. The officers of each national and international union work out general provisions satisfactory to themselves and their members, and such provisions appear very generally in the local agreements of the respective unions.

With the exception of the agreements made by the glass, pottery, and wall-paper unions and provisions regarding the use of the label, few agreements binding the locals are made by the national officers, though the national officers of many unions demand the right to approve agreements made by the local unions.

In addition to the provisions relative to wages and hours, the agreements frequently contain clauses relative to the recognition of the union. Since the agreement is between the union and the employer it is but natural that a clause should be inserted obligating the employer to employ union members exclusively. Further, to assure the observance of this rule, a clause is frequently inserted requiring employers to obtain their workers through union officials. In some instances where employers are unwilling to be bound so

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closely the clause provides that as between two applicants for a job, one of whom is a union and the other a nonunion worker, the employer is to give preference to the union man, other things being equal.

Foremen and superintendents are generally considered as representatives of the employer and therefore as not eligible for membership in the union, but some agreements require membership in the union, especially if these employees do any journeyman work. Some unions, notably those of the painters, specifically forbid their members assuming the rôle of contractor.

The hours of work are always stated in the agreement. The 8-hour day is very generally observed. The 44-hour week is practically the rule of the building, clothing, metal, printing, and stone trades for daywork, while in many instances 40 hours' work only is required of night workers. There are indeed some cases where but 40 hours a week are required from day workers also.

Very seldom do collective agreements provide for a 7-day week. Sunday is the general day of rest, but in continuous occupations any day may be so observed. State holidays are generally observed by unions, and, except in the building trades, these are frequently paid for. There are a few cases where provision is made that employees shall be given a week or two of vacation with pay.

Work done outside the regular working hours is considered overtime. Many efforts have been made by the unions to reduce the amount of such work. In some cases no overtime work is allowed until the consent of the union officials has been obtained. In other cases the amount of overtime is limited to one or two hours a day or a few hours a week. As a rule the workers are paid time and a half or double time for overtime. In continuous operations and in trades where there is regular night work or the employees work in shifts, overtime rates do not apply. Instead, a separate wage scale is made which often calls for either a slight increase in wages over the day scale or a decrease in the number of hours worked per shift.

A number of agreements make some provision for arbitration and forbid strikes during the term of the agreement. The form of arbitration is similar in nearly all cases—a board of one, two, or three appointed from each side to the controversy with one impartial member chosen by the members appointed by the two sides. Some of the provisions relating to arbitration are very elaborate and contain minute directions for procedure. Both sides agree beforehand to observe the decision of the board.

Many agreements contain provisions relating to apprenticeship, showing that the apprenticeship system is far from passing into disuse. Apprenticeship matters are under the direction of a joint committee of employers and employees which articles apprentices to employers, examines them periodically in regard to their progress, sees that they attend school for the required length of time each year, and on the completion of the apprenticeship period, varying from six months to five years, examines them and admits them into the union if found qualified.

The matter of unemployment is variously handled. The usual method in time of slack periods is to discharge all unnecessary help

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and keep at work only as many as may be needed, in which case the agreements generally provide that the employees older in point of service shall be retained and those with shorter periods of service shall be discharged first. Other agreements forbid discharges under such circumstances and require an equal distribution of work. Of late there has been tried in the clothing industries a system of unemployment insurance, whereby a fund is created by contributions from the employers and employees and is used to make payments to employees during the period of unemployment.

Seniority in the public utilities and the check-off in the mining industry are other matters referred to in agreements. Not infrequently the agreements prescribe the working conditions, such as provisions relative to the comfort and safety of employees, proper sanitary arrangements, toilets, wash rooms, dressing rooms, and lockers. Some agreements require employers to carry liability insurance.

As a rule, agreements are made for one year, though the term may be for as short a period as six months or for as long as five years. Agreements running for more than a year generally contain a provision allowing wages to be revised yearly. Many agreements are for an indeterminate period.

Collective Bargaining by Actors

A STUDY of trade-unionism among performers of the English-speaking legitimate stage in America is given in Bulletin 402 of the United States Bureau of Labor Statistics, issued in 1926.

Prior to 1913, business relations between manager and actor were of a purely individual character and their dealings were far from satisfactory. Contracts were in many cases entered into by both parties with a mental reservation that they would not be bound by the terms should self-interest intervene.

Although several unions had been formed, none had been strong enough to have any appreciable success in remedying the abuses in the industry. The first step toward the formation of a live association of actors was taken December 22, 1912, and the Actors' Equity Association was formally constituted at a general meeting held May 26, 1913, with a charter membership of 112.

The first five years of the life of the association were spent in an only partially successful effort to secure the general and peaceful adoption of a standard contract. The indifference of the producing managers, however, forced the organization to take steps toward affiliation with the American Federation of Labor. Although no affiliation was effected at the time, the fact that negotiations to that end were in progress had its effect upon the managers and a standard contract was approved by the managers' and actors' associations on October 2, 1917. It soon appeared, however, that the managers had accepted the contract only in theory. In January, 1918, although all but four of the recognized producing managers in New York City had agreed to accept the new contract, it was actually being used by only about one-fifth of them.

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During the spring of 1919 a new association of managers was formed which refused to recognize the right of the actors to bargain collectively through the Equity Association. The actors therefore struck on July 29, 1919, to maintain this right. In this struggle they were assisted by the American Federation of Labor, to which they had finally succeeded in becoming affiliated only 11 days before the strike was called.

By the end of August the managers realized that the fight was lost, on September 3 negotiations were opened, and on September 6 an agreement was signed. The most vital provisions of this agreement, from the point of view of the actors, were the following:

1. It definitely recognized the right of the Actors' Equity Association to represent its members in their dealings with the managers.
2. It provided for the use, by all members of the Producing Managers' Association, of a standard minimum contract.
3. It agreed to submit to arbitration all questions of dispute between manager and actor, or between their respective associations.

In the fall of 1921 the union succeeded in introducing the so-called "Equity shop"—providing for a closed shop but also a wide-open union, which any person playing on the speaking stage may join. This had a highly stimulating effect upon the membership of the union, sending it to 12,308 (nominal membership) by December of that year, with a paid-up membership of 5,668.

Several attempts have been made to break the power of the union, but without success. At present its contracts provide for an 80 per cent Equity shop for the signatories; outsiders, or independents, must have 100 per cent Equity casts. Of the actors, some 7,400 (or about 97 per cent of the total) now belong to the Actors' Equity Association; approximately 100 are members of the Actors' Fidelity League; and the remainder (probably less than 50 in all) are not connected with either organization, but are allowed to work under the 80–20 agreement, contributing to the Equity Association the same amounts as though they were members. On November 6, 1925, the Actors' Equity Association had a paper membership of 11,007, with a paid-up membership of 7,379. The officials of the association believe that fully 97 per cent of American dramatic and musical comedy actors are now members of the Actors' Equity Association, and that the membership will show substantial increase, if at all, only as the field of theatrical production expands.

The union has done much to improve the condition of the actor. Through its efforts he is guaranteed a season of at least two weeks or salary therefor. He is assured that his work will be continuous from opening to close of the season, however short the season may be, except for possible lay-offs during Holy Week and the week before Christmas. He is protected against sudden loss of employment, by one week's notice if the play is to close and by two weeks if he individually is to be dismissed. He has witnessed the obsequies of the "satisfaction" or "joker" clause, which permitted summary dismissal at the will of the manager. He is required to give only four weeks of unpaid rehearsals if engaged for a dramatic production, or five weeks if the play is musical comedy or revue. He is paid full salary for all time played. He receives a stated salary for a standard week of eight performances and is paid extra, on a pro

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rata basis, for extra performances. He is guaranteed full transportation back to the starting point if the production goes on tour. He is required to supply in the way of costume only conventional clothes of modern style, and if the actor be a woman all stage clothes are paid for by the manager. The actor is permitted to call for arbitration of any disputed point of contract or of any claim which he may have against a manager.

The remarkable fact is that even among the former enemies of the Equity there can be found no genuine opposition to the working conditions summarized above. There is criticism of the methods by which these conditions were achieved and especially of affiliation with the American Federation of Labor and the introduction of the Equity-shop policy. But the fairness of the personal working relations which Equity has set up is attested by the managers themselves, upon whom, if upon any one, these conditions would work a hardship.

The author of the report sums up the successful operation of the association as follows:

> In so far as the business interests of the legitimate actor can be handled collectively, they come within the scope of the Actors' Equity Association. This organization, in its existence of 12 years, has witnessed the dissolution of two managerial groups and the gradual decline of a rival actors' association. It has adopted and enforced a policy which virtually insures it against loss of membership. It has won the good will of the public, and, to a remarkable degree, the good will of the managers as well. Thus intrenched, it would seem to be safe against attack so long as it continues the policy of moderation which has characterized it in the past.

Labor Relations in the Lace and Lace-Curtain Industries

A STUDY of labor relations in the lace and lace-curtain industries in the United States is presented in Bulletin No. 399 of the United States Bureau of Labor Statistics, published in 1926. These industries, while small, are of interest because of their importance in international trade and American tariff problems and because of certain outstanding features of their labor relations. The industries are of comparatively recent growth, having been transplanted from Europe and encouraged by tariff protection.

Of the 12 lace-curtain mills, 8 are in Pennsylvania; in the lace industry Rhode Island is credited with having 215 of the 590 machines in the country. According to the 1920 census there are over 7,000 wage earners in the cotton-lace industry.

The lace-curtain plants have no trade association, but cooperate in labor matters, meeting to discuss labor problems and to negotiate with the union. The employees in the industries are organized in a federation of a number of crafts and occupations, divided into three sections, two of which are composed of skilled operatives while the other is composed of the semiskilled and unskilled workers, and each is an independent self-governing unit. The organization is thus partly a craft and partly an industrial union.

As the industries are affected greatly by changes in styles, which makes for irregular employment, and as the skilled workers predominate in the industries, the labor policies of the union have naturally

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centered in security of employment, effective control of the labor supply being secured through "(1) high initiation fees if the circumstances warranted restriction; (2) length-of-service requirements in accepting transfer or traveling cards from European lace workers' trade-unions; (3) regulation of apprenticeship with respect to numbers allowed, age limits, and length of term to be served; (4) semi-official and official action on importation of lace weavers by American employers under the alien contract labor law; and (5) attainment of the closed shop." As a result of these policies the skilled workers in the industries have occupied a strategic position in bargaining with their employers because of the scarcity of trained labor and the necessity of importing men or of training apprentices.

A piecework wage scale, adopted in 1900, which developed from the old English piecework price lists established in the early years of bargaining over machine rates, is the basis of the collective bargaining as to wages. In the scale an average size and gauge of machine is fixed as the standard, with fixed differentials for additional equipment and variations in width and gauge. Percentage increases or decreases of this scale are made in times of prosperity or depression in the trade, price conferences being held semiannually and a joint technical committee deciding disputed points. The union secured a 9-hour day in 1907, but has not as yet obtained the 44-hour week for which it has been striving.

An elaborate code of shop regulations has been evolved for the handling of grievances and settling of disputes, which has brought comparative stability to the industry. A shop committee, composed of a shop steward and two committeemen, and the foreman handle disputes in the first instance, those not so settled being referred to the branch trade committee and a higher authority in the management, and then, if still unsettled, to the executive board of the union and the highest authorities in the management of the firm. Most cases are now settled by the shop committee and the foreman.

To offset the losses due to irregular employment because of the seasonal nature of the industry and the style changes, the lace workers have striven for higher wages and unemployment insurance. A contributory plan for unemployment insurance, which would obviate the necessity of continually demanding higher wages, has been proposed by the lace-curtain weavers and, while not yet adopted on a national scale, is being gradually adopted in the various local branches.

Thus in these industries, in which security of employment is dependent on tariff protection and style changes and highly specialized skill is required of most of the workers, the labor policies adopted through collective bargaining have made for assurance of tenure in the job and a satisfactory settlement of grievances.

Workers' Health Bureau

THE Workers' Health Bureau, located in New York City, has affiliated to it 160 trade-union organizations in 22 States and British Columbia, according to the annual report[9] of the

[9] Steam Shovel and Dredge Magazine, August, 1926, pp. 84, 85.

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organization submitted by its officials to its trade-union advisory council in 1926. The bureau's services have been extended to 17 trades and, in addition to the local unions, 4 international unions and 5 State federations of labor are affiliated with it.

Health agreements prepared for its affiliated unions during the year included the painting, stonecutting, glass beveling, and mirror-making industries, and surveys of working conditions were made in bakeries, stonecutting, and glass-beveling establishments. Assistance was also given in States in which attempts were being made to improve compensation laws, and the bureau has assisted organized labor by supplying health arguments to be used by strikers in winning their demands. The furriers' union in New York City was supplied health data in support of its fight for a 40-hour week and a study is being made of the health hazards in the textile industry, based on medical examinations of 404 men, women, and children, for the benefit of the textile workers in Passaic, N. J.

The following resolutions were adopted by the advisory council as the policies of the bureau:

Resolution No. 1.—Urging local unions throughout the country to take advantage of the health facts prepared by the bureau to support the campaign for the 40-hour week now under way in many parts of the country.

Resolution No. 2.—Supporting the efforts of Federal employees' unions to make the present law more liberal by reducing the age at which workers are retired, increasing the pension, and giving preference to workers in hazardous occupations.

Resolution No. 3.—Favoring an aggressive campaign to gain the adoption of national health regulations in dangerous trades with Federal control of poisonous and dangerous work methods.

Resolution No. 4.—Calling on international unions to adopt a national health program for the control of dangerous working conditions to protect the health and life of their membership.

Resolution No. 5.—Announcing that the Workers' Health Bureau is prepared to place at the disposal of unions information on dangerous working conditions in unorganized trades for use in organizing the great mass of unorganized workers.

Resolution No. 6.—Urging labor organizations to avail themselves of the bureau's research material for use in time of strikes.

At the third annual convention [10] held in New York City in January, 1927, the bureau adopted a constitution and elected a trade-union council of 17 members, an executive committee of 7 who are also members of the council, and an administrative staff of 3, replacing the former advisory council. and 2 directors. This form of organization is designed to give the widest possible representation to the affiliated groups and territories, and establishes a basis upon which the bureau may better meet the demands of a growing membership and a wider range of activities.

Union Health Center, New York [11]

THE Union Health Center, New York City, was organized about 13 years ago by the International Ladies' Garment Workers' Union to take care of the health of the members of the union. The services of the medical and dental departments were made avail-

[10] The Painter and Decorator, March, 1927, p. 12.
[11] Union Health Center News, New York, February and May, 1926.

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able also to members of other trade-unions on the same terms as to its own members.

A complete medical clinic is maintained at the health center which provides for general medical care; physical examinations, electric, baking, and light treatments; eye examinations and refraction; nose, adenoid, and tonsil operations; and also contains a laboratory and a fully equipped X-ray department. The dental clinic, which has recently been enlarged at an expense of $25,000, is said to be the largest in the world. It now occupies 10,000 square feet of floor space, with 22 chairs or dental units, and has a capacity of 500 patients a day. Since the clinic was established nine years ago, nearly 20,000 patients have been treated. All kinds of dental work, extractions, X rays, prophylaxis, fillings, children's work, and making of plates, bridges, etc., are done in the department. The charges are based on the actual cost of the services rendered, but show a small deficit. During 1925 the actual cost of every hour's work in the clinic was $4.12, while the income per hour was $4.08. Patients treated during the year totaled 4,611.

The medical clinic had an attendance of 21,963 during the year 1925, and 23,362 examinations and treatments were given. In this department also there was a deficit, amounting to about $4,200, due to the fact that while the charge for the physical examination is $1 the actual cost of the examination is $1.49.

The attitude of this organization toward self-help by trade-union organizations in securing better health conditions and in providing insurance against sickness and accident is shown in the following statement from the Union Health Center News:

> Labor unions should extend their activities to workers' health and health education.
>
> The function of labor unions was and is to improve the economic conditions of the workers and the members of their organizations. By economic conditions are meant a living wage, reasonable hours of labor, decent working conditions, and an American standard of living.
>
> Decent working and living conditions imply also safe and fire-protected buildings to work in, clean and sanitary shops, safeguarded machinery and the prevention of accidents, elimination of occupational diseases, a working-day short enough to prevent fatigue, good food, decent housing, time for recreation, insurance against accidents, unemployment, sickness, and old age.
>
> Lately the unions have extended their activities to banking and to the care of the savings of the workers. If the care of the monetary savings of the workers is of importance, how much more important is it for the union to take care of the health of the workers and save their lives. If the unions are beginning to introduce insurance for unemployment, why not also inaugurate insurance for accidents and for sickness and other hazards of the worker's life in his trade and in his home?
>
> There is a big project among the workers for their own life insurance institution. Why not also inaugurate an insurance against sickness? Is not sickness many times a cause of unemployment and of the general misery of the workers?
>
> The time has come for a broader conception of the care of the workers by their own organizations. There is no reason why workers should be compelled to depend upon charity or philanthropic organizations for care during sickness. The unions should enlarge their scope to include health as well as "bread and butter."
>
> Just as it is important to educate workers in their economic problems, it is equally important to spread the gospel of health education among the workers, to make them healthier and stronger union members, and to furnish them with health facts about themselves and their industry.

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LEGAL AID

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Legal Aid Work in the United States

WAGE earners, and others of low income, are at a serious disadvantage before the courts, because of the heavy expense usually attaching to the prosecuting or defending of a case at law. Various measures have been devised in the effort to remedy this evil—such as special small claims courts for the inexpensive handling of cases involving only small sums of money, the employment by the State of lawyers to defend persons who are without means of their own, and the establishment of free legal aid societies.

A report of the Bureau of Labor Statistics published in 1926 (Bulletin 398), entitled "Growth of legal aid work in the United States," traces the origin, development, and present status of the several types of remedial agencies. The report was prepared by Reginald H. Smith of the Boston bar and John S. Bradway of the Philadelphia bar. A preface by Mr. Chief Justice Taft of the United States Supreme Court points out the vital importance of the problem. The following is a brief summary of the facts developed in this report.

Small Claims Courts

A SMALL claims court is a court of law having a quick, simplified, and inexpensive procedure and jurisdiction over small cases, such jurisdiction in most States being over matters involving on an average $50 or less. Its decisions and judgments are as binding and as enforceable as those of any other court in the country.

The penalty for refusing to obey the summons of a small claims court is a default. The cases are heard by a judge whose decision is founded on the rules of substantive law. The hearings are public. Sometimes the judge of the small claims court acts as a conciliator, in which case the court is for the time being transformed into a conciliation tribunal.

The first small claims court was set up in Cleveland in 1913. In 1915 the small claims department of the District Court of Multnomah County, Portland, Oreg., was provided for by law, the plan being extended in 1917 to all counties of that State. In 1916 the Chicago Municipal Court established a special division for small cases. In 1920 the Philadelphia Municipal Court inaugurated a small claims department and Spokane instituted a small claims court. Before the beginning of 1924 California, Idaho, Massachusetts, Nevada, and South Dakota had created state-wide systems of small claims courts. Iowa had also passed a law giving the judges in the lower courts "power to regulate the procedure in small claims" and Minnesota, having tried the small claims court experiment in Minneapolis, had extended the scheme to St. Paul and Stillwater. Thus in various localities in seven States and in four large cities in other States the small claims court is an established fact.

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It is not rare for a judge of a small claims court to dispose of 100 cases in a day. According to the authors of the report, "these courts are a success because for the pressing need that exists, they provide a perfect answer."

The Massachusetts law and procedure for a state-wide system of small claims courts are in various respects the best yet worked out. Some of the principal features of this act are given below:

SECTION 21. The justices, or a majority of them, of all the district courts except the municipal court of the city of Boston, shall make uniform rules applicable to said courts, and the justices of the municipal court of the city of Boston shall make rules applicable to that court, providing for a simple, informal, and inexpensive procedure, hereinafter called the procedure, for the determination, according to the rules of substantive law, of claims in the nature of contract or tort, other than slander and libel, in which the plaintiff does not claim as debt or damages more than $35, and for a review of judgments upon such claims when justice so requires. The procedure shall not be exclusive, but shall be alternative to the formal procedure for causes begun by writ.

SEC. 22. The procedure shall include the beginning of actions with an entry fee of $1 but without writ, and without requirement, except by special order of court, of other pleading than a statement to the clerk or an assistant clerk, who shall reduce the same to concise written form in a docket kept for the purpose. The procedure shall include notice by registered mail instead of the mode of service heretofore required, and shall include provisions for early hearing. The procedure may include the modification of any or all rules of pleading and practice, anything contained in other chapters, sections or acts notwithstanding, and may include a stay of the entry of judgment or of the issue of execution. The rules for the procedure may provide for the elimination of any or all fees and costs, and that costs shall be in the discretion of the court. In causes begun under procedure, the court may on application for cause shown issue writs of attachment of property or person as in causes begun by writ.

Conciliation Tribunals

THE small claims court plan, however, is at present inapplicable in numerous cities and judicial districts, as there are States which have no courts between the justice of the peace and the circuit courts, except the probate courts and the special courts in the cities and larger towns. It is suggested that in these localities conciliation may afford the most practicable solution for settling differences between individuals, wage claims, rent, debts, property damages, breach of contract, and particularly those small cases which fall within the scope of conciliation tribunals. At present there are only a few of these tribunals in the country. The North Dakota experiment is the only one in the United States from which one may hope to secure at present any practical notion of the nature and accomplishment of conciliation tribunals. The attorney general of that State reports that the results of conciliation have not justified the expectation of those who drafted the law providing for the appointment of conciliators. Although the history of this form of conciliation in the United States has not been encouraging, it would be unwise, the authors think, to disregard it altogether in plans for improving the administration of justice.

Industrial Accident Commissions

THE legislation which established the workmen's compensation principle practically eliminated all costs and fees for claimants, provided for a summary procedure, and in order to do away with the

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necessity for counsel placed the administration of workmen's compensation laws in the hands of quasi-judicial industrial accident boards or commissions.

The Connecticut compensation law even provided that in the event a case was appealed from the commission there should be no charges in the supreme court. Even stenographic expenses are taken care of by most of the commissions.

The commissions have also had an encouraging record in the prompt adjustment of claims. According to a statement of the late Mr. E. H. Downey, an expert on workmen's compensation, published in 1924, "at least 95 per cent of all compensation claims are settled by direct agreement between the parties without reference to any tribunal."

The contested cases are also handled with much greater promptitude than ordinary court cases. Thus, the 1917 report of the California Industrial Accident Commission shows that over 86 per cent of such cases were decided within 62 days. The average time for the completion of court action in common-law personal injury suits is 2 years and 5 months, according to a statement of an actuary of the Ohio commission.

The industrial accident commissions have also done a great deal to aid injured persons to prepare their cases. In the judgment of the authors of this report, the need for an attorney to represent the injured workers in contested cases will grow more and more apparent. In this connection the assistance of legal aid organizations is suggested. Already the International Association of Industrial Accident Boards and Commissions and the National Association of Legal Aid Organizations have appointed a special committee to consider how far such a cooperative arrangement may now be feasible and workable or may be made to be.

Wage Payment Legislation

IN THE matter of wage claims the workers have found the legal machinery in this country most inadequate. State after State has realized this and undertaken to institute remedies.

The first legislative experiment along this line was the Massachusetts act passed in 1879, which required the weekly payment of wages. Some States have sought to compel wage payments by imposing a penalty for nonpayment, as by making the wages run till paid, leaving, however, the unpaid wage earner to collect the penalty through an ordinary suit in the ordinary courts. Other States have tried to aid the worker by providing that, if he wins his suit, the defendant must pay the lawyer's fee.

The most interesting legislative attempt in this connection is declared to be the creation of an administrative official and placing in his hands the duty of enforcing wage payment laws, as has been done in California, Massachusetts, Nevada, Utah, Washington, and Wyoming.

In 1886 Massachusetts corporations in specified industries were "made liable to criminal proceedings and to fines for nonpayment of wages." Later the act was extended to all employers in every important line of business.

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In California and in Washington the administrative officials may arbitrate seasonal labor wage claims and all of the officials have acquired a sort of de facto jurisdiction to hear complaints and to adjust them partly by arbitration and partly by conciliation. But the commissioner can not enforce a decision against an employer who refuses to comply. In such case he must proceed in court.

Judging from the experience in connection with the collection of wage claims, the best scheme would seem to be to enact legislation requiring the weekly payment of wages, making their nonpayment a criminal offense and intrusting the enforcement of this law to an administrative official, generally a labor commissioner. This is the present Massachusetts system, which seems to be more effective than that followed by any comparable States.

This scheme will probably prove satisfactory for the collection of the great majority of wage claims, but there will no doubt be some disputed cases in which the claimant should be represented by counsel. It is suggested that in these cases labor commissioners cooperate with legal aid organizations. The Association of Governmental Labor Officials of the United States and Canada and the National Association of Legal Aid Organizations have each recently appointed a committee to devise practical methods for such cooperation.

The Defender in Criminal Cases

THE defender in criminal cases is a lawyer who represents persons in straitened circumstances who are accused of crime. He may be paid by a private organization or by the State.

The plan of assigning counsel for poor defendants operates best in capital cases because the dramatic character and publicity of such cases tend to arouse the interest of the assigned counsel and to urge him to his best efforts. Furthermore he is paid for his work. Even in "noncapital cases when assigned counsel are paid the plan does serve to provide adequate representation for the defense, although * * * this is accomplished in an unnecessarily expensive and cumbersome manner. But in at least 35 States the indigent defendant, unless he is charged with murder, must rely on unpaid assigned counsel or go without any representation at all," unless some individual or organization affords him relief.

As a result of this situation varied experiments with defenders in criminal cases have been tried—in Chicago through the bar association of that city; in Minneapolis, Omaha, and San Francisco, through municipal defenders; and in Cleveland and Los Angeles, through defenders in connection with the inferior courts. The Connecticut public defenders are county officers. There are also two important defender organizations—the Voluntary Defenders Committee in New York City and the Public Defender of Los Angeles County.

At present there are 12 defenders' offices in the United States. It is estimated that the 1924 volume of work of defenders' offices approximated 6,000 cases and it seems fair to conclude that since the establishment of these offices they have extended their aid to about 45,000 persons in criminal cases.

In large communities the public defender system is preferable to the paid assigned counsel system not because the former better

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protects innocent defendants but because it serves them equally well and is also more economical and efficient. This is due to the centralization of all the cases of indigent persons in one office and also to the concentration of responsibility in that office. These conditions result in rapid expert service.

Whether a private or public defender organization is preferable in thickly populated centers is a moot question. One of the leading arguments advanced in favor of the public defender is that his position is official and his financial backing more solid. On the other hand, the private defender has the advantage of greater freedom from political interference. It seems quite certain, however, that the trend will be toward the establishment of public defenders' offices.

In the smaller communities where the number of cases is not sufficient to demand the setting up of a public defender's office, the assigned counsel plan can be made to work very well.

Legal Aid Organizations

IN 1876 in New York City the first legal aid organization came into existence. In the beginning this movement for the legal protection of the poor made slow progress. At the close of the nineteenth century legal aid work was being done in only 3 cities in the United States—Chicago, Jersey City, and New York.

From 1900 to 1909 the movement steadily extended, Boston, Newark, Philadelphia, Cleveland, Denver, Brooklyn, Cincinnati, Pittsburgh, and Detroit being among the centers in which legal aid organizations were established. The outstanding development in the 1910–1913 period was the creation of the first municipal legal aid bureau in Kansas City, Mo. Prior to this all legal aid organizations were supported by charities, the bar associations or the general public as philanthropic corporations. In this period also legal aid activities were begun in Baltimore, Rochester, St. Louis, Akron, Buffalo, Colorado Springs, St. Paul, Duluth, Minneapolis, Louisville, and some efforts were made along this line in Birmingham and New Orleans. From 1913 to 1917 there was a further expansion followed by a setback due to the war. In a few years, however, the work advanced with revived momentum.

In 1921 a new scheme of legal aid organization particularly adapted to smaller communities was devised which was to be worked out by the Illinois Bar Association in cooperation with the local bar associations of that State. This scheme, approved in 1922, called for "an informal series of legal aid committees to which the social service agencies in their respective communities could refer persons needing legal advice and assistance." Previous to this time legal aid services had been mainly available in the larger cities. The "Illinois plan" constituted a simple and practicable system for the extension of such services to smaller communities where the need for legal aid is not sufficient to justify the setting up of a formally organized bureau or society.

By 1922 there were about 48 legal aid organizations in this country and by 1925 they numbered 72.

In 1912 a national alliance of legal aid societies was formed which in 1923 was superseded by an improved national association of legal

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aid organizations "with defined duties and powers for the guidance of legal aid work, * * * to cooperate with the judiciary, the bar, and all organizations interested in the administration of justice."

Existing legal aid organizations annually assist over 125,000 clients. They collect about half a million dollars in amounts averaging a little over $15 a case. This work as carried on at present costs annually almost a third of a million dollars, averaging approximately $2.50 a case.

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MINIMUM WAGE

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Minimum Wage Laws and Their Operation

IN SEVERAL countries legislation has been enacted to fix a minimum rate below which employers may not go in the payment of wages to their employees. In the United States such legislation has been limited to the employment of women and minors.

Minimum Wages for Women and Minors

MINIMUM wage legislation for women and minors originated in the United States with the Massachusetts law of 1912. Thereafter the movement spread rather rapidly and, by 1923, legislation of this character had been enacted in the following jurisdictions: Arizona, Arkansas, California, Colorado, District of Columbia, Kansas, Massachusetts, Minnesota, Nebraska, North Dakota, Oregon, Porto Rico, South Dakota, Texas, Utah, Washington, and Wisconsin. In two other States—Louisiana and Ohio—constitutional amendments authorizing such legislation were adopted but no legislation was enacted.

With the exception of the Massachusetts law, all these laws were compulsory in character, and in consequence all were adversely affected by a series of court decisions, beginning in 1923, when the United States Supreme Court held unconstitutional the minimum wage law of the District of Columbia.

Prior to that time the validity of legislation of this class had been upheld by the supreme courts of five States,[1] and the principle seemed quite thoroughly established until a test was made of the act of Congress prescribing a minimum wage law for the District of Columbia. It was then (1923) held by the Supreme Court of the United States that such legislation was an unwarranted interference with the freedom of contract guaranteed by the due process clause of the fifth amendment and the protective provisions as to life, liberty, and property of the fourteenth amendment to the Constitution. (Adkins *v.* Children's Hospital, 261 U. S. 525, 43 Sup. Ct. 394.)

Subsequent to the decision above noted, the law of Wisconsin was declared unconstitutional by a Federal court in so far as it applied to adult females (Folding Furniture Works *v.* Industrial Commission (1924), 300 Fed. 991); the Supreme Court of Minnesota sustained the law of that State in its application to children only (Stevenson *v.* St. Clair (1925), 201 N. W. 629); and the Supreme Court of Kansas declared its law unconstitutional in its application to adult women (Topeka Laundry Co. *v.* Court of Industrial Rela-

[1]Arkansas (State *v.* Crowe (1917), 130 Ark. 272, 197 S. W. 4); Massachusetts (Holcombe *v.* Creamer (1918), 231 Mass. 99, 120 N. E. 354); Minnesota (Williams *v.* Evans (1917), 139 Minn. 32, 165 N. W. 495); Oregon (Stettler *v.* O'Hara (1914), 69 Oreg. 519, 139 Pac. 743); Simpson *v.* O'Hara (1914), 70 Oreg. 261, 141 Pac. 158); Washington (Larsen *v.* Rice (1918), 100 Wash. 642, 171 Pac. 1037).

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tions; Topeka Packing Co. *v.* Same (1925), 237 Pac. 1041). Each of these decisions had in view the effect of the rule of the Supreme Court in the Adkins case, the Kansas court being divided on the point of whether the decision controlled as establishing a general principle or whether it was limited simply to the local condition of an act of Congress passed solely for the District of Columbia. This question was put at rest by the decision of the Supreme Court in the case of Murphy *v.* Sardell (1925), 46 Sup. Ct. 22, which sustained the judgment of the United States District Court, District of Arizona, declaring unconstitutional the minimum wage law of that State, which was applicable only to women. Of like tenor was the more recent decision in the case, Donham *v.* West-Nelson Mfg. Co. (1927), 47 Sup. Ct. 343, in which the Arkansas law was held void.

This strongly points to the conclusion that all laws of a compulsory nature are practically nullified as regards women by the rule laid down by the Supreme Court, at least so far as penal enforcement is concerned. The recommendatory law of Massachusetts is unaffected, and the laws of the other States, in so far as their application to children is concerned, may continue to function, so far as is indicated by any judicial pronouncement yet made.

In this connection it will be of interest to notice the action of the Legislature of Wisconsin in May, 1925 (i. e., subsequent to the decision in the Adkins case and that in the case, Folding Furniture Works *v.* Industrial Commission, already noted, but prior to that in the Arizona case by the Supreme Court), amending the laws as to adult females by declaring that: "No wage paid or agreed to be paid by any employer to any adult female employee shall be oppressive. Any wage lower than a reasonable and adequate compensation for the services rendered shall be deemed oppressive and is hereby prohibited." The commission is given power to make rules permitting substandard workers to receive less than a standard rate; also to license employers to pay less if they are unable to pay the standard wage, but the inefficiency of the employer is not to be ground for a license. The payment of wages in violation of any order of the commission is a violation of the section. Separate provision is made for the wages of minors, which "shall be not less than a living wage," unless license is granted on account of inability to earn such wage. It seems apparent that the purpose of these amendments is to open the way for a continued operation of the law, certainly as to minors, and if possible, to adult females as well.

Operation of Massachusetts Law

IN VIEW of the questionable constitutionality of the various compulsory minimum wage laws, it seems unnecessary at this time to give details regarding the character and operation of such laws.

The Massachusetts law, however, as already noted is in a different category. It is not compulsory and therefore is unaffected. It resembles the majority of the laws of the other States in its creation of boards for the investigation of the cost of living and the recommendation of rates to the administrative department, but differs, as indicated, in omitting the penal features for noncompliance. As enacted, the law contained a provision requiring newspapers to

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publish the names of noncomplying employers, but this provision was held unconstitutional as interfering with the rights of publishers to make their own contracts and to refuse business judged undesirable (Commonwealth *v.* Boston Transcript Co. (1924), 249 Mass. 477, 144 N. E. 400). In practice, this has not affected the activities of the minimum wage commission, since an adequate number of papers have accepted the advertisements as offered.

Under the Massachusetts law, minimum wage rates for women and minors have been determined and made effective for a number of industries. The following is a list of decrees now in force, with the minimum weekly wage rates established for experienced woman workers. This list was published in mimeographed form by the Massachusetts Department of Labor and Industries.

Industry:	Date effective	Minimum weekly rate
Corset	Mar. 1, 1920	$13.00
Men's clothing and raincoat	Feb. 1, 1920	15.00
Knit goods	July 1, 1920	13.75
Office cleaning	Feb. 1, 1921	15.40
Paper box	May 15, 1922	13.50
Women's clothing	do	14.50
Muslin underwear	June 1, 1922	13.75
Men's furnishings	do	13.75
Retail store	do	14.00
Laundry	July 1, 1922	13.50
Brush	Mar. 1, 1923	13.92
Druggists' preparations and proprietary medicines	Jan. 2, 1924	13.20
Canning and preserving, minor confectionery, and food preparation	Apr. 1, 1925	13.00
Bread and bakery products	May 1, 1925	13.00
Millinery	July 1, 1925	13.00
Stationery and envelope	Jan. 1, 1926	13.75
Candy	Mar. 1, 1926	13.00
Jewelry and related lines	Jan. 1, 1927	14.40
Toys, games, and sporting goods	Mar. 1, 1927	13.50

According to the reports of the minimum wage division of the State department of labor and industries, minimum-wage decrees have been very generally observed by employers. Thus the report for the year ending November 30, 1925, says:

> The firms where publication has been necessary represent a very small proportion of those inspected under the decrees in question. In the case of retail stores the firms advertised represent 2.9 per cent of all of the firms inspected employing women; in the case of laundries, 5.3 per cent; paper-box factories, 3.1 per cent; and in the case of the other decrees under which it has been necessary to publish, from 0.3 to 2.5 per cent.

Minimum Wage Laws for Men

AS ALREADY pointed out, there has been no legislation in the United States attempting to fix the minimum wages of adult males. In a number of foreign countries, notably in certain of the British colonies, the principle of a legal minimum for the wages of all workers, including men, has been well established, and the recent developments in Canada along this line are of peculiar interest to the United States because of the general similarity in industrial conditions in the two countries.

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As early as 1919 the Legislature of British Columbia had enacted a law authorizing a minimum wage board for coal miners, but no action had ever been taken thereunder. In Alberta, too, it was enacted that "no person shall be employed by any employer in any factory, shop, office, or office building at a wage less than $1.50 per shift, except in the case of apprentices, who may be paid a wage of not less than $1 per shift." (Sec. 24, ch. 20, Acts of 1917.) However, such a rate was too low to affect adult males.

On December 19, 1925, the Legislature of British Columbia enacted a law entitled "The male minimum wage act," applicable to male employees in general, but farm laborers, fruit pickers and packers, fruit and vegetable canners, and domestic servants being excepted. The law is compulsory when standards have been fixed by the administration board, which is a permanent body. The first application of the act was to the lumber industry, the order fixing a minimum rate of 40 cents per hour, effective November 1, 1926. It was estimated that this would raise the wages of some 8,850 of the approximately 40,000 persons in the industry. This act has been held constitutional in its specific application to the occupations and industries affected by the order.

The Select Standing Committee on Industrial and International Relations of the Canadian House of Commons had before it in 1926 a resolution to establish a legal minimum wage for employees without regard to sex. The committee reported that in adopting the peace treaties at the close of the World War the country had accepted the principle of the minimum wage law incorporated in the treaty. It found that the method as applied to women "was working satisfactorily," and that there was no reason why it should not be extended to men, "at least to some classes of men's wages," not as fixing a standard for wages generally but only "as a device for protecting the low-paid workman, for protecting the subsistence level." However, enactment of the necessary laws, the committee believed, would rest with the Provinces rather than with the Dominion Government.[2]

[2] Canada. House of Commons. Select Standing Committee on Industrial and International Relations: Minutes of proceedings and evidence, session 1926. Ottawa, 1926.

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NEGRO IN INDUSTRY

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Migration of the Negro[1]

DURING the past decade a considerable movement of negroes from the South to the North and West—especially to northern cities—has taken place, with the result that the negro has become more of an industrial factor than previously.

This northward movement had been under way for some time before anyone thought of collecting statistics relating thereto. To some extent, indeed, this northward movement has been going on ever since the Civil War, principally from Virginia to the States of Pennsylvania, New Jersey, and New York. With the beginning of the World War period, however, the movement began to increase in volume, growing in intensity until, by 1917, the question had become one of great importance to the South, especially to the landowners who began to have difficulty in securing sufficient labor to man the farms.

By 1920, the census shows, the total number of southern-born negroes in the North was 737,423, and there were also 43,371 in the West. Data collected by the United States Department of Labor show that during the year ending in September, 1923, alone, the negro migration from 13 Southern States reached a total of 478,700.

Reasons for Migration

THE reasons for the exodus from the South were many. The main reason was doubtless the much higher wages offered in the North. War industries were booming and the need of men was great. At the same time the South was experiencing a depression. Floods in some regions, crop failures, the inroads of the boll weevil, and for a while, the glut of the cotton market and the growers' inability to dispose of the crops at a fair price, created a situation which made it difficult to pay living wages.

In such circumstances, the high wages and greater equality of treatment in both the economic and educational field, offered in the North, were an increasing inducement to the negroes. Those who went North wrote glowing accounts home. One observer said: "Every negro that makes good in the North and writes back to his friends, starts off a new group."

The migration resulted in a serious labor shortage in some sections of the South, but had the good effect of bringing to the attention of southern whites, in a most striking manner, the causes of the exodus and the necessity for remedying them if the exodus were to be checked.

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[1] Data are from United States Department of Labor, Office of Secretary, Division of Negro Economics, Negro migration in 1916–17, Washington, 1919; "Recent northward migration of the negro," by Joseph A. Hill (Labor Review, March, 1924); and "Negro migration in 1923" (Labor Review, April, 1924); Labor Review, April, 1926; and press releases of the United States Department of Labor for Sept. 20, 1924, and Jan. 10, 1927.

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The Negro Migrant as an Industrial Factor

IN THE spring of 1923, the Federal Department of Labor made an effort to learn where the migrants were going and what proportion of skilled workers were included in their ranks. Pay-roll data were secured from 273 employers of negro labor in California, Connecticut, Delaware, Illinois, Indiana, Kansas, Kentucky, Maryland, Massachusetts, Michigan, Missouri, New Jersey, New York, Ohio, Oklahoma, and Wisconsin. A special study was made of a group of 19,747 negroes among the whole number of 60,421 employed on April 30, 1923, particularly as to the number whom employers could positively identify as having moved northward into employment during the past year. It was found that 4,702, or 23.8 per cent, had come direct from the South during the year. Taking the whole group and allowing for those who could not be definitely assigned, the conclusion was reached that the distribution of migrants among the States listed can be approximately indicated by the following percentages:

	Per cent
Ohio	37.26
Pennsylvania	21.63
Michigan	10.53
New Jersey	6.40
New York	4.76
Missouri	4.74
Illinois	4.49
Kentucky	4.36
Connecticut	3.04
Maryland	1.30
Wisconsin	.85
California	.32
Oklahoma	.26
Nondistributable	.06
Total	100.00

It will be noticed that several of the States in this list are distinctly southern, and that one or two appear in the list of States from which migration was in progress. The department called attention to the fact that the migration is a continuous process. Immigrants from the far South move northward, work in their new location for a time, and then move on until they reach the North, while new migrants fill their places as they move on. This is particularly noticeable along the border. "The reports indicated that migrants frequently come to border States, and after working a while use a portion of their earnings to remove to points of vantage farther north. This particular feature is, perhaps, largely productive of causes of turnover, which was not strongly noticeable in the States farthest north."

The 273 employers listed with the department had 60,421 colored workers on their pay rolls on April 30, 1923. An effort to learn what proportion of these were migrants led to the following conclusions:

	Per cent of migrants among workers studied
New Jersey	62.19
Oklahoma	54.54
Michigan	52.27
Ohio	36.01

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	Per cent of migrants among workers studied
California	30.00
Pennsylvania	29.82
Connecticut	20.82
Missouri	19.08
Wisconsin	19.14
Kentucky	14.91
Maryland	12.03
New York	11.88
Illinois	5.17

Unfortunately, the employers in Delaware, Indiana, Kansas, Massachusetts, and West Virginia, did not furnish reports on this point so these States are omitted from the list. The department feels that the distribution of migrants as shown above points to two conditions which strongly influence the migration—wages and types of employment available in Northern States, and geographical location. "No doubt, direct touch of trunk lines from southern points and the amount of railroad fare required have their effect upon these workers who desire to move northward; and on the other hand distinctive types of work with attractive wages form another inducement."

The classification of the workers as skilled or unskilled showed the following results:

	Apr. 30, 1922	Apr. 30, 1923
Skilled workers	10,794	14,951
Unskilled workers	31,577	45,470
Total	42,371	60,421

This shows an increase during the year of 38.5 per cent for the skilled and 44 per cent for the unskilled workers.

High marks were reached in the increase of negro skilled workers who advanced by 186.86 per cent in Maryland; 90.48 per cent in Connecticut; 70.73 per cent in Michigan; 68.97 per cent in Kansas; 68.04 per cent in Ohio; 60 per cent in California; 43.68 per cent in Pennsylvania; 39.94 per cent in Illinois; 33.33 per cent in Wisconsin; 30 per cent in New York; 18.18 per cent in Indiana; and 13.93 per cent in Kentucky. New Jersey and Oklahoma showed respective increases of 12.96 and 3.85 per cent in the number of negro workers taken on in the skilled occupations during the year, while West Virginia showed a loss of 1.82 per cent.

The percentage increase during the year in the number of unskilled colored workers ranged from 15.69 per cent in Oklahoma to 102.86 per cent in Indiana, with Connecticut and New Jersey both showing increases of between 80 and 90 per cent.

Industrial Employment of the Negro

Cleveland, Ohio

THE New York Economic World reprinted in its issue of May 3, 1924, an article published by the Union Trust Co. of Cleveland, Ohio, giving the experience of manufacturing concerns of that city with the southern migrants. The article, written by John B. Abell, was based on an inquiry carried on among industrial employers of the Greater Cleveland district.

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Migration from the South constantly increased, "until in 1923 there were more than 43,000 southern negroes who settled in Cleveland alone, as against 2,000 for the year 1880." To a large extent the negroes came from the southern cities, not from the agricultural regions. They were a mixed group, including the good and the bad, the industrious and the lazy, the capable and the inefficient, much as any other cross section of the population would show. They were, however, stated to compare favorably with the average of immigrant races. From the employer's point of view they have one great advantage over the foreign immigrants in that they understand the language and the basic ideals of the country.

The survey on which the article was based covered 75 of the larger employers of the district, and the findings of this inquiry were checked up by an investigation of conditions in 20 large factories of the city. The questions of the steadiness of the negro as a worker and his fitness for skilled work are particularly dwelt upon.

As to steadiness, the first and most persistent complaint against the colored worker is that he is unreliable and shiftless, prone to be absent on slight occasion, and fond of changing from one employer to another. Investigation, however, fails to show that this charge is generally true.

To be sure, there has been a large turnover in some of the plants where these colored men have been employed. In some instance firms report that where 25 per cent of their workers are negroes, the turnover among them has sometimes been as high as 75 per cent of the turnover for the entire plant. On the other hand, an equal number of firms state that the turnover has never, even at the start, been greater than for other racial groups.

It is suggested that where the turnover is large there are several reasons, quite apart from the character of the colored workers, to account for it. The newcomer has often been obliged to take the first job he could get, and naturally, if this does not suit him, he leaves it as soon as he can get something better. Also the employers, it is said, have in general taken little pains to try to fit the colored migrant into the place for which he is qualified. They have taken on negroes when they were hard pressed for help and put them at "what might be termed turnover work—work not fitted to the man's training, and upon which there would be a constant change of employees under any circumstances."

As an incidental proof of the tendency of the negro worker to hold on to his job, the results were cited of an inquiry made by a local manufacturer who employed both races.

Picking 200 colored and a like number of white workers at random, he found that 150 of the negroes had savings accounts, while only 35 of the other employees had such reserve resources. This condition, he asserts, shows that the colored man must have been fairly regular at work in order to lay aside weekly earnings.

In another plant, employing 445 colored people out of a total of a little more than 1,000 it was found that 140 colored men were putting money in shop savings accounts. Many of them reported that they were doing this in order to purchase homes here in the North—or in other words, that they might establish themselves permanently as a part of the community.

The actual situation as to turnover for 15 plants was found to be as follows:

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PER CENT OF EMPLOYEES WHO ARE COLORED AND PER CENT OF TOTAL TURNOVER DUE TO COLORED WORKERS IN 15 CLEVELAND PLANTS

Nature of plant	Per cent of total employees who are colored	Per cent of total turnover due to colored workers	Nature of plant	Per cent of total employees who are colored	Per cent of total turnover due to colored workers
Metal working	50	35	Paints	15	20
Chemical	15	15	Castings	25	30
Railroad labor	40	80	Foundry	25	15
Foundry	50	20	Do	30	20
Chemical	25	35	Machinery, castings	35	10
Steel mill	10	60	Foundry	50	20
Machinery	10	75	Do	55	60
Foundry	35	55			

The experience of these 15 firms is typical of those included in the survey of the 75 plants.

Accepting these plants as typical of general conditions in Greater Cleveland, we find the average factory employment among them for the negroes is 32⅓ per cent of the total, while the average per cent of turnover among them is 36⅔ per cent. Thus, in spite of the fact that the negro in industry is a comparatively new factor in this territory, he is but slightly more responsible for the shifting of jobs than is the native of the district or the foreign born, who on the whole has had a longer time to adapt himself to local conditions.

The greatest number of the southern negroes went into foundry mills and machine-working plants. A number of them were taken on as war emergency help, and many of these were dismissed at the close of the special need, though in some plants the foreign workers were dismissed and the negroes retained, as being more desirable.

Twelve foundries or plants primarily engaged in foundry work report that from 10 to 60 per cent of their plant employees are colored. The average for these plants is 33 per cent negro workers. An equal number of important machinery factories report but a slightly smaller average of all employees as being colored migrants.

In all but one of the foundries it was found that the negroes have advanced from labor to semiskilled work, and finally to skilled positions. * * * One such plant reports that there is no opportunity for the negro beyond semiskilled work. This is not due so much to his inability to qualify, but rather to a distaste of other workers to working alongside of him.

Practically all of the machine-working plants stated that the negro is finding his place in nearly all factory jobs, from common labor up through foremanships and mechanical maintenance work. They say that while some of the migrants have not made good on certain skilled work, that it is not due to racial traits but rather to lack of fitness of the particular individual.

The suggestion is advanced that the one place in production work to which the negro does not seem to be so well fitted as the white is the semiskilled or routine machine work. In Cleveland, at least, the newcomers "have landed in large numbers and for longer times on either straight labor work or the highly skilled trades." Several examples are given of the ability which negroes have displayed on skilled work, and in what might be called professional lines, such as industrial chemistry, for instance. On the whole, the conclusion is reached that the negro is likely to be a permanent and an important factor in the industries of Cleveland.

While it would be pure guess to state now what positions may or may not be efficiently handled in the future by the southern negro, experience thus far has

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established the fact that they have not as a race failed in any class of work upon which they were given a fair trial. Although during the last five years their range of opportunity has been greatly widened, their field is still limited because of lack of understanding by both employer and employee, and in some instances because of the color prejudice.

It is almost unanimously agreed that during the time they have been used to any great extent in northern industry, the negroes have made as rapid progress to better jobs as have immigrants who came in on the same footing. It is generally acknowledged the negro is no longer an emergency factor in industrial employment, but that he is here to stay, with the probability that his numbers will increase as years go by.

Pennsylvania

TWO studies of the industrial employment of the negro in Pennsylvania have appeared, one made by the Department of Labor and Industry of Pennsylvania, and the other by the executive secretary of the Pittsburgh Urban League. The results of the first were given in the January, 1926, issue of the department's official publication, Labor and Industry. Questionnaires relating to the period from January 1, 1923, to September 1, 1925, were sent to 1,478 employers, including manufacturers, railroad companies, coal-mining companies, and general construction companies or contractors. Hotels, restaurants, dining cars, and other places in which colored workers are customarily and frequently employed were omitted. Replies were received from 1,075 employers, of whom 559 reported that they did not employ negroes, 55 had formerly employed them but did not do so during the period covered, and 461 were employing them in numbers varying from 5 or fewer in the case of 157 employers to 50 and over in the case of 97. The general reason assigned for not employing them was that they were scarce in the employer's particular neighborhood or not to be found there at all. "In only a few instances, so few as to be practically negligible, does there appear to be any racial prejudice or antagonism." Colored women were practically not found in these industrial employments, but the number of colored men was large. "During this period the railroads report a gross employment of over 1,700; the coal-mining companies, a gross employment of over 3.400; contractors, a gross employment of over 5,400; and general industries, a gross employment of nearly 24,000."

In general the employers stated that the greatest increase in the employment of colored workers had occurred in 1923, being caused by a period of business prosperity coupled with a shortage of white labor, either native or foreign. In 1924 there was a marked falling off, due to industrial depression. In building construction the variations in the employment of colored labor were seasonal, the lowest point being reached in the winter of 1925. The employment of colored labor followed closely the movement of other employment.

Questions as to the dependability and adaptability of colored workers brought varying replies, ranging from the statement that "they require constant supervision to keep them active," to "their dependability compares favorably with that of other groups." No tabulation is given of opinions on this point, but replies quoted, which are said to be typical, give rather a favorable impression of both the dependability and the adaptability of the group. Questions as to their health and their aptitude brought much the same kind

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of answers. Employers for the most part thought either that there was no noticeable difference between the colored and other workers or that the balance inclined slightly in favor of the colored.

Steel Industry

The second study referred to appeared in the March, 1926, issue of Opportunity, the journal of the National Urban League. This survey, made by John T. Clark, deals with the employment of negroes in the steel industry in the vicinity of Pittsburgh, and covers approximately the same period as the more general inquiry made by the department of labor and industry. Negroes have entered this field in large numbers. The ease with which they made their entry here is attributed by the writer to two facts: The cutting off of the almost unlimited stream of immigrants upon which the industry had depended for certain types of workers, and the open-shop character of the steel industry, which had prevented the development of established customs or conventions interfering with the employment of workers of any race, creed, or color.

As in the wider study, so also in the steel industry it was found that the highest point of negro employment occurred in 1923; that there was a falling off in 1924 and a gradual increase in 1925, this movement being due to the general industrial situation rather than to local causes. In 1923 it was reported that 23 steel mills in the Pittsburgh district employed 16,000 colored workers—21 per cent of their entire working force. A period of industrial depression set in at the close of 1923, and by December, 1924, the mills had reduced their output to from 30 to 60 per cent of their normal capacity. At this time a check-up was made to see how the colored workers were faring in the general reduction of forces, and rather unexpectedly it was found that they had been retained more generally than the white workers.

The terse reply of one employer that "we are responsible for output, not color," sums up the general attitude of employers throughout the mills in this district during this period, while depleting their labor forces. In one plant, the A. M. Byers Co., the entire force of negroes was retained, although the plant's output was reduced to 60 per cent by letting out white workmen. The assistant superintendent stated that "they had retained the men upon whom they could rely the most." In the Clark Mills of the Carnegie Steel Co. the percentage of negroes during peak times in 1923 was 42 per cent and at the lowest point in 1924 they were 56 per cent of the total working force.

It is suggested that several causes besides the quality of their work may have contributed to this greater retention of colored workers. It is easier for white men to find other work, and so when the mills began working short time, they would be more likely than colored employees to leave in order to get jobs elsewhere. Again, numbers of the colored workers are single men living in boarding houses and bunks, and these, if laid off, would be likely to leave the district. Therefore to lay them off would mean losing them completely, and when business improved the managers would have the expensive task of building up their colored force again from outside districts. And again, "there are evidences that employers have felt some responsibility toward these newcomers who have not quite had a sufficient opportunity to entrench themselves in the communities."

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In December, 1925, after the industrial revival had begun, another check-up showed nine of the largest mills in the district "averaging 82 per cent output and employing 22 per cent negroes of their total working force of 29,560 men."

It appears that in the larger mills which employ and retain men more on a basis of the workman's actual efficiency than the smaller mills, more negroes in proportion are found at work, which leads us to believe that negro steel workers have "made good," notwithstanding any reports to the contrary.

Another reason for reaching the same conclusion is found in the gradual increase in the number of colored workers in minor supervisory positions.

In 1923 the largest number of straw bosses found in any mill was 35. We found in December, 1925, in one mill employing 1,500 negroes, 53 straw bosses. These men are gang foremen, who determine the personnel of their gangs. These negro leaders of gangs composed largely of negroes eliminate some of the causes for such heavy negro labor turnover, which has been the greatest complaint against negro workmen * * *. Foremen naturally are appearing out from the ranks of straw bosses. In 7 out of the 9 mills investigated, from 2 to 10 negro foremen each were found in complete control of certain processes.

There are admittedly difficulties about the coming in of colored workers. Landlords and business men are inclined to raise prices when they appear, and as these increases are carried over to the whole community the workers already on the spot object to the influx of newcomers. Housing is a serious difficulty. The sections in which negroes may find homes are unsightly and very far from satisfying to the colored workers. "In a steel town of 19,000 inhabitants, employing about 1,400 negroes, only three negroes have bought property during the last five years." The steel companies have talked of building homes for the colored workers, but practically none have done anything for the last seven years, and housing conditions grow worse instead of better. On the other hand, the Ku Klux Klan movement seems in these communities to have died down, and it is to the interest of the mill concerns who find the colored workers practically indispensable to see that no such movement becomes effective. The general conclusion reached is that the negro is in the steel industry to stay and that conditions in the mill communities are being gradually adjusted to his presence.

West Virginia

THE report of the West Virginia Bureau of Negro Welfare and Statistics for the biennium 1923, 1924 presents a wide range of facts concerning the situation and activities of the negro population. Unlike most of the Southern States, West Virginia is gaining instead of losing population through the negro migration, and unlike most of the Northern States, it finds that the newcomers tend to settle in rural districts instead of congregating in the large cities. Data in the possession of the bureau lead to the conclusion that during the two years covered there was a net increase of between 6,000 and 7,000 in the colored population of the State.

The figures as to employment seem to show that the negroes of West Virginia are a body of workers. Of the negro males aged 10 years and over, 83.8 per cent are gainfully employed; among the native whites of native parentage the corresponding figure is 74;

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among the native whites of foreign or mixed parentage it is 72.3, and among the foreign born 93.4 per cent. Foreign-born whites are the only group in West Virginia with a higher percentage gainfully employed than negroes. The prosperity which this indicates is reflected in the situation of the women.

While a higher percentage of negro males are employed in West Virginia than in other States, it is noteworthy that West Virginia has the lowest percentage of negro females employed of any State in the United States. We account for this condition by citing the fact that approximately 75 per cent of the male negroes of this State over 16 years of age are employed in the coal-mining industry, which pays the highest wages of any unskilled occupation in which negroes are engaged in large numbers, which makes it economically possible for negro men to support their women dependents.

The coal-mining industry is the largest employer of negro labor, the bureau's data showing that 22,421 are engaged in it. The manufacturing and mechanical industries employ approximately 5,000, transportation somewhat over 3,000, domestic and personal service 2,834, and trade, public and professional service, and miscellaneous clerical occupations, somewhat over 1,400. The bureau has worked steadily to extend the field of employment for negroes, and has secured their employment in several industries in which they had not previously been employed. The results have been satisfactory, though sometimes a little care was necessary to secure proper adjustments.

In the beginning of negro employment in some industries the turnover was greater than among the old employees of other races, and many of the negroes recently brought in from the South would not work Saturdays or the day following pay day. A process of careful selection of married men or single men over 25 years of age, in some cases with motherless and younger brothers and sisters to support, brought into the industry a group of workers who remain on the same job as long as work lasts, and after a few months most of the new arrivals settle down to punctual, regular, everyday work.

In the coal mines the number of negroes has increased steadily for a period of years. Moreover, they are winning positions which require skill and training. Negro foremen, bosses, and inspectors are becoming more common, and few occupations are closed to the race.

The thousands of negro miners and laborers, hundreds of skilled workmen, and scores filling positions of responsibility in the coal industry are daily demonstrating their fitness for any position in the coal industry from trapper to manager, and the operators are realizing more and more that the negro is a valuable asset in the production of coal.

One fortunate feature of this situation is that the negro penetration of the coal fields has been accomplished without racial friction. The United Mine Workers of America admits negroes to its unions without discrimination of any kind, and while negroes have been concerned in certain strikes, it was as workers, not as negroes. "The strikers are composed of members of both races, and where strike breakers have been used they were men of both races."

The same lack of race antagonism has been apparent throughout the industries of the State. The bureau attributes this partly to the character of the whites and negroes in West Virginia before the migration began, partly to the character of the newcomers and their dispersion throughout the State, so that there is no massing of the

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colored population in one location, and partly to the careful and deliberate effort of the leaders of both races to prevent any developments of the kind.

During the last two years a campaign has been carried on to increase farm ownership among the negro workers. Many who come for mining own farms in other States, to which they return when employment is poor in mining. If, instead, they owned farms in West Virginia they would be spared the expense of the trip, they would be at hand when needed, and they would be adding to the taxable values and the food supply of the State. One difficulty is that small holdings of cultivated land are not available to any extent, and usually when a negro buys land he must take an undeveloped plot, clear it, make it ready for cultivation, build the house and outbuildings, and generally do pioneer work. Nevertheless, progress has been made.

This bureau during the past two years has been directly responsible for 82 negroes buying farm tracts in this State of from 10 to 135 acres, and 17 of the purchasers are working their farms themselves or have relatives working them. Others will go to their farms when they have paid in full for them, and still others are earning money at the coal mines to erect homes, equip and stock their farms before beginning farm operations.

Home ownership is handicapped by the difficulty of financing building projects. It is a slow business to save enough to pay for a house outright, and the negro worker usually finds it difficult to borrow. To meet this situation the organization of building and loan associations is encouraged, and thrift campaigns have been promoted. Two building and loan associations, owned by negroes, have already been organized and are doing so well that two more are being planned.

A campaign is under way to wipe out illiteracy. According to the census of 1920, the percentage of illiteracy among all negroes in West Virginia aged 10 years and over was 15.3. The percentage varied according to age and place of residence; among the urban population it was 10.8, and among the rural negroes it was 17; among those aged 10 to 14 it was only 2.2 per cent, but rose to 59.7 per cent among those aged 65 and over. It is evident from these figures that illiteracy is found mainly among those who, either through age or remoteness from educational facilities, have no opportunity to learn. To meet this situation, night schools have been established in the counties having large numbers of negroes. In 1924 there were 43 such schools, with an enrollment of 953.

If proper night-school facilities are provided, it will be only a few years before there will be practically no negro illiterates in the State under 55 years of age, except those constantly coming here from the South, and they will remain here but a short time before they catch the fever to learn.

As to day schools, it is pointed out that there is much need of better buildings and equipment, that many schools are greatly overcrowded, that sanitary arrangements are too often of the poorest and most objectionable kind, and that the teachers are poorly paid. On the other hand, salaries are better than they were in the past, new schools are being added to those already existing; since 1922 the number of first-class high schools has been increased from six to nine, and over 7 per cent of the colored pupils of the State are found in high schools.

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Throughout the report emphasis is laid on the fact that negroes can understand and work with their own race better than whites can. This principle is already recognized to some extent, the State having colored workers in the health department, a colored field agent for the board of children's guardians, and a number of counties and municipalities having colored officials of different grades. The recommendations with which the report closes stress the desirability of extending this practice. The appointment of more negroes as constables, policemen, and prohibition officers is advised. It has been found, wherever tried, that officers of a given race are more successful than others in discovering and preventing crime among the members of that race, and there is every reason to believe that this holds true with the colored people. Negro probation officers to work among colored juvenile delinquents are especially urged. Three counties already have such officers, and the results there are held to be the strongest possible argument for installing them elsewhere. The appointment of more negro physicians and nurses for public health work, and the provision of negro physicians in industries employing large numbers of negroes and contracting for the medical care of their employees is urged.

Railroads and Other Industries

IN THE fall of 1924 a study was made by the United States Department of Labor of the employment of negroes on railroads. The study disclosed that there were 136,065 colored persons in the employ of the railroads. Negro railway employees are usually thought of as being porters, and the study did, indeed, show that some 20,224 negroes (nearly 15 per cent of the total), of whom 23 were colored women, were so engaged. The other occupations showed, however, that the colored workers were by no means confined to porter work:

Officials and superintendents	2
Telegraphers	97
Conductors	33
Engineers	111
Firemen	6,478
Inspectors of way and structures	202
Telegraph and telephone linemen	202
Baggage and freight agents	111
Switchmen and flagmen	2,874
Foremen and overseers	1,195
Boiler washers and engine hostlers	2,377
Brakemen	4,485
Laborers	95,713
Miscellaneous	1,961

Other industries entered by negroes in considerable numbers include the laundry, iron and steel, foundry and machine shop, construction, and coal-mining industries, and domestic service.

An enameling plant at Palmyra, N. J., is owned and operated entirely by negro workers. It has a capital of $125,000 and has been in operation for four years. Twenty-five skilled workers are employed at the plant, which is said to demonstrate "industrial efficiency as well as the stability and adaptability of negro workers."

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Adaptation of Negroes to Northern Industrial Conditions

THE research director of the National Urban League in an article in Industrial Psychology for June, 1926, on "How the negro fits in northern industries," reviews the history and causes of the northward migration of the negro, and gives a brief summary of the good and bad features of the present situation. The migration is fundamentally an economic movement, he considers, and he points out that the same causes produced among the white population of the South even a greater tendency than among the colored to seek new fields. "Actually, their rate of mobility was calculated by the census at 20 per cent, as compared with 16 per cent for the negroes." Other conditions offered strong inducements to the negroes for their mass move to the North, but these were, after all, only secondary motives.

Their entrance into industrial employment could hardly have been brought about but for the shortage of white labor, due first to the war, and later to the restriction of immigration. At first, their unfamiliarity with the conditions of northern industry put them at a disadvantage, but they soon proved themselves sufficiently adaptable to make their way, "and of necessity they are being advanced to fill the gaps in semiskilled and skilled positions created by promotion, retirement, and death." The negro's ability to speak and understand English has been one point to his credit in the large plants, his strength and general docility have added to his acceptability, and the fact that in general he has not been unionized has counted in his favor.

Of the problems precipitated by the arrival of the migrants in large numbers, the article dwells especially upon housing, health, and unions. The difficulties of the housing situation are much the same, whatever the particular locality under consideration. The newcomers are generally crowded into former residence sections, near what have become the business parts of the city. Because of the location, the property is too valuable for the negroes to be able to purchase it to any extent; and because of the probability that the houses will soon have to give way to the encroachments of business, the owners do not care to go to the expense of keeping them in repair, so that the tenants suffer from a double disadvantage. Moreover, any attempt on their part to move into other residence districts meets with keen hostility, and they find themselves with increasing numbers confined to a strictly limited area, with the natural results that rents are raised, lodgers are taken to meet the cost of the higher rents, congestion grows greater, and normal family life is seriously disturbed.

In regard to health, the situation is hopeful. The greater severity of the climate and the change from rural to urban conditions at first told heavily on the newcomers, but they seem to have adapted themselves very quickly to the change. Under the better sanitary regulations of northern cities, with the benefit of hospital treatment which they could not get in the rural South, and with the improved standards of living which they have quickly adopted, the mortality

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of negroes is now actually showing a decrease. The studies of the Metropolitan Life Insurance Co., which has more than a million and a half of negro policyholders, show that between 1911 and 1922 there was a decrease of 22 per cent in the death rate. "In Chicago, while the population increase was 182 per cent between 1910 and 1920, the death rate declined 17 per cent, and in New York 12.5 per cent."

In regard to the unions the situation is dubious. Some unions definitely exclude colored workers, some permit the formation of separate negro locals, some give them a qualified form of membership, and some admit them on precisely the same terms as white workers. Where this last is the case, the negroes seem to take to unionization very readily.

Of the 5,886 negro longshoremen in New York City, about 5,000 are organized. Of the 735 negro carpenters, 400 are members of the United Brotherhood of Carpenters and Joiners. Of the 2,275 semiskilled clothing workers, practically all are members of the International Ladies' Garment Workers' Union. The musicians are 50 per cent organized. The great preponderance of negro jobs is still in lines which are not organized. The porters, laundresses (outside of laundries), and servants have no organization. The negroes listed as painters are not in the painters' union, many of them being merely whitewashers. The tailors are in large part cleaners and pressers. The waiters and elevator tenders (except female) are poorly organized.

In considering the outlook for the future the author points out, as one of the most promising features, that the breaking up of the black belt in the South will, by weakening the fear of negro domination, lessen the violence of prejudice and lead to better relations between the races. "The creation of more than 800 interracial bodies in counties of the South is an evidence of altered sentiment in the section." Moreover it will also mean the breaking up of the plantation system, and should benefit both white and negro tenants by making available large fertile tracts of land for more intensive individual cultivation as small farms.

As other probable developments the author sees an increase in the number of skilled workers among the negro migrants as they gain industrial experience. The housing problem may improve through the tendency of some industries to desert the large cities and to carry their workers with them. The cultural contacts to which the newcomers are daily exposed, when they do not merely live in transplanted southern colonies, have already raised the standard of living and this process is apt to be cumulative. The rapid growth of northern industries demands workers at a rate beyond the capacity of the native-born white population to supply, so that the migration from the South to satisfy this need will probably continue for years to come, to the advantage of both sections.

The realignment of relations with the white population will doubtless be accompanied at first with conflicts more or less severe, as, for example, in the seven or eight riots which developed around the first sudden contacts of South and North, but the ultimate relations, there is warrant for believing, will be both more permanent and more mutually tolerable.

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Vocational Education in Agriculture for Negroes

A VOCATIONAL program in agriculture for negroes is discussed in a report[2] of the United States Federal Board for Vocational Education issued in 1926. Some of the findings in this report are summarized below.

The 1920 census shows that in the 17 Southern States 57 per cent of the employed male negroes are in agricultural work while over 46 per cent of the whites are so occupied; also, that the improved farm land operated by the negro farmers averages 50.2 acres per capita while the average area of such land operated by whites is 119.4 acres. Slightly above 76 per cent of the negro farmers are renters while only a little less than 40 per cent of the whites are in this class.

The negro farmer raises 39 per cent of the cotton produced in the United States, 21 per cent of the sweet potatoes, 10 per cent of the tobacco, 9 per cent of the rice, and 1 per cent of the white potatoes.

There are good opportunities for negro farmers to acquire acreages in various parts of the South, but these agriculturists need managerial training; another drawback is that they have too low a standard of living. In most instances, according to the report, they could provide themselves with improved living conditions at little cost other than their own labor. They are free and careless spenders but frequently are willing to sacrifice necessaries to get things they wish to have.

In recent years the negro migration from the country to the cities has been very considerable—in fact, 200 to 500 per cent greater in the decade from 1910 to 1920 than in any previous decade since the Civil War.

The number of rural elementary schools for negroes is increasing, and these schools offer excellent facilities for vocational departments of agriculture. Few rural negroes avail themselves of the facilities of the village high school or county training school.

The number of all-day agricultural schools has increased from 39 departments in 1917–18 to 264 departments in 1924–25. The enrollments in these schools have increased from 1,025 to 6,374 in the same period.

Other types of schools, as day-unit, evening, and part-time, have shown proportionate increases, although so far the all-day school has dominated the program in point of numbers.

The returns from courses of supervised farm practice by negroes in various Southern States indicate that there are considerable differences in labor incomes. The proportion of those who complete their course ranges from 50 to 92 per cent while the average is 83 per cent. In three of the Southern States—Tennessee, Arkansas, and Oklahoma—more rural negroes than rural whites, on the basis of population, are receiving vocational agricultural instruction. In the remaining Southern States the proportion of negroes to whites receiving such instruction on the basis of population is much lower.

Funds to promote negro education in the South are being contributed by five private agencies. Much of this expenditure is for facilities and equipment for vocational agricultural instruction.

[2] United States. Federal Board for Vocational Education. Bul. No. 111: Vocational education in agriculture for negroes. Washington, 1926.

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Both the United States Bureau of Education and the Federal Board for Vocational Education have certain responsibilities in connection with negro land-grant colleges, the former with reference to the technical agricultural curricula and the latter with regard to the professional teacher-training courses. The agricultural courses of the negro land-grant colleges originally included only one or two essentially high-school subjects taught from textbooks. The present courses are more numerous and are of recognized college grade.

The Southern States have manifested a tendency to provide adequately for agricultural teacher training for negroes. Since 1917 there has been a notable increase in the registration in agricultural college courses of the negro land-grant institutions. This is probably the result of the operation of the Federal vocational education act. The systematic training of vocational teachers of agriculture followed the passage of this law.

Of those trained in agricultural teaching under the Federal vocational education act, 60 per cent were occupied in agricultural work in 1925, 36 per cent being actually engaged as vocational teachers.

In all of the agricultural teacher-training institutions for negroes provision has been made for the trainees to do some practice teaching under supervision, although in several instances such provision is inadequate.

In most of the agricultural teacher-training departments for negroes the physical equipment is inadequate.

The agricultural teacher-training faculties have a higher than average professional training as compared with other teachers in the institution but about one-third need more special training.

In order to improve teachers already in service, itinerant training and conferences are being resorted to in all States with large negro populations, and certain of these States have also provided extensive courses and summer sessions.

Among the many recommendations made in the report are the following:

Continued encouragement should be given to day-school programs and particular attention to the development of the part-time schools and evening schools.

Where it is not possible to establish vocational departments an effort should be made to provide an itinerant teacher for several rural schools. It is suggested that the farm facilities in the locality might be utilized to greater advantage in connection with agricultural schools.

It is important that the agricultural teacher's schedule be so arranged as to facilitate his conduct of different types of agricultural schools or classes. The content of agricultural instruction should include the activities of the farm occupation studied and the ideals governing these activities. Some things which should be specially emphasized in the instruction is the use of improved machinery, modern credit facilities, how to spend money effectively, managerial ability, and how to raise one's standard of living by direct production and one's own labor.

The opportunity for supervised farm practice should be provided for in many instances by agreements with landlords and by carefully worked out programs for supervised practice, including projects and other farm work.

In general follow the suggestions set forth in Federal Board Bulletin No. 112, "Supervised practice in agriculture, including home projects."

The instruction of the agricultural teacher should be organized and presented on the basis of occupational requirements. The instructor

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should also provide, when practicable, definite opportunities for the placement of his students completing their courses.

The courses in agriculture at the negro land-grant colleges as well as the farm practice facilities of these institutions "should be adapted to the purpose of training for productive farming operations."

Agricultural teachers should be encouraged to attend intensive summer school courses which do not cover more than three weeks. Proper provision must be made, however, for the supervision of the farm practice for which such teachers are individually responsible.

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OCCUPATIONAL DISTRIBUTION OF POPULATION

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Occupational Distribution of the Gainfully Employed

THE data given below regarding the occupations of the gainfully employed persons in the United States are taken from the United States census, as summarized in the abstract of the Fourteenth Census published by the United States Bureau of the Census. The latest census covering occupations was for the year 1920. The figures cited relate solely to the continental United States.

Number and Proportion of Persons Gainfully Employed Each Census Year, 1880–1920

TABLE 1 shows for each of the census years from 1880 to 1920 the number and proportion of persons over 10 years of age gainfully employed, by sex. The term "gainful workers" includes all workers, except women doing housework in their own homes, and children working at home merely on general housework, or chores, or at odd times on other work.

TABLE 1.—NUMBER AND PROPORTION OF PERSONS GAINFULLY OCCUPIED, BY SEX, FOR THE UNITED STATES, 1880–1920

Sex and census year	Total population	Population 10 years of age and over	Persons 10 years of age and over engaged in gainful occupations		
			Number	Per cent of total population	Per cent of population 10 years of age and over
Males:					
1880	25,518,820	18,735,980	14,744,942	57.8	78.7
1890 [1]	32,067,880	24,352,659	[2] 19,312,651	60.2	79.3
1900	38,816,448	29,703,440	23,753,836	61.2	80.0
1910	47,332,277	37,027,558	30,091,564	63.6	81.3
1920	53,900,431	42,289,969	33,064,737	61.3	78.2
Females:					
1880	24,636,963	18,025,627	2,647,157	10.7	14.7
1890 [1]	30,554,370	23,060,900	[2] 4,005,532	13.1	17.4
1900	37,178,127	28,246,384	5,319,397	14.3	18.8
1910	44,639,989	34,552,712	8,075,772	18.1	23.4
1920	51,810,189	40,449,346	8,549,511	16.5	21.1
Both sexes:					
1880	50,155,783	36,761,607	17,392,099	34.7	47.3
1890 [1]	62,622,250	47,413,559	[2] 23,318,183	37.2	49.2
1900	75,994,575	57,949,824	29,073,233	38.3	50.2
1910	91,972,266	71,580,270	38,167,336	41.5	53.3
1920	105,710,620	82,739,315	41,614,248	39.4	50.3

[1] Figures for 1890 are exclusive of persons in Indian territory and on Indian reservations, area especially enumerated at that census, but for which occupation statistics are not available.
[2] Corrected figures; for explanation, see Occupation Report for 1900, pp. LXVI-LXXIII.

Distribution by General Divisions of Occupations, 1910 and 1920

TABLE 2 shows the distribution of occupied persons, by sex and general divisions of occupations, for 1910 and 1920, for continental United States. The classification is occupational rather than industrial. The occupations are grouped, however, under nine large

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industry or service units. Since the occupation classification used at the 1920 census differs somewhat from that of the 1910 census, a few occupations are here presented under different general divisions from those under which they were presented in 1910. Such transfers have changed slightly for 1910 the total number of persons in certain general divisions of occupations.

As the Census Office points out, the change in the census date from April 15 in 1910 to January 1 in 1920 doubtless had a pronounced effect on the number of workers returned as pursuing those occupations which are seasonal or largely seasonal. A comparison with the 1910 statistics for the respective agricultural pursuits indicates strongly that, especially in the case of farm laborers, the marked decrease from 1910 to 1920 probably was due in large part to an underenumeration in 1920, because in most sections of the United States agricultural work, especially the work of field laborers, is at or near its lowest ebb in January. In some measure, the decrease in farm laborers is believed to be apparent only and due to an overenumeration in 1910, especially of children engaged in this occupation. The large increase from 1910 to 1920 in the number of laborers and semiskilled operatives in fruit and vegetable canning, etc., probably resulted to a considerable extent from changing the census date to a time nearer the latest harvest season for fruits and vegetables.

The World War brought about drastic and rapid changes in many of our industries. To meet war needs new industries sprang into existence and some existing industries, because not needed to further the war efforts of the Nation, rapidly declined in importance. Along with these industrial changes went corresponding changes in the occupational activities of the people, the number of workers declining rapidly in some occupations and increasing rapidly in others. Large numbers of workers were drawn from the fields to the factories, and from factories producing nonessentials or luxuries to those producing munitions or essentials. The readjustment to a peace-time basis was only partially completed at the date of the census. Hence it is believed that many of the changes from 1910 to 1920 in the number of workers in the respective occupations may properly be ascribed in large part to the changes brought about by the World War.

TABLE 2.—TOTAL PERSONS 10 YEARS OF AGE AND OVER ENGAGED IN GAINFUL OCCUPATIONS DISTRIBUTED BY SEX AND GENERAL DIVISIONS OF OCCUPATIONS, FOR THE UNITED STATES, 1910 AND 1920

Sex and general division of occupations	1910		1920	
	Number	Per cent	Number	Per cent
Males				
All occupations	30,091,564	100.0	33,064,737	100.0
Agriculture, forestry, and animal husbandry	[1] 10,851,581	36.1	9,869,030	29.8
Extraction of minerals	[1] 964,075	3.2	1,087,359	3.3
Manufacturing and mechanical industries	[1] 8,808,161	29.3	10,888,183	32.9
Transportation	[1] 2,530,795	8.4	2,850,528	8.6
Trade	3,146,582	10.5	3,575,187	10.8
Public service (not elsewhere classified)	445,733	1.5	748,666	2.3
Professional service	[1] 959,470	3.2	1,127,391	3.4
Domestic and personal service	[1] 1,241,338	4.1	1,217,968	3.7
Clerical occupations	1,143,829	3.8	1,700,425	5.1

[1] Figures corrected to conform to 1920 classification.

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TABLE 2.—TOTAL PERSONS 10 YEARS OF AGE AND OVER ENGAGED IN GAINFUL OCCUPATIONS DISTRIBUTED BY SEX AND GENERAL DIVISIONS OF OCCUPATIONS, FOR THE UNITED STATES, 1910 AND 1920—Continued

Sex and general division of occupations	1910		1920	
	Number	Per cent	Number	Per cent
Females				
All occupations	8,075,772	100.0	8,549,511	100.0
Agriculture, forestry, and animal husbandry	1,807,501	22.4	1,084,128	12.7
Extraction of minerals	1,094	(2)	2,864	(2)
Manufacturing and mechanical industries	[1] 1,820,570	22.5	1,930,341	22.6
Transportation	[1] 106,625	1.3	213,054	2.5
Trade	468,088	5.8	667,792	7.8
Public service (not elsewhere classified)	13,558	.2	21,794	.3
Professional service	[1] 733,891	9.1	1,016,498	11.9
Domestic and personal service	[1] 2,531,221	31.3	2,186,924	25.6
Clerical occupations	593,224	7.3	1,426,116	16.7
Both sexes				
All occupations	38,167,336	100.0	41,614,248	100.0
Agriculture, forestry, and animal husbandry	[1] 12,659,082	33.2	10,953,158	26.3
Extraction of minerals	[1] 965,169	2.5	1,090,223	2.6
Manufacturing and mechanical industries	[1] 10,628,731	27.8	12,818,524	30.8
Transportation	[1] 2,637,420	6.9	3,063,582	7.4
Trade	3,614,670	9.5	4,242,979	10.2
Public service (not elsewhere classified)	459,291	1.2	770,460	1.9
Professional service	[1] 1,693,361	4.4	2,143,889	5.2
Domestic and personal service	[1] 3,772,559	9.9	3,404,892	8.2
Clerical occupations	1,737,053	4.6	3,126,541	7.5

[1] Figures corrected to conform to 1920 classification.

[2] Less than one-tenth of 1 per cent.

Trend of Occupations in the Population

THE purpose of this analysis is to determine to what extent the occupations of the people of the United States have changed in character over a long period of years; to what extent the so-called skilled trades are increasing or decreasing; and what has been the effect of the great extension of machinery upon the character of the human labor required in the operation of the machinery. The main study can not be carried later than the date of the most recent occupational census, that of 1920, but additional information for some few industries is available from the censuses of manufactures of 1921 and 1923.

The general results of the study seem to show that some of the skilled trades of 1850 either no longer exist or are fast disappearing, due to the changes in the customs and desires of the people, as well as to the introduction of machinery. Others, however, have expanded and new trades have arisen in many cases to take the place of those no longer needed. Also a large part of the machinery used in manufacturing establishments is not entirely automatic and requires operators who, in many cases, are more skilled than were the hand employees whom the machines replaced.

Data from Censuses of Occupations

THE information upon which the main part of this study is based was compiled from the decennial reports of the occupational census of all persons 10 years of age and over in the United States. The purpose has been to assemble all the reasonably comparable

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data available covering significant occupations, both skilled and unskilled, and to present the figures in sufficient detail for further analysis.

The first attempt to classify the people of the United States by occupations was made in 1850. While some occupational data had been accumulated for years as far back as 1820, it had quite generally been thought that not much could be made of statistics of this sort and consequently little effort was made to use them. Growing interest in social and industrial problems, however, brought about the classification of 1850. While some mistakes were made in this first attempt, as is usually the case in pioneer work of any sort, the importance of a reliable occupational census was demonstrated. Unfortunately the occupations of males alone were published in 1850, and apparently no inquiry was made as to the occupations of the female members of the family. The number of male and female wage earners was shown separately, however, in the manufacturing census of 1850. These occupation statistics have since become an important part of each population census and are available for each 10-year period from 1850 to 1920. The occupations of women were reported, as well as those of the men, for 1860 and each succeeding census.

Before entering into any discussion of the material presented, attention must be called to the fact that many of the trades or occupations of the present day are not strictly comparable with the same trade or occupation in 1850. New tools, new methods, different products, all tend to change the trade as well as the number employed in it. For example, the carpenter of the present day uses many tools similar to those which were in use in 1850, but he no longer makes his own window frames, doors, and door sash, etc. These are now almost all made in factories. For the purposes of this study, however, occupations of the same name have been assumed to be comparable. Also, it should be stated that these figures should be accepted only as representative of the general trend of the occupations and not as absolutely accurate measurements of the number of people employed in any occupation. The difficulties of enumeration are greater for occupation statistics than for almost any other statistics gathered by the Census Office, part of this being due to the great complexity of modern industrial establishments and processes. Also it must be remembered that these statistics are taken at 10-year intervals and many changes take place between censuses. The relative importance of occupations is continually changing, and unfortunately the occupations have not received the same treatment in each decennial census report. Different occupational terms and combinations thereof are used, and some occupations, which are shown separately for a few years, have drifted into the "all other" group in other years, rendering comparison impossible. Another thing which should be remembered is that the census for any year is taken as of one day in that year and the same date has not always been used. During the years 1850 to 1900 it was the custom to take the census as of June 1, but in 1910 April 15 was chosen. The date of January 1 was used in 1920. These changes in census dates affect the comparisons to some extent in the more or less seasonal occupations.

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The occupations for which figures are presented below have been arranged under seven industrial groups. Figures are shown for each occupation for each census period for which fairly comparable information is available. It was not possible to include all of the occupations reported by the census, as in many cases they are of no particular significance in any year and also many of them could not be traced on a comparable basis through the various reports. The occupational terms used in the table are mostly general ones designed to cover the material for all years, although they may not be the exact terms used in any census report. Wherever necessary, combinations have been made in order to maintain the comparison from year to year.

While employees in most of the trades have increased in actual numbers from one census period to another, when compared with the changes in population many of them show relative decreases. The population increased from 23,191,876 in 1850 to 105,710,620 in 1920, and it is only by considering the changes in the occupations with relation to this increase in population that the real significance of the changes becomes apparent. The table below shows the number of employees per million of population.

TABLE 1.—NUMBER OF EMPLOYEES PER MILLION OF POPULATION, ENGAGED IN VARIOUS TRADES AND OCCUPATIONS, AS SHOWN BY THE OCCUPATION CENSUS FOR EACH TEN-YEAR PERIOD, 1850 TO 1920

Occupation	Number of workers per million of population in—							
	1850	1860	1870	1880	1890	1900	1910	1920
Agriculture, forestry, and animal husbandry								
Agricultural laborers	------	25,305	74,848	66,271	47,723	57,449	65,047	37,544
Farmers and planters	103,097	79,809	77,320	84,318	83,904	74,606	64,231	57,550
Fishermen and oystermen	486	844	703	825	956	907	742	500
Gardeners, nurserymen, florists, vine growers, etc.	366	697	872	1,117	1,153	1,406	3,015	2,955
Lumbermen, raftsmen, wood choppers, etc.	491	614	651	865	1,582	1,422	1,753	1,826
Stock raisers, drovers, herders, etc.	105	318	396	879	1,124	1,118	1,256	1,271
Extraction of minerals								
Quarry operatives	83	131	352	302	598	455	879	427
Miners, coal and metalliferous	3,338	4,699	3,945	4,670	5,554	6,959	8,758	8,351
Oil and gas well operatives	------	------	99	146	145	237	278	809
Manufacturing and mechanical industries								
Apprentices	80	1,760	451	881	1,310	1,072	1,294	1,364
Bakers	615	604	718	823	956	1,042	974	927
Blacksmiths	[1] 4,308	3,587	3,677	3,444	3,262	2,869	2,533	1,847
Boiler makers	68	105	180	255	339	410	487	701
Brick and stone masons	2,733	2,011	2,327	2,043	2,525	1,962	1,842	1,314
Plasterers		417	612	440	620	465	518	362
Boot and shoe workers	5,644	5,348	4,438	3,870	3,392	2,741	2,836	2,879
Cabinetmakers	1,611	1,131	1,111	1,010	571	469	456	431
Carpenters and joiners	8,509	7,992	8,937	8,400	9,714	7,693	8,884	8,394
Coopers	1,884	1,387	1,084	980	754	490	275	180
Electricians	------	------	------	------	------	667	[2] 1,307	2,014
Engravers	95	88	110	91	132	147	152	142
Glassworks operatives	140	111	247	358	545	658	892	784
Harness and saddle workers	982	814	851	797	691	528	246	189
Iron and steel workers, including blast furnace, rolling-mill, foundry, etc., employees	528	800	1,215	2,284	3,355	3,919	8,052	8,006
Laborers, general	39,229	30,827	26,756	37,069	30,396	30,059	29,872	28,829
Machinists	1,039	1,394	1,420	2,016	2,813	3,508	5,016	7,586
Marble and stone cutters	607	631	670	655	970	717	389	209
Millers and mill workers (grain, flour, and feed)	1,199	1,186	1,078	1,066	839	534	396	468
Painters, glaziers, and varnishers	1,215	1,659	2,208	2,563	3,494	3,632	3,635	3,017
Paper and pulp mill operatives	128	146	323	427	442	478	737	1,012

[1] Includes a few whitesmiths.
[2] Estimated by Bureau of Census in 1920.

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TABLE 1.—NUMBER OF EMPLOYEES PER MILLION OF POPULATION, ENGAGED IN VARIOUS TRADES AND OCCUPATIONS, AS SHOWN BY THE OCCUPATION CENSUS FOR EACH TEN-YEAR PERIOD, 1850 TO 1920—Continued

Occupation	Number of workers per million of population in—							
	1850	1860	1870	1880	1890	1900	1910	1920
Manufacturing and mechanical industries—Con.								
Paper hangers	112	64	65	100	197	287	278	177
Upholsterers		102	149	208	408	406	220	280
Pattern and model makers	63	87	103	116	164	198	256	262
Plumbers, gas and steam fitters	81	191	289	387	899	1,214	1,613	1,956
Potters and pottery workers	179	110	131	144	237	212	277	277
Printers, compositors, pressmen, lithographers, bookbinders, etc	788	944	1,285	1,726	2,260	2,394	2,552	2,339
Roofers and slaters	19	62	71	80	112	118	153	108
Rubber factory operatives	7	15	101	127	257	288	477	1,302
Steam engineers and firemen (stationary)	510	[3]	888	1,588	2,220	2,941	3,722	3,651
Structural-iron workers, building							124	178
Tailors, tailoresses, seamstresses, dressmakers, milliners, etc	[4]	8,045	6,585	8,357	10,884	10,652	10,712	6,662
Tanners, curriers, and tannery workers	646	446	744	595	625	561	591	565
Textile workers [5]	1,925	1,686	4,842	6,015	5,442	7,087	8,162	9,097
Tinsmiths and tinware workers and coppersmiths	582	615	847	920	935	925	848 [6]	1,059
Tobacco and cigar factory operatives	467	681	1,044	1,536	1,773	1,730	1,826	1,706
Wagon and coach makers	673	618	1,101	995	549	[3]	376	182
Wheelwrights	1,323	1,040	543	311	204	178	41	35
Transportation								
Chauffeurs							498	2,697
Draymen, hackmen, teamsters, drivers, etc	1,757	2,468	3,132	3,541	5,854	7,092	4,826	3,975
Conductors, brakemen, and other railroad employees (not clerks)	208	1,163	3,995	4,707	6,080	6,714	11,378	10,914
Locomotive engineers and firemen					1,104	1,409	1,877	1,904
Motormen, conductors, and other street railway employees (not clerks)			132	238	593	920	1,667	1,634
Sailors and deck hands	3,044	2,142	1,470	1,198	888	795	506	519
Professional service								
Architects	26	40	52	67	128	139	181	172
Chemists, assayers, and metallurgists	20	20	20	39	72	116	177	312
Clergymen	1,157	1,194	1,138	1,290	1,401	1,469	1,283	1,204
Photographers and daguerreotypists	40	100	196	199	318	355	346	324
Dentists	126	178	203	246	278	390	435	531
Lawyers, judges, and justices	1,032	1,081	1,057	1,279	1,424	1,506	1,247	1,159
Physicians and surgeons	1,757	1,751	1,618	1,708	1,665	1,737	1,643	1,372
Domestic and personal service								
Barbers, hairdressers, and manicurists	259	354	621	894	1,350	1,725	2,123	2,045
Servants, housekeepers, stewards, stewardesses, etc	[4]	18,696	25,337	21,492	23,111	22,579	20,113	16,285
Clerical occupations								
Clerks, stenographers, typewriters, bookkeepers, accountants, etc	4,369	5,933	1,926	2,999	16,117	20,793	16,569	26,691
Clerks and salesmen and saleswomen in stores			6,139	7,691			13,748	14,565

[3] Reported under another designation.
[4] Not shown, as males only were reported.
[5] Including spinners, weavers, warpers, loom fixers, scourers, bleachers, dyers, knitters, etc., of cotton, wool, worsted, silk, linen, and hosiery.
[6] Includes sheet-metal workers.

Building Trades

The table shows that building trades have undergone a considerable change since 1850. This is not surprising when one stops to think how vastly different the buildings of to-day are from those of 75 years ago. In the early days lumber was the easiest as well as the cheapest material to get with which to build, and as a result most buildings were made of wood. To-day, however, almost all of our large buildings are constructed with brick, concrete, steel, and,

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to some extent, stone, with probably an inside finish of wood. These materials are also growing in favor among home builders, especially in the larger cities. The use of steel for framing has accounted for the new trade of structural-iron worker. This was shown separately for the first time in the census return for 1910 when 124 workers per million of population were reported in this trade. They had increased to 178 per million in 1920.

The bathroom, a luxury enjoyed by few families in 1850, has become almost a necessity. Only 81 plumbers per million of population were employed in 1850, but almost 25 times that relative number were needed in 1920. Electric lights were unknown in 1850, while now practically all of the large buildings and a large proportion of homes are equipped with electricity for lighting. Thus 2,014 electricians per million of population were reported in 1920 as compared with 667 in 1900, the first year for which a separate report was made for them. Most of the other trades, when measured by the change in population, increased rapidly from 1850 to about 1890 or 1900 and then began to fall off, in some cases even more rapidly. Notwithstanding the changes in building construction, however, carpenters and joiners have increased in almost the same proportion as the population during the 70-year period but brick and stone masons, plasterers, and marble and stone cutters have decreased perceptibly when compared with population. Brick and stone masons and plasterers combined numbered 2,733 per million in 1850 as compared with 2,525 masons and 620 plasterers in 1890 but decreased to 1,314 masons and 362 plasterers in 1920. Marble and stone cutters are only about one-fifth as numerous as they were in 1890 and one-third as numerous as in 1850. Stone is now, to a large extent, cut at the quarry by machinery, only the finer work being done by hand. The result of the introduction of these machines was first noticeable in the census returns for 1910. The huge increase in quarry operatives reported for that year, however, would seem to indicate that probably some marble and stone cutters have been included under that head for that year. Painters, glaziers, and varnishers increased steadily from 1,215 per million in 1850 to 3,635 in 1910 but decreased to 3,017 in 1920. Through the period there has been an increase in factory painting and varnishing and most of the glazing is now done at the factory. Commercially upholstered furniture was included among the furnishings of but a few homes in 1850, and most of the families that did indulge in the luxury of wall paper did not incur the expense of a paper hanger. The two trades combined—upholsterers and paper hangers—numbered only 112 employees per million of population in 1850. As the homemade furniture of the early years began to be replaced with the new factory-made upholstered product, the trade of upholsterer became more important. Wall paper also became less and less of a luxury and the custom of employing professional paper hangers became more general. By 1900 more than 400 upholsterers per million of population were employed, and paper hangers had increased to 287 per million. Both trades have declined somewhat since then, there being only 280 upholsterers and 177 paper hangers per million of population in 1920.

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Woodworking Crafts

The principal woodworking shop crafts have decreased amazingly since 1850. Coach and wagon makers, an important trade at that time, have decreased from 673 to 182 factory operatives per million of population in 1920. Wheelwrights have almost faded from the picture. Only 35 per million were employed in 1920 as compared with 1,323 in 1850. Wheels are no longer made by hand as in the early days, machines having replaced this trade almost entirely. The identity of some wheelwrights employed in factories has probably been lost in the group of factory operatives, but this would not materially affect the number shown. The cooper's trade, a very necessary one in 1850, is also fast disappearing. Steel drums, pails, sacks, and other containers have been substituted for the old wooden barrel.

The decrease of cabinetmakers from 1,611 per million of population in 1850 to 431 in 1920 is due more to the change to the factory system of manufacturing than to the introduction of machinery. More desks, tables, chairs, etc., are probably made to-day than ever before, but most of them are now made in the factory. Owing to the occupational classification used for the census, it was impossible to include these factory operatives with the hand cabinetmakers. Thus, the decrease shown in this occupation represents the decrease of hand cabinetmakers and not the decrease in the trade generally.

Metal Trades

In the metal-working trades, machinists have increased to more than seven-fold during the 70 years—1,039 per million of population to 7,586—more than half of this increase occurring in 1910 and 1920, the automobile era. Boiler makers and pattern and model makers also have increased. Blacksmiths, however, have decreased greatly. Back in 1850 the blacksmith was a very important individual in any community. He made all the metal parts of the wagons, except the axle thimble, welded the broken parts of almost any kind of machinery or made new parts, made his own horseshoes and horseshoe nails, and many other things. Now new parts for most machines may be obtained for less than it would cost to have the blacksmith repair the old ones. The automobile and motor truck are crowding the horse-drawn wagons off the roads, literally as well as figuratively, and those that are used are made in factories. There is little left for the blacksmith to do, and as a consequence he is rapidly disappearing even from the rural communities.

The workers in automobile factories were shown separately under "iron and steel industries" in the censuses for 1910 and 1920. While the automobile is made mainly of iron and steel, yet wood, leather, and many other things also enter into its manufacture. For this reason these figures have not been included in this study as they represent only a part of the industry.

Printing Trades

The printing trades have increased slightly less than twofold in the last 75 years. This increase seems at first to be too small when

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we consider the number of newspapers, magazines, and periodicals printed to-day as compared with 1850, but machinery is the answer.

Steam Engineers and Firemen

Stationary steam engineers and firemen have grown from 510 per million of population in 1850 to 3,651 in 1920. All we need to do is to look around and see the thousand and one uses to which the steam engine is now put in order to understand this increase. Locomotive engineers and firemen were shown separately for the first time in 1890 when 1,104 per million of population were employed. This number had increased to 1,904 in 1920.

Bakers

The increase in bakers is due largely to the substitution of "store" bread for the home-made variety.

Shoe and Leather Workers

The effect of the introduction of machinery into our manufacturing establishments is cleary illustrated in the occupation of boot and shoe workers. The boot and shoe industry has grown by leaps and bounds since 1850, although the number of workers per million of population has decreased steadily. Back in the early days a boot and shoe maker made a pair of shoes completely. He did his own cutting, lasting, sewing, pegging—in other words, actually began and finished the shoes. At the present time practically all shoes are made in the factory. Men operating high-grade machines do the lasting, sewing, etc. In some factories a machine does even the cutting. One man seldom performs more than one operation on a pair of shoes.

The 982 harness and saddle makers per million of population in 1850 had been reduced to 189 factory operatives in 1920. The advent of the automobile and motor truck has, of course, had a great deal to do with this reduction.

Iron and Steel Workers

The tremendous increase in the use of machinery, steel frames for building, steel rails, etc., is reflected to a large extent in the increase of iron and steel workers. Beginning with 528 blast furnace and foundry employees per million of population in 1850, the industry has increased to 8,006 employees per million in blast furnaces, rolling mills, foundries, etc., in 1920.

Textile Workers

Textile workers increased from 1,925 spinners and weavers per million of population in 1850 to 9,097 factory operatives in 1920. Spinning and weaving are still the most important occupations in the textile industry, even though the cloth is made in factories, but the operation of the modern looms and spindles is so different from the old hand processes of 1850 as to make spinning and weaving almost entirely new occupations.

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Teamsters, etc.

There were more than twice as many draymen, hackmen, teamsters, etc., in 1920 per million of population as in 1850, although the relative decrease since 1900 has been tremendous. Here again the effect of the introduction of the automobile and motor truck is apparent. The new occupation of chauffeurs sprang into being to take the place of a large number of teamsters and drivers. This occupation was reported separately for the first time in 1910 and increased from almost 500 per million of population in that year to 2,697 in 1920.

Sailors

Sailors and deck hands have grown fewer with the relative decline in American ships. Our shipping industry was quite important in 1850 and 3,044 sailors per million of population were employed. By 1920 this number had shrunk to only 519 per million.

Professional and Personal Service

Chemists increased more than fifteenfold in relation to population during the 70-year period. There were relatively eight times as many photographers in 1920 as in 1850. The relation between clergymen and population has remained fairly constant, as is also the case with lawyers and judges, but the number of physicians and surgeons was greater in 1850 per million of population than at any time since and was less in 1920 than in any other census year of the period covered. The ever-increasing amount of training necessary for the doctor's profession is largely responsible. Dentists have increased from 126 per million of population in 1850 to 531 in 1920.

Barbers, hairdressers, and manicurists have increased relatively almost sevenfold during the period covered, but domestic servants decreased considerably. During the war large numbers of domestics left their former employers for more congenial employment at better wages, and when the war closed they continued in other lines of employment.

Clerks

It was not possible to separate clerical employees from clerks and salesmen in stores for all years, but wherever possible the separation has been made. Strictly clerical employees increased a great deal more than clerks (sales people) in stores, but both types have increased enormously.

Farm Labor

The changes which have taken place in the occupation of agricultural laborers are better understood when considered in connection with the changes in farmers and planters. The limits of these occupations have not been sufficiently definite in all years to allow for entirely separate consideration. In 1850 no farmer laborers were reported, but it is evident from the large number of farmers and planters shown that no separation was made between the farmer and his helper for that year. Slaves, who performed a large part of the farm labor in the South in 1850 and 1860, were not, of course,

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included. This accounts for the large increase in the farm laboring class in 1870. Farmers and planters and agricultural laborers combined were fewer in 1920, per million of population, than in any other census year. This large decrease, which is more noticeable in the occupation of farm laborers than in that of farmers and planters, was due in part to the fact that many who served in the World War had not returned to their homes in time for the 1920 census, while others never returned to farming; in part to the increased use of farm machinery, and in part to the date of the census enumeration.

Fishermen

Fishermen and oystermen were only a few more per million of population in 1920 than in 1850 and considerably less than in any other year of the period.

Miners

The expansion of the coal and iron industries increased the number of miners employed from 3,338 per million of population in 1850 to 8,351 in 1920, and the increased amount of gasoline used in automobiles and trucks raised the number of employees of oil and gas wells from 99 per million of population in 1870, the first year in which separate returns were made for them, to 809 in 1920.

Data from Censuses of Manufactures

While the occupation census reports from which the above figures were compiled afford the only measure of the proportion of the several occupations in the population, additional data bearing on the subject are available from the census of manufactures which contains, among other things, a report of the average number of wage earners employed in the various industries by the manufacturing establishments of the country. Occupations, however, are not considered. These reports are available by 10-year periods from 1850 to 1899, and by 5-year periods from that time to 1919. The first biennial census was taken in 1921, and figures for 1921 and 1923 are included in the present study.

Before attempting any explanation of the material contained in Table 2, it should be noted that the manufacturing census is a census of factories, with more attention given to product and investment than to producers. These statistics are compiled primarily for the purpose of showing the absolute and relative magnitude of the various branches of industry covered, and their growth and decline. However, in addition, the number of wage earners is reported, and when the various industries are being studied without regard to occupations, these figures are probably preferable to the occupation statistics. In the occupation census, for example, a carpenter is reported under the head of carpenter regardless of where he may be employed, while in the manufacturing census he would be included only as a wage earner under the industry in which he works.

In presenting the following data compiled from the census of manufactures, only four of the principal industries in the United States have been chosen. Three of them are industries having occu-

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pations that are included in the occupation table. In no case, however, are the figures in this table comparable with those in the other, as the method of collecting data is entirely different. The method of enumeration used in the occupation census is the house-to-house canvass, the occupation of each individual being reported regardless of whether or not he is actually employed at the time of the census. Every person 10 years of age or over engaged in productive labor is included in the occupation information. Reports prepared by manufacturing plants are used for the census of manufactures, and only those persons employed in manufacturing plants with annual products of a value of $500 or over are included in the data.

The figures shown in the table below, while not comparable with those for the same industries in the occupation data, serve a distinct purpose and have been included in this article as supplemental or additional information and not with the idea of comparison. In the case of boot and shoe workers, for example, in the occupation table the effort has been made to trace the boot and shoe makers from 1850 to 1920. Census designations have changed in the 70-year period and the shoemaker has given way to the shoe-factory operative. In the manufacturing census the wage earners, while mainly operatives engaged in the manufacture of shoes, include a few general occupations in the plants, as those of carpenter, machinist, engineer, fireman, etc.

In date the enumeration of population does not coincide with the manufacturing census. To illustrate, the population count was made as of June 1, 1900, while the manufacturing census covered the year 1899 and gave the average number of wage earners during that year. These two numbers, however, are used together in computing the proportion per million of population, as in point of time they speak for nearly enough the same date. The population count of 1920 was as of January 1. The estimates of population which the Census Office made for the years 1904, 1914, 1921, and 1923, have been used, however, as the census of population is taken at 10-year periods only.

TABLE 2.—ACTUAL NUMBER OF WAGE EARNERS, AND NUMBER OF WAGE EARNERS PER MILLION OF POPULATION, EMPLOYED IN VARIOUS INDUSTRIES AS SHOWN BY THE CENSUS OF MANUFACTURES, 1850 TO 1923

Industry	1850	1860	1870	1879	1889	1899
Iron and steel						
Blast furnaces:						
Wage earners	20,448	15,927	27,554	[1] 30,000	33,415	39,241
Wage earners per million population	882	507	715	598	531	516
Steel works and rolling mills:						
Wage earners	39,837	49,034	91,651	110,798	137,766	183,249
Wage earners per million population	1,718	1,559	2,376	2,209	2,189	2,411
Textiles						
Cotton goods:						
Wage earners	92,286	122,028	135,369	172,544	218,876	302,861
Wage earners per million population	3,979	3,881	3,511	3,440	3,477	3,985
Woolen goods:						
Wage earners	45,438	50,419	105,071	132,676	154,271	159,108
Wage earners per million population	1,959	1,603	2,725	2,645	2,451	2,094
Silk goods:						
Wage earners	1,723	5,435	6,649	31,337	49,382	65,416
Wage earners per million population	74	173	172	625	784	861
Hosiery and knit goods:						
Wage earners	2,325	10,532	18,846	30,699	59,774	83,691
Wage earners per million population	100	335	489	612	950	1,101

[1] Not reported separately; this number is an estimate.

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TABLE 2.—ACTUAL NUMBER OF WAGE EARNERS, AND NUMBER OF WAGE EARNERS PER MILLION OF POPULATION, EMPLOYED IN VARIOUS INDUSTRIES AS SHOWN BY THE CENSUS OF MANUFACTURES, 1850 TO 1923—Continued

Industry	1850	1860	1870	1879	1889	1899
Boots and shoes [2]						
Boots and shoes (including repairing):						
Wage earners	105,305	123,030	138,662	143,301	----------	----------
Wage earners per million population	4,541	3,913	3,596	2,857	----------	----------
Boots and shoes (not including repairing):						
Wage earners	----------	----------	----------	115,972	142,116	151,231
Wage earners per million population	----------	----------	----------	2,312	2,258	1,990
Motor vehicles [3]						
Wage earners	----------	----------	----------	----------	----------	(4)

Industry	1904	1909	1914	1919	1921	1923
Iron and steel						
Blast furnaces:						
Wage earners	35,078	38,429	29,356	41,660	18,698	36,712
Wage earners per million population	432	418	300	394	173	332
Steel works and rolling mills:						
Wage earners	207,562	240,076	248,716	375,088	235,515	388,201
Wage earners per million population	2,554	2,610	2,540	3,548	2,184	3,508
Textiles						
Cotton goods:						
Wage earners	315,874	378,882	393,404	446,852	425,835	495,197
Wage earners per million population	3,887	4,120	4,017	4,227	3,949	4,475
Woolen goods:						
Wage earners	179,976	202,029	195,285	196,404	190,948	237,454
Wage earners per million population	2,215	2,197	1,994	1,858	1,771	2,146
Silk goods:						
Wage earners	79,601	99,037	108,170	126,782	121,603	125,234
Wage earners per million population	980	1,077	1,105	1,199	1,128	1,132
Hosiery and knit goods:						
Wage earners	104,092	129,275	150,520	172,572	162,078	194,244
Wage earners per million population	1,281	1,406	1,537	1,632	1,503	1,755
Boots and shoes [2]						
Boots and shoes (not including repairing):						
Wage earners	160,294	198,297	206,088	229,705	196,586	240,214
Wage earners per million population	1,972	2,156	2,104	2,173	1,823	2,171
Motor vehicles [3]						
Wage earners	12,049	75,721	127,092	343,115	213,116	404,886
Wage earners per million population	148	823	1,298	3,246	1,976	3,659

[2] Including cut stock and findings.
[3] Including bodies and parts.
[4] No data covering bodies and parts—2,241 wage earners for motor vehicles.

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OLD-AGE PENSIONS AND RELIEF

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State Old-Age Pension Laws

Importance of Problem of Old-Age Dependency

THE problem of caring for the aged poor in the United States is becoming more and more urgent as the country gets farther away from its early conditions. It is not definitely known how large the group of the aged and dependent poor is. The research director of the Pennsylvania Old Age Pensions Commission, in a study recently issued,[1] estimates that there are approximately "1,800,000 dependent aged persons aged 65 years and over in the country to-day," of whom from 5 to 6 per cent are cared for through the medium of pensions received from private employers, thus leaving a body of well over a million and a half who must be cared for in some way by public or private charity. Neither this nor any other estimate for the country as a whole can be more than a rough approximation, for no complete survey has ever been made. Nevertheless, it is evident from the partial information available that the problem of old-age dependency in the United States is one of great proportions.

A number of State commissions have studied this subject and their reports agree in general as to the character of this group. Two reasons are pointed out for the increasing size of the problem: Medical science is increasing the span of life, while at the same time the rapid pace of modern industry is lowering the age at which a man ceases to be a desirable employee, so that the period of unemployability on account of age is increasing. The worker of to-day as compared with his grandfather may count on a longer period of life, but a shorter period of industrial availability. Again, the reports stress the fact that the majority of aged dependents come from the ranks of the lower-paid workers, whose earnings have not been sufficient to support their families and also to make provision for their own old age. They point out that dependency in old age can not be regarded as proof of thriftlessness or individual maladjustment, but that among its leading causes are impaired physical condition and the lack of family connections, that for the great majority of those thus reduced to want the poorhouse is the only refuge, and that this form of care is inadequate, antiquated, and very costly, considering the returns made for the sums expended. As a substitute there is a growing tendency to recommend some form of pension, to be regarded not as charity but rather as an honorable recognition of past services, to be paid under careful supervision, and to be sufficient to enable the recipient to remain among his own friends instead of obliging him to become an inmate of an institution, with all which that implies in the way of loss of self-respect, comfort, personality, and interest in life.

[1] Pennsylvania Old Age Pensions Commission. The Problem of Old-Age Pensions in Industry. Harrisburg, 1926, p. 4.

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Progress of the Movement in the United States

LITTLE attention was paid to this question in the United States until the present century. The first active step in connection therewith seems to have been the appointment of a commission by Massachusetts in 1907 to investigate and report on the subject. No action resulted from that report. In the report of an investigation of the subject eight years later, by another Massachusetts commission, occurs this statement:

> No general system of old-age insurance or pensions has been established by the United States Government or by any of the individual States, although there are in operation special pension systems covering certain classes of public employees such as veterans, retired Army and Navy officers, State employees (in Massachusetts) and certain other municipal employees. * * * No very considerable portion of the population of this country, or of any of the States, is yet covered by any system of old-age insurance or pensions. (Report of a special inquiry relative to aged and dependent persons in Massachusetts, 1915, p. 94.)

A year earlier, however, Arizona had made an attempt to provide such a system. In 1914 an initiative act was passed (Arizona Acts, 1915, Initiative measures, p. 10) abolishing almshouses and establishing old-age and mothers' pensions. The act was so loosely worded that before it could come into effect it was pronounced unconstitutional on the ground of its vagueness, the constitutionality of its pension provisions, if properly expressed, being left undiscussed. Alaska followed suit with a law, passed in 1915, providing a pension of $12.50 a month to those aged 65 and upward who met certain requirements as to residence, need, and character. This law has been amended several times, but is still in operation.

The effects of the war renewed interest in the idea of provision for the aged, and within the last decade a number of State commissions have been appointed and in some cases action has followed their reports. In 1923 Nevada, Montana, and Pennsylvania enacted old-age pension laws. In Ohio in the same year the question of establishing an old-age pension system was submitted to a referendum vote, and was decided adversely by a vote of almost two to one. In 1924 the Pennsylvania law was declared unconstitutional, the decision being based largely on a clause in the constitution which prohibits the legislature from making appropriations for charitable, benevolent, and educational purposes.

The year 1925 saw much activity in regard to old-age pensions, with varying results in different States. In both Nevada and Montana bills were introduced repealing the old-age pension laws, and in Nevada the repeal was accomplished. A number of State commissions brought in favorable reports, and by the middle of the year bills were pending in Michigan, Illinois, Minnesota, Ohio, Maine, New Jersey, and Indiana. In Texas and Kansas, bills were reported favorably, but failed to pass either house of the legislature. In New Jersey and Indiana they passed the lower house but were not acted upon by the upper chamber. In Colorado and Utah, commissions to study the subject were appointed. In Pennsylvania the legislature created a new commission to study the question further, and passed a resolution providing for a constitutional amendment to permit appropriations for old-age pensions. In Nevada a new law

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was enacted, differing in some respects from the former one. Wisconsin passed an old-age pension law, which was signed by the governor, and California passed one, which was vetoed.

The year 1926 showed no diminution of interest in the subject. In January, the Legislature of Washington passed an old-age pension act, but it was vetoed by the governor. Early in the year the Virginia State Commission brought in a report recommending the adoption of an old-age pension system, but the legislature failed to take final action upon it. In Massachusetts a commission on the subject handed in a divided report, the majority strongly recommending a bill establishing a pension not to exceed $1 a day to needy citizens aged 70 or over. The pension committee of the legislature voted to postpone action upon this report for a year. In April the New York Legislature appointed a commission for the purpose of investigating the condition of the aged poor in the State, with a view to devising a State policy, and presenting recommendations for legislation to make the policy effective. As yet, this commission has not reported. The Legislature of Kentucky passed an old-age pension law, which was signed by the governor, and became effective in June, 1926. The close of 1926, therefore, found pension legislation in effect in four States and in Alaska, with the subject on the list of matters to be considered in a number of the legislatures meeting in 1927.

Provisions of Existing Laws

THE Nevada law, as passed in 1925, authorizes the county commissioners to pay pensions to the aged poor when they consider this method desirable. Applicants must be at least 65, and must have been residents of the State for 10 years and citizens of the United States for 15 years. The pension must not exceed an amount which, when added to the applicant's other income from all sources, will bring the total income to $1 a day. Funds are to be raised by a special tax of 2½ mills on each $100 of taxable property in each county.

Under the Montana law, the pensions are strictly county matters. The law contemplates the establishment in each county of an old-age pension board or commission, which may receive applications from persons who are 70 years of age and have been citizens of the United States and residents of the State of Montana for at least 15 years. The amount of benefits may not exceed $25 a month, and may be less than that according to the conditions in each case.

The Wisconsin law (Acts of 1925, ch. 121) also throws upon the county the primary responsibility for pensions, but gives the State a measure of supervision based upon its contribution of one-third of the amount thus paid out. County boards may decide, by a two-thirds vote, to establish a pension system, which, after a trial of a year or more, may be given up if the board so wishes. Applications for pensions must be made to the county judge, who "shall promptly make or cause to be made such investigation as he may deem necessary." If he approves the application, the judge issues to the applicant a pension certificate, stating when payments are to commence and the amount of the installments, which may be paid either monthly or quarterly. Applicants must be at least 70, and must have

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been citizens of the United States and residents of the county in which application is made for 15 years, besides meeting certain requirements as to character and need. The amount of the pension plus the applicant's income from all other sources may not amount to more than a dollar a day. A county establishing the system must appropriate annually enough to meet its demands, and from this the county treasurer must pay out the pensions upon the orders of the judge of the county court. This is to be repaid by the local units which are responsible for the pensioner, each city, town, and village reimbursing the county for all amounts of money paid in old-age pensions to its residents less the amounts received by the county from the State. Each city, town, or village shall annually levy a tax sufficient to meet such charges, which shall be collected as are other taxes and paid into the county treasury.

Each year the county treasurer is to certify to the secretary of state and the State board of control the amount paid out in old-age pensions during the preceding year, and if the board of control approves the report, the State gives the county a credit of one-third of the amount paid in pensions against the State taxes next due from it. To meet this provision, the State appropriates annually an amount not to exceed $200,000. If this is not enough to meet all the credits due the counties, it is to be prorated among them according to the amounts paid out. The State also appropriates annually $5,000 for its administrative expenses in connection with old-age pensions.

The Kentucky law resembles that of Wisconsin in that the county is the unit of administration, and that it is optional with each county to accept or reject the plan. If adopted, the plan is to be administered by the county judge. The maximum pension is $250 a year. The applicant must be aged 70 or over, must have been a citizen of the United States for 15 years and a resident of the county for 10, and must meet certain requirements as to need.

Wisconsin and Montana Laws in Operation

NONE of these laws are of sufficiently long standing for their real effect to have become apparent, and for Nevada and Kentucky no data concerning their operation are as yet available. For Wisconsin and Montana, however, some facts have been made public. The Wisconsin State Board of Control has compiled the data relating to the operation of the Wisconsin law up to June 1, 1926. Five counties had accepted the plan—two in December, 1925, one in January and two in February, 1926. Applications had been received from 301 persons, and of these 261 had been granted. The average pension for the entire group was 79 cents a day, but 104 persons received the maximum amount permissible, $1 a day. Of those receiving pensions, 161 are men and 100 women.

No very recent information is available regarding the working of the Montana law. However, in the summer of 1924, the Massachusetts Commission on Pensions sent questionnaires to the 55 counties in Montana, and replies received showed that 31 counties were then paying pensions.

According to the answers received, 378 persons were in receipt of old-age pensions in the summer of 1924, at a total cost of approximately $6,500 a month.

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Eighty-six of the pensioners, or 22 per cent, received the maximum of $25 a month, the amount of pension being fixed at the discretion of the county commissioners. No almshouses were closed through the application of this law; several counties had none to close. * * *

Of the counties, however, in which pensions were being granted, more than a majority reported that the law was working advantageously, 17 answering in the affirmative and 11 in the negative. (Report on old-age pensions by the Massachusetts Commission on Pensions, November, 1925, p. 216.)

In 1925 the Associated Industries of Montana issued a memorandum on the working of the law in which figures are quoted from reports made by the county auditors showing that in 1923, the year in which the law went into effect, 29 counties paid pensions to 349 pensioners, the amount paid out being $22,869.95, or an average of $65.53 per pensioner. In 1924 the number of counties using the system increased to 36, the total number of pensioners rose to 521, and the amount paid in pensions to $79,058.24, an average of $151.74 per pensioner.

Criticisms of Old-Age Pension Systems Now in Force

THE opponents of old-age pension legislation base their objections upon several grounds. They claim that a noncontributory system, the only kind which has been adopted in this country, saps self-reliance, discourages thrift and energy, and promotes pauperism by relieving it of some of its more unpleasant features. They object because of the expense and because pensions act to weaken the sense of responsibility for their own aged relatives which decent people should feel. They fear a tendency toward increasing reliance upon Government aid rather than on private resources, and they claim that wherever the system has been tried there has been a disposition to make pensions increasingly large, and the conditions of granting them increasingly easy.

The friends of such legislation look with apprehension upon the present situation from entirely different motives. The real purpose of old-age pensions, they say, is to make it possible for those reduced to poverty by age to spend their declining years in self-respecting privacy, free from the anxieties of want and the stigma of pauperism, living independently in their own surroundings instead of being massed together in an institution. The mere substitution of outdoor for indoor relief, although perhaps a step in the right direction, is far from accomplishing this end. At present, they say, the pension is not sufficiently differentiated from poor relief.

The Montana law sets up old-age pension commissions composed of the boards of county commissioners, who are also generally in charge of county poor relief, with no central State supervision whatsoever. That this, in practice, is merely an extension of the principle of outdoor relief, and fails even to remove one of the main objectionable features—the stigma of pauperism—is evident from the fact that the State auditor's report for 1924 shows an average allowance per applicant of $151.74 as against the maximum of $300 allowed under the law. Obviously, these grants are not based on the principle of adequate pensions, and are hardly more than the accustomed poor relief given prior to the enactment of the so-called pension law. * * *

But at least under the Montana law the county commissioners are required to act as old-age pension commissioners. The law is made compulsory. The new Nevada law eliminates even that, and provides for old-age pension boards made up of the county commissioners, who are also the poor relief officials,

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who may authorize this pension if they decide to do so. It is but natural that they should continue to look at this as merely poor relief under a new name. (National Conference of Social Work, Proceedings, 1925, p. 333.)

Notwithstanding these criticisms from both sides, the subject is attracting an increasing amount of attention, and it is certain that in some form or other the provision of pensions for the aged poor will be before a number of State legislatures during the current year.

Industrial Old-Age Pension Plans

IN 1916 the Bureau of Labor Statistics published a survey of industrial old-age pensions then in effect. In 1925 it made another survey of the field, giving the results in the Labor Review for January, 1926. Except when credit is given to other sources, the following article is based on these two investigations.

The industrial old-age pension system is largely a growth of the present century, and especially of the 15 years between 1910 and 1925. Only four or five of the systems now in force were established before 1900. In 1916 the bureau listed 117 plans as then being carried on by private employers; the investigations of 1925 disclosed more than double this number, while a still later survey made by the research director of the Pennsylvania Old Age Pensions Commission puts the number in 1926 at about 370.[2] In addition, a number of employers have informal plans under which pensions are paid to elderly or incapacitated employees in individual cases, although they maintain no general system.

Pension Plans Defined

AN INDUSTRIAL old-age pension plan is a system under which an employer engages to provide for all employees who meet certain requirements as to age, length of service, satisfactory conduct, and the like, an annual pension beginning when the employee reaches a specified age. In a few cases the employee is required to make definitely specified contributions from his salary or wages to a fund from which this pension is to be paid, but this is not common. Among over 200 pension plans concerning which information was received, there were only 13 of these so-called contributory systems. In some cases pensions for disabled or incapacitated employees are included in the system, but this is not an essential feature.

Purposes of Pension Plans

THE most obvious purpose of a pension plan is to make it possible to discharge an aged employee who is becoming inefficient or incapable without subjecting him to the hardships of complete destitution. It is widely recognized that there are large numbers of workers who can not, from their earnings, meet their necessary family expenses and also provide for their own old age. Humanity

[2] Pennsylvania Old Age Pensions Commission. The Problem of Old-Age Pensions in Industry, by Abraham Epstein. Harrisburg, 1926, p. 21.

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forbids turning them adrift when they have become too old for employment elsewhere, and efficient business management forbids retaining them after they have become more or less incapable.

There are various subsidiary purposes. Many employers state that they established the plan to promote good feeling between the workers and the management, and to secure loyal and enthusiastic cooperation in advancing the business. Some mention a reduction of labor turnover as one of the benefits to be gained through establishing a pension system. Frequently the plan is intended to act as a deterrent to labor troubles, and especially to hinder employees from joining in strikes. The contributory plans are sometimes used as a kind of insurance against dishonesty, it being provided that if the employee leaves or is dismissed, any amount which he may owe the employer shall be deducted before his contributions to the pension fund are returned to him. Other purposes may enter in, but in general the humanitarian impulse, the hope of securing more permanent and whole-hearted service, and the desire to reduce labor troubles are the main reasons for initiating pension systems.

Leading Features of Pension Plans

Inclusiveness

GENERALLY pension plans apply to all employees of a company, but where they are designed for only one class they are more apt to be for the wage earners than for the salaried employees. It is not unusual to exclude the executive officers of the company, and sometimes the plan is confined to those who earn less than a specified sum a year.

Methods of Determining Amount of Pensions

The commonest method of determining the benefit is to fix the pension at a certain percentage of the average salary for a specified period, multiplied by the number of years of service. The period over which the salary is averaged is usually 10 years, and while the usual custom is to take for this purpose the 10 years immediately preceding retirement, in a few instances it is specified that the 10 consecutive years of highest salary shall be used. The percentage varies from 1 to 2½. Sometimes the initial percentage is increased in proportion to the length of service. Sometimes the salary is divided and different percentages are used for the different parts, while in other cases all of the salary above a given amount, varying from $4,000 upward, is omitted from the calculation. While this method is common, it is not universal. Some plans provide for the payment of a flat rate or for a certain percentage of the final salary, and other variations may be found in individual cases.

Minimum, Maximum, and Average Pensions

Very commonly, in connection with the method of calculating the amount, the plans set a minimum and a maximum for the pension. In the plans studied by the bureau in 1925 the minima range from $5

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to $50 a month, $20 and $25 a month appearing more frequently than any other amounts, while the maxima range from $25 to $500 a month. Sometimes the maximum is set as a percentage of the average salary for the last 5 or 10 years, or of the salary at time of retirement. These percentages range from 30 up to 100, the latter being found in only one instance.

There does not seem to be any close relation between these limits and the average amount actually received. When the pension is calculated as a percentage of the average salary over a period of years, multiplied by the number of years of service, it is evident that at even the most liberal rate, which in these plans is 2½ per cent, few workers would have salaries sufficient to bring their pensions up to the higher maxima. The United States Steel and Carnegie Pension Fund, which has published very full reports of the working of its pension plan, affords an illustration of this. The maximum pension allowed under this plan is $100 a month, but in 1924 the average pension received was $41.50 a month, and this was the highest average paid since the fund began operation in 1911. Comparatively few companies publish these figures, but data were secured from a number concerning the average pension paid during their latest fiscal year, from which the following table was compiled:

Average pension—	Number of plans
Under $20 a month	3
$20 and under $30	8
$30 and under $40	14
$40 and under $50	19
$50 and under $60	5
$60 and under $75	4
$75 and under $100	2
$100 and over	4

A study of these plans shows that there is much variation in the average pension, even when the same maxima and minima are set. Five of those included had maxima ranging from $200 a month upward, and the average pensions paid during the latest fiscal year were respectively $28, $33, $36, $85, and $110 a month. Six had maxima ranging from $125 to $175, inclusive; the average pensions paid under these were in two cases $40, in one $47, in one $37, in one $55, and in one $57 a month. Four had maxima of $100 a month and paid average pensions of $34, $37, $49, and $60 a month, and two with a maximum of $75 paid average pensions of $40 and $41.

On the whole, these data showed that the average pension tended to approximate the minimum more closely than the maximum limit, but the approach was seldom close in either direction.

Age and Service Requirements

Practically all the plans call for age and service qualifications. The length of service demanded ranges from 10 to 45 years, but both of these limits are exceptional, 20 and 25 years being the periods commonly set. Sometimes a plan sets a service period, with an age requirement, but gives also a longer period with the proviso that the worker may retire after having completed such a term of service, regardless of age. Thus one company, whose plan places the normal age of retirement at 65, after 15 years' service, permits

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retirement at any age after a service of 45 years. More often, a longer period of service is linked with retirement at an early but specified age. Thus, the plan of one company provides that men may retire at 65 after a service of at least 30 years, but at 60 if by that time they have served 40 years.

There is a good deal of elasticity about the age requirements. Generally the plans provide one age at which retirement is expected, the so-called compulsory age, and another at which it is permitted, but neither of these is absolutely fixed. Usually the employers reserve the right to continue the employee in service after the compulsory age is reached, if in their discretion that seems best, and usually retirement at the optional age depends upon the consent or approval of the pension committee, or the directors, or some other official body. In a few plans no age limit is fixed, but the whole matter is left to the discretion of the officials. In a few others, completion of a certain term of service qualifies the employee for a pension, without regard to age. In the majority of plans, however, definite limits are set. Sixty-five and seventy are the ages usually set for compulsory retirement, while the age for optional retirement ranges from 50 upward. Not infrequently the retiring age for women, whether compulsory or optional, is placed at from 5 to 10 years earlier than for men. Usually, however, no similar reduction is made in the required period of service.

Contributory Pension Systems

Contributory systems usually provide that employees shall contribute a certain percentage of their salary, rarely exceeding 3 per cent, to a fund from which pensions are to be paid. If the employee dies before reaching pensionable age, his contribution is usually returned to his dependents with interest. If he resigns or is dismissed before reaching the age limit, his contribution is returned, but the plans differ as to whether or not he receives any interest. As stated before, contributory plans are few. "Of 98 plans adopted since 1920, only 5 have put into effect the compulsory contributory principle," says Epstein.[3]

Miscellaneous Provisions

The commonest of these deal with the employer's liability and the restrictions upon the employee. Generally speaking, the plans expressly disclaim any responsibility upon the employer's part, and assert his entire freedom to operate or annul the system as he may choose. A typical provision runs as follows:

> This pension plan is a voluntary act on the part of the —— Company, and is not to be deemed or construed to be a part of any contract of employment, or as giving any employee any enforceable right against the —— Company. The board of directors of the company reserves the right to alter, amend or annul or cancel the plan or any part of it at any time. The right of the company to discharge any employee at any time shall not be affected by this plan, nor shall such employee have any interest in any pension after such discharge.

It is commonly assumed that a pension, once granted, is to continue during the recipient's lifetime, but often this duration is conditioned

[3] Pennsylvania Old Age Pensions Commission. The Problem of Old-Age Pensions in Industry, by Abraham Epstein. Harrisburg, 1926, p. 46.

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upon the employee's observance of certain restrictions. Thus the pensioner's right to take up any business after his retirement is often discussed. Sometimes this is authorized, provided the business entered upon is not prejudicial to the interests of the pensioning company. Sometimes the pensioner is permitted to engage in business, provided it is not of the same nature as his former employer's, and sometimes he is warned that entering upon any business of any kind may, "in the discretion of the company, be deemed sufficient cause to terminate such pension allowance." Very commonly it is stipulated that the pensioner must secure the consent of the pensioning company before he may undertake any business activity.

The suspension or termination of a pension is another matter on which there is considerable diversity. One of the commonest provisions is that the pension may not be assigned, and that any attempt to evade this prohibition will be considered grounds for its annulment. Another provision, almost equally common, is that the pension may be revoked in case of gross misconduct on the part of the recipient, the employer being the judge of what constitutes such misconduct. Bankruptcy of the pensioner, conviction of any felony or misdemeanor, or the entry of any judgment or decree or order of any court of law or equity are also rather commonly given as grounds for suspending or revoking the pension. Sometimes it is provided that the pension shall be forfeited if the pensioner engages in conduct inimical to the interests of the company, and sometimes the whole matter is left to the discretion of the administering body, which is given wide powers. For example, one plan states that pension payments "may be suspended or terminated at any time by the directors, if in their judgment the conduct of the pensioner may seem unworthy of this bounty," and another provides that a pension "may be refused, suspended, or terminated at the discretion of the executive committee for such reasons as it may deem sufficient, and its judgment in that regard shall be conclusive."

Objections to Pension Plans

FROM the employer's standpoint, one of the most serious objections to a pension system is its cost, a feature which is seldom fully realized at the time a plan is inaugurated. The number added to the pension roll each year bears some relation to the size of the force at the time when the length of service period began to run. If a system is started in 1920, with a service period of 30 years, those who are pensionable the first year will be the survivors of the force in 1890, in 1925 they will be those remaining from the force of 1895, and so on. Within the last few decades there has been a tremendous increase in industrial activity with a corresponding expansion of the pay rolls of many industries, which in turn means a greatly increased basis for pensions. Also, wages have risen, and since pension allowances are frequently calculated as a percentage of the average wages for the last 10 years of service multiplied by the total years of service, the pensions which are now becoming due are apt to be much larger than those paid when the systems were first inaugurated. Again, those who are once on the pension roll usually stay there until they die, and since few if any systems have reached

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a point where the annual removals by death equal the annual additions to the pension roll, the cumulative cost of the system increases rapidly. For all these reasons the costs mount at a rate which makes the maintenance of a system a very serious burden.

One company, whose plan calls for a service qualification of 25 years, and a pension of 1 per cent of the average earnings of the final 10 years multiplied by the number of years of service, presented figures covering the first 12 years during which the plan was in operation, which show how rapidly the annual payments increased:

	Annual payments		Annual payments
1913	$37,031	1919	$120,780
1914	43,030	1920	113,273
1915	55,267	1921	134,923
1916	83,897	1922	156,323
1917	96,425	1923	173,428
1918	109,911	1924	199,100

It will be seen that not only has the annual cost of the system increased more than fivefold, but that it is steadily rising, with the constant load not yet in sight.

Unsound Financing

The cost, however, is not so serious an objection as the uncertain basis on which many of the plans are established. A pension system involves definite commitments for the future, and if it is adopted without full provision for meeting the coming demands, it is a very unsafe proposition. In many of the plans studied the actuarial basis on which the system should have been established has been ignored. In some cases a considerable reserve fund was set aside at the beginning to meet pension costs; in others, the corporation appropriates year by year what is found to be necessary; in others, an initial reserve fund is supplemented by annual appropriations not to exceed a fixed amount. In general, the reserve funds and annual appropriations appear to have been determined rather arbitrarily, without reference to the age distribution of the employees at the time the plan was established, or any study of the prospective rates of retirement, the rates of withdrawing before becoming pensionable, the death rate both for those in active service and on the pension roll, and other factors which go to determine the future demands on the pension fund.

In some instances employers have recognized the insecure position of their funds, and have taken steps to put their plans on a sound actuarial basis; more often, they have preferred to go on meeting the present difficulties as they rise and shutting their eyes to future possibilities. The danger of the situation is recognized by all who have studied the pension question. Several plans have already been given up, and in one very large system the terms of the plan were changed, the age limit being advanced and the period of service lengthened, on account of the rapid rise in costs. The wording of the plans usually protects the employers against any legal liability to carry on the systems longer than they find convenient, but the failure of a pension plan means severe hardship to those who have worked

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long and faithfully and then find their hopes disappointed when it is too late for them to make other provision.

Objections from the Employees' Standpoint

The workers' objections may be summed up under three heads: First, such plans reduce the mobility of labor, tend to make the worker submit to poor conditions without vigorous resistance, and to tie him to one job, especially as he grows older. The acceptance of a lower wage scale than could be secured by fighting for increases is prominent among the effects to which they object. Second, pension systems may be used to keep the worker from taking part in strikes or other action intended to secure an improvement or prevent a worsening of conditions, and may even be used as a strong lever to force him into strike breaking. Third, even after fulfilling every condition set, the worker has no legal right of any kind to a pension, but receives it purely as a gratuity which may be suspended, reduced, or revoked at the employer's option.

As to the objections grouped under the first head, it will be noted that they are, for the most part, the very purposes frequently cited as grounds for establishing the systems. To lessen labor turnover, to promote loyal and faithful service, and to induce cordial and efficient efforts on the part of the employees to forward the plans of the employer are often given in the outline of pension systems as ends to be obtained by their establishment. Whether or not the noncontributory systems tend to keep down the wage level is perhaps open to argument, but it is a view accepted by many who study the theory of pensions, and the workers themselves hold it strongly.

As to the second point, that pension systems may be used to prevent collective action on the part of labor, the wording of many of the plans confirms the charge. A very common provision is that in order to qualify for the pension a worker must give continuous service, and the definition of "continuous" is such as to bar any one who takes part in a strike. Voluntary withdrawal from the service constitutes a breach of continuity, and if the worker is reinstated he comes in, so far as pensions are concerned, as a new employee, or may forfeit his pensionable status altogether. Some plans put the matter more explicitly. One limits pensions to employees who "have not been engaged in demonstrations detrimental to the company's best interests." Another states that "employees who leave the service of their own volition or under stress of influences inimical to the company, or who are discharged by the company, thereby lose all benefits of the benefit and pension system," while another states flatly that "employees who leave the service under strike orders forfeit all claims to pension benefit." Under such provisions a man who has worked all his days for one company and is on the verge of retiring with a pension may find himself forced to choose between giving up all hope of the pension he has earned or, as he sees it, being false to his fellows and to his own lifelong principles as a union man.

The possibility of being called upon to act as a strike breaker is not so common, but exists under some of the plans. A number contain clauses giving the company power to revoke pensions at their discretion, or in case "the conduct of the pensioner may seem

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unworthy of this bounty," or if "the pensioner displays a decided lack of appreciation of the company's liberality in granting the pension." It is evident that a refusal to come back to the service, in the event of a strike, might easily be construed as lack of appreciation or unworthy conduct, or as justifying the company in using its discretion to revoke the pension. A few plans distinctly provide that a pensioner must come back whenever called.

Such clauses are by no means universal, however, and at least one company distinctly provides against a retired employee being forced into service against his will, by stipulating that while the company has the right to continue pensioners in service if it wishes, no pensioner "shall be compelled to accept such employment, and if he refuse, it shall in no wise affect his rights to a pension."

Naturally enough, the plans which provide for recalling pensioned employees to the service are found mainly in industries in which labor troubles have played a considerable part, and in which the existence of a body of potential strike breakers may be of value to the employers. Organized labor cites cases in which employers have exercised this right, and superannuated workers have found themselves obliged to accept service against their comrades or to forfeit in old age the pensions for which they have qualified by long and faithful service.

The third objection, the worker's lack of any contractual right to a pension, is considered by many to be an almost fatal objection to the system. The worker has no rights whatever in the matter, even when he has fulfilled every condition laid down in the plan. The plans are frequently explicit on this point. The following provision is only a trifle more outspoken than those of numerous other plans:

> This pension system is established voluntarily by the company and may be amended, suspended, or annulled, and any pension granted under the same may be revoked at any time at the pleasure of the company, it being expressly understood that * * * every pension allowance hereunder will be granted only at the discretion of the company and continued only at its pleasure.

Even in the case of a contributory system the courts have ruled that the employees have no right to anything beyond the return of their contributions. The worker's moral right to a pension which he has earned by fulfilling the conditions laid down is generally recognized, but his legal right is nonexistent.

Deferred Annuity Systems

TO AVOID the disadvantages of the pension system as generally conducted and yet to retain its good points, various schemes have been advanced, of which the one most generally approved by financial experts is some form of deferred annuity handled through an insurance company. Such a plan involves the purchase of an annuity for each employee, payments being made for each employee annually and each account being kept separate from all others. The annuity is to be purchased through some well-established insurance company, and its cash-surrender value naturally increases with each year for which payments are made. The employer may bear the whole cost, or the employee may be required to contribute. The plan may be optional or obligatory for the individual employee, he may have a right to the cash-surrender value of the policy at any time,

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or may be unable to realize anything from it until he reaches the age at which the annuity is to begin, or other variations may be introduced.

The outstanding advantages of the plan are that it puts the whole matter on a business basis instead of making it a matter of the employer's liberality; that it is fair to the employees as among themselves, since each receives his own amount, and one who leaves the employment before retirement gets back what he has earned by his period of service instead of having contributed for the benefit of those who remain; that it gives the worker a contractual instead of only a moral right, so that he may plan his future with more assurance; that it can not be used, as the pension system may, for disciplinary purposes; and that since the annuity is written by a strong insurance company, even the employer's failure or withdrawal from business does not affect the worker's surety. From the employer's standpoint it secures the great advantage of a pension system in that it enables him to retire employees who are becoming less efficient without undue hardship to them, while at the same time it enables him to calculate his costs accurately and it involves him in no future obligations. The payments of each year are a completed transaction, and if at any time he should find it necessary to give up the system, each worker would still receive the full benefit of all payments made on his account up to that time. In other words, there is no pension fund which must be maintained unless old employees are to be disappointed in their legitimate expectations, and which may come to grief if the employer fails, dies, or retires. Moreover, it meets the complaint that the pension is really deferred pay, which the man who withdraws before reaching retiring age never gets, since every worker under such a plan gets his own deferred pay, his return being greater or less as his period of service varies.

Against such a system as this it is sometimes urged that, as the years go on, the increasing cash-surrender value of the policy becomes an inducement to the employee to leave his employer's service in order to secure the lump sum at once. One company which has recently adopted the general principle underlying this plan varies its operation in such a way as to eliminate this possibility. For each employee who has been in its service for five years or more, the company purchases annually a bond providing an annuity of $1 a month commencing at the normal retirement age, which is set at 65 for men and 60 for women. These bonds remain the property of the company until the employee either retires or completes 30 years of service, when they are delivered to him. If he continues in the service after 30 years, the company continues to buy an annual bond on his account, which is delivered to him on purchase. The employee can not at any time get a cash-surrender value on these bonds, and if he leaves the service before he has either reached the retiring age, or completed the 30-year period, he receives no benefit whatever from the plan. This modification of the system does not meet the issue of deferred pay, i. e., if the worker leaves before the set period he receives nothing for the time he has served, but it does insure his getting the pension if he remains to the end, regardless of what may befall his employer's business.

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Cost and Conduct of American Almshouses

THE almshouse or poorhouse or poor farm, as it is variously known, has been the long-established method of taking care of aged dependents in the United States. Until comparatively recently, these institutions were accepted more or less as a matter of course. During the past few years, however, discussions of old-age pension and retirement plans have led to more critical examination of the conduct and cost of the almshouse system.

Recently the United States Department of Labor, through the Bureau of Labor Statistics, made a study of poor farms and almshouses in each of the 48 States. Cooperating with the department, various fraternal organizations throughout the country supplemented the scope of the Government investigation. The department found the value and extent of public property used or intended for poor farms and almshouses and the cost of operating these institutions over a period of one year, while the fraternal societies studied the physical and social conditions surrounding almshouse inmates. To put it differently, the Department of Labor covered the financial side, and private agencies cooperating with it and to a certain extent under its direction studied the social and humanitarian side of institutional pauper relief. The report of the department was published as Bulletin 386 of the United States Bureau of Labor Statistics (Cost of American almshouses); the report of the studies of the fraternal societies was issued in 1926 under the title "The American poor farm and its inmates," by Harry C. Evans (published by Loyal Order of Moose (Mooseheart, Ill.), and other fraternal organizations). A summary of the bureau's report is given below:

Cost of American Almshouses

THE report on the cost of American almshouses made by the Department of Labor and published by the Bureau of Labor Statistics in Bulletin 386 presents the results of an investigation made in 1923 and 1924 and covers data for the latest available fiscal year, the fiscal year varying in the several States.

The report covers 2,183 almshouses, or 93 per cent of the public pauper institutions of the country. These 2,183 almshouses have 345,480 acres of land, of which 184,087 acres are cultivated. The value of the land and farm equipment is $48,366,556 and that of the buildings and furnishings $102,118,675, representing a combined investment of $150,485,231.

The average cost of maintaining 85,889 paupers, 28,201 of whom are females, in almshouses was $334.64 each for the year. The average number of acres of institutional land per inmate was 4.02, over half of which was being cultivated. The total property value per inmate was $1,752.09. The income per pauper from the sale of farm products was $33.91. The maintenance cost per inmate varies greatly from State to State; for example, the average cost of maintenance per pauper in Alabama was $187.53 and in Nevada it was $865.10.

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Acreage, Value of Property, Income, and Maintenance

TABLES 1 and 2 show the number of institutions reporting, the average number of inmates, the total acreage and the acreage under cultivation, and the value of land and farm equipment and of buildings and furnishings, by State. Table 1 gives aggregate amounts, while Table 2 shows the average per inmate, giving also separate averages for land, for farm equipment, for buildings, and for furnishings.

TABLE 1.—NUMBER OF ALMSHOUSES, AVERAGE NUMBER OF INMATES, ACREAGE, AND VALUE OF LAND AND FARM EQUIPMENT AND OF BUILDINGS AND FURNISHINGS, BY STATE

State	Number of institutions reporting	Average number of inmates			Land		Value of property		
		Males	Females	Total	Total acreage	Acres in cultivation	Land and farm equipment	Buildings and furnishings	Total
Alabama	55	452	448	900	5,297	2,228	$187,910	$328,315	$516,225
Arizona	7	162	21	183	560	298	95,825	140,270	236,095
Arkansas	28	216	165	381	1,582	935	99,675	296,250	395,925
California	42	4,485	1,325	5,810	3,276	1,636	1,661,541	4,993,304	6,654,845
Colorado	25	702	376	1,078	1,777	711	284,898	521,604	806,502
Connecticut	48	919	452	1,371	4,189	1,480	770,279	2,169,120	2,939,398
Delaware	2	180	55	235	88	43	13,800	600,000	613,800
District of Columbia	1	197	107	304	200	150	100,000	225,000	325,000
Florida	11	155	78	233	623	180	229,420	115,750	345,170
Georgia	58	378	464	842	7,871	3,450	465,341	378,165	843,506
Idaho	10	105	28	133	978	520	88,480	235,450	323,930
Illinois	90	4,095	1,583	5,678	16,738	11,995	2,989,608	11,644,210	14,633,819
Indiana	92	2,177	1,041	3,218	19,242	13,773	2,671,957	3,477,285	6,149,242
Iowa	97	1,945	1,171	3,116	22,261	16,366	4,980,400	4,136,687	9,117,087
Kansas	83	775	316	1,091	14,463	8,487	1,152,573	1,052,490	2,205,063
Kentucky	71	619	417	1,036	8,929	3,502	637,115	736,514	1,373,629
Louisiana	5	17	8	25	215	40	7,200	4,100	11,300
Maine	100	439	262	701	11,010	2,927	513,137	695,765	1,208,902
Maryland	15	687	290	977	2,271	1,437	676,740	2,422,000	3,098,740
Massachusetts	144	3,738	2,321	6,059	12,981	3,683	2,905,634	6,167,938	9,073,572
Michigan	81	3,678	1,544	5,222	12,355	9,194	1,448,581	4,506,598	5,955,179
Minnesota	44	854	177	1,031	5,985	3,973	923,532	1,500,732	2,424,264
Mississippi	27	130	108	238	1,871	550	39,420	59,500	98,920
Missouri	85	1,955	889	2,844	10,287	6,463	1,120,547	4,832,035	5,952,581
Montana	22	247	23	270	2,164	1,216	165,503	353,244	518,747
Nebraska	54	417	163	580	10,393	7,726	1,468,139	679,914	2,148,053
Nevada	8	107	19	126	141	51	15,530	161,000	176,530
New Hampshire	11	719	410	1,129	5,535	1,236	655,618	975,453	1,631,071
New Jersey	30	1,438	669	2,107	3,857	2,209	574,903	3,107,596	3,682,409
New York	61	6,092	3,111	9,203	11,389	6,700	4,101,156	12,220,182	16,321,338
North Carolina	97	830	954	1,784	15,688	4,990	1,218,673	2,095,021	3,313,694
North Dakota	11	110	48	158	3,064	2,059	192,812	264,749	457,561
Ohio	89	4,844	2,303	7,147	22,629	15,752	3,954,114	7,873,906	11,828,020
Oklahoma	31	254	92	346	4,511	2,525	324,265	307,896	632,161
Oregon	17	499	64	563	1,312	647	239,320	394,400	633,720
Pennsylvania	79	7,272	3,401	10,673	17,300	10,390	4,534,102	11,842,731	16,376,833
Rhode Island	20	431	336	767	1,923	384	512,429	2,195,497	2,707,926
South Carolina	27	229	240	469	4,870	2,197	404,798	283,500	688,298
South Dakota	29	138	48	186	6,506	3,992	683,194	358,571	1,041,765
Tennessee	59	799	796	1,595	10,101	4,563	740,157	1,243,312	1,983,469
Texas	54	657	294	951	8,682	4,645	747,929	651,576	1,399,506
Utah	7	181	79	260	460	328	80,061	576,799	656,860
Vermont	38	157	82	239	6,107	2,019	207,286	229,739	437,025
Virginia	91	632	567	1,199	19,330	4,688	998,666	780,163	1,778,829
Washington	24	747	115	862	1,794	1,286	490,485	1,187,343	1,677,828
West Virginia	45	409	284	693	9,688	3,854	596,966	1,011,805	1,608,771
Wisconsin	52	1,389	454	1,843	9,240	6,379	1,323,815	2,040,695	3,364,510
Wyoming	6	30	3	33	3,747	230	73,025	44,500	117,525
Total	2,183	57,688	28,201	85,889	345,480	184,087	48,366,556	102,118,675	150,485,233

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TABLE 2.—AVERAGE ACREAGE OF ALMSHOUSES, ACREAGE IN CULTIVATION, AND VALUE OF LAND AND FARM EQUIPMENT AND OF BUILDINGS AND FURNISHINGS, PER INMATE, BY STATE

State	Number of institutions reporting	Land, per inmate		Value of property, per inmate						
				Land and farm equipment			Buildings and furnishings			Grand total
		Total acreage	Acres in cultivation	Land	Farm equipment	Total	Buildings	Furnishings	Total	
Alabama	55	5.88	2.47	$187.34	$21.44	$208.78	$331.83	$32.96	$364.79	$573.57
Arizona	7	3.06	1.62	475.41	48.22	523.63	680.71	85.79	766.50	1,290.13
Arkansas	28	4.15	2.45	220.93	40.68	261.61	706.43	71.13	777.56	1,039.17
California	42	.56	.28	221.60	64.38	285.98	750.89	108.55	859.44	1,145.42
Colorado	25	1.65	.66	209.00	55.29	264.29	435.67	48.20	483.87	748.16
Connecticut	48	3.05	1.08	458.42	103.41	561.83	1,474.56	107.59	1,582.15	2,143.98
Delaware	2	.37	.18	56.17	2.55	58.72	2,127.77	425.55	2,553.32	2,612.04
District of Columbia	1	.66	.49	328.95	-------	328.95	657.89	82.24	740.13	1,069.08
Florida	11	2.67	.77	972.19	12.45	984.64	451.93	44.85	496.78	1,481.42
Georgia	58	9.34	4.10	483.50	69.16	552.66	394.51	54.62	449.13	1,001.79
Idaho	10	7.34	3.91	574.74	90.53	665.27	1,539.10	231.20	1,770.30	2,435.57
Illinois	90	2.95	2.11	479.53	47.00	526.53	1,634.69	416.07	2,050.76	2,577.29
Indiana	92	5.98	4.28	736.48	93.84	830.32	1,017.94	62.63	1,080.57	1,910.89
Iowa	97	7.14	5.25	1,332.26	266.07	1,598.33	1,206.60	120.96	1,327.56	2,925.89
Kansas	83	13.25	7.77	984.01	72.42	1,056.43	894.78	69.93	964.71	2,021.14
Kentucky	71	8.61	3.38	583.12	31.85	614.97	646.91	64.01	710.92	1,325.89
Louisiana	5	8.60	1.60	288.00	-------	288.00	132.00	32.00	164.00	452.00
Maine	100	15.70	4.17	549.37	182.64	732.01	846.78	145.75	992.53	1,724.54
Maryland	15	2.32	1.47	633.88	58.79	692.67	2,390.07	88.95	2,479.02	3,171.69
Massachusetts	144	2.14	.61	417.58	61.98	479.56	909.63	108.35	1,017.98	1,497.54
Michigan	81	2.36	1.76	216.28	61.12	277.40	748.79	114.22	863.01	1,140.41
Minnesota	44	5.80	3.85	646.66	249.15	895.81	1,292.43	163.17	1,455.60	2,351.41
Mississippi	27	7.86	2.31	150.29	15.34	165.63	225.00	25.00	250.00	415.63
Missouri	85	3.61	2.27	368.51	25.49	394.00	1,622.06	76.97	1,699.03	2,093.03
Montana	22	8.01	4.50	527.52	85.46	612.98	1,151.11	157.20	1,308.31	1,921.29
Nebraska	54	17.91	13.32	2,387.55	143.72	2,531.27	953.62	218.64	1,172.26	3,703.53
Nevada	8	1.12	.40	95.48	27.78	123.26	1,071.43	206.35	1,277.78	1,401.04
New Hampshire	11	4.90	1.09	415.19	165.52	580.71	774.45	89.55	864.00	1,444.71
New Jersey	30	1.83	1.05	236.92	35.93	272.85	1,348.84	126.05	1,474.89	1,747.74
New York	61	1.23	.73	412.49	33.15	445.64	1,267.74	60.11	1,327.85	1,773.49
North Carolina	97	8.79	2.80	639.38	43.73	683.11	1,137.94	36.40	1,174.34	1,857.45
North Dakota	11	19.39	13.03	1,022.53	197.80	1,220.33	1,423.83	251.79	1,675.62	2,895.95
Ohio	89	3.17	2.20	468.68	84.58	553.26	1,014.93	86.78	1,101.71	1,654.97
Oklahoma	31	13.04	7.30	861.27	75.91	937.18	833.66	56.21	889.87	1,827.05
Oregon	17	2.33	1.15	376.12	48.96	425.08	627.89	72.65	700.54	1,125.62
Pennsylvania	79	1.62	.97	384.23	40.59	424.82	1,011.54	98.06	1,109.60	1,534.42
Rhode Island	20	2.51	.50	609.96	58.13	668.09	2,291.54	570.91	2,862.45	3,530.54
South Carolina	27	10.38	4.68	818.97	44.14	863.11	558.42	46.06	604.48	1,467.59
South Dakota	29	34.98	21.46	3,138.63	534.45	3,673.08	1,769.46	158.34	1,927.80	5,600.88
Tennessee	59	6.33	2.86	426.71	37.34	464.05	665.08	114.43	779.51	1,243.56
Texas	54	9.12	4.88	722.43	64.04	786.47	623.24	61.91	685.15	1,471.62
Utah	7	1.77	1.26	284.42	23.50	307.92	2,047.76	170.70	2,218.46	2,526.38
Vermont	38	25.55	8.45	588.70	278.60	867.30	885.77	75.48	961.25	1,828.55
Virginia	91	16.12	3.90	763.51	69.41	832.92	566.30	84.38	650.68	1,483.60
Washington	24	2.08	1.49	490.89	78.11	569.00	1,177.10	200.32	1,377.43	1,946.43
West Virginia	45	13.98	5.56	775.67	85.75	861.42	1,356.85	103.18	1,460.03	2,321.45
Wisconsin	52	4.92	3.39	588.98	129.32	718.30	973.14	134.13	1,107.27	1,825.57
Wyoming	6	113.55	6.95	1,849.24	363.64	2,212.88	1,242.42	106.06	1,348.48	3,561.36
Total	2,183	4.02	2.14	491.96	71.17	563.13	1,068.22	120.73	1,188.96	1,752.09

Table 3 shows the annual income of the institutions from all sources and the total annual expenditures. Table 4 gives the same data per inmate, and also detailed data as to pay-roll expenditure per inmate.

The income of institutions is divided under three heads: (1) The amount received directly from the tax funds of the political unit operating the almshouse, whether county, township, or municipality.

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This amount is credited to the institution, either as a direct appropriation out of which all expenses must be met, or by means of paying through the local treasury all bills contracted by the superintendent. (2) The amount of money earned by the farm in the sale of surplus produce. Generally, money thus earned is available to the superintendent for the maintenance of the institution, and the amount of money required from the tax fund is decreased that much. In Massachusetts, however, and in many counties in all the States, all money earned by the institution reverts to the local treasury and is reappropriated for almshouse use through official channels. Whenever this custom prevails the amount appropriated is given as the total income of the institution, the portion of that amount earned by the institution also being shown. Hence the net cost to the community is the difference between the amount appropriated and the amount earned. For example, in Massachusetts, $2,723,313 was paid out of tax funds for the support of the various almshouses. The institutions themselves, however, earned $489,513 of that amount, leaving a net cost to the public of $2,233,800. In all such instances the amounts earned but not used directly by the institution have been shown in the proper columns of the table, but are not included in the amount shown under "Net annual income." (3) Income from "other sources" includes money received from paid-for inmates, from rent of part of the land belonging to the poor farm, and in the case of a large number of contract farms the rent of the farm itself, and such other occasional sources of revenue as the institution may have.

The section of Table 4 showing the amount of salaries and wages of employees per inmate requires no explanation except in the case of the large institutions. Employees in these large institutions have been arbitrarily grouped under the simple divisions sufficient for all but a few. Thus the engine-room staff, electricians, etc., in the very large establishments are included under "laborers, etc.," while clerks and other executive employees other than the superintendent are included as administrative officers, under "superintendents, etc."

The item "All other expenditures" under "Annual maintenance cost" is a comprehensive one, including all operating costs exclusive of pay roll. It includes all the food not raised on the farm; clothing; drugs; medical attendance, except for those institutions in which a staff doctor is included among the employees; burial expenses; fuel, lighting; upkeep and repairs for the institution; and all the expenses incidental to the cultivation of the farm.

It has been impossible to secure reliable data on the value of produce raised on the farm and consumed by the inmates and staff. From such material as is dependable $75 is a fair estimate of the value of farm produce consumed per person in a year, assuming a reasonable degree of farm cultivation.

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TABLE 3.—ANNUAL INCOME AND MAINTENANCE COST OF ALMSHOUSES, BY STATE

State	Number of institutions reporting	Annual income from—			Refund	Net annual income	Annual maintenance cost
		Public funds	Sale of farm produce	Other sources			
Alabama	55	$164,022	$2,789	$2,000	-------	$168,812	$168,779
Arizona	7	107,614	574	245	-------	108,433	107,974
Arkansas	28	102,963	8,358	1,480	-------	112,801	112,801
California	42	2,510,064	194,226	134,561	$14,947	2,823,903	2,413,493
Colorado	25	236,216	17,767	8,773	-------	262,757	246,217
Connecticut	48	532,740	51,552	45,580	36,567	593,304	591,152
Delaware	2	77,482	1,639	521	-------	79,641	79,641
District of Columbia	1	84,752	-------	-------	-------	84,752	84,583
Florida	11	72,914	9,800	683	883	82,514	82,085
Georgia	58	214,049	9,101	1,132	630	223,652	218,095
Idaho	10	45,651	5,956	847	-------	52,454	50,856
Illinois	90	1,627,547	197,516	36,000	3,598	1,857,465	1,831,104
Indiana	92	955,577	118,346	20,443	50,080	1,044,285	1,003,858
Iowa	97	771,901	309,345	78,000	13,987	1,145,260	1,114,982
Kansas	83	257,277	61,573	9,836	946	327,739	311,174
Kentucky	71	193,114	19,660	11,625	-------	224,399	224,183
Louisiana	5	5,940	-------	-------	-------	5,940	5,940
Maine	100	253,921	93,447	29,046	5,258	371,155	354,016
Maryland	15	245,902	14,285	4,061	600	263,648	263,291
Massachusetts	144	2,723,313	279,906	209,608	489,513	2,723,313	2,723,388
Michigan	81	1,452,322	92,411	494,810	480	2,039,063	1,935,708
Minnesota	44	371,970	60,531	36,635	15,522	453,615	505,998
Mississippi	27	50,637	250	-------	-------	50,887	50,887
Missouri	85	622,237	49,633	16,337	-------	688,207	681,186
Montana	22	143,699	6,167	4,329	-------	154,196	140,109
Nebraska	54	207,654	60,178	9,752	1,500	276,083	267,788
Nevada	8	104,547	774	4,171	-------	109,492	109,003
New Hamphsire	11	361,490	100,740	28,733	13,597	477,366	470,844
New Jersey	30	759,220	53,438	3,210	24,946	790,922	790,136
New York	61	2,552,690	203,894	108,198	31,747	2,833,035	[1] 2,753,327
North Carolina	97	387,170	33,565	3,070	3,560	420,244	419,674
North Dakota	11	64,093	15,168	11,003	4,500	85,765	82,529
Ohio	89	2,016,850	248,787	118,498	43,752	2,340,383	2,304,548
Oklahoma	31	99,357	6,789	7,397	-------	113,543	111,805
Oregon	17	137,889	4,751	5,672	-------	148,311	147,871
Pennsylvania	79	2,820,177	177,120	193,932	16,257	3,174,971	3,160,488
Rhode Island	20	239,511	45,499	42,046	764	326,292	325,930
South Carolina	27	120,372	15,650	4,550	-------	140,572	138,874
South Dakota	29	78,072	26,062	5,083	-------	109,218	105,390
Tennessee	59	327,225	25,712	6,424	5,174	354,187	352,089
Texas	54	223,067	52,684	36,186	9,547	302,390	293,689
Utah	7	88,358	2,536	11,619	7,200	95,313	93,793
Vermont	38	102,007	46,656	7,450	-------	156,113	152,953
Virginia	91	253,456	36,972	2,909	-------	293,338	291,763
Washington	24	262,655	40,752	5,259	17,613	291,053	290,471
West Virginia	45	179,965	26,057	11,806	-------	217,827	217,807
Wisconsin	52	432,670	81,350	53,332	-------	567,352	535,327
Wyoming	6	20,635	2,600	-------	-------	23,235	22,935
Total	2,183	25,662,954	2,912,566	1,826,851	813,169	29,589,202	[1] 28,740,535

[1] Includes New York City pay roll.

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TABLE 4.—AVERAGE ANNUAL INCOME AND MAINTENANCE COST OF ALMSHOUSES, PER INMATE, BY STATE

State	Annual income, per inmate, from—			Refund	Net annual income	Annual maintenance cost, per inmate					
						Pay roll				All other expenditures	Total
	Public funds	Sale of farm produce	Other sources			Superintendents, etc.	Matrons and nurses	Cooks, domestics, etc.	Laborers, etc.		
Alabama	$182.25	$3.10	$2.22	------	$187.57	$65.64	$4.99	$6.44	$7.09	$103.37	$187.53
Arizona	588.06	3.13	1.34	------	592.53	60.44	58.65	33.42	31.15	406.34	590.00
Arkansas	270.24	21.94	3.88	------	296.06	113.12	12.44	10.71	5.67	154.12	296.06
California	432.02	33.43	23.16	$2.57	486.04	17.40	54.93	23.60	21.09	298.38	415.40
Colorado	219.12	16.48	8.14	------	243.74	28.29	18.76	19.87	11.55	149.93	228.40
Connecticut	388.58	37.60	33.25	26.67	432.76	31.08	22.67	16.88	34.76	325.80	431.19
Delaware	329.71	6.97	2.22	------	338.90	17.62	10.83	25.99	-------	284.47	338.91
District of Columbia	278.79	------	------	------	278.79	3.95	28.12	8.88	28.05	209.23	278.23
Florida	312.94	42.06	2.93	3.79	354.14	47.58	37.35	13.19	17.48	236.71	352.31
Georgia	254.22	10.81	1.34	.75	265.62	48.49	7.04	13.79	9.51	180.20	259.03
Idaho	343.24	44.78	6.37	------	394.39	100.41	18.05	18.97	22.97	221.99	382.39
Illinois	286.64	34.79	6.34	.63	327.14	21.81	36.49	9.07	42.49	212.63	322.49
Indiana	296.95	36.78	6.35	15.56	324.52	27.39	11.09	14.48	23.72	235.28	311.96
Iowa	247.72	99.28	25.03	4.49	367.54	44.52	9.99	14.47	24.64	264.21	357.83
Kansas	235.82	56.44	9.02	.87	300.41	69.65	11.45	9.33	15.81	178.98	285.22
Kentucky	186.40	18.98	11.22	------	216.60	63.63	6.98	5.79	10.50	129.50	216.40
Louisiana	237.60	------	------	------	237.60	148.80	------	14.40	-------	74.40	237.60
Maine	362.23	133.31	41.43	7.50	529.47	68.96	19.24	17.06	50.83	348.93	505.02
Maryland	251.69	14.62	4.16	.61	269.86	18.02	26.04	8.11	11.38	205.94	269.49
Massachusetts	449.47	46.20	34.59	80.79	449.47	28.58	55.74	27.11	45.77	292.28	449.48
Michigan	278.12	17.70	94.75	.09	390.48	17.80	6.94	41.87	36.94	267.14	370.69
Minnesota	360.79	58.71	35.53	15.05	439.98	67.76	9.09	16.91	28.13	368.89	490.78
Mississippi	212.76	1.05	------	------	213.81	139.58	------	.50	-------	73.73	213.81
Missouri	218.79	17.45	5.74	------	241.98	39.94	12.98	14.94	21.42	150.24	239.52
Montana	532.22	22.84	16.03	------	571.09	156.85	43.77	22.44	25.76	270.09	518.91
Nebraska	358.02	103.75	16.81	2.59	475.99	78.85	9.07	10.50	34.73	328.55	461.70
Nevada	829.74	6.14	33.10	------	868.98	190.76	108.65	44.90	25.63	495.16	865.10
New Hampshire	320.19	89.23	25.45	12.04	422.83	14.03	17.41	14.61	36.92	334.07	417.04
New Jersey	360.33	25.36	1.53	11.84	375.38	18.87	30.78	19.68	57.87	247.80	375.00
New York	277.38	22.16	11.76	3.45	307.85	[1]16.83	[1]17.28	[1]20.73	[1]28.52	213.25	299.18
North Carolina	217.02	18.81	1.72	2.00	235.55	53.64	7.62	6.40	7.68	159.90	235.24
North Dakota	405.65	96.00	69.64	28.48	542.81	49.62	70.14	17.24	52.00	333.33	522.33
Ohio	282.20	34.81	16.58	6.12	327.47	15.42	26.86	23.14	25.77	231.26	322.45
Oklahoma	287.16	19.62	21.38	------	328.16	66.32	8.93	11.79	12.72	223.38	323.14
Oregon	244.92	8.44	10.07	------	263.43	48.38	19.53	21.77	15.47	157.50	262.65
Pennsylvania	264.23	16.60	18.17	1.52	297.48	11.27	24.30	9.83	24.36	226.37	296.13
Rhode Island	312.27	59.32	54.82	1.00	425.41	32.79	54.05	30.38	21.35	286.37	424.94
South Carolina	256.66	33.37	9.70	------	299.73	48.49	8.07	8.36	20.65	210.54	296.11
South Dakota	419.74	140.12	27.33	------	587.19	145.98	25.22	8.69	35.91	350.81	566.61
Tennessee	205.16	16.12	4.03	3.24	222.07	37.36	16.65	5.21	13.70	147.82	220.74
Texas	234.56	55.40	38.05	10.04	317.97	63.80	12.25	9.86	12.85	210.05	308.81
Utah	339.84	9.75	44.69	27.69	366.59	29.66	26.54	21.54	27.25	255.76	360.75
Vermont	426.81	195.21	31.17	------	653.19	120.26	13.37	6.66	31.15	468.53	639.97
Virginia	211.39	30.84	2.43	------	244.66	32.28	18.76	7.36	27.88	157.05	243.33
Washington	304.70	47.28	6.10	20.43	337.65	46.30	21.81	24.13	28.68	216.05	336.97
West Virginia	259.69	37.60	17.04	------	314.33	81.36	25.17	10.79	24.93	172.04	314.29
Wisconsin	234.76	44.14	28.94	------	307.84	25.79	12.11	19.72	25.36	207.48	290.46
Wyoming	625.29	78.79	-------	------	704.08	190.73	54.55	14.55	10.91	424.26	695.00
Total	298.79	33.91	21.27	9.46	344.51	[1]28.84	[1]24.02	[1]17.18	[1]26.76	234.48	334.64

[1] Exclusive of New York City.

Comparative Cost of Large and Small Institutions

THE report gives detailed comparisons between the cost of operating the larger and more efficiently operated institutions and the smaller and less efficiently managed. Table 5 makes such a comparison between a group of 333 institutions having from 26 to 50 inmates each, and a group of 16 institutions having from 501 to 2,000 inmates each.

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TABLE 5.—COMPARISON OF INVESTMENT AND COST OF MAINTENANCE OF SMALL ALMSHOUSES WITH THAT OF LARGE ALMSHOUSES

Item	Small almshouses (26 to 50 inmates)	Large almshouses (501 to 2,000 inmates)
Number of almshouses	333	16
Number of inmates	11,959	11,959
Value of land and farm equipment	$8,107,961	$3,594,308
Investment per inmate	$678	$301
Value of buildings and furnishings	$13,911,713	$15,043,955
Average per institution	$41,777	$940,247
Average per inmate	$1,163	$1,258
Total investment (land, buildings, and farm and home equipment)	$22,019,674	$18,638,263
Average per inmate	$1,841	$1,559
Number of acres embraced in institutions	58,699	5,597
Number of acres under cultivation	38,134	2,588
Number of acres per inmate	4.9	.47
Number of acres cultivated per inmate	3.2	.22
Employees in service of institutions	1,918	1,168
Ratio of employees to inmates	1 to 6.24	1 to 10.24
Total wages and salaries of employees	$1,145,185	$1,068,887
Annual cost of wages and salaries of employees per inmate	$95.76	$89.38
Annual maintenance cost per inmate	$335.66	$281.72

It will be seen from the table that 333 institutions on 58,699 acres of land, representing a total investment of $22,019,674, cared for 11,959 paupers at $335.66 per capita for the year covered, while 16 other institutions, with 90 per cent less land and $3,381,411 less invested, maintained their inmates at $281.72 per head. Attention is also called to the probable superiority of institutions and equipment averaging approximately a million dollars in value to those averaging a little less than $42,000. Moreover, 333 institutions necessitate 333 superintendents and staffs, and of the 1,918 employees in the first group only about 800 can properly be considered as ministering directly to the inmates. The other 1,118 are farm laborers on the immense acreages, unskilled workers, and domestics in the 333 separate dining rooms and kitchens. For this whole group of 333 almshouses only 135 nurses are reported—one to each 89 paupers—and only 9 of these institutions had staff doctors.

Each of the 16 institutions in the second group has a resident physician, and the number of nurses, orderlies, and other persons directly concerned in caring for the paupers is 566. Although a large percentage of the employees in these 16 institutions are skilled professional men and women, the service cost per inmate is $6.38 less per annum than in the first group in which the labor overhead covers twenty-one times as many almshouses.

Manifestly it is reasonable to assume that the 11,959 indigents who are housed in institutions constructed and equipped to care for them in illness or in health and who are in the care of trained persons are better off than are the 11,959 scattered throughout 333 institutions with 333 different standards of treatment and efficiency in management.

Institutions Without Inmates

ONE hundred and thirty-seven poor-farm properties, comprising 19,968 acres, were reported as having no inmates. Fifty-eight of these are wholly idle, apparently abandoned; 44 are leased to tenant farmers; 12 are maintained as almshouses, with superin-

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tendents and other employees, but having, for the time being at least, no inmates; and 23 are worked by private individuals on a crop-share basis or are let for pasture.

Rent on the leased farms ranges from $60 to $1,500 a year and totals $11,870, averaging $270. The amount returned to public funds from sale of produce, pasturage, hay, etc., is $20,444. The total earnings of the 19,968 acres of land are $32,314, or $1.60 an acre.

However, more than half that amount, $18,831, is paid out again in salaries to superintendents retained in the unused almshouses, for caretakers, repairs, upkeep, insurance, and so on. The expenditure for salaries and wages is $7,347.

The valuation of these 19,968 acres of public land is given as $980,120. With publicly owned equipment amounting to $33,276, the value of these unused poor farms is over a million dollars. The buildings valuation, with $7,646 worth of furnishings, is $280,091. Most of the almshouses are large, ranging from 8 to 30 rooms, unused except for those occupied by tenants and their families.

Aside from the inadequate returns from the farms which are yielding any revenue at all, it must be borne in mind that not only they but the 58 unproductive properties are public land and hence nontaxable. Accordingly, we find an unproductive investment of more than a million and a quarter dollars, in nearly 20,000 acres of tax-free land, which yields less than a dollar an acre to the communities whose property it is.

Self-Supporting Institutions

ASIDE from those farms which are leased to tenants in exchange for the full support of paupers committed to them and which are maintained without actual money cost to the community, 18 almshouses scattered throughout the country were reported as being self-supporting.

These 18 farms embrace 4,208 acres, of which 2,432 are in cultivation. The aggregate value of the land and the publicly owned equipment and stock is $515,509.

The total amount earned by these farms in the sale of farm produce, stock, etc., was $82,014.75, of which $66,694.36 was expended in the maintenance of the institutions. The number of paupers cared for was 115.

One large county farm in Virginia returns a substantial revenue to the county each year after all the expenses of a well-managed institution are met. The Maine State almshouse inspector, commenting on one of the town farms in that State, say that it is "a financial asset to the community," as well as being "one of the few in the State which would meet with public approval."

A county farm in Kentucky is operated in conjunction with a ferry, the concession for which is given the man who runs the farm. The ferry, operated by almshouse inmates, earned $2,000 of the $2,500 which the institution cost for the year reported.

Public Control

IN MOST States the governing body of the county, whether known as county commissioners, trustees, or supervisors, constitutes the controlling responsible factor in almshouse management. In New

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England control is vested in the town, with the overseers of the poor as the immediately responsible officials. California, Michigan, and New York have an elected county official, usually called the county superintendent of the poor, who is the administrative head of public poor relief, including the county almshouse. In Louisiana the police jury is the controlling body, and in Arkansas, Missouri, Oregon, and West Virginia the almshouses are under the jurisdiction of the county courts.

In States which have official bodies in the field of public charity and social work, such as State departments of public welfare, public welfare commissions, State boards of charity, and the like, some degree of centralized control, or at least supervision, obtains. In only one, however, has the State body actual authority over the local management. The Michigan State Welfare Department has power to enforce its recommendations for the improvement of physical conditions in county almshouses, and to administer State laws with regard to poor relief. But in most States the State body merely has the right to inspect local institutions and to recommend changes and improvements.

Operation

TWO different systems of operation of almshouses are found in practically every State. These are (1) direct management by the county officials, or, in States not organized on the county basis, the poor officials, through a hired superintendent or "keeper," and (2) the contract system.

The first prevails in 88 per cent of the institutions. Under it the public officials responsible for the care of paupers and the administration of the poor laws employ a superintendent, on a stated salary, to run the almshouse. This superintendent either has a definite appropriation on which to operate, as is the case in the large institutions, or he charges the needs of the institution to the county or town and the treasurer pays all bills. The produce of the farm belongs to the institution. What is not consumed by the inmates and staff is sold, the proceeds in some cases reverting to the local treasury and in other cases being available to the superintendent for almshouse use. Other employees are hired by the officials, the number depending on the size of the farm, the number of inmates, and the funds available.

The hired manager thus becomes the immediately responsible party. Theoretically he is held accountable by the public, through its selected officials, for the successful, economical, and humane administration of the almshouse. The degree of supervision over him maintained by county and town officials depends, of course, on the interest which those officials take in their local institutions and the conscientiousness with which they discharge their duties.

Under the contract system responsibility is even less definitely fixed. By this scheme the farm and almshouse are leased to an operator for the care of the poor. There are several different ways in which this plan is used. One is on a "full maintenance" contract, under which the lessee operates the farm and takes entire care of the inmates, feeding and clothing them, and furnishing necessary medical attention for a stipulated sum per inmate per month, paid by

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the community. This sum is usually $25, $30, or $35 per month. Produce of the farm is consumed in the institution, and generally the lessee is entitled to the proceeds of the sale of the surplus after almshouse needs are supplied.

More frequently, however, the lessee is paid a much smaller amount, ranging from $7 to $20 and averaging about $12 per month, for the board of each inmate, the county or town furnishing in addition clothing, bedding, fuel, tobacco, medical service, and drugs. Under this arrangement the lessee generally pays a nominal rent for the farm ($75 to $150 a year), furnishes his own farm implements, and is entitled to all produce. This system is quite extensively used throughout the South.

It should be understood that "contract," as here used, refers to contracts leasing public almshouse property. There is, of course, another form of contract for the care of paupers used in many counties and communities which do not maintain almshouses. That is the system by which an individual farmer undertakes for a certain amount of money to board and care for paupers on his own farm and in his own home. This expenditure would have to be included in any complete survey of the entire expense of maintaining paupers. But inasmuch as no capital investment of public money is involved, this form of pauper maintenance, as well as outdoor relief, does not enter into the present study of the subject.

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PHILIPPINE ISLANDS—LABOR CONDITIONS

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Labor Conditions and Relations in the Philippine Islands

ALTHOUGH there have been few comprehensive studies of labor conditions in the Philippine Islands, considerable information on certain phases of this subject is available in various recent official reports, among which the following are of particular interest, and from which (except where otherwise noted) the present article was compiled:

War Department. Annual Reports of the Governor General of the Philippines. Washington. (1925 report mimeographed.)

Philippine Islands. Department of Commerce and Communication. Bureau of Commerce and Industry. Statistical Bulletin, Manila (annual).

Philippine Islands. Bureau of Labor Bulletin (issued irregularly). Manila.

Philippine Islands. Bureau of Labor. Principal activities of Bureau of Labor, 1925. Manila, 1926. (Typewritten.)

Occupations and Earnings

THE total population of the Philippine Islands in 1918, according to the census of that year, was 10,314,310, of whom 6,441,150 were reported as being engaged in some gainful occupation. The occupational distribution was as follows:

TABLE 1.—INDUSTRIAL DISTRIBUTION OF POPULATION OF PHILIPPINE ISLANDS, 1918

Occupation group	Males	Females	Total	Per cent
Agricultural	1,871,197	730,102	2,601,299	40.4
Industrial	168,999	696,699	865,698	13.4
Commercial	252,894	173,653	426,547	6.6
Professional	409,737	275,770	685,507	10.6
Domestic service	518,103	1,335,701	1,853,804	28.8
Unknown	3,666	4,629	8,295	.1
Total	3,224,596	3,216,554	6,441,150	100.0

Wages and Hours of Labor

TABLE 2 shows the average wages in various industrial establishments in the city of Manila in 1925. Table 3 gives the daily hours of labor in 1,154 establishments. The wages are shown in pesos, a peso being equivalent to 50 cents in United States money.

TABLE 2.—AVERAGE WAGES OF LABORERS IN VARIOUS ESTABLISHMENTS IN THE CITY OF MANILA, BY OCCUPATION, 1925

[Peso=50 cents]

Establishment and occupation	1925		Establishment and occupation	1925	
	Per day	Per month		Per day	Per month
Aerated water, brewery and distillery:	*Pesos*	*Pesos*	Automobile repairing and carriage shops:	*Pesos*	*Pesos*
Machinists	3.50	75.00	Mechanics	4.50	165.00
Machine tenders	------	45.00	Blacksmiths	2.50	------
Temperers	------	45.00	Painters	2.00	------
Labelers	------	19.00	Carpenters	3.00	------
Firemen	------	62.00	Carriage makers	2.75	------
Purifiers	------	70.00	Electricians	3.00	------

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TABLE 2.—AVERAGE WAGES OF LABORERS IN VARIOUS ESTABLISHMENTS IN THE CITY OF MANILA, BY OCCUPATION, 1925—Continued

Establishment and occupation	1925	
	Per day	Per month
Automobile repairing and carriage shops—Continued.	*Pesos*	*Pesos*
Vulcamizers	2.30	37.00
Welders		[1] 45.00
Bakeries and confectioneries:		
Bakers	1.50	75.00
Ovenmen	2.20	45.00
Kneaders	.80	32.65
Confectioners	1.50	45.00
Grinders	1.42	
Caramel cutters	1.25	
Packers [2]	.75	
Beds, trunks, furniture and carpentry shops:		
Carpenters	3.00	[3] 35.00
Varnishers	2.90	27.50
Rattan weavers	2.50	
Curvers	3.00	
Sawyers	2.75	
Box makers	1.05	
Bicycles, nickel plating, typewriting, and repairing shops:		
Nickel platers	2.00	
Mechanics	3.16	
Bottle and mirror factory:		
Blowers	2.10	
Amalgamators		60.00
Cutters		[3] 38.00
Building construction and electrical installation:		
Carpenters	2.50	
Masons	2.20	
Tinsmiths	2.10	
Electrical installers	2.00	
Blacksmithing:		
Blacksmiths	2.25	45.00
Hammerers	1.70	
Cigar and cigarette factories:		
Cigar makers	2.00	57.50
Cigarette makers [2]	1.63	
Wrappers	1.50	
Strappers	1.30	57.00
Packers [2]	1.87	55.00
Stem strippers	1.15	56.00
Machinists		105.00
Ring makers [2]	1.25	
Cutters (tobacco)	.82	
Choosers [2]	.70	
Labelers [2]		20.00
Cold storage plants:		
Machinists	3.25	
Chauffeurs	2.22	
Ice cutters	1.75	34.00
Drydocks and stevedoring:		
Machinists	3.37	
Foundrymen	5.30	
Carpenters	3.50	
Boiler makers	3.70	
Blacksmiths	4.37	
Checkers	3.00	
Embroidery shops: [2]		
Embroiderers	1.37	27.00
Ironers	1.50	
Cutters	1.30	37.00
Ribboners	1.25	
Hemstitching	1.10	
Gas works:		
Stockers	2.10	
Gas makers	1.85	
Fitters	2.15	
Hat making and repairing:		
Hat makers	2.00	
Molders	2.10	52.00
Ribboners	1.25	
Hemp pressing:	*Pesos*	*Pesos*
Pressers	2.50	
Classifiers	1.85	50.00
Hemp cleaners	.95	
Balers	1.50	
Jewelry, watch repairing, etc.:		
Silversmiths	1.82	265.00
Watch repairers	1.60	157.00
Engravers	3.50	105.00
Lumber yards and mills:		
Laborers	2.50	57.00
Sawyers	3.20	
Carpenters	3.00	
Machinery and foundry shops:		
Turners	2.80	
Apprentices	.90	
Mechanics	4.00	
Boiler makers	3.25	
Compositors	3.00	
Musical instrument manufacturing and repairing:		
Compositors	2.35	
Carpenters	2.50	
Printing and binding:		
Compositors	3.85	60.00
Minerva operators	2.50	
Bookbinders	3.00	50.00
Linotypists	4.50	
Machinists	4.00	150.00
Engravers		75.00
Printers	4.15	45.00
Folders	1.75	
Pressmen	1.10	
Lithographers	3.15	
Oil factory:		
Machinists	3.17	300.00
Firemen	2.25	
Grinders	1.90	
Copra makers	1.65	
Feeders	1.75	
Painting shops and photo studios:		
Painters	2.70	
Designers	3.50	
Photographers		[1] 26.00
Retouchers		[1] 20.00
Picture and window framing and glassware:		
Frame makers		[3] 32.00
Carpenters	2.10	[3] 40.00
Amalgamators		[3] 40.00
Rope factory:		
Machine tenders	2.00	
Rope binders	1.15	
Railway and tramway transportation:		
Boiler makers	2.60	
Machinists	2.75	
Firemen	2.00	52.00
Electricians	2.35	285.00
Carpenters	3.34	
Riveters	2.75	
Motormen	2.43	
Conductors		87.00
Inspectors		170.00
Ticket sellers		105.00
Sculptures, marbleworks, and engraving:		
Sculptors	3.40	
Engravers	1.95	
Masons	2.10	
Shoes and leather goods:		
Shoemakers	2.50	[1] 13.00
Slipper makers	2.50	[3] 27.00
Harness makers	2.30	[3] 26.00

[1] Per week. [2] Women only. [3] Free food and lodging.

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TABLE 2.—AVERAGE WAGES OF LABORERS IN VARIOUS ESTABLISHMENTS IN THE CITY OF MANILA, BY OCCUPATION, 1925—Continued

Establishment and occupation	1925	
	Per day	Per month
Shoes and leather goods—Con.	*Pesos*	*Pesos*
Trunk makers	2.30	
Braziers	1.30	
Soap factory:		
Confectioners	2.07	[3] 32.00
Molders	1.70	
Tailoring and shirt making:		
Tailors	2.50	90.00
Cutters	2.25	165.00
Sewers	1.62	[3] 28.00
Tannery:		
Cutters		[3] 45.00
Confectioners		[3] 55.00
Telephone and telegraph:		
Automatic switchboard	2.76	
Cable splicers	4.18	
Telephone and telegraph—Con.		
Groundmen	1.58	
Installers	2.25	
Linemen	2.50	
Operators [2]		47.00
Miscellaneous:		
Bag sewers	1.10	
Candle makers	1.75	[3] 30.00
Dairymen		60.00
Plumbers	3.20	74.00
Rice cleaners [2]	.65	
Rubber-stamp makers	2.83	
Tile makers	1.55	
Umbrella makers	1.50	25.00

[2] Women only.

[3] Free food and lodging.

TABLE 3.—HOURS OF LABOR IN VARIOUS INDUSTRIAL ESTABLISHMENTS IN THE CITY OF MANILA, 1925 [1]

Industrial group	Number of establishments	Hours of labor	Number of laborers
Food and kindred products	160	8 - 9	2,517
Textiles and clothing	171	8 - 9	2,909
Metal, mechanical, and electrical	161	8 - 9	4,548
Home construction and furniture making	92	8½- 9	2,458
Leather and allied products	124	9	1,359
Printing and allied industries	62	8 - 9	1,139
Liquors, beverages, and tobacco	51	8 - 9	8,960
Chemical and allied products	73	8 - 9½	1,528
Clay, stone, and glass products	5	9	197
Cars and carriages and allied industries	49	8½-10	8,309
Works of art	19	8½- 9	172
Lumber and wood manufactures	57	9 -10	952
Miscellaneous	130	8 -10	3,255
Total	1,154		38,303

[1] Data cover only establishments inspected by the Bureau of Labor.

Agriculture.—The total number of agricultural laborers in 46 Provinces in 1924 was 1,897,283. The distribution of these workers by sex and average daily wages are shown in Table 4.

TABLE 4.—AGRICULTURAL LABORERS IN 46 PROVINCES OF THE PHILIPPINES, 1924

[Peso = 50 cents]

Class of workers	Number of workers	Average daily wages (pesos)
Adults:		
Males	964,241	0.82
Females	452,340	.49
Minors:		
Males	290,829	.45
Females	189,873	.35
Total	1,897,283	

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According to the 1918 census of the islands, only 12.5 per cent of their area was cultivated land; commercial and noncommercial forests covered 63.5 per cent, and the remaining 24 per cent was grass and open land (18.8 per cent), mangrove swamp (0.9 per cent), and unexplored territory (4.3 per cent).

Embroidery industry.[1]—In 1925 the United States imports of Philippine embroideries amounted to over $4,000,000.

Although the concerns in and around Manila which are engaged in the supervision of the embroidery industry are called factories, in none of them is the embroidering done on the premises, the industry being very largely a household art. Practically all of the embroidery work is done in remote places and by people of the poorest classes. As a part of her training in the public schools every girl pupil studies the art of embroidery from about the third grade through the seventh.

The so-called factories maintain from 5 to 100 employees in the Manila headquarters and from 10 to 100 agents who deal directly with the pieceworkers. The factories distribute the stamped cloth to the embroiderers or their agents and upon the completion and acceptance of the material it is laundered in the factory or on contract and prepared for export.

In many of the newer factories another practice has been inaugurated. Native agents or contractors, called "cabicillas," contract with the factory to embroider large lots of cloth. The cabicillas distribute these lots among subcontractors or direct to the embroiderers. This system is based on credit, the factory crediting the contractors, who in turn credit the subcontractors and embroiderers.

The factories may be classified as follows: Those developed by Manila concerns which sought a market in the United States and those developed because of the desire of American distributors for an independent source of supplies. The first group includes most of the factories making ladies' undergarments and infants' and children's wear, and the second those working almost exclusively on ladies' underwear.

Sixty per cent of the output of one of the largest and oldest factories has been on popular-priced undergarments, but it has continued the manufacture of high-grade embroideries, comparing favorably with the best that Europe can turn out.

Wages for embroidering are paid on a piece-rate basis varying from 0.75 to 1 peso[2] for simple designs, and from 2.50 to 5 pesos for a better grade of work, while special designs are paid for by agreement. Although pieceworkers average from 1.50 to 3.50 pesos per day, in some cases as much as 15 pesos is paid for the embroidery on one piece. Most of the employees at headquarters in Manila work on a salary basis and are engaged in cutting, sewing, trimming, ribboning, ironing, and packing the goods for export. Adults doing the ironing, packing, etc., are paid from 1.50 to 2.50 pesos a day, while boys doing similar work receive from 0.80 to 1 peso. Unskilled sewers, generally girls just learning, receive a daily wage

[1] Data are from the United States Bureau of Foreign and Domestic Commerce Trade Information Bulletin No. 392, 1926, pp. 34–41.
[2] Peso=50 cents.

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of about 0.80 to 1 peso. Cutters are paid about 0.80 to 1 peso, and skilled woman workers receive from 1.50 to 2.50 pesos per day.

Notwithstanding a resumption of the manufacture and export of embroideries from Europe after the war, investigations indicate that Philippine hand embroideries have attained a permanent place in the American market, and it is expected that the industry will be extended and the yearly exports further increased.

Wholesale and Retail Prices

THE average retail prices of various articles of food in city of Manila markets for the years 1921 to 1925, inclusive, are given in Table 5, and index numbers for the various food groups are given in Table 6.

TABLE 5.—AVERAGE RETAIL PRICES OF FOODSTUFFS IN THE MARKETS OF THE CITY OF MANILA, 1921-1925

Article	Unit	1921	1922	1923	1924	1925
Cereals and grains:						
Coffee	Liter	₱0.84	₱0.67	₱0.70	₱0.70	₱0.82
Mongos	do	.17	.15	.14	.13	.11
Rice	Ganta	.37	.37	.40	.43	.44
Fish and other sea products:						
Bañgos	One	.51	.40	.40	.39	.35
Candole	do	.32	.31	.35	.30	.33
Crabs	do	.31	.24	.23	.23	.30
Shrimps	Hundred	2.77	3.61	2.82	2.94	2.74
Fowls:						
Chickens	One	.63	.54	.50	.51	.55
Ducks	do	3.08	3.10	2.46	2.18	2.20
Hens	do	1.48	1.33	1.24	1.19	1.30
Roosters	do	1.36	1.18	1.13	1.11	1.26
Wild ducks	do	1.79	1.69	1.41	1.11	1.32
Fruits:						
Bananas, latundan	Hundred	1.62	1.26	1.13	.96	.92
Coconuts	One	.08	.06	.07	.06	.08
Lemons	Hundred	2.82	5.10	5.46	3.65	1.08
Native oranges	One	.16	.15	.12	.05	.10
Papayas	do	.28	.23	.20	.17	.17
Meat:						
Beef, fresh	Kilo	1.37	1.12	1.18	1.14	1.17
Beef, frozen	do	1.09	.92	.93	.87	.87
Pork	do	1.21	.95	.93	.93	.89
Vegetables:						
Amargoso	One	.09	.06	.07	.06	.06
Beans, native	Atado	.10	.10	.09	.08	.10
Eggplants	Hundred	2.28	1.92	1.89	1.96	2.04
Onions, Bombay	Kilo	.33	.28	.21	.20	.22
Peas	Liter	.39	.33	.26	.17	.36
Peppers, red	Hundred	1.10	1.20	1.43	1.16	1.35
Potatoes	Kilo	.20	.19	.15	.16	.16
Red squash	One	.31	.26	.28	.25	.28
Sweet potatoes	Sack	1.74	1.69	1.80	2.18	4.41
Tomatoes	Hundred	1.78	1.58	1.42	1.10	1.29
White squash	One	.33	.32	.40	.38	.41
Miscellaneous foodstuffs:						
Condensed milk	Can	.51	.45	.38	.38	.37
Eggs—						
Chinese	Hundred	4.90	4.37	3.21	3.30	3.90
Duck	do	6.02	5.44	4.71	4.84	5.81
Native	do	6.86	5.87	5.22	5.22	5.52
Flour	Liter	.10	.08	.07	.06	.04
Sugar—						
Brown	Kilo	.37	.22	.31	.36	.29
Refined	do	.43	.36	.34	.34	.34
Vinegar	Liter	.03	.03	.02	.03	.03
White salt	do	.03	.04	.03	.03	.02

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TABLE 6.—INDEX NUMBERS OF RETAIL PRICES OF FOODSTUFFS, BY YEARS AND GROUPS, 1921–1925

[Average prices in 1913=100]

Year	Cereals and grains	Fish and other sea products	Fowls	Fruits	Meat	Vegetables	Miscellaneous foodstuffs
1921	257.84	305.06	195.47	312.52	187.63	229.33	193.44
1922	234.06	271.07	182.41	327.89	153.16	209.00	171.09
1923	233.96	258.37	158.12	312.63	153.42	197.68	151.62
1924	221.93	214.63	145.24	271.99	150.64	159.28	152.36
1925	239.04	207.04	158.61	129.82	150.64	221.02	170.75

Average wholesale prices and index numbers of wholesale prices of important staple products from 1921 to 1925 are shown in Table 7:

TABLE 7.—AVERAGE WHOLESALE PRICES OF STAPLE PRODUCTS AND INDEX NUMBERS THEREOF, 1921–1925[1]

Year	Rice (per cavan)	Manila hemp (per picul)	Sugar (per picul)	Coconut oil (per kilo)	Copra (per picul)	Tobacco (per quintal)	Maguey (per picul)
1913	₱5.34	₱16.02	₱4.79	₱0.28	₱14.31	₱15.90	₱9.13
1921	7.56	22.58	6.89	.311	9.65	15.92	7.10
1922	7.69	21.51	6.17	.285	9.66	11.21	7.61
1923	8.50	24.22	12.13	.327	10.98	13.78	9.22
1924	9.67	27.30	10.38	.3542	11.669	16.24	13.35
1925	9.40	33.90	6.85	.4116	13.208	18.04	16.35
	Index numbers						
1913	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1921	141.6	141.0	144.1	111.1	67.4	100.3	77.8
1922	144.0	134.3	128.8	101.8	67.5	70.5	83.4
1923	159.2	151.2	253.2	114.3	76.7	86.7	101.0
1924	181.0	170.4	216.7	126.5	81.6	102.1	146.3
1925	176.0	211.7	142.9	147.0	92.4	113.5	179.0

[1] These are average prices based on all classes of each staple quoted in the Manila market.

Activities of Philippine Bureau of Labor

THE director of the bureau of labor of the Department of Commerce and Communications of the Philippine Islands has furnished the United States Bureau of Labor Statistics with an account of the functions of his office and an analysis of the work done by it during 1925. The following is a summary of that report:

The work of that bureau, whether prescribed by law or merely understood, is to see to the enforcement of existing laws relating to labor and capital and to promote the enactment of new legislation for the benefit of the workers; to collect and publish statistical data relating to labor; to inspect all workshops and other labor centers and take proper legal steps to insure the protection of the lives and health of the workers; to assist the workers to secure just compensation for their services and the indemnity prescribed by law for injuries resulting from accidents; to bring about the settlement of labor disputes or avert them if possible; to organize free public employment agencies; to promote interisland migration and the distribu-

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tion of the population of the Philippine Islands so as to colonize unoccupied land; and to supervise contracts of laborers for service abroad. Under instructions from the government, or upon the request of the interested parties, the bureau also intervenes in conflicts between agricultural landowners and their tenants, making the necessary investigations and arranging settlements.

In connection with its supervision of contracts with laborers for service abroad, it is the duty of the bureau to prevent the making of contracts with minors under 15 years of age, and with minors of 18 years of age without the consent of their parents or guardians. Attention is given to the clothing supplied to contract laborers, especially if they are going to a climate requiring heavier clothing than is worn in the Philippines, and also to the sanitation of the ships in which these laborers travel. In September, 1925, the director made an investigation of the operation of the contract system and of the living conditions of Filipino contract laborers in Hawaii. A résumé of his report on this subject is published in this Handbook (p. 172).

Since 1913 the island legislature has been allotting funds for the purpose of establishing and maintaining agricultural colonies and the encouragement of interisland migration, in order to make a just and proper redistribution of population, to encourage the possession of small landholdings among the greatest number of people by means of homesteads, and to increase the production of foodstuffs, such as rice, corn, and other cereals. The amount of money made available for this purpose is said to be inadequate, but, according to the director, the systematic propaganda campaign carried on by the bureau of labor to induce people in the densely populated regions to migrate to unoccupied public lands has met with enthusiastic response from the working classes, and large numbers of them have migrated to these lands at their own expense and without seeking the assistance of the bureau. During the five-year period 1921 to 1925 the bureau recruited and shipped to sparsely populated regions 6,846 emigrants, the expense incurred being 92,000 pesos ($46,000).

Factory Inspection

THE factory inspection activities of the Philippine Bureau of Labor for the 5-year period 1921 to 1925 are shown in Table 8:

TABLE 8.—FACTORY INSPECTION WORK OF THE PHILIPPINE BUREAU OF LABOR, 1921–1925

Year	Factories and industries		Mercantile		Plantations or haciendas		Total	
	Number	Workers	Number	Workers	Number	Workers	Number	Workers
1921	4,958	54,429	------	------	1,031	60,966	5,989	115,395
1922	3,874	46,903	1,265	6,755	561	25,000	5,700	78,658
1923	1,073	44,728	201	2,345	47	11,119	1,321	58,192
1924	1,765	65,042	171	2,671	112	5,408	2,048	73,121
1925	2,445	60,418	329	6,067	47	3,396	2,821	69,881
Total	14,115	271,520	1,966	17,838	1,798	105,889	17,879	395,247

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Wage Claims and Complaints

ONE of the most important duties of the bureau of labor is the settlement of complaints of employers and employees. These adjustments entail a large amount of work, as the disputants have to be brought together and the requisite witnesses interviewed.

Table 9 indicates the extent of this activity for a five-year period:

TABLE 9.—ADJUSTMENTS OF WAGE CLAIMS AND COMPLAINTS, 1921–1925

[Peso=50 cents]

Year	Number of claims and complaints	Number of claimants	Adjustments		Amount collected
			Favorable	Unfavorable	
					Pesos
1921	549	719	344	205	24,277.66
1922	582	727	312	270	14,579.72
1923	769	1,652	379	390	21,371.54
1924	688	1,155	431	257	30,339.09
1925	615	1,371	365	250	19,209.63
Total	3,203	5,624	1,831	1,372	109,777.64

Employment Offices

THE work of the four free employment agencies in Manila, Cebu, Iloilo, and Albay for the five-year period 1921–1925 is recorded below:

	Registrations	Placements
1921	3,765	3,028
1922	5,814	4,018
1923	5,809	5,326
1924	4,673	4,246
1925	5,106	4,469
Total	25,167	21,087

Industrial Accidents

INDUSTRIAL accident reports to the bureau of labor are summarized in Table 10 for the years 1921 to 1925, inclusive:

TABLE 10.—INDUSTRIAL ACCIDENTS IN THE PHILIPPINES, 1921–1925

Year	Number of accidents	Number injured				Adjustment		
		Temporarily	Permanently	Fatally	Total	Indemnified	Unindemnified	Amount collected (in pesos)
1921	306	246	17	111	374	250	124	18,284.08
1922	417	383	17	69	469	149	320	9,036.22
1923	343	298	5	86	389	196	193	12,471.46
1924	500	437	31	61	529	214	315	11,404.81
1925	430	390	15	48	453	198	255	11,890.85
Total	1,996	1,754	85	375	2,214	1,007	1,207	63,087.42

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Strikes

THE statistics of strikes in the Philippine Islands from 1921 to 1925 are reported by the bureau of labor as shown in Table 11:

TABLE 11.—INDUSTRIAL DISPUTES, 1921-1925

Year	Strikes and other industrial disputes		Causes of conflict		Adjustment in favor of—	
	Number	Workers involved	Wages	Other than wages	Workers	Employers
1921	35	19,782	22	13	13	22
1922	24	14,955	19	5	9	15
1923	26	8,331	18	8	14	12
1924	20	6,784	13	7	12	8
1925	23	9,936	12	11	19	4
Total	128	59,788	84	44	67	61

Labor Organizations and Unemployment

THE number of labor organizations in the islands is 129. There are also 87 mutual benefit associations. A membership of 44,228 was reported voluntarily by 43 unions in Manila, and 26 unions in the Provinces stated they had a membership of 17,957. No information was received from the other unions. The Philippine director of labor reports for 1925 that "the tendency to unionism and collective bargaining continues."

Although the labor organizations reported approximately 33 per cent unemployed, the director states that "the unemployment problem has not given any cause of great alarm." He points out that the population has been moving cityward, which has temporarily dislocated the labor market and resulted in unemployment. On the other hand, however, certain new industrial undertakings have drawn rather heavily upon the surplus labor supply.

Immigration and Emigration

ONE of the sections of the annual report of the Governor General of the Philippines for the year ending December 31, 1925, makes the following statement regarding the immigration of Asiatics into the Philippine Islands: "Immediately prior to and during the World War some 12,000 Japanese were in the Philippine Islands. Most of them were located about the Gulf of Davao, and engaged in the growing of hemp. Shortly after the close of the war many Japanese left the islands and returned to their own country, and their numbers were eventually reduced to somewhat less than 4,000. Recently Japanese have again commenced to come to the islands * * * and they number now in the neighborhood of 5,000; practically all of them are located near Davao along the shores of the gulf."

Chinese immigration is prohibited by the exclusion act. Nevertheless a considerable number manage to enter the islands each year. When detected they are arrested and deported, but some succeed in returning, usually through the southern islands. Were Chinese permitted to come freely, they would flood

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the islands in a very short time. * * * Although the number of Chinese in the archipelago is not over 65,000, they control upwards of 70 per cent of the retail trade of the islands. They are frugal, industrious, and commercially aggressive, and the Filipinos find successful competition with them very difficult.

Col. Carmi A. Thompson, in his recent report on conditions in the islands,[3] states that "Philippine labor is without sufficient employment and is emigrating to Hawaii, the United States, and other countries."

Cooperative Movement

THE activities of the Philippine rural agricultural credit cooperative societies are of considerable importance, as indicated in the statistics given in Table 12. The data are derived from the Philippine Statistical Bulletin, 1925.

TABLE 12.—SUMMARY OF OPERATIONS OF RURAL AGRICULTURAL CREDIT COOPERATIVE ASSOCIATIONS, 1921–1925

[Peso=50 cents]

Year	Number of associations	Total number of members	Paid-in capital stock	Total resources including loans, interest, and deposits	Loans to members
1921	536	70,444	₱814,128	₱2,393,647	₱2,296,179
1922	544	75,667	848,333	2,523,314	2,424,082
1923	547	77,479	872,668	2,605,043	2,488,836
1924	546	81,791	890,621	2,653,782	2,531,997
1925 [a]	544	83,900	904,500	2,595,800	2,457,600

[a] Estimated.

[3] United States. Congress. Senate. Conditions in the Philippine Islands—Message from the President, transmitting a report by Col. Carmi A. Thompson, Washington, 1926, p. 2. (S. Doc. No. 180, 69th Cong., 2d sess.).

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PHYSICAL EXAMINATION OF WORKERS

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Physical Examination of Workers

IN RECENT years there has been a rapid development of the practice of physical examinations of employees. The initiative has come largely from the employers, but interest in the subject is also active among a number of labor organizations, as indicated, for example, by the establishment of a trade-union health clinic in New York (see p. 378).

Extent and Character of Physical Examinations in Industrial Establishments

THE extent, importance, and general character of the present-day physical examinations of employees carried on by various large companies was described in an article in the Labor Review, April, 1926, by Frank L. Rector, M. D., secretary of the American Association of Industrial Physicians and Surgeons, and editor of the Nation's Health. This article, somewhat condensed, is as follows:

Purpose of Examinations

THE physical examination in industry is but one aspect of the larger subject of physical examinations of the general population, although the object in view is more directly related to a specific activity. In general, such examinations are carried out for the sole purpose of fitting the worker to his employment with the least danger to his physical or mental health. It may be true that in years gone by, before the modern conception of the relation of medicine to industry took form, the medical department and physical-examination procedures were prostituted to unworthy motives in that they were used at times to eliminate undesirable workers from an organization. This was because some employers did not have sufficient courage to state their true reason for discharging a worker and because the physician who would lend himself to such procedures was of a servile and dishonorable type who would fail in honest medical practice.

But those days have passed and the motives behind the practice of physically examining workers and applicants for employment to-day are such that they are of equal benefit to the worker and the employer. Physicians engaged in this work are often among the most prominent in the community, and are well-trained and capable men.

The enactment of workmen's compensation laws threw upon the employer the entire responsibility for the care of workers injured while in his employ, and in order to protect himself and to see that potential injury cases were safeguarded as far as possible physical examinations were introduced. Through physical examinations, workers are not denied employment but are selected on the basis of their ability to do the work for which they apply.

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The guiding principle in the application of physical findings has been epitomized by the Conference Board of Physicians in Industry in the declaration that, providing there are positions to be filled in the organization, no one should be denied employment for physical reasons unless if employed he would become a danger to himself, to others, or to property. To the application of this principle of physical examinations, no one, be he employer or employee, can take honest exception. The worker who, for reasons of disability such as contagious disease, tuberculosis, etc., should not be employed in a given industry, certainly can not object to his lack of acceptance for employment. If such an individual should be employed, not only would he aggravate his existing condition but his fellow workmen might become infected as well; and, further, if such an individual were suffering from epilepsy, heart disease, high blood pressure, or similar conditions in which he was subject to fainting or irrational seizures, he would not only be a danger to himself by physical injury due to falls into machinery, but would also endanger the safety of his fellow workmen and possibly endanger property in the form of machinery or equipment which he was supervising at the time his disability took an acute form. Also, if an individual were affected with some mental abnormality which at times made him difficult to manage, the refusal of employment would be justified.

Frequency of Rejections

THAT such cases as those just described are few is seen from the experience of those industries which have employed physical-examination procedures for many years. In the average industry, probably not over 2 per cent of the rejections are traceable to the results of physical examinations. In some selected cases of slight defects in vision or hearing or cases where marked dexterity or mental alertness is required, the rejection rate would run higher. In a recent study of industrial medical practices made by the writer for the National Industrial Conference Board, 20 of 255 plants reported that they rejected no worker for physical reasons. These were obviously large concerns with many varieties of jobs for workers of different capacities.

The State frequently contributes to the rejection rate for workers by workmen's compensation decisions which hold employers responsible for disabilities or aggravation of existing disabilities for which they are not to blame. As long as this continues, certain workmen will be unemployed through no fault of their own or of the employer.

Employment of Physical Defectives

THE question is sometimes asked, What is to become of those rejected for employment on account of their physical condition? If the principle laid down by the Conference Board of Physicians is adhered to, there will be very few unemployable workers. The problem of their care becomes one of family responsibility or, if this is inadequate, one of community responsibility. As the principle of physical examinations is accepted more and more, there will be fewer derelicts in the industrial world, the number of the families

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now dependent in whole or in part upon organized charity for assistance will be much reduced, and the care of those in the unemployable class will add little, if any, to the burden now being borne in the care of those partially dependent. The care of the unemployable is a community problem, not an industrial problem, just as is the care of the blind, the insane, the feeble-minded, and other unfortunates.

In practically every industry there are positions which can be filled by those who are partially disabled. Even totally blind workers are employed in certain industries, and there are many positions where the loss of one eye, a hand, or a foot, or partial deafness would be no bar to efficient employment. Here, however, industry meets with the problem of its responsibility under the various workmen's compensation acts for injuries sustained, and in the case of injuries to employees already partially disabled the danger of permanent total disability is much greater than in the case of similar injuries to normal individuals. Until the compensation laws and procedures are changed to relieve the employer of the whole responsibility for permanent and total disability of such cases, it will be difficult to find proper employment for them.

When a defective worker has been placed in remunerative employment he is usually more appreciative of his work than is a sound worker. His work is usually of a high quality and his output measures up favorably with that of others. It has been the experience in certain cases that during times of depression, when reduced working forces were necessary, defective workers were retained while physically sound employees were laid off, the choice being made on quality and quantity of output alone.

An argument sometimes heard against physical examinations is that, as they are made by the company physician, the information disclosed is always held against workers for purposes of discipline. In this connection it should be said that the findings of examinations are in the vast majority of cases held strictly confidential by the physician making the examination, and the employer knows only in general terms whether the one examined is fitted to do the work for which he applied. The examination findings should always be kept as confidential between the worker and the physician as would be the case if the worker were examined by the physician in his own private office. There is an opportunity, however, in the analysis of mass figures of physical examinations, in which individuals are in no way identified, to throw considerable light upon the question of the physical status of certain groups of members of a given community. In other words, the examination of industrial workers furnishes a cross section of the physical condition of a given group of people, and, next to the statistics collected by life insurance companies, offers one of the best sources of public-health statistics of this kind.

As heretofore stated, the physical findings should never be used for purposes of discipline, and no physician worthy of the name would to-day consider lending himself to such purposes. Rejection for employment and discharge from employment should rest with the employment office or the plant superintendent or other

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executive, never with the medical department. The prostitution of the medical department to such purposes will effectually destroy its usefulness for any purpose, and confidence once shaken can not easily be restored.

Advantages to Employer and Employee

THE advantages which industry may derive from physical examinations are a healthier working force, greater freedom from injury and illness, reduced compensation expenses, less labor turnover, and greater efficiency. The advantages which the one examined derives are of much greater importance as they affect not only himself but his dependents and indirectly the community in which he lives. It has been shown over and over again that the first indication a worker had of disability was when he underwent a physical examination for employment. Cases of unsuspected heart disease, tuberculosis, kidney disease, eye disabilities, and similar conditions have been found times without number, and through the free advice and cooperation of the examining physician corrective treatment has been instituted and what would soon have developed into a permanent disability has been corrected and the danger obviated. Men have been saved months and even years of suffering and misery by learning from the examining physician just what to do with their disabilities. A timely minor operation, a change in habit of living, a change in diet and exercise, and similar matters have brought about a return to full health and efficiency; whereas, if the employee had continued without medical supervision and particularly without the physical examination, he would sooner or later have been forced to relinquish his employment and have become a charge upon his family or the community.

That physical examinations pay has been demonstrated in many instances by a reduction in accidents among workers who have undergone such examinations as compared with groups of workers who have not been examined. While the differences are not great, they are sufficiently important to merit the earnest consideration of all workers. In two investigations made approximately five years apart, it was found that in the first investigation, covering over 200 plants, workers in 98 plants with physical examinations sustained an average of 1.56 injuries per worker per year as compared with 1.92 injuries per worker per year for workers in 105 plants without examinations; and similar figures for the later investigation among more than 400 plants were 1.66 injuries per worker per year in 217 plants with physical examinations as contrasted with 1.72 injuries per year in 225 plants without.

The time consumed in making the physical examination will depend both upon the skill of the examining physician and upon the type of employment the worker is seeking. It is the experience in industry that from 5 to 15 minutes is usually occupied in each examination. This, of course, is insufficient to give a thorough examination, but it should be borne in mind that certain types of disability have no bearing whatever upon a worker's capacity to do the work for which he is being hired and, therefore, need little or no consideration at such a time. As compared with the thorough physical examination by a private practitioner, it may be said that in the case

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of the worker we are dealing with a person who is well or thinks he is well and who is being examined for an estimation of his fitness for doing a particular kind of work, while, on the other hand, the individual who receives an examination by his private physician is frequently either ill or thinks he is ill and asks as complete an examination as that physician's ability permits. By this contrast, the impression should not be created that industrial physical examinations are in any way superficial, for long practice in this work enables the physician by his fairly rapid survey to weed out those cases demanding further detailed examination, such cases being subjected to a more searching examination as soon as opportunity offers.

Attitude of Workers

IT HAS been frequently said that labor unions and similar organizations are opposed to the principle of physical examinations for employment. While at one time there may have been grounds for this opposition, the development of high-class medical work in industry has eliminated such practices as complained of and there is seldom objection on the part of anyone at this time to the physical-examination practice. When the matter has been explained to individual workmen and union leaders, it has been an easy matter to convince them of the desirability of the physical-examination practice and their consent has been obtained. In 250 plants employing over 800,000 workers there are practically no objections. Physicians in industry report that when an examination alone stands between a man and a job, he usually waives any objections he may have to the procedure.

That physical examinations in industry are proving their worth is seen from a survey recently made of some 500 plants in approximately 50 per cent of which physical examinations were in use. Of this number only 10 had discontinued the practice. Among the reasons given were change of management, scarcity of labor, war conditions, reduction of working forces, and lack of sympathy of the management for such procedures.[1]

Physical Examination of Street-Railway Employees

THE results of the examination of 900 men ranging from 50 to 76 years of age, employed in the operating department of the Boston Elevated Railway, are given in an article by Dr. B. E. Sibley in the Electric Railway Journal of October 16, 1926.

The company has recently adopted the policy of annual physical examinations for car and train operators when they reach the age of 50, as after this age the appearance of changes in arteries, heart, and kidneys necessitates a change in personal habits and hygiene if the effects of these changes are to be minimized or retarded. The yearly physical examination has been found to stimulate the interest of the men and to impress them with the importance of following the advice given. Without the regular "follow-up" the advice given by the doctor is often forgotten and nothing is done until some serious condition causing disability develops. The experience of the company

[1] A partial list of firms having physical examinations is given in the Labor Review for April, 1926.

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has been that the spirit of appreciation and cooperation is growing among the men and that there is an increasing number who return each year with pathological conditions corrected. This is partly due to the realization by the men that the examination is not given for the purpose of laying them off but to keep them in health and on the job longer. Each man examined is told the results of the examination, and if treatment is needed, he is referred to his own physician. He is given a report form covering heart, urine, and blood pressure to be filled out by his doctor, so that a further observation and check-up on whether medical aid has been sought is obtained.

The examination is not a long one, but includes a test of eyes and ears and the condition of the teeth, heart, lungs, blood pressure, and urine, and hernia and varicose veins are noted. In cases where a condition is found which makes it unsafe to run cars or trains men are laid off and given other work until in better condition, while men who are not really unfit but who nevertheless are not good risks are kept under observation and are reexamined at frequent intervals.

Of the 900 men examined 25 per cent had bad teeth, many more poor teeth, and nearly all showed almost complete neglect of the teeth. Next to high blood pressure bad teeth present the most important pathological condition because it is the most prevalent and is a factor in causing derangement of the digestion, heart and arterial trouble, and rheumatism. Twenty-one per cent of those examined had varicose veins, which, however, were not in any case causing disability; 16 per cent had hernia; 7½ per cent had heart trouble; 3 per cent had some bronchial affection; and 3 per cent had albumin and 2 per cent sugar in the urine.

High blood pressure—that is, systolic pressure of 180 or over—was present in 9 per cent, and of these hypertension cases 23 per cent showed pathological heart conditions, 4 per cent heart conditions and albumin, and 9 per cent albumin with no heart pathology. This group therefore had a considerable number of cases in which sclerotic changes in the arteries, the heart, and the kidneys were the cause of the high blood pressure. On the other hand, many in this group owed their hypertension to faulty habits of diet and resulting overweight, and to the excessive use of tobacco, tea, or coffee, in which case the high blood pressure could readily be helped. The latter group it was considered received probably the greatest service from the yearly examination, as it prevented the development of later chronic and incurable organic changes.

The employees suffering from high blood pressure are the most important from the standpoint of safe operation of the cars, especially since many of the older men who were formerly conductors have become one-man car operators. Two years ago 76 men who had systolic blood pressure ranging from 200 to 250 and diastolic from 120 to 140 were selected for observation. These men were under treatment by their own doctors during this time. At the end of the two years one-fourth of the men had either died or been retired on a pension, part of the deaths being due to "shock" or heart failure. A serious risk is involved in any group which loses 25 per cent of its personnel in so short a time if they are engaged in operating street-railway cars or trains, as it is only a matter of chance whether some of these men will not die while running their cars.

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Although it is not easy to fix a hard-and-fast rule as to blood pressure limits, since the condition of the heart, kidneys, and the general health should be considered, certain limits have been fixed by the company as a sort of rough working standard. No man with a diastolic pressure of 120 or more is permitted to operate a car or train, nor with a systolic pressure of 200 or over unless he has a diastolic below 120. More stress is laid upon the diastolic than upon the systolic pressure, as the men who have died have had high diastolic readings while none of those with high systolic but relatively low diastolic pressures have died.

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PORTO RICO—LABOR CONDITIONS

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Labor Conditions in Porto Rico

NO FIRST-HAND investigation of labor conditions in Porto Rico has been made by the United States Bureau of Labor Statistics since the surveys embodied, respectively, in its Bulletin No. 34 (1901) and Bulletin No. 61 (1905). In 1919, however, the United States Employment Service issued a report on labor conditions in Porto Rico, and in 1923 the United States Children's Bureau, a report entitled "Child welfare in the insular possessions of the United States: Part I, Porto Rico." In 1924, Public Health Bulletin No. 138 (Tuberculosis survey of the Island of Porto Rico, October 11, 1922 to April 18, 1923) was issued by the United States Public Health Service.

The annual reports of the Governor of Porto Rico and of the island commissioner of agriculture and labor contain important current information. The latest available report of the commissioner of agriculture and labor is for 1924–25.

Industrial Distribution of the Population

THE population of Porto Rico in 1920 was 1,299,809. The occupational distribution in that year of gainfully employed persons 10 years of age and over is shown in Table 1.

TABLE 1.—OCCUPIED PERSONS IN PORTO RICO, 10 YEARS OF AGE AND OVER, BY SEX, 1920 [1]

General division of occupations	Male		Female		Total	
	Number	Per cent	Number	Per cent	Number	Per cent
Agriculture, forestry, and animal industry	227,565	70.6	17,719	20.5	245,284	60.0
Extraction of minerals	202	.1			202	(2)
Manufacturing and mechanical industries	40,707	12.6	30,809	35.6	71,516	17.5
Transportation	9,780	3.0	283	.3	10,063	2.5
Trade	24,669	7.7	916	1.1	25,585	6.3
Public service (not otherwise classified)	4,380	1.4	63	.1	4,443	1.1
Professional service	3,688	1.1	3,253	3.8	6,941	1.7
Domestic and personal service	7,142	2.2	32,482	37.6	39,624	9.7
Clerical occupations	4,333	1.3	937	1.1	5,270	1.3
All occupations	322,466	100.0	86,462	100.0	408,928	100.0

[1] U. S. Department of Commerce. Bureau of the Census. Fourteenth Census of the United States, 1920. Vol. IV. Population: Occupations. Washington, 1922, p. 1286.
[2] Less than one-tenth of 1 per cent.

The great majority of the workers are unskilled agricultural laborers. According to an estimate made by the Commissioner of Agriculture and Labor of Porto Rico in his annual report for 1924–25, there are approximately 190,000 unskilled agricultural workers on the island, as follows: 85,000 in the sugar section, 35,000 in the coffee section, 22,000 in the tobacco section, and 48,000 in the fruit and general farm section.

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Wages

Sugar Industry

THE report of the commissioner of agriculture and labor for 1924–25 presents the prevailing rates of wages on the sugar-cane plantations and in the sugar factories. There is a great lack of uniformity in these rates even in the same occupations in the same sections of the island, some water boys receiving as little as 35 cents and others as much as 85 cents per day while the prevailing rates for overseers on plantations ranged from $1 to $5. In sugar factories prevailing rates run from 50 cents, the lowest rate reported (for stablemen), to $6.33, the highest compensation listed (for mechanics).

Table 2 gives the highest and lowest prevailing rates in certain occupations on sugar plantations and in sugar factories inspected by agents of the Porto Rican Bureau of Labor:

TABLE 2.—HIGHEST AND LOWEST DAILY WAGE RATES PREVAILING IN SPECIFIED OCCUPATIONS ON SUGAR PLANTATIONS AND IN SUGAR FACTORIES, PORTO RICO, 1924–25

Occupation	Daily wage		Occupation	Daily wage	
	Lowest	Highest		Lowest	Highest
Plantations			*Factories*		
Foremen	$0.75	$2.25	Mechanics	$1.50	$6.33
Guards	.65	2.00	Electricians	.90	3.57
Overseers	1.00	5.00	Overseers	1.00	4.16
Timekeepers	.90	2.66	Foremen	.90	3.00
Plowing	.60	1.50	Machinists	1.00	3.00
Furrowing	.55	2.00	Stokers	.75	2.50
Chopping and lopping	.55	1.25	Weighers	1.43	3.57
Cross plowing	.60	1.50	Defecators	.75	2.28
Harrowing	.50	2.00	Crystalizers	.75	2.50
Hilling	.65	1.75	Stablemen	.50	1.43
Ditching	.60	1.75	At the molasses boilers	.65	2.00
Hole digging	.65	1.73	At the sugar boilers	.80	2.00
Hauling seeds	.60	1.50	Triplers	1.10	3.00
Planting	.60	1.73	Centrifugalers	.90	3.00
Replanting	.55	2.00	Boilers	.80	3.50
Fertilizing	.50	1.25	At the pumps	.70	2.50
Weeding	.45	1.75	Track repairing	.60	2.00
Cleaning stems	.50	1.25	At the crane	.75	2.50
Cane cutting	.60	1.75	Painters	.80	2.95
Cane hauling	.60	2.00	At the filters	.70	2.00
Filling cars and wagons	.50	1.50	At the furnaces	.75	2.50
Water boys	.35	.85	Lime workers	.60	2.00
Yoke drivers	.35	.80	Grinders	.70	2.50

Table 3 shows the sliding scale of wages continued in force the whole season in a sugar district of eastern Porto Rico, 1924–25, and being considered for other sections:

TABLE 3.—SLIDING WAGE SCALE IN SUGAR DISTRICT OF EAST PORTO RICO

Sugar price per 100 pounds	Harvesting per day	Cultivation per day
$4.00	$0.75–$0.90	$0.60–$0.75
$5.00	.90– 1.10	.65– .80
$6.00	1.10– 1.30	.70– .90
$7.00	1.30– 1.50	.75– 1.00
$8.00	1.50– 1.75	.80– 1.10
$9.00	1.75– 2.00	.90– 1.20
$10.00	2.00– 2.25	1.00– 1.30

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Coffee Industry

THE officials of the island bureau of labor investigated 217 coffee plantations, employing 5,581, of whom 2,851 were men, 2,635 women, and 95 children. There was a very great variation in the daily wages of these workers, the lowest paid among the men being 28 cents a day and the highest being $1, while the women's wages ranged from 18 cents to $1 and the children's from 15 cents to 57 cents.

The inadequate half pay for the six hours' work during dull seasons is causing alarm among the laborers on most of the coffee farms. Laborers and their families, anxiously looking for better opportunities, move to the near towns and cities, where drawn-work, lace, and needlework industries operate and may give employment (no matter how low the salary is) to women and girls who can not earn wages up in the rural district.

Tobacco Industry

THE 216 tobacco plantations visited by the inspectors of Porto Rican Bureau of Labor employed 3,566 men, 2,442 women, and 158 children, a total of 6,166 workers. Wages paid to men per day for this labor in 1924–25 ranged from 30 cents to $1, to women from 25 cents to $1, and to children from 25 to 60 cents. Free lunch is furnished in addition to wages.

The number of stripping shops on the island is reported as 142 and the number of cigar shops as 501.

In 1915 in the cigar factory the average wage for men was $1.13 and for women 47 cents; in 1920, $1.41 for men and 70 cents for women. The average wages for 1924–25 in cigar manufacture, as shown by the records of the Porto Rican Bureau of Labor, were—

	Men	Women
Leaf selecting	$0.83	$0.74
Leaf drying	1.05	.70
Leaf curing	1.03	.73
Cigarettes	2.47	1.17

Taking the first three occupations as representative of the industry, the commissioner of agriculture and labor concludes that the average wage for men has not risen, while the average wages of women have increased from 47 cents in 1915 to more than 72 cents in 1925, as a result of the "greater working skill of women in certain tasks."

Other Industries

FRUIT growing and packing.—Wages for unskilled men and women in 1924–25 ranged from 50 cents to $1 per 8-hour or 9-hour day; for children permitted gainful employment, from 20 to 26 cents per 7-hour day, and slightly more for packing.

Building industry.—In San Juan and certain other cities where building operations have been particularly active, masons received in 1925, $3.10, or 68.4 per cent more than in 1916, and carpenters $2.79, an advance of 87.8 per cent as compared with 1916.

In certain municipalities the minimum for masons and carpenters has been fixed at $3 and $3.50.

Buttons, artificial flowers, handkerchiefs, laces, drawn work, undershirts, waists, hats, suits, dresses, and candies.—In these industries

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in 1924–25, woman and girl workers were being paid from 25 cents to $1 per day, while men, except agents and employees in managing sections, are reported as receiving from $1 to $2 per day.

"During 1916 and 1917 the [needlework] industry developed enormously, over 20,000 women being employed, with the main centers of work being Ponce and Mayaguez. The wages paid ranged between $0.70 and $0.80 on an average, although some skillful workers averaged $1.25 and $1.50." In 1919 the Porto Rican Legislature fixed "the minimum wage for women at $4 a week for those under 18 years of age, and at $6 a week for those over that age. This minimum wage did not apply to woman labor employed in agriculture or agricultural industries." This act, however, was declared unconstitutional in 1924, but long before this the law was made ineffectual by carrying on the needlework as "task work in the individual homes. * * * Fully 25,000 women who were paid $1 had to abandon the shops to work in their homes for ridiculously low wages." In partial justification of employers who declared they could not pay the $1 minimum, the commissioner calls attention to the sharp competition the Porto Rican needlework exporters had to meet with, after the armistice, in the reopening of the French and Italian markets.

During the fiscal year 1924–25, however, "marked improvements have been reported, both in wages and general prosperity of the industry." In this year more than 30,000 women were working in 291 shops, the average daily wage for the year being 77.9 cents—about double that of 1922–23.

Wage Claims

DURING 1924–25, 304 claims for unpaid wages were filed at the Porto Rican Bureau of Labor, the sums involved totaling $7,385.87. Of these claims, 144 were amicably adjusted through the bureau, the successful collections amounting to $2,209.03. No settlement was effected in 95 claims, aggregating $3,854.20, while 65 cases were still pending at the close of the year.

Cost of Living

THE approximate daily cost of maintenance of an agricultural laborer's family of five in 1924–25 in the coffee section of the island is estimated as follows in the report of the Commissioner of Agriculture and Labor of Porto Rico:

	Cents
1½ lbs. of rice (second class)	10.12
½ lb. of red beans	5.75
½ lb. of codfish (second class)	6.75
1 lb. of corn flour	4.75
¼ lb. of sugar (third class)	1.62
⅛ lb. of coffee (second class)	3.41
Native viandas (root crops)	5.00
Lard and bacon	2.00
Total daily cost	39.40

It is stated that a family of five is a conservative average, also that such a family in the sugar section consumes double the amount

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of coffee and sugar and that its allowance for root crops costs 12 cents instead of 5 cents, that a double quantity of lard and bacon should be included and likewise 2 cents for wood (*leña*), bringing the total estimate to 55.4 cents. In this connection the Porto Rican commissioner points out that "while the wage of a sugar laborer has been increased 26.5 per cent since 1915, the cost of his family's diet has increased 48.6 per cent during the same period of time." Coffee labor has had a somewhat similar experience, "wages having increased 32.2 per cent which did not balance a 36.9 per cent increase [of cost] in the diet."

In his annual report for 1924–25 the commissioner of agriculture and labor attributes the low standard of living and low wages "to the island's overpopulation. We have an evident excess of labor."

The main articles of food for the poor, rice and codfish, have very low vitamin content and vegetables, meat, milk, or eggs are luxuries for our peasant population. This underfeeding, combined with uncinariasis [hookworm] and malaria through many generations, have made the jibaro a type of human species worthy of compassion and care on the part of the Government.

Child Labor

AN INVESTIGATION of the employment of children under working age by the Porto Rican Bureau of Labor in 1924–25 revealed the fact that there were 2,000 children gainfully occupied—the greater number of them in the sugar-cane industry, but seeming violations of the child labor law could not be prosecuted as in the majority of cases the evidence of parents, relatives and fellow workers "resulted adversely." It has been estimated that four-fifths of the child workers in agricultural undertakings could not get seats in the public schools.

In the year covered by the report 1924–25 there was a notable increase in the number of working permits for children over 14 to 16 years during school vacations and in the number of age certificates for children above 16 years of age. Parents who were questioned in the matter claimed to be without funds or that children were forced to work because there were no school facilities.

Housing

THE report of the commissioner of agriculture and labor for 1921–22 contains a most drastic criticism of housing both in the rural and urban districts of Porto Rico. It states that it is not possible to call the peasants' homes houses, as their huts lack all "the conditions necessary to the life of civilized men" and may not be compared to the housing of any other workmen in progressive countries.

The living conditions of the rural families visited by the commissioner's inspectors were reported as very deplorable. Eight, ten, or twelve members of a family were found herded together without furniture, sleeping in hammocks, field beds (*catres*) and on the floor, covered with their day garments. Furthermore, the huts were found infested with pests.

The commissioner declares that in the urban zone, the housing of the laborers is unhealthful and utterly out of harmony with the

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development of the cities. He also accuses the landlords of having taken advantage of the dearth of houses to advance rentals in an unreasonable way.

Government Aid to Housing

AN ACT of March 11, 1915, created a homestead commission in Porto Rico consisting of the commissioner of the interior and two other persons appointed by the governor, for the purpose of "providing for the sale to laborers of certain lands of the people of Porto Rico" for dwelling and farming purposes. Due to lack of funds this act was never put into effect. On November 27, 1917, however, another act was passed authorizing the issuing of bonds to the amount of $250,000 for the purpose of "constructing houses for artisans and laborers; providing for the leasing of the same with a certain right to the ownership thereof; improving sanitary conditions of certain lands of the people of Porto Rico; promoting the creation of farms to be leased to farm laborers and to grant them title thereto, and for other purposes." The law also provided that the commission was to be composed of the commissioner of the interior as chairman ex officio, the treasurer of Porto Rico, the commissioner of health, the commissioner of agriculture and labor, and three other persons representing the three principal political parties in the island, to be appointed by the governor with the consent of the senate. On July 11, 1921, the Legislative Assembly of Porto Rico approved a law (No. 53) which embodied all previous legislation on the subject and provided the means by which the poor inhabitants of towns and the industrious farmers are able to obtain comfortable housing as well as holdings of fertile land on a part-payment plan.

A report [1] of the homestead commission shows its activities for the period from 1915 to 1924, from which the following résumé was made.

Houses for City Workers

A part of the municipality of San Juan, known as Puerta de Tierra, was made uninhabitable by dredging operations of the harbor, large numbers of persons being compelled to leave their places of abode and find new locations. The homestead commission then proceeded to establish a workingman's settlement at Martin Peña in the environs of San Juan and obtained a 62-acre plot of land. This was divided into 1,050 lots of about 200 square meters [2] each, with avenues 15 meters wide, cross streets 10 meters wide, and a recreation park of over 2 acres. The location of this area is one of the best of San Juan, being situated on a sloping plain which affords the proper drainage of the whole area. A modern system of electric lighting, sewers, and water supply was provided at a cost of $98,369, and 50 frame houses of a standard type were built. Each house contained a parlor, two bedrooms, kitchen, and balcony. The houses cost approximately $250 each, and the tenants paid about $3 per

[1] Porto Rico. Comisión de Hogares Seguros. Memorial de los Trabajos, 1915–1924. San Juan, 1925.
[2] 1 square meter=10.764 square feet.

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month and had a right to the ownership of the house they occupied—that is, the house became theirs when their monthly payments equaled the cost of construction. The commission then successively ordered the construction of 60 houses similar to those already built but more solidly constructed and costing about $500 each, for which the inhabitants pay $5 per month, and of 100 houses of double capacity and still better construction which cost $1,000 each and sold at the rate of $8 a month. This was followed by the erection of 150 houses of reinforced concrete at an approximate cost of $2,500 each, for which tenants pay $12 a month. By June 30, 1921, 460 houses had been constructed, 310 of which were frame and 150 were reinforced concrete.

Under the plan, in 10 or 15 years the lessee becomes the owner of the property he occupies. Such is the demand for these small sanitary houses that the Government has never had resources to satisfy it. During the fiscal year ending June 30, 1924, payments averaged $4,275 per month, while the receipts for the year amounted to $51,308.

In addition to the dwellings the commission built a schoolhouse and acquired an administration building where two of the rooms are fitted out as classrooms. Through the efforts of the commission the services of a doctor, a surgeon, and several nurses were secured. A dispensary for first-aid care was also established. An inspector for the supervision of sanitary work has been assigned by the department of sanitation.

Also, a number of commercial buildings have been established by private interests and a church has been erected. According to the report of the commission the whole group gives the appearance of an industrious and prosperous little town.

Homestead Allotments for Small Farmers

One of the most interesting activities of the commission is the establishment of homestead farms on public lands in Porto Rico. Under the provisions of the law public lands are subdivided into small farms and sold or leased to those who are willing to build a small house on the land within 12 months at a cost of not less than $100; within two years to have under cultivation one-third of the land and keep it under cultivation for 10 years; within five years to live personally on the farm. Upon completion of full payment of appraised value the purchaser becomes the owner of the land, which is not subject to attachment or mortgage. The occupants pay as rental and part payment 10 per cent each year.

At Vega Baja a tract of land consisting of 320 acres was subdivided into small farms of from 2 to 5 acres. One hundred and five families are now living and working on this property. At Bayamon a tract of 94 acres was divided into eight small farms, which are now all taken. In the rural district near Cayey a 262-acre tract has been divided into 14 small farms, and two other small tracts have also been subdivided and are now occupied. Two tracts of land measuring 11 and 15 acres, respectively, situated in the rural district called "Beatriz," in the municipality of Caguas, have been divided into 22 small farms. A tract of land consisting of 2,069 acres near

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Utuado, land near Guayama amounting to 831 acres, and land near Morovis and Manati amounting to 2,080 acres are being sold under similar conditions. Other lands will also be opened to homestead purchase as soon as the necessary surveys and arrangements are made.

Commenting on the accomplishments of the homestead commission, the Governor of Porto Rico in his annual report for the fiscal year ending June 30, 1924, makes the following statement:

> The plans of the department for securing small farms by rental payments and of securing homes in or adjoining the cities and towns of the island by the workingmen with families is proving a great boon to these people who would otherwise never be able to acquire a farm or home of their own. No other work of the Government is more greatly appreciated by the laboring classes of both the city and country than this, and no other is more successful. It will be extended as rapidly as the resources of the Government will permit.

At the close of the fiscal year 1925, 169 homestead farms were occupied. (Twenty-fifth Annual Report of the Governor of Porto Rico, p. 56.)

Emigration

DURING the year 1924–25, a corporation in Hawaii, a large California employer, and the Government of the Dominican Republic made appeal to Porto Rico for unskilled labor. A substantial number of men and women have requested the bureau of labor to register them as emigrants, generally expressing a desire to leave Porto Rico, regardless of destination or distance. The bureau states that it "will not accept or recommend any emigration plan unless the interests of the emigrants are protected and their welfare looked after."

There are more than a million acres of land available for agricultural purposes. "It is the hope of the bureau that by efforts directed toward the cultivation of all the agricultural land in the country, public and private, with sharing-crop contracts in operation and the selling to laborers plats of land on the installment plan, we will ultimately find the way to prevent the exodus of our laborers to far and unknown lands."

Recommendations

AMONG the recommendations made in the annual report of the commissioner of agriculture and labor for 1924–25, are the following:

(1) Federal legislation on minimum wages for women and minors of working age and for the restriction of home work.

(2) Congressional appropriations for the education of children; for the elimination of adult illiteracy and for the foundation and upkeep of seven well-equipped industrial schools.

(3) An extension of the benefits of the Federal safety appliance act of Porto Rico.

(4) A local legal measure "providing for compulsory sanitary and comfortable housing for laborers" in the rural district.

(5) Further encouragement of embroidery and handwork activities.

Local legislation providing for an appeal to the principal financial centers of the United States for capital to establish new industries.

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(6) A wide extension of the fruit industry, an expansion of the cotton-growing industry, legislation for the proper enforcing of the cultivation sharing-crop contract.

(7) Congressional legislation to provide that United States transports may carry Porto Rican high-school and university graduates who can not afford to pay their passage to the United States so that they may secure profitable positions in that country.

Provision for transportation facilities for workers willing to settle and become landowners in the Dominican Republic.

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PRICES—WHOLESALE AND RETAIL

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Retail Prices in the United States

Retail Prices of Food in 1926

RETAIL prices of most foods averaged somewhat higher in 1926 than in the preceding year. This was particularly true of fresh beef and pork, bacon, ham, hens, rice, and potatoes. Butter, cheese, eggs, flour, lard, corn meal, sugar, and coffee, on the other hand, were cheaper than in 1925.

Prices of fresh beef, including sirloin and round steak, rib and chuck roast, and plate beef steadily increased in the early months of the year, but declined after July. Chuck roast and plate beef increased again in fall and winter. Pork chops were highest in fall months, while bacon, ham, and lard reached high levels in midsummer. Prices of most meats at the end of the year averaged slightly higher than at the beginning.

Butter prices receded steadily from January to May, rising thereafter and attaining a high level in December. Eggs showed strong seasonal fluctuations, slumping from January to March and rising rapidly thereafter. Prices in December were 69 per cent higher than in March. Prices of bread were uniform throughout the year, while flour declined appreciably. Corn meal also showed some decrease in early months, but was stationary after April. Rice also showed little price variation. Potato prices were erratic, declining from January to March, increasing steeply in April, and declining again to August, when they were 46 per cent cheaper than in April. Some reaction was shown in the last four months.

Sugar increased steadily during most of the year, while coffee declined slightly. Tea showed little price variation. All commodities, as measured by the weighted food index, declined from January to March, increased in April, declined again from May to August, and increased again to December. The general price level for December was 2 per cent lower than the level for December, 1925.

Table 1 shows for the United States average retail prices of specified articles of food for the years 1913 and 1926 and for each month of 1926.

TABLE 1.—AVERAGE RETAIL PRICES OF SPECIFIED FOOD ARTICLES IN THE UNITED STATES, BY YEARS, 1913 AND 1926, AND BY MONTHS FOR 1926

Article	Unit	Average for year 1913	1926												Average for year 1926
			Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	
		Cts.	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
Sirloin steak	Pound	25.4	40.8	40.6	40.7	41.1	41.5	42.0	42.0	41.8	41.9	41.5	40.9	40.7	41.3
Round steak	do	22.3	35.0	34.8	34.9	35.2	35.8	36.2	36.3	36.2	36.4	36.0	35.5	35.3	35.6
Rib roast	do	19.8	30.0	29.3	29.9	30.2	30.4	30.6	30.7	30.4	30.6	30.6	30.2	30.2	30.3
Chuck roast	do	16.0	22.1	22.1	22.1	22.3	22.5	22.7	22.7	22.5	22.7	22.8	22.7	22.7	22.5
Plate beef	do	12.1	14.5	14.6	14.6	14.7	14.6	14.6	14.5	14.3	14.5	14.6	14.7	14.9	14.6

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TABLE 1.—AVERAGE RETAIL PRICES OF SPECIFIED FOOD ARTICLES IN THE UNITED STATES, BY YEARS, 1913 AND 1926, AND BY MONTHS FOR 1926—Continued

Article	Unit	Average for year 1913	1926												Average for year 1926
			Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	
		Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.
Pork chops	Pound	21.0	36.5	36.3	37.2	38.3	40.3	42.0	41.7	40.5	42.5	42.6	39.3	37.2	39.5
Bacon, sliced	do	27.0	48.2	48.9	48.4	48.5	49.3	51.5	52.3	52.0	51.9	51.7	51.0	49.6	50.3
Ham, sliced	do	26.9	53.3	53.6	54.0	54.5	55.9	59.7	60.9	60.7	60.4	59.8	58.4	57.1	57.4
Lamb	do	18.9	39.1	38.4	37.9	37.9	39.9	41.9	40.3	39.2	39.1	38.3	37.9	37.7	39.0
Hams	do	21.3	38.6	38.9	39.4	40.5	41.0	40.2	39.2	37.9	37.8	37.6	37.1	37.2	38.8
Salmon, canned, red.	do	----	37.3	37.6	37.6	37.8	37.9	38.1	38.1	38.2	37.2	35.6	34.7	34.1	37.0
Milk, fresh	Quart	8.9	14.2	14.2	14.0	13.9	13.9	13.8	13.8	13.9	14.0	14.0	14.1	14.2	14.0
Milk, evaporated	(1)	----	11.6	11.6	11.6	11.5	11.5	11.5	11.4	11.4	11.5	11.4	11.4	11.4	11.5
Butter	Pound	38.3	55.4	54.5	53.6	50.9	50.0	50.3	50.1	50.6	52.5	54.3	55.7	59.3	53.1
Oleomargarine (all butter substitutes.)	do	----	31.3	31.2	30.9	30.5	30.2	30.1	30.2	30.2	30.2	30.3	30.1	29.6	30.4
Cheese	do	22.1	37.6	37.5	37.2	36.5	36.0	35.7	35.6	35.7	36.1	36.7	36.9	37.4	36.6
Lard	do	15.8	22.3	22.2	21.9	21.5	21.5	22.6	22.9	22.7	22.3	21.9	21.1	20.4	21.9
Vegetable lard substitute.		----	25.6	25.6	25.6	25.7	25.6	25.8	25.9	25.9	25.9	25.7	25.6	25.4	25.7
Eggs, strictly fresh	Dozen	34.5	53.9	43.8	38.5	38.6	38.9	40.7	42.1	44.9	51.5	58.2	66.0	65.2	48.5
Eggs, storage	do	----	42.2	34.6	----	----	----	----	----	----	----	45.9	47.0	46.9	----
Bread	Pound	5.6	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
Flour	do	3.3	6.2	6.3	6.2	6.1	6.1	6.1	6.0	6.0	5.8	5.7	5.7	5.6	6.0
Corn meal	do	3.0	5.2	5.2	5.2	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Rolled oats	do	----	9.1	9.1	9.1	9.1	9.1	9.1	9.1	9.0	9.1	9.1	9.1	9.1	9.1
Corn flakes	(2)	----	11.0	11.0	11.0	11.0	11.0	10.9	10.9	10.9	10.9	10.9	10.9	10.9	10.9
Wheat cereal	(3)	----	25.3	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4	25.4
Macaroni	Pound	----	20.3	20.3	20.3	20.2	20.3	20.3	20.2	20.2	20.2	20.1	20.1	20.2	20.2
Rice	do	8.7	11.6	11.6	11.7	11.7	11.7	11.7	11.7	11.6	11.7	11.6	11.3	11.2	11.6
Beans, navy	do	----	9.8	9.6	9.4	9.3	9.2	9.2	9.2	9.2	9.1	9.1	9.3	9.3	9.3
Potatoes	do	1.7	5.8	5.7	5.6	6.7	6.0	5.0	4.1	3.6	3.9	3.8	4.0	4.0	4.9
Onions	do	----	5.9	5.9	5.9	6.3	7.7	7.4	6.8	5.9	5.3	5.0	5.0	5.0	6.0
Cabbage	do	----	5.6	6.4	7.2	7.4	6.2	6.1	5.1	4.3	4.2	4.0	4.0	4.2	5.8
Beans, baked	(4)	----	12.3	12.2	12.1	12.0	11.9	11.9	11.9	11.8	11.7	11.7	11.7	11.7	11.9
Corn, canned	(4)	----	16.8	16.7	16.6	16.5	16.5	16.4	16.4	16.4	16.4	16.3	16.3	16.2	16.5
Peas, canned	(4)	----	17.8	17.7	17.7	17.6	17.5	17.4	17.4	17.5	17.4	17.4	17.3	17.3	17.5
Tomatoes, canned	(4)	----	12.6	12.3	12.2	12.0	11.9	11.9	11.8	11.8	11.8	12.1	12.1	12.2	12.1
Sugar, granulated	Pound	5.5	6.7	6.7	6.7	6.6	6.7	6.9	6.9	7.0	7.0	7.1	7.1	7.3	6.9
Tea	do	54.4	76.1	76.1	76.1	76.3	76.4	76.9	77.0	77.1	77.0	77.3	77.1	76.9	76.7
Coffee	do	29.8	51.3	51.3	51.3	51.1	51.0	51.0	51.1	51.0	51.0	50.9	50.8	50.7	51.0
Prunes	do	----	17.2	17.2	17.1	17.1	17.1	17.1	17.2	17.2	17.1	16.9	16.5	16.2	17.0
Raisins	do	----	14.5	14.5	14.6	14.6	14.7	14.7	14.8	14.8	14.8	14.8	14.6	14.4	14.7
Bananas	Dozen	----	35.8	35.7	35.3	35.5	35.4	35.9	35.2	34.5	34.4	34.9	34.9	34.9	35.2
Oranges	do	----	46.9	46.5	47.8	52.6	53.1	50.3	49.6	50.7	50.7	56.0	55.1	49.3	50.7

[1] 15–16 ounce can. [2] 8-ounce package. [3] 28-ounce package. [4] No. 2 can.

The figures in Table 2 show the per cent of increase in the average retail price of each of 22 important food articles in 1926 compared with the pre-war year 1913, arranged according to increase.

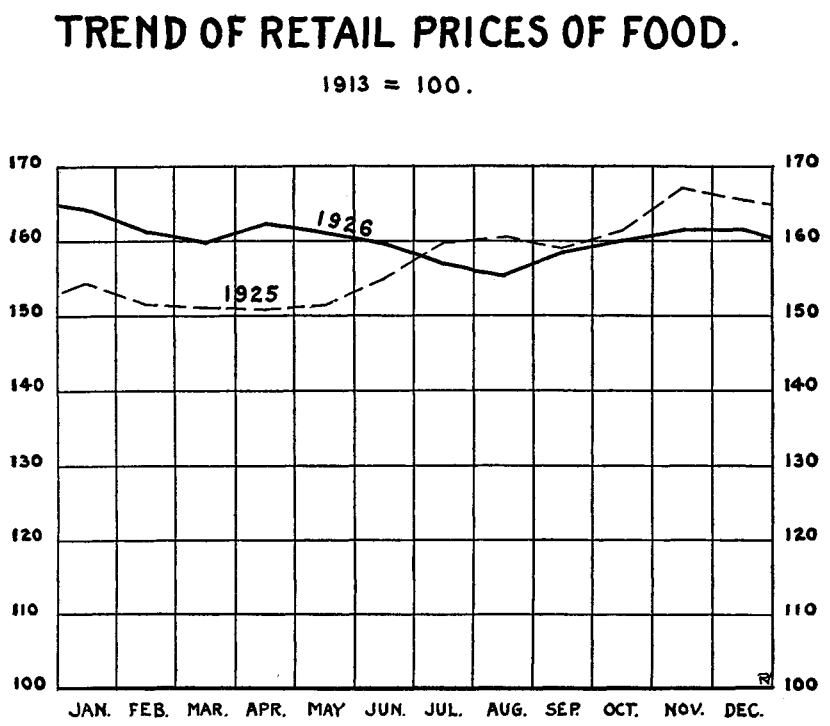
TABLE 2.—PER CENT OF INCREASE IN RETAIL PRICES OF 22 ARTICLES OF FOOD IN 1926 COMPARED WITH 1913

Article	Per cent of increase in 1926 compared with 1913	Article	Per cent of increase in 1926 compared with 1913	Article	Per cent of increase in 1926 compared with 1913
Potatoes	188.2	Bread	67.9	Eggs	40.6
Ham	113.4	Cheese	65.6	Butter	38.6
Pork chops	88.1	Sirloin steak	62.6	Lard	38.6
Bacon	86.3	Round steak	59.6	Rice	33.3
Hens	82.2	Milk	57.3	Sugar	25.5
Flour	81.8	Rib roast	53.0	Plate beef	20.7
Coffee	71.1	Tea	41.0		
Corn meal	70.0	Chuck roast	40.6		

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Monthly Price Changes of Food, 1916 to 1926

RETAIL price movements during the period 1916 to 1926 for the United States as a whole are shown in Table 4.[1] The year 1913 forms the base period, and average prices in all years and months are measured in terms of average prices in that year. To aid in the comparison there is also shown the per cent of increase or decrease in prices for each year or month as compared with the preceding year or month. As will be seen, the retail cost of food reached the peak in July, 1920, when prices were 119.2 per cent above the 1913



level. In March, 1922, prices had fallen to 38.7 per cent above the 1913 level, but they increased to 64.3 per cent above that level in January, 1926.

The accompanying chart and Table 3 show by index numbers the trend in the retail cost of food in the United States from 1890 to 1926. The percentage increase in the cost from 1925 to 1926 was 2, while the percentage increase from 1890 to 1926 was 131. This means that the cost of food in 1926 was more than two and a third times as much as it was in 1890.

[1] Comparable information for the months of 1913 to 1915, inclusive, will be found in Bul. No. 396, p. 12.

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TABLE 3.—INDEX NUMBERS SHOWING THE TREND IN THE RETAIL COST OF FOOD IN THE UNITED STATES, BY YEARS, 1890 TO 1926 [1]

[Average for year 1913=100]

Year	Relative price	Year	Relative price	Year	Relative price	Year	Relative price
1890	69.6	1900	68.7	1910	93.0	1920	203.4
1891	70.6	1901	71.5	1911	92.0	1921	153.3
1892	69.3	1902	75.4	1912	97.6	1922	141.6
1893	71.0	1903	75.0	1913	100.0	1923	146.2
1894	67.8	1904	76.0	1914	102.4	1924	145.4
1895	66.5	1905	76.4	1915	101.3	1925	157.9
1896	64.9	1906	78.7	1916	113.7	1926	160.6
1897	65.4	1907	82.0	1917	146.4		
1898	67.1	1908	84.3	1918	168.3		
1899	67.7	1909	88.7	1919	185.9		

[1] The number of articles included in the index number for each year has not been the same throughout the period, but a sufficient number have been used fairly to represent food as a whole. From 1890 to 1907, 30 articles were used; from 1907 to 1913, 15 articles; from 1913 to 1920, 22 articles; and from 1921, 43 articles. The relatives for the period have been so computed as to be comparable with each other.

TABLE 4.—INDEX NUMBERS OF RETAIL COST AND PER CENT OF INCREASE OR DECREASE IN ALL ARTICLES OF FOOD COMBINED FOR THE UNITED STATES, 1913 TO DECEMBER, 1926

Year and month	Index number (average cost for 1913=100)	Per cent of increase (+) or decrease (−) each specified year as compared with year preceding and month with month preceding	Year and month	Index number (average cost for 1913=100)	Per cent of increase (+) or decrease (−) each specified year as compared with year preceding and month with month preceding
1913: Average for year	100.0		1919—Continued		
1914: Average for year	102.4	+2.4	September	188.3	−1.8
1915: Average for year	101.3	−1.1	October	188.6	+.1
1916: Average for year	113.7	+12.3	November	192.2	+1.9
1917: Average for year	146.4	+28.7	December	196.6	+2.3
January	127.5	+1.2			
February	133.0	+4.3	**1920: Average for year**	203.4	+9.4
March	132.5	−.4	January	201.2	+2.4
April	144.9	+9.3	February	200.0	−.6
May	150.8	+4.1	March	200.0	(1)
June	151.5	+.5	April	210.6	+5.3
July	145.8	−3.8	May	215.5	+2.3
August	148.7	+2.0	June	218.7	+1.5
September	153.0	+2.9	July	219.2	+.2
October	157.1	+2.7	August	206.7	−5.7
November	154.8	−1.5	September	203.7	−1.4
December	156.8	+1.3	October	198.4	−2.6
			November	193.3	−2.6
1918: Average for year	168.3	+15.0	December	177.9	−8.0
January	160.3	+2.3			
February	161.1	+.5	**1921: Average for year**	153.3	−24.6
March	153.8	−4.5	January	172.4	−3.1
April	154.0	+.1	February	157.7	−8.5
May	158.2	+2.7	March	156.1	−1.0
June	162.0	+2.4	April	152.1	−2.6
July	167.6	+3.4	May	144.7	−4.8
August	171.1	+2.1	June	144.4	−.3
September	177.9	+4.0	July	148.4	+2.8
October	181.0	+1.7	August	154.7	+4.3
November	183.4	+1.3	September	153.1	−1.1
December	186.6	+1.7	October	152.6	−.3
			November	151.7	−.5
1919: Average for year	185.9	+10.4	December	149.9	−1.3
January	185.2	−.8			
February	172.0	−7.1	**1922: Average for year**	141.6	−7.6
March	175.3	+1.9	January	142.0	−5.3
April	181.7	+3.6	February	141.6	−.3
May	184.9	+1.8	March	138.7	−2.0
June	184.0	−.5	April	138.9	+.1
July	190.0	+3.3	May	139.2	+.2
August	191.8	+1.0	June	140.7	+1.1

[1] No change.

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TABLE 4.—INDEX NUMBERS OF RETAIL COST AND PER CENT OF INCREASE OR DECREASE IN ALL ARTICLES OF FOOD COMBINED FOR THE UNITED STATES, 1913 TO DECEMBER, 1926—Continued

Year and month	Index number (average cost for 1913=100)	Per cent of increase (+) or decrease (−) each specified year as compared with year preceding and month with month preceding	Year and month	Index number (average cost for 1913=100)	Per cent of increase (+) or decrease (−) each specified year as compared with year preceding and month with month preceding
1922—Continued			1924—Continued		
July	142.1	+1.0	October	148.7	+1.3
August	138.7	−2.4	November	150.1	+.9
September	139.7	+.7	December	151.5	+1.0
October	142.6	+2.1			
November	144.9	+1.6	1925: Average for year	157.4	+7.9
December	146.6	+1.2	January	154.3	+1.8
			February	151.4	−1.9
1923: Average for year	148.2	+8.3	March	151.1	−.2
January	144.4	−1.5	April	150.8	−.2
February	142.3	−1.5	May	151.6	+.5
March	141.9	−.2	June	155.0	+2.2
April	143.1	+.8	July	159.9	+3.2
May	143.4	+.2	August	160.4	+.3
June	144.3	+.6	September	159.0	−.9
July	147.2	+2.0	October	161.6	+1.6
August	146.4	−.5	November	167.1	+3.4
September	149.3	+2.0	December	165.5	−1.0
October	149.8	+.4			
November	151.1	+.8	1926: Average for year	160.6	+2.0
December	150.3	+.5	January	164.3	−0.7
			February	161.5	−1.7
1924: Average for year	145.9	−.2	March	159.9	−1.0
January	149.1	−.8	April	162.4	+1.6
February	147.3	−1.2	May	161.1	−0.8
March	143.7	−2.5	June	159.7	−0.9
April	141.3	−1.6	July	157.0	−1.7
May	141.0	−.2	August	155.7	−0.8
June	142.4	+1.0	September	158.5	+1.8
July	143.3	+.6	October	160.0	+0.9
August	144.2	+.6	November	161.6	+1.0
September	146.8	+1.8	December	161.8	+0.1

Index numbers showing changes in the retail prices of 22 important food articles for the years 1920 to 1926 are contained in Table 5. All index numbers are based on average prices in 1913 as 100.

TABLE 5.—INDEX NUMBERS OF RETAIL PRICES OF PRINCIPAL ARTICLES OF FOOD BY YEARS, 1913, AND 1920 TO 1926, AND BY MONTHS FOR 1925 AND 1926

[Average for year 1913=100]

Year and month	Sirloin steak	Round steak	Rib roast	Chuck roast	Plate beef	Pork chops	Bacon	Ham	Hens	Milk	Butter	Cheese
1913	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1920	172.1	177.1	167.7	163.8	151.2	201.4	193.7	206.3	209.9	187.6	183.0	188.2
1921	152.8	154.3	147.0	132.5	118.2	166.2	158.2	181.4	186.4	164.0	135.0	153.9
1922	147.2	144.8	139.4	123.1	105.8	157.1	147.4	181.4	169.0	147.2	125.1	148.9
1923	153.9	150.2	143.4	126.3	106.6	144.8	144.8	169.1	164.3	155.1	144.7	167.0
1924	155.9	151.6	145.5	130.0	109.1	146.7	139.6	168.4	165.7	155.1	135.0	159.7
1925	159.8	155.6	149.5	135.0	114.1	174.3	173.0	195.5	171.8	157.3	143.1	166.1
1926	162.6	159.6	153.0	140.6	120.7	188.1	186.3	213.4	182.2	157.3	138.6	165.6
1925: January	152.4	147.1	143.9	128.1	109.9	146.2	149.3	177.0	168.1	156.2	136.6	162.4
February	151.6	146.6	143.4	127.5	109.1	144.3	150.4	178.8	169.5	156.2	132.1	164.7
March	155.9	150.7	147.0	131.3	111.6	178.1	164.4	190.3	173.2	155.1	144.9	165.2
April	159.1	155.2	150.0	135.0	114.1	175.2	172.6	198.9	177.9	155.1	139.2	165.2
May	160.6	157.0	150.5	138.1	115.7	171.4	171.9	197.0	177.9	153.9	135.5	164.3
June	161.4	157.8	150.5	136.3	114.0	172.4	174.1	197.0	173.2	153.9	137.6	165.2
July	166.1	163.7	153.5	140.0	115.7	186.7	180.4	202.2	171.8	155.1	138.9	165.6
August	165.4	162.3	153.0	138.1	114.9	190.5	182.6	204.1	170.0	156.2	141.3	166.5
September	163.8	159.6	152.0	137.5	114.9	192.4	185.0	204.1	171.8	159.6	145.7	167.4

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TABLE 5.—INDEX NUMBERS OF RETAIL PRICES OF PRINCIPAL ARTICLES OF FOOD BY YEARS, 1913, AND 1920 TO 1926, AND BY MONTHS FOR 1925 AND 1926—Continued

Year and month	Sirloin steak	Round steak	Rib roast	Chuck roast	Plate beef	Pork chops	Bacon	Ham	Hens	Milk	Butter	Cheese
1925—Continued.												
October	162.2	158.7	151.5	137.5	116.5	186.2	183.7	201.9	171.4	160.7	155.1	168.3
November	158.7	154.3	149.0	135.0	116.5	178.6	182.2	198.9	168.1	160.7	155.9	169.2
December	158.7	154.3	149.5	135.6	116.5	170.0	180.0	197.4	171.4	160.7	153.0	169.7
1926: January	160.6	157.0	151.5	138.1	119.8	173.8	178.5	198.1	181.2	159.6	144.6	170.1
February	159.8	156.1	148.0	138.1	120.7	172.9	181.1	199.3	182.6	159.6	142.3	169.7
March	160.2	156.5	151.0	138.1	120.7	177.1	179.3	200.7	185.0	157.3	139.9	168.3
April	161.8	157.8	152.5	139.4	121.5	182.4	179.6	202.6	190.1	156.2	132.9	165.2
May	163.4	160.5	153.5	140.6	120.7	191.9	182.6	207.8	192.5	156.2	130.5	162.9
June	165.4	162.3	154.5	141.9	120.7	200.0	190.7	221.9	188.7	155.1	131.3	161.5
July	165.4	162.8	155.1	141.9	119.8	198.6	193.7	226.4	184.0	155.1	130.8	161.1
August	164.6	162.3	153.5	140.6	118.2	192.9	192.6	225.7	177.9	156.2	132.1	161.5
September	165.0	163.2	154.5	141.9	119.8	202.4	192.2	224.5	177.5	157.3	137.1	163.3
October	163.4	161.4	154.5	142.5	120.7	202.9	191.5	222.3	176.5	157.3	141.8	166.1
November	161.0	159.2	152.5	141.9	121.5	187.1	188.9	217.1	174.2	158.4	145.4	167.0
December	160.2	158.3	152.5	141.9	123.1	177.1	183.7	212.3	174.6	159.6	154.8	169.2

Year and month	Lard	Eggs	Bread	Flour	Corn meal	Rice	Potatoes	Sugar	Tea	Coffee	All articles [1]
1913	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1920	186.7	197.4	205.4	245.5	216.7	200.0	370.6	352.7	134.7	157.7	203.4
1921	113.9	147.5	176.8	175.8	150.0	109.2	182.4	145.5	128.1	121.8	153.3
1922	107.6	128.7	155.4	154.5	130.0	109.2	164.7	132.7	125.2	121.1	141.6
1923	112.0	134.8	155.4	142.4	136.7	109.2	170.6	183.6	127.8	126.5	146.2
1924	120.3	138.6	157.1	148.5	156.7	116.1	158.8	167.3	131.4	145.3	145.9
1925	147.5	151.0	167.9	184.8	180.0	127.6	211.8	130.9	138.8	172.8	157.4
1926	138.6	140.6	167.9	181.8	170.0	133.3	288.2	125.5	141.0	171.1	160.6
1925: January	144.3	204.4	164.3	181.8	180.0	123.0	147.1	147.3	136.4	173.2	154.3
February	144.3	154.8	169.6	193.9	183.3	124.1	152.9	140.0	137.5	174.8	151.4
March	146.2	113.3	167.9	193.9	183.3	125.3	147.1	140.0	138.1	175.5	151.1
April	146.8	110.4	167.9	184.8	183.3	126.4	141.2	136.4	138.8	174.8	150.8
May	143.0	113.9	167.9	184.8	180.0	126.4	158.8	130.9	139.0	175.2	151.6
June	144.9	122.6	167.9	184.8	180.0	126.4	205.9	130.9	139.3	170.5	155.0
July	148.7	133.9	167.9	184.8	180.0	128.7	258.8	129.1	139.3	170.5	159.9
August	153.8	141.7	167.9	184.8	180.0	129.9	158.8	127.3	139.5	170.8	160.4
September	151.9	150.4	167.9	184.8	180.0	129.9	211.8	127.3	139.3	171.4	159.0
October	152.5	174.8	167.9	178.8	176.7	129.9	217.9	123.6	139.3	171.5	161.6
November	147.5	201.2	167.9	181.8	176.7	131.0	305.9	120.0	139.2	171.8	167.1
December	143.0	191.9	167.9	184.8	173.3	131.0	305.9	121.8	139.3	172.1	165.5
1926: January	141.1	156.2	167.9	187.9	173.3	133.3	341.2	121.8	139.9	172.1	164.3
February	140.5	127.0	167.9	190.9	173.3	133.3	335.3	121.8	139.9	172.1	161.5
March	138.6	111.6	167.9	187.9	173.3	134.5	329.4	121.8	139.9	172.1	159.9
April	136.1	111.9	167.9	184.8	170.0	134.5	394.1	120.0	140.3	171.5	162.4
May	136.1	112.8	167.9	184.8	170.0	134.5	352.9	121.8	140.4	171.1	161.1
June	143.0	118.0	167.9	184.8	170.0	134.5	294.1	125.5	141.4	171.1	159.7
July	144.9	122.0	167.9	181.8	170.0	134.5	241.2	125.5	141.5	171.5	157.0
August	143.7	130.1	167.9	181.8	170.0	133.3	211.8	127.3	141.7	171.1	155.7
September	141.1	149.3	167.9	175.8	170.0	134.5	229.4	127.3	141.5	171.1	158.5
October	138.6	168.7	167.9	172.7	170.0	133.3	223.5	129.1	142.1	170.8	160.0
November	133.5	191.3	167.9	172.7	170.0	129.9	235.3	129.1	141.7	170.5	161.6
December	129.1	189.0	167.9	169.7	170.0	158.7	235.3	132.7	141.4	170.1	161.8

[1] 30 articles in 1907; 15 articles in 1908–1912; 22 articles 1913–1920; 43 articles 1921–1926.

Food Prices, by Cities

CHANGES in the retail prices of food in each of the 51 cities covered by the bureau's reports are shown in Table 6. Comparisons for each month of 1926 are made with the base year 1913, with the corresponding month of 1925, and with the last preceding month. Increases are denoted by the plus sign (+) and decreases by the minus sign (−).

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TABLE 6.—CHANGES IN THE RETAIL PRICES OF FOOD SINCE 1913, IN 12 MONTHS AND IN 1 MONTH, BY CITIES AND BY MONTHS, 1926

City and period	Per cent of change in specified city and period in—											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Atlanta:												
Since 1913	+68.9	+64.6	+62.5	+66.1	+65.9	+65.1	+64.9	+62.4	+64.7	+65.8	+66.1	+64.7
In 12 months	+10.4	+9.4	+8.3	+9.0	+8.7	+5.7	+2.1	+0.1	+1.2	+1.9	−1.0	−2.1
In 1 month	+0.4	−2.5	−1.3	+2.2	−0.2	−0.5	−0.1	−1.5	+1.4	+0.7	+0.2	−0.9
Baltimore:												
Since 1913	+70.2	+68.5	+66.7	+68.5	+69.5	+68.0	+62.9	+63.4	+65.8	+67.3	+69.5	+68.8
In 12 months	+5.4	+6.7	+5.9	+6.3	+4.7	+2.8	−2.8	−2.4	+0.5	−0.1	−1.9	−1.9
In 1 month	−1.1	−1.0	−1.0	+1.1	+0.6	−0.9	−3.1	+0.3	+1.5	+0.9	+1.3	−0.4
Birmingham:												
Since 1913	+71.7	+68.9	+67.5	+68.7	+69.9	+67.3	+68.0	+66.5	+66.1	+66.9	+67.0	+67.8
In 12 months	+4.9	+5.0	+4.5	+5.0	+6.2	+2.4	+0.9	−0.8	−0.2	−0.3	−2.5	−2.6
In 1 month	−0.4	−1.6	−0.8	+0.7	+0.7	−1.6	+0.4	−0.9	−0.3	+0.5	0.0	+0.5
Boston:												
Since 1913	+66.4	+63.6	+61.2	+65.5	+60.4	+58.4	+58.3	+58.1	+59.4	+60.8	+65.2	+63.8
In 12 months	+6.4	+7.1	+8.0	+11.5	+7.6	+4.9	−2.3	−3.9	−1.2	−3.6	−3.2	−2.5
In 1 month	−0.9	−1.7	−1.5	+2.7	−3.1	−1.2	−0.1	−0.1	+0.8	+0.9	+2.8	−0.9
Bridgeport:												
In 12 months	+9.0	+7.9	+8.6	+10.6	+9.3	+4.3	−1.7	−2.6	−0.4	−0.5	−2.7	−2.1
In 1 month	−0.5	−2.0	−1.5	+1.6	−0.9	−2.2	−1.2	+0.4	+1.8	+1.3	+1.7	−0.5
Buffalo:												
Since 1913	+71.1	+68.2	+67.5	+69.3	+67.2	+66.3	+61.0	+60.5	+62.5	+64.4	+68.5	+69.1
In 12 months	+6.7	+8.8	+7.7	+10.3	+9.8	+5.9	−1.8	−3.7	−0.9	−1.9	−2.7	−1.7
In 1 month	−0.5	−1.7	−0.4	+1.1	−1.2	−0.5	−3.2	−0.3	+1.2	+1.2	+2.5	+0.3
Butte:												
In 12 months	+0.8	+2.4	+0.1	+4.7	+3.2	−1.1	−2.5	−4.0	−2.4	−0.3	−4.4	−1.4
In 1 month	−1.4	−1.0	−1.4	+2.3	−0.6	−0.7	+1.4	−1.6	0.0	+0.8	+0.9	−0.2
Charleston, S. C.:												
Since 1913	+69.2	+66.7	+65.2	+68.7	+65.4	+61.1	+60.4	+60.1	+61.7	+62.0	+63.8	+63.9
In 12 months	+8.1	+7.6	+7.3	+8.3	+7.0	+3.0	+0.1	−2.5	+0.8	−0.2	−1.1	−0.7
In 1 month	+2.6	−1.5	−0.9	+2.1	−2.0	−2.6	−0.4	−0.2	+1.0	+0.2	+1.1	+0.1
Chicago:												
Since 1913	+74.1	+71.6	+71.1	+73.5	+71.7	+71.6	+67.8	+63.8	+68.0	+71.6	+73.0	+74.0
In 12 months	+7.2	+8.1	+6.6	+9.2	+8.2	+3.6	−1.9	−4.3	+0.2	+1.3	−1.8	+0.2
In 1 month	+0.2	−1.4	−0.3	+1.4	−1.0	−0.1	−2.2	−2.4	+2.6	+2.1	+0.8	+0.6
Cincinnati:												
Since 1913	+64.7	+62.5	+61.3	+62.8	+64.4	+62.1	+59.6	+59.7	+62.7	+63.8	+63.8	+62.9
In 12 months	+9.6	+9.4	+7.1	+8.2	+8.5	+3.4	−1.5	−0.2	+2.4	+3.0	−1.5	−0.7
In 1 month	+0.4	−1.3	−0.8	+0.9	+1.0	−1.4	−1.6	0.0	+1.9	+0.7	0.0	−0.6
Cleveland:												
Since 1913	+63.5	+61.7	+60.7	+64.2	+63.8	+63.9	+56.3	+56.0	+60.7	+62.5	+63.1	+62.6
In 12 months	+7.9	+9.4	+6.6	+10.6	+8.5	+4.0	−3.7	−3.1	+2.1	+2.0	−0.2	+0.3
In 1 month	+0.8	−1.1	−0.6	+2.2	−0.3	0.0	−4.6	−0.2	+3.0	+1.1	+0.4	−0.3
Columbus:												
In 12 months	+8.3	+9.6	+6.7	+8.9	+8.5	+4.1	−1.2	−2.7	+1.5	+0.4	−1.5	−1.4
In 1 month	−0.4	−1.4	−2.7	+2.5	0.0	−0.6	−1.6	−2.5	+3.2	+0.4	+1.8	+0.3
Dallas:												
Since 1913	+60.2	+54.7	+54.5	+54.4	+55.5	+54.3	+53.6	+52.4	+55.4	+55.7	+57.4	+57.4
In 12 months	+1.1	+1.3	+0.4	+0.2	+1.6	0.0	−1.5	−2.2	−0.3	−1.5	−1.2	−2.1
In 1 month	−0.4	−3.5	−0.1	−0.1	+0.7	−0.8	−0.4	−0.8	+1.9	+0.2	+1.2	−0.1
Denver:												
Since 1913	+47.2	+43.9	+42.9	+47.0	+45.5	+46.4	+41.9	+39.4	+40.5	+44.3	+46.9	+47.7
In 12 months	+2.8	+6.2	+7.3	+8.6	+5.6	+1.5	−2.4	−4.8	−1.9	−1.4	−3.6	−1.7
In 1 month	−2.0	−2.2	−0.8	+2.9	−1.0	+0.6	−3.1	−1.7	+0.8	+2.6	+1.8	+0.6
Detroit:												
Since 1913	+75.9	+71.2	+70.6	+72.7	+70.4	+70.8	+65.2	+64.1	+66.7	+67.2	+68.9	+68.8
In 12 months	+11.3	+10.3	+7.8	+9.8	+7.5	+3.1	−4.5	−4.3	+1.0	0.0	−2.5	−2.6
In 1 month	+1.5	−2.7	−0.3	+1.3	−1.4	+0.3	−3.3	−0.7	+1.6	+0.3	+1.0	0.0
Fall River:												
Since 1913	+64.0	+61.2	+58.6	+59.9	+58.3	+55.8	+53.6	+52.6	+54.4	+56.8	+61.6	+62.1
In 12 months	+8.0	+8.3	+10.2	+11.7	+9.6	+5.7	−0.9	−2.8	−1.5	−2.2	−3.0	−2.7
In 1 month	−1.6	−1.7	−1.6	+0.9	−1.0	−1.6	−1.4	−0.7	+1.2	+1.5	+3.0	+0.3
Houston:												
In 12 months	−1.0	+3.0	0.0	+1.0	+0.8	−1.3	−2.5	−3.4	−2.7	−1.8	−3.3	−3.5
In 1 month	−1.9	−3.1	−1.8	+1.5	−0.9	−0.3	+0.2	−0.8	+1.2	+1.6	+0.5	+0.4
Indianapolis:												
Since 1913	+61.2	+57.0	+55.2	+59.1	+57.6	+57.3	+56.0	+51.4	+56.6	+56.1	+58.1	+57.7
In 12 months	+8.8	+10.3	+8.1	+11.6	+9.7	+5.0	−0.1	−2.7	+2.3	+1.2	−1.8	−1.4
In 1 month	+0.8	−2.6	−1.1	+2.5	−0.9	−0.2	−0.8	−2.9	+3.4	−0.3	+1.3	−0.3
Jacksonville:												
Since 1913	+67.0	+62.6	+60.2	+61.1	+58.8	+59.3	+58.8	+60.5	+62.1	+63.2	+62.0	+59.4
In 12 months	+13.7	+11.4	+11.2	+10.2	+9.8	+8.2	+3.9	+2.2	+3.9	+2.1	−2.1	−3.1
In 1 month	+1.6	−2.7	−1.5	+0.6	−1.4	+0.3	−0.3	+1.0	+1.0	+0.7	−0.8	−1.6
Kansas City:												
Since 1913	+62.5	+59.9	+59.1	+61.6	+59.3	+60.4	+54.6	+50.6	+56.2	+57.1	+57.0	+56.9
In 12 months	+6.0	+7.0	+5.1	+8.5	+6.7	+4.6	−1.2	−3.2	+0.4	−0.3	−4.3	−3.6
In 1 month	−0.2	−1.6	−0.5	+1.6	−1.4	+0.7	−3.6	−2.6	+3.8	+0.5	0.0	−0.1

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TABLE 6.—CHANGES IN THE RETAIL PRICES OF FOOD SINCE 1913, IN 12 MONTHS AND IN 1 MONTH, BY CITIES AND BY MONTHS, 1926—Continued

City and period	Per cent of change in specified city and period in—											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Little Rock:												
Since 1913	+54.7	+51.9	+51.7	+53.6	+54.4	+52.3	+51.5	+49.7	+51.0	+51.9	+54.4	+54.4
In 12 months	+3.5	+5.4	+4.3	+6.4	+6.8	+4.0	+0.8	−1.7	−0.1	−0.5	−1.0	−0.8
In 1 month	−0.6	−1.9	−0.1	+1.2	+0.5	−1.3	−0.5	−1.2	+0.9	+0.6	+1.6	0.0
Los Angeles:												
Since 1913	+47.8	+46.4	+44.4	+46.6	+46.4	+42.9	+43.6	+44.0	+46.6	+48.4	+48.6	+47.8
In 12 months	+0.7	+1.6	−0.7	+2.6	+1.0	−2.7	−2.7	−3.2	−2.1	−4.2	−5.3	−2.7
In 1 month	−2.7	−0.9	−1.4	+1.6	−0.2	−2.4	+0.4	+0.3	+1.8	+1.3	+0.1	−0.6
Louisville:												
Since 1913	+61.1	+57.6	+54.5	+56.2	+59.1	+57.1	+54.0	+49.7	+55.5	+56.7	+58.4	+58.7
In 12 months	+6.2	+7.2	+4.3	+6.3	+6.7	+2.7	−0.3	−3.3	−0.5	−1.0	−4.3	−1.2
In 1 month	+0.2	−2.2	−2.0	+1.1	+1.9	−1.3	−2.0	−2.8	+3.9	+0.8	+1.1	+0.2
Manchester:												
Since 1913	+60.9	+59.2	+56.7	+59.2	+55.0	+53.2	+55.2	+53.8	+54.7	+57.1	+59.5	+58.1
In 12 months	+8.4	+6.3	+8.9	+10.9	+7.3	+4.4	+0.4	−2.5	+0.5	−0.5	−3.1	−2.3
In 1 month	−0.5	−1.1	−1.6	+1.6	−2.6	−1.1	+1.3	−1.0	+0.6	+1.5	+1.5	−0.9
Memphis:												
Since 1913	+56.0	+52.9	+52.4	+54.5	+54.3	+52.9	+51.3	+50.1	+50.3	+50.9	+51.5	+50.4
In 12 months	+2.9	+5.8	+3.6	+6.3	+6.3	+3.2	−0.8	−2.3	−0.8	−1.0	−3.0	−3.7
In 1 month	−0.1	−2.0	−0.3	+1.4	−0.1	−1.0	−1.0	−0.8	+0.2	+0.4	+0.4	−0.8
Milwaukee:												
Since 1913	+63.8	+61.0	+60.8	+66.2	+63.9	+63.5	+60.9	+56.8	+60.5	+63.1	+64.7	+64.3
In 12 months	+5.7	+6.7	+5.4	+10.7	+8.9	+5.2	−2.0	−0.5	+3.4	+3.4	+0.3	+0.3
In 1 month	0.0	−1.7	−0.1	+3.4	−1.4	−0.3	−1.6	−2.5	+2.3	+1.7	+1.0	−0.2
Minneapolis:												
Since 1913	+64.2	+61.0	+60.9	+63.4	+61.4	+62.1	+56.8	+51.0	+55.9	+55.8	+55.7	+56.7
In 12 months	+11.0	+9.1	+7.5	+9.7	+7.9	+6.6	−0.7	−3.0	−0.4	−1.6	−4.9	−4.3
In 1 month	+0.3	−2.0	−0.1	+1.6	−1.2	+0.4	−3.2	−3.8	+3.2	0.0	−0.1	+0.6
Mobile:												
In 12 months	+4.5	+5.0	+5.4	+5.5	+6.9	+1.8	−0.9	−0.8	+1.4	+2.3	−1.7	−0.6
In 1 month	−1.1	−0.9	−0.5	+1.5	−0.5	−2.2	+0.5	−0.2	+0.5	+1.5	+0.1	+0.7
Newark:												
Since 1913	+57.3	+53.4	+52.1	+55.5	+57.0	+53.4	+48.6	+47.1	+50.1	+54.1	+56.3	+56.1
In 12 months	+5.5	+5.2	+5.1	+7.8	+8.3	+4.3	−1.6	−4.1	−1.8	−1.0	−2.3	−2.0
In 1 month	−1.2	−2.5	−0.8	+2.3	+1.0	−2.3	−3.1	−1.0	+2.1	+2.6	+1.4	−0.1
New Haven:												
Since 1913	+65.7	+63 7	+61.0	+63.6	+59.8	+56.7	+55.3	+56.3	+57.7	+61.0	+63.5	+64.4
In 12 months	+8.4	+8.5	+9.2	+12.5	+9.8	+4.2	−0.7	−1.3	−0.7	−0.8	−3.4	−1.7
In 1 month	−0.9	−1.2	−1.7	+1.6	−2.3	−2.0	−0.9	+0.6	+0.9	+2.1	+1.6	+0.5
New Orleans:												
Since 1913	+61.6	+57.4	+56.0	+58.3	+56.9	+52.6	+53.5	+52.9	+55.1	+57.1	+57.1	+58.3
In 12 months	+3.2	+3.3	+2.1	+3.9	+5.2	+0.5	−2.1	−2.7	−0.6	−0.4	−2.9	−2.5
In 1 month	−0.5	−2.6	−0.9	+1.4	−0.8	−2.7	+0.6	−0.4	+1.5	+1.3	0.0	+0.8
New York:												
Since 1913	+66.7	+65.2	+63.6	+66.5	+67.1	+62.8	+58.6	+57.2	+60.4	+64.0	+66.9	+66.0
In 12 months	+6.1	+6.6	+5.9	+8.5	+8.7	+4.7	−0.7	−3.6	−1.2	−1.3	−3.0	−2.1
In 1 month	−1.8	−0.8	−1.0	+1.8	+0-4	−2.6	−2.6	−0.9	+2.0	+2.3	+1.7	−0.5
Norfolk:												
In 12 months	+7.6	+7.5	+6.5	+8.2	+9.1	+5.4	+0.3	−0.6	+2.2	+2.1	−0.2	−1.4
In 1 month	−0.8	−1.7	−1.8	+2.1	−0.3	−0.5	−1.8	−0.1	+2.2	+1.3	+0.8	−0.6
Omaha:												
Since 1913	+64.4	+60.6	+59.4	+62.0	+59.5	+57.9	+55.0	+52.2	+55.9	+58.0	+58.2	+58.4
In 12 months	+8.0	+9.4	+6.8	+9.0	+6.3	+2.1	−2.6	−4.0	−0.3	−0.3	−3.5	−3.7
In 1 month	−0.1	−2.3	−0.8	+1.6	−1.6	−1.0	−1.8	−1.8	+2.4	+1.3	+0.1	+0.1
Peoria:												
In 12 months	+6.7	+7.3	+3.4	+6.7	+5.6	+4.3	−1.9	−2.7	+0.4	+0.1	−2.6	−0.6
In 1 month	−0.2	−1.7	−1.4	+1.3	−0.8	+0.5	−2.2	−2.6	+2.6	+1.3	+1.0	+1.8
Philadelphia:												
Since 1913	+67.7	+64.7	+62.8	+65.1	+65.2	+63.5	+58.8	+57.6	+61.9	+64.3	+67.7	+68.5
In 12 months	+9.0	+7.7	+7.8	+9.4	+7.6	+3.4	−2.3	−2.8	+1.0	0.0	−2.0	−0.5
In 1 month	−1.0	−1.8	−1.2	+1.4	+0.1	−1.0	−2.9	−0.8	+2.8	+1.5	+2.0	+0.5
Pittsburgh:												
Since 1913	+67.6	+64.0	+62.1	+62.9	+60.7	+61.8	+56.2	+56.9	+60.6	+62.1	+66.0	+66.7
In 12 months	+7.2	+7.3	+6.6	+8.0	+5.0	+2.8	−3.2	−2.1	+1.7	+0.1	−1.3	−0.6
In 1 month	0.0	−2.1	−1.2	+0.5	−1.3	+0.7	−3.5	+0.4	+2.4	+1.0	+2.4	+0.4
Portland, Me.:												
In 12 months	+5.9	+5.0	+6.9	+10.5	+6.8	+4.4	−0.4	−3.1	−0.4	−1.5	−2.9	−0.6
In 1 month	−0.4	−0.8	−1.3	+2.7	−3.1	−0.5	−0.6	+0.3	+0.7	+0.9	+2.1	−0.4
Portland, Oreg.:												
Since 1913	+42.1	+40.8	+39.5	+41.1	+40.0	+40.1	+37.2	+38.5	+40.0	+41.6	+41.2	+42.1
In 12 months	+0.1	+3.8	+1.3	+3.2	+0.6	−1.4	−3.6	−2.8	−3.0	−2.8	−5.6	−1.8
In 1 month	−1.8	−0.9	−0.9	+1.1	−0.8	+0.1	−2.0	+0.9	+1.1	+1.1	−0.3	+0.7

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TABLE 6.—CHANGES IN THE RETAIL PRICES OF FOOD SINCE 1913, IN 12 MONTHS AND IN 1 MONTH, BY CITIES AND BY MONTHS, 1926—Continued

City and period	Per cent of change in specified city and period in—											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Providence:												
Since 1913	+66.6	+65.6	+60.6	+64.8	+59.9	+59.3	+58.5	+58.2	+60.1	+61.7	+64.4	+62.2
In 12 months	+7.5	+8.3	+8.3	+11.1	+7.4	+5.2	−1.9	−2.9	−0.8	−1.9	−3.4	−2.8
In 1 month	−0.2	−0.6	−3.0	+2.6	−3.0	−0.3	−0.5	−0.2	+1.2	+1.0	+1.7	−1.3
Richmond:												
Since 1913	+75.5	+71.2	+69.5	+73.3	+72.2	+70.2	+66.6	+64.8	+67.9	+70.3	+70.1	+69.2
In 12 months	+7.2	+6.9	+6.9	+8.3	+8.0	+4.1	0.0	−2.3	+0.2	+0.5	−3.1	−3.7
In 1 month	−0.1	−2.4	−1.0	+2.2	−0.6	−1.2	−2.1	−1.1	+1.8	+1.5	−0.1	−0.5
Rochester:												
In 12 months	+7.8	+7.2	+5.8	+8.8	+8.0	+4.1	−3.4	−4.7	+0.2	−1.4	−2.3	−3.4
In 1 month	−1.0	−1.7	−2.7	+2.0	−1.0	−0.2	−2.9	−0.3	+2.6	0.0	+2.6	−0.7
St. Louis:												
Since 1913	+67.6	+64.9	+63.2	+66.0	+65.8	+65.5	+60.0	+56.0	+62.0	+63.6	+65.2	+65.2
In 12 months	+7.2	+7.8	+5.4	+8.1	+7.6	+4.8	−1.9	−3.6	0.0	−0.3	−2.4	−1.4
In 1 month	0.0	−1.6	−1.0	+1.7	−0.1	−0.2	−3.3	−2.5	+3.9	+1.0	+0.9	0.0
St. Paul:												
In 12 months	+9.5	+9.0	+6.7	+10.1	+8.9	+7.3	+0.4	−1.2	+0.7	−0.5	−3.6	−3.0
In 1 month	−0.4	−1.5	−0.2	+1.9	−0.4	0.0	−3.0	−2.7	+2.1	+0.1	+0.2	+1.0
Salt Lake City:												
Since 1913	+36.2	+35.7	+33.6	+35.6	+33.9	+36.1	+31.7	+32.0	+35.3	+37.3	+38.0	+37.5
In 12 months	−1.2	−1.8	−1.1	+0.6	−3.2	−5.4	−6.5	−6.8	−4.5	−3.3	−3.7	−1.8
In 1 month	−2.8	−0.3	−1.6	+1.5	−1.2	+1.6	−3.3	+0.3	+2.4	+1.5	+0.5	−0.4
San Francisco:												
Since 1913	+56.1	+53.3	+51.1	+53.4	+53.5	+50.6	+50.3	+51.5	+53.2	+55.6	+55.9	+54.8
In 12 months	+0.8	+3.1	+0.8	+2.7	+1.7	−2.3	−2.8	−3.2	−3.3	−3.5	−5.9	−3.3
In 1 month	−2.5	−1.8	−1.4	+1.5	+0.1	−1.9	−0.2	+0.8	+1.1	+1.5	+0.2	−0.7
Savannah:												
In 12 months	+9.7	+9.7	+9.0	+8.1	+9.5	+5.8	+2.1	+0.4	+2.1	−0.4	−2.8	−3.6
In 1 month	−1.8	−1.4	−0.8	+1.0	+0.8	−1.9	−0.3	−0.3	+1.3	−0.4	+0.5	−0.3
Scranton:												
Since 1913	+69.2	+67.6	+65.5	+67.5	+66.8	+64.9	+61.3	+58.9	+61.6	+63.4	+68.8	+67.9
In 12 months	+7.8	+6.5	+7.0	+8.8	+8.4	+3.2	−1.4	−4.5	−1.4	−1.0	−1.3	−2.7
In 1 month	−1.9	−0.9	−1.2	+1.2	−0.4	−1.2	−2.2	−1.5	+1.7	+1.1	+3.3	−0.5
Seattle:												
Since 1913	+49.0	+48.0	+47.3	+49.5	+48.8	+48.0	+45.7	+45.7	+47.0	+46.0	+45.2	+47.3
In 12 months	+1.2	+1.8	+1.0	+2.9	+1.4	−1.0	−2.8	−2.4	−2.6	−4.6	−7.7	−3.9
In 1 month	−2.8	−0.7	−0.5	+1.5	−0.5	−0.5	−1.6	0.0	+1.0	−0.7	−0.5	+1.5
Springfield, Ill.:												
In 12 months	+5.2	+7.0	+4.4	+7.8	+6.8	+4.2	−2.0	−3.3	+0.4	+0.3	−2.3	−0.1
In 1 month	−0.5	−1.6	−1.7	+1.8	−0.7	−0.2	−2.4	−2.6	+2.8	+0.9	+2.3	+2.1
Washington:												
Since 1913	+72.3	+69.7	+66.4	+70.4	+69.7	+69.3	+65.1	+65.2	+68.4	+71.1	+71.5	+72.4
In 12 months	+6.6	+7.1	+6.1	+8.6	+7.1	+3.9	−1.7	−1.4	+1.3	+0.9	−1.2	+0.5
In 1 month	+0.4	−1.5	−2.0	+2.4	−0.4	−0.2	−2.5	+0.1	+1.9	+1.6	+0.2	+0.5

How Food Prices Are Obtained

RETAIL prices of food are collected from retail dealers through monthly reports of actual selling prices on the 15th of each month. The stores are selected by agents of the bureau from those patronized largely by wage earners. Prices are secured from every type of store—the neighborhood store, the downtown store, the department store, and the chain store—provided a large part of the patronage comes from wage earners. Some of the stores are credit and delivery, some are cash and carry, and some are cash and delivery. No "fancy" stores are included.

The number of firms is apportioned according to the industrial importance of each city. For the larger cities reports are obtained from 25 to 30 stores and for the smaller cities from 10 to 15 stores. The total number of firms furnishing prices on one or more articles of food each month is now approximately 1,800. Quite naturally firms are not constant, but when one firm drops out permanently another firm, similar in kind, is selected to replace it. Moreover, as

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the wage-earning population of a city shifts, stores are selected in the new localities to preserve the representative character of the prices.

At the beginning of the year 1913 retail prices of food were being collected by the bureau from 39 cities, as follows:

Atlanta, Ga.	Indianapolis, Ind.	New York, N. Y.
Baltimore, Md.	Jacksonville, Fla.	Omaha, Nebr.
Birmingham, Ala.	Kansas City, Mo.	Philadelphia, Pa.
Boston, Mass.	Little Rock, Ark.	Pittsburgh, Pa.
Buffalo, N. Y.	Los Angeles, Calif.	Portland, Oreg.
Charleston, S. C.	Louisville, Ky.	Providence, R. I.
Chicago, Ill.	Manchester, N. H.	Richmond, Va.
Cincinnati, Ohio.	Memphis, Tenn.	St. Louis, Mo.
Cleveland, Ohio.	Milwaukee, Wis.	Salt Lake City, Utah.
Dallas, Tex.	Minneapolis, Minn.	San Francisco, Calif.
Denver, Colo.	Newark, N. J.	Scranton, Pa.
Detroit, Mich.	New Haven, Conn.	Seattle, Wash.
Fall River, Mass.	New Orleans, La.	Washington, D. C.

The following cities were added to the list on the dates named:

St. Paul, Minn., June, 1913.	Mobile, Ala., April, 1918.
Springfield, Ill., May, 1914.	Norfolk, Va., April, 1918.
Butte, Mont., January, 1915.	Houston, Tex., May, 1918.
Rochester, N. Y., May, 1916.	Peoria, Ill., May, 1918.
Columbus, Ohio, June, 1916.	Portland, Me., June, 1918.
Bridgeport, Conn., October, 1916.	Savannah, Ga., January, 1920.

Retail prices are shown, therefore, for 39 cities from the beginning of 1913 and for the remaining 12 cities from the dates given above. For most of the cities retail prices of certain articles from 1890 to 1903 were published in the Eighteenth Annual Report of the Commissioner of Labor and were continued in subsequent bulletins.

Effort is made to secure quotations on similar grades of commodities in the different cities. There are, however, some local customs which must be considered when any comparison is made of the prices in the different cities. For example, the method of cutting sirloin steak in Boston, Mass., Manchester, N. H., Philadelphia, Pa., Providence, R. I., and Portland, Me., differs from that in other cities. The cut known as "sirloin" in these five cities would be known in other cities as "porterhouse." There is in these cities, owing to the methods of dividing the round from the loin, no cut that corresponds to that of sirloin in the other cities. There is also a greater amount of trimming demanded by the retail trade in these cities than in others. This is particularly true of Providence, R. I. In any comparison of prices in one city with those in another due consideration should be given to the following facts:

1. The trade demands and is furnished more expensive grades of articles in some cities than in others.

2. The cities for which prices are shown in this report are widely separated; some are in localities near the source of supply, while others are a considerable distance from it, making it necessary to include in the prices a greater charge for transportation.

3. Methods and costs of doing business vary greatly in different localities, due to the demands of customers and to rents, wages, and other fixed charges or expenses.

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Method of Constructing Index Numbers of Food Prices

IN CONSTRUCTING the index numbers of retail food prices issued by the bureau average annual prices for the United States have been computed for each of 43 articles by dividing the sum of all prices for an article in the 51 cities by the total number of reporting firms. The average price of each article was then multiplied by a figure denoting the average annual family consumption of that article in the United States as shown by an investigation conducted by the bureau in 1918.[2] The products for the several articles thus obtained were next added, giving the cost of a year's supply of these foods when purchased by a family at the retail prices shown. The result was then reduced to a percentage of the corresponding result for the year 1913, taken as the base. Monthly index numbers have been constructed in the same manner as the yearly index numbers by using average monthly prices instead of average yearly prices, the year 1913 being the base period in all cases.

For the years 1913 to 1920 the index numbers were uniformly computed from the prices of 22[3] food articles. In 1921, when the number of articles was increased to 43,[4] the following plan was adopted: It was assumed that the total cost of the 43 articles, if this information had been obtained, would have shown the same percentage of change from 1913 to December, 1920, as was shown by the 22 articles. Therefore the index number for the 22 articles in December, 1920, which was found to be 177.85, was accepted as the index number for the 43 articles. The money cost of the 43 articles in December, 1920, was found to be $461.51. The ratio of the money cost to the relative cost in December, 1920, was therefore 461.51 to 177.85, or 1 to 0.3854. For each month since December, 1920, the index number has been obtained by multiplying the money cost of the 43 articles by 0.3854. The resulting index numbers are comparable with the index numbers for years and months prior to January, 1921, on 22 articles.

The average annual family consumption of the 43 articles is here given for geographical sections and for the United States as a whole, as shown by the bureau's cost of living study of 1918.

TABLE 7.—FOOD WEIGHTS: ANNUAL CONSUMPTION PER FAMILY

Article	Unit	United States	North Atlantic	South Atlantic	North Central	South Central	Western
Sirloin steak	Pound	32	27	35	34	38	39
Round steak	do	32	27	35	34	38	39
Rib roast	do	31	30	24	32	24	39
Chuck roast	do	31	30	24	32	24	39
Plate beef	do	23	25	17	23	16	27
Pork chops	do	36	29	43	45	42	25
Bacon	do	17	13	20	18	17	19
Ham	do	22	26	43	14	19	10
Lamb	do	8	14	2	2	1	13
Hens	do	23	25	24	23	22	19

[2] See United States Bureau of Labor Statistics Bul. No. 357.

[3] These are sirloin steak, round steak, rib roast, chuck roast, plate beef, pork chops, bacon, ham, lard, hens, flour, corn meal, eggs, butter, milk, bread, potatoes, sugar, cheese, rice, coffee, and tea.

[4] Articles added in 1921 are lamb, canned salmon, evaporated milk, oleomargarine, nut margarine, vegetable lard substitute, rolled oats, corn flakes, wheat cereal, macaroni, navy beans, onions, cabbage, baked beans, canned corn, canned peas, canned tomatoes, prunes, raisins, bananas, and oranges.

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TABLE 7.—FOOD WEIGHTS: ANNUAL CONSUMPTION PER FAMILY—Continued

Article	Unit	United States	North Atlantic	South Atlantic	North Central	South Central	Western
Salmon, canned	Pound	9	10	9	9	9	6
Milk, fresh	Quart	337	412	155	364	177	377
Milk, evaporated	Pound	77	95	73	48	85	92
Butter	do	66	75	56	53	60	89
Oleomargarine	do	16	8	9	30	16	8
Nut margarine	do	6	4	5	11	3	2
Cheese	do	12	12	13	12	11	15
Lard	do	34	27	38	45	38	18
Vegetable lard substitute	do	9	6	10	5	22	16
Eggs, strictly fresh	Dozen	61	68	57	53	55	70
Bread	Pound	531	642	417	521	450	438
Flour	do	264	224	313	263	318	280
Corn meal	do	54	29	108	39	140	34
Rolled oats	do	41	45	31	39	38	45
Corn flakes	do	7	6	6	6	13	5
Wheat cereal	do	7	7	2	6	3	12
Macaroni	do	23	25	15	20	29	27
Rice	do	35	32	55	26	56	28
Beans, navy	do	22	23	17	25	21	19
Potatoes	do	704	746	514	810	485	706
Onions	do	66	72	52	62	82	64
Cabbage	do	65	62	61	70	66	61
Beans, baked	do	7	8	10	6	5	4
Corn, canned	do	10	8	9	13	10	10
Peas, canned	do	10	10	9	13	9	9
Tomatoes, canned	do	16	15	21	10	35	12
Sugar	do	147	140	145	154	133	161
Tea	do	8	13	6	5	3	6
Coffee	do	40	33	42	45	52	35
Prunes	do	11	14	9	11	8	10
Raisins	do	9	9	4	11	7	12
Bananas	Dozen [1]	11	11	8	11	13	9
Oranges	do	7	6	9	6	9	8

[1] In cities where most of the sales on bananas are by the pound rather than by the dozen, the weightings as given in the above table have been multiplied by 3 and have then been applied to the prices on the pound.

By giving to each article a weighting equal to its relative importance in the consumption of the average family, the total expenditure for food on a given date forms a proper basis of comparison with the expenditure for the same articles of food on any other date. For the purpose of showing the movement in retail prices it is assumed that this relative importance remained the same through the whole period under review. The average family expenditure in each city in the year 1913 has therefore been taken as the base for that city, and index numbers have been computed for each year from 1913 to 1926 and for each month of 1925 and 1926, following the same method used for the United States as a whole. These index numbers show the trend in the retail cost of all foods combined in each individual city as compared with the average cost in that city in the year 1913.

Retail Prices of Coal

TABLE 8 shows for the United States both average and relative retail prices of Pennsylvania white ash anthracite coal, stove and chestnut sizes, and of bituminous coal in January and July, 1913, to 1924, and for each month of 1925 and 1926. An average price for the year 1913 has been made from the averages for January and July

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of that year and the average price for each month has been divided by this average price for the year 1913 to obtain the relative prices shown.

TABLE 8.—AVERAGE AND RELATIVE PRICES OF COAL IN THE UNITED STATES, JANUARY, 1913, TO DECEMBER, 1926

Year and month	Pennsylvania anthracite, white ash				Bituminous	
	Stove		Chestnut		Average price	Relative price
	Average price	Relative price	Average price	Relative price		
1913—						
Average for year	$7.73	100.0	$7.91	100.0	$5.43	100.0
January	7.99	103.4	8.15	103.0	5.48	100.8
July	7.46	96.6	7.68	97.0	5.39	99.2
1914—						
January	7.80	100.9	8.00	101.0	5.97	109.9
July	7.60	98.3	7.78	98.3	5.46	100.6
1915—						
January	7.83	101.4	7.99	101.0	5.71	105.2
July	7.54	97.6	7.73	97.7	5.44	100.1
1916—						
January	7.93	102.7	8.13	102.7	5.69	104.8
July	8.12	105.2	8.28	104.6	5.52	101.6
1917—						
January	9.29	120.2	9.40	118.8	6.96	128.1
July	9.08	117.5	9.16	115.7	7.21	132.7
1918—						
January	9.88	127.9	10.03	126.7	7.68	141.3
July	9.96	128.9	10.07	127.3	7.92	145.8
1919—						
January	11.51	149.0	11.61	146.7	7.90	145.3
July	12.14	157.2	12.17	153.8	8.10	149.1
1920—						
January	12.59	162.9	12.77	161.3	8.81	162.1
July	14.28	184.9	14.33	181.1	10.55	194.1
1921—						
January	15.99	207.0	16.13	203.8	11.82	217.6
July	14.90	192.8	14.95	188.9	10.47	192.7
1922—						
January	14.98	193.9	15.02	189.8	9.89	182.0
July	14.87	192.4	14.92	188.5	9.49	174.6
1923—						
January	15.43	199.7	15.46	195.3	11.18	205.7
July	15.10	195.5	15.05	190.1	10.04	184.7
1924—						
January	15.77	204.1	15.76	199.1	9.75	179.5
July	15.24	197.2	15.10	190.7	8.94	164.5
1925—						
January	15.45	200.0	15.37	194.2	9.24	170.0
February	15.43	199.7	15.34	193.9	9.36	172.2
March	15.41	199.4	15.32	193.6	9.16	168.6
April	15.02	194.4	14.83	187.4	8.75	161.0
May	14.98	193.8	14.78	186.8	8.63	158.8
June	15.05	194.8	14.84	187.5	8.61	158.4
July	15.14	196.0	14.93	188.6	8.61	158.5
August	15.35	198.6	15.07	190.4	8.69	159.8
September	15.64	202.4	15.48	195.7	9.11	167.7
October	15.87	205.4	15.72	198.6	9.24	169.9
November	(1)	(1)	(1)	(1)	9.71	178.6
December	(1)	(1)	(1)	(1)	9.74	179.2
1926—						
January	(1)	(1)	(1)	(1)	9.74	179.3
February	(1)	(1)	(1)	(1)	9.72	178.8
March	16.12	208.6	15.91	201.1	9.25	170.2
April	15.54	201.2	15.37	194.2	9.11	167.6
May	15.41	199.5	15.18	191.8	8.76	161.2
June	15.40	199.3	15.18	191.8	8.67	159.5
July	15.43	199.7	15.19	191.9	8.70	160.1
August	15.49	200.4	15.23	192.5	8.81	162.1
September	15.55	201.3	15.30	193.4	9.25	170.3
October	15.56	201.4	15.31	193.5	9.59	176.5
November	15.64	202.4	15.41	194.7	10.24	188.4
December	15.66	202.7	15.44	195.0	10.15	186.8

[1] Insufficient data.

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Retail Prices of Gas

THE net price per 1,000 cubic feet of gas for household use in each of 51 cities is shown in the following table. In this table the average family consumption of manufactured gas is assumed to be 3,000 cubic feet per month. In cities where a service charge or a sliding scale is in operation, families using less than 3,000 cubic feet per month pay a somewhat higher rate than here shown, while those consuming more than this amount pay a lower rate. The figures here given are believed to represent quite closely the actual monthly cost of gas per 1,000 cubic feet to the average wage earner's family. Prices for natural gas have been quoted for those cities where it is in general use. These prices are based on an estimated average family consumption of 5,000 cubic feet per month. For Buffalo and Los Angeles prices are given for natural and manufactured gas mixed.

TABLE 9.—NET PRICE PER 1,000 CUBIC FEET OF GAS BASED ON A FAMILY CONSUMPTION OF 3,000 CUBIC FEET, IN SPECIFIED MONTHS FROM APRIL, 1913, TO DECEMBER, 1926, BY CITIES

Manufactured gas

City	Apr. 15, 1913	Apr. 15, 1914	Apr. 15, 1915	Apr. 15, 1916	Apr. 15, 1917	Apr. 15, 1918	Apr. 15, 1919	Apr. 15, 1920	May 15, 1921	Mar. 15, 1922	Mar. 15, 1923	Mar. 15, 1924	June 15, 1924	June 15, 1925	June 15, 1926	Dec. 15, 1926
Atlanta	$1.00	$1.00	$1.00	$1.00	$1.00	$1.00	$1.15	$1.15	$1.90	$1.65	$1.65	$1.55	$1.55	$1.55	$1.55	$1.55
Baltimore	.90	.80	.80	.75	.75	.75	.75	.75	.75	.92	.92	.85	.85	.85	.85	.85
Birmingham	1.00	.95	.95	.95	.95	.95	.95	.95	.88	.88	.80	.80	.80	.80	.80	.80
Boston	.81	.81	.80	.80	.80	.86	1.05	1.08	1.40	1.34	1.25	1.20	1.20	1.18	1.18	1.18
Bridgeport	1.00	1.00	1.00	1.00	1.00	1.00	1.10	1.10	1.47	1.60	1.50	1.50	1.45	1.45	1.45	1.45
Buffalo	1.00	1.00	1.00	1.00	1.00	1.00	1.45	1.45	1.45	1.45						
Butte	1.49	1.49	1.49	1.49	1.49	1.49	1.49	1.49	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10
Charleston, S. C.	1.10	1.10	1.10	1.10	1.00	1.10	1.10	1.25	1.55	1.55	1.55	1.55	1.55	1.55	1.55	1.55
Chicago	.80	.80	.80	.80	.80	.72	.90	.87	1.20	1.07	1.07	1.02	1.02	1.02	1.02	1.02
Cleveland	.80	.80	.80	.80	.80	.80	.80	80	.80	.80	.80	1.25	1.25	1.25	1.25	1.25
Denver	.85	.80	.80	.80	.80	.85	.95	.95	.95	.95	.95	.95	.95	.95	.95	.95
Detroit	.75	.75	.75	.75	.75	.75	.79	.79	.85	.79	.79	.79	.82	.82	.79	.79
Fall River	.80	.80	.80	.80	.80	.95	.95	1.05	1.25	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Houston	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.09	1.09	1.09	1.09	1.09	1.09	1.05		
Indianapolis	.60	.55	.55	.55	.55	.55	.60	.60	.90	.90	1.20	1.15	1.15	1.10	1.05	1.05
Jacksonville	1.20	1.20	1.15	1.15	1.15	1.25	1.25	1.50	1.75	1.75	1.65	1.97	1.97	1.97	1.97	1.92
Manchester	1.10	1.10	1.00	1.00	1.00	1.00	1.18	1.18	1.58	1.48	1.48	1.38	1.38	1.38	1.38	1.38
Memphis	1.00	1.00	1.00	1.00	.93	.93	.93	1.27	1.35	1.35	1.20	1.20	1.20	1.20	1.20	1.20
Milwaukee	.75	.75	.75	.75	.75	.75	.75	.75	.90	.90	.86	.82	.82	.82	.82	.82
Minneapolis	.85	.80	.80	.77	.77	.77	.95	.95	1.28	1.02	1.03	1.00	1.01	.95	.97	.95
Mobile	1.10	1.10	1.10	1.10	1.10	1.10	1.35	1.35	1.80	1.80	1.80	1.80	1.80	1.80	1.80	1.80
Newark	1.00	.90	.90	.90	.90	.97	.97	1.15	1.40	1.40	1.25	1.25	1.20	1.20	1.20	1.20
New Haven	.90	.90	.90	.90	.90	1.00	1.10	1.10	1.27	1.27	1.18	1.18	1.18	1.13	1.13	1.13
New Orleans	1.10	1.00	1.00	1.00	1.00	1.00	1.30	1.30	1.39	1.45	1.30	1.30	1.30	1.30	1.30	1.30
New York	.84	.84	.83	.83	.83	.83	.85	.87	1.40	1.32	1.23	1.23	1.23	1.23	1.23	1.23
Norfolk	1.00	1.00	1.00	1.00	1.00	1.20	1.20	1.60	1.40	1.45	1.40	1.40	1.40	1.40	1.33	1.33
Omaha	1.15	1.15	1.15	1.00	1.00	1.15	1.15	1.15	1.47	1.27	1.18	1.18	1.18	1.08	1.08	1.08
Peoria	.90	.90	.90	.90	.85	.85	.85	.85	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Philadelphia	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Pittsburgh	1.00	1.00	1.00	1.00	1.00	1.00	1.00									
Portland, Me.	1.10	1.00	1.00	1.00	1.00	1.00	1.40	1.40	1.85	1.75	1.55	1.55	1.55	1.55	1.50	1.42
Portland, Oreg.	.95	.95	.95	.95	.95	.95	.95	.95	1.38	1.25	1.16	1.16	1.16	1.16	1.19	1.19
Providence	.85	.85	.85	.85	.85	1.00	1.30	1.30	1.42	1.42	1.27	1.22	1.22	1.17	1.17	1.13
Richmond	.90	.90	.90	.80	.80	.80	1.00	1.00	1.30	1.30	1.30	1.30	1.30	1.30	1.29	1.29
Rochester	.95	.95	.95	.95	.95	.95	.95	.95	1.18	1.10	1.05	1.00	1.00	1.00	1.00	1.00
St. Louis	.80	.80	.80	.80	.75	.75	.75	.85	1.05	1.05	1.00	1.00	1.00	1.00	1.00	1.00
St. Paul	.95	.90	.90	.85	.85	.85	.85	.85	1.00	1.00	1.00	.85	.85	.85	.90	.90
Salt Lake City	.87	.87	.87	.87	.87	.87	1.15	1.35	1.57	1.57	1.57	1.57	1.57	1.53	1.53	1.52
San Francisco	.75	.85	.85	.85	.85	.85	.95	.95	1.05	1.04	.92	1.00	1.00	1.05	.95	.95
Savannah								1.25	1.60	1.60	1.45	1.45	1.45	1.45	1.45	1.45
Scranton	.95	.95	.95	.95	.95	1.15	1.30	1.30	1.70	1.70	1.60	1.50	1.50	1.50	1.50	1.40
Seattle	1.00	1.00	1.00	1.00	1.00	1.20	1.20	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45	1.45
Springfield, Ill.	1.00	1.00	1.00	1.00	1.00	1.00	1.10	1.10	1.40	1.40	1.40	1.35	1.35	1.35	1.25	1.25
Washington, D.C.	.93	.93	.93	.93	.80	.90	.95	.95	1.25	1.10	1.05	1.00	1.00	1.00	1.00	1.00

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TABLE 9.—NET PRICE PER 1,000 CUBIC FEET OF GAS, BASED ON A FAMILY CONSUMPTION OF 5,000 CUBIC FEET, IN SPECIFIED MONTHS FROM APRIL, 1913, TO DECEMBER, 1926, BY CITIES—Continued

Natural gas

City	Apr. 15, 1913	Apr. 15, 1914	Apr. 15, 1915	Apr. 15, 1916	Apr. 15, 1917	Apr. 15, 1918	Apr. 15, 1919	Apr. 15, 1920	May 15, 1921	Mar. 15, 1922	Mar. 15, 1923	Mar. 15, 1924	June 15, 1924	June 15, 1925	June 15, 1926	Dec. 15, 1926
Buffalo	$0.30	$0.30	$0.30	$0.30	$0.30	$0.30	$0.35	$0.35	$0.35	$0.42						
Cincinnati	.30	.30	.30	.30	.35	.35	.35	.35	.35	.50	$0.50	$0.50	$0.50	$0.75	$0.75	$0.75
Cleveland	.30	.30	.30	.30	.30	.30	.35	.35	.35	.40	.40	.55	.55	.55	.60	.60
Columbus	.30	.30	.30	.30	.30	.30	.30	.30	.30	.45	.45	.45	.45	.55	.55	.55
Dallas	.45	.45	.45	.45	.45	.45	.45	.45	.68	.68	.68	.68	.68	.74	.74	.74
Houston															.75	.75
Kansas City, Mo.	.27	.27	.27	.27	.30	.60	.80	.80	.90	.90	.95	.95	.95	.95	.95	.95
Little Rock	.40	.40	.40	.40	.40	.40	.45	.45	.45	.45	.45	.65	.65	.65	.65	.65
Louisville		.45	.45	.45	.45	.45	.45	.45	.45	.45	.45	.45	.45	.45	.45	.45
Pittsburgh	.28	.28	.28	.28	.28	.28	.35	.35	.45	.50	.50	.53	.53	.60	.60	.60

Manufactured and natural gas mixed

Buffalo											$0.62	$0.62	$0.60	$0.60	$0.65	$0.65
Los Angeles			$0.68	$0.68	$0.68	$0.68	$0.75	$0.75	$0.75	$0.76	.68	.68	.68	.68	.68	.68

From the prices quoted on manufactured gas, average prices have been computed for all of the cities combined and are shown in the next table for April 15 of each year from 1913 to 1920, and for May 15, September 15, and December 15, 1921; March 15, June 15, September 15, and December 15, 1922, 1923, and 1924; and June 15 and December 15, 1925 and 1926. These prices are based on an estimated average family consumption of 3,000 cubic feet.

Relative prices have been computed by dividing the price of each year by the price in April, 1913.

The price of manufactured gas in December, 1926, showed an increase of 28.4 per cent since April, 1913. From June, 1926, to December, 1926, there was a decrease of eight-tenths of 1 per cent in the price of gas.

TABLE 10.—AVERAGE AND RELATIVE NET PRICE PER 1,000 CUBIC FEET OF MANUFACTURED GAS, BASED ON A FAMILY CONSUMPTION OF 3,000 CUBIC FEET IN SPECIFIED MONTHS OF EACH YEAR, 1913 TO 1926

Date	Average net price	Relative price	Date	Average net price	Relative price
Apr. 15, 1913	$0.95	100.0	Dec. 15, 1922	$1.25	131.6
Apr. 15, 1914	.94	98.9	Mar. 15, 1923	1.25	131.6
Apr. 15, 1915	.93	97.9	June 15, 1923	1.24	130.5
Apr. 15, 1916	.92	96.8	Sept. 15, 1923	1.24	130.5
Apr. 15, 1917	.91	95.8	Dec. 15, 1923	1.25	131.6
Apr. 15, 1918	.95	100.0	Mar. 15, 1924	1.24	130.5
Apr. 15, 1919	1.04	109.5	June 15, 1924	1.24	130.5
Apr. 15, 1920	1.09	114.7	Sept. 15, 1924	1.24	130.5
May 15, 1921	1.32	138.9	Dec. 15, 1924	1.24	130.5
Sept. 15, 1921	1.31	137.9	June 15, 1925	1.23	129.5
Dec. 15, 1921	1.30	136.8	Dec. 15, 1925	1.23	129.5
Mar. 15, 1922	1.29	135.8	June 15, 1926	1.23	129.5
June 15, 1922	1.27	133.7	Dec. 15, 1926	1.22	128.4
Sept. 15, 1922	1.26	132.6			

Retail Prices of Electricity

THE following table shows for 51 cities the net rates per kilowatt hour of electricity used for household purposes for specified months, in 1913, 1925, and 1926. For the cities having more than

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one tariff for domestic consumers the rates are shown for the schedule under which most of the residences are served.

The consumption per month is expressed in hours of demand for several of the cities from which prices for electricity have been obtained. Since the demand is determined by a different method in each city, the explanation of these methods is given on pages 508 and 509.

TABLE 11.—NET PRICE PER KILOWATT-HOUR FOR ELECTRICITY FOR HOUSEHOLD USE IN DECEMBER, 1913, AND JUNE AND DECEMBER, 1925 AND 1926, FOR 51 CITIES

City	Measure of consumption, per month	December, 1913	June, 1925	December, 1925	June, 1926	December, 1926
		Cents	*Cents*	*Cents*	*Cents*	*Cents*
Atlanta	First 100 kilowatt-hours	[1] 7.0	8.1	8.1	8.1	8.1
Baltimore [2]	First 20 hours' use of demand	[3] 8.5	[4] 8.0	8.0	8.0	8.0
	Next kilowatt-hours up to 800			4.0	4.0	4.0
Birmingham	First 100 kilowatt-hours	[5] 8.5	7.7	7.7	7.7	7.7
Boston:						
Company A	First 1,000 kilowatt-hours	[6] 10.0	9.5	8.5	8.5	8.5
Company B	do	[6] 10.0	9.5	8.5	8.5	8.5
Bridgeport	All current	9.0	6.5	6.5	6.5	6.5
Buffalo [2]	First 60 hours' use of demand	7.0	5.0	5.0	5.0	5.0
	Next 120 hours' use of demand	5.0	4.0	4.0	4.0	4.0
	Excess	1.5	1.5	1.5	1.5	1.5
Butte	First 25 kilowatt-hours	[7] 9.5	8.0	8.0	8.0	8.0
	Next 25 kilowatt-hours		4.0	4.0	4.0	4.0
Charleston	First 50 kilowatt-hours	[8] 10.0	10.0	10.0	10.0	10.0
	Next 50 kilowatt-hours	8.0				
Chicago [2]	First 30 hours' use of demand	10.0	8.0	8.0	8.0	8.0
	Next 30 hours' use of demand	5.0	5.0	5.0	5.0	5.0
	Excess	4.0	3.0	3.0	3.0	3.0
Cincinnati [2]	First 30 hours' use of demand	9.5	8.5	8.5	8.5	8.5
	Nest 30 hours' use of demand	6.7	6.5	6.5	6.5	6.5
	Excess	3.8	3.5	3.5	3.5	3.5
Cleveland:						
Company A	First 500 kilowatt-hours	[9] 10.0	[6] 5.0	[6] 5.0	5.0	5.0
	Excess	5.0				
Company B	All current	[10] 8.0	[11] 3.0	[11] 3.0	[11] 3.0	[11] 3.0
	Next 600 kilowatt-hours	5.0				
Columbus	First 75 kilowatt-hours	[6] 7.0	[6] 7.0	[6] 7.0	7.0	7.0
Dallas	First 800 kilowatt-hours	10.0	6.0	6.0	6.0	6.0
Denver	All current	8.0	8.0	8.0	8.0	8.0
Detroit	First 3 kilowatt-hours per active room	[12] 12.6	10.8	10.8	9.0	9.0
	Excess	3.6	3.6	3.6	3.6	3.6
Fall River	First 25 kilowatt-hours	[13] 9.5	9.0	9.0	8.5	8.5
	Next 975 kilowatt-hours		8.5	8.5	7.5	7.5
Houston [2]	First 30 hours' use of demand	[14] 12.4	7.2	7.2	7.2	7.2
	Excess	7.0	4.5	4.5	4.5	4.5
Indianapolis:						
Company A	First 50 kilowatt-hours	[15] 7.5	6.8	6.8	6.8	6.8
	Next 150 kilowatt-hours		6.3	6.3	6.3	6.3
Company B	First 50 kilowatt-hours	[13] 7.0	6.8	6.8	6.8	6.8
	Next 150 kilowatt-hours		6.3	6.3	6.3	6.3

[1] First 150 kilowatt-hours.
[2] For determination of demand see explanation following table.
[3] First 50 kilowatt-hours.
[4] First 40 kilowatt-hours.
[5] The gross rate is 10 cents per kilowatt-hour with discounts of 10 per cent for a monthly consumption of 1 to 25 kilowatt-hours and 15 per cent for a monthly consumption of 25 to 150 kilowatt-hours. The average family used 25 or more kilowatt-hours per month.
[6] All current.
[7] First 100 kilowatt-hours.
[8] First 25 kilowatt-hours.
[9] First 36 hours' use of demand. For determination of demand see explanation following table.
[10] First 10 kilowatt-hours.
[11] Service charge 30 cents per month additional.
[12] First 2 kilowatt-hours per active room.
[13] First 200 kilowatt-hours.
[14] First 2 kilowatt-hours per 16 candlepower of installation.
[15] All current. This rate applies to a 5-year contract with a minimum charge of $1 per month. For a 1-year contract the rates per kilowatt-hour are 10 cents without a minimum charge, or 9⅝ cents with a minimum of $1 per month.

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TABLE 11.—NET PRICE PER KILOWATT-HOUR FOR ELECTRICITY FOR HOUSEHOLD USE IN DECEMBER, 1913, AND JUNE AND DECEMBER, 1925 AND 1926, FOR 51 CITIES—Continued

City	Measure of consumption, per month	December, 1913	June, 1925	December, 1925	June, 1926	December, 1926
		Cents	*Cents*	*Cents*	*Cents*	*Cents*
Jacksonville	All current	7.0	7.0	7.0	7.0	7.0
Kansas City	First 5 kilowatt-hours per active room (minimum, 3 rooms).	[16] 9.9	7.5	7.5	7.5	7.5
	Next 5 kilowatt-hours per room	-------	5.0	5.0	5.0	5.0
	Excess	4.5	2.5	2.5	2.5	2.5
Little Rock	First 200 kilowatt-hours	[6] 13.5	10.0	10.0	10.0	10.0
Los Angeles:						
Company A	First 100 kilowatt-hours	5.5	5.6	5.6	5.6	5.6
Company B	----do----	5.5	-------	-------	-------	-------
Louisville	1 to 149 kilowatt-hours	7.6	7.6	7.6	7.6	7.6
Manchester	First 25 kilowatt-hours	[6] 11.4	12.0	12.0	12.0	12.0
	Next 50 kilowatt-hours	-------	6.0	6.0	6.0	6.0
Memphis	First 6 kilowatt-hours per room	[6] 10.0	8.0	8.0	8.0	8.0
	Excess	-------	5.0	5.0	5.0	5.0
Milwaukee	First 9 kilowatt-hours for each of the first 6 active rooms.[19]	[17] 11.4	[18] 7.6	[18] 7.6	[18] 7.6	6.7
	Additional energy up to 9 kilowatt-hours for each active room.	[20] 4.8	5.7	5.7	5.7	-------
	Excess	3.8	3.1	3.1	3.1	2.9
Minneapolis	First 3 kilowatt-hours per active room	8.6	9.5	9.5	9.5	9.5
	Next 3 kilowatt-hours per active room	[21] 5.7	7.1	7.1	7.1	7.1
Mobile	First 50 kilowatt-hours	7.0	9.0	9.0	9.0	9.0
Newark	First 20 kilowatt-hours	[22] 10.0	9.0	9.0	9.0	9.0
	Next 480 kilowatt-hours	-------	8.0	8.0	8.0	8.0
New Haven	All current	9.0	6.5	6.5	6.5	6.5
New Orleans	First 20 kilowatt-hours [23]	[24] 13.0	9.1	9.1	9.1	9.1
	Next 30 kilowatt-hours	[21] 6.0	7.8	7.8	7.8	7.8
New York:						
Company A	First 1,000 kilowatt-hours	[25] 10.0	[26] 7.3	[26] 7.2	[26] 7.2	[26] 7.2
Company B	All currents [27]	10.0	10.0	10.0	10.0	10.0
Company C [2]	First 60 hours' use of demand	11.0	[26] 7.8	[26] 7.8	[26] 7.8	[26] 7.8
Norfolk	First 60 kilowatt-hours	[7] 9.0	[7] 9.0	[7] 9.0	9.0	9.0
Omaha	All current	[24] 11.4	5.5	5.5	5.5	5.5
	Next 125 kilowatt-hours	[21] 5.7	-------	-------	-------	-------
Peoria	First 5 kilowatt-hours for each of the first 2 rooms.[28]	[29] 9.9	9.0	9.0	9.0	9.0
	Second 5 kilowatt-hours for each of the first 2 rooms.[28]	-------	6.0	6.0	6.0	6.0
Philadelphia:						
Company A	First 12 kilowatt-hours	[6] 10.0	8.0	8.0	8.0	8.0
	Next 36 kilowatt-hours	-------	[30] 7.0	[30] 7.0	7.0	7.0
Company B	First 20 kilowatt-hours	[22] 10.0	9.0	9.0	9.0	9.0
	Next 480 kilowatt-hours	-------	8.0	8.0	8.0	8.0
Pittsburgh [2]	First 30 hours' use of demand	[6] 10.0	8.0	8.0	8.0	8.0
	Next 60 hours' use of demand	-------	5.5	5.5	5.5	5.5
Portland, Me	All current	9.0	8.0	8.0	8.0	8.0
Portland, Oreg.:						
Company A	First 9 kilowatt-hours	7.6	7.6	7.6	7.6	7.6
	Next kilowatt-hours [31]	[32] 6.7	6.7	6.7	6.7	6.7
	Next 50 kilowatt-hours	[33] 5.7	2.9	2.9	2.9	2.9

[2] For determination of demand, see explanation following table.
[6] All current.
[7] First 100 kilowatt-hours.
[16] First 3 kilowatt-hours per active room; minimum, 3 rooms.
[17] First 4 kilowatt-hours for each of the first 4 active rooms and the first 2½ kilowatt-hours for each additional active room.
[18] First 5 kilowatt-hours for each of the first 5 active rooms and the first 2½ kilowatt-hours for each additional active room.
[19] And the first 7 kilowatt-hours per month for each active room in addition to the first 6.
[20] Additional energy up to 100 kilowatt-hours.
[21] Excess.
[22] First 500 kilowatt-hours.
[23] Surcharge, 25 cents per month additional.
[24] First 30 hours' use of connected load.
[25] First 250 kilowatt-hours.
[26] Price includes a coal charge.
[27] A discount of 5 per cent is allowed on all bills of $2 or over when payment is made within 10 days from date of bill.
[28] And 4 kilowatt-hours for each additional active room.
[29] 1 to 200 kilowatt-hours.
[30] Next 48 kilowatt-hours.
[31] The number of kilowatt-hours paid for at this rate is that in excess of the first 9 kilowatt-hours until 100 hours' use of the demand is reached. After 100 hours of demand have been consumed the lower rate can be applied. For determination of demand, see explanation following table.
[32] Next 70 kilowatt-hours.
[33] Next 100 kilowatt-hours.

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TABLE 11.—NET PRICE PER KILOWATT-HOUR FOR ELECTRICITY FOR HOUSEHOLD USE IN DECEMBER, 1913, AND JUNE AND DECEMBER, 1925 AND 1926, FOR 51 CITIES—Continued

City	Measure of consumption, per month	December, 1913	June, 1925	December, 1925	June, 1926	December, 1926
		Cents	*Cents*	*Cents*	*Cents*	*Cents*
Portland, Oreg.—Con.						
Company B	First 13 kilowatt-hours	[34] 9.0	7.3	7.3	7.3	7.3
	Next 7 kilowatt-hours	[35] 7.0	[36] 6.7	6.7	6.7	6.7
	Next 50 kilowatt-hours	[21] 4.0	2.9	2.9	2.9	2.9
Providence	All current	10.0	[37] 6.9	[37] 6.8	[37] 6.8	[37] 6.9
Richmond	First 60 kilowatt-hours	[7] 9.0	[7] 9.0	[7] 9.0	9.0	9.0
Rochester	All current	8.0	8.0	8.0	8.0	8.0
St. Louis:						
Company A	First 9 kilowatt-hours per active room	[17] 9.5	6.7	6.7	6.7	6.7
	Excess	5.7	2.4	2.4	2.4	2.4
Company B	First kilowatt-hours [38]	[39] 9.0	6.7	6.7	6.7	6.7
	Excess	5.7	2.4	2.4	2.4	2.4
St. Paul	First 3 kilowatt-hours per room	[40] 9.9	[40] 9.9	[40] 9.9	9.5	9.5
	Next 3 kilowatt-hours per room				7.1	7.1
	Excess	6.6	6.6	6.6	2.9	2.9
Salt Lake City	First 250 kilowatt-hours	9.0	8.1	8.1	8.1	8.1
San Francisco:						
Company A	First 10 kilowatt-hours	[7] 7.0	9.0	9.0	9.0	9.0
	Next 40 kilowatt-hours		6.0	6.0	6.0	6.0
Company B	First 10 kilowatt-hours	[7] 7.0	9.0	9.0	9.0	9.0
	Next 40 kilowatt hours		6.0	6.0	6.0	6.0
Savannah	First 100 kilowatt-hours	[10] 12.0	9.0	9.0	9.0	9.0
	Excess	6.0				
Scranton	First 150 kilowatt-hours	[6] 9.0	10.0	10.0	10.0	10.0
Seattle:						
Company A	First 40 kilowatt-hours	[41] 6.0	5.5	5.5	5.5	5.5
Company B	----do	[41] 6.0	5.5	5.5	5.5	5.5
Springfield:						
Company A	First 30 kilowatt-hours	[42] 10.0	6.0	6.0	6.0	6.0
	Next 70 kilowatt-hours	[43] 7.0	3.0	3.0	3.0	3.0
Company B	First 30 kilowatt-hours		6.0	6.0	6.0	6.0
	Next 70 kilowatt-hours		3.0	3.0	3.0	3.0
Washington, D. C.[2]	First 120 hours' use of demand	10.0	7.5	7.5	7.0	7.0

[2] For determination of demand see explanation following table.
[6] All current.
[7] First 100 kilowatt-hours.
[10] First 10 kilowatt-hours.
[17] First 4 kilowatt-hours for each of the first 4 active rooms and the first 2½ kilowatt-hours for each additional active room.
[21] Excess.
[34] First 6 per cent of demand. For determination of demand see explanation following table.
[35] Next 6 per cent of demand. For determination of demand see explanation following table.
[36] For an installation of 600 watts or less 7 kilowatt-hours will apply. For each 30 watts of installation in excess of 600 watts 1 additional kilowatt-hour will apply.
[37] Service charge, 50 cents per month additional. Reductions under the fuel clause were 1 mill in December, 1926, and June, 1925, and 2 mills in December, 1925, and June, 1926.
[38] For a house of 4 rooms or less, 18 kilowatt-hours; for 5 or 6 rooms, 27 kilowatt-hours; and for 7 or 8 rooms, 36 kilowatt-hours.
[39] For a house of 6 rooms or less, 15 kilowatt-hours; for a house of 7 or 8 rooms, 20 kilowatt-hours.
[40] First 30 kilowatt-hours
[41] First 60 kilowatt-hours.
[42] First 30 hours' use of demand. For determination of demand see explanation following table.
[43] Next 30 hours' use of demand. For determination of demand see explanation following table.

Determination of Demand

SEVERAL cities have sliding scales based on a variable number of kilowatt-hours payable at each rate. The number of kilowatt-hours payable at each rate in these cities is determined for each customer according to the watts of installation, either in whole or in part, in the individual home. The number of watts so determined is called the customer's "demand."

In Baltimore the demand is the maximum normal rate of use of electricity in any half-hour period of time. It may be estimated or determined by the company from time to time according to the cus-

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tomer's normal use of electricity and may equal the total installation reduced to kilowatts.

In Buffalo the demand consists of two parts—lighting, 25 per cent of the total installation, but never less than 250 watts; and power, 2½ per cent of the capacity of any electric range, water heater, or other appliance of 1,000 watts or over and 25 per cent of the rated capacity of motors exceeding one-half horsepower but less than 1 horsepower. The installation is determined by inspection of premises.

In Chicago the equivalent in kilowatt-hours to 30 hours' use of demand has been estimated as follows: For a rated capacity of 475 to 574 watts, 11 kilowatt-hours; 575 to 674 watts, 12 kilowatt-hours; 675 to 774 watts, 13 kilowatt-hours; and 775 to 874 watts, 14 kilowatt-hours. Although the equivalent in kilowatt-hours to 30 hours' use of demand of from 1 to 1,500 watts is given on the printed tariff, the equivalent is here shown only for installations of from 475 to 874 watts; the connected load of the average workingman's home being, as a rule, within this range.

In Cincinnati the demand has been estimated as being 70 per cent of the connected load, excluding appliances.

In Cleveland, from December, 1913, to December, 1919, inclusive, Company A determined the demand by inspection as being 40 per cent of the connected load. From December, 1919, to the present time there has been a flat rate for all current consumed.

In Houston the demand is estimated as 50 per cent of the connected load, each socket opening being rated at 50 watts.

In New York the demand for Company C, when not determined by meter, has been computed at 50 per cent of total installation in residences, each standard socket being rated at 50 watts and all other outlets being rated at their actual kilowatt capacity.

In Pittsburgh since December, 1919, the demand has been determined by inspection. The first 10 outlets have been rated at 30 watts each, the next 20 outlets at 20 watts each, and each additional outlet at 10 watts. Household utensils and appliances of not over 660 watts each have been excluded.

In Portland, Oreg., the demand for Company A has been estimated as one-third of the connected lighting load. Ranges, heating devices, and small power up to rated capacity of 2 kilowatts are not included.

For Company B the demand, when not based on actual measurement, was estimated at one-third of the connected load. No demand was established at less than 233 watts.

In Springfield, Ill., the demand for Company A in December, 1913, was the active load predetermined as follows: 80 per cent of the first 500 watts of connected load plus 60 per cent of that part of the connected load in excess of the first 500 watts—minimum active load, 150 watts.

In Washington, D. C., the demand is determined by inspection and consists of 100 per cent of the connected load, excluding small fans and heating and cooking appliances when not permanently connected.

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Wholesale Prices in the United States

Wholesale Prices in 1926

THE general trend of wholesale prices was downward in 1926. From January to December the bureau's weighted index number, including 404 commodities or price series, declined 6 per cent. Farm products in particular showed large decreases in price. Grains fell over 18 per cent from January to November, and although a slight recovery took place in December, the end of the year found prices considerably below those of the beginning; these prices in 1926 averaged about 14 per cent lower than in 1925. Cattle prices declined in the early months of the year, reacted to some extent in June, but declined to new low levels in August. Somewhat higher prices prevailed during the rest of the year. Hog prices were erratic, rising to high levels in June and subsiding thereafter. Prices of sheep and lambs also varied widely during the year, the average being well below that of 1925. Compared with 1913 prices, cattle in 1926 were relatively much lower than either hogs or sheep. Cotton, hides, tobacco, and wool averaged considerably lower than in the year before, while potatoes were higher. Timothy hay varied but little in price from the preceding year, but alfalfa and clover hay showed increases. All farm products, considered in the aggregate, were about 10 per cent lower than in 1925.

Among food products there were marked variations during the year in the prices of fresh and cured meats, butter, eggs, coffee, flour, fruits, lard, and sugar. Prices in this group averaged about 3 per cent lower than in 1925. Clothing materials showed considerable declines from prices of the preceding year, cotton goods in particular being much cheaper.

Prices of anthracite coal, owing to the strike, were available for only 10 months of the year. These showed a small decline from March to June and a rise thereafter. Averages for 1925 and 1926, based on months for which prices could be obtained, showed an increase of nearly 4 per cent. Bituminous coal declined in the early months of the year, but increased rapidly thereafter. In November, prices were 22 per cent above those prevailing in April. The average for 1926 was, however, only 3 per cent above the 1925 average. Coke prices were quite erratic, Connellsville furnace coke at the ovens averaging $7.84 per ton in February and declining to $2.84 in June. Crude petroleum, fuel oil, and gasoline were fairly stable in price during most of the year.

Iron and steel prices averaged slightly below those of 1925, being highest in January and lowest in June. Nonferrous metals likewise were somewhat lower than in the year before, the December average being but little above the pre-war level. All metals averaged 2.5 per cent lower than in 1925. Prices of lumber were on a par with those of the year before, while other building materials were somewhat cheaper. Chemicals showed a drop from 1925 prices, but fertilizer materials and drugs showed a slight increase. House-furnishing goods, including furniture, were cheaper than in 1925.

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In the group of miscellaneous commodities, cattle-feed prices were 13 per cent lower than in 1925, while leather, paper and pulp, and other commodities, particularly rubber, also were lower.

Comparing prices in 1926 with those prevailing in 1913, the group of commodities showing the largest increase was that of fuels, in which the rise was 79.9 per cent. Clothing materials came next with an increase of 75.9 per cent. Other increases were: Building materials, 73.4 per cent; house-furnishing goods, 61.8 per cent; foods, 52.9 per cent; farm products, 42.2 per cent; chemicals and drugs, 30.6 per cent; metals, 26.7 per cent; and miscellaneous commodities, 23.9 per cent. All commodities on an average were 51 per cent higher in 1926 than in 1913.

The table which follows shows for each of the 10 groups the number of commodities or separate commodity units for which comparable wholesale prices were obtained for use in the weighted index for the years 1925 and 1926, and the number that increased or decreased in 1926 as compared with the year previous:

TABLE 1.—CHANGES IN AVERAGE PRICES FROM 1925 TO 1926, BY GROUPS OF COMMODITIES

Change	Farm products	Foods	Clothing materials	Fuels	Metals and metal products	Building materials	Chemicals and drugs	House-furnishing goods	Miscellaneous	All commodities
Increases	14	21	5	14	7	12	16	3	3	95
Decreases	46	69	50	5	27	19	23	21	18	278
No change		2	10		3	1	4	7	4	31
Total	60	92	65	19	37	32	43	31	25	404

Wholesale Prices, 1913 to 1926

THE figures in the table which follows afford a comparison of wholesale-price fluctuations of different groups of commodities since 1913. Similar information for each month of the period from 1913 to 1924 has been published in Bulletin No. 367 (pp. 219–229) and Bulletin No. 390 (pp. 16–23).

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TABLE 2.—INDEX NUMBERS OF WHOLESALE PRICES, BY GROUPS AND SUBGROUPS OF COMMODITIES, 1913–1926

[1913=1000]

Year and month	Farm products				Foods				Clothing materials	
	Grains	Live-stock and poul-try	Other farm prod-ucts	All farm prod-ucts	Meats	Butter, cheese, and milk	Other foods	All foods	Boots and shoes	Cotton goods
1913	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1914	108.5	103.0	99.4	102.6	104.0	96.6	102.3	101.8	103.3	94.6
1915	135.2	95.1	97.6	103.9	95.9	95.5	111.4	104.5	107.3	88.9
1916	141.7	113.9	122.5	122.8	111.2	107.8	130.2	121.2	126.8	121.6
1917	243.7	167.6	185.0	189.6	150.3	143.4	182.7	167.2	168.3	176.2
1918	239.2	201.8	224.6	218.5	185.5	171.7	194.8	188.4	180.4	264.8
1919	250.6	210.9	240.4	230.8	196.0	194.8	215.4	206.6	248.2	267.0
1920	255.5	175.4	240.7	217.9	179.5	194.4	246.7	219.7	278.2	328.6
1921	134.2	107.7	134.2	123.7	134.3	144.7	148.5	144.0	204.7	158.5
1922	124.2	116.4	153.7	133.3	130.2	132.8	144.2	138.4	180.9	171.7
1923	124.5	109.6	178.8	141.1	123.2	152.1	150.9	143.8	183.1	199.1
1924	141.3	112.4	173.6	143.4	129.0	139.5	153.0	144.2	182.1	194.5
1925										
Average for year	172.3	140.1	167.0	158.1	155.0	147.9	162.1	157.5	186.2	181.1
January	201.7	123.2	182.6	163.4	140.5	147.0	174.0	159.8	185.4	185.7
February	198.7	126.9	175.7	161.5	141.6	147.7	168.1	156.9	185.9	184.3
March	179.6	143.8	167.9	161.3	156.8	152.8	162.8	158.9	186.5	185.4
April	167.2	137.4	159.7	153.0	157.9	148.3	155.0	154.0	186.5	183.7
May	179.7	131.9	156.3	151.9	150.6	143.6	158.5	153.2	186.5	180.4
June	175.3	139.7	159.5	155.4	151.3	141.9	162.4	155.3	186.5	178.6
July	164.6	153.7	166.6	161.8	160.6	146.1	160.3	157.3	186.6	179.6
August	168.8	155.0	166.5	163.1	162.4	150.3	161.5	159.2	186.7	181.4
September	157.5	155.5	164.9	160.4	165.8	154.5	160.7	160.3	186.7	182.3
October	153.2	145.3	164.5	155.3	159.7	157.8	157.6	157.6	186.7	182.9
November	158.2	135.0	168.9	153.9	152.7	157.6	165.7	160.2	186.7	178.7
December	165.3	130.5	165.6	152.2	151.0	155.7	161.5	157.1	186.6	175.7
1926										
Average for year	148.1	135.4	144.4	142.2	153.6	148.6	155.0	152.9	185.2	160.3
January	169.7	129.5	163.4	151.8	150.7	152.8	160.9	156.2	186.1	172.5
February	163.5	135.9	155.4	149.9	149.0	151.2	156.8	153.2	186.1	170.0
March	152.2	133.9	148.4	144.0	149.9	148.0	154.2	151.4	186.1	167.2
April	154.1	133.1	150.4	144.9	152.8	145.0	157.1	153.2	186.0	164.3
May	150.7	138.2	145.3	144.2	156.3	142.6	157.2	153.8	186.0	161.5
June	145.0	143.5	141.6	143.7	163.8	142.6	158.8	156.6	185.8	158.8
July	145.8	138.1	139.5	140.8	159.4	141.9	155.5	153.6	184.2	157.3
August	139.2	131.9	141.7	137.9	153.4	144.7	152.6	150.8	184.3	160.3
September	138.6	141.0	140.8	141.1	157.4	150.0	151.1	152.0	184.3	161.3
October	142.5	139.5	133.7	138.4	154.3	152.6	151.7	152.0	184.3	153.0
November	138.1	129.2	136.7	134.6	148.1	154.5	152.3	151.1	184.3	150.3
December	142.2	128.8	136.0	134.9	146.9	158.7	151.5	151.0	184.3	146.6

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TABLE 2.—INDEX NUMBERS OF WHOLESALE PRICES, BY GROUPS AND SUBGROUPS OF COMMODITIES, 1913-1926—Continued

Year and month	Clothing materials			Fuels				Metals and metal products		
	Woolen goods	Silks, etc.	All clothing materials	Anthracite coal	Bituminous coal	Other fuels	All fuels	Iron and steel	Non-ferrous metals	All metals and metal products
1913	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1914	93.3	100.0	97.7	100.0	98.2	88.1	92.9	84.5	85.9	84.9
1915	102.7	92.0	98.3	99.9	95.1	80.8	87.9	89.2	122.6	99.3
1916	132.8	131.3	127.0	105.6	133.1	128.7	126.4	155.0	177.4	161.8
1917	194.4	154.2	175.3	113.5	219.4	158.3	168.9	251.2	184.7	231.0
1918	265.5	176.0	228.0	131.6	187.0	175.4	169.8	199.5	158.5	187.1
1919	259.4	237.1	252.9	158.6	197.3	182.2	180.5	176.0	130.3	162.1
1920	300.7	235.4	295.5	182.9	270.9	247.4	241.4	219.3	128.8	191.7
1921	178.8	165.2	179.5	203.8	242.9	177.5	199.4	148.0	85.6	129.0
1922	183.6	193.5	180.8	205.8	309.7	170.1	217.5	135.1	91.8	122.0
1923	210.9	219.0	200.1	212.1	247.8	144.3	185.1	162.0	104.2	144.4
1924	208.9	163.1	190.9	222.3	206.2	138.7	170.3	148.9	101.4	134.5
1925										
Average for year	212.7	171.6	189.6	218.3	200.5	144.4	174.7	138.3	110.5	129.9
January	219.2	166.4	191.1	228.4	200.1	132.9	167.9	145.7	115.5	136.3
February	218.9	168.5	191.0	224.9	196.5	154.8	177.5	146.1	112.4	135.6
March	220.1	159.6	190.7	222.4	195.6	150.0	174.4	145.1	108.3	133.7
April	218.4	160.9	189.9	213.1	193.4	143.7	169.0	140.0	103.6	128.7
May	214.4	165.4	188.4	212.6	193.2	143.0	168.2	137.6	104.0	127.2
June	213.5	169.8	188.2	213.9	192.2	152.0	172.6	135.6	105.1	126.1
July	213.1	172.1	188.8	215.6	192.1	150.5	172.1	134.9	107.8	126.4
August	211.6	177.5	189.7	219.4	194.0	143.9	170.0	134.0	112.6	127.3
September	206.9	180.6	189.3	229.0	200.4	135.4	169.3	133.7	113.1	127.2
October	206.4	181.0	189.5	(1)	200.9	139.9	171.7	134.2	114.3	127.9
November	207.7	177.3	187.9	(1)	205.8	142.8	174.8	136.2	116.0	129.8
December	207.3	180.3	187.1	(1)	207.3	141.9	174.8	137.0	113.0	129.5
1926										
Average for year	194.3	158.8	175.9	226.2	205.9	154.1	179.9	135.1	108.3	126.7
January	206.7	177.9	185.5	(1)	203.2	148.1	176.5	136.7	111.7	128.9
February	204.9	175.1	183.9	(1)	203.1	154.1	179.4	136.1	111.5	128.4
March	201.0	162.1	180.5	232.0	200.4	146.2	175.1	136.2	108.9	127.7
April	196.1	149.4	176.8	224.9	195.6	149.6	174.0	135.5	106.7	126.5
May	194.8	154.2	176.1	223.7	196.1	159.1	178.7	134.2	105.3	125.2
June	192.6	157.8	175.1	222.9	196.2	160.4	179.2	133.7	106.2	125.1
July	189.8	156.7	173.3	223.7	196.5	155.3	177.0	134.1	108.8	126.2
August	189.7	160.1	174.7	225.4	198.5	158.4	179.5	133.9	110.8	126.6
September	189.2	162.2	175.2	225.4	202.3	161.0	182.0	134.5	110.5	127.0
October	189.0	154.4	171.5	225.5	214.5	157.4	184.4	135.0	108.6	126.7
November	189.3	148.1	169.9	226.5	239.7	151.6	190.2	135.5	106.6	126.5
December	189.3	147.8	168.6	226.6	222.1	148.7	182.9	135.3	104.5	125.7

[1] Insufficient data.

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TABLE 2.—INDEX NUMBERS OF WHOLESALE PRICES, BY GROUPS AND SUBGROUPS OF COMMODITIES, 1913–1926—Continued

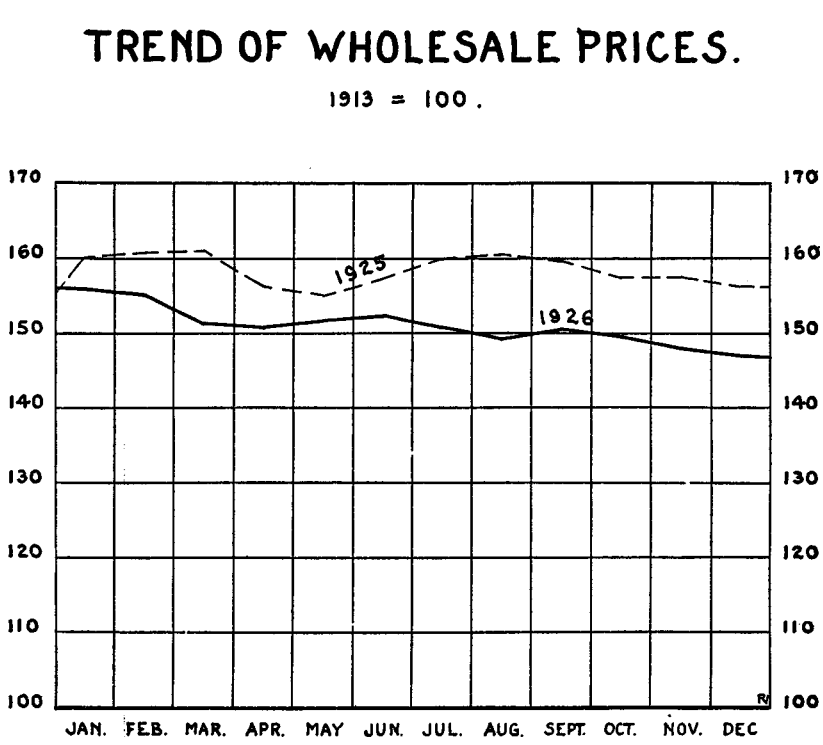
Year and month	Building materials					Chemicals and drugs			
	Lumber	Brick	Structural steel	Other building materials	All building materials	Chemicals	Fertilizer materials	Drugs and pharmaceuticals	All chemicals and drugs
1913	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1914	91.6	98.7	77.8	95.1	92.0	99.9	91.0	111.6	100.7
1915	89.4	99.2	84.7	101.9	94.0	120.8	104.3	193.5	133.7
1916	102.0	107.7	167.2	137.1	120.3	194.7	137.0	185.0	180.9
1917	134.6	131.8	247.4	171.5	157.0	208.9	175.9	207.8	202.0
1918	155.4	175.8	198.6	189.3	172.0	205.7	212.6	241.8	215.1
1919	210.4	206.3	166.9	195.4	201.4	160.8	182.9	178.7	169.3
1920	307.5	278.9	187.3	218.3	264.1	196.8	214.9	193.2	199.7
1921	163.5	232.0	135.3	169.0	165.4	127.6	125.8	165.2	135.6
1922	183.4	201.7	114.8	155.9	168.4	112.2	111.6	166.7	124.2
1923	206.5	213.5	160.4	168.8	189.1	118.0	111.4	182.7	131.0
1924	182.9	212.8	148.0	166.9	175.1	122.7	98.0	179.5	130.4
1925									
Average for year	185.4	206.2	132.5	167.0	175.1	126.5	106.8	179.9	134.4
January	190.3	208.1	139.1	169.6	179.3	128.2	105.5	180.4	135.2
February	197.5	208.5	135.7	169.6	182.8	126.8	106.0	180.3	134.5
March	192.9	208.0	139.1	167.2	179.8	126.3	106.8	179.8	134.2
April	184.5	208.4	135.7	165.0	174.4	125.6	106.0	179.7	133.6
May	183.7	208.1	132.4	164.9	173.6	125.1	105.1	179.5	133.1
June	178.8	206.1	132.4	164.0	170.7	124.8	104.3	179.6	132.8
July	178.1	205.2	132.4	163.3	170.1	125.2	105.3	179.6	133.3
August	181.9	204.2	127.5	165.3	172.4	127.2	106.2	179.6	134.6
September	182.8	204.1	129.1	168.3	174.1	128.7	108.2	178.5	135.6
October	182.4	204.2	129.1	168.2	173.9	126.8	109.8	178.7	134.9
November	185.8	204.3	129.1	167.9	175.6	126.6	110.0	181.6	135.4
December	189.5	204.7	129.1	166.6	177.0	124.9	109.6	182.3	134.5
1926									
Average for year	185.3	204.8	129.7	162.9	173.4	118.1	109.1	182.7	130.6
January	191.6	205.5	129.1	166.0	177.9	121.6	111.9	183.0	133.2
February	191.1	205.6	129.1	164.8	177.1	119.5	113.1	182.9	132.3
March	189.4	205.6	129.1	162.9	175.5	118.3	114.7	182.0	131.6
April	186.3	204.9	129.1	161.1	173.2	116.6	113.4	181.5	130.3
May	184.4	204.9	129.1	159.3	171.6	117.5	111.9	182.4	130.7
June	183.4	204.3	122.5	161.2	171.2	118.7	108.1	184.4	131.1
July	181.4	204.3	129.1	163.4	171.5	118.3	108.4	184.1	130.9
August	180.9	204.7	129.1	164.8	171.8	118.7	108.5	182.5	130.8
September	182.3	205.0	132.4	163.7	172.4	118.9	108.2	182.5	130.8
October	181.8	205.0	132.4	163.6	172.1	117.8	103.6	182.5	129.3
November	186.0	204.1	132.4	162.9	174.0	116.2	104.4	182.4	128.5
December	184.6	203.9	132.4	161.3	172.7	115.4	105.4	182.4	128.2

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TABLE 2.—INDEX NUMBERS OF WHOLESALE PRICES, BY GROUPS AND SUBGROUPS OF COMMODITIES, 1913–1926—Continued

Year and month	House-furnishing goods			Miscellaneous					All commodities
	Furniture	Furnishings	All house-furnishing goods	Cattle feed	Leather	Paper and pulp	Other miscellaneous	All miscellaneous	
1913	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1914	99.5	101.7	100.0	106.3	104.4	98.9	89.8	95.4	98.1
1915	100.0	98.9	99.8	107.2	109.2	98.0	87.3	94.7	100.8
1916	102.0	120.7	106.3	114.5	152.5	157.1	101.4	120.8	126.8
1917	114.2	162.7	125.4	170.0	201.2	197.9	114.0	148.3	177.2
1918	131.2	223.6	152.5	175.5	193.5	181.3	134.3	156.3	194.3
1919	164.7	246.3	183.6	221.6	268.1	195.7	132.1	174.7	206.4
1920	236.7	311.3	253.8	222.2	266.8	296.0	139.6	195.5	226.2
1921	181.2	241.4	195.1	105.4	156.1	189.5	105.3	128.1	146.9
1922	163.1	218.5	175.8	127.9	145.5	155.0	96.3	117.5	148.8
1923	165.7	240.8	183.1	142.5	144.5	168.4	99.4	122.7	153.7
1924	153.2	237.2	172.8	130.9	137.4	167.8	93.1	116.7	149.7
1925									
Average for year	149.3	234.8	169.2	133.8	144.7	176.1	119.8	134.7	158.7
January	153.5	235.1	172.6	154.9	150.5	165.0	104.4	127.1	160.0
February	153.5	234.9	172.5	130.0	153.2	158.1	104.9	124.5	160.6
March	150.2	235.3	170.1	127.3	153.2	157.7	107.1	125.4	161.0
April	150.2	236.8	170.5	127.4	149.2	185.2	106.0	128.8	156.2
May	150.2	236.8	170.5	141.4	142.7	185.2	110.4	131.3	155.2
June	150.2	234.5	169.9	141.3	143.0	184.6	121.9	137.8	157.4
July	149.7	232.8	169.2	131.6	141.9	185.7	133.5	143.4	159.9
August	149.7	232.9	169.2	134.8	140.3	186.5	123.5	137.9	160.4
September	147.7	232.9	167.6	130.5	140.3	186.5	118.8	134.9	159.7
October	147.4	234.7	167.9	122.3	140.3	174.0	129.4	138.0	157.6
November	145.3	232.9	165.9	130.2	140.9	175.3	134.6	142.0	157.7
December	145.3	232.8	165.9	128.0	140.1	170.0	130.0	138.2	156.2
1926									
Average for the year	141.5	228.0	161.8	115.9	137.3	171.5	107.2	123.9	151.0
January	144.7	230.6	164.9	129.9	140.1	181.5	121.2	135.3	156.0
February	143.7	229.8	163.9	117.6	140.1	187.8	116.9	132.9	155.0
March	143.5	230.5	163.9	112.8	140.1	180.3	111.9	128.3	151.5
April	142.8	230.5	163.4	124.0	139.6	175.3	108.5	126.5	151.1
May	141.5	230.0	162.2	114.4	137.1	175.3	107.6	124.7	151.7
June	141.3	228.4	161.7	111.0	136.0	175.3	104.6	122.5	152.3
July	140.6	228.4	161.1	116.7	134.7	175.3	104.1	122.5	150.7
August	140.2	228.4	160.8	115.2	134.8	171.8	104.2	121.8	149.2
September	140.1	226.5	160.4	109.5	135.9	164.3	104.5	120.4	150.5
October	140.1	226.5	160.3	107.1	136.0	156.8	103.9	118.6	149.7
November	139.9	225.4	159.9	113.0	136.3	156.9	101.2	117.7	148.1
December	139.9	223.1	159.4	123.3	136.3	157.6	99.5	117.8	147.2

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Wholesale Prices of Agricultural and Nonagricultural Commodities

THE figures in the following table furnish a comparison of wholesale price trends of agricultural and nonagricultural commodities during the period from January, 1910, to December, 1926, inclusive. These index numbers have been made by combining into two groups the weighted prices of all commodities included in the bureau's regular series of index numbers. Roughly speaking, all articles originating on American farms have been placed in the first group, while all remaining articles have been put in the second. The five-year period 1910–1914, instead of the year 1913, forms the base in this presentation.

TABLE 3.—INDEX NUMBERS OF WHOLESALE PRICES OF AGRICULTURAL AND NONAGRICULTURAL COMMODITIES, BY YEARS AND MONTHS, 1910 TO 1926

[1910–1914=100]

Month	1910		1911		1912		1913		1914		1915	
	Agricultural	Non-agricultural	Agricultural	Non-agricultural	Agricultural	Non-agricultural	Agricultural	Non-agricultural	Agricultural	Non-agricultural	Agricultural	Non-agricultural
Average for year	103.0	102.2	93.9	95.5	101.2	100.3	99.4	104.5	102.4	97.4	104.3	101.1
January	104.9	103.1	96.0	96.7	97.5	94.9	97.1	107.3	101.0	99.6	104.4	95.6
February	104.5	103.3	91.7	96.8	98.0	96.5	97.1	107.2	100.8	100.2	106.6	95.8
March	108.3	103.8	90.3	99.4	99.4	97.3	98.0	106.5	100.0	100.6	105.4	95.7
April	106.3	107.4	88.5	97.2	102.8	100.1	98.7	105.5	99.3	99.9	106.2	95.7

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TABLE 3.—INDEX NUMBERS OF WHOLESALE PRICES OF AGRICULTURAL AND NON-AGRICULTURAL COMMODITIES, BY YEARS AND MONTHS, 1910 TO 1926—Continued

Month	Agricultural	Non-agricultural	Agricultural	Non-agricultural	Agricultural	Non-agricultural	Agricultural	Non-agricultural	Agricultural	Non-agricultural	Agricultural	Non-agricultural
	1910		1911		1912		1913		1914		1915	
May	103.8	106.5	88.9	95.5	104.0	99.7	96.9	104.7	99.4	98.5	106.7	97.0
June	102.9	104.5	90.2	93.9	101.4	99.6	98.5	104.3	100.0	96.8	103.0	98.5
July	104.2	102.8	92.4	94.3	100.7	100.3	100.2	103.6	101.2	96.4	104.6	99.9
August	104.7	101.6	96.1	94.8	102.1	100.9	100.8	103.6	108.9	96.2	102.8	100.8
September	103.1	100.4	97.4	95.2	103.1	102.5	103.0	104.2	109.2	97.2	100.1	102.8
October	100.2	97.5	98.2	94.5	103.4	103.1	101.6	104.0	103.4	95.0	103.6	105.2
November	96.8	97.0	98.1	93.7	102.0	102.7	101.5	103.0	103.4	93.7	103.4	109.3
December	96.7	97.7	96.2	93.9	100.4	104.5	100.4	100.6	102.0	94.9	104.8	115.0
	1916		1917		1918		1919		1920		1921	
Average for year	120.6	138.4	179.1	182.1	207.8	187.6	221.1	199.0	220.6	241.0	133.2	167.4
January	107.9	122.5	142.8	169.7	198.0	176.8	216.3	187.7	239.2	235.6	151.0	196.3
February	108.8	126.2	147.7	172.7	199.8	177.8	209.0	184.1	230.2	243.5	142.1	185.3
March	110.5	131.7	156.3	175.5	200.1	179.5	217.0	180.9	230.6	247.4	141.0	176.7
April	113.0	134.5	174.0	178.6	203.1	183.2	224.3	179.0	244.1	254.4	131.5	170.9
May	114.1	136.2	186.8	185.4	200.5	186.3	227.3	183.3	248.2	254.4	129.3	168.2
June	113.5	137.3	183.8	194.7	201.4	188.4	218.7	193.7	245.3	250.4	125.7	163.8
July	115.8	135.9	183.6	199.2	206.5	192.5	227.3	203.8	239.8	250.8	129.5	158.6
August	122.6	135.3	190.6	195.6	212.9	193.3	228.1	211.2	223.4	248.8	133.4	155.5
September	127.8	136.7	191.8	189.4	219.9	194.8	215.6	212.6	215.6	246.1	132.6	156.1
October	133.9	142.8	196.3	175.4	215.1	195.6	215.7	214.7	194.5	237.2	130.3	158.9
November	142.3	154.9	199.2	172.8	217.0	195.7	223.2	219.0	180.2	221.0	126.7	161.0
December	138.2	166.0	196.9	174.1	217.8	193.3	230.9	223.9	158.5	208.1	125.0	160.8
	1922		1923		1924		1925		1926			
Average for year	136.2	168.0	142.8	171.3	144.2	161.6	158.4	165.3	146.5	160.8	------	------
January	124.2	158.4	141.3	176.6	144.3	163.7	160.8	164.7	152.7	164.7	------	------
February	132.5	156.1	141.9	177.7	142.7	166.3	159.4	167.3	150.9	164.5	------	------
March	135.2	155.1	144.0	179.4	139.7	165.8	162.0	165.4	146.7	161.6	------	------
April	135.1	156.1	143.5	180.4	138.7	163.7	155.4	162.3	147.8	159.5	------	------
May	137.7	163.8	142.4	176.1	137.6	161.8	154.3	161.3	148.5	160.2	------	------
June	137.4	168.2	140.6	172.4	135.2	159.3	156.9	163.2	149.9	159.9	------	------
July	140.0	176.6	138.3	168.8	141.1	158.4	160.9	164.3	147.3	159.2	------	------
August	135.1	182.1	139.3	166.7	146.6	158.9	162.5	163.7	143.6	160.1	------	------
September	135.1	178.6	146.2	166.9	145.3	158.2	161.5	163.3	145.6	160.6	------	------
October	138.6	176.4	146.7	165.0	150.8	158.1	156.0	164.5	144.5	160.0	------	------
November	142.5	175.2	146.4	163.2	150.5	160.2	154.9	165.9	140.5	161.0	------	------
December	144.2	174.8	145.5	162.0	156.4	162.8	152.8	165.0	141.3	158.3	------	------

Trend of Wholesale Prices in the United States, 1801 to 1926

THE trend of wholesale prices in the United States since the beginning of the last century is shown by the figures in the following table. The index numbers for the years 1801 to 1840 are arithmetical means of unweighted relative prices of commodities as published on pages 235 to 248 of Bulletin No. 367 of the Bureau of Labor Statistics. They were originally computed by Alvin H. Hansen of the University of Minnesota on prices in the year 1825 as the base, but are here converted to the 1913 base in conformity with the bureau's practice.

For the years 1801 to 1815 the index numbers were constructed from monthly quotations of commodities appearing in the Boston Gazette, and for the years 1816 to 1825 from quotations in the Boston Patriot. The index numbers for 1825 to 1840 were made from monthly prices at New York as published in the report of the Secretary of the Treasury for 1863. The quotations were taken for the first of each month, or as close thereto as possible. When a range

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of prices was shown, the arithmetical mean of the quotations was used. The average annual price for each commodity was found by adding the monthly quotations and dividing the sum by the number of months for which quotations were given. For some years it was not possible to obtain quotations for all months. The Boston quotations include 79 commodities and the New York quotations 63 commodities.

The index numbers for 1841 to 1889 also are arithmetical averages of unweighted relative prices and have been taken from the Report of the Committee on Finance of the United States Senate on Wholesale Prices, Wages, and Transportation, March 3, 1893 (52d Cong., 2d sess., Rept. No. 1394, Pt. I, p. 9). As originally published, these figures were computed with 1860 as the base year. They are here changed to 1913 as 100. The prices used are in currency, and the number of commodities varies from approximately 150 in the earlier years to 250 in the later years of the period.

The index numbers from 1890 to 1926 are the bureau's regular weighted series. In using the data in this table it should be borne in mind that the figures in the three series here joined are not strictly comparable, since they are based on different lists of commodities in different markets, and are, moreover, unweighted for the years prior to 1890. It is believed, however, that they reflect with a fair degree of accuracy wholesale price changes in general over the period stated.

TABLE 4.—INDEX NUMBERS OF WHOLESALE PRICES, 1801 TO 1926

[1913=100]

Year	Index number	Year	Index number	Year	Index number
1801	162	1843	89	1885	82
1802	133	1844	89	1886	81
1803	136	1845	90	1887	81
1804	147	1846	93	1888	83
1805	151	1847	93	1889	83
1806	148	1848	89	1890	80.5
1807	139	1849	87	1891	80.0
1808	136	1850	90	1892	74.8
1809	143	1851	93	1893	76.6
1810	156	1852	90	1894	68.7
1811	152	1853	96	1895	70.0
1812	154	1854	99	1896	66.7
1813	179	1855	99	1897	66.8
1814	224	1856	99	1898	69.6
1815	176	1857	99	1899	74.9
1816	150	1858	89	1900	80.5
1817	151	1859	88	1901	79.3
1818	148	1860	88	1902	84.4
1819	130	1861	88	1903	85.5
1820	111	1862	103	1904	85.6
1821	106	1863	130	1905	86.2
1822	109	1864	167	1906	88.6
1823	104	1865	190	1097	93.5
1824	103	1866	168	1908	90.1
1825	104	1867	151	1909	96.9
1826	103	1868	142	1910	100.9
1827	104	1869	135	1911	93.0
1828	99	1870	125	1912	99.1
1829	98	1871	119	1913	100.0
1830	95	1872	122	1914	98.1
1831	102	1873	121	1915	100.8
1832	103	1874	117	1916	126.8
1833	102	1875	112	1917	177.2
1834	95	1876	104	1918	194.3
1835	108	1877	97	1919	206.4
1836	121	1878	89	1920	226.2
1837	120	1879	85	1921	146.9
1838	115	1880	94	1922	148.8
1839	121	1881	93	1923	153.7
1940	103	1882	95	1924	149.7
1841	102	1883	93	1925	158.7
1842	95	1884	87	1926	151.0

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Method of Computing Index Numbers of Wholesale Prices

IN CONSTRUCTING the index numbers for the various groups of commodities the average price of each article in the year 1913 (selected as the base period in order to provide a pre-war standard for measuring price changes) has been multiplied by the estimated quantity of that article marketed in the census year 1919. The products thus obtained have been added to give the approximate value in exchange in 1913 of all the articles in each group and of the total list of commodities. Similar aggregates have been made for each other year and for each month since January, 1890, by multiplying the average price of each article for the year or month by the quantity marketed in 1919 and adding the results. The index number for each group and for all commodities for each year and for each month has then been obtained by comparing the aggregate for such year or month with the corresponding aggregate for 1913, taken as 100.

If, during the period under consideration, there had been no changes in the list of commodities included in the index numbers, the percentage changes in the cost of the different groups of commodities would be accurately measured by dividing the aggregates for the months and years specified by the corresponding aggregates for 1913. However, articles have been added or dropped from time to time as circumstances demanded, while substitution of one article for another at a different price has been necessary in numerous instances. Therefore, in computing the index numbers for a series of years a method had to be adopted that would allow for variations in the number and kind of commodities. This method, which is identical in principle with that now being used by the bureau in its reports on retail prices and on wages, consists in computing two separate aggregates for any year or month in which a change occurs, the first aggregate being based on the list of articles before making additions, subtractions, or substitutions, and the second aggregate on the revised list of articles. In this way comparisons between any two consecutive years or months is limited to aggregates made up of identical commodities. The index numbers are, therefore, chain relatives tied back to a fixed base, viz, 1913.

To ascertain the quantities of the various commodities marketed in 1919, every available source of information, official and private, was drawn upon. In the case of articles consumed to a large extent by the producer, as corn, oats, hay, etc., only the portion actually marketed, as near as could be determined, was taken. A similar plan was followed with regard to semimanufactured articles, such as cotton and worsted yarns, pig iron, and steel billets, which often are carried into further processes of manufacture in establishments where produced. The quantity of each article sold in the markets was ascertained as nearly as possible and used to weight the prices for different years and months.

In the selection of commodities for inclusion in the bureau's reports on wholesale prices it has been the aim to choose only important and representative articles in each group. To this end, in addition to utilizing all available information from official sources, careful inquiry has been made in the principal market centers to determine

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which articles within the general class or group enter to the largest extent into exchange from year to year. Thus, for some years past eggs classed as "firsts" have been quoted instead of the "new-laid" grade at one time carried, since it has been ascertained that "firsts" are relatively more important in the market. In the case of butter and several other articles the quotations have been enlarged in recent years by the addition of lower priced grades that were found to constitute a considerable part of the volume of sales. In the case of commodities classed as chemicals or drugs, where a range of prices was found, the lower quotations were selected because these quotations are believed to represent the prices of larger lots, while the higher quotations represent the prices of smaller lots. The sources from which price quotations for the past two years have been drawn are as follows:

TABLE 5.—SOURCES OF PRICE QUOTATIONS: 1925 AND 1926

Source	Farm products	Foods	Clothing materials	Fuels	Metals and metal products	Building materials	Chemicals and drugs	House-furnishing goods	Miscellaneous	All commodities
Standard trade journals	49	71	2	13	31	13	43	----	18	240
Manufacturers or sales agents	4	13	60	6	5	12	----	31	7	138
Boards of trade, associations, etc	3	8	3	----	----	7	----	----	----	21
Federal or State bureaus	4	----	----	----	1	----	----	----	----	5
Total	60	92	65	19	37	32	43	31	25	404

So far as possible, the quotations for the various commodities have been secured in their primary markets. For example, the prices quoted for livestock and most animal products, as well as for most grains, are for Chicago; wheat and flour prices are mainly for Kansas City and Minneapolis; pig iron and steel prices are for Pittsburgh, etc. The prices used are, in all instances where this information could be obtained, based on first-hand transactions. Thus the cattle and other livestock prices used are those paid by slaughterhouses to the commission man acting for the producer. Grain prices are those ruling on the floor of the exchange for grain shipped in by country elevators. Cotton and wool prices are for sales made to manufacturers. Cotton and woolen goods prices are in most instances those quoted by manufacturers to wholesalers, jobbers, and manufacturers of wearing apparel. Butter and egg prices are for consignments to the wholesale trade. Fluid milk prices are those to producers for milk delivered on city platform. Flour prices are those made by millers to large wholesale dealers, jobbers, and bakers. Leather prices are those from tanners to manufacturers. Coke prices are those to operators of blast furnaces. Pig-iron prices are those to foundry operators and large steel makers. Steel prices are those to jobbers or large manufacturing consumers.

For commodities of great importance, more than one price series has been included. In no case, however, is an article of a particular description represented by more than one series of quotations for the same market. For most articles weekly prices have been secured.

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In a large number of instances, particularly since the beginning of 1918, it has been possible to obtain average monthly prices from daily quotations. For those commodities whose prices are quite stable, such as certain textiles and building materials, only first of the month prices have been taken. These details are summarized for 1925 and 1926 as follows:

TABLE 6.—NUMBER OF COMMODITIES, OR SERIES OF QUOTATIONS, CLASSIFIED AS TO FREQUENCY

Frequency of quotation	Farm products	Foods	Clothing materials	Fuels	Metals and metal products	Building materials	Chemicals and drugs	House-furnishing goods	Miscellaneous	All commodities
Weekly	50	81	3	19	29	15	43	----	12	252
Monthly	5	9	8	----	2	8	----	18	9	59
Average for month	5	2	54	----	6	9	----	13	4	93
Total	60	92	65	19	37	32	43	31	25	404

It is obvious that in order to arrive at a strictly scientific average price for any period, one must know the precise quantity marketed and the price at which each unit of the quantity was sold. It is manifestly impossible to obtain such detail, and even if it were possible the labor and cost involved in such a compilation would be prohibitive. The method employed here, which is the one usually employed in computing average prices, is believed to yield results quite satisfactory for all practical purposes.

Wholesale Prices in the United States and in Foreign Countries, 1913 to 1926

IN THE following table the more important index numbers of wholesale prices in foreign countries and those of the United States Bureau of Labor Statistics have been brought together in order that the trend of prices in the several countries may be directly compared. In some instances the results here shown have been obtained by merely shifting the base to the year 1913—i. e., by dividing the index number for each year or month on the original base by the index number for 1913 on that base as published. In such cases, therefore, these results are to be regarded only as approximations of the correct index numbers. It should be understood, also, that the validity of the comparisons here made is affected by the wide difference in the number of commodities included in the different series of index numbers. Finally, it should also be remembered that the prices given are in the currencies of the respective countries, and consequently that the index in each country is affected by any change in the values of its currency.

For the United States and several other countries the index numbers are published to the fourth significant figure in order to show minor price variations.

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INDEX NUMBERS OF WHOLESALE PRICES IN THE UNITED STATES AND IN CERTAIN FOREIGN COUNTRIES

[Index numbers expressed as percentages of the index number for 1913. See text explanation]

Country	United States	Canada	Belgium	Bulgaria	Czechoslovakia	Denmark	Finland	France	Germany	Italy
Computing agency	Bureau of Labor Statistics	Dominion Bureau of Statistics	Ministry of Industry and Labor	Director General of Statistics	Central Bureau of Statistics (revised index)	Finanstidende	Central Bureau of Statistics	General Statistical Bureau	Federal Statistical Bureau	Riccardo Bachi
Commodities	404	[1] 238	128	38	135	33	135	45	38	[2] 107
Year and month										
1913	100.0	100.0	----	100	----	----	100	100	100.0	100
1914	98.1	102.3	[3] 100	121	[4] 100	[5] 100	----	102	----	95
1915	100.8	109.9	----	185	----	138	----	140	----	133
1916	126.8	131.6	----	268	----	164	----	188	----	202
1917	177.2	178.5	----	667	----	228	----	262	----	299
1918	194.3	199.0	----	831	----	293	----	339	----	409
1919	206.4	209.2	----	1166	----	294	----	356	----	364
1920	226.2	243.5	----	2392	----	382	1183	509	----	631
1921	146.9	171.8	----	2006	----	250	1263	345	----	577
1922	148.8	152.0	367	2472	1334	179	1219	327	----	562
1923	153.7	153.0	497	2525	977	201	1095	419	95.1	575
1924	149.7	155.2	573	2823	997	226	1100	489	122.5	585
1925	158.7	160.3	558	3067	1001	200	1129	551	130.4	690
1923										
January	155.8	151.4	434	2657	991	181	1134	387	65.0	575
April	158.7	156.9	480	2757	1012	200	1096	415	89.5	588
July	150.6	153.5	504	2408	949	207	1080	407	88.8	566
October	153.1	153.1	515	2263	960	205	1077	421	117.9	563
1924										
January	151.2	156.9	580	2711	974	210	1071	494	117.3	571
February	151.7	156.8	642	2658	999	223	1078	544	116.2	573
March	149.9	154.4	625	2612	1021	227	1094	499	120.7	579
April	148.4	151.1	555	2798	1008	228	1095	450	124.1	579
May	146.9	150.6	557	2551	1001	225	1090	458	122.5	571
June	144.6	152.3	565	2811	968	219	1088	465	115.9	566
July	147.0	153.9	566	2737	953	220	1085	481	115.0	567
August	149.7	156.8	547	2853	986	233	1111	477	120.4	572
September	148.8	153.9	550	2848	982	231	1117	486	126.9	580
October	151.9	157.0	555	2988	999	234	1114	497	131.2	602
November	152.7	157.7	569	3132	1013	231	1120	504	128.5	621
December	157.0	160.9	566	3181	1024	232	1139	507	131.3	640
1925										
January	160.0	165.5	559	3275	1045	234	1137	514	138.2	658
February	160.6	164.7	551	3309	1048	234	1141	515	136.5	660
March	161.0	161.6	546	3272	1034	230	1131	514	134.4	659
April	156.2	156.5	538	3244	1020	220	1133	513	131.0	658
May	155.2	158.8	537	3177	1006	216	1122	520	131.9	660
June	157.4	158.6	552	3225	998	216	1129	543	133.8	683
July	159.9	158.1	559	3041	1009	206	1118	557	134.8	707
August	160.4	158.9	567	2870	993	189	1142	557	131.7	731
September	159.7	156.2	577	2834	996	168	1133	556	125.9	721
October	157.6	156.0	575	2823	989	163	1121	572	123.7	716
November	157.7	161.2	569	2822	977	158	1118	605	121.1	712
December	156.2	163.5	565	2913	977	160	1120	633	121.5	715
1926										
January	156.0	163.8	560	2901	966	157	1094	634	120.0	708
February	155.0	162.2	556	2899	950	151	1091	636	118.4	704
March	151.5	160.1	583	2844	938	145	1081	632	118.3	693
April	151.1	160.6	621	2774	923	141	1081	650	122.7	692
May	151.7	157.0	692	2938	928	141	1070	688	123.2	698
June	152.3	155.7	761	2842	926	140	1079	738	124.6	709
July	150.7	156.2	876	2838	948	141	1079	836	127.4	724
August	149.2	153.9	836	2759	963	143	1092	769	127.0	741
September	150.5	152.5	859	2723	973	141	1093	787	126.8	731
October	149.7	151.1	856	2716	972	145	1095	751	130.2	712
November	148.1	151.5	865	2739	978	150	1097	683	131.6	709
December	147.2	150.5	860	2718	978	145	1101	627	131.1	681

[1] 236 commodities since April, 1924.
[2] 36 commodities prior to 1920; 76 commodities in 1920 and 1921; 100 commodities in 1922.
[3] April.
[4] July.
[5] July 1, 1912–June 30, 1914.

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INDEX NUMBERS OF WHOLESALE PRICES IN THE UNITED STATES AND IN CERTAIN FOREIGN COUNTRIES—Continued

Country	Netherlands	Norway	Spain	Sweden	Switzerland	United Kingdom	Australia	New Zealand	South Africa	Japan	China	India
Computing agency	Central Bureau of Statistics	Central Bureau of Statistics	Institute of Geography and Statistics	Chamber of Commerce	Dr. J. Lorenz	Board of Trade	Bureau of Census and Statistics	Census and Statistics Office (revised)	Office of Census and Statistics	Bank of Japan, Tokyo	Bureau of Markets, Treasury Department, Shanghai	Labor Office Bombay
Commodities	[6] 48	174	74	160	71	150	92	180	187	56	[7] 117	44
Year and month												
1913	100	100	100	100	-------	100.0	-------	100	100	100	100.0	-------
1914	109	-------	101	-------	[4] 100.0	-------	[4] 100	104	97	95	-------	[4] 100
1915	146	-------	119	-------	-------	-------	141	117	107	97	-------	-------
1916	226	-------	141	-------	-------	-------	132	126	123	117	-------	-------
1917	276	-------	166	-------	-------	-------	146	143	141	147	-------	-------
1918	373	-------	207	-------	-------	-------	170	169	153	193	-------	236
1919	304	-------	204	-------	-------	-------	180	176	165	236	-------	222
1920	292	-------	221	359	-------	307.3	218	207	223	259	152.0	216
1921	182	-------	190	222	196.5	197.2	167	192	161	200	150.2	199
1922	160	-------	176	173	167.7	156.8	154	165	129	196	145.5	187
1923	151	232	172	163	179.9	158.9	170	158	127	199	156.4	181
1924	156	267	183	162	175.7	166.2	165	165	129	206	153.9	182
1925	155	253	188	161	162.9	159.7	162	161	128	202	159.4	163
1923												
January	157	223	170	163	174.7	157.0	163	-------	131	184	152.7	181
April	156	229	174	168	185.9	162.0	167	-------	126	196	157.7	180
July	145	231	170	162	179.8	156.5	180	-------	124	192	155.4	178
October	148	235	171	161	181.1	158.1	171	-------	125	212	156.1	181
1924												
January	156	251	178	161	183.2	165.4	174	-------	131	211	155.8	188
February	158	261	180	162	183.4	167.0	170	-------	-------	208	159.5	188
March	155	264	180	162	180.1	165.4	167	-------	-------	206	157.5	181
April	154	263	184	161	181.4	164.7	166	-------	126	207	153.7	184
May	153	261	179	160	180.4	163.7	165	-------	-------	205	154.3	181
June	151	262	179	158	178.3	162.6	163	-------	-------	199	151.8	185
July	151	265	182	157	173.3	162.6	163	-------	125	195	151.5	184
August	151	271	182	160	170.6	165.2	162	-------	-------	200	148.8	184
September	158	272	184	163	169.9	166.9	162	-------	-------	206	149.1	181
October	161	273	186	167	169.0	170.0	163	-------	133	213	152.8	181
November	161	276	181	167	168.5	169.8	163	-------	-------	214	154.9	176
December	160	279	198	168	169.8	170.1	165	-------	-------	213	157.4	176
1925												
January	160	279	191	169	170.8	171.1	163	166	130	214	159.9	173
February	158	281	192	169	170.8	168.9	162	162	-------	210	159.2	173
March	155	279	193	168	169.9	166.3	160	162	-------	204	160.3	171
April	151	273	190	163	165.9	161.9	158	162	130	202	159.3	165
May	151	262	191	162	163.0	158.6	159	162	-------	199	157.8	164
June	153	260	187	161	161.9	157.2	162	162	-------	200	157.3	160
July	155	254	188	161	160.6	156.9	162	161	127	198	162.8	158
August	155	249	184	159	159.6	156.2	162	161	-------	200	160.3	160
September	155	237	185	157	159.4	155.1	162	160	-------	201	160.2	157
October	154	223	187	154	159.2	153.9	163	162	124	200	159.0	158
November	154	220	186	155	157.0	152.7	165	161	-------	198	158.4	160
December	155	220	187	156	156.7	152.1	160	160	-------	194	158.1	154
1926												
January	153	214	186	153	155.5	151.3	161	159	124	192	164.0	154
February	149	211	186	152	154.5	148.8	160	159	-------	188	163.0	151
March	145	205	183	149	150.8	144.4	163	157	-------	184	164.4	150
April	143	199	179	150	148.4	143.6	168	156	120	181	162.8	151
May	143	197	179	151	146.6	144.9	167	156	-------	177	159.7	151
June	144	194	177	150	145.1	146.4	163	155	-------	177	155.8	150
July	141	192	178	148	145.0	148.7	162	156	122	179	156.9	149
August	139	193	180	147	145.5	149.1	162	154	-------	177	160.5	148
September	140	193	178	146	146.0	150.9	158	153	-------	176	164.2	149
October	143	198	179	148	145.3	152.1	154	153	127	174	171.1	147
November	147	199	185	148	146.9	152.4	155	151	-------	171	174.4	146
December	146	184	186	150	148.3	146.1	155	153	-------	170	172.0	146

[4] July. [6] 52 commodities in 1920; 53 commodities from August, 1920, to December, 1921. [7] 147 items.

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PRODUCTIVITY OF LABOR

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Meaning of Labor Productivity

THE question of the productivity of labor, although it had been a matter of interest to specialists and technicians for a long time, did not occupy a prominent place in the attention of industry and the general public until after the war. But within the last few years a widespread popular interest in the subject has developed, both here and abroad. Of particular importance in this respect has been the action of various trade-union organizations, which, by official pronouncement and by actual practice, have committed themselves to the principle of basing wages, in part at least, upon the productivity of the workers. As a result of all these things the statistical data available for an analysis of this problem have greatly increased in recent years, thus making it possible in certain industries to measure the productivity of labor and to express the changes in productivity in numerical terms.

Productivity of labor means work done in a given time; ordinarily it is best expressed as the output per man per hour, although it may be stated as output per man per day, per crew per week, etc. The advantage of using man-hour output as a basis of measurement is that it is more precise and exact than the others.

The "productivity" of labor must be clearly differentiated from the "efficiency" of labor, or from any term which is narrowed down to express only the output due to the ability and willing cooperation of the workers themselves. It is of the utmost importance that these two ideas be kept clearly distinct. The notion of labor productivity contains no implication as to the causes of the large or small output; the laborer is simply used as the unit of measurement in expressing the technical progress or decline in an industry over a period of time, regardless of whether the changes in output were due to new machinery, managerial skill, or better work by the employees.

There are two ways of expressing the productivity of labor—first, in the actual physical output of the product per man-hour, per man-day, or whatever the unit of measurement is; and second, by means of index numbers. The former method has several advantages: It shows the absolute level of productivity at a given time; it stands by itself in that it does not require any comparative figures from another period; and, above all, it is easily understood by everyone. But the value of this method is very greatly reduced because of two important defects: It requires data more specific and more complete than are usually available, and it can very seldom be used at all to express the productivity of labor in a whole industry. For example, with reference to the former point, it is clear that the actual physical output per man-hour could not be computed from a chain index of employment, such as that published by the Bureau of Labor Statistics. The other disadvantage restricts still more the use of the method. It is possible to measure the actual output per

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man in an industry where there is only a single important product, such as coal, cement, sugar, or cigarettes, and this has been already done in the case of coal. But where there is a multiplicity of products (and this includes the great majority of industries), it is necessary to use the method of index numbers, a method in which there is a statistical device for dealing with the problem of multiple products.

Labor Productivity as Measured by Physical Output

Coal Mining

THE productivity of coal miners has been recorded for many years, and data on this point are available for nearly all the important coal-producing countries. In the recent report of the British Coal Commission,[1] there is a table showing the yearly per capita output of coal for some 50 years past. The results are given in the form of five-year averages so as to get representative data by avoiding the peaks of the good years and the troughs of depression years.

TABLE 1.—AVERAGE YEARLY OUTPUT (IN TONS) OF COAL PER PERSON EMPLOYED IN COAL MINING

Period	United Kingdom	France	Belgium [1]	Germany [1]	United States		
					Bituminous	Anthracite	Total
1874–1878	302	172	151	234	382	362	366
1879–1883	358	209	188	288	566	419	478
1884–1888	358	220	194	301	503	381	446
1889–1893	316	225	188	288	563	391	497
1894–1898	321	233	195	293	572	376	501
1899–1903	324	222	189	277	690	414	607
1904–1908	317	217	181	281	691	474	636
1909–1913	287	218	178	287	782	503	712
1914–1918	282	170	140	320	876	558	795
1919–1923	218	148	151	188	735	539	698
1924	246	[2] 167	[2] 152	234	781	550	734
1925	243	170	158	262			

[1] The Belgian figures throughout, like the German ones from 1914–1918 onward, are based on an assumed number of "full workers," i. e., the number of persons required to produce the recorded output if both mines and men had worked continuously without unemployment or absence.
[2] Provisional figure, subject to modification.

The table is affected, of course, by the changes in ownership brought about by the war and by the variations in methods of reporting over so long a period. The figures for France since 1919 include Alsace-Lorraine, but not the Saar. The Belgian figures include Limburg from 1917 onwards, while the German figures exclude Alsace-Lorraine after 1918, the Saar and Hultschin after 1920, and Upper Silesia after June, 1922. The American figures represent in 1874–1878 only one-fifth of the industry, and in 1879–1883 only 54 per cent.

In commenting upon this table the report calls attention to the sharp contrast in per capita output between the United States and

[1] Great Britain. Royal Commission on the Coal Industry (1925). Report, Vol. I. London, 1926.

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the European countries, and also to the difference in the trend of productivity in Great Britain and elsewhere. From the period 1879–1883 down to the war, it is pointed out, the American production rises conspicuously, the French, German, and Belgian outputs remain substantially unchanged, while the British output falls from 358 to 218 tons per capita. British mining, even before the war, was losing ground as compared with other European countries and America, and since the war the loss has been increasing. One important factor which has been responsible for the decline in British output is the small-scale production incident to the existence of no less than 1,400 coal-mining companies in Great Britain, as contrasted with only 70 companies in the whole Ruhr district of Germany.

Another table showing the comparative productivity in the United States and in some foreign countries during recent years has been compiled from other sources.

TABLE 2.—ANNUAL PER CAPITA OUTPUT OF COAL IN VARIOUS COUNTRIES

Year	Average yearly output (in tons) of coal per person employed				
	Nova Scotia [1]	Canada [2]	Netherlands [2]	United States [3]	
				Bituminous	Anthracite
1913		538	213	837	520
1915	569			794	504
1916	665			896	548
1917	628			915	[4] 646
1918	569			942	[4] 672
1919	523	503	181	749	570
1920	563	507	185	881	[4] 618
1921	491		173	627	567
1922	424		190	609	349
1923	540	553	216	801	592
1924	369		229	781	550
1925	319				

[1] Nova Scotia. Department of Public Works and Mines. Report on Mines, 1925. (See Labor Review, May 1926, p. 89.)
[2] Germany Reichskohlenrat. Statistische Übersicht über die Kohlenwirtschaft im Jahre 1924. Berlin, 1925. (See Labor Review, January, 1926, p. 125.)
[3] United States Geological Survey reports.
[4] Heavy washeries output.

The above data on yearly output per man have one serious defect—no account is taken of the fact that the working year may vary from 150 days to nearly 300 days. The sharp declines from 1920 to 1921, for example, are due for the most part to the fewer number of days worked in the latter year. Even the five-year averages used by the British Coal Commission do not obviate this difficulty entirely. The most satisfactory unit for expressing productivity is the man-hour, and while there are no data on this very point, the German Federal Coal Council (*Reichskohlenrat*) has recently issued a bulletin in which are included international statistics of per capita output per shift together with the duration of the shift in hours. Thus, from these figures it is possible to get a rough approximation of the man-hour output. The following table contains the data as given by the German Federal Coal Council.[2]

[2] Germany. Reichskohlenrat. Statistische Übersicht über die Kohlenwirtschaft im Jahre 1924. Berlin, 1925.

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TABLE 3.—OUTPUT OF COAL PER CAPITA PER SHIFT IN LEADING COUNTRIES (ON BASIS OF TOTAL WORKERS EMPLOYED)

Country	1913		1919		1920		1921	
	Hours of work	Output per shift (tons)	Hours of work	Output per shift (tons)	Hours of work	Output per shift (tons)	Hours of work	Output per shift (tons)
United States:								
Anthracite	8-10	2.02	8	2.14	8	2.28	8	2.09
Bituminous	8-10	3.61	8	3.84	8	4.00	8	4.20
Great Britain	8½	1.14	7½	.88	7½	.81	7½	.90
France	9	.69	8-9	.49	8-9	.58	8	.57
Belgium	9	.58			8	.53	8	.50
Czechoslovakia	9½	.84	8½	.66	8½	.61	8½	.64
Poland:								
East Upper Silesia		1.32						
Dombrova		1.16						
Cracow		1.10						
Germany-Dortmund	8½	1.03			7	.70	7	.69
West Upper Silesia	9-10	1.26						
Aix-La-Chapelle	8½	.84			7	.55	7	.54
Lower Silesia	8½	.74			7	.45	7	.46
Saxony	8-9	.78						
Ruhr	8½	1.03					7	.69

Country	1922		1923		1924		1925	
	Hours of work	Output per shift (tons)	Hours of work	Output per shift (tons)	Hours of work	Output per shift (tons)	Hours of work	Output per shift (tons)
United States:								
Anthracite	8	2.31	8	2.21	8	2.00		
Bituminous	8	4.28	8	4.48	8	4.56		
Great Britain	7½	1.01	7½	1.00	7½	.98	7½	1.01
France	8	.55	8	.61	8	.62		
Belgium	8	.51	8	.53	8	.51	8	.52
Czechoslovakia	8	.69	8	.82	8	.84		
Poland:								
East Upper Silesia		.66		.67		.80		
Dombrova				.62				
Cracow				.60				
Germany-Dortmund	7	.70			8	.95	8	.99
West Upper Silesia	7½	.69	7½	.69	8½	1.03	8½	1.16
Aix-La-Chapelle	7	.55	7	.41	8½	.67	8½	.74
Lower Silesia	7	.49	7	.47	8	.61	8	.69
Saxony	7	.46	7	.41	8	.52	8	.60
Ruhr	7	.70			8	.95	8	.99

International statistical data on coal production and especially those on per capita output of mine workers are not comparable from country to country because the location and richness of the coal deposits, the methods of mining, and the mechanical and technical equipment vary greatly in the individual countries. Only national data are comparable.

In Germany, in all the mining districts, the per capita output per shift showed a great falling off in postwar years up to 1924 when an improvement set in. This improvement was chiefly due to an increase in the duration of the shift by one hour. Owing to the decreased per capita output a greatly increased working force had to be employed in all mining districts. In 1924, however, the working staffs had been reduced considerably, especially in the Ruhr district, and the improvement in per capita output must, therefore, in part be also ascribed to increased efficiency of the workers. The improvement in per capita output continued during the first quarter of 1925.

In Great Britain the per capita output per shift reached its lowest point in 1920 with 0.81 ton. In 1921 and 1922 it rose to 0.90 and 1.01 tons, respectively. It decreased again slightly in 1923 to 1 ton

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and in 1924 to 0.98 ton, and during the first quarter of 1925 stood at 1.01, a decrease of about 11 per cent as compared with 1913. This decrease is largely due to a reduction of the duration of the shift in postwar times from 8½ to 7½ hours.

While the total of production has increased in France, per capita output per shift has decreased considerably; in 1924 the per capita output was only 0.62 ton, as against 0.69 ton in 1913. If only underground workers are considered the corresponding figures are 1.08 and 0.88 tons.

Belgian coal production in 1924 shows an increase over that in 1913, but the per capita output per shift of all mine workers and that of all underground workers has decreased in postwar times, although that of pick miners has increased from 3.48 tons in 1913 to 3.87 tons in 1924, in spite of a reduction of the daily hours of labor from nine to eight.

The newly acquired Polish mines in East Upper Silesia show a great falling off in production in spite of the fact that the working force employed has been greatly increased. The mines in Dombrova and Cracow have maintained their pre-war production but only by means of a working staff twice as large as in 1913. The per capita output per shift in the East Upper Silesia mines has decreased from 1.32 tons in 1913 to 0.66 ton in 1922. In 1923 it rose to 0.67 ton, in 1924 to 0.80 ton, and in the first two months of 1925 to 1.01 tons.

In Czechoslovakia, the per capita output per shift was the same in 1924 as in 1913, namely 0.84 ton.

In contrast with the large coal-producing countries in Europe the United States not only maintained its pre-war coal production in most of the postwar years but even increased it considerably in 1920 and 1923. A slump in bituminous coal production took place in 1921, and in 1922 in both bituminous coal and anthracite production. In the latter year this was due to the miners' strike which lasted several months. In 1924 producers curtailed bituminous coal production considerably, owing to unfavorable conditions in the iron and steel industry.

The most remarkable fact is that in postwar times the per capita output per shift in American bituminous coal mines increased from year to year in spite of shorter hours of labor; in 1913 the average per capita output was 3.61 short tons and in 1924 it had gradually increased to 4.56 tons. In anthracite production per capita output reached its highest level in 1922 with 2.31 short tons, which represent an increase of about 14 per cent over 1913; since then per capita output has fallen off considerably, and in 1924 it was only 2 short tons, as compared with 2.02 short tons in 1913.

Common Brick Industry

THE Bureau of Labor Statistics several years ago made a study[3] of the manufacture of common building brick in the United States, beginning with the digging or gathering of the clay and ending with the loading of the brick for shipment from the plant, and showing the average time cost of labor and the average money cost of labor in manufacturing 1,000 bricks.

[3] Bureau of Labor Statistics Bul. No. 356. Washington, 1924.

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The report was compiled in part from establishment cost statements covering a specified period of time whenever such cost figures were found to be available, and in part worked out from the number of thousand brick produced and the individual hours worked. The data were gathered by the Bureau of Labor Statistics through its agents from the records of 79 manufacturers of common building brick, employing 5,076 wage earners in 23 States for a pay period in the latter part of 1922 or early in 1923.

The "time cost" per 1,000 bricks for each department was obtained by dividing the total number of one-man hours worked in the several departments during a stated period of time, by the number of thousand bricks produced in that period of time.

The three processes of manufacture are: (1) The stiff-mud process, (2) soft-mud process, and (3) dry-clay process.

Stiff mud is clay of such a degree of consistency that brick molded from it can be stacked (hacked) eight-high as they come from the machine without injuring the one at the bottom. Very little water is applied during the making.

In the soft-mud process, because of the application of water in quantity during manufacture, the bricks come from the machine so soft that they can not be lifted or moved by hand. The clay is pressed into molds by the machine, after which the molds are automatically ejected one by one from the machine and the bricks dumped from the molds onto metal pallets. The dumping may be done either by hand or automatically by the brick machine.

In the dry-clay process, no water is applied. The clay is gathered and usually "weathered" several months before it is made into brick. It is so dry and so compactly pressed in the molds that the bricks are taken directly from the brick-making machine and set in the kilns where they are "water-smoked" and burned, it not being necessary to dry them in the dryer or in the open air as must be done with green brick molded from stiff mud or from soft-mud clay.

It has been estimated by competent authorities that 50 per cent of the common brick manufactured in the United States is produced by the "stiff-mud" process, 40 per cent by the "soft-mud" process, and 10 per cent by "dry-clay" process. Nearly 6,000,000,000 common bricks were produced in the United States during 1922, an increase of 30 per cent over 1921, but 10 per cent less than in 1914.

The wage districts shown in this report were formed by grouping or combining data of States in which the average earnings per hour of employees in the industry were approximately the same, regardless of the geographical location, or by showing data for one State only when the average earnings per hour were not approximately the same as for any other State.

The brick-yard departments are: (1) Clay pit, (2) machine house, (3) setting, (4) burning, (5) loading, and (6) miscellaneous. The digging, loading, and transferring of clay from its source to the machine house is done in the clay-pit department; and the hoisting of the clay to the pug mill, the pugging, granulating, tempering of the clay, the molding of the clay into brick, the transferring of the green brick from the brick machine to the dryer or to the open-air drying yard and the drying of the brick is done in the machine house. In the setting department the dried bricks are taken from the

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drying place and set in the kiln. The firing or burning of the kilns with wood, coal, oil, or gas is done by the burning department. After this the bricks are taken from the kilns and loaded onto carts, wagons, trucks, railroad cars, boats, or barges.

The average "time cost," expressed in hours and hundredths of an hour per 1,000 bricks, are shown in Table 4 for each of the three processes of manufacture by wage districts and for each of the six departments into which the work of manufacturing brick is divided and for all departments combined.

The number of establishments for which costs are shown by departments in some instances exceeds the number for all departments. This is due to the inclusion of data for one or more departments of establishments in which there was no work in the clay-pit department, no burning, no loading, etc., and the exclusion of the data for such establishments from the data used in computing time and labor costs per 1,000 bricks for all departments combined. In other instances the number of plants reported under "all departments" exceeds the number for individual departments. This is explained by the fact that certain plants had full cost records for all departments combined, but not for each department separately.

TABLE 4.—AVERAGE TIME COST PER 1,000 BRICK, BY DEPARTMENT, PROCESS, AND DISTRICT

Stiff-mud process

District	Clay pit			Machine-house			Setting		
	Establishments	Employees	Time cost (man-hours) per 1,000 bricks	Establishments	Employees	Time cost (man-hours) per 1,000 bricks	Establishments	Employees	Time cost (man-hours) per 1,000 bricks
1. Kansas, Kentucky, Nebraska, New Jersey, Ohio, Pennsylvania, Wisconsin	16	118	1.17	16	178	2.08	13	85	1.21
2. Florida, Georgia, Louisiana, Mississippi, South Carolina	9	77	1.21	9	162	2.85	8	119	1.72
3. Maryland, North Carolina, Virginia	10	56	.88	9	123	2.02	10	112	1.65
4. Illinois	6	54	.37	5	226	1.42	6	108	.59
5. Arkansas, Missouri	3	23	1.10	3	53	3.21	2	21	1.54
Total	44	328	.72	42	742	1.86	39	445	.97

Soft-mud process

1. Connecticut, Massachusetts	7	43	1.07	4	65	2.72	4	77	3.39
2. New Jersey, New York	4	55	1.07	5	190	2.71	3	39	.99
3. Kentucky, Ohio, Pennsylvania	5	28	.57	5	60	1.26	5	40	.94
4. Louisiana, Mississippi, Texas	3	24	2.01	4	56	3.47	4	36	2.87
5. Michigan	3	15	.45	3	56	1.52	2	26	1.00
Total	22	165	.88	21	427	2.19	18	218	1.50

Dry-clay process

1. Kansas, Missouri	3	23	2.02	3	17	1.52	4	37	2.42
2. Texas	3	26	1.97	3	19	1.26	3	23	1.70
Total	6	49	1.99	6	36	1.36	7	60	2.02

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TABLE 4.—AVERAGE TIME COST PER 1,000 BRICK, BY DEPARTMENT, PROCESS, AND DISTRICT

Stiff-mud process

District	Burning			Loading			Miscellaneous			All departments		
	Establishments.	Employees	Time cost (man-hours) per 1,000 bricks	Establishments.	Employees	Time cost (man-hours) per 1,000 bricks	Establishments.	Employees	Time cost (man-hours) per 1,000 bricks	Establishments.	Employees	Time cost (man-hours) per 1,000 bricks
1. Kansas, Kentucky, Nebraska, New Jersey, Ohio, Pennsylvania, Wisconsin	15	59	1.00	8	52	1.11	12	123	1.70	12	570	8.74
2. Florida, Georgia, Louisiana, Mississippi, South Carolina	8	95	2.23	7	76	1.28	8	131	2.30	8	578	11.95
3. Maryland, North Carolina, Virginia	10	64	1.41	9	104	1.49	9	122	1.59	8	508	9.12
4. Illinois	6	29	.26	4	113	.73	5	186	1.19	5	637	4.34
5. Arkansas, Missouri	2	5	.57	1	19	2.08	2	21	2.42	2	147	10.27
Total	41	252	.78	29	364	.99	36	583	1.50	35	2,440	6.82

Soft-mud process

1. Connecticut, Massachusetts	2	8	0.65	2	6	1.93	2	68	5.76	5	402	13.29
2. New Jersey, New York	3	25	1.15	3	95	1.50	5	96	1.49	3	429	8.66
3. Kentucky, Ohio, Pennsylvania	3	12	1.02	3	17	1.59	2	27	.96	5	233	6.97
4. Louisiana, Mississippi, Texas	3	8	.62	3	17	1.34	4	63	3.66	1	52	16.16
5. Michigan	2	4	.23	1	10	.94	1	18	1.40	2	118	6.27
Total	13	57	.73	12	145	1.44	14	272	2.10	16	1,234	8.74

Dry-clay process

1. Kansas, Missouri	2	10	1.81	4	17	2.14	3	23	2.55	3	119	11.23
2. Texas	4	12	.97	1	3	.90	2	23	1.56	1	20	9.33
Total	6	22	1.15	5	20	1.87	5	46	1.97	4	139	10.81

The cost figures in the above table represent the average time cost (man-hours) per 1,000 bricks when applied to the plants and the States as grouped by districts. They do not, however, show the very great differences between individual plants. To illustrate the wide differences, two plants, both included in Table 4 under the stiff-mud process, have been selected for comparison. Plant A is in district 2 and Plant B is in district 4. Plant B is very large, is equipped with the best, improved machinery and labor-saving devices, and is also efficiently organized and operated, while plant A is small and not so well equipped, organized, or operated. The table below gives a detailed comparison of these two plants, thus emphasizing the vast differences in labor productivity which exist in the industry.

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TABLE 5.—AVERAGE TIME COST PER 1,000 BRICKS IN TWO ESTABLISHMENTS USING STIFF-MUD PROCESS

Operations	Total employees		Total hours		Output in bricks per man-hour		Man-hours per 1,000 bricks	
	Plant A	Plant B	Plant A	Plant B	Plant A	Plant B	Plant A	Plant B
Clay pit	6	11	330	1,337	382	4,366	2.62	0.23
Machine house	12	80	640	8,607	197	678	5.08	1.47
Setting crew	9	21	375	2,463	272	2,370	3.68	.42
Burning	3	8	193	1,483	389	3,833	2.57	.26
Loading	2	46	60	4,932	833	1,184	1.20	.84
Miscellaneous	6	37	325	4,111	388	1,420	2.58	.70
Total	38	203	1,923	22,933	56	254	17.73	3.93

It is quite astonishing to find that one plant has an output of only 56 bricks per man-hour, while the other produces 254 bricks per man-hour; or, to reverse the units of measurement, that the first plant expends 17.73 hours of labor to turn out 1,000 bricks, while in the second plant the same output requires only 3.93 hours. The smaller plant still manages to exist, however, because such low wages are paid that the total labor costs in the two plants are about the same. The average earnings of all employees in Plant A was 15 cents per hour, while in Plant B the average earnings were 79 cents per hour, or over five times as much. Another factor contributing to the survival of the smaller plant is the decentralization of the industry, which has not yet reached the stage of development where the large, efficient plants are sufficiently organized to drive the small, local manufacturer out of business.

The results are almost as striking, even when whole districts are compared, instead of individual plants. The next table presents for each district the average production rate per man-hour in the plant as a whole and in the machine-house department only. The plants included in this table cover only such as furnished detailed information for all departments into which the manufacture of brick is divided, the information for the machine house being complete and not including in any case any work of any other department.

In arriving at the average production rate for the plant, the number of employees actually necessary to operate all departments combined was multiplied by the number of hours the brick machine was in operation during the pay period covered. The aggregate man-hours so obtained was then used as the divisor of the number of thousand bricks produced by the machine during that period. The production rate for the machine house was obtained by the same method by using the actual number of employees (complete machine-house crews) necessary to operate that department.

The number actually necessary to man all departments or to man the machine-house department only was used instead of the number found on the pay records, because it is frequently found that, owing to turnover of personnel, the number of individuals appearing on the pay rolls exceeds the number of full-time men actually necessary to man the plant as a whole or the machine-house department alone.

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TABLE 6.—PRODUCTION OF BRICKS PER MAN-HOUR, ALL EMPLOYEES, AND MACHINE-HOUSE EMPLOYEES, BY PROCESS AND DISTRICT

District and process	Number of establishments	Number of employees		Production rate per man-hour (number of bricks)	
		All departments	Machine-house department only	All employees, all departments	Employees of machine-house department only
Stiff-mud process:					
1. Kansas, Kentucky, Nebraska, New Jersey, Ohio, Pennsylvania, Wisconsin	11	501	115	130.5	545.0
2. Florida, Georgia, Louisiana, Mississippi, South Carolina	8	477	127	85.9	295.7
3. Maryland, North Carolina, Virginia	8	426	80	119.8	616.6
4. Illinois	4	446	153	359.9	1,066.0
5. Arkansas, Missouri	2	126	37	98.5	335.6
Total	33	1,976	512	221.8	763.4
Soft-mud process:					
1. Connecticut, Massachusetts	2	173	37	100.6	470.5
2. New Jersey, New York	3	366	113	125.2	403.7
3. Kentucky, Ohio, Pennsylvania	5	198	56	214.4	767.8
4. Louisiana, Mississippi, Texas	1	53	12	51.5	227.3
5. Michigan	2	115	40	168.0	482.1
Total	13	905	258	140.9	482.6

This table makes it clear that the two plants previously compared were merely representative of their respective districts. For the stiff-mud process the output per man-hour in district 4, the plants of which are all located in or near Chicago, is over four times what it is in district 2, consisting wholly of Southern States; even in the machine-house department alone the man-hour output in the Chicago district is three and six-tenths times that in the South. These differences are due to the improved machinery generally used, especially to the mechanical handling of the product, the character of the clay, and to the process of burning.

For the soft-mud process there is almost as great a divergence in productivity in different parts of the country. The average output per man-hour in district 3 (Kentucky, Ohio, Pennsylvania) is over four times the output per man-hour in district 4 (Louisiana, Mississippi, and Texas), but the significance of the comparison is greatly reduced because of the fact that the data for district 4 are for one plant only.

Cotton-Textile Industry

New England Cotton Mill, 1838–1925

IN SOME industries statistics of production and employment are not sufficiently comprehensive, or else the units of measurement of production are not precise enough to be comparable, so that it is impractical to attempt to get any expression of productivity for the industry as a whole. In such cases it is necessary to get results by using the method of samples. Data on productivity are obtained from some representative establishments in the industry. Sometimes

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these results can be assumed to be indicative of conditions throughout the industry.

Two such intensive studies have recently been made in the cotton-textile industry. One of these covers the productivity of a New England cotton mill from 1838 to 1925.[4] A long-established New England mill producing staple goods was selected and a study was made of its production record. This mill was built in 1813, and until 1890 devoted itself exclusively to the manufacture of a standard grade of sheetings. In the latter year the manufacture of flannels was introduced, and in 1910 these formed 82.7 per cent of the total output, declining, however, to 25.9 per cent of the total in 1919. In 1920 a new mill was erected, equipped with the latest improved machinery and a complete conveyor system for distributing the stock in process from the time it leaves the storehouse in bales until it arrives in the cloth room as cloth. This new mill was turned over exclusively to the manufacture of sheetings and pillow tubings, and the manufacture of flannels remained in the old mill.

Much thought and attention have been given to putting production in this new mill on a highly scientific basis, and careful studies are constantly being made for the purpose of detecting and checking all possible waste and maintaining production and efficiency at a maximum. An excellent opportunity is thus afforded for making comparisons of the productivity of the new and scientifically equipped and operated sheeting mill with the old mill operating with old machinery and under less advantageous conditions. An opportunity is afforded, further, to make a 50-year comparison of efficiency in production of the same grade of cloth, without the disturbing factor of flannels, the new mill being devoted exclusively in 1925 to the manufacture of sheetings of practically the same grade as those produced in 1876.

Neither yards nor pounds are satisfactory units of measurement in determining the output of the mill, so a new unit was devised. The plant records show, for each grade of cloth manufactured, the number of picks to the yard, and this figure, multiplied by the yards produced, gives the output in picks, which are the filling or cross threads interlaced with the warp yarns by means of the shuttle. The whole product thus reduced to picks was then thrown back again into pounds by means of a constant, that is, an arbitrary statistical unit of conversion. Even this standardized pound is far from being a perfect unit, because no allowance can be made for the differences in the conditions which exist in the manufacture of the cloth, and which may influence the productivity of the workers.

Since most of the workers were on piece rates there were no data on actual man-hours, so these had to be calculated by multiplying the number of full-time workers by the mill-hours. This results in a quite accurate estimate of man-hours. In these calculations certain classes of workers were excluded, such as all those who participated in management, all clerical and administrative workers, and even certain overhead groups of manual laborers, chiefly yardmen and repair-shop employees. The man-hours, as finally computed, cover only those workers directly concerned with the productive process, beginning with the opening and picking operations and ending with

[4] See Labor Review, October, 1926, p. 21.

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the weave room. Even the cloth-room workers, who finish the cloth and prepare it for shipment, were not included.

The productivity of the workers was found by dividing the total output of the mill by the total man-hours. This man-hour production was calculated both by straight pounds and by pounds derived by first reducing the whole product to picks and then reconverting the picks into pounds, a standard grade of sheeting produced in this mill being used as a unit. The following table shows the results:

TABLE 7.—MAN-HOUR PRODUCTION OF COTTON CLOTH IN A NEW ENGLAND COTTON MILL, IN POUNDS AND PICKS, 1838 TO 1925

Unit of measurement	Units of cloth produced per man-hour						
	1838	1850	1876	1890	1910	1919	1925
Straight pounds [1]	0.98	1.21	2.24	3.31	5.00	4.98	7.53 (sheeting). 8.94 (flannel). 7.83 (both).
Pounds based on D grade:							
Product reduced to picks			2.28	3.20	3.18	3.84	8.12 (sheeting). 4.36 (flannel).
Product reduced to 36-inch picks							8.31 (sheeting). 4.04 (flannel).

[1] The proportions that flannels formed of the total product in the years when flannels and sheeting were combined were as follows: 1890, 5.9 per cent; 1910, 82.7 per cent; 1919, 25.9 per cent; and 1925, 24 per cent.

On the basis of straight pounds, production in this mill increased between 1838 and 1925 from 0.98 pound per man-hour to 7.53 pounds in the sheeting mill and to 8.94 pounds per man-hour in the flannel mill. The flannel mill would thus seem, at first sight, to be more efficient than the sheeting mill. The discrepancy comes, of course, because of the fact that flannels, with fewer yards to the pound than the sheetings, give a false index of productivity—a much higher one than is justified in comparison with the production of sheetings. This is seen when the output is calculated in pounds on the basis of picks. By this method the man-hour production of cloth shows an increase between 1876 and 1925 from 2.28 pounds to 8.12 pounds in the sheeting mill and 4.36 pounds in the flannel mill.

The sheeting mill figures are the better index of productivity. As noted previously the whole output in 1876 consisted of sheetings only, so the man-hour output of 1876 is directly comparable with the sheeting mill output of 1925. In 50 years, then, the man-hour output increased from 2.28 pounds to 8.12 pounds, or an increase in productivity of 256 per cent.

The two periods in which the greatest increases in productivity took place were 1850–1876 and 1919–1925. The first period covers a span of a quarter of a century, which saw the introduction of many technical improvements in the industry. Thus in 1855 there were 134 new looms installed; in the seventies the first stop motions were placed on the looms, making it possible for one operative to tend more looms; beginning with 1874 the whole system of spinning began to be changed from throstle to ring spinning. The remarkable increase in productivity between 1919 and 1925 is due to the fact that the figures for the latter year are for the new mill, while those for 1919 are for the old mill. The superiority of the new mill is due to several factors: (1) The more efficient routing of

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material, which results in the elimination of a number of workers; (2) a better layout of the plant, which prevents useless transportation of material; and (3) new and improved machinery, such as the Barber-Colman machine for tying ends. The point to be emphasized in this connection is that technical progress in the cotton-textile industry is far in advance of productive performance. If the industry ever becomes prosperous enough to discard the older factories and machinery, the productivity of labor can probably be increased many times in a very few years.

Southern Cotton Mill, 1911–1925

THE Bureau of Labor Statistics [5] recently conducted a study of labor productivity and labor costs in cotton manufacturing in one of the southern mills in which practically the same class, size, and quality of goods had been manufactured during the entire 15-year period from 1911 to 1925.

In calculating the man-hours, it was determined that figures covering a pay-roll period during 1911—one-half month or two weeks—would under normal conditions be sufficiently representative and comparable with figures for a similar period during 1925, and would, when reduced to the man-hour basis, give practically the same results as figures for a longer period. The question of what constitutes chargeable productive labor is somewhat arbitrary. It was decided, for the purpose of the survey, to include all who were actively engaged in the production of the output, so that productive labor in this instance covers supervisory and general help, such as engineers and firemen, carpenters and electricians, or watchmen whose labor is necessary for the operation of the plant and consequent production of the material.

The survey covered only the manufacture of the fundamental article, gray cloths, and disregarded any bleaching, dyeing, or other converting process which might be used in connection with it. No attempt was made to express the labor productivity for the process of cloth manufacture as a whole, but figures on man-hour output were obtained for each of the three major divisions of the work—yarn production, cloth production, and finishing operations. The man-hour output of yarn in pounds was calculated for the whole labor force engaged in this particular process, and also for the largest group of workers in the process, the spinners. The productivity of weavers, and of all workers engaged in cloth production proper, was determined in the same way, the output being measured in pounds. In the case of the finishing department, which includes inspecting, folding, wrapping, etc., the amount of cloth turned out was recorded in both pounds and linear yards, so the man-hour output was calculated for both measurements. The table following shows the results obtained in this study.

[5] See Labor Review, September, 1926, pp. 7–18.

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TABLE 8.—MAN-HOUR OUTPUT IN SPINNING, WEAVING, AND FINISHING OPERATIONS IN A COTTON MILL

Item		1911	1916	1925
Yarn produced:				
Total	pounds	403,232	382,527	366,959
Per man-hour—				
All yarn workers	do	10.08	10.57	11.59
Spinning	do	45.09	43.12	48.69
Cloth woven:				
Total	do	393,642	395,259	421,966
Per man-hour—				
All cloth workers	do	7.95	8.26	10.31
Weaving	do	13.65	16.53	24.49
Production of finished cloth:				
Total	do	383,127	437,966	383,830
	yards	916,628	1,128,968	957,363
Per man-hour	pounds	56.62	74.63	63.40
	yards	135.47	192.38	158.14

There are, of course, many uncertainties in the figures. In the case of yarn production, for example, no attempt was made to separate the warp-yarn production from the filling-yarn production, although variations in the relative proportions of these would make considerable difference in the amount of work required, since the filling yarn was of a finer grade, necessitating more twist in the spinning and requiring more yards to weigh a pound. Roughly, about two-thirds of the yarn was warp yarn, and the remaining one-third was filling yarn. The variation in these proportions may be responsible for the apparent decline in the man-hour output in spinning from 1911 to 1916.

In the production of woven cloth, the man-hour output of weavers increased much more rapidly between 1916 and 1925 than did that of the other workers in this process. The increase in man-hour output for the whole department from 8.26 pounds in 1916 to 10.31 pounds in 1925 is due almost entirely to the 50 per cent increase in the output of weavers, which means that the productivity of the other workers must have remained about constant.

The sharp decline in the output of the workers engaged in finishing operations is due to the fact that a larger number of workers were used in this department in order to insure better quality of the finished product.

Paper Box-Board Industry

AS A RESULT of two conferences held in Washington, D. C., in 1924 and 1925, the great majority of paper box-board manufacturers agreed to eliminate Sunday work, and many of them changed from a two-tour to a three-tour system, thus instituting the 8-hour day. The Bureau of Labor Statistics secured detailed information from 11 paper box-board mills for a representative two-week pay period in 1924 and a similar period in 1925, presenting in detail the changes resulting from reduced working hours, especially with reference to the effect of the shortened hours upon output.[6]

In the seven establishments that changed from two tours to three tours, the average days of operation decreased from 11.1 days in 1924 to 10.5 days in 1925. The average daily tonnage output of these seven plants, however, increased from 150 tons in the two-week period in 1924 to 166 tons in the two-week period in 1925.

[6] For detailed report see Bureau of Labor Statistics Bul. No. 407. Washington, 1926.

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In the four plants that reduced their working week from six days to five days the average daily tonnage decreased slightly from 107 tons in the two-week period in 1924 to 106 tons in the two-week period in 1925.

The table which follows gives the output in pounds per man-hour. This production is arrived at by dividing the total output (in pounds) for the two-week period by the total hours worked in the beater room, the machine room, and in all departments.

TABLE 9.—OUTPUT IN POUNDS PER ONE-MAN HOUR IN A TWO-WEEK PERIOD, 1924 AND 1925, BY ESTABLISHMENT

Establishment	Output per one-man hour in—								
	Beater room			Machine room			All departments		
	1924	1925	Per cent of change	1924	1925	Per cent of change	1924	1925	Per cent of change
	Mills which changed from 2 tours to 3 tours [1]								
	Lbs.	*Lbs.*		*Lbs.*	*Lbs.*		*Lbs.*	*Lbs.*	
No. 1	421	424	+0.7	333	360	+8.1	113	119	+5.3
No. 2	649	787	+21.3	565	713	+26.2	135	147	+8.9
No. 3	588	719	+22.3	814	1,001	+23.0	175	209	+19.4
No. 4	663	680	+2.6	643	706	+9.8	162	173	+6.8
No. 5	548	704	+28.5	636	857	+34.7	145	179	+23.4
No. 6	938	1,064	+13.4	682	871	+27.7	216	246	+13.9
No. 7	684	907	+32.6	854	1,054	+23.4	188	236	+25.5
Average	642	723	+12.6	612	729	+19.1	162	180	+11.1
	Mills which changed from 6 days to 5 days of production								
No. 8	466	410	−12.0	636	531	−16.5	139	110	−20.9
No. 9	528	536	+1.5	551	585	+6.2	131	127	−3.1
No. 10	488	516	+5.7	663	651	−1.8	134	130	−3.0
No. 11	554	762	+37.5	646	617	−4.5	197	214	+8.6
Average	513	565	+10.1	632	613	−3.0	151	146	−3.3
Grand average	596	674	+13.1	618	695	+12.5	158	170	+7.6

[1] Two of these mills also reduced their days of production from 6 to 5.

Study of the table shows that for the seven plants that changed from two tours to three tours, the output per man-hour increased in every case and for every department. In the beater room the average output per man-hour increased from 642 pounds to 723 pounds, in the machine room the increase was from 612 pounds to 729 pounds per man-hour, and for all departments there was an increase from 162 pounds to 180 pounds per man-hour. For two of the mills (No. 1 and No. 4) the increases were very small, but for the other five mills, and especially for No. 5 and No. 7, the net improvement in productivity was quite substantial.

In the four mills which reduced the working-days from six to five, the results are not so striking. In the beater room the average output per man-hour increased from 513 pounds to 565 pounds, but in the machine room and for all departments combined there was a decline in productivity—from 632 to 613 pounds per man-hour in the machine room and from 151 to 146 pounds per man-hour for all departments. It must be emphasized, however, that Plant No. 8, which showed large decreases in productivity throughout, was manufacturing a better grade of board in 1925 than in 1924, so that the figures for this plant are not strictly comparable. With this

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plant eliminated it is apparent that there was a slight increase in output per man-hour following the change from the six-day week to the five-day week.

Another way of analyzing the situation is to express the changes in productivity in terms of the number of man-hours required to produce a ton of paper box-board. These are shown in Table 10.

TABLE 10.—LABOR COST PER TON OF PRODUCT (IN MAN-HOURS) IN A TWO-WEEK PERIOD, IN 1924 AND 1925, BY ESTABLISHMENT

Establishment	Labor cost per ton of product (in man-hours) in—								
	Beater room			Machine room			All departments		
	Man-hours		Per cent of change	Man-hours		Per cent of change	Man-hours		Per cent of change
	1924	1925		1924	1925		1924	1925	
	Mills which changed from 2 tours to 3 tours [1]								
No. 1	3.40	2.78	−18.2	2.46	2.00	−18.7	11.41	9.59	−16.0
No. 2	4.75	4.71	−.8	6.00	5.55	−7.5	17.75	16.87	−5.0
No. 3	3.08	2.54	−17.5	3.54	2.80	−20.9	14.85	13.63	−8.2
No. 4	2.92	2.21	−24.3	2.34	1.90	−18.8	10.61	8.48	−20.1
No. 5	2.13	1.88	−11.7	2.93	2.30	−21.5	9.24	8.13	−12.0
No. 6	3.65	2.84	−22.2	3.14	2.33	−25.8	13.75	11.16	−18.8
No. 7	3.02	2.94	−2.6	3.11	2.83	−9.0	12.36	11.56	−6.5
Average	3.11	2.77	−10.9	3.27	2.75	−15.9	12.36	11.10	−10.2
	Mills which changed from 6 days to 5 days of production								
No. 8	3.61	2.62	−27.4	3.10	3.24	+4.5	10.13	9.36	−7.6
No. 9	4.10	3.88	−5.4	3.02	3.07	+1.7	14.90	15.34	+3.0
No. 10	3.79	3.73	−1.6	3.63	3.42	−5.8	15.27	15.74	+3.1
No. 11	4.29	4.88	+13.8	3.15	3.77	+19.7	14.41	18.15	+26.0
Average	3.90	3.54	−9.2	3.17	3.27	+3.2	13.23	13.73	+3.8
Grand average	3.35	2.97	−11.3	3.24	2.88	−11.1	12.62	11.78	−6.7

[1] Two of these mills also reduced their days of production from 6 to 5.

The data in this table simply express in another way the same results as the preceding table. The only difference is that the comparison is reversed, the unit being a ton of product instead of a man-hour. In the seven establishments which changed to the three-tour system the number of man-hours required to produce a ton of box-board declined 10.9 per cent in the beater room, 15.9 per cent in the machine room, and 10.2 per cent in all departments. The apparent increase in man-hours per ton of product among the four plants which changed from the six-day to the five-day week is due solely to the influence of the plant mentioned above, which changed the quality of its product in 1925.

Pottery Industry

A RECENT bulletin of the Bureau of Labor Statistics [7] contains data on the productivity of labor in various phases of the pottery industry. The data having especial significance are those on productivity of the clay shop in the manufacture of semivitreous ware.

[7] Bureau of Labor Statistics Bul. No. 412. Washington, 1926.

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Since the crew, rather than the individual worker, is the unit for production purposes, the output has been expressed in crew-hours rather than in man-hours.

A report as to the production of semivitreous 7-inch plain-edge plates was obtained for 58 crews, each consisting of a jigger man, a batter-out, a mold runner, a finisher, and a clay carrier for a fractional part of the time, the fractional time of the carrier for each crew is from an eighth to a sixteenth of the total time given by the carrier to the several crews to which he delivers clay. The average production per crew per hour was 28.1 dozen, distributed as follows:

Output of plates per crew per hour:	Number of crews
Under 20 dozen	2
22 and under 24 dozen	3
24 and under 26 dozen	5
26 and under 28 dozen	15
28 and under 30 dozen	16
30 and under 32 dozen	12
32 and under 36 dozen	5

Data as to the production of ordinary semivitreous tea cups were obtained for 42 crews, each consisting of a jigger man, a baller, a mold runner, and a clay carrier for a fractional part of the time. The average production per crew per hour was 53 dozen, distributed as follows:

Output of cups per crew per hour:	Number of crews
32 and under 34 dozen	2
42 and under 44 dozen	1
44 and under 46 dozen	3
46 and under 48 dozen	1
50 and under 52 dozen	8
52 and under 54 dozen	3
54 and under 56 dozen	12
56 and under 58 dozen	7
58 and under 62 dozen	2
62 and under 64 dozen	1
64 and under 66 dozen	1
68.8 dozen	1

In the study of production of semivitreous saucers figures were obtained for 48 crews, each consisting of a jigger man, a batter-out, a mold runner, a finisher, and a clay carrier for a fractional part of the time. The average production per crew per hour was 42.8 dozen, distributed as follows:

Output of saucers per crew per hour:	Number of crews
32 and under 36 dozen	2
36 and under 40 dozen	6
40 and under 44 dozen	19
44 and under 48 dozen	20
50 and under 52 dozen	1

Labor Productivity as Measured by Index Numbers

AS INDICATED above, changes in productivity can be measured by means of index numbers. This method must be used for all industries in which there is more than one product. For example, the system of expressing productivity in

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terms of tons of coal or number of bricks per man-hour can not be applied to the iron and steel, paper and pulp, or rubber tires industries. Also, the index number is a more satisfactory unit for measuring changes over a period of time. The Bureau of Labor Statistics has undertaken to calculate indexes of productivity for a number of industries for which it is impracticable to measure the actual output per man-hour in products.

The original data on annual production, from which the indexes were constructed, were derived from a variety of sources. The bulk of the data was taken from the Census of Manufactures and the Department of Commerce monthly magazine, Survey of Current Business. Sometimes the Department of Commerce itself gathers original production statistics in certain industries, but for the most part the survey is a compilation of data furnished by trade associations and private agencies.[8] Occasionally it was found advisable to use some other than these two sources. The data on meat production, for instance, were taken from a pamphlet of the Department of Agriculture,[9] while the figures for pig iron and steel ingot production were taken directly from the annual reports of the American Iron and Steel Institute.

The index of man-hours was constructed from (1) the average number of men employed in the industry each year, (2) the average full-time official hours per week, and where possible (3) the average hours actually worked per week. The average number of men employed is given in the Census of Manufactures for the census years; these figures can be supplemented by the monthly indexes of employment published by the Bureau of Labor Statistics, covering the period 1916–1925 for some industries and 1922–1925 for others. The average full-time official hours per week were determined from the census reports on prevailing hours of labor, supplemented by special studies of the Bureau of Labor Statistics. Usually, such special studies contain statistics on average hours actually worked by the employees, and the data on this point were incorporated into the index of man-hours whenever possible. In the boot and shoe industry,[10] for instance, there is a considerable amount of information on actual hours of labor as distinguished from official full-time hours.

On the basis of all these sources the index of employment was combined with an index of hours to form an index of man-hours. Such an index is subject to a certain amount of inaccuracy very difficult to estimate. Inadequate statistics on part time in bad years and overtime in prosperous years, the occasional use of interpolation to span the gaps in the data, and the necessarily frequent averaging—all these operate in the direction of inaccuracy. On the other hand, as against these must be listed the comprehensiveness of most of the data and the fairly close correlation of data from two different

[8] The origin of the statistics of production appearing in the Survey of Current Business is as follows: Automobiles, National Automobile Chamber of Commerce; sugar, Willet and Gray, Statistical Sugar Trade Journal; rubber tires, Rubber Association of America; flour, Russell's Commercial News; paper and pulp, Federal Trade Commission, Newsprint Service Bureau, and the American Paper and Pulp Association; iron and steel, American Iron and Steel Institute; leather tanning, boots, and shoes, Department of Commerce, Bureau of the Census; cement, petroleum, Department of Commerce, Bureau of Mines.

[9] United States. Department of Agriculture. Bureau of Animal Industry. Meat production, consumption, and foreign trade in the United States, 1907–1926, by John Roberts. Washington, 1926.

[10] Bureau of Labor Statistics Buls. Nos. 134, 154, 178, 232, 260, 278, 324, 360, and 374.

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sources. The man-hours index in most of the 11 industries is not so accurate as the production index, but the probable error in either case is not large enough to destroy the value of the resulting productivity index.

After indexes of production and man-hours had been constructed for an industry, these two were combined to form an index of productivity with 1914 as the base. That is not an ideal year for a productivity base because of the fact that there was a serious depression at that time, but in the case of many industries it is impossible to get data prior to 1914. Even when it is possible to push the indexes back to 1909 or 1904, the uncertainties in the figures and the probable inaccuracies are much too great, in all except one or two industries, to justify using any of these years as a base. The year 1913 would have been a very satisfactory base as far as industrial conditions were concerned, but it was not a census year. Therefore, in the following table the productivity indexes for all industries have been based on 1914, although, wherever possible, indexes have been constructed for 1909, 1904, and 1899. The indexes for these early years, of course can not be anything more than the most general approximations of the productivity situation, and they must not be considered to be so clearly indicative of actual conditions as those of recent years.

Secondly, it must be emphasized once more that these index numbers give absolutely no indication as to the absolute amount of output per man-hour in each industry; the index is relative only. We can draw the conclusion that the output per man-hour in the iron and steel industry in 1925 was over two and one-half times what it was in 1899, but we do not know how many tons of pig iron were produced per man-hour in either case.

The productivity indexes for 11 industries are given in the table below:

TABLE 1.—INDEXES OF PRODUCTIVITY OF LABOR IN 11 INDUSTRIES

[1914=100]

Year	Iron and steel			Boots and shoes	Leather tanning	Slaughtering and meat packing	Petroleum refining	Paper and pulp	Cement manufacturing	Automobiles	Rubber tires	Flour milling	Cane-sugar refining
	Industry as a whole	Blast furnaces	Steel works and rolling mills										
1899	60	44	63	100	93	------	62	------	------	------	------	------	------
1904	69	59	71	108	92	------	57	82	------	40	------	94	------
1909	100	80	104	100	92	115	117	95	------	36	------	93	------
1914	100	100	100	100	100	100	100	100	100	100	100	100	100
1915	120	------	------	------	------	------	------	------	------	------	------	------	------
1916	124	------	------	------	------	------	------	------	------	120	------	------	------
1917	109	------	------	------	------	------	------	101	------	133	------	------	------
1918	103	------	------	------	98	------	------	101	------	[1] 90	------	------	------
1919	100	96	101	105	101	93	92	104	103	136	130	96	79
1920	115	------	------	------	99	------	------	102	------	150	------	------	------
1921	94	110	92	115	126	119	111	94	124	193	190	118	82
1922	136	------	------	116	130	125	126	118	------	249	------	------	------
1923	139	154	137	107	134	128	135	116	132	270	266	128	102
1924	137	------	------	107	131	129	163	128	143	262	301	------	114
1925	159	------	[2] 159	106	126	127	183	134	161	272	311	136	128

[1] This figure is not representative of productivity in the automobile industry in 1918 because of the fact that the Government, for war purposes, placed a restriction on the number of cars which could be produced. In addition, many manufacturers were extensively engaged in executing war orders.

[2] Estimated. For details, see December, 1926, issue of the Labor Review, pp. 31, 32.

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Some detailed explanation of the various indexes is essential to a clear understanding of the meaning and import of the figures, so a brief analysis of the productivity index for each industry will be made in order to emphasize the peculiar conditions affecting the index. For a more complete and detailed exposition of the conditions in each industry, it will be necessary to refer to the articles on productivity which have appeared in the Labor Review.[11]

Automobile Industry

IN THE automobile industry production can be measured only by the number of cars produced, although these represent a wide variety of models, sizes, and workmanship. Since 1914, several important changes in the production of cars have taken place. First, there has been a disproportionate increase in small light cars as contrasted with heavy ones. Second, the production of passenger cars has increased far more than the production of trucks and business vehicles. Third, the closed car, which was a negligible factor in 1914, has now almost superseded the open car. Fourth, the growth of the automobile bodies and parts industry has reduced the work of some automobile companies to very little more than mere assembling.

Not all these factors can be taken into account statistically in the computation of an index of production for the industry, but the more important ones can. Separate production figures are given for closed cars, open cars, and trucks, so that the changing proportions of these three can be eliminated as a factor by assigning a weight to each type, the weights being based largely on the comparative value of each. Secondly, the man-hour data were made to cover the bodies and parts branch as well as the automobile industry proper. Concerning the remaining point, it is not unreasonable to assume that the trend toward smaller cars is at least partly counterbalanced by improved quality all along the line.

In reference to productivity, it may be said that the automobile industry is one which in 10 years has grown from almost nothing at all into one of the leading industries in the country. Under the stimulus of a rapidly expanding demand, the technique of mass production has been perfected to such an extent that the output per man-hour has been increased nearly three times. It is obvious that in a new industry like this one the productivity of labor can be increased much more rapidly than in an old, well-established industry where a high level of productivity has been maintained for years.

Cane-Sugar Refining

THIS is an industry in which there is a single basic raw material, uniform in quality; while the products are quite diversified. It is impossible, in the present state of statistical reports, to do anything in the way of making an adequate index of the output in products. Quite a large percentage of the workmen in a refining plant are engaged in the production of cube, pressed or wrapped

[11] July, 1926 (pp. 1–19), iron and steel, automobiles, boots and shoes, and paper and pulp; October, 1926 (pp. 10–21), cement manufacturing, leather tanning, flour milling, and cane-sugar refining; November, 1926 (pp. 30–40), petroleum refining and slaughtering and meat packing; December, 1926 (pp. 28–34), iron and steel (revised) and rubber tires.

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sugar, and other specialties which can not be adequately accounted for in estimating the final total product. For these and other reasons, it seems better to construct an index of production from the amount of raw material used in each year.

This is also an industry in which the basic processes are very highly chemical and mechanical, with comparatively little labor involved. However, since the war there has been a great development of specialties such as pressed and wrapped table sugar, the production of which involves a large amount of labor that was not necessary when nearly the whole product was disposed of as ordinary granulated sugar. The tendency in recent years has been for sugar refineries to multiply the kinds of manufactured sugar and the sizes of containers. All this results in the employment of a large labor force not directly concerned with the refining, but which is charged up against the industry and reduces the productivity index. The marked improvement in the last two years is probably due to the fact that this side line has become a factor of such importance that attention is being directed toward improving the productivity of this class of labor by the introduction of machinery, rerouting of materials, etc.

Another factor to be taken into consideration is the fact that in the refining processes proper equipment is much more important than men; that is, production can be expanded enormously (up to the full capacity of the equipment) without the addition of a proportionate amount of labor, and, on the other hand, a curtailment of output does not reduce the labor force much. Sugar refining is not the only industry in which this is the case, but it is affected in a much greater degree than most. Thus the amount of sugar refined increased from an index of 112 in 1921 to 161 in 1925 with a practically stationary labor force, but this was not due to any marked improvements in machinery or increases in refining plants.

Lastly, in taking notice of the situation in 1919, attention must be called to the fact that this was a year of extreme shortage, high prices, and Government regulation. The United States Sugar Equalization Board was still operating and the available raw sugar was being apportioned among refiners in accordance with the original agreement in 1918. These chaotic and uncertain conditions naturally resulted in a great increase in clerical workers as well as wage earners; each plant would keep all the men it considered necessary to run at full speed, while the actual delivery of raw sugar to be refined might be much below the capacity of the plant. It should also be noted that turnover in 1919 must have been exceedingly high, and the refineries would keep an extra force on hand to guard against being short-handed when shipments of sugar arrived. All these things combined resulted in a very high employment index for that year, although the output of sugar was not exceptionally large; hence, the statistics are hardly comparable with those of other years.

In summary, it should be again emphasized that the index of productivity is open to considerable doubt. Due to the nature of the industry, the chaotic conditions in 1918 to 1920, and the recent tendencies in marketing, an index of productivity, however accurate, would not be so significant as the indexes for the other industries.

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Flour-Milling Industry

FLOUR milling is difficult to handle because (1) it is such a small-scale industry, so much so that the individual proprietors are almost as numerous as the salaried employees, and the large corporation is the exception; (2) the industry contains many grist mills, which grind grain on shares or for a stipulated price, without buying any grain themselves; and (3) there are several important products and several raw materials. The effect of these three is to make it difficult to construct a production index. The most important product of this industry, of course, is wheat flour, but other products of importance are corn flour and corn meal, rye flour, bran and middlings, and feed, screenings, etc. Allowance must be made for all of them, because the output of wheat flour is not always indicative of the production of the others. The method used in this study was simple addition by tonnage, without the use of any system of weights. This gives the offal, like feed or bran, as much influence in determining the index as a valuable product like wheat flour, but there seems to be no other method. In view of the fact that the employment data are also subject to a wide range of error, it is evident that considerable allowances must be made for the productivity indexes in this industry.

The production of milling products varies relatively little from year to year, as is to be expected in an industry supplying a basic food product. There was a peak in wheat-flour production in 1919 because of the heavy exports to Europe, while in 1921 Europe bought the raw wheat, and flour production in this country reached the lowest point in years. These two years represent the extremes in production of milled products for the last 13 years.

The increase in productivity, therefore, has come about through a reduction in employment. The total man-hours expended in the milling industry in 1925 was over 30 per cent below that of 1914, while production in 1925 was only 6 per cent below.

Iron and Steel Industry

CONSIDERING first the composite index of both branches of the iron and steel industry, attention must be called to the sharp fluctuations in annual production. Of all the major industries in this country iron and steel is probably the most sensitive to conditions of prosperity and depression; and while the fluctuations in production are quickly communicated to the employment, nevertheless there is enough of a lag to cause productivity to fall in periods of depression.

The trend of productivity itself is worthy of some comment. No amount of probable error in the figures could nullify the conclusion that there was a great advance in productivity during the years 1900–1909, coincident with the early development of the United States Steel Corporation. This increase in productivity undoubtedly continued through the period 1909–1913, but the depression in 1914 wiped out all the gains, and the productivity index fell to the level of 1909. The beginnings of war prosperity in 1915 and 1916

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were accompanied by high productivity, which, however, declined during the years of American participation in the war. This was probably the result of influences both internal and external to the industry. The reorganization incident to the performance of war orders for the Government would account for some of the decline, while the transportation crisis and the loss of workers to the Army undoubtedly accentuated it. In 1919, under pressure of the strike, the productivity index continued to fall and once more crossed the 1909 line.

The effect of the abolition of the 12-hour day can be seen in the last great advance of productivity in 1925. Despite the large production of that year there were fewer workers in the industry than in 1919, 1920, or 1923, although the hours of so many employees had been reduced. The man-hour productivity of the workers in an 8-hour day has increased to such an extent that no more labor has been required than before it went into effect.

Considerable caution must be exercised in interpreting the results shown by the segregated indexes. It is clear that in blast-furnace operation the productivity index is not so much affected by prosperity and depression as are the steel mills; or, to put it another way, the employment fluctuates about as sharply and quickly as production. On the other hand, it is evident that the steel works and rolling mills can not dispense with their workers so easily in bad times.

From the data on steel works and rolling mills it might be inferred that the productivity in this branch of the industry remained below the 1909 level all during the period 1909–1921. Such, however, is not the case. It just happens that all three years for which separate indexes can be constructed were bad years for the industry—1914 was a year of severe depression, in 1919 occurred the strike, and in 1921 the bottom dropped out of the market. It is in fact almost certain, judging from the composite index, that the productivity index in steel works and rolling mills was over 100 in every missing year.

When all due allowances have been made, the fact remains that the blast-furnace productivity index has increased much more rapidly than that of steel works and rolling mills, but it is by no means certain just what this indicates. Superficially, it might seem evident that there has simply been a greater improvement in blast-furnace operation, but there is another possible interpretation of the figures which is worth serious consideration.

The blast furnace is a single productive unit, while many distinct operations are grouped together under the heading "Steel works and rolling mills." In the second place, it is extremely doubtful if production of steel ingots is anything like as good a measure of steel-manufacturing activity as pig-iron production is of blast-furnace output. Just as the composite productivity index of both branches of the industry effectively conceals the remarkable productivity increases in blast furnaces, so the general index for steel works and rolling mills may conceal great improvements in the subdivisions. This could only be established by a special field investigation, however, for no census data are available on this point.

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Leather and Boot and Shoe Industries

THE leather tanning and boot and shoe industries are so closely related that even their respective labor productivities are somewhat interdependent. This is due to the fact that nearly the whole leather output of the tanneries must be marketed with the boot and shoe manufacturers. Therefore, any variation in the demand of the public for shoes practically determines the condition of the boot and shoe industry and profoundly affects the tanning industry. For this reason, the indexes of productivity in these industries react quite similarly at times, as shown in the last three or four years, for example. In fact, the close similarity of the indexes in the two years, is in itself good evidence that the indexes are quite accurate.

The calculation of an index of production for leather tanning is exceedingly difficult, because of the fact that both the raw materials and the products are so diversified, and there is no one uniform unit of measurement in either case. In constructing the index, the less important products were omitted, and only the production data for sole, belting, upper, and patent leather were included. Since the original data on this output are expressed in hides, sides, butts, skins, etc., these have all to be reduced to comparable units by means of the table of conversion used by the Census Office. Even at that all sole and belting leather is eventually expressed in pounds, while the upper and patent leather unit is the square foot. Therefore, these two must be first turned into separate indexes and then combined later.

The productivity index for leather tanning indicates that the great improvement in man-hour output came right after the big depression of 1920–1921. The leather industry was one of the first to be struck by the depression, so that for all practical purposes 1920 was the depression year in this industry. The depression drove many small firms out of business, and greatly reduced the employment, although the leather output did not decline very markedly from the peak in 1919. In 1922 and 1923 the total output for the industry was higher than that of 1919, but the man-hours did not even rise to the 1914 level again. It seems likely that the crisis in the leather industry was more financial than industrial, and the great advance in productivity was due more to the elimination of inefficient firms than to any special improvements in production. Since 1923 the annual output of leather has decreased steadily, and this factor has been responsible for the decline in productivity.

Productivity in the boot and shoe industry since the war closely parallels that in the leather industry. There are no production data for boots and shoes in 1920, but it seems probable that this industry, like leather, experienced the depression early in the year, and that the productivity, were it available, would show a decline from 1919. After reaching a high point in 1922, productivity in boots and shoes has declined since that time. The comparatively slight increase in output per man-hour in the boot and shoe industry can be ascribed to two influences: (1) The declining production in recent years because of poor demand, and (2) the rapid development in the demand for odd styles and specially made shoes which has prevented any advance at all in mass production. In addition to these factors within the industry itself, there is another which must not be overlooked.

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Up to and including the year 1921, the statistics on production of boots and shoes were gathered by the Census Office at the regular census periods, but, beginning with 1922 the figures have been compiled from monthly reports of over 1,000 firms in the industry, representing practically complete production. However, the data from such monthly reports, while complete enough for all practical purposes, are almost certain not to be comparable to the data gathered in the biennial census of manufactures, because the latter covers even the smallest firms. In many industries it has been possible to adjust such monthly figures upward to bring them into line with the census figures, but this can not be done in the case of boots and shoes because the two sets do not overlap and so there is no basis of comparison. It is not likely that an adjustment of this kind would make more than a few points' difference in the productivity indexes for 1922–1925.

The results obtained in this study of productivity stand in rather strong contrast with some other data on productivity in the boot and shoe industry published by the Bureau of Labor Statistics. These are the data on the labor time involved in manufacturing 100 pairs of shoes by the hand methods of 1863, and the machine methods of 1895, 1916, and 1923.[12] The two sets of index numbers are compared in the following table:

TABLE 2.—COMPARISON OF PRODUCTIVITY INDEX WITH THE LABOR TIME OF MANUFACTURING 100 PAIRS OF SHOES

Index	1863	1895	1899	1914	1916	1923	1925
Labor time:							
Hours	1,831.67	236.1			142.7	106.86	
Index of output per hour	7.8	60.4			100.0	133.5	
Productivity index			100.0	100.0		107.0	106.0

The discrepancy here seems to be sufficiently large to cast doubt on one or the other or both of the indexes; but as a matter of fact it is not difficult to reconcile the two sets of data. The labor-time figures are for a particular type of shoe in a particular establishment, and represent the very best performance that could be expected at the time and place. But, of course, one particular establishment may have advanced much more rapidly than the general trend of the industry, and secondly, the labor time on a medium-priced shoe which could be manufactured in large quantities would be vastly different than that necessary in small shops on specialty and novelty shoes. Therefore, both results may be quite correct, but each must be interpreted in its own way. The labor-time figures seem to show that considerable labor-saving machinery and improved methods have been introduced into the industry in the last quarter century, and that the best practice of 1925 should be more than double the best performance of the nineties; but the productivity data for the industry as a whole can be interpreted as showing that the increased labor productivity under mass production has been about counterbalanced by the growth in the demand for specialty and novelty shoes. The production of boots and shoes is still a small-scale industry for the most part, and there is a wide gap between the best possible machine performances on standard shoes and the actual industry-wide situation on productivity.

[12] Bureau of Labor Statistics Bul. No. 360. Washington, 1924.

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Paper and Pulp Industry

THE index of productivity for this industry must be considered in the light of the uncertainties in the production index. In computing the total output of the industry account must be taken of at least six different classes of manufactured paper—newsprint, boxboard, book, wrapping, fine writing, and "all other"—and of four kinds of pulp—sulphite, sulphate, soda, and ground wood. The first problem is that of weighting the different kinds of paper and pulp in the construction of separate indexes for paper and pulp respectively; and the only method which can be followed is that of weighting in accordance with relative prices, which in this case are not very satisfactory for this purpose.

Then there is another difficulty to be overcome in combining the paper index with the pulp index. Since the manufacture of the pulp is only an intermediate step in the manufacture of paper, it would be logically sound to use pulp production only as the measure of the total output of the industry, and this procedure would have the advantage that the pulp index is much more accurate than the paper index and very much simpler to compute. But there are two obstacles to such a solution of the problem. First, pulp is often manufactured and then put into storage, so that the output of paper in a given year would not be exactly proportional to the production of pulp. This in itself is not important enough, however, to justify the rejection of the method. But there is a much more serious cause of discrepancy between pulp production and paper production, namely, the importation on a large scale of manufactured pulp from Canada. In 1919 the imports from Canada were 200,000 tons of mechanical pulp and 435,000 tons of chemical pulp, while in 1925 these had increased to 330,000 tons of mechanical and 1,340,000 tons of chemical. In the latter year about one-third of the total chemical pulp used in the United States was imported. Since the amount of pulp manufactured in this country will probably continue to decline relatively, it is obviously impossible to use either pulp or paper production alone as the key to the output of the industry as a whole. Consequently the two separate indexes were combined into a composite production index, both being weighted equally.

The productivity index indicates that there has been a fairly steady increase in man-hour output since 1904. The decline in 1920 and 1921 can undoubtedly be at least partly accounted for by inadequate data on hours of labor during the depression. It is probable that this industry, like boots and shoes, would show much more remarkable productivity increases for particular plants on standardized products like newsprint or wrapping paper, but any such advances are partly counterbalanced by the low productivity in specialty products.

Petroleum Refining

PETROLEUM refining consists in the separation of crude petroleum into its constituent parts by a process of distillation. The crude oil is composed of hydrocarbons of different atomic weights, each of which has its own distinctive properties, including its own boiling point. When petroleum is subjected to heat, the more vola-

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tile parts of the liquid become vaporized and pass off into a condenser, where they are cooled and liquefied again. The first products of distillation are gasoline or naphtha, the second are kerosene or illuminating oil, and the third, gas oil or fuel oil. The remainder, after paraffin wax has been extracted, becomes lubricating oil.

In view of the fact that the products of the industry are so diversified, while crude petroleum is the only important raw material, it has been the custom of the engineers and accountants within the industry to use crude petroleum consumption as a measure of the output of products. Since the total volume of the products in gallons or barrels is substantially equal to the amount of crude petroleum consumed, this method would be quite satisfactory if it were not for the recent development of the "cracking process." This process, which may be described as distillation under pressure, causes gas oil or low quality crude oil to yield additional gasoline instead of other products. The chemical explanation of this is that the combination of pressure with heat "cracks" the molecules of heavier hydrocarbons so that they break down, producing the lighter hydrocarbons which go to make gasoline. The advantage of this process is that it greatly increases the amount of gasoline which can be recovered from a barrel of crude oil, as is shown by the fact that the production of gasoline per barrel of crude petroleum increased from 7 gallons in 1914 to nearly 15 gallons in 1925.

The effect of this increase in the quality of the products should be expressed in the index of production, but as yet no method has been devised for doing so. The industry still uses crude petroleum consumption as a measure of production, so that method was followed in calculating an index of production for the industry, although such an index is obviously an inadequate measure of output and results in a productivity index which is too low for recent years.

Portland Cement Industry

THE manufacture of Portland cement differs from most of the industries considered in this series in two important respects: (1) It is to a certain degree an extractive industry, and bears some resemblance to other extractive industries, such as mining, lumbering, farming, fishing, etc., in that the output is dependent to some extent upon the richness of the deposits of raw material and the condition of the weather; (2) the output of the industry consists of a single product, practically uniform in quality and easily measurable in quantity. From a statistical point of view, there is no problem of weighting, combining indexes, or estimating the total value of the product as must often be done in other industries. The only operation involved in making an index of production is to reduce the actual production figures to percentages.

The production of cement fell off markedly during the war, the total output in 1918 being fully 20 per cent below the output of 1914, and the output in 1919 being about 9 per cent below that of 1914. Under these conditions the productivity remained about stationary, with no significant increase in 1919 over 1914. In the next six years, however, the annual output was doubled—from 80,777,935 barrels in 1919 to 161,658,901 barrels in 1925.

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This great expansion was accompanied by a marked increase in productivity. The output per man-hour increased from an index of 103 in 1919 to 161 in 1925, because, although the production was doubled, the number of man-hours expended increased only 25 per cent.

Rubber-Tire Industry

THE great increase in productivity in the rubber-tire industry can be explained in large measure by the remarkable expansion of the industry in the last decade. The production index for 1925 was 680, nearly seven times as great as in 1914. Or, stated in terms of the original production figures themselves, the output of casings increased from about 8,000,000 in 1914 to nearly 60,000,000 in 1925, and the output of inner tubes increased from slightly less than 8,000,000 to over 75,000,000 in the same period. The production index is very conservatively estimated; in fact, it is probably too low, because of the weight assigned to truck tires, the production of which increased at a slower rate than that of casings and inner tubes.

Employment reached a high point in 1919, when, according to the computations mentioned above, there must have been nearly 130,000 employees in the industry. This number was cut to around 69,000 in 1921, and rose again to 87,000 in 1923. The preliminary census figures for 1925 give only the number of wage earners, not including salaried employees, but the number of the latter employed in 1925 can be estimated on the basis of the relative number in 1923. The result of this computation indicates that the total number of workers on the pay rolls in 1925 must have been around 96,000.

The productivity index, while it is extremely high, is not surprising, in view of the production index. A rapidly expanding industry is always favorably situated for an increase in output per man-hour, especially when, as in this case, the industry is a new one, with the technique of production largely undeveloped. The industry can scarcely be said to have been in existence 20 years ago, although, of course, the rubber industries from which it branched were well developed. The growth of the industry has naturally paralleled that of the automobile industry, and it is interesting to note the close similarity of the two productivity indexes. In both cases the output per man-hour in 1925 was approximately three times that in 1914.

Slaughtering and Meat-Packing Industry

THE slaughtering and meat-packing industry is an interesting one for a productivity study because it differs so markedly from all other industries in its class. Statistics on meat production, for instance, show that there is comparatively little change from one year to the next, although there has been a gradual increase during the past 20-year period. Periods of prosperity and depression do not influence the output of meat products to anything like the same extent that they influence the output of iron and steel, automobiles, paper, etc. This is probably not so much due to any policy of stabilization within the industry as it is to the nature of the business. Meat is a basic food commodity, and consumption figures indicate that the public buys meat quite regularly, regardless of whether times are good or bad; and on the other hand, the farmers in depression years are either unable or unwilling to hold the animals on the

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farm, with the results that large numbers are unloaded onto the market regardless of prices. This tends to keep up the volume of slaughtering in bad years.

In the second place, although in total value of products it is one of the leading industries in the country, ranking first in 1919 and 1921 and third in 1923, yet in respect to value added by manufacture it is far down the list, being twelfth in 1919 and sixteenth in 1921 and 1923. In very few industries is the contrast as sharp as this. Again, this is an industry in which labor occupies a peculiar position. Of all the large industries in this country, slaughtering and meat packing ranks as one which is probably least susceptible to mechanization. Direct hand labor still plays an important, if not a predominant, part in the processes of slaughtering and packing. Yet in spite of this strategic importance of labor in the industry, labor cost is a comparatively small item. Data from the Census of Manufactures shows that, on the average, the amount paid in salaries and wages is only about 7 per cent of the total value of the goods produced, while the cost of the raw materials constitutes 87 per cent of the value of the products, with 6 per cent remaining for profits and overhead expenses.

It is difficult to explain the productivity situation. The output per man-hour seems to have declined steadily from 1909 to 1919, and in the latter year the output was barely 80 per cent of what it was in 1909. Then the figures show that by 1921 the lost ground had been fully made up, the productivity being 3.7 per cent higher than in 1909 and about 30 per cent greater than in 1919. After 1921 there was a steady improvement until the high point was reached in 1924, 29 per cent above the man-hour output of 1914. In 1925 there was a slight decline in productivity, but in view of the great decline in meat production in that year, this is not surprising. It is barely possible that 1914 and 1919 were both exceptional years and not at all indicative of the productivity situation in the industry at those times. The former was a year of exceedingly low production, while in 1919 the industry was still being affected by the war conditions. One factor which might have been responsible in part for the situation is the character of the labor force itself. In an industry so dependent upon hand labor, skill, speed, and experience are necessary qualifications for many of the jobs; and it is possible that many of these experienced men went into the Army during the war and were lost to the industry. This might account for the low productivity figures for 1919, but this factor could not have been operating in 1914. At any rate, the indexes show that there was a marked decline in productivity for 10 years following 1909, and then a sharp recovery in the last six years. In 1925 the output per man-hour exceeded that of 1909 by about 10 per cent; but at the same time it was about 27.5 per cent greater than the productivity in 1914.

Productivity of Labor on the Railroads

THE results of a recent study published in the Labor Review show that the recent increases in the productivity of labor have not been confined to manufacturing industries. On the railroads there has been a steady increase in the productivity of labor since 1890, although the greatest changes have taken place in the last 10 years.

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Due to the fact that in 1915 the Interstate Commerce Commission changed the rules for reporting the service of employees, there is a break in the character of the data at this point. Prior to this time no reports were made by the railroads on the actual hours worked by employees, nor were the data classified in such a way that the productivity of the different classes of workers could be separately determined. Therefore it is only since 1915 that a productivity index for train and engine crews could be calculated.

The unit used as the measure of transportation output is the "traffic unit," computed by adding the ton-miles of freight to three times the number of passenger-miles. This is the generally accepted method of combining these two incommensurable units. The man-hours used in the computations are the "hours of duty" reported by the companies, but prior to 1915 there were no data of this kind, so that the only figures available for the period 1890–1914 are the total number of employees each year. In view of the fact that the hours worked per day declined slightly during this period, the use of the total number of employees as an index of man-hours operates conservatively on the productivity index.

The data used in the study include line-haul roads only, the service of switching and terminal roads not being included. This does not imply that yard and terminal service is excluded, however, for the greater part of such work is done by the line-haul roads. For the years 1890–1910 the figures represent the operations of all railroads in the country, while those for the years 1911–1926 are for Class I roads only. Since the latter include about 95 per cent of all railroad employees, the error thus introduced is not serious.

The index numbers of productivity of all employees from 1890 to 1926 is shown in Table 3.

TABLE 3.—INDEX NUMBERS OF PRODUCTIVITY OF ALL RAILROAD EMPLOYEES IN THE UNITED STATES, 1890 TO 1926

Year ending—	Traffic units	Man-hours [1]	Traffic units per man-hour	Year ending—	Traffic units	Man-hours [1]	Traffic units per man-hour
June 30, 1890	100.0	100.0	100.0	June 30, 1909	273.9	200.6	136.6
June 30, 1891	104.9	104.7	100.2	June 30, 1910	315.0	226.8	138.9
June 30, 1892	114.8	109.6	104.8	June 30, 1911	310.5	213.5	145.4
June 30, 1893	122.0	116.6	104.6	June 30, 1912	319.4	219.2	145.7
June 30, 1894	110.2	104.0	106.0	June 30, 1913	357.4	234.8	152.2
June 30, 1895	109.0	104.8	104.0	June 30, 1914	347.8	218.9	158.9
June 30, 1896	120.8	110.3	109.1	June 30, 1915	330.5	197.1	167.7
June 30, 1897	118.0	109.9	107.4	June 30, 1916	394.5	212.5	185.7
June 30, 1898	138.0	116.7	118.2	Dec. 31, 1916	417.2	222.4	187.6
June 30, 1899	149.8	124.0	120.9	Dec. 31, 1917	459.0	233.1	196.9
June 30, 1900	169.8	135.8	125.0	Dec. 31, 1918	477.3	244.3	195.3
June 30, 1901	178.2	143.0	124.7	Dec. 31, 1919	450.4	215.7	208.8
June 30, 1902	193.6	158.7	122.0	Dec. 31, 1920	492.9	233.4	211.1
June 30, 1903	211.2	175.2	120.5	Dec. 31, 1921	374.7	174.9	214.2
June 30, 1904	215.0	173.0	124.3	Dec. 31, 1922	398.8	179.4	222.3
June 30, 1905	230.7	184.5	125.1	Dec. 31, 1923	471.2	205.7	229.1
June 30, 1906	260.7	203.0	128.4	Dec. 31, 1924	444.5	189.0	235.1
June 30, 1907	286.1	223.2	128.2	Dec. 31, 1925	466.8	188.5	247.6
June 30, 1908	273.5	191.7	142.7	10 months, 1926	[2]	[2]	254.0

[1] Man-hours for the years 1890–1914 are assumed to be proportional to number of employees.

[2] Index numbers based upon figures representing the operations of only a part of the year would not be comparable with those based upon the entire year's operations. Derivative figures (traffic units per man-hour) are exempt from this restriction.

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The table shows an increase of 154 per cent in the 37½ years from July 1, 1889, to 1926, or an average of 4.1 per cent per year. In general, the curve of productivity has been quite smooth, although there has been a marked bending upward because of the rapid increase of productivity in recent years. The rate of increase for the 23 years from July 1, 1889, to June 30, 1912, was only 2 per cent per year, while for the 14½ years from July 1, 1912, to December 31, 1925, the rate was 5.1 per cent per year. For the whole period 1890–1926 traffic increased 366.8 per cent, or an average of 10 per cent per year, while man-hours increased only 88.5 per cent, or 2.4 per cent per year.

Table 4 shows the index numbers of traffic units per man-hour for all employees and for train and engine crews on Class I line-haul railroads for the period 1915–1926. The base period selected is the 2½-year period from July, 1914, to December, 1916. In the first year under the new rules (1915 fiscal year) about 20 of the larger carriers failed to report any data for employees, nor were the data reported by the other roads as carefully collected as in later reports. In 1916 the change was made from the fiscal to the calendar year, so that by using this 2½-year period as a base it is possible to use the data from three full yearly reports.

TABLE 4.—INDEX NUMBERS OF PRODUCTIVITY OF RAILROAD LABOR IN THE UNITED STATES, 1915 TO 1926

[July 1, 1914–Dec. 31, 1916=100.0]

Year ending—	Traffic units	All employees		Train and engine crews	
		Hours on duty	Traffic units per man-hour	Hours on duty	Traffic units per man-hour
June 30, 1915	86.8	93.6	92.8	90.8	95.6
June 30, 1916	103.6	100.9	102.7	101.3	102.2
Dec. 31, 1916	109.6	105.6	103.8	107.9	101.6
Dec. 31, 1917	120.6	110.6	109.0	115.7	104.2
Dec. 31, 1918	125.4	116.0	108.1	117.7	106.6
Dec. 31, 1919	118.3	102.4	115.6	102.3	115.7
Dec. 31, 1920	129.5	110.8	116.8	115.6	112.0
Dec. 31, 1921	98.4	83.0	118.5	84.3	116.7
Dec. 31, 1922	104.8	85.2	123.0	88.2	118.8
Dec. 31, 1923	123.8	97.6	126.8	103.2	119.9
Dec. 31, 1924	116.7	89.7	130.1	93.5	124.9
Dec. 31, 1925	122.6	89.5	137.0	93.8	130.7
10 months, 1926	(1)	(1)	140.5	(1)	134.5

[1] Index numbers based upon figures representing only a part of the year's operations would not be comparable with those based upon the entire year's operations. Derivative figures (traffic units per man-hour) are exempt from this restriction.

As shown in the table, the output per man-hour of all employees increased 40.5 per cent during the period. For train and engine crews alone the increase was 34.5 per cent. In this connection it is important to note that the railroad shop workers are included in the man-hours because there are no data available for computing the man-hours index without them. This is especially important because of the practice of some railroads of farming this work out to contractors. However, the figures of the United States census on employees in railroad repair shops show that the increase in this

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class of labor on the railroads is at least equal to the increase in other classes. Therefore, the indexes of productivity are not affected seriously by this situation.

The results of this study serve to emphasize the fact that the recent increases in the productivity of labor have not been confined to manufacturing industries. The increase in productivity on railroads since 1890 is probably far in excess of that in a great many industries, and it is all the more remarkable because of the fact that it has been a steady increase, not one due to the adoption of any revolutionary methods or inventions.

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SICKNESS STATISTICS

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Disabling Sickness Among Industrial Employees

THE United States Public Health Service has been carrying on a study of the morbidity records of a group of industrial mutual benefit associations and company medical departments since January, 1920. The reports, which are made monthly by these companies to the Public Health Service, cover those cases lasting eight days or longer for which sick benefits have been paid, with the exception of the reports for 1920, which include a number of cases lasting only seven days.

The reports do not include all disabling sickness, since the benefit associations do not pay sick benefits for illness resulting from the venereal diseases, from the violation of any civil law, or from willful or gross negligence, and in most cases they do not pay for chronic diseases contracted prior to the date of joining the organization. There are certain rules, also, which if not complied with many result in a member being denied disability benefits, thus further limiting the number of cases recorded, and the age limits for eligibility to membership prevent the age distribution from being typical of that of employees as a whole. The data from the company medical departments have so far as possible been made to conform with those from the benefit associations by excluding diseases for which the latter do not pay benefits. It is evident that the incidence rates of sickness shown by these reports are an understatement of the extent of sickness in industry, although, in view of the general lack of statistical information as to industrial morbidity the information, even though inadequate and incomplete, is believed to be of value.

Sickness Rates for 1922 and 1923 [1]

THE number of persons used as the basis for the calculation of sickness frequency rates is, in the case of benefit associations, the number of members and, in the case of medical departments, the number on the pay roll at the end of each month. About 90 per cent of the total number of employees for whom reports were made were men. Sickness cases among women include only diseases common to both sexes, but in spite of that fact the frequency of cases among the women was about 35 per cent higher than among the men.

The table following shows the frequency of different diseases lasting eight consecutive days or longer in 1923 compared with 1922.

[1] United States Public Health Service. Public Health Reports, Oct. 31, 1924, pp. 2721–2730: "Frequency of disabling illnesses among industrial employees."

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TABLE 1.—NUMBER OF CASES OF SICKNESS CAUSING DISABILITY OF ONE WEEK OR LONGER AMONG A GROUP OF INDUSTRIAL EMPLOYEES AND NUMBER OF CASES PER 1,000 PERSONS IN 1922 AND 1923

General grouping of diseases and conditions causing disability	Number of cases		Number of cases per 1,000 persons	
	1922	1923	1922	1923
Number of persons included in the record	71,728	99,879		
General diseases [1]	2,258	3,277	31.5	32.7
Diseases of the nervous system [2]	483	538	6.7	5.4
Diseases of the circulatory system	274	298	3.8	3.0
Diseases of the respiratory system	1,184	1,503	16.5	15.1
Diseases of the digestive system	1,355	1,805	18.9	18.1
Diseases of the genito-urinary system	190	224	2.6	2.2
Diseases of the skin and cellular tissue	259	339	3.6	3.4
Diseases of the bones and organs of locomotion	349	398	4.9	4.0
External causes (nonindustrial accidents)	663	1,020	9.2	10.2
Ill-defined diseases	218	417	3.1	4.2
Total	7,233	9,819	100.8	98.3

[1] Including influenza and grippe. [2] Including organs of special sense (eyes, ears).

During both 1922 and 1923 the high frequency of influenza and grippe was outstanding, accounting for 21 per cent in 1922 and 24 per cent in 1923 of all the disabilities for which sick benefits were paid. Even in 1921, when there was no marked epidemic of influenza, as was the case in the two following years, the curve for influenza or grippe rose as high as the curve for all other respiratory diseases combined. The other epidemic diseases, including typhoid fever, smallpox, malaria, measles, etc., formed only 2.4 per cent of the total number of cases, less even than appendicitis. This is considered to reflect an important achievement in public health work.

The following table shows the number of cases of sickness per 1,000 persons and the per cent of total cases in 1923, classified according to the principal causes of disability:

TABLE 2.—PRINCIPAL CAUSES OF DISABILITY IN 1923 AMONG A GROUP OF WAGE EARNERS IN DIFFERENT INDUSTRIES

Principal cause of disability	Number of cases per 1,000 persons	Per cent of total cases	Number of cases	Principal cause of disability	Number of cases per 1,000 persons	Per cent of total cases	Number of cases
Number of persons covered in the records	99,879			"Degenerative" diseases	4.6	4.7	462
				Diseases of the skin	3.4	3.5	339
				Appendicitis	3.2	3.2	318
Influenza and grippe	23.3	23.7	2,328	Epidemic and endemic diseases	2.4	2.4	238
All other respiratory diseases	16.3	16.6	1,626	All other diseases	14.1	14.3	1,409
Nonindustrial accidents	10.2	10.4	1,020				
Rheumatism	8.7	8.9	875				
Diseases of the pharynx	6.5	6.6	649	Total	98.3	100.0	9,819
Diseases of the stomach, and diarrhea	5.6	5.7	555				

There was marked seasonal variation in the incidence rate of disabilities lasting longer than one week. This was due almost exclusively, however, to the cases of influenza and grippe, supplemented by the other respiratory diseases, which also had their highest incidence at the time when influenza and grippe were most prevalent.

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These diseases produced an extremely high sickness rate in January February, and March in each of the four years studied, but the records showed that when all the diseases of the respiratory system were eliminated there was comparatively little seasonal variation in the sickness rate.

The frequency rate varied greatly among the different establishments. The lowest male sickness rate was 48 cases per 1,000 persons and the highest 198, while the rate for women ranged from 29 to 261 per 1,000. These differences suggest, the report states, that detailed studies of those establishments having the highest rates, in comparison with the sickness incidence in the establishments having the lowest rates, would provide a starting point for combating the waste and inefficiency resulting from needlessly high disability rates in industry.

Sickness Rates for 1924 [2]

THE report for 1924 shows that during tne year there were 10,948 cases causing disability of eight days or longer in a group of 114,065 male industrial workers employed in different industries. The leading cause of serious disability was influenza and grippe, accounting for 18 per cent of all the sickness claims. During recent years, the report states, no other disease has been so disastrous from the standpoint of interrupted production, wages lost, and cost to sick-benefit associations, and any considerable reduction in its frequency even in nonepidemic years would mean the elimination of thousands of days of disability for American wage earners. For the five years ending December 31, 1924, the frequency rate for this disease was 6.6 times the frequency of the epidemic, endemic, and infectious diseases against which health work is so largely directed.

The next most important cause of disability in 1924 as in the two preceding years was nonindustrial accidents. It appears from the rates for these years that the trend of nonindustrial accidents is upward, due, without doubt, to the increasing number of automobile accidents. Acute and chronic rheumatism, diseases of the stomach and diarrhea, and diseases of the pharynx, all having practically the same frequency, formed the next most important groups, while appendicitis was more frequent than pneumonia. The rate for pulmonary tuberculosis was not much above the general death rate for this disease, due probably to the fact that many of those who are tubercularly inclined either do not get into industry or leave before they are actually incapacitated.

A compilation of the annual incidence rates for different diseases and disease groups for the five years ending December 31, 1924, shows that respiratory diseases, including influenza and grippe, pulmonary tuberculosis, and disease of the pharynx, accounted for 47 per cent of all the cases of sickness.

A comparison of the sickness frequency according to sex shows that the women who were members of the sick-benefit associations had 44 per cent more sickness than the men during the three years ending December 31, 1924, although these reports cover, in most cases, benefits paid only for diseases which are common to both sexes.

[2] United States Public Health Service. Public Health Reports, Jan. 22, 1926, pp. 113–131: "Sickness among industrial employees."

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When the waiting period for sickness benefits is less than one week the difference is even more marked and the records of industrial medical departments indicate that the disability rate for women may be nearly twice the male rate when all sickness causing absence from work for one day or longer is included.

The frequency of different diseases and groups of diseases is shown for men in the iron and steel industry, in public utilities, and in a group of miscellaneous industries. The highest disability rate was found among the men in the public utilities. In this industry the rate was high for practically all ailments, there being no one specific disease or disease group which stood out as accountable for the high frequency rate. The lowest rate was found in the iron and steel industry, where the frequency rate was especially low for diseases of the nervous system and the digestive system and for bronchitis, influenza and grippe. Because of the heavy nature of the work in this industry there is evidently a selective process of recruitment and dismissal which results in the employment of physically stronger workers. The pneumonia rate was so high among these workers, however, that it suggested the desirability of a special study of pneumonia morbidity and mortality in this industry.

Severity rates were computed for those reporting associations which had the same benefit period and while the number was too few to be conclusive, it showed that certain disease groups are much more important from the standpoint of the amount of time lost than from their frequency of occurrence. These groups included diseases of the nervous system, of the circulatory system, and of the genito-urinary system, while "influenza and grippe" were important from the point of view both of frequency and of severity.

Hookworm Disease in Cotton-Mill Villages of Alabama and Georgia [3]

A STUDY of the value of sanitation as a factor in hookworm control in a section of the country where the soil is heavily infested with hookworms was made in the summer of 1925 in four cotton-mill villages in southern Alabama and Georgia. These villages, which were owned and controlled by the mill owners, were chosen because they were well sanitated and because the residents originally came from rural districts where there was practically no sanitation and where hookworm disease was so severe as to form an economic menace to the people, affecting particularly the health of children of school age.

After the families have moved into the village where the housing and sanitary conditions are better and there is little or no opportunity for them to come in contact with infested soil, practically no new infestation is acquired, and the hookworms previously acquired die in from three to five years. In view of this fact, it seemed that a comparative study of the incidence and intensity of infestation in sanitated and unsanitated districts and study of the hookworm

[3] The Journal of Industrial Hygiene, September, 1926, pp. 382–391: "Hookworm disease in cotton mill villages of Alabama and Georgia: A study on the value of sanitation in a soil province heavily infested with hookworm," by Donald L. Augustine.

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infestation of individuals having different lengths of residence in the mill villages would show the value of sanitation in the control of hookworm disease.

A total of 386 children from the four villages was examined for hookworm, of whom 263, or 68.1 per cent, showed some degree of infestation. Each child was given a general physical examination which included his weight and the determination of his hemoglobin value, and all individuals with outstanding physical defects were excluded. Among those excluded were 17 positive cases which were found to be unsatisfactory for examination for intensity of infestation.

Fifty-five of the children examined had received hookworm treatment, and of this number only 13 were found to be free from hookworms. In most cases the treatments were given, however, from one to several years before the family left the farm, so that the treatments were only a slight factor in influencing the condition of the children. Of the total of 369 who were examined for intensity of infestation, 123 were negative, 176 were lightly infested, 60 were moderately infested, and 10 were heavily infested. Although a high incidence of the disease is shown for the entire group, a comparison of the intensity of infestation according to the length of residence in the villages shows that the intensity decreased rapidly with the increasing years of residence, so that after seven years the disease was practically eliminated. The resulting improvement in health is shown by a comparison of the weight and of the hemoglobin of the children, as great improvement was evident among those who had been longest away from the country, in spite of the fact that only a few hookworm treatments had been given at the mill village.

In view of the fact that residence in the sanitated area had resulted in so largely eliminating the disease, it is recommended that all children from heavily infested areas should be examined by an intensity method on their entrance into mill villages, and that a standard treatment be given to all children suffering from the disease in order to relieve suffering and bring about an earlier control of the disease than can be secured by sanitation alone.

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STRIKES AND LOCKOUTS

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Strikes and Lockouts in the United States, 1926

THE following tables present statistics of strikes and lockouts in the United States in 1926, and also, for purposes of comparison, statistics of strikes and lockouts for preceding years back to 1916, inclusive, by years, States, causes, and industries. The term "dispute" is used in this report interchangeably with "strikes and lockouts."

The bureau has no machinery for the prompt and full reporting of strikes and lockouts, but depends largely upon newspapers, trade journals, and labor periodicals for the preliminary reports of disputes. These preliminary reports are followed up by correspondence, and any necessary revision is made. For these reasons the data here presented do not pretend to be absolutely complete or fully accurate. It is believed, however, that practically all of the more significant strikes and lockouts are recorded, and that the information submitted is sufficiently accurate to give a fair presentation of the situation in the United States in the matter of strikes and lockouts.

Strikes and Lockouts Beginning in 1926

TABLE 1 shows the number of strikes and lockouts beginning in 1926, by months, and the number of persons involved:

TABLE 1.—STRIKES AND LOCKOUTS BEGINNING IN 1926, BY MONTHS [1]

Month	Total number of disputes	Disputes in which number of employees directly involved is known		
		Number of disputes	Number of employees involved	Average number of employees per dispute
January	62	36	16,486	458
February	74	57	38,545	676
March	84	69	29,163	423
April	127	101	32,106	318
May	141	116	39,696	342
June	73	62	14,591	235
July	84	66	78,943	1,196
August	98	72	17,756	247
September	85	71	26,759	377
October	60	46	12,907	281
November	48	46	10,418	226
December	33	23	9,712	422
Month not stated	66	18	2,510	139
Total	1,035	783	329,592	421

[1] Excluding those involving fewer than 6 persons and those lasting less than 1 day.

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Table 2 shows the number of disputes in which the number of employees directly involved was reported, the number of such employees, and the average number of employees per dispute:

TABLE 2.—NUMBER OF DISPUTES AND EMPLOYEES INVOLVED, BY YEARS, 1916 TO 1926

Year	Disputes in which number of employees involved was reported			Year	Disputes in which number of employees involved was reported		
	Number of disputes	Employees			Number of disputes	Employees	
		Number	Average per dispute			Number	Average per dispute
1916	2,667	1,599,917	600	1922	899	1,612,562	1,794
1917	2,325	1,227,254	528	1923	1,199	756,584	631
1918	2,151	1,239,989	576	1924	898	654,641	729
1919	2,665	4,160,348	1,561	1925	1,012	428,416	423
1920	2,226	1,463,054	657	1926 [1]	783	329,592	421
1921	1,785	1,099,247	616				

[1] Excluding those involving fewer than 6 persons and those lasting less than 1 day.

Disputes, by Months and Years

TABLE 3 shows the number of disputes beginning in each month, 1916 to 1926:

TABLE 3.—NUMBER OF DISPUTES BEGINNING IN EACH MONTH, 1916 TO 1926

Year	Number of disputes beginning in—												Total disputes
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Month not stated	
1916	188	206	294	434	617	354	313	326	252	261	197	149	198	3,789
1917	288	211	318	445	463	323	448	360	349	322	257	197	469	4,450
1918	191	223	312	321	392	296	288	278	212	145	208	250	237	3,353
1919	199	198	192	270	431	322	381	417	425	334	165	140	156	3,630
1920	280	214	288	427	422	317	298	264	231	192	106	108	264	3,411
1921	238	172	194	292	575	152	167	143	124	90	92	76	70	2,385
1922	131	96	75	109	104	64	101	95	85	64	64	43	81	1,112
1923	69	72	123	212	246	133	146	106	93	117	66	59	111	1,553
1924	102	70	118	144	155	98	89	81	71	74	61	40	146	1,249
1925	94	89	83	161	161	108	103	123	104	77	63	45	90	1,301
1926 [1]	62	74	84	127	141	73	84	98	85	60	48	33	66	1,035

[1] Excluding those involving fewer than 6 persons and those lasting less than 1 day.

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Place of Occurrence of Disputes

TABLE 4 shows the number of disputes beginning in each year, 1916 to 1926, by States and by sections of the country:

TABLE 4.—NUMBER OF DISPUTES BEGINNING IN EACH YEAR, 1916 TO 1926, BY STATES AND SECTIONS OF THE COUNTRY

State and section	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926 [1]
Alabama	15	20	13	18	25	15	4	6	-------	3	5
Alaska	3	5	3	3	1	1	-------	-------	-------	2	-------
Arizona	7	20	4	7	9	4	1	1	-------	-------	1
Arkansas	20	36	11	7	15	7	2	2	3	4	-------
California	55	112	94	102	120	99	37	47	29	40	34
Canal Zone	4	-------	-------	1	1	-------	-------	-------	-------	-------	-------
Colorado	17	48	32	31	22	27	7	3	5	10	5
Connecticut	326	178	92	135	128	61	30	52	26	46	29
Delaware	12	17	14	11	10	4	1	1	-------	4	8
District of Columbia	8	14	13	10	14	5	4	6	5	11	6
Florida	9	16	20	30	9	19	5	4	2	10	16
Georgia	8	28	40	39	29	21	3	4	4	5	9
Hawaii	4	1	1	-------	1	-------	-------	-------	5	-------	-------
Idaho	5	32	10	10	5	3	-------	1	-------	-------	-------
Illinois	159	282	248	267	254	164	63	72	80	84	72
Indiana	75	73	76	106	99	61	15	35	28	45	32
Iowa	26	65	41	57	47	42	15	14	15	12	14
Kansas	15	53	41	45	14	21	4	5	6	12	2
Kentucky	13	38	19	26	22	17	10	11	12	2	12
Louisiana	8	39	23	51	37	29	8	16	7	3	5
Maine	30	40	36	40	22	24	11	7	6	10	1
Maryland	48	59	72	41	57	27	12	19	25	17	7
Massachusetts	383	353	347	396	377	201	139	217	97	162	113
Michigan	71	64	60	84	63	71	18	19	10	14	12
Minnesota	30	53	40	49	50	45	9	14	4	5	9
Mississippi	4	13	5	2	4	9	-------	1	-------	-------	-------
Missouri	97	122	105	69	63	54	26	27	35	11	9
Montana	15	77	33	23	16	21	2	7	1	1	4
Nebraska	21	28	11	17	12	11	3	1	2	2	1
Nevada	-------	2	7	5	4	1	3	1	1	-------	-------
New Hampshire	20	20	17	34	32	6	30	6	8	5	8
New Jersey	417	227	138	183	145	125	71	78	92	92	84
New Mexico	-------	4	2	4	1	2	-------	-------	-------	-------	-------
New York	592	711	689	536	600	384	202	403	281	301	216
North Carolina	8	7	14	22	21	26	6	6	4	7	2
North Dakota	-------	2	3	-------	4	8	2	1	1	-------	-------
Ohio	290	279	197	237	206	167	73	65	68	73	68
Oklahoma	24	35	19	32	24	29	9	2	6	10	2
Oregon	23	58	18	38	22	23	8	15	13	5	8
Pennsylvania	574	494	311	280	250	222	101	234	261	184	162
Porto Rico	23	6	5	58	118	3	24	-------	4	1	3
Rhode Island	77	105	53	78	89	42	37	25	5	25	28
South Carolina	5	7	3	11	5	12	2	1	1	-------	1
South Dakota	-------	3	3	3	5	3	-------	-------	1	-------	-------
Tennessee	26	42	26	40	27	28	8	7	10	3	7
Texas	28	56	41	50	73	64	10	15	16	11	4
Utah	3	21	14	22	14	5	1	1	2	2	-------
Vermont	10	8	9	13	12	2	13	-------	-------	4	1
Virginia	16	35	37	28	31	14	5	3	4	1	3
Virgin Islands	-------	-------	-------	-------	-------	1	-------	-------	-------	-------	-------
Washington	58	294	130	113	69	63	22	36	15	15	5
West Virginia	40	64	50	63	49	28	8	28	23	20	11
Wisconsin	63	57	54	77	68	41	21	10	15	14	8
Wyoming	-------	2	5	4	6	4	-------	1	1	1	-------
Interstate	4	25	4	21	10	19	27	23	10	12	8
Total	3,789	4,450	3,353	3,630	3,411	2,385	1,112	1,553	1,249	1,301	1,035
North of the Ohio and east of the Mississippi	3,186	3,034	2,466	2,678	2,431	1,607	840	1,249	1,007	1,091	869
South of the Ohio and east of the Mississippi	174	315	248	337	346	190	90	71	64	52	69
West of the Mississippi	425	1,076	635	594	624	569	155	210	168	146	89
Interstate	4	25	4	21	10	19	27	23	10	12	8

[1] Excluding those, involving fewer than 6 persons and those lasting less than 1 day.

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Causes of Dispute

THE principal causes of strikes, for each year, 1916 to 1926, are shown in Table 5:

TABLE 5.—PRINCIPAL CAUSES OF DISPUTES BEGINNING IN EACH YEAR, 1916 TO 1926

Cause of dispute	Number of disputes beginning in—										
	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	[1] 1926
Increase of wages	1,301	1,571	1,397	1,115	1,429	120	156	445	255	277	260
Decrease of wages	35	36	36	86	147	896	261	49	125	117	52
Wages, not otherwise specified	------	------	------	------	------	------	29	82	63	57	60
Nonpayment of wages	13	18	31	11	20	5	10	3	2	7	------
Increase of wages and decrease of hours	481	378	256	578	269	34	16	58	30	29	39
Decrease of wages and increase of hours	------	------	------	------	------	77	40	------	7	4	1
Increase of hours	7	18	6	25	8	18	12	5	5	6	4
Decrease of hours	113	132	79	117	62	294	22	16	18	7	19
Recognition of union	349	292	179	352	123	55	74	96	81	73	82
Recognition and wages	93	132	79	78	87	106	10	37	21	30	11
Recognition and hours	20	27	16	16	6	14	3	6	1	1	------
Recognition, wages, and hours	56	48	49	76	45	11	8	25	7	4	13
General conditions	59	104	61	71	82	71	64	72	76	80	59
Conditions and wages	58	71	54	62	58	43	33	53	27	24	29
Conditions and hours	3	18	2	5	2	7	------	4	1	------	2
Conditions, wages, and hours	25	26	8	37	43	7	4	6	4	9	12
Conditions and recognition	4	13	7	14	6	6	6	8	9	1	4
Discharge of foreman demanded	17	38	54	19	30	7	7	6	4	13	------
Discharge of employees	127	208	138	144	140	38	37	73	50	61	61
Employment of nonunion men	73	79	60	12	38	24	10	30	30	49	65
Objectionable persons hired	1	8	2	11	22	16	8	12	4	4	5
Discrimination	9	12	32	52	34	12	8	8	3	9	7
Open or closed shop	13	22	45	42	113	88	52	56	55	32	28
Closed shop and other causes	42	19	17	128	72	48	11	1	16	4	7
Unfair products	7	9	1	5	30	27	18	7	8	4	16
In regard to agreement	40	84	46	50	59	68	74	121	74	118	45
New agreement	40	24	4	36	11	33	11	46	66	28	39
Sympathy	33	71	35	108	67	36	33	31	22	39	29
Jurisdiction	19	21	16	16	20	10	10	13	23	59	17
Unsatisfactory food	4	11	1	8	2	------	------	1	------	------	------
Miscellaneous	116	168	181	106	81	51	22	100	54	55	21
Not reported	631	792	461	250	305	163	63	83	108	100	48
Total	3,789	4,450	3,353	3,630	3,411	2,385	1,112	1,553	1,249	1,301	1,035

[1] Excluding those involving fewer than 6 persons and those lasting less than 1 day.

Industries and Occupations Affected

TABLE 6 shows, for each year, 1916 to 1926, the number of labor disputes occurring in the industries named.

TABLE 6.—NUMBER OF DISPUTES IN SPECIFIED INDUSTRY GROUPS, 1916 TO 1926

Industry	Number of disputes										
	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	[1] 1926
Building trades	394	468	434	473	521	583	113	208	270	349	272
Clothing	227	495	436	322	336	240	240	395	238	231	194
Furniture	50	43	26	35	26	17	4	12	35	56	46
Iron and steel	72	56	74	76	25	25	10	10	7	7	2
Leather	34	19	16	27	32	26	17	17	5	5	11
Lumber	44	299	76	46	38	25	10	19	6	9	3
Metal trades	547	515	441	581	452	194	83	113	58	48	75
Mining, coal	373	355	162	148	161	87	44	158	177	100	78
Mining, other	43	94	46	28	22	8	5	1	1	4	------
Paper manufacturing	54	41	40	47	39	42	12	16	6	6	10
Printing and publishing	27	41	40	71	83	506	56	19	12	14	9
Shipbuilding	31	106	140	109	45	20	4	6	1	------	------
Slaughtering, meat cutting, and packing	70	38	42	74	42	30	6	11	14	2	5
Stone	61	26	14	13	29	34	61	15	15	17	11
Textile	261	247	212	273	211	114	115	134	80	139	90
Tobacco	63	47	50	58	38	19	13	16	12	4	14
Transportation, steam and electric	228	343	227	191	241	37	67	31	18	7	8

[1] Excluding those involving fewer than 6 persons and those lasting less than 1 day.

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Principal Strikes and Lockouts in 1926

CLOAK and suit workers, New York.—The most important disturbance during the year was the strike of about 40,000 clothing workers in New York City beginning July 1. Their demands at the outset included a working week of 40 hours instead of 44, wage increases, and a minimum of 36 weeks' employment during the year.

The industry embraces the manufacture of women's cloaks, suits, and skirts and is characterized by a system of production peculiar to itself. There are three employing groups, namely (*a*) the "inside" manufacturers, represented by the Industrial Council of Cloak, Suit, and Skirt Manufacturers (Inc.); (*b*) the "independent" manufacturers; and (*c*) the submanufacturers or contractors, represented by the American Cloak and Suit Manufacturers' Association, who get their orders and material from still another group called "jobbers," who do not employ labor directly, but by reason of their resources and strategic position in the industry constitute a most powerful indirect factor, being represented by the Merchants Ladies' Garment Association.

An agreement was reached with the inside manufacturers on November 13, which also applied, it was said, to the employees of the independent manufacturers. This agreement runs to June 1, 1929, and calls for a 42-hour week until the first Monday of June, 1928, and a 40-hour week thereafter. Important wage increases are also stipulated. The manufacturers in the industrial council secured the right to reorganize their shops, i. e., to the extent of displacing 10 per cent of their force annually, a point in dispute which had been stressed during the later phases of the struggle. It was provided that all members of the council having a regular force of 35 or more employees, and who have paid in wages and overtime the equivalent of 32 weeks' employment during the year preceding reorganization, shall have the right to displace 10 per cent of their workers. New firms admitted to the council will not be privileged to reorganize until they have been members of the council for six months. This agreement disposed of the dispute with the inside manufacturers and the independent manufacturers, but there still remained the submanufacturers or contractors. Here the disagreement centered largely in the right of reorganization. Finally, through the intervention of the higher officials of the union, the strike was practically settled on December 15 through agreements to submit to arbitration the differences with the submanufacturers especially that as to the right of reorganization in shops employing fewer than 35 workers. The decision of the arbitrators was reported in the press of December 21, and appears to allow the right of reorganization to shops employing 35 workers, on condition that the firms have been in business two years, that they provide 32 weeks' employment, and that after June 1, 1928, only those submanufacturers employing 40 or more workers shall have the reorganization privilege. Shops with fewer than 35 workers are excluded from reorganization rights. Wage increases were allowed as in the case of employees of the inside manufacturers.

Fur workers, New York.—The fur workers of New York City were called out on general strike February 16. The strike order

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applied to some 12,000 workers of both sexes, and followed the lockout order of the Associated Fur Manufacturers' Association (Inc.) of February 11, affecting 5,000 or more workers in the shops it controlled. The strike order of the union, however, included not only the manufacturers' association but the independent manufacturers, who immediately declared a lockout. The agreement under which the furriers had been working expired January 31, 1926, and the two sides had been unable to get together upon the terms of a new agreement, in which the union wanted to include a 40-hour week, a contribution from the employers of 3 per cent of their pay rolls for the establishment of a fund to insure all workers against periods of unemployment and an equal division of work during the year to minimize the slack season and the lay-off.

An agreement to run until January 31, 1929, was finally consummated on June 15, and the workers began to return on the 16th, more than fourth months after the disturbance began.

By this strike the workers gained a minimum wage increase of 10 per cent and a 40-hour week during eight months of the year; during September, October, November, and December, "overtime" of four hours on Saturday is permitted, to be paid for at regular rates. Some losses, however, were sustained in other directions. These are set forth in the following full account of the settlement taken from the June issue of the Fur Worker, the official organ of the union:

After a protracted conference on Thursday, June 10, lasting until Friday, June 11, 3.30 a. m., the 17-week-old strike of the New York furriers was finally settled. For some days previously outside mediators had been ironing out the points acceptable to both parties. The main difficulty seems to have been what points the union should barter away in order to gain a 40-hour week for eight months in the year. In the editorial and other columns in this issue the new agreement is closely analyzed. Here the changes are given with explanatory notes.

The twelve points

1. One collective agreement in the industry.

[NOTE.—Until now there was only one collective agreement with the Associated Fur Manufacturers, while all the independents signed individual agreements with the union. Most of these employers were required to deposit cash security as guaranty for their compliance with provisions, and the union officials were free to visit their shops at any time for purpose of control. They could not visit any association shop save in company with the appointed officials of the association. Since two new associations have recently sprung up, most of the employers will now seemingly enjoy unusual privileges.]

2. Agreement to terminate January 31, 1929.

3. Hours of work, 40 per week; five-day week.

4. No overtime except that during the months of September, October, November, and December, manufacturers are permitted to work four hours on Saturday. Single time to be paid for such hours.

[NOTE.—By these terms the workers lose the benefit of time-and-a-half payment for overtime. In other words, it means that during the four busy months there will be a six-day week consisting of 44 hours. So that the union did not secure a clear gain of the five-day 40-hour week.]

5. Legal holidays, 10; New Year, Lincoln's Birthday, Washington's Birthday shall not be paid for.

[NOTE.—Thus the workers lose three days' wages a year.]

6. Minimum-wage increase 10 per cent. Second-class work revised and limited to following skins: Angora, astrakhan (common), buffalo, coneys, dog, hamster, horse, jackal, kangaroo, llama, lion, mice, mufflon, American opossum, rabbits (all types), sheep, swan, thibet, wallaby, wombat, and zebra.

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7. Foremanship: Each firm is allowed one foreman for nailing, operating, and cutting, and one foreman (head finisher) for finishers. A firm, one of whose members is actually continuously managing the shop, is not entitled to a foreman for operating, nailing, and cutting unless it employs at least 10 workers, excluding finishers. For finishers that intent is not to limit the employment of a foreman in such a case.

The conference committee shall have authority to legislate on this subject as the needs of the situation may demand.

8. No apprentices be permitted until February 1, 1928.

9. No worker shall be discharged in a week preceding a holiday week.

10. The entire garment shall be made on the same premises, and no section of a garment shall be given out to contractors.

Paragraph 3 of article 28 to read: Firms giving out merchandise for the production of complete garments to be made by any other firm shall immediately file the names of such firm or firms with the conference committee. It is understood that in the exercise of the right of the manufacturer to give such work to other firms first consideration and preference shall be given to the workers employed directly by the firm.

[NOTE.—The changes in this provision imply a mere change of words. The words "part of a garment" in the old agreement are replaced by the word "merchandise" and the words "outside shop or contractor" are replaced by the words "any other firm or firms."]

11. Eliminate article 31 of the agreement.

[NOTE.—This implies the loss of the unemployment insurance fund.]

12. Penalties: (*a*) For violation of overtime—

First offense: The worker pays the amount earned at time and a half—the employer the same amount.

Second offense: Double the amount of first offense.

(*b*) For violation of minimum scale—

First offense: The worker pays the amount under the scale collected. The employer pays the same amount.

Second offense: Double the amount of first offense.

(*c*) For violation of contracting regulations—

First offense: A maximum of $150.

Second offense: A maximum of $300.

Third offense: Suspension or expulsion.

Method of imposing penalties

It shall be the duty of the conference committee to recommend to the association or the union, as the case may be, the imposition of penalties in accordance with the above schedules upon firms or workers found guilty of violations of these regulations.

The moneys so collected shall be turned over to the conference committee and proper separate accounts kept. The money shall be disposed of as follows: Moneys collected from manufacturers shall be disposed of as the members of the conference committee representing the association shall deem proper. Moneys collected from workers shall be disposed of as the members of the conference committee representing the union shall deem proper.

Subject to ratification by the respective organizations. Dated June 11, 3.30 a. m.

Textile workers, New Jersey.—A protracted disturbance among the woolen and worsted textile workers of Passaic, N. J., and vicinity began January 25 at the Botany Worsted Mills, when some of the employees struck in response to the call of the so-called United Front Committee, headed by Albert Weisbord. They demanded "that the 10 per cent cut in wages made last summer be returned, that overtime be paid for at the rate of 50 per cent extra, and that there be no discrimination against members of the United Front Committee."

Other mills gradually became involved until the strikers numbered between eight and twelve thousand.

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Following the withdrawal of the so-called United Front Committee and the induction of the strikers into the American Federation of Labor as Local 1603 of the United Textile Workers of America, a settlement was effected with one of the mills, viz, the Passaic Worsted Spinning Co., on November 11, which recognized the right of the workers to organize and to bargain collectively, and provided that no discrimination and preference would be shown in employing help; that a closed shop would not be demanded; and that in the event of future trouble the workers would remain at work pending arbitration.

Further settlements along similar lines were effected with the Botany Worsted Mills and the Garfield Worsted Mills on December 13, and with the Dundee Textile Co. (cotton and silk) on December 20. Additional settlements were reached with the Forstmann & Huffman Co. on February 14, and with the New Jersey Worsted Mills and the Gera Mills on February 16, but these were less successful, as the mills simply agreed to reemploy the workers as rapidly as conditions would permit without discrimination on account of membership in legitimate organizations.

The strike against the remaining mill, the United Piece Dye Works, was also called off, as reported in the press, in accordance with the decision of the strikers at a gathering in Lodi on the night of February 28. The union, it was said, had the verbal assurance of the mill officials that there would be no discrimination against any former workers because of union affiliation.

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TURNOVER OF LABOR

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Labor Turnover in American Industry

LABOR turnover is one of the subjects about which much has been said, but about which, except in sporadic instances, little has been done. The subject first rose to prominence during the war when the demand for products emphasized the need for sufficient and stable labor forces in industry, and private employers as well as Government authorities having to do with the administration of labor and with the production of war materials began to study the question.

The Bureau of Labor Statistics in 1918–19 made a number of studies of labor turnover on the Pacific coast and in various cities of the Middle West, the results of which were published in the Labor Review.[1] In the June, 1920, issue were given data for the years 1910 to 1919, covering altogether 260 establishments with more than 500,000 workers.[2] The Federal Board for Vocational Education, among the other Federal agencies interested in the subject of labor mobility, in November, 1919, published as its Bulletin No. 46 a report on labor turnover, bringing together the available data on the subject.

With the end of the war period and the advent of the industrial depression, labor turnover, while still of interest, became less pressing. In times of labor scarcity and good business, turnover increases, but in times of business depression, turnover decreases. Individual firms, however, kept turnover records, and studies of individual plants or industries were made, but until recently no very comprehensive detailed work has been done along this line, although, as before stated, much has been written on the general subject of turnover, mainly from the point of view of holding the man to the job.

The restriction of immigration, however, the tendency toward a longer period of schooling for children, and the prevailing high wages as compared with those of a few years ago are cited as reasons for the need of the more careful conservation of industrial labor and the more careful study by employers of late years.

Increased efforts to reduce absenteeism and tardiness, sickness and accidents among employees may be viewed as corollaries of the fundamental fact that industrial labor is rather scarce and very expensive. Individual manufacturers are scrutinizing as never before the facts and figures showing the labor turnover experience of their own plants. Among the forces making for the recent rapid spread of group insurance, an important place must be assigned to the desire of employers to conserve that part of the labor supply which they have managed to preempt.[3]

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[1] See issues of September, 1919, to June, 1920.
[2] Later published in much greater detail by Paul F. Brissenden and Emil Frankel under the title "The Causes of Labor Turnover." (New York, The Ronald Press Co., 1921.)
[3] Brown Business Service, Apr. 13, 1926.

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Labor Turnover, by Industries

Coal Industry

DURING the course of the survey of the coal-mining industry made by the United States Coal Commission in 1921, valuable data were secured on labor mobility in both the anthracite and bituminous fields. Summary data from the commission's report are given in the table below:

TABLE 1.—LABOR TURNOVER IN THE COAL-MINING INDUSTRY IN 1921

[Source: U. S. Coal Commission Report, Washington, 1925, parts 2 (p. 507) and 3 (p. 1267)]

Occupation	Anthracite			Bituminous		
	Average number on pay roll	Separations	Turnover (per cent)	Average number on pay roll	Separations	Turnover (per cent)
Contract miners	24,159	17,249	71.4			
Contract laborers	11,849	32,146	271.3			
Loaders	[1] 451	[1] 349	[1] 77.4	39,891	43,825	109.9
Machine miners	36	44	122.2	5,283	4,013	76.0
Pick miners				30,918	29,909	96.7
Inside day men	21,715	19,110	88.0	30,874	28,534	92.4
Outside day men	22,192	12,399	55.9	14,646	15,032	102.6
Total	80,402	81,297	101.1	121,612	121,313	99.8

[1] Contract loaders.

The study disclosed, as regards the bituminous industry:

1. That the turnover for the industry as a whole is not remarkably high as compared with other industries, although it is excessive in some districts.
2. That for various reasons labor is much more unstable in nonunion districts than in union districts.
3. That in mixed nonunion and union districts the turnover percentage occupies a middle point between the extremes of the other two.
4. That the turnover among machine miners is noticeably lower than for the other two tonnage worker groups, pick miners and loaders.
5. That the turnover is higher among outside day men than among inside day men, although the stability is greater in the first group.

Cotton Mills

THE United States Women's Bureau in a recent report (Bul. No. 52) made a study of lost time and labor turnover in 18 cotton mills, 9 of which were in the North and 9 in the South. The rates of turnover found were as follows:

TABLE 2.—LABOR TURNOVER IN COTTON MILLS IN 1922

Mills and sex of workers	Average number of full-time workers	Final separations	Turnover (per cent)
Northern mills:			
Men	1,184.3	1,133	95.7
Women	891.5	836	93.8
Total	2,075.8	1,969	94.9
Southern mills:			
Men	1,303.1	2,401	184.3
Women	778.4	1,544	198.4
Total	2,081.5	3,945	189.5
Grand total	4,157.3	5,914	142.3

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Silk Industry

CHENEY Bros., silk manufacturers, have for a number of years been keeping labor turnover records. Data collected by the company [4] show that the rate of turnover, based on the average daily number of employees, for the last 10 years has been as follows:

	Turnover (per cent)
1917	57.83
1918	77.83
1919	57.59
1920	59.91
1921	36.30
1922	30.00
1923	36.37
1924	27.64
1925	26.74
1926	[5] 25.44

The data show that married men are the most stable employees, followed in order by single women, single men, and finally, by married women.

The relation of length of service and stability is shown in the statement below, giving the yearly rate of turnover for each classified service group:

	Turnover (per cent)
Under 1 year	95
1 and under 2 years	59
2 and under 3 years	56
3 and under 5 years	38
5 and under 10 years	26
10 and under 20 years	18
20 and under 30 years	11
30 and under 50 years	11

General Labor Turnover Records [6]

FOR several years about 25 employers in various lines of business, located in and about Philadelphia, have been furnishing labor turnover data to the University of Pennsylvania department of industrial research. More recently the National Metal Trades Association has invited the university to extend its work to include members of that association.

The work of collection of labor turnover data being done by Brown University and the Metropolitan Life Insurance Co. is described by Prof. W. A. Berridge as follows:

"Since May, 1925, certain Rhode Island manufacturers have been reporting on their monthly labor turnover experience to the bureau of business research at Brown University. They now number about 45, and employ about 25,000 wage earners.[7] Since January, 1926, certain national manufacturers have been reporting,

[4] Factory, April, 1924: "What 86 years have taught us about selecting labor," by Horace B. Cheney (reprinted in Labor Review, May, 1924); and American Management Association, Office Executive Series No. 21: A statistical analysis of personnel.

[5] Nine months.

[6] Data from Brown Business Service, Apr. 13, 1926; and Factory, September, 1926: "Your labor turnover: good or bad?" by W. A. Berridge, and original data furnished to the Bureau of Labor Statistics by Professor Berridge.

[7] Figures as of early February, 1927.

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on a similar schedule, to the Metropolitan Life Insurance Co. In this investigation the reporting manufacturers now number about 175; they employ about 800,000 wage earners,[7] or between 8 and 10 per cent of the total number employed in American factory industries, according to the censuses of manufactures. In both cases the index numbers form only part of a comprehensive project for measuring, analyzing, and so far as possible, improving the stability of labor.

"The form circulated each month calls simply for the following six items:

1. Total accessions.
2. Total separations:
   (*a*) Voluntary quits.
   (*b*) Lay-offs.
   (*c*) Discharges.
3. Average number on pay roll.

"The collecting organization then figures, for each reporting manufacturer, the ratio of each of the first five items to the average number on pay roll. Each of the five resulting sets of rates is then arrayed in order of magnitude. After considerable experimental study of the distribution thus formed, the central or median item was decided upon as the most reliable and significant form of average for the purpose at hand. The median rate successfully controls the influence of extremely high or low rates, and that of companies having unusually large work forces; it tends to approximate the mode or "normal"; it is easily determined; and it seems to avoid some of the difficulties arising from a changing size of sample (number of reporting companies). The median was therefore adopted for all but the total separation rate, which is the sum of the medians for the three component rates above specified.

"Chart 1 presents a graphic conspectus of the two sets of index numbers resulting from these investigations—that of Brown University (May, 1925, through December, 1926) at the left, that of the Metropolitan Life Co. (January through December, 1926) at the right. Although all the curves are plotted at monthly intervals, the chart is scaled in equivalent annual rates. In each case the full line represents the total separation rate (ignoring "miscellaneous" separations). The area beneath the full line is divided to show the changing composition of the total separation rate—the voluntary quit rate, the lay-off rate, and the discharge rate being represented by the three component areas or zones. The accession rate is shown by the crossed line.

"To study the earlier effects of seasonal and cyclical changes upon labor turnover experience, each of the indexes is being extended back to 1919 as rapidly as the collection of returns from representative establishments makes that possible. Thus far such an extension has been completed only for the voluntary quit rate. This more extended picture is shown in Chart 2 for both the national and the Rhode Island groups.

"These two charts and their companion tables present several interesting problems of interpretation; only a part of them can yet be solved, and a treatment of even these is beyond the scope of the present descriptive article. Suffice it to say that systematic efforts are being made to throw more light upon them by intimate study of

[7] Figures as of early February, 1927.

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length-of-service distribution, sex distribution, plant location, production stabilization, personnel policy, and other factors which are known or supposed to affect labor turnover experience. Such information is already proving highly valuable in interpreting the relationships between the composite experience measured by these indexes and the experience of an individual company or plant.

"Among the next steps in the index-number section of these investigations is the preparation of corresponding indexes for (*a*) certain regional labor markets and (*b*) certain selected industries. Among

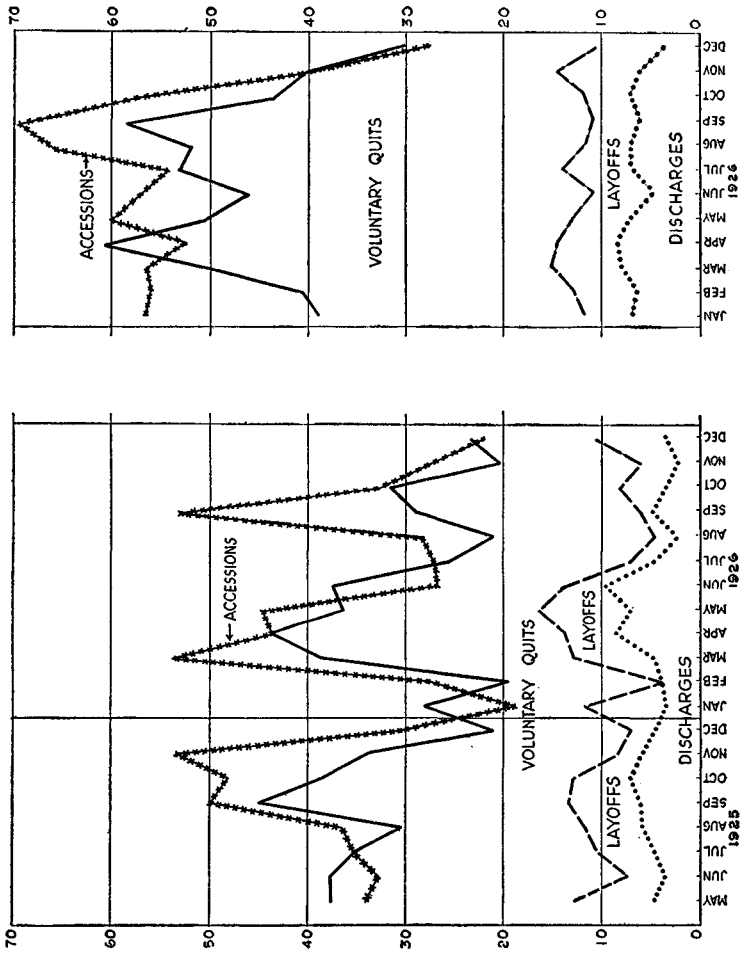


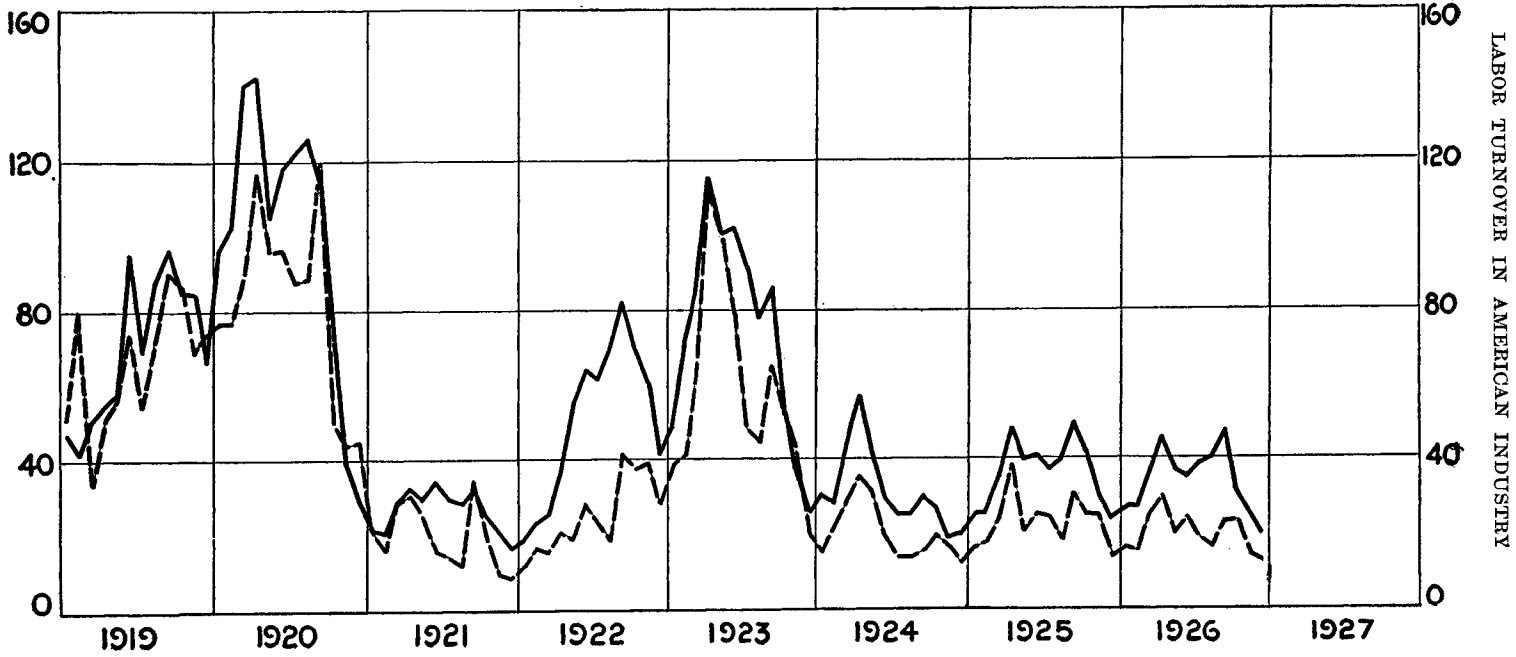
CHART 1.—RECENT LABOR TURNOVER OF TWO GROUPS OF MANUFACTURERS
(Monthly rate on equivalent annual basis)

the manufacturers reporting to the Metropolitan Life Insurance Co. certain well-represented industries will be selected for intensive analysis. This can not, however, be done for any large number of industries until the number of reporting establishments is somewhat larger. Partly with a view to such enlargement, certain properly equipped local organizations are being invited to cooperate in the company's undertaking. Before the end of 1927 more information along this and other lines of attack should be available."

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CHART 2.—INDEXES OF VOLUNTARY QUIT RATE AMONG SELECTED FACTORIES

—— United States (reporting to Metropolitan Life)
– – – Rhode Island (reporting to Brown University)
(Monthly rate on equivalent annual basis)



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TABLE 3.—AVERAGE TURNOVER RATES IN EACH MONTH OF 1926 IN SELECTED AMERICAN FACTORIES

[Monthly rate stated on equivalent annual basis [1]]

Month	Rhode Island factories reporting to Brown University					Factories reporting to Metropolitan Life Insurance Co.				
	Accession rate	Total separation rate [2]	Voluntary quit rate	Lay-off rate	Discharge rate	Accession rate	Total separation rate [2]	Voluntary quit rate	Lay-off rate	Discharge rate
January	18.8	28.3	16.5	8.2	3.5	56.5	38.9	27.1	4.7	7.1
February	27.4	19.6	15.6	0.0	3.9	56.1	40.4	27.4	6.5	6.5
March	54.2	38.9	25.9	8.2	4.7	56.5	50.6	35.3	7.1	8.2
April	43.8	43.8	30.4	4.9	8.5	52.3	60.8	46.2	6.1	8.5
May	44.7	36.5	20.0	9.4	7.1	60.0	50.6	37.7	5.9	7.1
June	26.8	37.7	24.3	3.7	9.7	57.2	46.2	35.3	6.1	4.9
July	27.1	25.9	18.8	2.4	4.7	54.2	53.0	38.9	7.1	7.1
August	28.3	21.2	16.5	2.4	2.4	65.9	51.8	40.0	4.7	7.1
September	53.5	29.2	23.1	1.3	4.9	69.4	58.4	47.5	4.9	6.1
October	33.0	31.8	23.6	4.7	3.5	57.7	43.6	31.8	4.7	7.1
November	28.0	20.7	14.6	3.7	2.4	40.2	40.2	25.6	8.5	6.1
December	22.4	23.6	13.0	7.1	3.5	27.1	30.6	20.0	7.1	3.5

[1] The annual turnover rates are derived from the monthly rates by multiplying each monthly rate by 365 and dividing by the number of calendar days in the month represented.
[2] Arithmetic sum of last three columns.

TABLE 4.—AVERAGE (MEDIAN) VOLUNTARY QUIT RATE IN SELECTED FACTORIES

[Monthly rate stated on equivalent annual basis [1]]

Month	1919	1920	1921	1922	1923	1924	1925	1926
	Rhode Island factories numbering up to 40							
January	50.7	76.7	21.2	11.8	38.9	15.3	16.5	16.5
February	80.6	76.9	15.6	16.9	41.6	22.7	18.2	15.6
March	33.0	89.7	28.3	15.3	62.5	29.5	24.8	26.0
April	50.0	117.1	30.5	20.7	112.2	35.4	39.0	30.5
May	56.6	95.6	24.8	18.9	101.5	31.9	21.2	20.1
June	74.4	96.4	15.9	28.1	80.5	19.5	25.6	24.4
July	54.3	87.3	14.2	23.6	48.4	14.2	24.8	18.9
August	74.3	88.5	11.8	18.9	44.8	14.2	18.9	16.5
September	90.3	120.8	34.2	41.5	65.9	15.9	31.7	23.2
October	86.1	50.7	18.9	37.8	53.1	20.1	26.0	23.6
November	68.3	43.9	9.8	39.0	42.7	17.1	25.6	14.6
December	74.3	44.8	8.3	28.3	21.2	13.0	14.2	13.0
Average	66.1	82.4	19.4	25.1	59.5	20.7	23.9	20.2
	American factories numbering up to 160—Rate not adjusted for seasonal variation							
January	47.2	96.8	21.2	18.9	48.4	30.7	26.0	27.1
February	41.6	103.3	20.8	23.4	71.5	27.7	26.0	27.3
March	50.7	140.4	29.5	26.0	85.0	44.8	35.4	35.4
April	54.9	142.7	32.9	36.6	115.9	57.3	48.8	46.4
May	57.8	105.0	29.5	55.5	100.3	42.5	40.1	37.8
June	95.2	118.3	34.2	64.7	102.5	30.5	41.5	35.4
July	68.4	122.7	29.5	61.4	92.0	26.0	37.8	38.9
August	88.5	126.3	28.3	70.8	77.9	26.0	40.1	40.1
September	96.4	114.7	32.9	83.0	86.6	30.5	50.0	47.6
October	85.0	72.0	24.8	69.6	54.3	27.1	42.5	31.9
November	84.2	39.0	20.7	61.0	37.8	19.5	30.5	25.6
December	66.1	29.5	16.5	41.3	26.0	21.2	24.8	20.0
Average	69.7	100.9	26.7	51.0	74.9	32.0	37.0	34.5

[1] Index obtained by multiplying each month's median rate by 365, and dividing by the number of calendar days in that month. As 1920 and 1924 were leap years, the figures for each month in those years were multiplied by 366 and divided by the number of days in that month.

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TABLE 4.—AVERAGE (MEDIAN) VOLUNTARY QUIT RATE IN SELECTED FACTORIES—Continued

Month	1919	1920	1921	1922	1923	1924	1925	1926
	American factories numbering up to 160—Rate adjusted for seasonal variation							
January	95.6	142.8	29.5	24.8	70.8	44.8	34.2	37.8
February	80.6	161.3	33.8	35.1	105.3	40.3	42.9	41.6
March	59.0	158.1	30.7	27.1	93.2	41.3	33.0	36.6
April	59.8	120.8	23.2	34.2	92.7	45.1	36.6	39.0
May	66.1	90.9	22.4	50.7	88.5	34.2	34.2	33.0
June	85.4	100.0	25.6	56.1	81.7	23.2	31.7	26.8
July	89.7	118.0	26.0	54.3	73.2	21.2	29.5	33.0
August	115.6	106.2	24.8	59.0	61.4	20.1	31.9	37.8
September	83.0	91.5	26.8	75.6	64.7	23.2	31.7	39.0
October	100.3	76.7	24.8	73.2	54.3	27.1	31.9	31.9
November	124.4	56.1	26.8	80.5	51.2	25.6	40.3	33.6
December	127.4	49.6	28.3	68.4	43.7	34.2	42.5	33.0
Average	90.6	106.0	26.9	53.3	73.4	31.7	35.0	35.3

Since April, 1926, the Wisconsin Industrial Commission has been collecting data on labor turnover in the industries in that State. These data are published from month to month in the Wisconsin Labor Market. The following table taken from the February, 1927, issue shows, for December, 1926, and January, 1927, the separation rates (on an annual basis) and weighted monthly rate of turnover in the various kinds of employment. In the computation of these figures, the separation rate per capita of work force for clerical employees and for manual employees for the time covered by the pay-roll report. The labor turnover is then converted to an annual basis by multiplying the separation rate for the pay-roll period covered by the number of such pay-roll periods in one year.

TABLE 5.—LABOR TURNOVER IN WISCONSIN INDUSTRIAL ESTABLISHMENTS, DECEMBER, 1926, AND JANUARY, 1927

Kind of employment	January, 1927			Separation rates per 100 employees expressed on an annual basis (weighted by number of employees)		Monthly turnover rate (weighted by number of employees)	
	Number of plants reporting	Number of employees	Annual loss of employees at separation rates shown by January reports	January, 1927	December, 1926	January, 1927	December, 1926
Agriculture	2	62	24	38.7	218.2	3.2	18.2
Logging	5	1,068	4,668	437.1	295.9	36.4	24.7
Mining:							
Lead and zinc	2	426	120	28.2	30.0	2.3	2.5
Iron	3	199	60	30.2	41.7	2.5	3.5
Stone crushing and quarrying	8	226	182	80.5	79.2	6.7	6.6
Manufacturing	320	66,364	43,439	65.5	73.9	5.5	6.2
Stone and allied industries—							
Brick, tile, and cement blocks	7	95	380	400.0	373.6	33.3	31.1
Stone finishing	5	365	24	6.6	135.0	5.4	11.2

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TABLE 5.—LABOR TURNOVER IN WISCONSIN INDUSTRIAL ESTABLISHMENTS, DECEMBER, 1926, AND JANUARY, 1927—Continued

Kind of employment	January, 1927			Separation rates per 100 employees expressed on an annual basis (weighted by number of employees)		Monthly turnover rate (weighted by number of employees)	
	Number of plants reporting	Number of employees	Annual loss of employees at separation rates shown by January reports	January, 1927	December, 1926	January, 1927	December, 1926
Manufacturing—Continued							
Metal—							
Pig iron and rolling-mill products	3	677	312	46.1	74.5	3.8	6.2
Structural-iron works	2	324	0	0	27.7	-------	2.3
Foundries and machine shops	29	4,899	4,313	88.0	71.7	7.3	6.0
Railroad repair shops	3	1,034	372	36.0	37.5	3.0	3.1
Stoves	4	1,300	316	24.3	61.5	2.0	5.1
Aluminum and enamel ware	3	3,765	1,380	36.7	30.6	3.1	2.5
Machinery	9	4,762	2,064	43.3	37.8	3.6	3.1
Automobiles	2	4,066	1,404	34.5	106.7	2.9	8.9
Other metal products	8	3,803	2,295	60.3	76.5	5.0	6.4
Wood—							
Sawmills and planing mills	13	2,077	4,402	211.9	138.0	17.6	11.5
Box factories	6	750	1,164	155.2	50.8	12.9	4.2
Panel and veneer mills	3	867	222	25.6	34.3	2.1	2.9
Furniture	17	3,526	2,718	77.1	40.9	6.4	3.4
Sash, door, and interior finish	10	2,532	716	28.3	67.8	2.4	5.6
Other wood products	6	1,638	1,220	74.5	238.6	6.2	19.9
Rubber	4	2,933	694	23.7	19.9	2.0	1.6
Leather—							
Tanning	2	1,711	494	28.9	40.3	2.4	3.4
Boots and shoes	5	2,583	3,952	153.0	83.6	12.7	7.0
Other leather products	14	1,431	796	55.6	54.1	4.6	4.5
Paper—							
Paper and pulp mills	7	4,255	1,932	45.4	35.8	3.8	3.0
Paper boxes	4	358	208	58.1	276.1	4.8	14.7
Other paper products	7	843	262	31.1	25.3	2.6	2.1
Textiles—							
Hosiery and other knit goods	6	3,115	858	27.5	38.8	2.3	3.2
Clothing	5	1,688	1,456	86.3	114.6	7.2	9.5
Other textile products	9	838	1,086	129.6	28.3	10.8	2.4
Foods—							
Meat packing	2	195	104	53.3	104.9	4.4	8.7
Baking and confectionery	14	2,037	1,980	97.2	114.9	8.1	9.6
Milk products	4	808	576	71.3	80.6	5.9	6.7
Canning and preserving	15	197	52	26.4	365.3	2.2	30.4
Flour mills	4	203	247	121.7	221.2	10.1	18.4
Tobacco manufacturing	11	551	1,118	202.9	18.8	16.9	1.6
Other food products	5	516	336	65.1	512.5	5.4	42.7
Light and power	10	2,231	1,932	86.6	53.1	7.2	4.4
Printing and publishing	43	1,972	738	37.4	28.8	3.1	6.8
Laundering, cleaning, and dyeing	15	702	902	128.5	83.9	10.7	11.4
Chemical (including soap, glue, and explosives)	4	717	414	57.7	57.4	4.8	4.8
Construction:							
Building	40	2,067	1,525	73.8	206.2	6.1	17.2
Highway	13	200	168	84.0	375.1	7.0	31.3
Railroad	2	124	192	154.8	266.7	12.9	21.4
Marine, dredging, sewer digging	1	59	48	81.4	147.7	6.8	18.6
Communication:							
Steam railways	3	516	216	41.9	-------	3.5	-------
Electric railways	6	441	756	171.4	352.4	14.3	28.3
Express, telephone, and telegraph	6	6,084	2,352	38.7	40.6	3.2	3.3
Wholesale trade	10	879	508	56.6	78.7	4.7	6.3
Hotels and restaurants	43	1,487	1,754	118.0	85.6	9.8	6.9
Retail trade—sales force only	23	4,221	3,736	88.5	150.5	7.4	12.1
Miscellaneous professional services	3	88	12	13.6	72.4	1.1	5.8

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Causes of Labor Turnover

SEPARATIONS may be either voluntary or involuntary; that is, the workers may leave or be discharged. Reasons for discharge are easy enough to obtain, but this is not always the case with data as to exactly why the workers leave. The latter reasons, however, are important to the employer, as indicating possible undesirable conditions in the plant which should be remedied. One large employer states: "It is the problem of our management to reduce at all times the causes that impel good employees to leave the company."[8] This same employer found, however, that the reasons for leaving were so scattered as to indicate no outstanding cause.

Authorities seem to agree that general industrial conditions and the demand for labor have a great deal to do with labor turnover. The manager of industrial relations of a large oil-refining company in Pennsylvania even goes so far as to say that in his opinion labor turnover is due primarily to general employment conditions, and that the policies of the individual plant have little to do with it. He states that, according to his observations, "there is much closer relationship of labor turnover with national employment conditions than with pension systems, insurance plans, welfare features, and other gestures of a friendly management."[9] In support of this opinion he compares the recent trend of the labor turnover in his own company with the employment conditions in the State of Pennsylvania as a whole, and also with the total labor turnover of over 50 concerns in the city of Philadelphia, employing some 40,000 workers. In both of the comparisons, presented in the form of charts, he finds a close relationship between the turnover curve of his own company, the curve of general employment conditions in the State, and the curve of turnover conditions in other plants of Philadelphia. Commenting on this relationship, he concludes:

> The sharp drop in company turnover since the middle of 1923 has again been accompanied by a parallel drop in other industries in the city of Philadelphia. Is it not fair to conclude that labor turnover, at least as exhibited in our company, is a function of general economic forces to a far greater extent than is generally supposed?

Somewhat the same conclusion was arrived at by the United States Commissioner of Labor Statistics after studying the figures of the United States Coal Commission. In a speech delivered at the eighty-sixth annual meeting of the American Statistical Association, at New York City, December 29, 1925, he said:

> As a quantitative measure of the success of welfare plans, shop committee plans, stock distributions, and other schemes having as their basic economic purpose the holding of employees, I consider labor turnover to be of direct and primary importance.
>
> It is all very well to say that the elements entering into turnover are so varied that it can not be considered an answer to any question, but the fact remains that if any industrial relations plan has been introduced for the purpose of holding the employees, the real test of the success or failure of that plan is, Does it hold the employees? Labor turnover is the individual

[8] American Management Association: A statistical analysis of personnel, by J. P. Lamb. New York, 1926.
[9] Manufacturing Industries, October, 1926. (Summarized in Labor Review, December, 1926, p. 46.)

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strike. By merely computing turnover percentages you can not, it is true, determine the cause of those strikes, but you can be sure that any specific scheme of management introduced to prevent dissatisfaction among the employees of that establishment has failed to reach the cause of the dissatisfaction.

High labor turnover in poorly paid industries or establishments is naturally attributed to low wages, and where the greatest percentage of turnover is in the more poorly paid occupations in an establishment or industry we seem to have further confirmation of this natural assumption, but when we find a high rate of turnover and high rates of wages side by side we must realize that wages are not all that men work for.

When we find benevolent feudalism paying high wages, giving steady employment or as steady as can be found anywhere else in the industry, furnishing its own free schools and paying its teachers. building its own churches and paying its preachers, furnishing the employees clubrooms, shower baths and Christmas turkeys, and yet discover a perfectly staggering percentage of labor turnover, does it not show that these individual strikes are against feudalism of any kind, form, or fashion, benevolent or otherwise, and that wages and wash rooms supplied with perfumed soap do not give us the answer as to what industrial relations should be?

I know the coal industry, because of the fitfulness of employment, is not an exceedingly good one to use to illustrate my point. However, when the comparison is made between mines or localities in which work in the mines is exceedingly fitful, where taken as a whole the miners do not average half time, and compare it with mining districts where employment is very much more steady and yet the turnover is very much greater, we can say that fitful employment is not a principal factor in labor turnover in coal mines.

To be specific, take the coal fields of central Illinois. It was found by the Coal Commission that 65 per cent of the employees were continuous throughout the year; that 35 out of each 100 men quit during the year, and that it required the hiring of 65 other men to keep these 35 jobs filled. In other words, while the percentage of turnover was 65 as applied to the total number of jobs, yet this 65 per cent operated only upon 35 per cent of the places to be filled.

In Colorado 45 out of each 100 continued in their employment throughout the year, and it required 125 hirings to fill their places. In other words, there was a labor turnover of 125 per cent with a 45 per cent stable force.

In Logan, W. Va., 25 per cent of the employees remained on the pay roll for the year. Out of each 100 jobs 75 men quit, and it required the hiring of 230 men to keep these 75 jobs filled. In other words, the turnover was 230 per cent of the entire force, but was active with only 75 per cent of the force.

We have here a quantitative answer as to the success of methods adopted having for their prime purpose the holding of men to their jobs. In the central Illinois coal fields there are no methods and from 65 per cent to 69 per cent of the men stay put. In other fields there are nothing but methods and from 25 per cent to 45 per cent of the men stay put—in one field as low as 19 per cent.

This does not prove that there is no room for improvement in industrial relationship in Illinois, but it does prove that the methods of some localities do not do the work as efficiently as no methods in Illinois, and would certainly cause any business man to stop and consider as to whether or not there was some better and less expensive way of doing it.

Cost of Labor Turnover

ESTIMATES of the cost of replacement of workers who leave vary widely. At the 1925 meeting of the Rocky Mountain Coal Mining Institute the cost of breaking in a new man in the coal industry was placed at $100.[10] The figures following showing estimated cost of replacement per man are taken from Industrial Management, September, 1925, pages 150–152.

[10] See Labor Review, May, 1925, p. 30.

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	Cost of replacement per man	
Shoe industry:		
Factory A	[11] $24.00–	[12] $239.00
Factory B		[13] 25.00
Rubber industry	40.00–	50.00
Fan and blower plant	50.00–	100.00
Electrochemical plant		50.00
Automobile industry		77.25
Soap industry	35.00–	50.00
Wire industry	100.00–	125.00
Linoleum plant		20.00
Radiator and boiler factory		75.00

[11] If new man is an experienced operator.
[12] If new man is unskilled operator.
[13] Low cost due to location of factory in a shoemaking center where the labor is predominantly shoe labor.

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UNEMPLOYMENT INSURANCE AND STABILIZATION OF EMPLOYMENT

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Unemployment Insurance and Stabilization of Employment

THE evils of unemployment or irregular employment are evident. The possible remedies fall under two general heads: (1) Unemployment insurance plans, by means of which the risk to the individual worker is met by the payment to him of some form of benefit during periods of unemployment; and (2) plans for stabilizing or regularizing business undertakings so that fluctuations in employment therein will be prevented or held within narrow limits.

Provision of some form of insurance against unemployment in foreign countries dates back many years and has assumed various forms. In the earliest systems the risk of unemployment was assumed to be a personal one and the entire cost was borne by the workers. There was a certain industrial factor in these early forms of insurance, in that the funds were usually set up by the trade-unions. Experience showed, however, that the risk was too great and the trade-union organizations were unable to cope with it unaided. The social nature of the risk was recognized when these funds were subsidized by government agencies, throwing part of the burden upon the community as a whole. Systems by which the burden is borne in varying combination and degree by the community, the employers, and the workers are now in force in a number of foreign countries.

In the United States unemployment insurance has not been made a matter of legislation in any of the States, although in some of them State laws on the subject have been urged similar in general idea to that of the workmen's accident compensation laws now in effect almost universally in the United States.

On the other hand, the seriousness of the problem of unemployment is now clearly recognized in this country and various remedial plans have been and are being tried, although for the most part on a limited scale and of an experimental character. Primarily these plans are directed to the stabilization of employment, but involve in a number of cases resort to the principle of insurance, the usual objective, however, being to insure employment to the worker rather than to insure him against unemployment.

Among the methods which are now being tried to secure for workers a reasonable degree of regular employment are the stabilization of seasonal industries by creating a steady demand through advertising and judicious marketing, by developing supplementary lines, and by manufacturing for stock in times when orders are scarce; the decasualizing of labor in such industries as longshorework and harvesting through better systems of employment; and the establishment of unemployment insurance which has for its purpose not so much the payment of an out-of-work dole as of guaranteeing a certain minimum of employment during the year to all the regular workers in the industry. This latter method meets the growing

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demand for treatment to be applied at that point where emergency remedies fail—a method of relief which will be reliable and as painless as possible to all concerned and which will cure, so far as it is possible to cure, the disease and prevent its recurrence. Insurance of employment, or of wages if work can not be furnished, is the method, therefore, which has found most general acceptance.

Brief description is given below of the various plans and methods in effect in this country for relieving and curing the evils of unemployment. This is based upon a general survey made by the Bureau of Labor Statistics in 1923–24, supplemented by such information regarding later developments as has come to the attention of the bureau.

Trade-Union Out-of-Work Benefits

IN THE survey of unemployment relief methods above referred to the Bureau of Labor Statistics made inquiry regarding trade-union out-of-work benefits of 161 national and international unions. Replies were received from 138 of the 161 unions so addressed. Only 3 of the 138 national or international unions reported a plan for out-of-work benefit now in operation, 4 reported that such plans had been in operation within the last few years but had been abandoned, and 13 that certain of their locals had such plans. Three organizations responded that unemployment insurance had been rejected by the national convention, and one that the convention voted to leave the matter to local action. Seven unions reported that their locals had made agreements providing for a guaranty of employment. One reported a national agreement providing such a guaranty. Seven unions explained that provision had been made for the division of work in slack periods by agreement with employers or through employment offices, or both. Fifteen of the national or international unions reported provision for payment of the dues of unemployed members. In some cases it was stated that because the nature of the work was continuous there was little need for such plans, and in others that the organization was too small to carry out such a plan. One union stated that such a plan was not favored because of its effect upon individual initiative.

The latest available data [1] show that unemployment benefits under the three national plans now operated are those of the Diamond Workers' Protective Union of America, the Deutsche Amerikanische Typographia, and the International Association of Siderographers.

The plan of the diamond workers has been quite successful. A comparatively high benefit rate has been paid with few interruptions. The position of this union is unique, however, as diamond cutting is practically a profession. There are comparatively few workers in the industry; they are practically 100 per cent organized and are almost all located in New York City. Difficulties of administration are therefore greatly minimized. The Deutsche Amerikanische Typographia shows an unusual record over a long period of years. Benefits have been paid since 1885.

[1] Labor Review, April, 1924, pp. 152–174; July, 1924, pp. 8–32; American Federation of Labor: Trade-union benefits, by George W. Perkins and Mathew Woll. Washington, 1925.

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When the unemployment fund of the Diamond Workers' Protective Union was started in 1912, $600 was transferred from the general fund to the out-of-work benefit fund. Members paid 10 cents per working week. The waiting period was 5 weeks, and the benefit $6 for the first week and $1 per day thereafter for not more than 78 days per fiscal year. Membership of the union at that time averaged 350. In July, 1913, the benefit was increased to $7.50 and the waiting period made 3 weeks instead of 5. During 1914 and 1915 expenditures greatly exceeded the income and large sums were taken from the general fund of the union. At the end of 1915 payments were suspended and members assessed $1 per working week until January 1, 1917, when payments were resumed and assessments reduced to 25 cents. In 1920 it became necessary to make the rule that members who at the close of any fiscal year had received benefits for two consecutive periods could not draw further benefits until the fund should be replenished. Since its inception there has been a net loss of about $55,000. At the present time members are assessed 50 cents per week.

The national benefit of the Deutsche Amerikanische Typographia is supplemented by only 1 of the 16 locals affiliated to the organization. This local continues the $6 benefit to unemployed members, if necessary, for a total period of 14 weeks each year, making a total of 30 weeks and a sum of $180, the maximum that a member of the local may receive.

Payment of Dues of Unemployed Members

AN INDIRECT form of unemployment benefit which seems to be growing in popularity is the exemption of unemployed members from the payment of dues by a system of out-of-work stamps. This form of benefit obviously does not buy bread, but it has the advantage of members retaining their good standing so that they are eligible for other union benefits. It also serves to prevent disorganization of the union and protects in some degree the employed worker.

The International Molders' Union of North America has perhaps the most elaborate system of the sort. For the three years 1922 to 1924 the dues exempted in this union amounted to $813,694.80.

The following national and international unions provide for the payment of the dues of their unemployed members: Coopers, blacksmiths, boiler makers, brewery workmen, railway carmen, electrical workers, metal polishers, molders, piano, organ, and musical instrument workers, shoe workers, stove mounters, cigar makers, pattern makers, machinists, leather workers, maintenance-of-way employees, oil-field workers, paper workers, and textile workers, while granite cutters are exempt from one-half the dues. The cigar makers' union reported in 1923 the sum of $16,059 in dues paid for out-of-work members.

Local Union Plans

THE national and international unions which report that certain of their locals pay out-of-work benefits are as follows: Bakers and Confectionery Workers' International Union of America,

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International Stereotypers and Electrotypers' Union of North America, International Photo-Engravers' Union of North America, Lithographers' International Protective and Beneficial Association, and International Wood Carvers' Association of North America.

Fifteen locals of the bakery workers' union make provision for out-of-work benefit during the winter months, usually from November to April. The general plan is similar in all the locals. The benefits paid usually amount to $10 per week for a specified number of weeks, and members must be in good standing in order to receive benefits.

Certain of the bakery workers' locals do not favor unemployment benefits, but prefer the division of work during slack periods. The steadily employed workers are required to give up one or one and one-half days per week to the unemployed, who substitute for them. In this way unemployed members get three or four days' work per week at the regular rate per day. Unemployed members are given preference when assignments are made for overtime work, for which they are paid the time and one-half rate. The cooperation of the employer is secured by agreement.

Another agreement provides that "Every boss must recognize a substitute for a steady man which is sent by the local union, if capable."

One local whose members are deliverymen, or salesmen, as they are called by the trade, provides that a member out of work may accompany a regular man on his route and receive the regular man's pay for the day.

Such plans the unions reporting them deem preferable to the payment of gratuitous benefits, because the member earns what he receives and the suspicion of charity is removed.

Local unions of the International Photo-Engravers' Union exempt members from local union dues during unemployment and pay the international dues of unemployed members. Most of the local unions also maintain unemployment funds. The benefits vary, but in the main approximate $25 per week.

The stereotypers provide unemployment benefits through local unions, and the lithographers' international, which discontinued benefits on a national scale in 1924, reports that benefits are paid by nearly all its locals.

Members of the Amalgamated Lace Operatives of America are paid unemployment benefits by the local unions.

Insurance Plans and Guaranteed Employment Through Collective Agreements

THE inadequacy of the insurance against unemployment which the national and local trade-unions have been able to support and the growing conviction on the part of the unions that unemployment, like accidents, should be, to some extent at least, a charge upon industry, have led to insistence by certain of the unions that employers contribute in some way to their protection from the hazard of unemployment. It is argued that only as industry is made to bear a part of the burden of unemployment will it seriously attack the problem of prevention. Certain plans have been worked out, prin-

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cipally in the clothing trades, by which the burden is jointly borne by employers and workers or by the employers alone.

One national and a number of local unions have concluded agreements which provide a guaranty of a specified number of weeks employment. In these cases the employer assumes the risk, except in the sense that the workers bear the burden of the remaining jobless weeks. The period guaranteed varies. In a number of cases wage decreases were accepted by the workers in return for the guaranty clause. The Cleveland plan represents what may be called a general market plan.

Cleveland Garment Industry Plan

A PLAN by which garment workers were guaranteed employment, or pay therefor, for a definite period each year was established in the Cleveland garment industry by decision of the board of referees handed down in May, 1921. It affects from 2,500 to 3,000 garment workers affiliated with the International Ladies' Garment Workers' Union and manufacturers who are members of the Cleveland Garment Manufacturers' Association. Its primary purpose is to eliminate seasonal unemployment through the device of offering an incentive to manufacturers to bring about its reduction.

The plan was the result of a compromise, the union agreeing to the introduction of production standards and the employers consenting to the assurance of a definite minimum annual income to the workers; that is, the union offers a reward for increased employment, the manufacturers a reward for increased production.

As now constituted the scheme provides that each worker shall be assured of at least 40 weeks of employment each year. The worker who exceeds 12 weeks of idleness is entitled to draw upon the unemployment fund to the extent of one-half of his weekly minimum. The employer's liability is limited to 10 per cent, i. e., he must lay aside each week a sum equal to 10 per cent of his total direct labor pay roll, on the basis of the May, 1919, wage scale (the peak scale), to constitute an unemployment insurance fund for his plant, and pay the workers one-half of their minimum wage for all time unemployed over 12 weeks, each worker to accumulate the full period of permissible unemployment before he begins to draw on the fund. Obviously, if an employer can keep his workers from 13 weeks of idleness he will retain the fund.

The fund is not actually laid aside, but the employer gives a surety bond to the board of referees, which has charge of the fund, in an amount equal to the contemplated percentage of his pay roll. This prevents holding idle capital but fully protects the worker.

It was estimated from available records that the average factory in the industry was working about 36 weeks a year, leaving 16 weeks of unemployment. Under the plan, therefore, industry is made responsible for 4 of the 16 weeks to the extent of one-half of the worker's wage, and responsibility for a maximum of 12 weeks is borne by the worker. Should a worker secure other work during his lay-off, his right to draw his unemployment pay from his regular employer is not affected, and assuming that he received the same

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wage, he would, after the 12-week period, receive 1½ times his scale. The unemployment pay not only is a substitute for employment, but is in the nature of a penalty imposed on the particular employer for failure to get work for his employee. It also eliminates the incentive for workers to remain idle which would exist if they should lose their unemployment pay by securing other work.

When a worker is laid off he is given a duplicate lay-off slip, marked with the date of lay-off and if possible the time of return. When he returns the date is marked on the slip. When the worker's slips show that he has accumulated 12 weeks of unemployment the benefit begins. By this method the worker knows exactly where he stands and misunderstandings are avoided. The manufacturer's record of unemployed time is kept on a form provided for the purpose.

The employer is given some latitude in the matter of employment of casual workers. New employees must pass a two weeks' probationary period before acquiring the status of regular employees, but each employer is permitted to employ, for a period not exceeding four weeks, once in each of the two seasons, additional workers not to exceed 20 per cent of the workers in any one department.

The manufacturers' association is responsible for submission to the impartial chairman of weekly data of the amount of the pay roll of each manufacturer, the amount paid out of the fund, and the amount available in the fund, so that the amount of unemployed time may be properly checked.

Numerous methods of meeting the situation have been devised by the employers affected by this plan. They have taken risks in cutting garments ahead of sales, they have added other lines of work, they have increased their sales forces, they have taken greater chances in purchasing materials in advance, and have accepted orders to be made up in otherwise idle time without profit or even at a loss.

The plan has undoubtedly proved an incentive to efficiency. There was an increase of work in the shops and an indirect gain through increased labor stability and increased production resulting from continuity of employment. It seems to be simple, practical, fair in its limitation of liability, and remunerates the worker in accordance with the work done. Its effectiveness in reducing seasonal unemployment refutes to some degree, at least, the argument that the burden of idle factories and weeks of nonproduction are so great that employers need no other incentive. Recurring seasons of unemployment have been accepted as a matter of routine, and this plan of rewarding the manufacturer who succeeds in holding down his seasonal unemployment to a minimum furnishes the shop incentive. The results depend upon his own efforts, not upon those of other manufacturers. The fund has acted as an automatic gradation of the scale. The manufacturer pays a scale which is in direct proportion to his unemployment. Employers having no unemployment as interpreted by the referees' decision pay 100 per cent; others pay 101 per cent, others 110 per cent, and so on according to efficiency in regularizing employment.

This effort to secure work on the part of individual employers has taken work from other employers and other workers, and the manufacturers argue that it puts the Cleveland market at a disadvantage

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competitively until the plan is made country wide. The argument that two-thirds of the wage was an incentive to idleness on the part of the workers and the charge that workers preferred idleness to the "fill-in work" are largely eliminated by the reduction of the payment for idle time to one-half of the minimum wage.

Chicago Clothing Industry Plan

A PRELIMINARY agreement between the Amalgamated Clothing Workers and the Chicago clothing manufacturers upon the basic principles governing the establishment of an unemployment insurance fund was concluded May 1, 1923. The details of the scheme were worked out later, and the principles, terms, and conditions of its operation were finally adopted in September, 1923.[2] Under this plan the weekly contribution to the unemployment fund is 3 per cent of the pay roll, 1½ per cent from the employer and 1½ per cent from the employee. Unemployment benefits are paid at the rate of 40 per cent of the average full-time weekly wages of the beneficiary and in no case may exceed $20 for each full week of unemployment, and no beneficiary may "receive more than an amount equal to five full weekly benefits in a single year." "No benefits shall be paid to an employee who voluntarily leaves his employment or to an employee who is discharged for cause or who declines to accept suitable employment."

Contributions to the fund began the first pay-roll week after May 1, 1923, but it was agreed that no benefits should be paid out until May, 1924, as a reserve fund had to be formed. The September 4, 1925, issue of the Advance, the official organ of the Amalgamated Clothing Workers of America, contains an editorial on the operation of the scheme from which the data below are taken.

The collection system and the payment of benefits has now become nearly automatic. In the six months ending October 31, 1924, members of the Amalgamated Clothing Workers were paid $944,291 in unemployment benefits, and in the next six months, $665,338—more than a million and a half dollars for the year ending April 30, 1925. The contributions to the fund for the two years closing April 30, 1925, aggregated a little over a million dollars a year. On May 1, 1925, the balance on hand was $564,315.

In one year the temporary cutters, averaging 600, were paid $79,151 in unemployment benefits. These workers have recently had protracted out-of-work periods and have received 10 weeks' benefits at the rate of 33⅓ per cent of their average earnings. This was effected through a special agreement with the permanent cutters, who were willing to have a reduction made in their own benefit rate.

There have been notably few difficulties in the administration of the fund despite its pioneer character. Although 70,000 separate checks for unemployment benefits were drawn in favor of members of the Amalgamated Clothing Workers in one year, the number of complaints against the fund was strikingly low. No grievances in regard to favoritism or unfairness have been presented.

[2] See Labor Review, July, 1923 (pp. 129, 130); November, 1923 (pp. 125–130); July, 1924 (pp. 23–25).

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The expense of administration amounted to only 5 per cent of the total income, which is regarded as "an unprecedented record" in the insurance field.

The fact that the unemployment insurance scheme has weathered two of the most adverse years the men's clothing industry of Chicago has ever experienced is considered an evidence of "the basic strength of the plan."

New York Clothing Industry Plan

ON November 25, 1924, the agreement to establish a similar unemployment insurance fund was formally ratified by the New York Clothing Manufacturers' Exchange and the Amalgamated Clothing Workers of America.

Ladies' Garment Workers' Fund, New York City

AN UNEMPLOYMENT insurance fund was established by the agreement made February 24, 1925, by the Association of Dress Manufacturers (Inc.) and the Joint Board of the Cloak, Skirt, Dress, and Reefer Makers' Union of the International Ladies' Garment Workers' Union, to be in effect until December 31, 1926.

This agreement affected 30,000 workers employed in 2,000 shops, which had an annual output of $250,000,000 worth of dresses and an annual pay roll of more than $50,000,000.

The fund established by this agreement was to be maintained by deductions of 1 per cent of the workers' wages and of 2 per cent of the employers' pay rolls. Employment of one year in the New York market is required for membership in the fund, and members must register at a registration office.

Unemployed members are paid $10 a week for 12 weeks, 6 weeks in the fall and 6 weeks in the spring, and benefits are not paid until the full period of employment has accumulated. Members who work 17 full weeks each in the fall and spring seasons are not entitled to benefits, as there is a recognized dull period of 9 weeks in each season. This section of the agreement has been included in the new agreement which will last until June 1, 1929.

A similar agreement is in effect in this industry in Boston and Baltimore.

Cloth Hat and Cap Industry

THE Joint Council of New York of the United Cloth Hat and Cap Makers of North America concluded an agreement in September, 1924, with the Cloth Hat and Cap Manufacturing Association, which provided for the maintenance of an unemployment fund solely by the employers. The members of the manufacturers' association pay 3 per cent of their pay roll by check each week to the joint council and the association has no rights or interest in the fund beyond the obligation to make the weekly payment. Benefits amount to $10 per week for male members and $7 per week for female members, but no member can receive more than four weeks' benefits from July to December, nor more than three weeks' benefits from January to June.

Similar plans are in effect in Chicago, Philadelphia, Boston, Baltimore, and Scranton.

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A plan guaranteeing payment for 48 weeks' employment each year is in effect in Milwaukee, St. Paul, and in some of the Baltimore plants manufacturing cloth hats and caps.

If the factory is in operation 48 weeks or more, the operative receives only his regular wages, but if the factory operates only 47 weeks, the employee will receive 1 per cent of his yearly earnings in addition to his regular wages. If the factory is in operation only 46 weeks, the employee will receive 2 per cent additional; if it operates 45 weeks, he will receive 3 per cent additional; and if it operates but 44 weeks, he will receive 4 per cent additional. In case the factory is in operation 43 weeks or less each operative is to receive in addition 5 per cent of his yearly earnings.

A sum equal to 5 per cent of the pay roll each week is given by each firm to the union to be kept until the number of weeks of employment for the ensuing year is determined. The entire amount is returned to the firm in case 48 weeks' work is provided, 4 per cent is returned if 47 weeks' work are given, and so on.

In Lowell, Mass., an agreement, which expires February 1, 1928, provides that each employer shall employ the members of the union working in his plant not less than 49 weeks during each year of the life of the agreement.

Other Guaranty Plans

ONE union is reported as having a national agreement providing for a guaranty of employment. The United Wall Paper Crafts of North America reports agreements with manufacturers in the wall-paper industry in 14 cities guaranteeing to machine printers, color mixers, and print cutters 48 weeks' employment per year. The agreement covers three periods. During the first period, 43 weeks' work at full pay is guaranteed and half time for any time that workers should be idle up to 48 weeks. For the second and third periods, 50 weeks of employment are guaranteed—45 weeks at full pay and half pay for the other five weeks.

The Philadelphia local of the Steel and Copper Plate Printers makes verbal agreements in which week workers are guaranteed 50 and 52 weeks' work per year, some on straight salary basis and some on a minimum with a bonus for production.

Locals of the American Federation of Musicians have agreements providing that its members will be employed in the theaters for a specified number of weeks in each season.

Establishment Insurance and Guaranty Plans

THE "unemployment risk" has never been measured, and the plans now operating in certain industrial establishments have little or no basis in actuarial science. They are merely carefully worked out experiments and quite frankly acknowledged as such. Apparently they have been variously motivated, sometimes by a sense of social responsibility, sometimes by the purely selfish motive of keeping a skilled force intact, and sometimes by a combination of such motives. The essential thing, however, whatever the motive, is that this group of employers has cared enough about the problem

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to be willing to undertake experiments which promise something worth while.

Insurance Plan of a Paper and Novelties Company

AS AT present constituted, the fund maintained by this company is administered by a small committee composed of an equal number of representatives of the management and the works committee. The plan provides that employees with more than six months' service who are temporarily laid off shall receive 80 per cent of their regular wages if they have dependents and 60 per cent if they have none. When employees of either class secure temporary work outside they are entitled to an amount equal to 10 per cent of their outside earnings plus 90 per cent of their earnings with the company, the unemployment fund being used to make up the difference between this amount and the pay they receive outside. When transfers are made within the factory, full wages are paid to time-workers and 90 per cent of their six weeks' average earnings to pieceworkers; the difference between what they are worth on the new job and their earnings is charged to the unemployment fund. The committee administering the fund may stop payments to any employee after six days' payments, if in its opinion the employee is not making an attempt to secure outside work. In case of long-continued depressions, if it becomes necessary to discharge workers, they are given two weeks' notice or pay for the same period.

Up to 1926 the fund had amounted to about $150,000, approximately $40,000 having been paid out of it since 1920. The amounts actually paid out each year have been negligible in comparison with the annual pay roll, as in 1921, although the payments were ten times greater than in any other year, they totaled only about seven-tenths of 1 per cent of the total yearly pay roll.

Unemployment Sinking Funds in Two Textile Finishing Establishments

THE unemployment insurance plan in effect in two textile finishing plants is a part of a general partnership plan which provides life insurance, health benefits, accident insurance, and profit sharing. By the unemployment feature of the plan two sinking funds are provided, designed to make the wages of both capital and labor constant. At the end of each year the board of directors of the company sets aside from the net profits of the company, if any, a sum sufficient to raise the sinking fund for capital's minimum wage to an amount equal to 6 per cent on the invested capital. This would amount to about $85,000. After this is accomplished, a further sum, to the amount of $85,000, is set aside to establish a sinking fund to be drawn upon by labor when the company is unable to furnish employment. Both funds are to be raised before the division of any profits, and both bear interest at 6 per cent. Interest on labor's fund may be used, in the discretion of the board of operatives, for sick benefits, etc. Interest on capital's sinking fund is at the disposition of the board of directors.

From labor's sinking fund, known as the unemployment guaranty fund, each operative who has been on the regular pay roll of the

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company for 12 consecutive months receives half pay for all time lost due to employment for less than 48 hours a week, not including overtime. These payments are continued until the fund drops below $50,000 or a figure similarly proportionate to the pay roll, when half time is paid for all time lost under 35 hours per week.

At least 24 hours' pay per week is guaranteed until the fund is exhausted. In weeks in which holidays occur the 48-hour limit is reduced by the number of hours lost by such holiday—the 35-hour limit is not affected. Six holidays are counted. The period during which benefits may be drawn is limited only by the fund.

The plan provides that at the end of the year the amount in excess of $85,000 in the employee's sinking fund is to be distributed as profits to officers and employees of the company, it being understood that the $85,000 bears a ratio to the pay roll and may be increased or decreased accordingly.

An operative forfeits his share of the fund if he is discharged for crime or neglect of duty (provision is made for appeals from discharges), or if he leaves without giving one week's notice or without satisfactory agreement with his foreman.

The operation of the fund is under the jurisdiction of the board of management made up of 12 members, 6 of whom are elected annually by the board of directors and 6, representing the operatives, selected by the board of operatives from their number.

Since the fund is made up of surplus earnings, obviously it is not increased when there are no earnings. Unemployment during the slump following the peak years of 1919 and 1920 was more severe than ever before in the experience of the companies. From the nature of the work, these companies are able to control only to a very limited extent the question of regularization, i. e., of operating or not operating.

In one plant the fund available for benefits at the beginning of 1920, when payment of benefits began, was approximately $107,400. Three years of depression followed. During the first year of operation about 7 per cent of the total annual pay roll was distributed in benefits. By June, 1923, the fund was exhausted.

In the other plant the plan has been somewhat more successful. Payments of about 2½ per cent of the total annual pay roll were made during the first year of its operation, between 400 and 500 operatives sharing in the distribution and receiving an average of about $35 each. Two per cent of the total pay roll was paid out in 1921, approximately 2.4 per cent in 1922, and about 0.9 per cent in 1923. There was probably as much unemployment in 1923 as in the previous years, but because of the sliding scale upon which the fund operates, the actual drafts upon it were not so heavy.

Unemployment Compensation for Discharged Railroad Employees

A NOVEL plan of compensation during unemployment resulting from dismissal for any cause was adopted by an important railroad company operating about 900 miles of road and employing approximately 14,000 workers. The scheme is a feature of a comprehensive group-insurance plan, based upon a contract between the company and a commercial insurance carrier, which became effective on January 1, 1922.

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The insurance plan of this company is based on the idea that there are five major hazards against which the employee and his family should be protected if he is to reach his highest efficiency. They are accident, sickness, superannuation, unemployment, and death. The insurance plan now furnishes some sort of protection against all of these contingencies.

The provision for unemployment compensation applies to employees within 24 months or more of continuous service who subscribe for and continue to carry at least two of the three forms of contributing insurance to which they are eligible. Such employees are automatically insured at the company's expense against unemployment resulting from dismissal for any cause, in the amount of $15 per week for a period not to exceed six weeks or for so much of that time as the employee is unable to find employment. Employees whose average annual compensation for the preceding two calendar years of service has not been more than $1,000 are paid $10 per week for the same period. The plan does not cover lay-offs.

Although the company assumes all charges under this plan, employees may be said to bear a part of the cost of protection against unemployment in that they are required to subscribe to two forms of contributory insurance in order to benefit by it. The cost per employee is small, however, the amount depending upon the amounts and kind of insurance to which he subscribes.

In the railroad industry, although the business fluctuates, there is little unemployment unless there is unusual business depression. For this reason and because the greatest turnover occurs among employees with less than two years' service the number of claims paid has been very small. Although about 68 per cent of the employees of the company were eligible for this form of insurance, only 103 claims were paid during the first three and one-half years that the insurance was in effect.

Guaranteed Employment in a Soap Manufacturing Plant

EFFECTIVE August 1, 1923, a large soap manufacturing concern guaranteed to 5,500 employees in its four largest plants, and in offices located in 26 cities of the United States and Canada, full payment for not less than 48 weeks of employment in each calendar year less only time lost by reason of the customary holiday closings, or through fire, flood, or strike or other extreme emergency.

The guaranty is subject to three provisions:

First. In order to benefit by the employment guaranty the employee must be a participant in the company's profit-sharing plan, by which it is provided that any employee, except salesmen and traveling representatives, who has been in the employ of the company for not less than six months and who is earning less than $2,000 a year, may purchase at the market value the nearest number of full shares of the common stock of the company the total cost of which to him equals or exceeds the amount of his annual earnings. The employee pays the company in cash each year after the purchase of the stock until it is fully paid for, not less than 5 per cent of the amount of his annual wages. Quarterly profit-sharing dividends are paid by the company on the amount of the employee's wages at the rate of

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10 per cent for first year of participation, 11 per cent for the second year, etc., the rate increasing 1 per cent a year until after the eleventh year, when it remains stationary at 20 per cent. Approximately 70 per cent of the employees have availed themselves of this opportunity.

Second. The company reserves the right under this guaranty to transfer an employee to work other than that at which he is regularly employed. The original rule provided that the employee be compensated for such work at his regular wage rate. New regulations effective May 1, 1924, limit the full-wage guarantee to temporary transfers.

By the terms of the third provision the company reserves the right to discharge any employee at any time for cause, and further reserves the right to terminate or modify the guaranty in whole or in part at any time after serving six months' notice to that effect.

If it should become necessary because of dull times to reduce the size of the force, the company states that a 10 or even a 15 per cent reduction in personnel could be made without cutting into the ranks of the old employees, because this percentage would represent the natural turnover—those who retire, leave, or are discharged.

No reserve fund has been necessary to finance the plan because there has been little additional cost involved.

Guaranteed Full-Time Earnings in Two Paper Mills

THE unemployment compensation plan of two associated paper mills in Holyoke, Mass., was inaugurated for the purpose of rewarding length of service and loyalty to the firm.[3] A progressive increase of wages is provided for during the first four years of employment and after the completion of five years of satisfactory continuous service full-time earnings are guaranteed. The plan applies to all wage earners from sweepers to skilled paper makers, numbering about 600, but not to office employees, executives, or others on a salary basis. The base rates at which employees are hired are equal to and in many cases higher than the rates for similar work in the locality, and for skilled workers a service differential of 2 cents an hour above the base rate is added for each of the first four years of satisfactory service and of 1 cent an hour for unskilled workers, so that at the end of the fourth year skilled workers are receiving 8 cents an hour differential and unskilled workers 4 cents an hour differential above the base rates. There are no further service differentials after the first four years but instead the workers may apply for and, if their work is satisfactory, receive a signed agreement which guarantees full-time employment. The agreement specifies that if the plant is not in operation a sufficient number of hours to equal or exceed the amount of the salary, the regular wage rate will be paid weekly. This amount will be subject to adjustment under any condition affecting a general adjustment of wages. No compensation is paid for lost time due to legal holidays.

For the purpose of the wage payments the year is divided into 13 periods of 4 weeks each so that a man earning $40 a week, for

[3] This summary is taken from an article by Dr. Herman Feldman in Industrial Management, New York, March, 1926.

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example, is guaranteed $160 for every 4-week period. If short time occurs, the worker is excused until he is needed and is paid the difference between his earnings and the guaranty. Extra earnings for overtime during a given period are applied against any short time occurring during the period, although overtime within any 4-week period is not balanced against short time in another period.

The plan is regarded as unusual in two respects: First, because as soon as an employee has received the protection of the guaranty no wages are lost on account of any "waiting period" or other qualifying stipulation and, second, because, although the agreement stipulates that the company has a right to terminate the plan on four weeks' notice, this is merely a technical provision designed to save the firm from legal liability if it is in danger of bankruptcy. This clause reads: "The company reserves the right to terminate this agreement, under any conditions which in the opinion of the company may make it powerless to continue it," but is followed by the statement, "It is not the intention of the company to exercise this right except in case of serious fire or other calamity or conditions beyond our control. Under such conditions * * * termination of the agreement will not become effective except after four weeks' notice."

The liability of a company in a plan of the kind described obviously depends upon the proportion of employees who will stay five years and thus be covered by this guaranty. When the plan was started it was made retroactive to the extent that five years of prior service was counted. At that time there were 121 employees with this length of service, while in October, 1925, there were 275, or an increase from 19½ per cent to 45½ per cent of the full working force. This increase in the average length of service has therefore increased the liability of the company, but the firm has weighed the matter carefully and considers that the advantages outweigh the disadvantages. The reasons which convince the firm that the risk is worth taking are that the extra payments have proved not to be so large as might be expected; certain economies are possible, and the liability which must be assumed stimulates constructive planning. The firm also believes that a wise investment in human nature is economically sound.

During the period from March 1, 1921, to October 1, 1925, the sum paid for time during which the employees under the guaranty were excused from reporting for duty amounted to $9,644, or 0.27 per cent of the total pay roll for both companies for that period, while the amount of wages paid to workers under guaranty while engaged on work supplied them other than their regular duties was $54,671, or 1.56 per cent of the total pay roll for the period.

The question of discharge is important in a plan of this kind as the power of dismissal might be abused in a dull period. During the time the plan has been in operation only 5 employees covered by the guaranty have been discharged, 2 for excessive drinking, 2 for insubordination, and 1 for repeated carelessness. The rules specify that no employee of five years' standing shall be discharged without the case being first submitted to the general superintendent or manager. An employee may be suspended without pay pending investigation by the general superintendent and if the charge is incompetency the question of placing such an employee in work better

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suited to his capabilities is considered. For infringement of rules or insubordination an employee may be summarily dismissed.

Guaranteed Time in the Meat-Packing Industry

A STUDY by the Bureau of Labor Statistics showing the trend of wages and hours of labor in the slaughtering and meat-packing industry in 1925 (Bulletin No. 421) shows the practice of guaranteeing pay for a stated number of hours a week in force in a large number of plants.

Of the 86 plants included in the study, the employees in a few of the important occupations in 3 plants and in a few of the important departments in 9 plants, and all of the employees of 43 plants have by agreement or promise, the assurance of pay for a specified number of hours per day or week. This assures to these employees pay at their regular rate for the specified number of hours whenever the hours of work are less than the guaranteed hours of pay. To be entitled to pay it is necessary for the employee to report for duty and work all the hours of operation on each day or in each week. The guaranty by 51 plants is 40 hours per week. A few of these guarantee 6⅔ hours' pay for each day the employee reports for duty and does any work. One plant guarantees 30 hours, one 45, one 48, and one 57¾ hours per week. There is no guaranty, however, in 31 of the 86 plants included in the study.

This plan, which was put into effect in the packing industry prior to the war, had its origin in the uncertainty of livestock receipts and the consequent variation of hours in the service of the butcher gangs, and the desirability of keeping the skilled force intact in order that there might be present, as wanted, experts on the various jobs and the work might be carried on without a break. The guaranty is not applicable to weeks or proportions of weeks during which the men are not called for work. The fact that an employee begins a week gives him a guaranty of 40 hours' employment for that week provided he reports for duty and does such work as is offered him. The right of lay-off is always present. If an employee voluntarily does not work a complete day when work is offered, the guaranteed minimum wage is reduced by an amount equal to pay for the uncompleted portion of the day.

Overtime is generally understood to mean any time worked by employees on any regular workday or in any full week in excess of the regular or customary full-time hours per day or per week as determined by the regular time of beginning work on each day, minus the regular time taken for lunch. Many (38) of the plants in this industry covered in 1925, report that the overtime rate of time and a half begins not with the completion of the regular hours per day or week, but after the completion of a fixed number of hours. Thus, for instance, 14 plants whose full-time hours are 8 per day and 48 per week pay extra for overtime only after 10 hours per day or 54 hours per week; 14 plants pay time and a half for all overtime; while 34 plants pay only the regular rate.

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VACATIONS

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Vacations with Pay for Wage Earners

DURING recent years there has been a marked change in the attitude of industrial employers toward the granting of annual vacations with pay to factory and shop employees. Ten years ago, when the Bureau of Labor Statistics made its first study of welfare work in industrial establishments in the United States, the idea that it was possible to give a vacation with pay to workers paid on an hourly or daily basis had made very little progress. Of 389 establishments which reported on the subject at that time, only 16 gave vacations to the larger part of the shop or unsalaried force. In this number only those establishments were included which did not require a longer period of service by their employees than two years in order to be entitled to a vacation. Although quite a number of companies gave vacations after periods of employment varying from 5 to 25 years, it was considered that the possibility of receiving a vacation under these conditions was so remote as to have little interest for the majority of the workers or little effect upon them.

General Survey of Vacation Plans

A SIMILAR study by the bureau, completed in August, 1926, indicates the realization by a growing number of employers that the cost of giving vacations to the rank and file of the employees can be met successfully. The data secured show that the practice of giving vacations to shop employees has grown appreciably in the past few years. Of the 430 firms which reported on the subject, 133 give vacations to all employees who have a record of service with the firm varying in the different establishments from a few months to not more than two years. These companies include 60 manufacturing establishments and public utilities with about 195,600 employees; 50 stores with about 127,320 employees; 19 employers of large office forces, such as banks and insurance companies, with approximately 40,250 employees; 2 hotels with a total of 3,700 employees; and 1 mining company and 1 marble quarry with a total of 2,760 employees.

Length of Service Required

THE method of determining the length of vacation with reference to the length of service is of considerable importance, and several schemes for the solution of the problem have been reported. In addition to the plan of specifying a definite length of service of six months, one year, or two years before a vacation is granted, some establishments take into consideration the date of employment with reference to the summer vacation period. This method is reported especially by stores which allow summer vacations to all clerks on the rolls previous to such dates as the 1st day of September, January,

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or March. Other establishments determine the length of time to be granted on a cumulative basis, at a certain rate per month for the time employed, usually with the requirement that the maximum vacation shall not exceed one week or in some cases two weeks.

In a few instances it was reported that pay was given for a certain number of legal holidays in addition to the regular vacation with pay.

Seventeen of the manufacturing establishments, 1 public utility, 29 stores, and all of the offices (19) require less than 1 year's service for vacation; 26 factories, 7 public utilities, 20 stores, and 2 hotels require 1 year's service; and 7 factories, 2 public utilities, and 1 store require 2 years' service before a vacation is granted, while 1 mining company gives 3 days if no time is lost during the year and the quarry divides the majority of its employees into five groups, the length of vacation varying from half a day to 2 weeks for the different groups.

For factory employees on an hourly rate of pay the usual vacation is 1 week, although when less than 1 year of service is required it may be for varying lengths of time from 3 days to a week. One factory requiring 2 years' service gives 2 weeks' vacation, while another plant which allows 1 day a month during the first year increases this to 2 weeks after the first year's employment.

A public utility with more than 7,500 employees allows all weekly employees, except those employed during the month of April, 1 day for each full month of service during the 12-month period prior to May 1 of any given year, with a maximum vacation of 2 weeks. In addition to this, employees who are entitled to two full weeks' vacation are allowed to leave the Friday night preceding their vacation. Weekly employees whose service entitles them to less than 1 full week's vacation may take, without pay, additional time to make up 1 full week, while those entitled to more than 1 week but less than 2 weeks' vacation may take additional time at their own expense to make up 2 weeks. During 1925, approximately 43 per cent of 3,977 weekly employees received 2 weeks' vacation, while the balance, or 57 per cent, received either no vacation or less than 2 weeks, the average for this group being approximately 1 week's vacation with pay. All hourly employees who have been in the service of the company for 1 year prior to May 1 of any given year receive 12 days' vacation with pay, but those who have been in the service of the company less than a year do not receive any vacation. During 1925 approximately 59 per cent of 3,344 hourly employees received 2 weeks' vacation with pay.

One of the hotels gives 1 week to housemen and 10 days to maids, and the other hotel allows all the unsalaried workers a week with pay after one year of service in the establishment.

In addition to the 133 establishments granting vacations for employees with service of not more than two years, 47 plants require a period of service ranging from 3 to 25 years. One company which allows 1 week after 3 years' employment increases this to 9 days for 4 years and 2 weeks for 5 years.

A rather unusual plan is that of a company which gives employees who have been with the firm 1 year 1 week's vacation with pay; those who have worked from 2 to 5 years the choice of 1 week's

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vacation with 1½ weeks' pay or 2 weeks' vacation with 1 week's pay; while those who have worked more than 5 years have the choice of 1 week's vacation with 1½ weeks' pay or 2 weeks' vacation with 1½ weeks' pay. In other words employees get a bonus if they choose to take only 1 week's vacation. Quite a number of the companies allow employees to take additional time without pay, being usually limited to 1 week.

It seems to be a quite general practice to recognize continued service by increasing the length of the vacation, in most instances the vacation being increased to 2 weeks after employees have been 10 years with the company. One firm with about 225 employees is reported as giving 1 month with pay to both office and shop employees after 10 years' service, and in addition to full pay for this period the company also gives each employee a medal and a check for $100. Store and office employees in almost all instances are given two weeks after their second year of employment.

Season of Vacation, Eligibility, and Cost

IT IS important, of course, to arrange vacations so that there will be as little interference with the work as possible. In cases where a plant shuts down for inventory or repairs this naturally becomes the vacation period for the employees, and in these cases employees who are eligible for a vacation receive the pay for the time to which they are entitled. Comparatively few establishments reported a shutdown, however, and it seems to be the general practice to arrange vacations some time between the middle of June and Labor Day. In one machine shop the shop employees are given a week at the Christmas holidays, while one establishment manufacturing food products gives the vacation to the office workers in the summer and to the factory workers in the winter. In some cases the vacation may be taken any time during the year.

It is customary to require continuous service for a certain specified time in order to be eligible for vacation. This is always the case when the vacation is called or is regarded as a bonus. In some instances perfect attendance and punctuality are required for a three-month period or in other cases the vacation is given to all who have lost not more than a stated number of hours during the year.

Where the workers are on a piece rate the average rate of pay for the year is usually given them.

Very little information has been secured as to the cost to employers of paid vacations. One firm with 1,275 employees reports that the vacation plan cost the company $30,000 in 1925, and another with 400 employees that it cost $20,000.

Vacation Information

IT IS often a problem to workers who have been granted a vacation, perhaps for the first time in their lives, to know where to go or what to do with the time given them. In this connection the personnel department can be, and often is, of great assistance in furnishing employees with information in regard to resorts and trips.

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Where companies maintain a summer camp in the country, the mountains, or at the seashore or some other body of water, as is quite frequently the case, the employees and often members of their families have the privilege of spending their vacations there. The rates at these camps are usually less than at resorts where the facilities for entertainment are similar and such camps are naturally within a reasonable distance of the city in which the firm is located. These camps are usually equipped to take care of a considerable number at one time. Provision is made for the various forms of outdoor recreation and a number of firms have reported an outdoor swimming pool where no other place suitable for swimming was available.

A very interesting nonprofit-making service has been developed in New York City, called the Vacation Bureau Service, which is designed to serve industrial and commercial establishments and their employees. The bureau was started about two years ago and was financed for a two-year period by a special contribution, after which time it was expected that the industries would contribute sufficient to pay the expense of maintaining this service.

The purpose of the bureau is to obtain and make available reliable information regarding good vacation places in the territory most frequented by residents of New York City for their vacations. Representatives visit shore, mountain, and country resorts in an ever-widening radius about the city and the data secured cover the nature of the accommodations, cost of board and of transportation, kind of recreation and amusements available, and in fact all the information which a person would naturally wish to secure in looking up a place to spend his or her vacation. While this information is as far as possible secured at first hand, recommendations of responsible townspeople are secured, and persons visiting the resorts as a result of the information furnished by the bureau are requested to report as to whether or not the accommodations and service were satisfactory, with a view to eliminating objectionable places. The time of trains or boats and connections are also furnished.

After last summer's season it was reported that about 150 firms in New York City had subscribed to the bureau and it was felt that it had passed beyond the limits of an experiment and had shown that it filled a real industrial need.

Results of Giving Paid Vacations

IT IS, of course, extremely difficult if not impossible to estimate the results of paid vacations. The fact that so many employers are taking up the practice, however, would seem to indicate that although the results may not be very tangible, still there is a favorable effect on the morale and perhaps also on the stability of the labor force. The large number of employees reported by some firms as having a considerable length of service to their credit is quite remarkable, although it must be remembered there are many more important factors than a policy of paid vacations which contribute to the stability of the labor force. One firm with approximately 16,500 employees reports 4,500 employees with a service record of at least 5 years, while another with 5,600 employees had 1,400 employees with

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a record of 10 years' service and 544 with 20 years' service, all of whom received a vacation of one or two weeks during the past year.

Vacation Policies in New York Factories

A STUDY of vacation policies in manufacturing industries in the State of New York, made in 1925 by the Bureau of Women in Industry of the New York Department of Labor, showed that of 1,500 firms furnishing information 270 gave vacations to part or all of their production workers, in some instances pieceworkers being excluded from participation in the vacation plan. It was found that large plants more often had vacation policies for production workers than small plants and that 60 per cent of the plants required that workers be employed for one year in order to qualify for vacations. Ninety-eight per cent of the plants maintaining vacation policies reported that the results were satisfactory.

Vacation Policies of Cincinnati Establishments

A SURVEY of the vacation policies for production workers in factories, stores, and miscellaneous establishments in Cincinnati, Ohio, has been made recently by the Consumers' League of that city. Of 272 firms replying to a preliminary questionnaire, 145 stated that they had no vacation policy, 16 refused information, and 111 reported that paid vacations are given to all or part of their production force. The establishments granting vacations include 52 factories, 50 stores, and 9 miscellaneous establishments; and 15,948 of the 23,729 employees of these companies were entitled to receive vacations at the time the study was completed. Sixty-seven of these firms grant vacations to the entire production force and 44 to a part only of these workers.

The length of vacation varies from 1 day to 2 weeks, 1 week being given in the majority of cases. The minimum period of service required in order to establish eligibility for vacations ranges from 1 week to 10 years; only 13 of the establishments, however, require service of more than 1 year before a vacation is granted. Although there is a minimum service requirement in all cases, the length of the vacation is not as a rule graduated according to length of service, as less than a third of the firms reporting on this point stated that they have a graduated scale. Of the 32 firms which stated that the length of vacation depends on the length of service, the minimum length of vacation given is less than a week in 7 cases and 1 week in 25 cases, while the maximum vacation is 2 weeks in 30 cases and 4 weeks in 2 cases. In the latter instance service of 10 years or more is required, and women having that length of service are given six weeks.

In general, the vacations granted by these firms are given during the summer months, although in some cases employees are allowed to take their vacation at any season of the year which they choose. Several factories reported shutdowns during which time employees entitled to vacations are paid, and one store reported that it closes for a week twice a year when all employees are paid for each period. Another store had tried the shutdown vacation for two years but had decided to discontinue it and allow the employees to take their vacation when they please.

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The time of paying for the vacation is important from the standpoint of the employee. Of 86 companies replying to this question, 52 reported that they pay before the vacation; 17 after; 10 when the employee wishes; 5 on the usual pay day; and 1 firm, giving 2 weeks, pays part before and part after the vacation, while another retains the entire amount until the first week in December.

The policy in regard to giving pay for legal holidays varies among the firms having vacation plans. Fifty-four companies reported that they paid for from 3 to 7 legal holidays in addition to the vacation allowed, 4 reported no pay for such holidays, while in 53 cases the number of holidays paid for was not specified.

A number of these companies have been granting vacations for many years, one store stating that it originated its vacation plan 66 years ago. The majority of both stores and factories, however, have adopted the practice within the last few years.

Although the majority of the employers interviewed failed to express their personal opinions regarding the results of giving vacations, a number regarded them as of importance in reducing turnover and in improving the morale, the health of the workers, and the quality of work and efficiency, or in increasing loyalty to the firm.

Vacations Given as a Result of Collective Agreements

IN ADDITION to vacations granted by establishments as a form of what may be called welfare work, definite provisions for vacations are frequently made in the agreements concluded between organized workers and their employers. While no complete information is available of the extent of this practice, particularly as many of the union arrangements on this point are verbal, a compilation by the American Federation of Labor of union agreements containing vacation regulations covering the years 1924–1927 records 215 such provisions. The majority of these agreements are local but in some of the railroad telegraphers' agreements the entire railroad system is covered. In a few cases the vacations are without pay although they are given for a definite period.

The usual length of service required in order to be eligible for vacations is one year and the length of the vacation in the majority of cases is two weeks. The number of agreements, which in some cases cover Canadian unions, are as follows: Bakery workers, 1; blacksmiths, 2; electrical workers, 4; engineers (steam and operating), 10; fire fighters, 86; glass bottle workers, 2; meat cutters and butcher workmen, 4; street and electric railway workers, 29; tailors, 2; teamsters and chauffeurs, 13; railroad telegraphers, 14; typographical workers, 46; all members of the United Wall Paper Crafts of North America, 1; and maintenance of way employees on various railroads, 1.

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VOCATIONAL EDUCATION

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Organization and Objects of Federal Board for Vocational Education [1]

THE vocational education act creating the Federal Board for Vocational Education was approved February 23, 1917. This law provides a plan of cooperation between the Federal Government and the States for the promotion of vocational education in the fields of agriculture, home economics, and industry. Under the act the Federal Government does not undertake the organization or immediate direction of vocational training in the States but agrees to make from year to year substantial financial contribution to the support of such training and to cooperate in fostering and promoting vocational education and the training of vocational teachers. The grants of Federal money are conditional and the acceptance of these grants imposes upon States specific obligations to expend the money paid over to them in accordance with the provisions of the act. The State must show the kinds of vocational education for which it is proposed that the appropriations shall be used, and the kinds of schools and the equipment of the schools in which the instruction is to be given. The State must also set up courses of study, methods of instruction, and qualifications of teachers who are to give such instruction.

The autonomy of the States, however, has been entirely preserved by the following provisions:

(*a*) The Federal Government deals with the work in the States only through an official State board created by the legislative machinery of the State.

(*b*) The Federal Government deals with the State only in terms of standards and policies, not in terms of particular institutions or individuals.

(*c*) The Federal Government deals with a State in terms of the conditions within that particular State and not in terms of the United States as a whole.

General Provisions of the Federal Vocational Education Act

THE Federal vocational education act provides that—

(*a*) All schools receiving Federal aid must be under public supervision or control;

(*b*) Instruction in these schools must be of less than college grade and "designed to meet the needs of persons over 14 years of age who have entered upon or who are preparing to enter upon a vocation"; and

(*c*) Every dollar of Federal funds must be matched by a dollar of State or local funds, or both.

The Federal Board for Vocational Education is an independent body with four ex-officio members—the Secretary of Labor, the

[1] This article is based entirely upon the annual reports of the Federal Board for Vocational Education.

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Secretary of Agriculture, the Secretary of Commerce, and the United States Commissioner of Education—and three members appointed by the President representing, respectively, labor, agricultural, and manufacturing and commercial interests.

The civilian rehabilitation act of 1920 charged the Federal Vocational Education Board with "the promotion of vocational rehabilitation of persons disabled in industry or otherwise and their return to civil employment." In 1921 the soldier-sailor rehabilitation work of the Federal board was transferred to the United States Veterans' Bureau.

Vocational Education in the United States Prior to Passage of Federal Act

FOR nearly a quarter of a century preceding the passage of the Federal vocational education act of 1917 there had been a growing realization in the United States of the need of a more practical education. The World War sharply accentuated the need for vocationally trained citizens and brought into relief the country's failure to provide adequate facilities for such training.

The following brief account of the status of vocational education prior to the Federal act of 1917 is abstracted from the report of the Federal board, 1918.

Trade and Industrial Education

WHEN the Federal act was passed only 8 of the 48 States could be said to have developed State systems providing State aid for vocational education; namely, California, Connecticut, Indiana, Massachusetts, New Jersey, New York, Pennsylvania, and Wisconsin. These States had laws which provided for the participation of the State in financially assisting vocational schools, and most of these States provided fairly well for various types of vocational education.

To a certain extent, out of the experience of these schools, there came to be recognized certain types of schools which were known as the all-day, the part-time, and evening schools, and the Federal act, shaped somewhat in accordance with the experience of these States, provided for these three kinds of schools.

Secondary schools in their development had come to be run primarily to provide preparation for higher institutions and due to this influence almost any secondary school had to formulate its course of study in terms of college entrance.

The attempt to compromise with this requirement and the growing demand on the part of the public for a more practical education led to the organization of technical high schools and manual training high schools. The four-year courses of these institutions gave the pupils experience in various kinds of industrial work but seldom gave complete preparation for a vocation and did not meet the real need of the very large proportion of boys who had to leave school for industrial employment.

In the States above mentioned and in a number of cities in other States schools had been organized which gave a preparation for

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one trade or industrial pursuit. In most instances, however, these schools were not organized on a four-year basis and in many cases the majority of the pupils in these schools had not completed an elementary education.

While the desirability of organizing part-time education had been rather generally accepted, only two States, Wisconsin and Pennsylvania, had, up to April, 1917, given the subject serious enough attention to provide for the compulsory part-time schools for young persons over 14 years of age. Some of the other States had provided for permissive part-time education but, with the notable exception of Boston, few cities had taken advantage of this provision of the State acts. Scattered here and there throughout the country there were part-time classes, usually on the week-about basis, for boys employed in industrial pursuits.

At least five of the States above mentioned had made provision for evening industrial classes to provide instruction supplementary to the day employment.

In the conduct of evening schools in general, no clear distinction or division was commonly made between classes to promote efficiency and classes designed to extend general education. In many of the cities there were privately endowed schools giving some form of trade or industrial education. Much credit is due to these institutions in showing the way to give effective evening-school work.

In the field of teacher training only two of the eight States above mentioned could have been said to have entered prior to 1917 upon any program of providing trade or industrial education, and in these two States the work had been only fairly begun. As a whole the States had almost no experience in training teachers for any kind of service in trade or industrial schools.

Agriculture

IN 1916, 2,166 high schools were reported as giving instruction in agriculture in a serious way. About 25 per cent of these schools stated that their courses were vocational in purpose. The proportion of such schools whose work was actually vocational was probably smaller. In 1918, probably between 20 and 25 per cent of all high schools were giving vocational instruction in agriculture.

Before the Federal act was passed, the States had established and were maintaining, partly through Federal aid, institutions of college grade equipped to prepare practical farmers and specialists in agricultural science. These institutions had not, however, except in a few instances, established training departments for teachers of vocational agriculture, nor was such training offered in other educational institutions, except in an inadequate way. Since the passage of the act every State has, through its State board for vocational education, set up plans for the training of these teachers and has designated institutions where the work is to be carried on.

Home Economics

UP TO the time of the passage of the Federal vocational education act there were comparatively few schools in the United States giving courses in vocational home economics, although every State had some type of home economics in the schools. According to the

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report of the board for 1918, "there is a fundamental difference between home economics education as a form of vocational education, and instruction in home economics subjects as usually given as a part of general education." There were only a few schools in the East and a few other schools scattered throughout the country which did have the vocational point of view and in which an attempt had been made to provide a course of study planned to prepare the student for home making. Many of the colleges, however, were offering excellent courses in home economics as a part of their four-year college course and much good teacher-training work was being done.

Commercial Education

WHILE commercial education is probably the oldest form of vocational training in this country, it had been so closely identified with academic courses in public high schools for more than 25 years preceding the creation of the Federal Board for Vocational Education that the vocational aspect of such training had been lost sight of to a large extent.

Developments Under the Federal Act

AS A RESULT of the cooperation established between the States and the Federal Government relative to the promotion and support of public vocational education, the number of Federally aided schools giving vocational education increased from 1,741 in 1917–1918 to 7,930 in 1926. During the same period the pupils enrolled in vocational courses in schools receiving Federal aid have increased from 164,186 to 752,150. Tables 1, 2, and 3 give statistics in some detail from 1918 to 1926 regarding the number of vocational education reimbursement units, the pupils enrolled, and teachers of vocational courses in such institutions.

These tables, as well as all other data in this article, are from the annual report of the Federal Board for Vocational Education, 1926.

TABLE 1.—NUMBER OF REIMBURSEMENT UNITS FEDERALLY AIDED, BY FISCAL YEARS, 1918 TO 1926

Year	Agricultural schools					Trade and industrial schools					Home economics schools				Grand total
							Part time								
	Evening	Part time	All day	Short unit course	Total	Evening	Trade extension	General continuation	All day	Total	Evening	Part time	All day	Total	
1918	------	-----	609	------	609	300	341	-----	168	809	123	-----	200	323	1,741
1919	------	-----	863	------	863	325	83	138	167	713	127	27	309	463	2,039
1920	------	-----	1,375	------	1,375	435	119	322	199	1,075	193	45	462	700	3,150
1921	30	82	1,610	------	1,722	504	134	418	216	1,272	240	57	586	883	3,877
1922	50	202	1,935	------	2,187	620	150	506	237	1,513	410	131	723	1,264	4,964
1923	358	97	2,165	53	2,673	686	173	534	241	1,634	539	128	726	1,393	5,700
1924	551	103	2,480	192	3,326	776	238	582	279	1,875	616	123	877	1,616	6,817
1925	672	135	2,778	234	3,819	816	225	556	297	1,894	700	97	920	1,717	7,430
1926[1]	829	197	3,081	264	4,371	666	208	572	307	1,753	670	113	1,023	1,806	7,930

[1] Provisional, subject to final audit of State accounts.

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Table 2 gives the number and sex of pupils in and teachers of vocational courses in Federally aided agricultural, trade and industrial, and home-economics schools, by years, 1918 to 1926:

TABLE 2.—PUPILS IN AND TEACHERS OF VOCATIONAL COURSES IN FEDERALLY AIDED SCHOOLS, FISCAL YEARS, 1918 TO 1926

Year	Pupils			Teachers		
	Males	Females	Total	Males	Females	Total
1918	101,139	63,047	164,186	3,236	2,021	5,257
1919	120,351	74,544	194,895	4,104	2,148	6,252
1920	163,228	101,830	265,058	4,992	2,677	7,669
1921	192,306	131,941	324,247	6,530	3,536	10,066
1922	259,287	216,541	475,828	7,447	4,896	12,343
1923	283,103	253,425	536,528	8,630	5,828	14,458
1924	349,224	303,370	652,594	9,899	6,293	16,192
1925	370,966	305,721	676,687	11,068	6,478	17,546
1926 [1]	405,474	[2] 346,676	752,150	12,740	6,895	19,635

[1] Provisional, subject to final audit of State accounts.
[2] Includes 42 male pupils enrolled in home-economics classes, 14 in evening schools, and 28 in all-day schools.

Table 3 shows the number and sex of pupils enrolled in vocational courses in agricultural, trade and industrial, and home-economics schools or classes organized under provisions of the State plan as approved by the Federal Board for Vocational Education, including both those Federally aided and those not Federally aided, by years, 1924 to 1926:

TABLE 3.—PUPILS IN VOCATIONAL COURSES IN SCHOOLS, BOTH FEDERALLY AIDED AND NOT FEDERALLY AIDED, FISCAL YEARS, 1924 TO 1926

Year	Males	Females	Total
1924 [1]	363,443	326,612	690,055
1925	420,999	371,405	792,424
1926	463,293	420,714	884,007

[1] Prior to 1924, enrollment in schools not Federally aided was not available.
[2] Includes 42 male pupils in home-economics schools, 40 in evening classes, and 2 in all-day classes.

Expenditures for Vocational Education

TABLES 4 and 5 show the amounts expended (including Federal, State, and local expenditures) in the specified years for vocational schools, vocational teacher training, and vocational civilian rehabilitation:

TABLE 4.—EXPENDITURES (FEDERAL, STATE, AND LOCAL) UNDER VOCATIONAL EDUCATION ACT FOR SPECIFIED KINDS OF VOCATIONAL EDUCATION, FOR FISCAL YEARS, 1918 TO 1926

Year	Amounts expended for vocational education			
	Agricultural [1]	Home economics	Part-time general continuation	Trade or industrial [2]
1918	$739,933	$334,548	$347,400	$1,189,039
1919	1,413,938	554,195	374,146	1,628,327
1920	2,437,286	1,054,489	987,807	2,408,919
1921	3,393,088	1,822,348	1,955,543	3,336,218
1922	4,058,440	2,118,563	2,574,216	3,843,561
1923	4,647,042	2,748,947	3,138,136	4,374,993
1924	4,253,913	2,744,636	3,495,695	5,059,789
1925	6,146,124	2,943,524	3,973,767	5,604,127
1926 [3]	7,164,354	3,137,499	4,456,729	6,192,914

[1] Includes expenditures for salaries of supervisors.
[2] Not including expenditures for part-time general continuation schools.
[3] Provisional, subject to final audit of State accounts.

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TABLE 5.—EXPENDITURES (FEDERAL, STATE, AND LOCAL) UNDER VOCATIONAL EDUCATION ACT FOR TEACHER-TRAINING INSTITUTIONS, FOR FISCAL YEARS, 1918 TO 1926

Year	Amounts expended for training of teachers of—		
	Agriculture	Home economics	Trade or industrial subjects
1918	$121,244	$205,800	$81,785
1919	306,895	412,266	262,007
1920	556,580	599,427	490,655
1921	703,855	750,097	657,113
1922	740,052	778,436	799,721
1923	745,535	781,175	696,618
1924	755,938	818,467	716,913
1925	759,356	778,577	714,382
1926 [1]	796,056	725,128	706,058

[1] Provisional, subject to final audit of State accounts.

It is interesting to note that the financial contributions of the several States to vocational education have increased more rapidly than the contributions of the Federal Government. Thus, according to the annual report of the board for 1926, the total State and local funds utilized for the operation and development of the programs of vocational education and of civilian vocational rehabilitation have continued to exceed the amounts required to match Federal funds. For the fiscal year 1926, on the basis of figures officially reported, for each dollar of Federal funds there has been provided for vocational education $2.54, and for civilian vocational rehabilitation $1.19.

The statement below shows the amount expended from Federal and State funds for civilian vocational rehabilitation, by years, 1922 to 1926:

	Amount expended
1922	$736,268
1923	1,188,081
1924	1,242,558
1925	1,187,609
1926 [2]	1,272,877

Trade and Industrial Education Service

AS INDICATED in Table 6, attendance in the trade and industrial classes increased from 117,934 pupils in 1917–18 to 466,152 in 1926. Of the latter number enrollments in the general continuation schools were 290,358; in other federally aided trade and industrial school, 175,794.

[2] Provisional, subject to final audit of State accounts.

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TABLE 6.—NUMBER AND SEX OF PUPILS ENROLLED IN VOCATIONAL COURSES IN TRADE AND INDUSTRIAL SCHOOLS, FEDERALLY AIDED, FISCAL YEARS 1918 TO 1926

Year	Pupils enrolled in—							
	Evening schools		Part-time schools				All-day schools	
			Trade extension		General continuation			
	Males	Females	Males	Females	Males	Females	Males	Females
1918	39,625	6,708	32,605	20,400			14,713	3,883
1919	42,094	1,391	17,276	5,340	27,324	23,459	15,111	3,553
1920	46,930	1,424	11,714	5,445	57,784	40,298	17,444	3,780
1921	48,867	2,966	18,476	2,502	63,353	56,304	21,051	3,991
1922	63,584	2,893	26,055	7,051	86,111	79,800	26,241	5,149
1923	66,598	3,258	29,732	8,199	90,730	93,271	28,132	5,969
1924	81,712	3,261	30,128	5,347	128,962	127,171	27,012	6,250
1925	80,758	4,795	26,084	5,259	141,581	130,928	33,533	6,133
1926	82,863	6,831	30,490	11,194	150,906	139,452	38,986	5,430

Among the special developments of recent years in the trade and industrial education work of the board the following description of the board's activities in regard to apprenticeship and plant training may be cited (Report of Federal Board for Vocational Education, 1926, pp. 96–99):

Apprenticeship

"DURING the past three years material progress has been made in the establishment of various types of programs for apprenticeship training in many of the skilled trades. This development has taken place more or less generally throughout the entire country. This interest in training for apprenticeship has arisen within the past few years as a result of a number of different factors. Formerly both employers and employees recognized definite periods of apprenticeship in the skilled trades. A definite schedule of wages for apprentices was in effect. The labor unions had definite apprenticeship quotas and young men took pride in entering upon apprenticeship. Within comparatively recent years this situation has largely broken down. The apprenticeship quotas set by the local unions are in most cases no longer restrictive, since it is only in an exceptional locality where a full quota of apprentices is found at work. Many employers do not hire apprentices because they do not wish to be bothered with a learner whose labor is often regarded as not worth very much in proportion to his pay for a considerable period of time subsequent to his employment. Moreover, desirable young men are no longer entering upon apprenticeships preparatory to becoming tradesmen, but instead either take training for semiprofessional or professional positions or secure jobs as specialized operatives at much higher wages than an apprenticeship would pay them.

"Several years ago the situation began to become increasingly apparent and evident to interested employers and employees in many of the skilled trades and a revival of interest in apprenticeship followed.

"In recognition of this fact, joint committees have been established in different trades and in various localities to draw up plans

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of apprenticeship training. The State boards for vocational education and local officials in charge of vocational education in many cities of the country have accordingly represented the public on such joint committees and have assisted not only by advising them but materially in the way of setting up cooperative public programs of apprenticeship under agreements drawn up to insure adequate training to apprentices under such a plan. As apprentice education has developed within the past few years in many localities, organized as it is under the guidance of a joint committee representing the employer, the employee, and the public, providing for definite rotation of work experience through the various levels of the trade, and containing provision for definite, organized educational training in connection with the work experience, it has been demonstrated that young people of the present day and generation will enter apprenticeship to learn a skilled trade. Where the program has been set up providing such incentives as those just enumerated, insuring definite training and education, together with adequate increases in pay as the learner advances, not only has the existing quota established by the joint committee been filled with desirable young people, but in many cities a waiting list has been established. The actual accomplishments now recorded in a number of cities in various trades in reestablishing a system of apprenticeship under modern conditions has led to tentative attempts in several of the States during recent sessions of legislatures to secure the enactment of a State apprenticeship law similar to the one which is in successful operation in the State of Wisconsin. While no other State has as yet enacted such comprehensive legislation, the indications are that it will only be a very short time until several additional States have such legislation upon their statute books. Even without the aid of a State law on apprenticeship the State of Pennsylvania has organized a State apprenticeship committee to promote apprenticeship in the plumbing trade.

"No attempt has been made to enumerate all centers or States offering apprenticeship training in one or the other of the skilled trades. It may be said that as the development has been taking place throughout the country, successful plans for offering apprenticeship training provide for a joint committee in charge of the program representing employers, employees, and the public; a definite schedule of working experience in the different levels of the trade; a plan for rotating apprentices among various employers where seasonal or other conditions operate to interfere with effective training; proper wage increases at different stages of the apprenticeship period; and a definite course of part-time instruction organized particularly for the special trade and conducted by the public-school authorities. Experience has fully demonstrated within the past two or three years that such a plan is successful in attracting desirable young people who will enroll as apprentices in trades with the expectation of completing their apprenticeship and becoming full-fledged tradesmen."

Plant Training

"PROGRAMS for training for their own employees have been maintained by many plants and industrial organizations, particularly in types of work involving high skill. Of recent years

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there has been a noteworthy development of training programs in the case of industries employing special operatives on work classed as semiskilled labor. Impetus was given to the establishment of plant-training programs during the war period. With the easing off of high-speed production and pressure many plants abandoned training programs established at that time. During the past several years, however, many programs have been reestablished or created partly as a direct result of the leadership and supervisory service rendered to industrial plants by State boards of vocational education and city officials in charge of vocational education. In certain cases the classes have been established, supervised, and aided from public funds, although conducted directly in the plant. In other cases the plants have preferred to operate their own programs and to finance them themselves, only asking for advisory assistance from the State department for vocational education."

Agricultural Education Service

UNDER the direction of the Federal Board for Vocational Education, in cooperation with the State boards for vocational education, vocational agriculture is now being taught in the public schools of every State in the Union. From 609 in 1917–18 the number of vocational agricultural schools receiving Federal aid for salaries of teachers, increased to 4,371 (including 264 short-unit courses) in 1926, while at the close of the same fiscal year the number of pupils enrolled in such schools and short-unit courses was 108,852 as compared with 15,453 in 1918—a gain of over 600 per cent.

Table 7 gives certain details concerning the enrollment in vocational courses in Federally aided agricultural schools, 1918 to 1926:

TABLE 7.—NUMBER AND SEX OF PUPILS ENROLLED IN VOCATIONAL COURSES IN FEDERALLY AIDED AGRICULTURAL SCHOOLS, FOR FISCAL YEARS, 1918 TO 1926

Year	Pupils enrolled in—							
	Evening schools		Part-time schools		All-day schools		Short-unit courses	
	Males	Females	Males	Females	Males	Females	Males	Females
1918	----------	----------	----------	----------	14,167	1,286	----------	----------
1919	----------	----------	----------	----------	18,399	1,534	----------	----------
1920	----------	----------	----------	----------	29,351	1,950	----------	----------
1921	1,139	----------	1,384	61	38,037	2,726	----------	----------
1922	1,333	----------	5,632	310	50,313	2,648	----------	----------
1923	8,886	433	2,071	19	55,409	2,569	1,534	377
1924	13,248	1,979	2,143	----------	62,912	2,446	3,063	193
1925	14,524	1,311	2,277	53	68,488	2,470	3,721	281
1926	16,386	2,614	2,583	133	78,539	3,266	4,721	610

According to the report of the board for 1923, the courses given in these agricultural schools have been made more practical and are chosen with regard to their adaptability to local conditions, thus eliciting increased interest on the part of pupils and greater support on the part of the community than did the more formal courses previously followed.

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Home-Economics Education Service

DURING the last three years, 1924–1926, according to the report of the board for 1926, while the program of vocational education in home economics has had a substantial growth numerically, both in the number of vocational schools of all types and in enrollment in these schools and in teacher-training institutions, the more important developments are found in such improvements in the programs in organization, administration, and instruction as have made possible the rendering of a much enlarged social service. Outstanding among these improvements are—

1. The increased availability of vocational instruction in home economics for girls and women out of full-time school.
2. The use of itinerant teachers for adult classes in home making.
3. The basing of courses of instruction on known group needs.
4. The increasing of the range of content to meet varying needs of groups to be instructed.
5. The organizing of the content into short units, to secure flexibility.
6. The taking note of occupational needs of employed girls and women.
7. The developing of checking devices for educational control.
8. The improving of preemployment teacher training.
9. The improving of the program for training teachers in service.
10. The training of experienced home makers as teachers in vocational schools.
11. The providing of local supervisors to promote home making instruction for girls and women, especially for the groups out of full-time school.
12. The developing of more constructive programs of work on the part of State supervisors of home economics.

Table 8 shows that there has been an increase in the enrollment in vocational courses in Federally aided home-economics schools from 30,799 in 1918 to 177,146 in 1926—an expansion of 475 per cent.

TABLE 8.—NUMBER OF WOMEN AND GIRLS ENROLLED IN VOCATIONAL COURSES IN HOME-ECONOMICS SCHOOLS, FEDERALLY AIDED, FISCAL YEARS, 1918 TO 1926

Year	Home-economics pupils in—		
	Evening schools	Part-time schools	All-day schools
1918	22,360	----------	8,439
1919	22,691	4,278	12,445
1920	24,768	7,733	16,437
1921	31,956	8,878	22,561
1922	66,025	23,696	28,987
1923	78,699	29,706	30,936
1924	[1] 93,074	27,440	36,253
1925	92,922	21,228	40,341
1926	[2] 101,305	34,278	41,563

[1] Includes 44 male pupils.
[2] Includes 42 male pupils enrolled in home-economics classes, 14 in evening schools, and 28 in all-day schools.

Commercial Education Service

WHILE no funds are appropriated by the Federal vocational education act for commercial schools, definite provision is made under the law for aiding the States in the solution of the important problems relating to better training for the occupations commonly classed as "commercial."

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Prior to the three-year period, 1923–1926, the work of the Federal board in the field of commercial education had included three distinct kinds of activity:

1. Making studies, investigations, and reports for use in aiding the States in giving instruction in commerce and commercial pursuits;
2. Assisting State boards for vocational education in solving problems in administering commercial schools and in organizing courses of study and instruction in commercial subjects; and
3. Showing school administrators, teachers of commercial subjects, and business men the need for a vocational type of commercial education.

During the past three years, according to the report of the board for 1926, a distinctly new line of work has been added, which hereafter undoubtedly will be the fourth kind of activity carried on by the Federal board, although in a way it but supplements the three older kinds. This fourth activity is cooperating with national organizations of business men in developing an educational program for those engaged in the business represented by the organization. Thus, during the past two years the National Association of Retail Grocers has been given help in organizing and outlining an educational program for retail grocery store managers and their employees and the Laundryowners National Association has been assisted in making the first steps toward a similar end. Tentative arrangements have been made also for helping other national trade organizations during the coming year.

Vocational Rehabilitation

PRIOR to the enactment of the Federal civilian vocational rehabilitation act of 1920 several States had legislation "looking to some form of restoration to a vocational status of the physically handicapped." In general the service as well as the efforts of various industrial corporations and philanthropic agencies was mainly along placement lines. The recognition of the economic losses arising from the failure to rehabilitate the industrially disabled led to the passage of the above-mentioned Federal act.

The annual record of permanently disabling industrial and public accidents emphasizes the need of Federally aided rehabilitation work. Previous to the passage of the Federal vocational rehabilitation act, which became effective June 2, 1920, only six States were engaged in rehabilitation work.

The following brief description of the growth of this work under the supervision of the Federal Board for Vocational Education is abstracted from the board's report for 1926.

Number of States Engaged in Rehabilitation Work

TO DATE 39 States have accepted the national civilian vocational rehabilitation act. The nine States which have not established rehabilitation services are Connecticut, Delaware, Florida, Kansas, Maryland, South Carolina, Texas, Vermont, and Washington. Indications point to the probable passage of rehabilitation legislation in five or six of these States during the calendar year 1927.

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Extent of Program

TO ASCERTAIN the degree to which the problem of the disabled is being met in the States, one must know the volume of service being given, as well as the extent of the problem. Since the inauguration of the national civilian vocational rehabilitation program, 24,000 disabled persons have been refitted or retrained and established in self-supporting employment. At the present time 14,000 persons are in process of rehabilitation in the 39 States engaged in the work. During the last fiscal year (1926), 5,600 persons were rehabilitated.

The Problem

EACH year many thousands of persons are injured through employment or public accident, diseases, or congenital conditions, but not all of them become permanently disabled. Of those who are permanently incapacitated physically, not all are vocationally handicapped. Furthermore, many persons who become vocationally handicapped are able to rehabilitate themselves. When these factors limiting the problem of vocational rehabilitation are borne in mind, and when it is also realized that accurate statistics of public accidents and disabilities arising out of disease and congenital conditions are not available, the difficulty of arriving at a satisfactory estimate of the number of disabled persons in need of rehabilitation at any one time is readily understood. Many of the States have in various ways sought to secure adequate data as to the problem, and all know that it is not being met. Several of them have taken censuses of the disabled only to find that the disabled population exceeded their original estimates. Students of accident and disability statistics, and of the rehabilitation program, have estimated that each year there are added to the army of the physically disabled in need of vocational rehabilitation from 50,000 to 70,000 persons. These figures, compared with those of accomplishments given above, furnish some idea of the extent to which the rehabilitation problem is being met in the States.

Expenditure of Federal and State Moneys

UNDER the act each year $1,034,000 is authorized to be made available to the 48 States. To the 39 States now cooperating about $877,000 is allotted. In the fiscal year (1926), in round numbers, $592,000 of this amount was expended by these States, which expenditure represents 68 per cent of the allotted Federal funds. During the same year these States expended from their own moneys $707,000. This means that for every dollar of Federal money that was expended $1.19 of State money was expended. However, the proportion of State money expended is in reality much larger, for much money is expended each year by the States for certain phases of the rehabilitation work that are not subsidized from Federal funds. Fifteen States expended last year practically all of their Federal allotments.

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Progress with respect to reduction of cost per case is shown in the statement following. The average cost per case is secured by dividing the total number of cases rehabilitated in the year into the total expenditures from both Federal and State funds, for all purposes (including administration), for all cases (both rehabilitated and still active):

Fiscal year:	Average cost per case in country
1922	$393
1923	262
1924	219
1925	225
1926	233

Returns of National Civilian Vocational Rehabilitation Program

FINALLY, in estimating the economic returns of the civilian vocational rehabilitation program, it is striking to observe that the average weekly wage of all persons rehabilitated in the United States during the fiscal year 1924 was $26.07. An analysis of the ages of these persons at the time of rehabilitation shows them as having on the average a life expectancy of at least 20 years. Thus, their total earnings during a period of 20 years following their rehabilitation will be $147,004,000. This is an enormous return when compared with the total cost to the Federal and to the State Governments of rehabilitating these persons—that is, $1,124,500.

Study of Vocational Guidance as Related to Civilian Vocational Rehabilitation

IT IS generally conceded that the two most important phases of any rehabilitation program are advisement and supervision. If a disabled person can be properly advised prior to beginning a course of training, and is carefully supervised while in training, the chances are that he will prove a successful rehabilitant. The battle is half won if the advisement and the supervision function. Experience has shown that there is a lack of knowledge on the part of supervisors and field agents, particularly those just entering upon rehabilitation work, of the principles of practical guidance work. There is a need, therefore, of placing in their hands certain data on guidance.

A study is now in progress which will be published in the fiscal year of 1927. It will cover—

1. A general statement on the guidance movement, showing its scope and importance and steps in progress;
2. Guidance in civilian rehabilitation;
3. Mental and aptitude tests, and their possible use in rehabilitation;
4. Training information on 25 vocations, showing for each—
   - *a.* Specifications of job objectives.
   - *b.* Selection of trainees.
   - *c.* Program of instruction.
   - *d.* Training facilities.
   - *e.* Employment information.

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Early Investigations of Vocational Education

THE interest of the Federal Government in industrial education before the setting up of the Federal Vocational Education Board was manifested by several important investigations of the United States Bureau of Labor Statistics. Among the reports on such surveys are the following:

Twenty-fifth Annual Report of the United States Commissioner of Labor, 1910: Industrial Education (1911);

Bulletin of the United States Bureau of Labor Statistics No. 159: Short-unit courses for wage earners and a factory school experiment (1915);

Bulletin of the United States Bureau of Labor Statistics No. 162: Vocational Education Survey of Richmond, Va. (1915);

United States Bureau of Labor Statistics Bulletin No. 199: Vocational Education Survey of Minneapolis, Minn. (1916).

The first listed report covered not only public industrial schools but also philanthropic industrial schools, apprenticeship schools conducted either by employers alone or by employers in cooperation with industrial schools, and correspondence schools.

Industrial education activities of a similar character under private auspices are still being carried on in various parts of the country and there are also some industrial educational enterprises conducted by trade-unions.

Rehabilitation Work of the United States Veterans' Bureau [3]

THE provisions of law extending the life of rehabilitation benefits beyond June 30, 1926, did not become effective until July 2, 1926. Consequently, the bureau's activities throughout the year were motivated by the idea that the best possible adjustment of veterans into employment must be made by June 30, 1926. The bureau by reason of this time limitation had to choose in many cases between providing the benefits desired by the veteran, such as the first two or three years of an extended professional course, or curtailing the course to one which would fit the veteran for employment in a related occupation requiring less training. The policy insisted on during the year was that indicated by section 6 of the World War veterans' act: "It shall be its duty [the bureau's] to provide for the placement of rehabilitated persons in suitable or gainful occupations," and was formulated as follows:

> In the case of trainees inducted prior to June 7, 1924, whose individual training programs as outlined contemplate training beyond June 30, 1926, the individual training program shall be revised to give a rounded-out course of training which can be completed on or before June 30, 1926, and which will meet the requirements of employability in the occupation stated as the employment objective, or if this can not be obtained on or before June 30, 1926, in another occupation which will capitalize the training already provided which can be attained on or before June 30, 1926. If no occupation can

[3] United States. Veterans' Bureau. Annual report of the director, 1926. Washington, 1926, pp. 24, 48–52.

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be found which will properly capitalize the training already provided, the trainee shall be given the option of continuing his present course to June 30, 1926, at which time all duty and obligation of the United States will cease, and after which no further expenditures may be incurred, or of pursuing another course to be prescribed by the bureau. Record shall be made of the trainee's option and all pertinent circumstances.

In the case of trainees inducted on or subsequent to June 7, 1924, the employment objective and the individual training program shall be selected and outlined in such a way that the requirements of employability in the employment objective selected can be met on or before June 30, 1926.

In no case shall a waiver or statement of the trainee agreeing to bear the cost of training after June 30, 1926, as needed to complete a course be considered by the bureau or made the cause of deviating from the principles of the preceding paragraphs.

It may be pointed out that the reaction of a veteran desiring the first years of a physician's training, whose objective was reduced by the bureau in accordance with the above-quoted policy to "assistant bacteriologist" requiring only two years' training, was in general unfavorable; nevertheless it appeared essential, having regard to the veteran's chances of immediate gainful employment at the conclusion of training, to insist in the great majority of cases on the reduction of objective. Many such readjustments which had not resulted satisfactorily were corrected after the end of the fiscal year under the terms of the amendatory act of July 2, 1926.

The watchword of the year was "adjustment into employment," and work was directed along this line by the following instructions issued to field stations in September, 1925:

Less than 10 months remain for the completion of rehabilitation work.

Within this short period 19,000 beneficiaries must be trained to employability and placed in suitable employment. The limited remaining time calls for added efforts from all in order that we may really complete our work successfully rather than to close by the operation of law. We shall serve our beneficiaries well if each trainee is given full opportunity to attain employability in an actual pay-roll job and is promptly employed immediately upon rehabilitation. General training toward vague or unattainable objectives will not equip trainees to meet the immediate problem of earning a living; such objectives must be studied and the efforts of the trainee directed toward an actual job.

To be a satisfactory facility for placement training an establishment must be willing to cooperate fully in arranging and following a program of instruction based upon actual requirements of a definite job for which men are employed by the firm. In addition, only those firms should be utilized, especially in the last stages of training, which can furnish employment upon rehabilitation.

Every effort must be made to offer employment to every trainee immediately upon rehabilitation. Trainees for whom placement training is authorized under existing policies can, if proper efforts are made, be placed in actual employment for the last month or two of the training period, training being continued pursuant to a program which will insure employability in the actual job which the trainee will fill upon rehabilitation. Training beyond the point of employability is, of course, not authorized by law and can not be permitted. This plan for absorbing placement trainees into actual employment will enable the bureau to secure numerous employment opportunities for trainees, as they occur slightly in advance of rehabilitation. Each rehabilitation assistant is also the employment officer for his cases; he must be constantly searching for satisfactory employment opportunities where his trainees can complete training and secure employment.

It is recognized that there are still in training many cases of the problem type in which training has continued for long periods. A definite employment opportunity compatible with the trainee's ability which gives him an opportunity to demonstrate to himself that he is able to earn his own living is the happiest solution of these cases.

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Continuous effort, careful study, and close supervision of the training and employment problems in each by all bureau officers will bring a successful termination of rehabilitation work. Will every individual in your organization put forth the extra effort which means success?

Adjustments as indicated were effected in all cases affording an opportunity to initiate the process of absorption into employment through the medium of arrangements satisfactory to the trainee, the employer, and the bureau. While desirable adjustments reasonably insuring rehabilitation as intended were in many cases attainable through the application of procedure provided by regulations, viz, changes in training program, objective or facility, in general more positive results were gained from a process of adjustment embracing a definite agreement for employment in a specific job in the selected objective entered into by, and acceptable to, both trainee and trainor. Negotiations for agreements of this nature fully recognized the necessity of establishing beyond all reasonable doubt the suitability of the pay-roll job proposed, and the ability of the trainor fully to discharge his part of the agreement. It was imperative, however, that the trainee fully understand and be satisfied with the action taken, and that the trainor be wholly convinced of the practicability of the arrangement from the business viewpoint, and satisfied with the trainee's ability.

Whenever possible, employment was arranged in the objective for which training was being provided, but in problem cases where inaptitude, physical condition, questionable advisement, or failure to profit from training provided had retarded progress in that objective to such a degree as apparently to defeat rehabilitation at the anticipated date, adjustments into employment in a reduced objective, in a former occupation, or in some other objective attainable without any prolongation of the training period were regarded as justified. Painstaking care was exercised to insure detailed and accurate record of any change in objective or deviation from the previously recorded training arrangements and compliance with all other recognized requirements of procedure. Where the accepted adjustment involved such modification of the rehabilitation date as to preclude 60-day notice before termination of training, waiver of this notice was encouraged in the trainee's acceptance of the adjustment proposed and made of record. Except in rare instances where justified by physical condition of the trainee, retardation in training for reasons beyond his control, or failure to profit or cooperate, prolongation of the training period was unnecessary.

While the curtailment of courses seemed arbitrary at times to those affected, it is felt that the program resulted in actual rehabilitation in a majority of instances. So far as present information goes, there will be no substantial number of justifiable appeals to the director for correction of error, and no substantial increase in the training load from the latest (August 31) figure of 1,386, a figure already 31.76 per cent lower than the total training status as of June 30, 1926.

At the beginning of this year there were in training status 21,417 veterans on the maintenance and support pay roll (sec. 400) and 1,520 under section 402 without such allowance, the accumulative percentages of termination having reached 86.5 per cent and 93.1 per

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cent in the two groups, respectively. During the year these totals were reduced to 1,825 and 202, respectively, making reductions of load during the year of 91.5 per cent and 86.7 per cent in the two groups, with final accumulative percentages of termination of 98.8 per cent and 99.1 per cent.

The percentage of terminations in comparison with previous years showed a rapid but not unanticipated increase. The bureau, while recognizing certain unsatisfactory aspects of its training program, takes particular pride in the regularly increasing yearly percentage of terminations and especially of rehabilitations. Each year has shown steady and increasing progress toward the goal.

Tables 1 and 2 give a synopsis of rehabilitation activities, 1922 to 1926, under sections 400 and 402 of the World War veterans' act:

TABLE 1.—SUMMARY OF WORK ON ENTERED TRAINING LOAD, SECTION 400, FISCAL YEARS, 1922 TO 1926

Training load	1922	1923	1924	1925	1926
Total training status beginning of period	89,030	112,238	95,883	46,313	21,417
Total entered training during period	37,325	14,360	5,129	5,689	358
Training load for period	126,355	126,598	101,012	52,002	21,775
Rehabilitated during period	10,862	22,722	32,893	26,279	19,297
Permanently discontinued during period	2,827	7,392	21,315	4,102	743
Deceased after induction during period	428	601	491	204	[1] −90
Total terminated during period	14,117	30,715	54,699	30,585	19,950
Remaining training status at end of period	112,238	95,883	46,313	21,417	1,825
Per cent of training load rehabilitated	8.6	17.9	32.5	50.5	88.6
Per cent of training load permanently discontinued	2.2	5.8	21.1	7.9	3.4
Per cent of training load deceased	.3	.5	.5	.4	[1] −.4
Per cent of training load terminated	11.1	24.2	54.1	58.8	91.6
Per cent of training terminations which were permanently discontinued	20.1	24.0	39.0	13.5	3.7

[1] Decrease due to the transfer of the case files of deceased trainees to central office.

TABLE 2.—SUMMARY OF WORK ON ENTERED TRAINING LOAD, SECTION 402, FISCAL YEARS, 1922 TO 1926

Training load	1922	1923	1924	1925	1926
Total training status beginning of period	10,357	16,128	11,974	3,854	1,520
Total entered training during period	7,814	1,144	688	426	4
Training load for period	18,171	17,272	12,662	4,280	1,524
Completed during period	1,054	2,077	3,973	1,698	1,130
Permanently discontinued during period	966	3,189	4,810	1,043	194
Deceased after induction during period	23	32	25	19	[1] −2
Total terminated during period	2,043	5,298	8,808	2,760	1,322
Remaining training status at end of period	16,128	11,974	3,854	1,520	202
Per cent of training load completed	5.8	12.0	31.4	39.4	76.9
Per cent of training load permanently discontinued	5.3	12.7	38.0	24.2	12.8
Per cent of training load deceased	.1	.2	.2	.4	
Per cent of training load terminated	11.2	24.9	69.6	64.0	89.7
Per cent of training terminations which were permanently discontinued	47.2	50.8	54.6	37.9	14.3

[1] Decrease due to the transfer of the case files of deceased trainees to central office.

Twenty-six bureau beneficiaries completed vocational training in the insular possessions and foreign countries during the fiscal year,

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while the number in active training status on June 30, 1926, was as follows: Insular possessions, 6; and foreign countries, 7.

On the financial side, the reduction of expenditure to $24,709,001 for vocational rehabilitation to the close of the fiscal year, as compared with $57,856,974 to the corresponding date in 1925 and $101,621,187 in 1924, is a source of satisfaction, though not recognized as a "saving," since it results rather from the normal progress of a diminishing task than from economies in management.

Of the total expenditure, 92.4 per cent went directly to trainees as their allowance for maintenance and support, 1.2 per cent for supplies, 4.2 per cent for tuition, 0.3 per cent for travel, and the remaining 1.9 per cent for miscellaneous expenses. The expenses for administration are not included in the total here under consideration. The average rate of maintenance and support allowance was $126.50 per month, a slight increase over the experience of earlier years, due, it is believed, wholly to increase in number of dependents, while the average monthly rate of other training expenses has been reduced to $12.15 per month, the reduction being due chiefly to the lack of necessity for initial purchases of supplies and equipment on account of the absence of new inductions.

Immediately subsequent to the conclusion of the fiscal year on July 2, 1926, amendatory legislation was enacted permitting the continuance of courses when the veteran had not attained employability, but not later than December 31, 1926, in placement and project cases and not later than July 2, 1928, in institutional cases. This provision made it possible for the bureau to extend needed benefits especially to late entrants, namely, those inducted in June, 1925, or immediately prior thereto. It is a matter of considerable satisfaction that the aggregate load from which such continuations are to be drawn was only 2,027 cases, which has been further reduced by a review of employability features, covering a portion of the load only, to 1,386 (August 31, 1926). It is anticipated that the eventual number of continuations, including those resulting from correction of error or appeal, will not exceed 1,300, of which approximately 900 will be institutional cases.

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WOMEN IN INDUSTRY

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Extent and Distribution of Women in Industrial Employment

FOR a long time the employment of a woman in factory, mill, or store was looked upon as a temporary phase; her serious business in life was in the home, and her work outside was either an unfortunate accident or a means of passing the time until she had the home in which to carry on her normal activities. Because of this belief, comparatively little interest was manifested in the conditions under which she worked, the wages she got, or the work she did. Industry was looked upon as predominantly a masculine affair, into which from time to time individual women might enter, stay a short time, and pass on, but their presence there was too temporary a matter to demand any serious consideration.

The beginning of a change in this attitude was seen during the seventies of the last century, when several State labor bureaus made studies of varying extent into the earnings and occupations of working women. As his annual report for 1888, the United States Commissioner of Labor published a study of working women in large cities, dealing with some 17,427 women in 343 distinct industries. This was the most important investigation of the subject which had been made up to that time. In 1894 Congress passed a resolution authorizing the commissioner "to investigate and make report upon the conditions attending the employment of women and children; their wages, earnings, sanitary surroundings, and cost of living; the effect of various employments upon their health and longevity; what measures are taken to protect their physical condition and to protect them from accidents; the rate of wages paid them in comparison with the rates paid men; and the effect, if any, their employment has had upon the employment and wages of men."

This was the most ambitious study which had then been undertaken, but it was in turn outdistanced by an investigation carried on in pursuance of a resolution of Congress, passed in 1907, which authorized the Secretary of Labor and Commerce "to report upon the industrial, social, moral, educational, and physical condition of woman and child workers in the United States." This investigation put the question upon a new basis. It definitely established the fact that the presence of women in industry was not a mere accidental or individual matter, but that they formed an important factor in the industrial development of the country; that they were there from economic pressure and not as a matter of whim or fancy; that there was every indication that they would continue to be employed, probably in increasing numbers; and that the welfare of the whole country, as well as of the individual woman and the individual business, would be advanced by recognizing these facts and adjusting industry accordingly.

This report was followed by a series of studies of women in industry published by the United States Bureau of Labor Statistics,

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but these did not satisfy the demand of the women of the country for special attention to the problems of women industrially employed, and in 1918 the Women in Industry Service was organized in the Department of Labor. In 1920 Congress established this as a separate and permanent agency, called the Women's Bureau, "to formulate standards and policies which shall promote the welfare of wage-earning women, improve their working conditions, and advance their opportunities for profitable employment."

Since that date the Federal Women's Bureau has been the chief source of information on general questions of women in industry. A number of the States have similar bureaus or divisions, and have published valuable studies of local conditions, but they deal only with their own States, while the Federal bureau is free to cover a wider field. The data used in the present article, except where credited to other sources, are taken either from census data brought together by the Women's Bureau or from the original studies of that bureau.

Number and Distribution of Women Gainfully Employed

THE following table shows the number and per cent of women and girls gainfully employed at each of the census dates since 1870, giving for comparative purposes the same data concerning men:

TABLE 1.—PROPORTION OF WOMEN AND OF MEN GAINFULLY OCCUPIED, 1880-1920[1]

Sex and census year	Population 10 years of age and over	Persons 10 years of age and over engaged in gainful occupations		Sex and census year	Population 10 years of age and over	Persons 10 years of age and over engaged in gainful occupations	
		Number	Per cent			Number	Per cent
Women:				Men:			
1880	18,025,627	2,647,157	14.7	1880	18,735,980	14,744,942	78.7
1890 [2]	23,060,900	4,005,532	17.4	1890 [2]	24,352,659	19,312,651	79.3
1900	28,246,384	5,319,397	18.8	1900	29,703,440	23,753,836	80.0
1910	34,552,712	8,075,772	23.4	1910	37,027,558	30,091,564	81.3
1920	40,449,346	8,549,511	21.1	1920	42,289,969	33,064,737	78.2

[1] U. S. Bureau of the Census. Fourteenth Census. Population: 1920. V. 4, Occupations, p. 33.
[2] Figures for 1890 are exclusive of persons in Indian Territory and on Indian reservations, areas specially enumerated at that census, but for which occupation statistics are not available.

The apparent decrease in the percentage of women employed in 1920 is explained as probably due to the change in the date for which the data were collected:

> In comparing the figures for 1910 and 1920, it is necessary to bear in mind that the census date changed from April 15 in 1910, to January 1 in 1920. This change in date, the Bureau of the Census points out, probably accounts for the decrease shown in the number of women engaged in agricultural pursuits, since in most localities agricultural work is at or near its lowest ebb in January. * * * To the extent the decreases were actual they are believed to have resulted mainly from the change in the census date and changes in the enumerators' instructions.[1]

[1] U. S. Women's Bureau Bul. No. 46: Facts about working women—a graphic presentation based on census statistics. Washington, 1925, p. 2.

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Occupational distribution.—The following table shows the distribution of gainfully employed women by main occupational divisions in 1910 and 1920:

TABLE 2.—DISTRIBUTION OF WOMEN BY MAIN OCCUPATIONAL DIVISIONS, 1910 AND 1920 [1]

Occupational division	Females 10 years of age and over			
	1910		1920	
	Number	Per cent	Number	Per cent
Agriculture, forestry, and animal husbandry	1,807,501	22.4	1,084,128	12.7
Extraction of minerals	1,094	(2)	2,864	(2)
Manufacturing and mechanical industries	1,820,570	22.5	1,930,341	22.6
Transportation	106,625	1.3	213,054	2.5
Trade	468,088	5.8	667,792	7.8
Public service (not elsewhere classified)	13,558	.2	21,794	.3
Professional service	733,891	9.1	1,016,498	11.9
Domestic and personal service	2,531,221	31.3	2,186,924	25.6
Clerical occupations	593,224	7.3	1,426,116	16.7
Total, all occupations	8,075,772	100.0	8,549,511	100.0

[1] U. S. Bureau of the Census. Fourteenth Census. Population: 1920. V. 4, Occupations, p. 34.
[2] Less than one-tenth of 1 per cent.

Here it will be observed that agriculture in its various branches and domestic and personal service show a decrease, both absolute and relative, in the numbers employed. As far as agriculture is concerned, it is probable that the decrease is merely apparent, accounted for by the change in the census date. For domestic service, no such extraneous cause can be discovered, and the decrease is probably real. All other occupations show an increase during the decade, and this is especially marked in the group of clerical occupations.

The extent to which women are gainfully employed differs widely in different parts of the country, the industrial States having many woman wage-earners while in the agricultural and mining States the proportion is much lower. Table 3 shows the number of females aged 10 years and over and the proportion gainfully employed, for each of the States in which one-fifth or more are so employed:

TABLE 3.—NUMBER AND PROPORTION OF WOMEN GAINFULLY EMPLOYED, 1920

State	Females 10 years of age and over			State	Females 10 years of age and over		
	Total number	Engaged in gainful occupations			Total number	Engaged in gainful occupations	
		Number	Per cent			Number	Per cent
South Carolina	615,092	205,656	33.4	Maryland	576,020	137,221	23.8
Rhode Island	246,672	80,562	32.7	Florida	365,637	85,262	23.3
Massachusetts	1,591,865	503,155	31.6	Louisiana	681,108	152,726	22.4
Mississippi	670,099	194,964	29.1	North Carolina	926,790	202,697	21.9
New Hampshire	180,644	49,302	27.3	California	1,339,057	286,647	21.4
Connecticut	540,073	146,252	27.1	Illinois	2,537,438	540,938	21.3
New York	4,215,968	1,135,295	26.9	Maine	306,658	64,845	21.1
Georgia	1,080,976	288,745	26.7	Delaware	87,128	18,102	20.8
Alabama	869,077	223,868	25.8	Pennsylvania	3,321,983	686,232	20.7
New Jersey	1,237,914	295,990	23.9				

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Nativity and Race

THE distribution by nativity and race of the women gainfully employed in 1920 is shown by Table 4:

TABLE 4.—PROPORTION OF WOMEN IN SPECIFIED NATIVITY AND RACE GROUPS GAINFULLY OCCUPIED, 1910 AND 1920[1]

Nativity and race group	Females 10 years of age and over					
	1910			1920		
	Total number	Engaged in gainful occupations		Total number	Engaged in gainful occupations	
		Number	Per cent		Number	Per cent
Native white—native parentage	18,147,527	3,098,639	17.1	21,716,069	3,733,329	17.2
Native white—foreign or mixed parentage	6,998,381	1,722,279	24.6	8,494,749	2,110,454	24.8
Foreign-born, white	5,623,333	1,222,791	21.7	6,078,195	1,118,463	18.4
Negro	3,680,536	2,013,981	54.7	4,043,763	1,571,289	38.9
Indian, Chinese, Japanese, and all other:						
Indian	92,176	14,710	16.0	85,379	9,848	11.5
Chinese	3,445	[2] 3,351	32.5	5,189	732	14.1
Japanese	6,852			25,432	5,289	20.8
All other	62	21	[3]	570	107	18.8
Total	102,535	18,082	17.6	116,570	15,976	13.7
Total, all groups	34,552,712	8,075,772	23.4	40,449,346	8,549,511	21.1

[1] U. S. Bureau of the Census. Fourteenth Census. Population: 1920. V. 4, Occupations, p. 340.
[2] Separate occupation figures for Chinese and Japanese for 1910 are not available.
[3] Per cent not shown, base being less than 100.

It will be noticed that gainful employment is more common among the colored than in any of the other large racial groups; next in this respect come the native whites of foreign or mixed parentage, followed by the foreign-born whites, and the native whites of native parentage. In absolute number, the last-named group is by far the largest, forming over two-fifths of the whole body of women gainfully employed, while the negro women form only a trifle over one-eighth.

Women Industrially Employed

Although there are over 8,000,000 women gainfully employed, public interest, as manifested in studies, investigations, and legislation, is mainly concerned with those who are frequently but not very accurately referred to as being industrially employed. This term is often used to cover those who are in manufacturing and mechanical industries, in such branches of domestic and personal service as laundries, hotels, and restaurants, in mercantile establishments, in transportation as represented by the telephone and telegraph, and to some extent in clerical occupations. The following definitions, taken from Bulletin No. 27 of the Women's Bureau, show some of the classes of workers most commonly made the subject of investigations and reports:

Manufacturing and mechanical industries.—Under manufacturing and mechanical industries are grouped not only all factory laborers

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and semiskilled operatives but all persons engaged in the skilled building and hand trades, together with their apprentices, and all persons working in manufacturing industries in proprietary, official, and supervisory capacities. Clerks in factories are grouped with clerical occupations.

Transportation.—This term includes water transportation; road and street transportation (including the building, repair, and cleaning of streets); railroad transportation; and transportation by express, post, telegraph, and telephone. The 106,625 women engaged in this general division of occupations in 1910 had practically doubled in 1920.

Trade.—Under "trade" are listed wholesale and retail dealers and most of their employees; bankers, brokers, and money lenders; real estate and insurance agents; undertakers; and workers in coal and lumber yards, grain elevators, stockyards, and warehouses.

The number of women engaged in trade increased 42.7 per cent from 1910 to 1920, and in many occupations, mainly those of a proprietary nature, enormous increases are shown. Of the total net increase of 199,704 women in trade, 164,637, or 82.4 per cent, were engaged in two occupations which women have long pursued—clerks in stores and saleswomen in stores. There is no occupation listed under "trade" in which women are not engaged.

Age Distribution

TABLE 5 shows the age distribution, in 1920, of all women gainfully employed:

TABLE 5.—AGE OF WOMEN IN EACH MAIN OCCUPATIONAL DIVISION, 1920 [1]

Number

Age group	Agriculture, forestry, and animal husbandry	Extraction of minerals	Manufacturing and mechanical industries	Transportation	Trade	Public service (not elsewhere classified)	Professional service	Domestic and personal service	Clerical occupations
10 to 16 years	188,071	146	81,002	3,295	14,134	45	1,486	37,924	20,507
16 to 19 years	152,924	603	435,638	67,362	122,786	641	80,899	206,877	343,697
20 to 24 years	130,790	510	382,765	70,702	138,915	2,929	298,827	302,226	481,411
25 to 44 years	337,087	1,125	730,250	63,266	291,658	12,096	490,894	972,489	518,508
45 to 64 years	219,802	405	271,047	7,660	91,725	5,554	130,500	568,448	57,338
65 years and over	54,356	66	26,986	547	7,408	471	10,976	93,135	2,955
Age unknown	1,098	9	2,653	222	1,166	58	2,916	5,825	1,700
10 years and over	1,084,128	2,864	1,930,341	213,054	667,792	21,794	1,016,498	2,186,924	1,426,116

Per cent

10 to 16 years	17.3	5.1	4.2	1.5	2.1	0.2	0.1	1.7	1.4
16 to 19 years	14.1	21.0	22.6	31.6	18.4	2.9	8.0	9.4	24.1
20 to 24 years	12.1	17.8	19.8	33.2	20.8	13.4	29.4	13.8	33.8
25 to 44 years	31.1	39.3	37.8	29.7	43.7	55.5	48.3	44.5	36.4
45 to 64 years	20.3	14.1	14.0	3.6	13.7	25.5	12.8	26.0	4.0
65 years and over	5.0	2.3	1.4	.3	1.1	2.2	1.1	4.3	.2
Age unknown	.1	.3	.1	.1	.2	.3	.3	.3	.1
10 years and over	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1] U. S. Bureau of the Census. Fourteenth Census. Population: 1920. V. 4, Occupations, p. 376, Table 3.

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A comparison of these figures shows that the lowest age level is found in the group engaged in transportation, where 66.3 per cent were under 25 and only 3.9 per cent over 44. In all probability this is due to the fact that telephone operating is almost entirely in the hands of distinctly young women and girls. Next comes clerical occupations, with 59.3 per cent under 25 and 4.2 per cent over 44, followed by manufacturing and mechanical industries with 46.6 per cent under 25 and 15.4 per cent over 44, while trade shows 41.3 per cent under 25 and 14.8 per cent over 44. It will be seen that the groups in which public interest is most developed are in the main composed of young women, but that along with these are very considerable numbers of middle-aged or even elderly women. "Women in industry" is by no means an affair of girls in their teens.

Hours and Earnings of Working Women

THE features most frequently considered in the investigations of working women are their occupations, their homes, their earnings, the conditions under which they work, their age and marital status, and their need of protective legislation. No general studies have been made covering all industries in all parts of the country, but a number of partial investigations have dealt with these features in particular localities or industries.

Hours of Work for Women

THE hours of work may be determined by legal regulation, by trade-union agreements, or by the custom of the particular community or industry. In general men's hours are decided by agreements or by custom, but for women many States of the Union have some legislation regarding the hours they may be employed. Where men and women work in the same industry they usually have the same hours, as appears in the studies of hours given elsewhere in this handbook. Sometimes the women simply come under the hours agreed upon by the trade-unions and the employers; sometimes, the laws restricting women's hours indirectly determine the men's hours too, because the work of the sexes is so interdependent that when one stops the other must stop also. The hours of women, however, have always received special attention, and a number of studies have been made with a view to discovering how far legal regulation is necessary or desirable. One of the most comprehensive of these studies was published in 1925 by the Women's Bureau as Bulletin No. 43, covering the hours worked in September, 1922, by 162,662 women in 13 States, employed in various forms of manufacturing and mechanical industries, in mercantile establishments, in 5-and-10-cent stores, and in laundries. Taking the group as a whole, the number and proportion of women working various daily scheduled hours were as follows:

	Number	Per cent
Under 8 hours	6,270	3.8
8 hours	26,068	16.0
Over 8 and under 9 hours	36,990	22.7

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	Number	Per cent
9 hours	55,571	34.1
Over 9 and under 10 hours	12,062	7.4
10 hours	22,906	14.1
Over 10 and under 11 hours	907	.5
11 hours	1,779	1.1
Over 11 hours	109	.1
Total	162,662	100.0

A point of interest here is that not one of the States included had an 8-hour law for women, yet practically one-fifth of those studied were working a day of eight hours or less. Only two States, Arkansas and Ohio, enforced so short a day as nine hours in any industry, and only 19.8 per cent of the women were in these two States, but 76.6 per cent of the women studied had a day of nine hours or less. On the other hand, nearly one-sixth had a day of 10 hours or over. The proportion in the extreme groups varied widely in different States, as shown in Table 1:

TABLE 1.—DISTRIBUTION OF WORKING WOMEN ACCORDING TO LENGTH OF WORKING-DAY, BY STATES

State	Number of women studied	Per cent having scheduled day of—		State	Number of women studied	Per cent having scheduled day of—	
		10 hours	8 hours or less			10 hours	8 hours or less
South Carolina	8,453	84.3	5.1	Iowa	7,878	6.7	36.8
Virginia	11,001	45.4	2.4	Maryland	11,148	3.5	33.5
Alabama	4,220	40.4	7.7	Ohio	30,464	----	29.9
Georgia	7,433	34.1	3.3	Missouri	18,834	----	27.2
Kentucky	8,399	29.9	15.8	New Jersey	34,629	5.4	19.0
Indiana	8,785	14.1	6.3				

These figures suggest that there is no close relation between the hours permitted by law and those actually worked. Neither Alabama nor Iowa had any restrictions upon the hours women may work, yet in Alabama the proportion working a 10-hour day was less than half that of South Carolina, which had a nominal 10-hour day, while in Iowa only one-sixteenth worked as long as 10 hours, and none had a longer day. New Jersey and Maryland both permitted a 10-hour day, yet in both the proportion working such a day was small, while in the former State, 19 per cent, and in the latter 33.5 per cent had a day of 8 hours or less.

It is pointed out that the prevalence of a working-day of a given length within a State may be determined by the presence of one large industry with a uniform policy as to hours. Thus, in South Carolina, Georgia, and Alabama, a large number of the women studied were in textile mills, in which the 10-hour day predominated. There was considerable difference among the industries in this respect. Table 2 shows the distribution by length of working-day of the women in the three industries which employed the largest number of women:

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TABLE 2.—SCHEDULED DAILY HOURS IN THREE LEADING INDUSTRIES

Industry	Number of women reported	Percentage of women whose scheduled daily hours were—								
		Under 8	8	Over 8 and under 9	9	Over 9 and under 10	10	Over 10 and under 11	11	Over 11 and under 12
Clothing	15,497	0.4	28.1	35.4	29.9	4.1	2.1	------	------	------
Textiles	33,984	------	5.9	18.9	17.8	7.3	42.4	2.3	5.2	0.2
General mercantile	17,865	29.7	54.2	9.2	6.8	.1	------	------	------	------

It will be noticed that just half of the women working in the textile industry had a day of 10 hours or more, while of those in mercantile employment 83.9 per cent had a day of 8 hours or less. In the clothing industry, 97.5 per cent were found in the groups having 8 and under 10 hours.

A shortened Saturday was common in most of the industries, so that the weekly hours can not be gauged by the length of the working-day. In this respect there was wide variation, the regular working week varying from under 44 to over 60 hours.

A 50-hour week was the standard for the largest group of women when the workers of all the States surveyed were considered together. In this respect one-third of all women had a scheduled week of 48 hours or less; Rhode Island, New Jersey, and Maryland took the lead with approximately 68 per cent, 55 per cent, and 52 per cent of the women reported in each, respectively, showing such a schedule. An overwhelming majority of the South Carolina workers, on the other hand, regularly put in more than 54 hours a week, while in both Georgia and Alabama practically two-thirds of the women reported had a scheduled week of more than 54 hours.

The Women's Bureau calls attention to the fact that the legal regulation of women's hours has nowhere secured for them terms as favorable as those enforced by many trade-unions, in the benefits of which women share. The most advanced legal standards yet established set for women an 8-hour day and a 48-hour week, while in the more effectively organized trades a 44-hour week is common, and a 40-hour week is by no means unknown.

The foregoing statements show that the standards established by trade-union agreements for all classes of workers have gone ahead of those set by law for woman workers. The greater proportion of union labor thinks in terms of an 8-hour day, with a 5½ or 6 day week.

Wages and Earnings of Women

THE studies of hours and wages given elsewhere in this Handbook include women as well as men, and information as to their wages in specified trades can be found in those studies. Here, it is sufficient to point out that in general women are found in the less well paid occupations, and that when they are in the same occupation as men they are often paid at a lower rate. This is not true, of course, of occupations in which the piece-rate system of payment prevails. Table 3, from the December, 1926, number of the

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bulletin issued monthly by the Industrial Commissioner of New York, shows the difference in the level of men's and women's earnings in factory occupations in that State:

TABLE 3.—MEN'S AND WOMEN'S AVERAGE WEEKLY EARNINGS[1] IN REPRESENTATIVE NEW YORK STATE FACTORIES, NOVEMBER, 1926—SHOP WORKERS ONLY

Industry	Total State		New York City		Remainder of State	
	Men	Women	Men	Women	Men	Women
Stone, clay and glass products	$34.70	$16.59	$44.02	$16.24	$29.49	$16.70
Miscellaneous stone and mineral products	45.05	(2)	56.83		33.14	(2)
Lime, cement, and plaster	32.14	19.06	34.47	18.15	31.61	20.31
Brick, tile, and pottery	26.91		33.32		25.69	
Glass	34.66	14.98	38.73	14.33	31.41	15.65
Metals, machinery, and conveyances	32.08	17.54	33.46	17.77	31.92	17.42
Gold, silver, and precious stones	36.80	20.13	43.00	22.14	33.85	19.68
Brass, copper, aluminum, etc	29.73	18.56	32.58	18.67	28.56	17.46
Pig iron and rolling-mill products	34.39	18.95			34.39	18.95
Structural and architectural ironwork	34.47	(2)	36.31		33.54	(2)
Sheet-metal work and hardware	30.22	16.18	30.44	16.76	30.11	14.63
Firearms, tools, and cutlery	28.74	15.54	(2)	(2)	28.37	15.49
Cooking, heating, and ventilating apparatus	32.38	12.60	35.31		32.25	12.60
Machinery (including electrical apparatus)	31.33	18.12	32.28	18.56	31.06	17.98
Automobiles, carriages, and aeroplanes	32.72	15.78	36.85	(2)	32.22	15.56
Cars, locomotives, and railroad repair work	34.05	22.84	34.19	(2)	34.04	22.32
Boat and ship building	34.63		34.51		35.74	
Instruments and appliances	31.71	16.81	30.16	17.95	32.29	16.59
Wood manufactures	31.42	16.14	35.76	17.02	28.84	16.44
Sawmill and planing-mill products	31.22	14.68	32.71	14.37	29.52	14.90
Furniture and cabinetwork	30.65	18.43	37.58	20.22	28.17	17.73
Pianos, organs, and other musical instruments	34.46	17.40	36.05	18.81	31.01	16.52
Miscellaneous wood and allied products	28.62	17.07	30.12	17.19	25.11	15.18
Furs, leather and rubber goods	33.12	18.22	42.69	22.63	25.91	14.91
Leather	24.70	14.33			24.70	14.33
Furs and fur goods	53.04	32.04	53.04	32.04		
Boots and shoes	28.89	16.65	33.35	20.64	24.82	14.73
Miscellaneous leather and canvas goods	41.31	18.42	49.00	21.85	27.66	14.01
Rubber and gutta-percha goods	34.13	19.96	32.85	20.13	36.00	19.23
Pearl, horn, bone, celluloid, hair, etc	29.55	18.73	34.99	21.02	25.91	16.05
Chemicals, oils, paints, etc	32.22	17.85	30.55	16.64	32.59	17.55
Drugs and chemicals	32.08	16.21	27.65	16.02	33.31	16.72
Paints, dyes, and colors	28.67	14.28	29.14	14.39	26.74	(2)
Animal and mineral-oil products	31.58	17.11	32.31	17.52	30.09	15.02
Miscellaneous chemical products	34.71	20.41	33.54	19.29	34.74	20.48
Paper	29.08	15.18	(2)	(2)	29.15	15.98
Printing and paper goods	41.16	19.23	44.09	20.85	35.69	16.71
Paper boxes and tubes	32.33	18.49	32.72	19.44	31.49	15.90
Miscellaneous paper goods	33.26	17.10	35.18	17.35	27.29	16.16
Printing and bookmaking	43.54	21.65	45.48	23.54	37.45	17.73
Textiles	27.32	16.69	31.76	19.50	26.56	16.63
Silk and silk goods	32.90	17.76	33.65	18.35	31.38	16.85
Wool manufactures	29.44	19.61	(2)	(2)	29.53	19.57
Cotton goods	22.36	14.58			22.36	14.58
Cotton and woolen hosiery and knit goods	28.54	16.71	(2)	(2)	26.41	16.40
Other textiles and allied products	28.47	17.33	30.94	18.47	25.66	15.11
Clothing, millinery, laundering, etc	35.94	20.34	39.66	23.28	24.93	14.56
Men's clothing	34.83	18.57	36.09	21.62	26.88	14.42
Men's shirts and furnishings	31.17	16.22	38.68	21.72	23.79	14.37
Women's clothing	47.18	25.83	47.83	27.67	31.63	13.10
Women's underwear and furnishings	34.59	20.14	34.85	20.81	29.29	12.36
Women's headwear	44.81	26.07	44.81	26.07		
Miscellaneous sewing	28.13	17.41	27.36	17.81	30.19	16.32
Laundering, cleaning, dyeing, etc	30.01	15.44	30.61	15.72	26.39	14.22
Food, beverages, and tobacco	31.61	16.59	33.03	18.92	29.38	14.17
Flour, feed, and other cereal products	29.32	12.14	26.58	(2)	30.09	12.12
Fruit and vegetable canning and preserving	27.86	13.80	31.19	15.60	27.36	13.12
Groceries, not elsewhere classified	32.64	16.31	31.55	16.28	33.64	16.33
Meat and dairy products	31.09	15.19	32.18	16.69	29.92	15.00
Bread and other bakery products	31.62	19.19	31.91	19.71	30.07	14.27
Confectionery and ice cream	28.03	16.22	29.08	16.74	25.01	13.44
Beverages	36.29	10.58	39.78		30.56	10.58
Cigars and other tobacco products	26.55	20.14	26.89	20.98	22.07	14.53
Water, light, and power	35.35	(2)	34.99	(2)	35.98	(2)
Total	33.17	18.73	37.00	21.63	30.39	15.68

[1] In the series of average weekly earnings for men and women the group and grand totals are weighted according to the percentage representation of men and women in each industry.
[2] Not computed because not enough firms report separately.

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It will be noticed that the women's earnings, as shown here, are conspicuously low, their range being from $10.58 in beverages to $32.04 in furs and fur goods, while men's earnings range from $22.07 in tobacco products to $56.83 in miscellaneous stone and mineral products. In July, 1926, the same office issued a study of the earnings of men and women, showing the lower level of the women's returns and giving some reasons for the situation, which may be thus summarized:[2]

The most conspicuous fact brought out by the study, according to this summary, is the difference in the earnings of the sexes. Women work in different trades and different occupations from those of men, "but taking all places open to women and all those open to men in factories the average earnings for men in 1924–25 were $31.36 a week, and those for women were $17.45, or about 56 per cent of the earnings received by the men."

This is perhaps in part due to the narrower field open to women. It is pointed out that there are very few manufacturing industries in which men form less than 20 per cent of the working force, but there are many in which women constitute less than 1 per cent of all the workers. Over 60 per cent of all the women in factories are in either the clothing or the textile groups, and the food industries account for 10 per cent more. On the other hand, they have but a small representation in the important group of metal-working industries, "and very few are at work on wood products or the manufacture of building materials like cement and brick, where employment has been unusually high in the last two years."

A second reason is that women suffer more seriously from unemployment than men do. Seasonal unemployment affects particularly such industries as the sewing trades, in which they are especially numerous, and in these the women's trades are more severely hit than the men's. A different kind of seasonal irregularity is found in such establishments as candy factories, in which a regular force is maintained throughout the year, and extra workers are taken on for the busy season. These extra workers are almost entirely women.

In the matter of employment women furnish an extra large proportion of the workers in the irregular or satellite industries and in those where the development of highly industrialized organization has proceeded to only a slight degree. They furnish also a large share of the irregular forces in the more highly organized industries.

These reasons, however, do not seem to cover the situation in other than factory industries, where the same differences exist. The Massachusetts Department of Labor and Industries made a study of office workers, based on conditions as of May, 1, 1926, from which Table 4 is taken:

[2] New York. Department of Labor. Special bulletin No. 143: Employment and earnings of men and women in New York State factories, 1923–1925. Albany, 1926.

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TABLE 4.—CLASSIFICATION OF OFFICE WORKERS BY SEX, OCCUPATION, AND SALARY GROUP

Occupation and salary group	Male		Female		Total	
	Number	Per cent	Number	Per cent	Number	Per cent
Clerical section:						
Less than $16 a week	440	7.5	1,129	19.4	1,569	13.4
$16 and under $20	449	7.7	1,714	29.4	2,163	18.5
$20 and under $25	684	11.7	1,671	28.7	2,355	20.2
$25 and under $30	837	14.3	815	13.9	1,652	14.2
$30 and under $40	1,499	25.7	380	6.5	1,879	16.1
$40 and under $50	788	13.5	80	1.4	868	7.4
$50 and over	1,147	19.6	40	.7	1,187	10.2
Total, all wage groups	5,844	100.0	5,829	100.0	11,673	100.0
Stenographic section:						
Less than $16 a week	14	7.3	391	8.6	405	8.5
$16 and under $20	26	13.5	896	19.6	922	19.4
$20 and under $25	24	12.4	1,588	34.8	1,612	33.9
$25 and under $30	38	19.7	1,122	24.6	1,160	24.4
$30 and under $40	54	28.0	485	10.6	539	11.3
$40 and under $50	22	11.4	68	1.5	90	1.9
$50 and over	15	7.8	13	.3	28	.6
Total, all wage groups	193	100.0	4,563	100.0	4,756	100.0
Accounting and bookkeeping section:						
Less than $16 a week	26	1.4	298	9.0	324	6.2
$16 and under $20	81	4.3	705	21.3	786	15.1
$20 and under $25	183	9.7	1,139	34.5	1,322	25.4
$25 and under $30	276	14.6	692	20.9	968	18.6
$30 and under $40	664	35.2	380	11.5	1,044	20.1
$40 and under $50	323	17.1	68	2.1	391	7.5
$50 and over	336	17.8	24	.7	360	6.9
Total, all wage groups	1,889	100.0	3,306	100.0	5,195	100.0
Office appliance section:						
Less than $16 a week	41	16.0	127	23.2	168	20.9
$16 and under $20	40	15.6	199	36.4	239	29.8
$20 and under $25	66	25.8	158	28.9	224	27.9
$25 and under $30	55	21.5	54	9.9	109	13.6
$30 and under $40	50	19.5	9	1.6	59	7.3
$40 and under $50	4	1.6			4	.5
$50 and over						
Total, all wage groups	256	100.0	547	100.0	803	100.0
Total—all sections:						
Less than $16 a week	521	6.4	1,945	13.7	2,466	11.0
$16 and under $20	596	7.3	3,514	24.7	4,110	18.3
$20 and under $25	957	11.7	4,556	32.0	5,513	24.6
$25 and under $30	1,206	14.7	2,683	18.8	3,889	17.3
$30 and under $40	2,267	27.7	1,254	8.8	3,521	15.7
$40 and under $50	1,137	13.9	216	1.5	1,353	6.0
$50 and over	1,498	18.3	77	.5	1,575	7.0
Total, all wage groups	8,182	100.0	14,245	100.0	22,427	100.0

As these figures deal with salaries, not earnings, the question of irregularity of employment does not enter into consideration, and there is no inevitable difference in the occupations, yet the great majority of the women are grouped in the low-salary classifications and of the men in the high. Only 10.8 per cent of the women, as against 59.9 per cent of the men, were drawing salaries of $30 and over a week, and only one-half of 1 per cent of the women, as against 18.3 per cent of the men, reached the scale of $50 and over weekly.

These differences are usually explained on the ground that a man's wage is designed to support a family, while the woman worker, being usually young and single, has only her own needs to consider, and is sometimes subsidized by her family even in this respect, and that, as she will marry and leave industry after a few years, pro-

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vision for her support in old age does not come into the question. To test this assumption the Women's Bureau has made several studies dealing with the responsibility of woman workers for the support of others.[3]

Family Status of Working Women

TAKING the census figures, the Women's Bureau prepared Table 5, showing the marital condition of working women:

TABLE 5.—MARITAL CONDITION OF WOMEN IN EACH MAIN OCCUPATIONAL DIVISION, 1910 AND 1920 [1]

Occupational division	Women 15 years of age and over engaged in gainful occupations									
	1910					1920				
	Total number	Married		Single, widowed, divorced, and unknown		Total number	Married		Single, widowed, divorced, and unknown	
		Number	Per cent	Number	Per cent		Number	Per cent	Number	Per cent
Agriculture, forestry, and animal husbandry	1,473,261	692,745	47.0	780,516	53.0	934,962	371,537	39.7	563,425	60.3
Extraction of minerals	1,660	371	35.0	689	65.0	2,781	1,278	46.0	1,503	54.0
Manufacturing and mechanical industries	1,775,917	330,914	18.6	1,445,003	81.4	1,904,132	466,663	24.5	1,437,469	75.5
Transportation	106,034	8,602	8.1	97,432	91.9	212,382	26,480	12.5	185,902	87.5
Trade	464,173	83,089	17.9	381,084	82.1	663,939	156,490	23.6	507,449	76.4
Public service (not elsewhere classified)	13,555	4,377	32.3	9,178	67.7	21,768	7,542	34.6	14,226	65.4
Professional service	733,342	76,287	10.4	657,055	89.6	1,015,904	123,578	12.2	892,326	87.8
Domestic and personal service	2,483,277	661,199	26.6	1,822,078	73.4	2,169,450	637,675	29.4	1,531,775	70.6
Clerical occupations	589,209	33,077	5.6	556,132	94.4	1,421,478	129,038	9.1	1,292,440	90.9
All occupations	7,639,828	1,890,661	24.7	5,749,167	75.3	8,346,796	1,920,281	23.0	6,426,515	77.0

[1] U. S. Bureau of the Census. Fourteenth census. Population: 1920. V. 4, Occupations, p. 693, Table 3.

This shows that in 1920 almost 1 in 4 of the gainfully employed women were married, the proportion running from 1 in every 11 among those engaged in clerical occupations to almost 1 in 2 in the small group engaged in the extraction of minerals. Among those usually included in studies of working women, the proportion runs from 1 in 8 in transportation to practically 1 in 4 in manufacturing and mechanical industries.

It was felt, however, that the census classification was too inclusive. The family responsibilities of a widow with several children may be widely different from those of a single woman, a fact which is obscured by putting them into one group. To test the effect of this, the Women's Bureau took the census data of four localities, and reclassified it, separating those who had been married from the single. The statement following shows the result in Jacksonville, Fla.:

[3] United States Women's Bureau Bul. No. 30: The share of wage-earning women in family support, Washington, 1923; and Bul. No. 41: The family status of breadwinning women in four selected cities, Washington, 1925.

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Marital status:	Number	Per cent
Single	4, 245	27. 0
Married, husband living with family	6, 727	42. 8
Married, husband not living with family	1, 257	8. 0
Widowed	3, 205	20. 4
Divorced	278	1. 8
Marital status not reported	14	(4)
Total	15, 726	100. 0

This shows that the proportion of woman breadwinners in Jacksonville who were or had been married was 73 per cent, instead of the 50.8 per cent whom the census classified as married; in other words, the economic and social position of 22 per cent of the woman breadwinners was obscured by grouping them with the single. In Butte, Mont., the reclassification did not show as marked a change, but still made a considerable difference, as appears from the following:

Marital status:	Number	Per cent
Single	2, 114	50. 8
Married, husband living with family	985	23. 7
Married, husband not living with family	178	4. 3
Widowed	726	17. 4
Divorced	147	3. 5
Marital status not reported	12	. 3
Total	4, 162	100. 0

Passaic, N. J., showed only 8.3 per cent of its woman breadwinners who were widowed, divorced, or whose marital status was not reported, and the fourth locality studied, Wilkes-Barre and Hanover Township, Pa., showed 10.8 per cent. Taking the whole group of 38,446 women and girls over 14 who were studied in the four localities, approximately 55 per cent were or had been married.

Practically all of the married women in industry, including under this heading the divorced, the widowed, and those living apart from their husbands, were found to be working from economic necessity. Sometimes they were the sole breadwinner of the family, and sometimes, while there were other workers, the family income was wholly insufficient without their earnings. Frequently the same conditions were true of single women at work.

Of the 31,482 breadwinning women in the four cities who reported on the number of wage earners in the family, 27 per cent were in families having no men wage earners and 21 per cent were classed as the sole breadwinner in the family. Butte shows the largest proportion of women breadwinners living in families lacking male wage earners (about 37 per cent) and Passaic the smallest proportion (approximately 15 per cent). In this latter city was found also the smallest percentage of women as sole breadwinners (9 per cent). Jacksonville, on the other hand, takes the lead in this respect, with three-tenths of its breadwinning women so classfied.

The women with broken marital ties reporting on the number of wage earners in the family, showed over four-fifths of their number as breadwinners in families devoid of men wage earners, and not far from three-fourths of these women were classed as sole breadwinners in the family.

It is apparent from facts and figures that the proportions of single women and of married women with husbands incapacitated for breadwinning who are compelled to earn a livelihood not only for themselves but for dependents are sufficiently large to challenge at-

[4] Less than one-tenth of 1 per cent.

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tention. In many cases, the burdens of such women would be lessened if there were more general recognition of the fact that women frequently are the sole support of families and have as great a need as do men of a wage rate sufficient to cover the cost of living for dependents.

Protective Legislation for Working Women

PROBABLY there is no other question concerning women in industry on which there is such sharp disagreement as that of protective legislation. Those who advocate it hold that women are more susceptible to injury from long hours, overstrain, and industrial poisons than men are, and that at the same time, because of their racial function, injuries to them have a more serious social effect than in the case of men. Therefore, for the sake both of the individual woman and of society, the law should step in and protect women from undesirable conditions, especially since they are later entrants into industry than men, are less used to organization, and are accordingly less able to protect themselves. The opponents of such legislation claim that it may easily become a handicap to the women it is intended to aid, making it impossible for them to enter the better-paid occupations and forcing them to crowd into the already overcrowded, badly paid ones. Moreover, they point out that at present we have very little reliable information about the effect of given occupations or conditions upon women's health, and that much of our special legislation for them is based upon a general impression that such and such conditions are desirable, rather than upon accurate knowledge. Where the advocates of protective legislation for women would forbid their employment in an occupation patently hazardous or carried on under evidently unhealthful conditions, the opponents of such legislation would devote themselves to prohibiting employment under such terms for any worker, and would legislate specially for women only where it can be definitely proved that some condition harmless to men is injurious to them.

In regard to the special liability of women to injury, it seems to be definitely established that they are more susceptible than men to some forms of industrial poisons. Dr. Alice Hamilton, a specialist in this subject, thus states the situation in a pamphlet (Bul. No. 57) prepared for the Women's Bureau:

> It would not be right to leave the subject of women in the poisonous trades without speaking of two further aspects of the subject: First, the evidence of a greater susceptibility to poisons on the part of women as compared with men, and, second, the evidence of poisoning in the offspring which results from poisoning in the mother.
>
> In England in 1897, when both men and women worked in the white-lead factories, the men had a rate of 1 case of lead poisoning for every 17 employed, but the women showed 1 case for every 8 to 9 employed, a rate just double that of the men. In 1910 the women dippers in the British potteries had twice as high a rate as the men. In 1920 women ware carriers in American potteries who worked with men in the dipping rooms had a rate of almost 5 per cent, while no cases were reported among the men. Among the dippers' helpers the men had a rate of 8.4 per cent, but the women's rate was 14.4 per cent. Women are also more liable to the severest forms of lead poisoning, the brain form, in which there is unconsciousness, delirium, convulsions, and blindness. The British figures show that 34.9 per cent of the lead-poisoned

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women potters suffered from this form of the disease, while only 15 per cent of the cases among the men were of the severe type. Among American cases the percentage is 22.5 for women and 5.8 for men.

During the war the English found that T. N. T. poisoning was worse among women munition workers than among men; the Germans found that dinitrobenzene poisoning was decidely worse among women; and the Americans found that women in the smokeless-powder works suffered more from ether poisoning than did men.

Most of our information concerning the damage to the next generation which is caused by industrial poisoning has been drawn from the lead trades. We have evidence based on French statistics and on animal experiments, that lead poisoning in the father affects the offspring, but the evidence is much stronger with regard to the effect of lead poisoning in the mother. There are striking statistics from English reports and also from the French which leave no doubt whatever that a woman who has chronic lead poisoning is more likely to be sterile than a normal woman. If she becomes pregnant, she is more likely to abort or to bear a stillborn child, and if her child is born living it is more likely to die within the first year of life. We have no figures with regard to the effect of other poisons than lead, but we do know that both carbon monoxide gas and benzol may produce abortion, and that the latter, by causing anemia, renders a healthy pregnancy almost impossible. It is plain to all that if a poison is circulating in the blood of the mother it is practically certain to affect the child she is carrying.

Apart from these special poisons, there seems to be very little definite knowledge regarding any harmful effect of industry upon women. At the Women's Industrial Conference held in Washington in January, 1926, at the call of the Women's Bureau, one meeting was devoted to the health problems of women in industry, at which several papers were presented, and these were followed by an attempt on the part of the audience to discover just what foundation in recorded fact exists for the belief that there is need of legislation to protect the health of working women. Questions from the floor brought out the fact that, except as to the poisons noted above, there are no authoritative data showing the effect of different occupations or even of industrial employment in general upon a woman's capacity for successful motherhood, and that there is an almost equal lack of information concerning its influence upon her own health. Questions were put as to the effect of industrial employment, especially of specific occupation, upon the health of woman workers, apart from their maternal functions, and Doctor Thompson, of the United States Public Health Service, was called upon to answer. He spoke of detailed studies being carried on by the service in textile mills, which show that the loss of time through illness is much greater in the case of women than of men. He was unable, however, to say how the morbidity rate of women in the mills compared with that of women in the general population or of women not industrially employed. (Speaking on this point at another meeting, Miss Josephine Goldmark called attention to a study of death rates made in Fall River, Mass., by Dr. Arthur Perry, of the United States Bureau of Labor Statistics, which showed that, taken by race and age groups, the death rates of female textile-mill operatives were higher than those of female nonoperatives. This was true of male operatives also, as compared with male nonoperatives, but in their case the disparity was not so great.) Further questions brought out the fact that there are no data showing the effect upon infantile mortality of the industrial employment of the mother. The infantile death rate is affected by many causes, and as yet no studies have been made sufficiently comprehensive and detailed to show the relative weight of different

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factors, such as poverty, insanitary environment, industrial employment of the mother, lack of intelligent care during pregnancy and confinement, and the like.

A special meeting of this conference was devoted to the subject of protective legislation for women, two speakers upholding and two opposing it. The following summary, taken from the account of the conference, published in the Labor Review for March, 1926, gives the main arguments on both sides:

Miss Mary Van Kleeck, of the Russell Sage Foundation, and Miss Mabel Leslie, of the International Brotherhood of Electrical Workers, spoke in favor of such legislation, and Miss Josephine Casey, of the Street Car Workers' Union, and Miss Gail Laughlin, of the National Woman's Party, opposed it. Miss Van Kleeck called attention to the fact that they all, whether they favored or opposed such legislation, are working for certain definite improvements in the condition of gainfully employed women, such as a reasonably short workday, opportunity to fit themselves for skilled trades and to enter them when fitted, good working conditions, fair pay, and the like. The only point on which the two sides differ is as to how these can best be obtained. There are a number of methods to be used—such as organization of the workers so that they may be strong enough to secure good conditions for themselves, education of public opinion to insist upon good conditions, education of employers to a perception of the improved efficiency which comes with the health and contentment of the workers—and, among the rest, the method of forbidding by law specific undesirable conditions. Why not use this method along with the rest? Organization and education are good methods, but slow, and it is notoriously hard to organize working women. By prohibiting by law long hours or night work or dangerous trades for women, protection is secured for them while they are being organized and awakening to their own power to secure good conditions. Moreover, shortening hours by legislation protects the unorganized workers against the strain of overfatigue and gives them leisure and strength to devote to the consideration of labor questions, thus helping them to gain education and promoting their unionization.

Miss Josephine Casey, speaking on the other side, followed with an appeal to the trade-union women to work through the union, instead of trusting to legislation. Miss Mabel Leslie, speaking in favor of special legislation, dwelt on the advantages she had herself experienced through the shortening of hours by law in New York State. Miss Laughlin, closing for the opposition, declared that they object to so-called protective legislation for women because it handicaps them in competition with men, because both directly and indirectly it hinders their entrance into profitable and suitable employments, because it tends to perpetuate the idea of woman's inferiority, classing her with children as a weakling who must be cared for by others instead of being able to defend her own interests, and because, in placing her on a different footing before the law from men, it opens the door to other legal discriminations against her. Laws restricting the hours of women but not of men not only keep women out of certain occupations in which occasional overtime may be necessary, but hinder their working up from the ranks into administrative positions. The better positions in industry go to people who can do the work, not to those who can work till a certain hour and then must stop. It is unreasonable to say that since men provide an eight-hour day for themselves through their unions, an eight-hour law for women does not place them at a disadvantage. The union limitation provides for overtime at an increased rate of pay, in case of an emergency, while the legal restriction is absolutely rigid. Naturally, under such conditions the employer will take a man in preference to a woman, and the law tends to give men the choice of jobs, relegating women to those which are so unpleasant or so ill-paid that men do not want them. The ends sought by the so-called protective legislation should be obtained by women for themselves through organization. It is not to the point to say they can not be organized for experience shows that they can be. One great obstacle in the way of doing so, however, is the attitude fostered by the continual repetition of the assertion that they can not be organized and that they must be protected by legislation. The way to protect them is to give them equal opportunity, not to impose on them restrictions and limitations. If there are conditions which can best be

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regulated by law, make the law applicable to the worker, not to the sex. This can be done, for when it has been shown that work of a certain kind is injurious either to the health of the worker or, through the worker, to the community, the courts have upheld restrictions upon the labor of men as well as of women.

Effects of New Inventions Upon the Field of Women's Employment

THE Women's Bureau of the United States Department of Labor issued in 1926 a report (Bulletin No. 50) dealing with the changing opportunities for the employment of women as a result of industrial research.

The usual objective in applying the results of such research is to reduce costs, increase production, and create new products or forms of service. When the objective is achieved, the employment opportunities of men or women or both are affected.

Among the applications of research which affect the employment of women are cited the utilization of hitherto dormant resources, the development of new raw materials, the invention of new products and new methods of communication, changes in methods which reduce excessive labor and hazard and improve working conditions, "thus reducing the number of occupations from which women rightly are debarred because of the physical strain involved," the increase in transportation facilities, and the calculating and recording inventions and the new commercial inventions brought into existence to keep distribution and accounting abreast with expanding industry.

As an instance of the development of new raw materials the report cites the discovery of how to produce from wood pulp, cotton waste, and other materials a viscose substance somewhat akin to the silkworm's secretions, and the further discovery of how to spin this substance into the fine filaments which are the basis of artificial silk, or rayon. This has not only created an entirely new industry peculiarly adapted to women, but has added a new field to the textile industry, in which women have always been employed. A somewhat similar development is found in the case of perfumes. "Within the past decade chemical research has discovered how to extract and to build up the perfumes of a thousand blooms and the flavors of acres of orchards from lumps of soft coal, which are but the residue of long dead forests and of millions upon millions of buried blooms." This industry is of such recent growth that the number and distribution of its workers is not known, but women are employed in it and it is known to be increasing rapidly in importance.

The effect of new inventions upon the field of women's employment is seen especially in the developments which followed the introduction of the typewriter, the telephone, and the radio. Not only are women employed in the actual operation of these to such an extent that typewriting and telephone operating are looked upon as distinctively feminine occupations, but they are largely employed in the manufacture of the various instruments used, and with each new application of electricity this field of their work increases. The sub-

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stitution of one material for another often opens up new avenues for the employment of women. An instance of this is the growing use of aluminum ware in the household, which is a recent development; the lightness of aluminum makes it possible to employ women in its manufacture more extensively than was possible when heavier metals were used. In the glass industry changes in methods and materials used have brought women into many occupations, and the use of the rare new minerals for the manufacture of small parts has opened up a new field for them. "One firm manufacturing tungsten and molybdenum products states that 70 per cent of its factory pay roll is made up of women, who are employed on light assembling jobs and on light machines, such as riveting machines."

While pointing out that the field of possible developments of this kind is wide, the report calls attention to two important facts disclosed by the survey made:

> That the increased opportunities for the employment of women growing out of the foregoing developments in applied research do not necessarily increase the total number of women in industry and commerce beyond the growth occasioned by the growth in the adult woman population. An analysis of census figures indicates that the increased opportunities are resulting in a continued relief of the congestion of woman labor in the older so-called woman-employing industries—a relief started by the shortage of male labor during the war.
>
> That the wider distribution of women over the field of industry and commerce and their advancement into better occupations have not, on the whole, reduced the number nor impaired the quality of the employment opportunities of men, for neither men nor boys have taken the places in the old industries deserted by women. The numbers of both men and boy wage earners have increased more than the numbers of woman and girl wage earners during the decade represented by the last population census. This fact should not convey the idea that occupations have not been shifted from men to women, from women to men, and from both to machines, as a result of applied research; it is only to show that the net increase in the number of women's employment opportunities resulting from applied research has not been accompanied by a net decrease in the employment opportunities for men.

Trend of Employment of Women and Men

THE purpose of this article is to compare the trend of employment (and, to some extent, wages) for men and women over a period of years for certain important industries.

Between 1890 and 1910 there was an increase in the proportion of females 10 years of age and over engaged in gainful occupations from 17.37 to 23.37. The percentage dropped to 21.14 in 1920. It is possible that the date at which the census was taken may have affected the 1920 figures; the 1890 and 1900 censuses were as of June 1, the 1910 census as of April 15, and the 1920 census as of January 1.

The changes in per cent of women employed in the various industry groups since 1890 are shown in Table 1:

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TABLE 1.—PER CENT OF ALL FEMALES, 10 YEARS OF AGE AND OVER, ENGAGED IN GAINFUL OCCUPATIONS, BY INDUSTRY GROUP, 1890–1920

Industry group	Per cent of females 10 years of age and over in gainful occupations			
	1890	1900	1910	1920
Agriculture, etc.	3.33	3.45	5.23	2.68
Extraction of minerals			(1)	.01
Manufacturing	4.46	4.64	5.27	4.77
Transportation	.99	1.78	.31	.53
Trade			1.35	1.65
Public service			.04	.05
Professional	1.35	1.52	2.12	2.51
Domestic and personal	7.23	7.41	7.33	5.41
Clerical	(2)	(2)	1.72	3.53
Total employed	17.37	18.80	23.37	21.14
Total unemployed	82.63	81.20	76.63	78.86
Grand total	100.00	100.00	100.00	100.00

[1] Less than one-hundredth of 1 per cent. [2] Not reported separately.

As the table shows, there was an increase in the per cent engaged in agriculture from 3.33 in 1890 to 5.23 in 1910, and then it dropped to 2.68 in 1920. Here the date of taking the census for 1920 makes the figures questionable. In manufacturing there was the same movement but the date of the census may have had no material effect. Trade and transportation show an increase from 0.99 in 1890 to 2.18 in 1920, while the professional class increased from 1.35 in 1890 to 2.51 in 1920. There was a marked falling off in domestic and personal service, from 7.23 in 1910 to 5.41 in 1920. The clerical employees, included in the other groups in 1890 and 1900, were classified separately in the later years and increased from 1.72 in 1910 to 3.53 per cent in 1920.

Table 2 shows the per cent of total population, males as well as females, 10 years of age and over, engaged in gainful occupations each year. For men there are yearly changes but no perceptible long-time trend, while for females there is a distinct upward trend. The second section of the table shows the same information for persons 16 years of age and upward. Again, there is no distinctive trend as far as males are concerned, but for females the increase is even more noticeable, increasing from 18.9 per cent in 1890 to 24 per cent in 1920.

TABLE 2.—TREND OF EMPLOYMENT OF POPULATION 10 YEARS OF AGE AND OVER AND 16 YEARS OF AGE AND OVER, BY SEX, 1890–1920

Year	Per cent gainfully employed			
	Persons 10 years of age and over		Persons 16 years of age and over	
	Males	Females	Males	Females
1890	79.3	17.4	88.7	18.9
1900	80.0	18.8	89.5	20.6
1910	81.3	23.4	91.1	25.5
1920	78.2	21.1	89.9	24.0

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Changes in the various nativity groups are shown in Table 3. The table shows that the per cent of females 10 years of age and over engaged in gainful occupations among the native whites of native parents increased from 12.4 per cent in 1890 to 17.2 per cent in 1920.

There were fluctuations but no definite trend in the percentages for native whites of foreign parents or in those for foreign-born whites.

Negro women work for wages to a far greater extent than white women. In 1910, 54.7 per cent of negro women were employed in gainful occupations, but the percentage went down to 38.9 in 1920. Many negro women are agricultural laborers, and here again it may be stated that the date of the census of 1920 (January 1) may have affected the figures.

TABLE 3.—PERCENTAGES OF FEMALES 10 YEARS OF AGE AND OVER ENGAGED IN GAINFUL OCCUPATIONS, BY NATIVITY GROUPS AND BY YEARS

Nativity	1890	1900	1910	1920
Native whites:				
Native parentage	12.4	14.5	17.1	17.2
Foreign or mixed parentage	25.3	25.4	24.6	24.8
Foreign-born whites	19.8	19.4	21.7	18.4
Negroes, native and foreign born	39.9	43.2	54.7	38.9

Cotton Goods Industry

IN THE cotton manufacturing industry in 1850 females constituted 64 per cent of the total number of employees. In 1860 they formed 62 per cent. The 1870 census gave returns for children, including thereunder males under 16 and females under 15, but did not report the sexes separately. Of the adult employees in the industry, however, in that year females constituted 62 per cent. The decade following saw a wonderful development of machinery in the industry, and in 1880 the percentage of female employees among total employees had dropped to 57. In 1890 the census figures again segregated children without reporting their sex, as was the case also in the censuses of 1899 and 1904; but based upon adult employees females constituted 55 per cent in 1890, 48 per cent in 1899, and 46 per cent in 1904. In 1909 the census again began reporting the sex of all employees, females forming 44 per cent in that year, 42 per cent in 1914, and 43 per cent in 1919. Like figures for 1921 and 1923 are not available.

From 1907 to 1913 the several wage studies of the Bureau of Labor Statistics covered only selected occupations, no attempt being made to copy the entire pay rolls of the establishments covered. Beginning with 1914 the agents of the bureau copied the entire pay roll for the period specified, and the published figures of the bureau give the earnings, by sex, of all employees. It thus becomes necessary to divide the bureau's material for the industry as a whole into two periods, the first extending from 1907 through 1913 and the second extending from 1914 to 1926.[5] In many of the selected occupations covered during the first period women only were employed. The

[5] During the first period these wage studies were made annually; since 1914, however, they have been made only every two years.

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per cent which women formed of the total number of employees from 1907 to 1913 can therefore be compared neither with the census figures nor with the figures of the Bureau of Labor Statistics for the second period. They do, however, represent largely the same mills and the same occupations in those mills.

While the main purpose of the present article is to trace the trend of female employment in the industries discussed, it was considered worth while also to draw from the record the earnings of men and women in the industry and in the selected occupations, so as to present at the same time the relation of the earnings of women to those of men.

In the first period, 1907 to 1913, the proportion of women in the total number of employees in cotton mills gradually decreased from 62 per cent in 1907 to 59 per cent in 1913. In the second period, covering the entire pay roll of the plants scheduled and extending from 1914 to 1926, the percentage began with 43, showing that the proportion of women in the industry as a whole was rather less than in the selected occupations covered in the former group. In 1926, 44 per cent were women, although during the boom year (1920) following the war the per cent reached 47.

Coming now to the specific occupations which have been carried on a uniform basis since 1907, we find the percentage of female drawing-frame tenders did not vary greatly, though, with the exception of the war period and the subsequent boom, there was a slight tendency downward. Speeder tenders show a very consistent drop from 78 per cent in 1907 to 54 per cent in 1926. In the occupation of frame spinner in the cotton mills women have always predominated, and the slight change in percentage from year to year can hardly be construed as indicative of anything. It would seem, however, that in the occupation of weavers there is a significant drop in the percentage of women employed, probably due in 1924 and 1926 to the increased number of looms which the male weavers were required to tend.

TABLE 4.—NUMBER AND PER CENT OF WOMEN AND THEIR EARNINGS AS COMPARED WITH THOSE OF MEN, IN COTTON MILLS, 1907 TO 1926

Occupation and year	Number of employees			Earnings per hour		
	Men	Women	Per cent women are of total	Men	Women	
					Amount	Per cent of men's earnings
The industry						
First period—Selected occupations:						
1907	4,362	7,247	62	$0.165	$0.133	81
1908	4,490	7,204	62	.162	.134	83
1909	4,825	7,586	61	.156	.128	82
1910	8,222	11,980	59	.156	.130	83
1911	13,871	19,740	59	.161	.133	83
1912	14,733	20,379	58	.176	.146	83
1913	14,497	21,225	59	.178	.148	83
Second period—Whole industry:						
1914	44,822	33,532	43	.162	.141	87
1916	48,717	35,620	42	.187	.168	90
1918	44,022	36,380	45	.283	.248	88
1920	31,384	28,181	47	.495	.434	88
1922	34,791	28,042	45	.342	.315	92
1924	45,056	32,940	42	.390	.348	89
1926	46,879	36,103	44	.347	.301	87

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TABLE 4.—NUMBER AND PER CENT OF WOMEN AND THEIR EARNINGS AS COMPARED WITH THOSE OF MEN, IN COTTON MILLS, 1907 TO 1926—Continued

Occupation and year	Number of employees			Earnings per hour		
	Men	Women	Per cent women are of total	Men	Women	
					Amount	Per cent of men's earnings
The industry—Continued						
Beamer tenders:						
1916	328	91	22	$0.271	$0.224	83
1918	280	113	29	.404	.315	78
1920	246	100	29	.711	.578	81
1922	313	85	21	.538	.377	70
1924	331	108	25	.621	.448	72
1926	276	32	10	.492	.411	84
Creelers or tiers-in:						
1920	27	428	94	.393	.347	88
1922	30	417	93	.304	.244	80
1924	59	548	90	.298	.272	91
1926	49	641	93	.274	.249	91
Doffers:						
1916	3,206	537	14	.139	.162	117
1918	2,857	703	20	.231	.255	110
1920	2,717	543	17	.453	.389	86
1922	2,716	460	14	.302	.324	107
1924	3,133	478	13	.334	.380	114
1926	3,657	502	12	.307	.344	112
Drawers-in:						
1916	----------	926	100	----------	.191	----------
1918	----------	834	100	----------	.273	----------
1920	----------	632	100	----------	.485	----------
1922	----------	664	100	----------	.352	----------
1924	61	726	92	.339	.383	113
1926	44	947	96	.330	.357	108
Drawing-frame tenders:						
1907	219	234	52	.100	.093	93
1908	234	232	50	.098	.093	95
1909	253	249	50	.099	.091	92
1910	436	359	45	.096	.090	94
1911	750	502	40	.097	.095	98
1912	723	525	42	.108	.110	102
1913	624	594	49	.109	.115	106
1914	660	574	47	.116	.118	102
1916	681	660	49	.126	.136	108
1918	515	818	61	.199	.209	105
1920	567	693	55	.427	.371	87
1922	552	623	53	.270	.276	102
1924	762	653	46	.295	.311	105
1926	822	682	45	.279	.281	101
Speeder tenders:						
1907	201	721	78	.116	.139	120
1908	224	694	76	.123	.138	112
1909	258	714	73	.129	.135	105
1910	426	1,175	73	.131	.133	102
1911	623	1,753	74	.135	.136	101
1912	666	1,784	73	.142	.149	105
1913	745	1,946	72	.145	.153	106
1914	799	2,001	71	.153	.155	101
1916	1,739	2,986	63	.174	.188	108
1918	1,478	3,214	68	.265	.277	105
1920	1,506	2,476	62	.533	.486	91
1922	1,745	2,372	58	.358	.369	103
1924	2,177	2,703	55	.394	.411	104
1926	2,547	2,950	54	.343	.368	107
Spinners, frame:						
1907	184	2,317	93	.124	.110	89
1908	214	2,114	91	.119	.107	90
1909	188	2,408	93	.117	.106	91
1910	261	3,704	93	.120	.108	90
1911	700	5,981	90	.126	.111	88
1912	564	6,364	92	.144	.124	86
1913	530	6,762	93	.143	.128	90
1914	483	6,906	93	.150	.132	88
1916	489	7,706	94	.164	.149	91
1918	383	7,752	95	.248	.233	94
1920	345	6,330	95	.475	.427	90
1922	547	6,634	92	.292	.301	103
1924	906	8,314	90	.369	.319	86
1926	561	9,684	95	.289	.282	98

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TABLE 4.—NUMBER AND PER CENT OF WOMEN AND THEIR EARNINGS AS COMPARED WITH THOSE OF MEN, IN COTTON MILLS, 1907 TO 1926—Continued

Occupation and year	Number of employees			Earnings per hour		
	Men	Women	Per cent women are of total	Men	Women	
					Amount	Per cent of men's earnings
The industry—Continued						
Weavers:						
1907	2,769	3,724	57	$0.161	$0.151	94
1908	2,848	3,903	58	.160	.152	95
1909	3,123	3,930	56	.151	.144	95
1910	5,334	6,334	54	.151	.147	97
1911	8,855	10,792	55	.156	.148	95
1912	9,775	10,998	53	.169	.163	96
1913	9,485	11,236	54	.170	.164	96
1914	9,755	11,188	53	.176	.167	95
1916	10,279	11,546	53	.205	.201	98
1918	8,301	10,993	57	.301	.285	95
1920	6,077	7,681	56	.573	.528	92
1922	7,410	7,644	51	.389	.380	98
1924	9,024	8,494	48	.449	.429	96
1926	8,603	7,596	47	.396	.375	95

The general impression that the wage increases during and since the war have affected women relatively much more favorably than men does not seem to be borne out by the facts revealed in these tables. In the cotton industry as a whole the earnings of women in 1914 were 87 per cent of those of men. In 1920, when wages were at their peak, women's wages were 88 per cent of the wages of men, but in 1926 they were again 87 per cent of the wages of men. In a few occupations, where the wages of females during the boom period exceeded the earnings of the males, a fair presumption is that boys were introduced into these occupations and were competing with women, who were older and more efficient.

Other Industries

THE records of the Bureau of Labor Statistics for certain other industries have been analyzed and tabulated in the same way as for the cotton industry. These data are given in the table below:

TABLE 5.—NUMBER AND PER CENT OF WOMEN AND THEIR EARNINGS AS COMPARED WITH THOSE OF MEN, IN SPECIFIED INDUSTRIES, 1907 TO 1926

Woolen and worsted mills

Occupation and year	Number of employees			Earnings per hour		
	Men	Women	Per cent women are of total	Men	Women	
					Amount	Per cent of men's earnings
The industry						
First period—Selected occupations:						
1907	3,283	3,497	52	$0.198	$0.159	80
1908	2,784	3,256	54	.192	.148	77
1909	3,197	3,601	53	.195	.146	75
1910	5,788	6,124	51	.201	.158	79
1911	8,078	8,264	51	.202	.157	78
1912	8,809	8,787	50	.224	.177	79
1913	7,672	8,036	51	.222	.173	78

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TABLE 5.—NUMBER AND PER CENT OF WOMEN AND THEIR EARNINGS AS COMPARED WITH THOSE OF MEN, IN SPECIFIED INDUSTRIES, 1907 TO 1926—Continued

Woolen and worsted mills—Continued

Occupation and year	Number of employees			Earnings per hour		
	Men	Women	Per cent women are of total	Men	Women	
					Amount	Per cent of men's earnings
The industry—Continued						
Second period—Whole industry:						
1914	23,160	16,916	42	$0.198	$0.161	81
1916	28,737	21,223	42	.247	.200	81
1918	29,705	22,223	43	.373	.300	80
1920	19,852	18,292	48	.666	.524	79
1922	21,980	17,450	44	.518	.411	79
1924	23,248	18,374	44	.585	.468	80
1926	22,152	17,818	45	.545	.418	77
Comber tenders:						
1907	52	101	66	.133	.099	74
1908	29	117	80	.131	.099	76
1909	29	111	79	.137	.102	74
1910	106	129	55	.139	.111	80
1911	188	139	43	.141	.109	77
1912	181	150	45	.156	.116	74
1913	115	163	59	.156	.117	75
1914	228	162	42	.161	.119	74
1916	274	178	39	.199	.177	89
1918	248	328	57	.314	.258	82
1920	162	155	49	.552	.478	87
1922	209	100	32	.435	.385	89
1924	212	114	35	.522	.418	80
1926	171	163	49	.478	.378	79
Doffers:						
1916	255	709	74	.161	.135	84
1918	138	829	86	.266	.203	76
1920	108	561	84	.497	.352	71
1922	165	619	79	.299	.275	92
1924	214	566	73	.301	.315	105
1926	52	701	93	.280	.280	100
Gill-box tenders:						
1920	130	383	75	.502	.442	88
1922	288	413	59	.363	.339	93
1924	343	435	56	.439	.382	87
1926	209	296	59	.405	.326	80
Spinners, frame:						
1907	----------	323	100	----------	.127	----------
1908	----------	284	100	----------	.122	----------
1909	----------	295	100	----------	.124	----------
1910	114	578	84	.125	.122	98
1911	194	1,002	84	.132	.126	95
1912	244	1,070	81	.158	.144	91
1913	115	751	87	.136	.140	103
1914	282	970	77	.145	.147	101
1916	266	1,202	82	.191	.180	94
1918	161	1,330	89	.316	.278	88
1920	49	1,026	95	.558	.481	86
1922	45	972	96	.357	.345	97
1924	46	1,106	96	.421	.417	99
1926	24	1,228	98	.371	.362	98
Weavers:						
1907	1,653	1,873	53	.203	.188	93
1908	1,409	1,882	57	.196	.166	85
1909	1,589	1,807	53	.199	.166	83
1910	2,907	2,855	50	.207	.180	87
1911	4,049	3,384	46	.210	.184	88
1912	4,476	3,586	44	.237	.206	87
1913	3,834	3,493	48	.232	.197	85
1914	4,336	3,862	47	.238	.203	85
1916	5,431	3,505	45	.304	.271	89
1918	5,812	5,295	48	.470	.406	86
1920	4,825	3,783	44	.807	.747	93
1922	5,518	3,622	40	.616	.576	94
1924	5,725	3,713	39	.701	.654	93
1926	5,528	2,748	33	.652	.600	92

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TABLE 5.—NUMBER AND PER CENT OF WOMEN AND THEIR EARNINGS AS COMPARED WITH THOSE OF MEN, IN SPECIFIED INDUSTRIES, 1907 TO 1926—Contd.

Men's clothing industry

Occupation and year	Number of employees			Earnings per hour		
	Men	Women	Per cent women are of total	Men	Women	
					Amount	Per cent of men's earnings
The industry						
First period—Selected occupations:						
1911	7,505	6,246	45	$0.281	$0.166	59
1912	9,415	7,853	45	.308	.166	54
1913	11,425	8,413	42	.321	.186	58
Second period—Whole industry:						
1914	14,150	10,447	42	.311	.181	58
1919	9,932	9,976	50	.559	.338	60
1922	13,915	11,028	44	.879	.528	60
1924	14,879	12,802	46	.931	.545	59
1926	17,048	16,611	49	.937	.548	58
Hand sewers:						
1911	221	3,663	94	.204	.153	75
1912	305	4,395	94	.212	.154	73
1913	144	4,504	97	.253	.177	70
1914	317	4,906	94	.270	.173	64
1919	66	3,944	98	.446	.326	73
1922	191	4,313	96	.898	.512	57
1924	140	4,283	97	.856	.543	63
1926	211	5,673	96	.888	.536	60
Machine operators:						
1911	1,461	1,667	53	.261	.192	74
1912	2,480	2,162	47	.261	.187	72
1913	2,869	2,593	47	.312	.204	65
1914	2,615	2,624	50	.316	.214	68
1919	2,349	4,001	63	.595	.353	59
1922	3,219	3,538	52	.946	.587	62
1924	3,611	4,467	55	1.010	.591	59
1926	4,407	5,856	57	1.012	.612	60

Boot and shoe industry

The industry						
First period—Selected occupations:						
1907	3,110	885	22	$0.337	$0.209	62
1908	3,045	825	21	.330	.207	63
1909	3,150	940	23	.342	.216	63
1910	7,431	3,150	30	.325	.193	59
1911	10,539	4,254	29	.332	.196	59
1912	13,665	5,142	27	.323	.196	61
1913	14,462	5,369	27	.349	.209	60
Second period—Whole industry:						
1914	35,270	17,775	34	.275	.181	66
1916	42,125	21,438	34	.295	.191	65
1918	40,568	22,707	36	.290	.240	62
1920	31,463	19,772	39	.655	.388	59
1922	29,054	18,453	39	.580	.375	65
1924	27,334	18,317	40	.599	.394	66
1926	29,925	22,772	43	.622	.401	64
Skivers, upper:						
1907	----------	74	100	----------	.188	----------
1908	----------	70	100	----------	.192	----------
1909	----------	79	100	----------	.191	----------
1910	74	338	82	.288	.175	61
1911	136	374	73	.292	.176	60
1912	156	371	70	.282	.193	68
1913	134	439	77	.299	.209	70
1914	116	446	79	.299	.209	70
1916	124	591	83	.311	.209	67
1918	96	697	88	.423	.267	63
1920	87	611	88	.576	.434	75
1922	77	539	88	.595	.430	72
1924	95	470	83	.619	.472	76
1926	96	552	85	.668	.486	73

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TABLE 5.—NUMBER AND PER CENT OF WOMEN AND THEIR EARNINGS AS COMPARED WITH THOSE OF MEN, IN SPECIFIED INDUSTRIES, 1907 TO 1926—Contd.

Boot and shoe industry—Continued

Occupation and year	Number of employees			Earnings per hour		
	Men	Women	Per cent women are of total	Men	Women	
					Amount	Per cent of men's earnings
The industry—Continued						
Vampers:						
1907	167	351	68	$0.318	$0.246	77
1908	99	321	76	.287	.242	84
1909	150	391	72	.287	.253	88
1910	263	863	77	.293	.238	81
1911	343	1,124	77	.315	.238	76
1912	483	1,088	69	.306	.230	75
1913	554	1,072	66	.320	.246	77
1914	534	1,116	68	.312	.243	78
1916	624	1,383	69	.333	.254	76
1918	573	1,477	72	.442	.312	71
1920	400	1,313	77	.700	.506	72
1922	357	1,142	76	.628	.480	76
1924	304	1,053	78	.707	.519	73
1926	294	1,170	80	.741	.531	72

In many industries there are certain occupations which have been held almost exclusively by women, just as there are occupations that are and have always been held by men, and while these occupations, of course, enter into the figures shown for the industry as a whole, it has not been considered worth while to discuss these as separate occupations.

So far as conclusions can be drawn from a study of the industries covered in this article, it would seem that, relatively to men, the employment of women is, to say the least, not increasing in these older manufacturing industries, and that we must look to the newer industries for an enlargement of the field of female employment and to the clerical, commercial, and industrial fields.

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WORKERS' EDUCATION

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Workers' Education in the United States

THE purposes of adult workers' education is to provide better facilities for the training of labor leaders and for the broader education of all workers. At the close of the war only occasional experiments of this kind had been made in this country. As late as 1920 a survey by the United States Bureau of Labor Statistics of adult working-class education in Great Britain and the United States (Bulletin No. 271) disclosed very few examples of workers' educational undertakings in the United States.

Thereafter, however, the movement became more active, and in 1926 the secretary of the Workers' Education Bureau reported workers' colleges or study groups in more than 300 industrial centers in some 40 States. By 1926, also, there were full-time directors of workers' education in a number of States. Practically all of these enterprises are financed by labor organizations.

At the 1926 convention of the American Federation of Labor, the progress of workers' education since the preceding convention was reviewed. It was estimated that 5,000 adult workers had been added to those enrolled in systematic instruction classes, constituting a total of over 40,000.

The federation's committee on education, the executive council reported, has 243 local cooperating committees, and included within its work of the past year the continuation of a survey of social textbooks, cooperation with the research department of the American Federation of Teachers, an investigation of a number of educational developments, the furnishing of local committees with data on provisions for recreation, an inquiry concerning the health activities of labor unions, and the issuance of a pamphlet of health rules.

Since the 1920 survey referred to above the United States Bureau of Labor Statistics has made no first-hand investigation of adult workers' education. The present article merely summarizes recently published articles and reports on some of the more significant developments along this line.

Workers' Education Bureau

PROBABLY the most important present influence in workers' education is the Workers' Education Bureau. This organization was founded in April, 1921, by a small group of teachers and trade-unionists.

The aims and activities of the central agency were made the subject of careful study by the executive council of the American Federation of Labor, and the bureau was given the most cordial support by the education committees of the 1922 and 1923 conventions of the federation, while the delegates at the latter meeting recommended the affiliation of the various unions with the bureau.

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At the 1924 convention, held at El Paso, the following plan of the executive council of the federation was unanimously adopted:

1. That each national and international union provide each year an education fund equivalent to one-half cent per member per annum.
2. That this educational fund be paid quarterly to the Workers' Education Bureau for the educational service to their membership.
3. That the local unions be urged to undertake active affiliation with the Workers' Education Bureau, and pay an annual membership fee of $1 for the regular educational service of the bureau.

The report of the executive council of the American Federation of Labor to the 1925 convention of that body declared that "the Workers' Education Bureau of America * * * may now be said to constitute an essential part of the educational service of the American Federation of Labor."

In the first half of 1925, 41 unions became actively affiliated with the bureau in conformity with the plan agreed upon at the El Paso meeting, and at the present time the affiliated bodies include almost 500 national and international unions, State federations of labor, and central and local labor unions in various parts of the United States. According to its amended constitution the purpose of the bureau is to collect and disseminate information concerning organized labor's educational efforts and to coordinate, assist, and stimulate such efforts. Any labor organization not dual or seceding in character is eligible for membership, as are also "all workers' educational enterprises under trade-union control and devoted to general education for workers." Annual membership dues for the different groups of organizations and individuals are as follows:[1]

1. International and national trade-unions, one-half cent per member per year, payable quarterly.
2. State federations of labor, $10; central labor unions, $5; local unions, $1; other forms of trade and labor organizations, $5.
3. American Federation of Labor, $100.
4. Workers' study classes and trade-union colleges, $2 per class or $1 for each local union affiliated therewith.
5. Honorary members, $100; sustaining members, $25; contributing members, $10; cooperating members, $5; associate members, $2.

The constitution provides that the bureau's executive committee shall consist of the president and secretary of the association and 9 other members to be selected or elected as follows: One to represent State federations of labor, city central bodies, local unions, and other forms of labor organization; two to represent workers' educational enterprises; three to represent the American Federation of Labor; and three to represent international and national trade-unions.

The constitution also provides for biennial conventions. Among the problems discussed at the 1925 convention of the bureau were: Education and social program, education and industrial peace, and education and international peace.

The character of the education aimed at places emphasis upon economic and labor subjects, but by no means neglects the so-called cultural branches. Thus, at the 1925 convention recommendation was made to include in a labor college curriculum the following subjects:

[1] At the 1926 convention of the federation a recommendation for more adequate contributions than those here reported was unanimously adopted.

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1. Labor history; Trade-union problems, policies, and aims; Labor and State.
2. History, with emphasis on social and economic forces and systems.
3. Economic geography.
4. Economics, particularly in relation to the industry of the group taught.
5. Social psychology and sociology.
6. Labor law and legislation.
7. Public speaking and parliamentary law, as far as possible in connection with the subject matter of other classes.
8. Literature, with emphasis on social interpretation.
9. English, with use of textbooks that are of value from a labor point of view, and with exercises of practical value to trade-unionists.
10. Health, with special reference to industrial conditions.

The bureau has instituted a monthly news service for its members, for labor colleges, and for the labor press, and also furnishes outline lessons on psychology, economics, and other subjects to some of the official labor organs.

Among the publications issued under the auspices of the Workers' Education Bureau are the following:

Workers' Bookshelf:
- Vol. 1. Joining in Public Discussion, by Alfred Dwight Sheffield.
- Vol. 2. The Control of Wages, by Walton Hamilton and Stacy May.
- Vol. 3. The Humanizing of Knowledge, by James Harvey Robinson.
- Vol. 4. Women and the Labor Movement, by Alice Henry.
- Vol. 5. The Labor Movement in a Government Industry, by Sterling D. Spero.
- Vol. 6. A Short History of the American Labor Movement, by Mary Beard.
- Vol. 7. Readings in Trade-Unionism, by David Saposs.

Workers' Education Pamphlet Series:
1. How to Start Workers' Study Classes, by Broadus Mitchell.
2. How to Run a Union Meeting, by Paul Blanshard.
3. Workers' Education, by Arthur Gleason.
4. The Voluntary Basis of Trade-Unionism, by Samuel Gompers.
5. The American Federation of Labor, by Matthew Woll.
6. Child Labor, by William Green.
7. How to Keep Union Records, by Stuart Chase.
8. The Women's Auxiliary and Workers' Education, by Theresa Wolfson.
9. The public Library and Workers' Education, by E. C. Lindeman.

In the spring of 1926 the executive committee of the Workers' Education Bureau authorized the establishment of a research department and the following October the director of this newly created agency entered on active duty. According to Workers' Education (New York), November, 1926, work has already been begun on a study of the content, courses of study, and curricula of workers' classes in this country and in Europe; a study of trade-union conventions, committees, etc.; and an interpretation of teaching methods as developed at the Frankfort on the Main Academy of Labor in Germany.

Brookwood Labor College [2]

BROOKWOOD College, founded in 1921, is a resident coeducational workers' institution located at Katonah, N. Y., about 40 miles from New York City.

The full course is two years of eight months each. The first-year courses are: How to study, training in speaking and writing, sociology, social economics, history of the American labor movement,

[2] Brookwood. Bulletin and announcement of courses, 1927. Katonah, N. Y. [1926?].

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current events, and labor dramatics. The second-year courses are: Sociology, the structure, government, and administration of trade-unions, trade-union organization, labor legislation and administration, foreign labor movements, speaking and writing, labor journalism, public speaking, statistics, workers' education, and the strategy of the labor movement.

Except in unusual cases, no student will be admitted to the college who has not worked in industry and who has not been a member of a labor union for at least a year. No examination nor specific scholastic preparation is required for entrance. In general, no student can enter without being prepared to pay $200 during each scholastic year. Exception, however, may be made to this regulation.

Farmer organizations and trade-unions are requested to establish scholarships of $450 per student per year, for which amount their candidates, if accepted, may avail themselves of the college courses without further obligation. Various scholarships have already been contributed, a limited number of them being at the disposal of the college. The charges for tuition and scholarships do not meet the total expenses of students for the year. To make up the deficit, each student gives seven hours of work a week. Such activities are assigned by a students' work committee and include dishwashing, waiting on the table, house cleaning, repair work, and clerical and library assistance.

A campaign for a building and endowment fund was begun in June, 1926.

Of the 19 members of the board of directors, 10 are selected by the labor members of the college corporation, 5 by the faculty, 2 by graduates, and 2 by students.

There is also a students' organization which is primarily responsible for student discipline, and also controls student activities and acts in an advisory capacity in educational matters.

Summer Labor Institutes

THE inauguration of summer institutes at Brookwood Labor College by important labor organizations is an interesting development of the workers' educational movement and is indicative of the increasing trend in trade-unionism toward the study and discussion of the larger aspects of industrial problems. Three of these conferences were held consecutively, July 12 to August 14, 1926, under the auspices, respectively, of the United Textile Workers of America, the International Brotherhood of Electrical Workers and Operators, and a group of railway labor unions.[3]

Textile Workers' Institute.—The Texile Workers' Institute, which opened July 12, was organized for the purpose of securing from the Brookwood faculty additional data as to the best possible methods the United Textile Workers of America could adopt to assist in stabilizing the textile industry. The discussion covered not only the matter of raw material used in the industry but also banking, trans-

[3] Data are from American Federationist, Washington, D. C., September, 1926, pp. 1100–1102; Journal of Electrical Workers and Operators, Washington, D. C., August, 1926, pp. 363–378, 402–403; Locomotive Engineers' Journal, Cleveland, September, 1926, pp. 656, 657, and 712; and Brookwood Review, Katonah, N. Y., May–June, 1926, pp. 1 and 3.

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portation, and distribution problems relative to the manufacture of textiles.

Electrical Workers' Giant-Power Conference.—A giant-power institute was in session from July 19 to 31 and was attended by delegates from 10 local unions of the International Brotherhood of Electrical Workers and Operators and representatives from several other labor organizations. Engineers, economists, and national labor officials were among the speakers, whose subjects included: The relation of giant power to the building trades; public ownership of giant power; mastering of power production; labor, the public and giant-power trends; the giant-power situation in Pennsylvania and in New York.

Railway Employees' Institute.—The program of the railway labor institute which met in the early part of August included the following addresses: The development of the railroad industry; activities of the Interstate Commerce Commission in the regulation of railroads and in the direction of transportation developments; company unions; analysis of the Parker-Watson Act; technical training and the effect of the new type of locomotive and of automatic train control on engineers; and benefits of union-management cooperation on several railroads.

Educational Activities of International Ladies' Garment Workers' Union

THE International Ladies' Garment Workers' Union was one of the first labor organizations in the field of workers' education in the United States.[4] The principle was approved at the Cleveland convention of the organization in 1914, and in the winter of 1917–18 the New York Board of Education allowed the use of four public schools as unity centers where popular lectures and courses might be given and meetings held under the auspices of the union. The Workers' University, which opened early in January, 1918, under the same auspices, is located in the Washington Irving School, New York City.

By 1923–24 there were eight unity centers operating in New York City and two others were organized, one in Boston and one in Philadelphia. According to a report made to the eighteenth convention of the International Ladies' Garment Workers' Union, held in December, 1925, the educational department of the organization had expanded and improved its work in the preceding 18 months. Numerous educational, health, and social activities were being carried on in the unity centers, and classes of an advanced character were being conducted at the Workers' University and at the International Ladies' Garment Workers' Union Building.

The 1926–27 Bulletin of the Educational Department of the International Ladies' Garment Workers' Union contains an outline of 29 courses under the auspices of that union. Eighteen of these courses are given at the Workers' University at Washington Irving High School, New York City; 5 at the unity centers or evening classes conducted in the public schools of the same city; and 6

[4] Levine, Louis: The Women's Garment Workers, A History of the International Ladies' Garment Workers' Union. New York, 1924.

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by the extension division in the offices of local unions for members who can not attend regular classes.

The titles of these various courses cover a wide range, such as The place of workers in history, Labor situation in basic industries, Economics of the women's garment industry, Shop economics, English, and Physical training.

Amalgamated Clothing Workers of America

A RESOLUTION passed at the seventh biennial convention of the Amalgamated Clothing Workers, held in Montreal in May, 1926, emphasizes the importance of the educational work of that organization and recommends that each local appoint an educational secretary. The resolution follows:

The convention calls upon all local organizations to renew the educational activities which were carried on in the previous years. It particularly emphasizes the following:

1. The educational forums conducted for the benefit of the larger numbers of our members and their families.

2. The publication of the almanacs and calendars approved by the Philadelphia convention of the Amalgamated Clothing Workers and which met with so much success in and outside of the organization.

The convention calls attention to the correspondence course in the economics of the clothing industry and the related problems, given by the education department. The course has been decidedly successful, and the success of it is due to the fact that an effort has been made to carry on educational activities in close relation to the problems of our own industries and of immediate significance to the life of our members. We recommend that this work be developed and members be encouraged to take up these studies.

The convention further recommends that efforts be made to organize children of the amalgamated members into junior amalgamated clubs or leagues and have these clubs or leagues linked with similar trade-union movements wherever such are developed for the purpose of bringing the children of our fellow members closer to the life and aspirations of their parents and the movement. The activities of these clubs or leagues should be kept free from specific or sectarian propaganda. They should attempt to develop in the children a sympathetic attitude toward an understanding of the struggle for a better life and a richer civilization such as the labor movement carries on.

The convention further recommends that in order to carry these decisions into the actual life and make them effective, each local union and joint board be requested to appoint an educational secretary as they see fit, upon whom shall rest the responsibility for developing the above educational activities, which are essential to the intellectual growth of our organization as well as to the growth of the economic power of our movement.

Headgear Workers' Educational Plan

THE interest of the Cloth Hat, Cap, and Millinery Workers' International Union in education is reflected in the following plan, agreed upon by the general education committee of that organization and approved by its general executive board in August, 1925:[5]

1. The committee shall have a meeting with the executive board of every local union in New York City to discuss and agree upon a program of educational work. Every local union may arrange its own educational work as it deems best. Whatever work the local may arrange, such as classes, forums, etc., will have the full cooperation of the general education committee.

2. The locals shall be urged to distribute the history of our union among our membership and to promote the sale of books on various phases of the labor movement published by the Workers' Education Bureau.

[5] The Headgear Worker, Long Island City, Sept. 25, 1925.

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3. An open forum shall be established on general labor problems to consist of a series of lectures and discussions under the auspices of the general education committee.

4. Arrangements shall be made for 12 musical evenings, with lectures and talks on current problems of the labor movement, to take place during the fall and winter.

5. [The librarian of the committee] was instructed to prepare a series of outlines to be used by the local officers at regular shop meetings for an introduction to a discussion on various trade-union and labor problems connected as far as possible with the current problems of the organization. Such an introduction not to take more than 20 minutes. The outline shall also contain recommended readings on the subject.

6. To invite active members and shop chairmen to write to The Headgear Worker about general union and shop problems, making any inquiries which are to be answered and explained by the editor in a special column devoted to this purpose. The Headgear Worker shall also devote some space to the outlines of lectures or educational articles which are especially necessary for the locals outside of New York.

7. The expenses of the educational activities shall be met partly by the local unions and partly by the general office, the contribution of the general office to be used primarily for the smaller locals who are not in a position to spend much for educational work.

Schools for Women

AMONG the more important educational undertakings for woman workers are the National Women's Trade Union League school for woman organizers, the Bryn Mawr Summer School, and the summer sessions attended by woman workers at the University of Wisconsin.

National Women's Trade Union League Training School.—The establishment of a school to train women in trade-union organization work was recommended at the 1913 convention of the National Women's Trade Union League of America and within the year the school was started in Chicago under the management of the officers and members of the league's executive board and a special committee. This school makes special academic training possible for trade-union girls who have shown an aptitude for leadership through work in their own locals. Under an arrangement with the educational department of the league the woman workers of this school are admitted as "unclassified students" for three months in the labor-problems class under the general political economy course at the University of Chicago. This three months' course is followed by field work and office practice. The educational opportunities afforded by this training school are made possible through the practical cooperation of friends of the National Women's Trade Union League of America.[6] Classes in English, parliamentary discussion, psychology, economics, literature, and sex hygiene have been organized by the Women's Trade Union League of New York and several other branches of the national league are cooperating in the workers' educational activities in their respective localities.

Bryn Mawr Summer School.—The Bryn Mawr College summer school for women in industry held its sixth session of eight weeks in 1926, and was attended by 102 students (including 5 colored girls) from 23 trades. Only about one-third of these industrial workers were trade-union members. The number of students in the past five years has averaged 100 per annum. Each girl who has a scholarship

[6] Life and Labor Bulletin, Chicago, May, 1925.

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is selected with care by a local committee and is obliged to attend local educational classes before she is admitted to the Bryn Mawr school.

Among the courses of study are: Modern industrial society, literature, social history, economics, psychology, English composition, public speaking, and physical training. The system of elective studies for the first and second year students has been carefully worked out.[7]

The composition courses are especially popular. When there was some question of the money needed to enlarge the teaching staff for such courses, the president emeritus of the college, M. Carey Thomas, declared: "We must have this additional assistance even if it means cutting somewhere else, for the school will be missing one of its real opportunities if it does not do all it can to help the labor movement find a voice and pen."[8]

The sense of freedom at the Bryn Mawr summer school is due to the fact that its operation is completely in the hands of a council made up of the faculty and students, which is responsible only to the joint administrative committee which has charge of the college building and grounds in summer.[8]

Wisconsin University Summer School.[9]—A summer school for working women was held in 1925 at the University of Wisconsin and fitted into the regular summer sessions. The 40 working women from 9 middle western States who constituted the newly inaugurated school took courses in English, economics, and physical education which were especially adapted to meet the needs of women wage earners. Teachers acted as leaders and counselors in class discussions, many of which were held in the open on the university campus. The 1926 session was also attended by 40 girls, about 2 to 1 being trade-unionists.

Characteristics of Trade-Union Colleges

AS STATED above, there are workers' colleges or classes in more than 300 industrial centers in some 40 States. Lloyd M. Crosgrave, field representative of the Workers' Education Bureau, sets forth some of the prevailing practices in such enterprises as follows:[10]

1. The workers' college usually consists of one or more classes conducted by adequate instructors. In addition to this, there is usually an open forum where matters of importance are thoroughly discussed.

2. The college is, as a rule, carried on under the auspices of a local labor organization. Generally it is the central trades and labor assembly in the particular city where the college exists, although there are cases in which trade-unions have their own college.

3. The students in the workers' college are, for the most part, adult wage earners.

4. The workers' college is conducted for the purpose of making its members more useful to themselves, to the labor movement, and to society in general.

5. The workers' college is self-determining so far as its practices are concerned. It decides what it shall study, when and where it shall meet, who shall

[7] Workers' Education, New York, August, 1926; "A brief review of summer schools and labor institutes," by Spencer J. Miller, jr.

[8] American Federationist, Washington, August, 1925, p. 655: "Bryn Mawr summer school," by Dr. Amy Hewes.

[9] American Federationist, Washington, October, 1925, pp. 943–945: "Wisconsin's summer school for working women," by John P. Troxell; Workers' Education, August, 1926, p. 37: "A brief review of summer schools and labor institutes," by Spencer J. Miller, jr.

[10] American Federationist, Washington, August, 1925, pp. 687, 688.

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be its instructors, how the classes shall be carried on, etc. As a rule, of course, it meets in the evening, and, if possible, it assembles in one or more labor halls, although frequently it is necessary to get other places because the halls may not be large enough or numerous enough. The teachers are usually persons who are connected with nearby educational institutions and who specialize in the subject they are called upon to teach. They are generally paid a sum of money for their assistance, $5 a night being a very common wage.

6. The most common subjects studied are: Public speaking, English composition, English literature, history of organized labor, and current labor problems.

A notable feature of some of the workers' colleges and classes is their liaison with important institutions for higher education. This relation has already been pointed out in the case of several schools for woman workers. Another outstanding instance is the inauguration of courses for workers at Springfield and Holyoke, Mass., by a joint executive committee comprised of two members of the faculty of Amherst College and two representatives each from the Holyoke Central Labor Union and the Springfield Labor Union. The Boston Trade Union College is in close touch with neighboring universities and avails itself of academic instruction and advice. The teachers at the Columbus (Ohio) Workers' College are members of the faculty of the State university and the Workers' College at Hamilton, which is controlled altogether by the local cooperative trades and labor council and draws its instructors mainly from Miami University. The Federated Trades Council of Colorado Springs has recently decided to maintain a chair in labor problems at Colorado College.[11]

The multiplication of summer courses and institutes for workers is another indication of the increasing momentum of their educational movement.

The labor chautauquas conducted in 1925 in mine district No. 2, Pennsylvania, were a new development and were conducted for the purpose of popularizing the miners' problems and convincing the community that these problems were its problems. The chautauquas are reported as having been very effective in holding the miners together during the strike.

Other Workers' Education Institutions

COMMONWEALTH College,[12] at Mena, Ark., is a resident school for the higher education of young men and women from working-class families. Three 30-week years of instruction are open to students who have a secondary-school education or its equivalent, while promising applicants who are not ready for college may be allowed to enter a two-year preparatory course as probationers. The general aim, according to the college announcements, is to fit students "for a life of cultural richness, coupled with practical social usefulness," with the special purpose of training them for social service work and activities in the labor movement.

The tuition fee at Commonwealth College is $100 per annum. Students work four hours a day at plowing, building, or whatever needs to be done in exchange for lodging, board, and laundry services. The teachers also take part in the communal or industrial work.

[11] The Brookwood Review, Katonah, March, 1926, p. 4.

[12] Labor Review, Washington, June, 1925, pp. 10, 11: "A new experiment in education for workers," by Harold Coy; press release from Commonwealth Workers' School, received Apr. 26, 1926.

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Under this arrangement the college can at present provide for only 50 students. Its 320-acre farm, however, is being developed; a cannery was to be operated in the summer of 1926, and the setting up of small shops was also in contemplation. The extension of such activities, the management hopes, will ultimately make the college entirely self-supporting.

The Rand School of Social Science, one of the oldest institutions in the United States for educating adult workers, is under the direction of the American Socialist Society. It receives support from the International Ladies' Garment Workers, the Amalgamated Clothing Workers, and the Workmen's Circle.[13] This institution offers opportunities for study of the aims and methods of the labor movement in the economic and political fields and endeavors "to give to participants in the movement such instruction and training as will make them more efficient workers for the cause of labor." Many thousands of young men and women have received instructions at this school and large numbers of them are taking an active part in the industrial and political organizations of the labor world.

The Workmen's Circle is a Jewish socialistic fraternal organization which has schools in about 40 cities in the United States and Canada. In 1924 approximately 5,000 students took about 10 hours' work a week after public school hours in Jewish history and literature and in the American and international labor movement.[14] The Work People's College, at Duluth, established in 1903, is under the auspices of the Industrial Workers of the World. The Workers' School, in New York City, is conducted by the Workers' (Communist) Party primarily for the training of party members and sympathizers. The American Labor Year Book for 1927 (p. 163) states that this is the largest single workers' school in the country.

[13] Hodgen, Margaret T.: Workers' Education in England and the United States, New York and London, 1925, p. 216.
[14] American Labor Year Book, 1925, New York, 1925, p. 219.

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WORKMEN'S COMPENSATION

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Workmen's Compensation in the United States, as of January 1, 1927 [a]

THE adoption of workmen's compensation for industrial injuries in lieu of the rule of the employer's liability for injuries due to his negligence stands out in its effect on the status of the worker as one of the most important legal-economic developments of modern times. A right to relief based on the fact of employment, practically automatic and certain, replaces the doubtful contest for a recovery based on proof of the employer's negligence and of the absence of the common-law defenses.

Recognition of the Principle

ABROAD, Germany in 1884 and Great Britain in 1897 and 1906 were influential in turning attention to the system of benefits for injuries due to employment, not necessarily to a proved negligent act. Laws of Maryland (1902, 1910) and Montana (1909) were results of early efforts to enact State laws, but without adequate regard for either legal or economic principles. The first official recognition of the principle by the Congress of the United States was the Federal act of 1908, providing limited benefits for designated classes of employees of the United States; though acts of 1882 (Life Saving Service) and 1900 (Postal Service) had made some provision of this nature for the services indicated.

Concurrently with these dates the subject came to attract quite general attention from State legislatures. Investigative commissions began to be provided for as early as 1903 (Massachusetts) and 1905 (Illinois), but no legislative results followed. Later commissions in both these States, and two and even three commissions in others, indicate the degree of caution with which the approach was made to the subject of compensation legislation. The following tables show the progress of action, both in the appointment of commissions and in the enactment of laws:

TABLE 1.—STATES, ETC., IN WHICH COMMISSIONS WERE APPOINTED AND IN WHICH COMPENSATION LAWS WERE ENACTED, BY YEARS, TO JUNE 30, 1926

State, etc.	Year commission was appointed	Year compensation law was enacted	State, etc.	Year commission was appointed	Year compensation law was enacted
Alabama	1915	1919	District of Columbia [1]		1919
Alaska		1915	Georgia		1920
Arizona		1912	Hawaii		1915
Arkansas	1919		Idaho		1917
California		1911	Illinois	1905	1911
Colorado	1911	1915	Indiana	1913	1915
Connecticut	1907	1913	Iowa	1911	1913
Delaware	1911	1917	Kansas		1911

[1] Public employees only.

[a] Except for the statement relative to the longshoremen's and harbor workers' act of 1927 on p. 683, the data herein are as of January 1, 1927.

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TABLE 1.—STATES, ETC., IN WHICH COMMISSIONS WERE APPOINTED AND IN WHICH COMPENSATION LAWS WERE ENACTED, BY YEARS, TO JUNE 30, 1926—Contd.

State, etc.	Year commission was appointed	Year compensation law was enacted	State, etc.	Year commission was appointed	Year compensation law was enacted
Kentucky	[2] 1915	[3] 1914 1916	Ohio	1910	1911 1915
Louisiana	1912	1914	Oregon	[4] 1911	1913
Maine		1915	Pennsylvania	1911	1915
Maryland	[4] 1913	1912	Philippine Islands		1905
Massachusetts	1903	1911	Porto Rico	1913	1916
Michigan	1911	1912	Rhode Island		1912
Minnesota	[4] 1909	1913	South Dakota		1917
Missouri	1910	[5] 1919 1925	Tennessee	1913	1919
			Texas	1911	1913
Montana	[3] 1910	[3] 1909 1915	Utah	1915	1917
			Vermont	1913	1915
Nebraska	1911	1913	Virginia	1916	1918
Nevada		1911	Washington	[4] 1910	1911
New Hampshire		1911	West Virginia	[4] 1911	1913
New Jersey	1910	1911	Wisconsin	1909	1911
New Mexico		1917	Wyoming		1915
New York	1909	[6] 1910 1913	United States	1910	1908 1916
North Dakota	1911	1919			

[2] Voluntary.
[3] Law declared unconstitutional.
[4] Appointed by the governor.
[5] Rejected on referendum.
[6] Two laws, one (compulsory) declared unconstitutional.

TABLE 2.—NUMBER OF WORKMEN'S COMPENSATION COMMISSIONS AND LAWS, BY YEARS

Year	Commissions formed or provided for	States, etc., enacting original law	Year	Commissions formed or provided for	States, etc., enacting original law	Year	Commissions formed or provided for	States, etc., enacting original law
1903	1	(1)	1911	12	10	1917		5
1905	1		1912	1	4	1918		1
1907	2		1913	7	7	1919	1	4
1908		[2] 1	1914		2	1920		1
1909	3	1	1915	3	9			
1910	8	1	1916	1	1	Total	40	47

[1] Philippine Islands. [2] United States.

The 40 commissions above accounted for operated in 32 jurisdictions, while laws have been enacted by the legislatures of 43 States, the Territories of Alaska and Hawaii, the Philippine Islands, and Porto Rico, and by Congress for the civil employees of the Federal Government and for the employees of the government of the District of Columbia. Not every law has been preceded by a commission, therefore; but every commission except that of Arkansas, appointed in 1919, has been followed by the enactment of a law, though in some cases so remotely as to suggest a lack of any real connection between the two events. Indeed, the United States commission considered only a statute relating to railroad employees, as to whom no law has yet been enacted. The year 1911 was marked by the creation of the largest number of commissions as well as by the enactment of the largest number of laws. But one investigative commission has been appointed since 1916—that of Arkansas—said to be to remove constitutional objections to a pending bill; only five have been created since 1913, and it is obvious that the day of their usefulness is ended,

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either as an aid in determining the desirability of compensation legislation or of working out deviations from accepted standards so as to meet supposed local peculiarities.

Progress of Legislation

REFERENCE to the foregoing tables discloses both the progress and extent of compensation legislation. All laws now on the statute books have either followed the investigations of commissions or have been enacted under conditions making the results of such commissions available to those interested.

The first of the laws of this class is the elective compensation law of New York, 1910, followed at the same session by a compulsory law for hazardous occupations. The latter law was declared unconstitutional after a very brief term of existence, but after an amendment to the constitution a new law was passed which has been sustained by both the State and the Federal courts.

Of the 10 laws enacted in 1911, 7 provided for simple compensation, 3 containing also provisions for insurance; while in 1912, three States enacted compensation laws and one an insurance law; in 1913 seven States were added to the list, in five of which compensation only was provided for, while in two there is also a system of insurance. In 1914 compensation laws were enacted in two States, though in one (Kentucky) the law was declared unconstitutional before the time for it to take effect. Of the 10 new laws enacted in 1915 (one taking the place of the unconstitutional statute of Montana), 9 provided for compensation merely, while 1 established an insurance system. A new compensation law was passed in Kentucky in 1916, in lieu of the earlier law declared unconstitutional; this and a law of Porto Rico which requires the insurance of the liabilities fixed by it are the only new laws of the year, though important amendments were made in Louisiana and New York. Indeed, practically every year is marked by amendments whose tendency is in general to strengthen the laws and enlarge their scope.

The extension of compensation legislation to five additional States in 1917, one in 1918, four in 1919, besides the inclusion of public employees of the District of Columbia, and one in 1920, marks the present bounds of compensation legislation. Of these, two of the laws of 1918, one in 1919, and the Arizona law of 1925, provide for a State insurance system, though in only one of them is this system exclusive. The Missouri enactment of 1919 was rejected by a referendum vote, as was one of 1923. A new enactment (1925) was voted on in November, 1926; it was adopted, coming into administrative effect November 16, 1926, and as to compensation payments on January 9, 1927.

The table following shows in chronological order the States, etc.,[1] that have enacted compensation laws.

[1] In the discussion that follows the word " State " will be used to include all jurisdictions, Territorial and other.

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TABLE 3.—STATES HAVING COMPENSATION LAWS, WITH THE DATE OF THEIR ENACTMENT AND COMING INTO EFFECT

State	Approved	Effective	State	Approved	Effective
United States [1]	May 30, 1908	Aug. 1, 1908	Wyoming	Feb. 27, 1915	Apr. 1, 1915
Washington	Mar. 14, 1911	Oct. 1, 1911	Indiana	Mar. 8, 1915	Sept. 1, 1915
Kansas	do	Jan. 1, 1912	Montana [2]	do	July 1, 1915
Nevada	Mar. 24, 1911	July 1, 1911	Oklahoma	Mar. 22, 1915	Sept. 1, 1915
New Jersey	Apr. 4, 1911	July 4, 1911	Vermont	Apr. 1, 1915	July 1, 1915
California	Apr. 8, 1911	Sept. 1, 1911	Maine	do	Jan. 1, 1916
New Hampshire	Apr. 15, 1911	Jan. 1, 1912	Colorado	Apr. 10, 1915	Aug. 1, 1915
Wisconsin	May 3, 1911	May 3, 1911	Hawaii	Apr. 28, 1915	July 1, 1915
Illinois	June 10, 1911	May 1, 1912	Alaska	Apr. 29, 1915	July 28, 1915
Ohio	June 15, 1911	Jan. 1, 1912	Pennsylvania	June 2, 1915	Jan. 1, 1916
Massachusetts	July 28, 1911	July 1, 1912	Kentucky [2]	Mar. 23, 1916	Aug. 1, 1916
Michigan	Mar. 20, 1912	Sept. 1, 1912	Porto Rico	Apr. 13, 1916	July 1, 1916
Rhode Island	Apr. 29, 1912	Oct. 1, 1912	South Dakota	Mar. 10, 1917	June 1, 1917
Arizona	June 8, 1912	Sept. 1, 1912	New Mexico	Mar. 13, 1917	June 8, 1917
West Virginia	Feb. 22, 1913	Oct. 1, 1913	Utah	Mar. 15, 1917	July 1, 1917
Oregon	Feb. 25, 1913	July 1, 1914	Idaho	Mar. 16, 1917	Jan. 1, 1918
Texas	Apr. 16, 1913	Sept. 1, 1913	Delaware	Apr. 2, 1917	Do.
Iowa	Apr. 18, 1913	July 1, 1914	Virginia	Mar. 21, 1918	Jan. 1, 1919
Nebraska	Apr. 21, 1913	July 17, 1913	North Dakota	Mar. 5, 1919	July 1, 1919
Minnesota	Apr. 24, 1913	Oct. 1, 1913	Tennessee	Apr. 15, 1919	Do.
Connecticut	May 29, 1913	Jan. 1, 1914	Dist. of Columbia [1]	July 11, 1919	Do.
New York [2]	Dec. 16, 1913	July 1, 1914	Alabama	Aug. 23, 1919	Jan. 1, 1920
Maryland	Apr. 16, 1914	Nov. 1, 1914	Georgia	Aug. 17, 1920	Mar. 1, 1921
Louisiana	June 18, 1914	Jan. 1, 1915	Missouri [3]	Apr. 30, 1925	Nov. 16, 1926

[1] Public employees only.
[2] Earlier laws of Montana (1909), New York (1910), and Kentucky (1914) were declared unconstitutional.
[3] The law of Missouri was suspended awaiting the results of a referendum.

The dates given above are the dates of the actual inception of compensation methods in the various jurisdictions. As indicated by the footnotes, earlier laws were enacted in a few States, but were never really operative. The existing laws of a number of jurisdictions, widely differing in some instances from those enacted at the dates given above, are of more recent enactment; but the operation of a compensation law has been continuous since the original act became effective. There are, therefore, at present but five States in the southeastern portion of the Union that are without compensation laws.[2] Efforts have been made, and are continuing, to secure legislation in some, at least, of these States.

Important fields of legislation lie outside of State control, however, and Congress has delayed action in areas exclusively within its jurisdiction. Thus, in the exercise of its function as local legislature for the District of Columbia, although 43 of the 48 States represented have compensation laws, it has thus far failed to provide for private employments in the District, where an antiquated and rigorous interpretation of the common law is the sole recourse of injured workers.

Employees in interstate commerce are also dependent on Congress for remedial legislation, which thus far consists only in a liberalization of the employers' liability rule by acts of 1908 and 1910. Originally applicable only to carriers by railroad, an act of 1915, amended in 1920 (41 Stat. 988, 1007), extends to injured seamen the same rights and remedies as are granted to railroad employees by these acts. As above stated, a Federal commission made an extensive study in 1911–12, of the subject of compensation for injured railroad employees, reporting a bill which passed both Houses, but with amendments that were not agreed upon when the Congress expired. Occa-

[2] North Carolina, South Carolina, Florida, Mississippi, and Arkansas.

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sional movements for a law have been made since 1912, but no bill has ever even been reported out.

Another group of workers that occupy a very anomalous position is also dependent on Congress for relief, and that is those engaged in maritime employments. The longshoremen and harbor workers generally are localized, but for at least a part of the time are within maritime jurisdiction. Two attempts have been made to amend the Judicial Code so as to permit the application of local compensation laws, but the Supreme Court has held both acts unconstitutional as attempting to remit to the divergent statutes of the States a subject that requires uniform treatment at the hands of Congress alone. In the meantime the act of 1915, 1920, relative to seamen, was passed, but was promptly held not to apply to longshoremen. (The Hoquiam (1918), 253 Fed. 627, 165 C. C. A. 253.) This construction prevailed for a number of years, until a decision of the Supreme Court on October 18, 1926, to the effect that the act of 1920, relating to seamen, is applicable to longshoremen. (International Stevedoring Co. *v.* Haverty, 47 Sup. Ct. 19.) This decision relates to longshoremen only, and not to the very extensive group of harbor workers, repair men, etc., who are also subject at times to maritime jurisdiction.

In 1926, a bill to compensate longshoremen and harbor workers generally was considered by both Houses of Congress, passing the Senate June 3, 1926. It remained in the hands of the House Judiciary Committee until January 14, 1927, when the measure was reported out in an amended form. Subsequent amendments brought the bill into an approved form, and it became a law March 4, 1927, in effect July 1, 1927, as the exclusive remedy for the classes of maritime workers (crews and masters of vessels being excluded) covered by the act. This act compensates occupational diseases as well as accidental injuries, pays 66⅔ per cent of wages as benefits, subject to a weekly maximum of $25, and is administered by deputy commissioners appointed by the United States Employees' Compensation Commission, which formulates rules for the administration of the act.

Besides the statutory enactments noted above, there have been constitutional provisions made in a number of States, adopted with a view to the removal or forestalling of objections to compensation legislation on grounds of constitutionality. Thus the constitution of Arizona, adopted on the admission of that State into the Union in 1910 (amended 1925), provides specifically for the enactment of a compensation law. Amendments in favor of such legislation were adopted in 1911 in California, in 1912 in Ohio (again amended, 1923), in 1913 in New York and Vermont, in 1914 in Wyoming, and in 1915 in Pennsylvania. In Oklahoma alone, of all the States where the question has been submitted to the people, was such an amendment rejected. This took place on August 1, 1916, the amendment failing along with eight others submitted at the time. Of this it has been said that the questions passed upon were rejected as a whole on account of other facts than the attitude of the public toward this particular subject.

The importance of such amendments to the Constitution as preliminary to the enactment of compulsory laws has been greatly discounted by reason of decisions of the Supreme Court of the United States upholding compensation laws of various types and form as

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not in conflict with constitutional provisions; so that in the absence of specific limitations which may be found by way of exception in some State constitutions no bar appears to the enactment of a compensation law compulsory in form and of general application. However, in but two States (California and Illinois) thus far has an original elective law been supplanted by a compulsory one.

Nature of Laws

THE rapid growth of compensation legislation, involving, as it has, the almost simultaneous enactment of laws in a number of States, has operated to prevent the adoption of any one form of law as a type, so that, although a single fundamental principle underlies the entire group of laws of this class, its expression and application present great diversity of details in the different States. This extends not only to the primary factors of the scope of the laws and the amount of compensation payable under them but also to the matter of making the laws compulsory or voluntary in their acceptance, the securing or not securing the payments of the benefits, the mode of securing where it is required, methods of administration, of election or rejection, etc.

No fixed form of analysis or summary presentation can give in complete detail the provisions of the laws under consideration. They relate not only to the compensation of accidents but to accident reporting, safety provisions, the enforcement of safety laws, the establishment of insurance systems, premium rates, investments, the scaling of payments in cases of certain forms of negligence or their increase under certain conditions, procedure in arbitration, forms of appeal, and a great variety of subjects on which it would be impossible to generalize, and which can be discovered only by a reading of the individual statutes, though the use of the index to the laws will aid in this. The adoption by a few States of laws generally similar can be clearly recognized, but it is obvious that at the present time it can not be said that any one type of law is predominantly approved. However, it seems none the less certain that the welfare of both employer and employee, as well as the public interest generally, would be served by the general adoption of uniform laws, just and certain in their operations, and not dependent for their acceptance on the personal views or interests of individuals or groups of individuals.

It is encouraging to note in this connection that though there is such diversity and a manifest disposition on the part of some administrative and legislative bodies to regard variations as warranted by local conditions, if not absolutely desirable, there are certain discoverable tendencies to move in a common direction and thus approach a common end. In several States amendments have been made at every session of the legislature since the original enactment.

These changes liberalize the laws by reducing the waiting time, increasing the amount of benefits paid, either by percentage increases, raising the maximum, or both, and by increased medical aid. There are also some extensions of inclusions or coverage, while occupational diseases have been recognized as compensable until at the present time there are 12 States and the Federal Government caring for such

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injuries. The percentage of wages paid as compensation is now 65 in 5 States and 66⅔ in 12 States, and in the Federal statutes; so that 25 States, as against 20 at the beginning of the year 1920, pay 60 per cent or more.

In 1920, 16 States fixed the maximum weekly payments at $12 or less. Now no State has a maximum less than $12 for temporary total disability, and only 6 have as low a standard as that, while 13 pay $18 or more, as against 5 at the earlier date. The waiting time is now less than one week in 9 jurisdictions, one week in 28, and more than one week in 10, while at the earlier date only 4 laws fixed a waiting time of less than one week, 22 of one week, and 20 of more than one week.

Another change that indicates a recognition of the previous (and in many cases continuing) inadequacy of relief consists of amendments making permanent partial disability payments additional to the payments for temporary total disability, or the healing time. Such changes have been made comparatively recently in Colorado, Georgia, Hawaii, and New Mexico; while in New York, if the healing time is protracted beyond specified periods, the schedule for partial disability payments is correspondingly extended. The restriction on term and amount of payments by way of medical relief has been raised or eliminated in a few States in recognition of the importance of adequate treatment to restore the injured man to his employment. In two States new requirements as to insurance have been made.

In most States (32) the employer and employee may exercise a choice as to accepting the provisions of the compensation law. Election by the employer is presumed in a majority of the States, but in 10[3] positive action is required. Where the employer rejects the law actions for damages may be brought without the customary common-law defenses. Where he elects to accept the provisions of the law, the acceptance by the employee is taken for granted, in the absence of rejection, except in Kentucky, where positive acceptance is required. In New Hampshire the employee may make his choice of remedy after the injury has been received. If the employer has accepted and the employee rejects the law, actions for damages are subject to the common-law defenses, except in 2 States (New Jersey and Pennsylvania), where the defenses are abrogated absolutely.

The laws are compulsory in 14 States, neither employer nor employee having the option of choosing another remedy, except in Arizona, where a workman may elect prior to the injury not to come under the act. Suit is permitted in a number of States if the employer has failed to insure or permits premiums to remain unpaid.

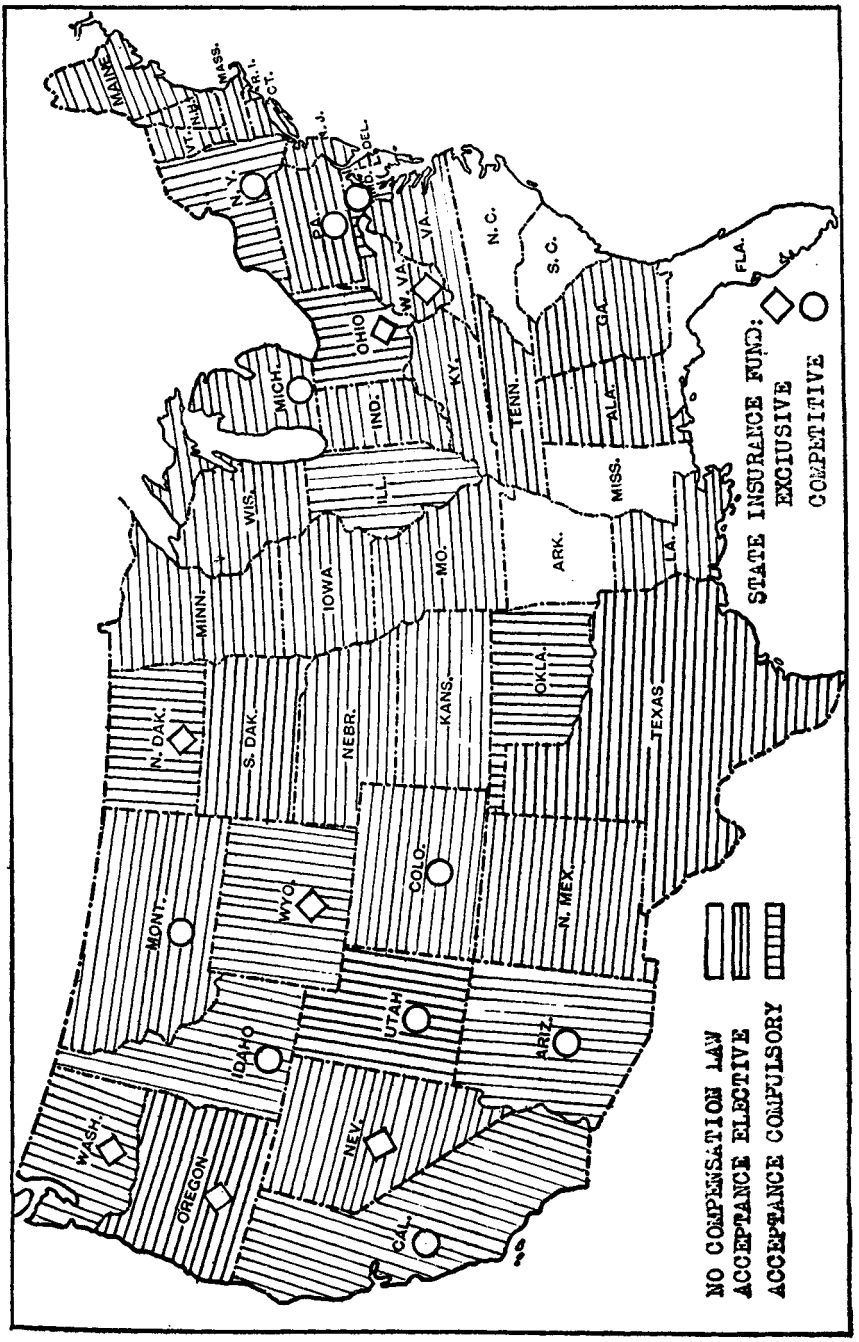
No law is of complete coverage, and the terms "elective" and "compulsory" apply to the laws in regard to the occupations said to be covered by the acts. Employers in other occupations than those so classed as "covered" may generally accept the terms of the acts, but forfeit no defenses by failure to do so.

The following map indicates the extent of compensation legislation in the United States and whether its acceptance is elective or com-

[3] Kentucky, Maine, Massachusetts, Michigan, Montana, Nevada, New Hampshire, Rhode Island, Texas, and West Virginia.

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pulsory; also what States have insurance funds managed by State officials and whether exclusive or competing with other insurance carriers:



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Comparison of Compensation and Insurance Systems

INSURANCE of the employer's liability to pay compensation is recognized as an essential feature of the system in all but three [4] jurisdictions. This may be effected through private insurance (stock or mutual companies), self-insurace (proof of solvency, with or without the giving of a bond or other security), or by insurance in State funds, which may be exclusive or competitive.

The following table shows for each compensation State whether compensation is compulsory or elective, and the forms of insurance provided for by the various laws. This table relates only to private employments; for while public employments are covered in whole or in part in most States, and compulsorily in some where the law is elective as to private employments, the subject is of less general interest and complexity.

TABLE 4.—COMPENSATION AND INSURANCE SYSTEMS

State	Compensation compulsory (14) or elective (32)	Insurance required in—	
		State fund: Exclusive (8) or competitive (11)	Private companies (34) or by self-insurance (35)
Alabama	Elective		
Alaska	do		
Arizona	Compulsory [a]	Competitive	Either.
California	do	do	Do.
Colorado	Elective	do	Do.
Connecticut	do		Do.
Delaware	do		Do.
Georgia	do		Do.
Hawaii	Compulsory		Do.
Idaho	do	Competitive	Do.
Illinois	do		Do.
Indiana	Elective [b]		Do.
Iowa	do		Do.
Kansas	do		
Kentucky	do		Do.
Louisiana	do		Do.
Maine	do		Do.
Maryland	Compulsory	Competitive	Do.
Massachusetts	Elective		Private companies.
Michigan	do	Competitive	Either.
Minnesota	do		Do.
Missouri	do		Do.
Montana	do	Competitive	Do.
Nebraska	do		Do.
Nevada	do	Exclusive	
New Hampshire	do		Self-insurance. [c]
New Jersey	do		Either.
New Mexico	do		Do.
New York	Compulsory	Competitive	Do.
North Dakota	do	Exclusive	
Ohio	do	do	Self-insurance. [d]
Oklahoma	do		Either.
Oregon	Elective	Exclusive	
Pennsylvania	do	Competitive	Do.
Porto Rico	Compulsory	Exclusive	
Rhode Island	Elective		Do.
South Dakota	do		Do.
Tennessee	do	Competitive [e]	Do.
Texas	do		Private companies.
Utah	Compulsory	Competitive	Either.
Vermont	Elective		Do.
Virginia	do		Do.
Washington	Compulsory	Exclusive	
West Virginia	Elective	do	Self-insurance. [c]
Wisconsin	do		Either.
Wyoming	Compulsory	Exclusive	

[a] As to employers.
[b] Compulsory as to coal mining.
[c] Self-insuring employers must contribute to maintenance of State fund system.
[d] Employers accepting the act must furnish proof of solvency or give bond; no other provision as to insurance.
[e] Coal mining only.

[4] Alabama, Alaska, and Kansas.

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Of the 43 States requiring insurance, 19 have provisions for a State fund, though in Tennessee this is by a separate act limited to coal mining only. In 8 of these the fund is exclusive, acceptance of the system being also compulsory in 5 of this group. In Ohio and West Virginia approved risks may be carried by the employers themselves, but under condition that contribution is made to the State-fund system. In 11 States the system is competitive.

Of the 34 States permitting insurance in private companies, all but 2 (Massachusetts and Texas) permit self-insurance as well; and of the number permitting self-insurance (35), all but 3 (New Hampshire, Ohio, and West Virginia) also permit private insurance. Indeed it would seem that employers in New Hampshire are free to take out private insurance, and that there is both statutory and administrative weakness in the lack of more definite requirements that insurance be secured.

The somewhat anomalous provisions of the Idaho statute seem to contemplate an exclusive State fund, but with an option for self-insurance and the deposit of a surety bond or guaranty contract as one means of satisfying the industrial accident board as to the security of payments. The reports of the board indicate, however, that the system is competitive in practice, and that approved private companies are admitted to do business in the State.

A sort of State mutual system, supervised by the State but managed by the employers, is provided for in 3 States (Kentucky, Massachusetts, and Texas), but these are, in effect, only private competing organizations.

Scope or Coverage

NO LAW undertakes to cover all employments. Various restrictive provisions are employed, the most important numerically being the exclusion of agriculture and domestic service. Interstate commerce is exempt by reason of the exclusive action of Congress, though its law creates liability and does not provide compensation. Laws that apply only to "hazardous" or "extrahazardous" employments exclude others, thereby distinguished as "nonhazardous." Casual employments are usually exempted, and those not for gain frequently.

Hazardous employments.—States whose laws apply only to hazardous employment are 12 in number—Illinois, Kansas, Louisiana, Maryland, Missouri (when there are less than 10 employees), Montana, New Hampshire, New Mexico, Oklahoma, Oregon, Washington, and Wyoming. Enumeration is made in the laws, but it is not complete in several, a blanket clause being used in some, while in others the commission or board may make additions. The principal industrial employments, with the exception of interstate transportation, are uniformly included in these lists.

Numerical exemptions.—Employers of less than a stipulated number of employees are exempt from the operation of the laws of 23 States. Voluntary acceptance is generally provided for, as is the case in regard to employments not classed as hazardous. The following table shows the list of States in which the number of employees determines coverage:

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TABLE 5.—STATES MAKING NUMERICAL EXEMPTIONS, BY MINIMUM REQUIREMENTS

Employers are exempt who have less than—							
2 employees (1)	3 employees (6)	4 employees (3)	5 employees (6)	6 employees (2)	10 employees (2)	11 employees (2)	16 employees (1)
Oklahoma.	Arizona. Kentucky. Ohio. Texas. Utah. Wisconsin.	Colorado. New Mexico. New York.[1]	Alaska. Connecticut. Delaware. Kansas. New Hampshire. Tennessee.	Maine. Rhode Island.	Georgia. Missouri.	Vermont. Virginia.	Alabama.

[1] Numerical exemption applies only in case of nonhazardous employments.

Agriculture and domestic service.—The exclusion of agriculture is universal among the compensation laws of the United States except in Hawaii and New Jersey; and of domestic service except in New Jersey. Voluntary acceptance of the laws in these occupations is quite generally provided for, though in some cases it appears that their exclusion is intended to be absolute. Threshing grain, etc., is specifically included in Kentucky, Minnesota, and South Dakota (separate act).

Public employment.—Employees in the service of the State and its subdivisions and municipalities are included generally in 26 States; in several of these the inclusion is compulsory where the law is elective as to private undertakings. The States are: Arizona (if receiving not over $2,400), California, Colorado, Connecticut, Hawaii, Idaho (if receiving not over $2,400), Illinois, Indiana, Louisiana, Maine, Michigan, Montana, Nebraska, Nevada, New Jersey (if receiving not over $1,200), New York, North Dakota, Ohio, Oregon, Pennsylvania, Porto Rico, Rhode Island, South Dakota, Utah, Virginia, West Virginia, and Wisconsin.

In 14 States there is a partial inclusion of public employees (Alabama, Delaware, Georgia, Iowa, Kansas, Kentucky, Maryland, Massachusetts, Minnesota, Oklahoma, Vermont, Washington, and Wyoming).

Public employees are excluded in seven States (Alaska, Missouri, New Hampshire, New Mexico, Tennessee, and Texas), though in Missouri and Tennessee the law authorizes an affirmative acceptance of its provisions by the State, its counties, and municipal corporations.

Other exclusions.—Employees whose employment is but casual and (sometimes "or") not in the usual course of the employer's trade or business are quite generally excluded, while outworkers are mentioned in a few laws. Exclusion of employees receiving above a designated wage or salary is provided in a few States, as follows: Hawaii ($36 per week), Missouri ($3,600 per year), North Dakota (executive officers receiving more than $2,400 per year), Porto Rico ($1,500 per year), Rhode Island ($3,000 per year), and Vermont ($2,000 per year).

The abrogation of the common-law defenses in suits against nonelecting employers does not apply to logging operations under the law of Maine. Clerical and other occupations not subject to the hazards of the employment are excluded in a few States.

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Occupational Diseases

NO LAW in its original enactment made specific provision for compensating occupational diseases. The dominant idea of accident has given way by degrees, however, until at the present time 12 States and the Federal Government provide compensation, either for occupational diseases generally or for designated diseases of this class. The Federal statute and that of North Dakota include under the term "injury" any "disease proximately caused by the employment," while that of California compensates for "any injury or disease arising out of the employment." The other laws are generally more restrictive in their terms. The States recognizing occupational diseases as entitled to compensation are California, Connecticut, Hawaii, Illinois (in certain employments by separate act), Massachusetts (by court decision), Minnesota (list), New Jersey (list), New York (list), North Dakota, Ohio (list), Porto Rico (list), Wisconsin, and the United States. The law of Kentucky also, by recent amendment, includes "injuries or death due to the inhalation in mines of noxious gases or smoke, commonly known as 'bad air,' and also shall include the injuries or death due to the inhalation of any kind of gas."

Election

IN 22 of the 32 elective States, election is presumed in the absence of active rejection, this presumption affecting both employer and employee. In 10 States the employer must take positive action, but if he acts the employee's acceptance is presumed, except in Kentucky, where he must sign an acceptance. In 7 of these (Kentucky, Maine, Michigan, Montana, Nevada, New Hampshire, and Rhode Island) acceptances are filed with designated State authorities, while in the other 3 (Massachusetts, Texas, and West Virginia) the act of insuring signifies election.

Inducement to election is offered by the abrogation of the common-law defenses where the employer rejects the law and by continuing them in effect where a rejecting employee sues an employer who has accepted it. Exceptions to this are the laws of New Jersey and Pennsylvania, which abrogate the defenses absolutely, without regard to the acceptance or rejection of the act.

Suits for Damages

ACTIONS for damages are generally forbidden where both parties have accepted the act, but in New Hampshire (an elective State) the employee may, after his injury, choose which remedy he will pursue. Where under an elective law the employer has accepted the act, a rejecting employee may sue, but the employer retains the common-law defenses, except in New Jersey and Pennsylvania. Upon failure of an employer to provide the insurance required by the act or his default in premiums, the employee may, in 24 States,[5] bring

[5] Arizona, California, Connecticut, Delaware, Indiana, Iowa, Kentucky, Maryland, Michigan, Montana, Nebraska, Nevada, New York, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Dakota, Tennessee, Utah, West Virginia, and Wyoming.

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action for damages with the common-law defenses removed. Suit may be brought also in 9 States [6] if there is "intent" or "deliberate intent" on the part of the employer to injure, or if the injury is due to his gross negligence or willful misconduct. No suits are permitted in 16 States.[7]

Waiting Time

MOST laws require a minimum duration of disability as a condition to the payment of compensation benefits. This does not apply to medical and hospital relief, which is to be provided at once. Two States require no waiting time. Conflicting provisions of the South Dakota statute call for 10 days' waiting time on the one hand, and for compensation from date of injury on certification of disability on the other. In practice the latter provision is said to prevail.

In several States the waiting time is compensated for if the disability continues for a specified term; or a part may be taken up in each of certain consecutive weeks until all is compensated for.

The following table shows the waiting time required in each State; also the number of weeks of disability required for the payment of compensation from date of injury, shown in the figure in parentheses following the name of the State:

TABLE 6.—WAITING TIME REQUIRED BY EACH STATE, AND TERM REQUIRED FOR FULL PAYMENT

No waiting time (2)	3 days (5)	5 days (1)	1 week (31)	10 days (4)	2 weeks (4)
Oregon. South Dakota.[a]	Maryland. Missouri (4). Utah. Washington. United States.	Oklahoma.	Alaska (8). Arizona (2). California. Connecticut (4). Georgia. Hawaii.[b] Idaho.[c] Illinois (4). Indiana. Kansas. Kentucky. Louisiana (6). Maine. Massachusetts (4). Michigan (6). Minnesota (4). Nebraska (6). Nevada (1). New Hampshire (1). New Jersey (7). New York (7). North Dakota (1). Ohio. Porto Rico. Rhode Island (4). Tennessee (6). Texas. Vermont. West Virginia. Wisconsin (3). Wyoming (3).	Colorado. New Mexico. Pennsylvania. Virginia (6).	Alabama (4). Delaware (4). Iowa.[d] Montana (6).

[a] By administrative construction of conflicting provisions.
[b] From first day of disability in case of partial disability, but no adjudication until after two weeks.
[c] One-third taken up in each of fifth, sixth, and seventh weeks of disability.
[d] From date of injury in case of permanent partial disability; in other cases, one-third is taken up in each of fifth, sixth, and seventh weeks of disability.

[6] Arizona, Kentucky, Maryland, Oregon, Porto Rico, Texas, Utah, Washington, and West Virginia.
[7] Alabama, Alaska, Colorado, Hawaii, Idaho, Illinois, Kansas, Louisiana, Maine, Massachusetts, Minnesota, New Jersey, New Mexico, Vermont, Virginia, and Wisconsin.

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Compensation Scale

THE amounts actually payable under the acts are determined by three factors, the rate (usually a percentage of the wages), term, and (in most States) a fixed maximum weekly or total payment, or both.

Per cent of wages.—In all but two States (Washington and Wyoming) the amount of compensation is based upon wages. A few States, however, provide fixed lump sums or pensions for certain injuries, but apply the percentage system to all others. In most of the States the prescribed percentage remains uniform for all injuries. A few States have varying percentages for different types of injuries, and in several the percentage varies with conjugal condition and number of children.

Using as a basis the rates for temporary total disability, it appears that 50 per cent of the employees' wages is allowed in compensation in 16 States (Alabama (60 per cent if two or more children), Alaska, Colorado, Connecticut, Delaware, Georgia, Illinois (65 per cent if three or more children), Montana, New Hampshire, New Mexico, Oregon (40 to 66⅔ per cent, according to number of dependents), Porto Rico, Rhode Island, Tennessee, Vermont, and Virginia); 55 per cent in 3 States (Idaho (increased 5 per cent for each child, total payments not over $16 weekly), Indiana, and South Dakota); 60 per cent in 8 States (Hawaii, Iowa, Kansas, Michigan, Nevada, Pennsylvania, Texas, and Utah); 65 per cent in 5 States (Arizona, California, Kentucky, Louisiana, and Wisconsin); and 66⅔ per cent in 12 States (Maine, Maryland, Massachusetts, Minnesota, Missouri, Nebraska, New Jersey, New York, North Dakota, Ohio, Oklahoma, and West Virginia), and also under the Federal statute.

Maximum term and amount.—It is obvious that the reduction of a workman's income by one-half or even by one-third, the most liberal percentage provision, leaves a large proportion of his loss uncompensated. But to restrict further the burden on the employer, even though it transfers it necessarily to the injured employee and his family, the term of payment is not fixed by the period of disability in most States, but by an arbitary maximum; death benefits likewise rarely continue for the period of their probable need.

The table following shows for the various States the maximum period and amount of benefits in case of death, permanent total disability, and partial disability. The limitations are in many cases more restrictive for temporary total disability than for permanent total disability, though, where the latter is compensated for life, the former is as a rule compensated during its continuance. In a few cases the rates for temporary disability are higher than for permanent disability. The provisions as to partial disability here reproduced are distinct from those contained in the schedules found in most laws.

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TABLE 7.—MAXIMUM PERIODS AND MAXIMUM AMOUNT OF COMPENSATION PAYABLE IN CASE OF DEATH, PERMANENT TOTAL DISABILITY, AND PARTIAL DISABILITY

State	Death		Permanent total disability		Partial disability	
	Weeks	Amount	Weeks	Amount	Weeks	Amount
Alabama	300	$5,000	550	$5,000	300	
Alaska		7,800		7,800		$6,240
Arizona	Death or remarriage.		Life.		During disability.	
California		5,000	Life.		[1] 240	5,000
Colorado	312	3,750	Life.		During disability.	3,120
Connecticut	312		520		520	
Delaware	[2] 285		475	4,000	285	
Georgia	300	5,000	350	5,000	300	
Hawaii	312	5,000	312	5,000	312	5,000
Idaho	400		Life.		150	
Illinois		4,350	Life.		416	
Indiana	300	5,000	500	5,000	300	
Iowa	300		400		225	
Kansas		3,800	416		416	
Kentucky	335	4,000	416	6,000	335	4,000
Louisiana	300		400		300	
Maine	300	4,000	500	6,000	300	
Maryland	416	5,000	Life.	5,000		3,750
Massachusetts	500	4,000	500	4,000	During disability.	4,000
Michigan	300		500	7,000	500	
Minnesota	Death or remarriage.[3]		Life.	10,000	300	
Missouri	300		[4] 300		100	
Montana	400		500		150	
Nebraska	350		Life.		300	
Nevada	Death or remarriage.		Life.		260	
New Hampshire		3,000	300		300	
New Jersey	[5] 300		400		500	
New Mexico	300		520		150	
New York	Death or remarriage.		Life.		During disability.	3,500
North Dakota	Death or remarriage.		Life.		During disability.	
Ohio	416	6,500	Life.		During disability.	3,750
Oklahoma	Not covered.		500		300	
Oregon	Death or remarriage.		Life.		104	
Pennsylvania	[5] 300		500	5,000	300	
Porto Rico		4,000		4,000		2,000
Rhode Island	300		500	5,000	300	
South Dakota		3,000	Life.	3,000	312	
Tennessee	400		550	5,000	300	
Texas	360		401		300	
Utah	312	5,000	Life.		312	5,000
Vermont	260	3,500	260	4,000	260	
Virginia	300	4,500	500	4,500	300	
Washington	Death or remarriage.		Life.			2,400
West Virginia	Death or remarriage.		Life.		340	
Wisconsin		5,600	1,000		During disability.	
Wyoming		5,600		8,000		1,500
United States	Death or remarriage.		Life.		During disability.	

[1] For life if 70 per cent or more disabled.
[2] To orphans or abandoned children, till 16.
[3] Maximum, $7,500.
[4] Then 25 per cent of annual earnings for life.
[5] To minor dependents till 16.

There is quite apparent a tendency to recognize the greater economic loss in case of a permanent total disability than in case of death. Death benefits continue in eight States[8] and under the Federal law for life or until remarriage, while 18 States[9] and the Fed-

[8] Arizona, Minnesota, Nevada, New York, North Dakota, Oregon, Washington, West Virginia.
[9] Arizona, California, Colorado, Idaho, Illinois, Maryland, Minnesota, Missouri, Nebraska, Nevada, New York, North Dakota, Ohio, Oregon, South Dakota, Utah, Washington, West Virginia.

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eral Government pay life benefits for permanent total disability. The significance of the latter provision is qualified in a few States by the limitation on the total amount payable, as $3,000 in South Dakota, and $5,000 in Maryland. Measured by these, the $10,000 fixed in Minnesota has the merit of comparative liability, but its provisions would be exhausted in 500 weeks at the maximum allowed rate of $20 per week. This period is equaled in eight other States[10] establishing limitations and exceeded in four.[11] But here again a comparative liberality in term of payment is affected by the maximum amount payable, which does not exceed $5,000 except in two States ($6,000 in Maine and $7,000 in Michigan).

Except in two States,[12] death benefits are a percentage of the employees' wages; in six there is the requirement that the total shall not exceed three or four years' earnings.[13] Minimum periods are 260 weeks (Vermont) and 285 weeks (Delaware). Thirteen States[14] pay for 300 weeks, seven[15] for from 312 to 360 weeks, and six[16] from 400 to 500 weeks. In Delaware, New Jersey, and Pennsylvania payments to certain minors continue to the age of 16, regardless of the expiration of the period fixed.

Weekly maximum and minimum.—Another leveling feature of most laws is the establishment of a weekly maximum and minimum. The former may prevent the higher paid employee from securing the full proportion of his earnings that the percentage provision would indicate, while the minimum named is often affected by a qualification that if the wages received are less than such minimum the amount of the actual wages shall be paid as a benefit. The result of the various restrictions has been computed as placing upon the injured worker about 50 per cent of the burden of industrial accidents in the most favorable States and from 65 to 80 per cent in those less favorable.

In most cases the actual maximum and minimum payments are named, but in a few it is the basic wage that is noted, payments being computable therefrom. No maximum or minimum provision is fixed in two States (Alaska and Arizona). Under the provisions for temporary total disability five States[17] have a maximum of $12, two[18] of over $12 and under $15, twelve[19] of $15, five[20] of $16, one[21] of $17, three[22] of $18, while twelve[23] permit amounts above $18 per week. Monthly maximums are prescribed in Nevada ($72), Oregon ($97), Wyoming ($90), and by the Federal law ($66.67).

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[10] Indiana, Maine, Massachusetts, Michigan, Oklahoma, Pennsylvania, Rhode Island, Virginia.
[11] Alabama, Connecticut, New Mexico, Tennessee.
[12] Alaska and Wyoming.
[13] Three years, in California, Kansas, New Hampshire; four years, in Illinois, South Dakota, Wisconsin.
[14] Alabama, Georgia, Indiana, Iowa, Louisiana, Maine, Michigan, Wisconsin, New Jersey, New Mexico, Pennsylvania, Rhode Island, and Virginia.
[15] Colorado, Connecticut, Hawaii, and Utah, 312 weeks; Kentucky, 335; Nebraska, 350; Texas, 360.
[16] Idaho, Montana, Tennessee, 400 weeks; Maryland and Ohio, 416; Massachusetts, 500.
[17] Colorado, New Mexico, Pennsylvania, Tennessee, Virginia.
[18] Indiana, $13.20; Michigan, $14.
[19] Alabama, Delaware, Georgia, Iowa, Kentucky, Montana, Nebraska, New Hampshire, Porto Rico, South Dakota, and Vermont.
[20] Idaho, Massachusetts, Rhode Island, Utah, West Virginia.
[21] New Jersey.
[22] Maine, Maryland, and Oklahoma.
[23] Wisconsin, $18.20; Ohio, $18.75; Illinois, $19; Hawaii, Louisiana, Minnesota, Missouri, New York, North Dakota, and Texas, $20; California, $20.83; Connecticut, $21.

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Partial disability.—Temporary partial disability is usually compensated for by the payment of a fixed percentage of the wage loss, the term and amount, both weekly and total, being limited. The term and maximum amount fixed by the various statutes are presented in the table on page 693.

Permanent partial disabilities are dealt with in two ways—one by paying a percentage of the wage loss, the other by payments for fixed periods for specified injuries. The two methods exist side by side in most States, all the laws but that of New Hampshire and the Federal statute having schedules of greater or less fullness, while injuries not included therein are compensated on a percentage basis. In all but three States the schedule payments are weekly amounts based on wages; while in these three (Alaska, Washington, and Wyoming) the payments are fixed sums. In Wisconsin weekly periods are fixed only for "lesser permanent partial" injuries, major injuries being compensated on the basis of percentage of permanent total disability.

Schedule provisions may provide for payments in addition to the period of total disability (healing period) or they may cover the entire allowance for the injury other than medical aid. Such payments are exclusive in 19 States,[24] and are in addition to the healing period in 25.[25] In Massachusetts compensation is paid for the term of total disability, and also for partial disability after the schedule period; the same is true in Rhode Island, subject to a maximum term of 300 weeks. In Maine the schedule payment is in lieu of temporary total disability payments, but subsequent partial disability is compensated to extend not more than 300 weeks from the date of the injury. In New York the schedule payments are normally in lieu of all other payments, but if the period of temporary total disability is protracted beyond designated periods the schedule period is extended correspondingly. In Georgia a uniform period of 10 weeks is allowed as healing time.

The following table shows the number of weeks' payments provided by the laws of the several States for the injuries specified:

TABLE 8.—NUMBER OF WEEKS FOR WHICH COMPENSATION IS PAYABLE FOR SPECIFIED INJURIES IN THE SEVERAL STATES

State	Loss of—													
	Arm (at shoulder)	Hand	Thumb	Index finger	Middle finger	Ring finger	Little finger	Leg (at hip)	Foot	Great toe	Other toe	Sight of one eye	Hearing, one ear	Hearing, both ears
Ala.[a]	200	150	60	35	30	20	15	175	125	30	10	100	------	150
Ariz.[b]	260	217	65	39	30	22	17	217	179	30	11	108	87	260
Calif.[a]	[c]246	[c]186	[c]42	[c]34	[c]25	[c]25	[c]16	[c]206	[c]166	[c]34	------	[c]125	------	------
Colo.[b]	208	104	35	18	13	7	9	208	104	18	4	104	35	139
Conn.[b]	208	156	38	38	30	25	20	182	130	38	13	104	52	156
Del.[a]	194	158	60	35	30	20	15	194	135	30	10	113	------	------

[a] Payments under this schedule are exclusive of or in lieu of all other payments.
[b] Payments under this schedule are in addition to payments for temporary total disability during the healing period.
[c] Compensation varies with occupation and age. Figures given are for laborer, 45 years of age.

[24] Alabama, Alaska, California, Delaware, Indiana, Iowa, Kansas, Kentucky, Louisiana, Michigan, Missouri, Montana, New York, Oklahoma, Pennsylvania, Tennessee, Texas, West Virginia, and Wisconsin.
[25] Arizona, Colorado, Connecticut, Georgia, Hawaii, Idaho, Illinois, Maryland, Massachusetts, Minnesota, Nebraska, Nevada, New Jersey, New Mexico, North Dakota, Ohio, Oregon, Porto Rico, Rhode Island, South Dakota, Utah, Vermont, Virginia, Washington, and Wyoming.

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TABLE 8.—NUMBER OF WEEKS FOR WHICH COMPENSATION IS PAYABLE FOR SPECIFIED INJURIES IN THE SEVERAL STATES—Continued

State	Loss of—													
	Arm (at shoulder)	Hand	Thumb	Index finger	Middle finger	Ring finger	Little finger	Leg (at hip)	Foot	Great toe	Other toe	Sight of one eye	Hearing, one ear	Hearing, both ears
Ga.[2]	200	150	60	35	30	20	15	175	125	30	10	100	------	150
Hawaii [2]	312	244	60	46	30	25	15	288	205	38	16	128	60	312
Idaho [2]	200	150	30	20	15	12	9	180	125	15	6	100	35	115
Ill.[2]	200	150	60	35	30	20	15	175	125	30	10	100	------	------
Ind.[1]	250	200	60	40	35	30	20	200	150	60	20	150	------	100
Iowa [1]	225	150	40	30	25	20	15	200	125	25	15	100	50	150
Kans.[1]	210	150	60	37	30	20	15	200	125	30	10	110	25	100
Ky.[1]	200	150	60	45	30	20	15	200	125	30	10	100	------	------
La.[1]	200	150	50	30	20	20	20	175	125	20	10	100	------	------
Me.[4]	150	125	50	30	25	18	15	150	125	25	10	100	------	------
Md.[2]	200	150	50	30	25	20	15	175	150	25	10	100	50	100
Mass.[5]	50	50	12	12	12	12	12	50	50	12	12	50	------	------
Mich.[1]	200	150	60	35	30	20	15	175	125	30	10	100	------	------
Minn.[2]	200	175	60	35	30	20	15	200	150	30	10	100	52	156
Mo.[1]	232	175	60	45	35	35	22	207	150	40	14	118	44	168
Mont.[1]	200	150	30	20	15	12	9	200	125	15	6	100	------	120
Nebr.[2]	225	175	60	35	30	20	15	215	150	30	10	125	50	100
Nev.[2]	260	217	65	39	30	22	17	217	173	30	11	108	87	260
N. J.[2]	200	150	60	35	30	20	15	175	125	30	10	100	40	160
N. Mex.[2]	150	110	30	20	15	10	12	140	100	15	8	100	35	135
N. Y.[6]	312	244	75	46	30	25	15	288	205	38	16	160	------	150
N. Dak.[2]	312	260	60	42	36	24	18	286	208	38	16	130	------	------
Ohio [2]	200	150	60	35	30	20	15	175	125	30	10	100	------	------
Okla.[1]	250	200	60	35	30	20	15	175	150	30	10	100	------	------
Oreg.[2]	416	329	104	69	39	35	26	381	277	43	17	173	156	416
Pa.[1]	215	175	60	35	30	20	15	215	150	------	------	125	------	------
R. I.[5]	100	75	25	15	12	12	12	100	75	12	12	75	------	------
S. Dak.[2]	200	150	50	35	30	20	15	160	125	30	10	100	------	------
Tenn.[1]	200	150	60	35	30	20	15	175	125	30	10	100	------	150
Tex.[1]	200	150	60	45	30	21	15	200	125	30	10	100	------	150
Utah [2]	200	150	30	20	15	12	9	180	125	15	6	100	------	------
Vt.[2]	170	140	40	25	20	15	10	170	120	20	10	100	43	170
Va.[2]	200	150	60	35	30	20	15	175	125	30	8	100	50	------
W. Va.[1]	240	200	80	40	28	20	20	240	140	40	16	132	------	------
Wis.[1]	------	------	------	35	25	15	16	------	------	25	8	------	------	------

[1] Payments under this schedule are exclusive of or in lieu of all other payments.
[2] Payments under this schedule are in addition to payments for temporary total disability during the healing period.
[4] Payments cover total disability. Partial disability based upon wage loss may be compensated at end of periods given for not over 300 weeks in all.
[5] Payments unless this schedule are in addition to payments for temporary total and permanent partial disability.
[6] In lieu of other payments unless period of temporary total disability exceeds fixed periods for each class of injury.

Medical Benefits

ALL compensation States now provide medical benefits. In 9 States [26] and under the Federal law neither time nor amount is limited. The period is without limit in 8 other States which limit the amount, while the time but not the amount is limited in 11 States. However, time or amount or both may be increased in the discretion of the commission in 19 States, so that there are but 9 States [27] in which both items are absolutely restricted.

[26] California, Connecticut, Hawaii, Idaho, Nebraska, New York, North Dakota, Porto Rico, and Washington.
[27] Alabama (limited supervision by compensation commissioner), Alaska, Kansas, Louisiana, New Hampshire, New Mexico, Rhode Island (commissioner of labor exercises certain functions), Tennessee, and Wyoming (fund is supervised by State treasurer).

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The provision is generally without cost to the workman, but in Alaska the employer may deduct $2.50 per month, in Arizona and Nevada, one-half the cost, not over $1 per month, and in Washington one-half the cost, from the employee's wages to maintain a medical fund.

The following table presents the facts in more detail:

TABLE 9.—MAXIMUM PERIODS AND AMOUNTS OF MEDICAL SERVICE UNDER VARIOUS COMPENSATION LAWS

State	Maximum period	Maximum amount	State	Maximum period	Maximum amount
Alabama	60 days	$100	Nevada	6 months [1]	[2] Unlimited.
Alaska	1 year	[2] Unlimited.	New Hampshire	14 days	Unlimited.
Arizona	90 days [1]	[2] Unlimited.	New Jersey	Unlimited	[1] $100
California	Unlimited	Unlimited.	New Mexico	10 days	150
Colorado	60 days	200	New York	Unlimited	Unlimited.
Connecticut	Unlimited	Unlimited.	North Dakota	do	Unlimited.
Delaware	30 days [1]	[1] 100	Ohio	do	[1] 200
Georgia	do.[1]	100	Oklahoma	60 days [1]	[1] 100
Hawaii	Unlimited	Unlimited.	Oregon	Unlimited	[1] 250
Idaho	do	Unlimited.	Pennsylvania	30 days	[1] 100
Illinois	8 weeks [1]	[1] 200	Porto Rico	Unlimited	Unlimited.
Indiana	30 days [1]	Unlimited.	Rhode Island	8 weeks	150
Iowa	4 weeks	[1] 100	South Dakota	12 weeks	150
Kansas	50 days	150	Tennessee	30 days	100
Kentucky	90 days [1]	[1] 100	Texas	4 weeks [1]	Unlimited.
Louisiana	Unlimited	250	Utah	Unlimited	[1] 500
Maine	30 days [1]	[1] 100	Vermont	2 weeks	100
Maryland	Unlimited	500	Virginia	60 days	Unlimited.
Massachusetts	2 weeks [1]	Unlimited.	Washington	Unlimited [2]	Unlimited.
Michigan	90 days	Unlimited.	West Virginia	do	800
Minnesota	do.[1]	Unlimited.	Wisconsin	90 days [1]	Unlimited.
Missouri	60 days [1]	250	Wyoming	Unlimited	300
Montana	6 months	500	United States	do	Unlimited.
Nebraska	Unlimited	Unlimited.			

[1] Additional service in special cases or at discretion of commission.
[2] Employees contribute.

Administration and Settlement of Claims

THE desirability of an administrative agency charged specifically with the supervision of the compensation laws is recognized by all but nine States[28] having such laws. In these States the agreements between the parties may be without supervision, or there may be provision for approval by the court (commissioner of labor in Rhode Island). Disputes are settled by the courts, though arbitrators are provided for in Kansas. Summary procedure is generally directed, but a jury trial may be demanded in certain cases. Appeals to courts, usually limited to questions of law, are provided for in practically all jurisdictions.

Accident Reporting and Prevention

NOTHING is more striking in connection with the subject of accident reporting than its lack of uniformity. The importance of complete reports, showing causes, nature, severity, and costs has been too little recognized, even among those charged with the administration of the laws; while the employer has been too prone to minimize or disregard the occurrence of accidents except as an unfortunate

[28] Alabama, Colorado, Kansas, Montana, New Mexico, Rhode Island, South Dakota, Tennessee, and Vermont.

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incident and a possible source of an action for damages. The necessity of securing complete data for purposes of safety engineering, as well as for the determination of fair and adequate insurance rates is, however, gaining recognition, but much yet remains to be done before actually comparable reports from the various States are available.

Only 21 States[29] call for reports of all accidents, while 9 require reports of those causing disability of one day[30] or more than one day.[31] Other periods prescribed are: More than two days, Pennsylvania; one week, Georgia (or requiring medical, etc., aid) and Rhode Island; more than one week, Illinois and Virginia; 10 days, Colorado; and over two weeks, Alabama. In four States[32] reports are to be made as directed or required by the authorities. The States[33] whose compensation laws contain no provisions for reports of accidents have other laws on the subject, limited, however, to coal mines, except in Louisiana, which requires reports of accidents causing disability of two weeks or more where women and children are employed. In Tennessee, besides the reports by coal operators in the State fund, mine operators generally and employers in mills, factories, etc., must report, the former to the chief mine inspector, and the latter to the inspector of factories and workshops.

Existing deficiencies in the compensation laws in regard to accident reporting and prevention are offset to some extent by the fact that most States, and in particular those of industrial importance, have inspection agencies for factories, mines, etc., which are charged with duties of prevention, chiefly by way of enforcing safety statutes, though some may also prescribe standards. Though some development appears in the direction of combining compensation administration with the enforcement of labor laws generally, the present situation is one of distributed rather than consolidated responsibility. However, the agency that administers compensation laws is also given certain powers as to safety devices, at least of inspection, in 18 States.[34]

Nonresident Alien Dependents

THE reopening of the question of discriminatory treatment of alien nonresident dependents came with the enactment of compensation laws. The rule had become almost universal under the liability system, that they should have the same status as residents or citizens of the States; but of the 22 State compensation laws on the statute books at the close of the year 1913 nearly one-third (7) made discriminations unfavorable to such claimants, while in 1916, of 35 States nearly one-half (17) effected discriminations. At the present time, of 46 States 28 have provisions more or less discriminatory, so that an increasing tendency in the direction of less favorable

[29] Arizona, California (involving time loss or medical aid), Delaware, Maine, Maryland, Massachusetts, Michigan, Montana, Nevada, New Jersey, New York, North Dakota, Ohio, Oklahoma, Oregon, Porto Rico, South Dakota, Tennessee (in coal mines in State fund), Utah, Washington, Wisconsin, and Wyoming.
[30] Connecticut, Hawaii, Idaho, Minnesota, and Vermont (or requiring medical aid).
[31] Indiana, Iowa, Kentucky, and Texas.
[32] Kansas, Nebraska, New Hampshire, and West Virginia.
[33] Alaska, Arizona, Louisiana, and New Mexico.
[34] Arizona, California, Colorado, Hawaii, Idaho, Indiana, Maryland, Montana, New Jersey, New York, North Dakota, Ohio, Oregon, Pennsylvania, Utah, Vermont, West Virginia, and Wisconsin.

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treatment is recognizable. This may be by way of exclusion (4 States[35]), reduced benefits (16 States[36]), permitting commutations to lump sums in reduced amounts (3 States[37]), restricting possible beneficiaries to persons of designated relationship, a provision that may exist alone or in connection with reduced benefits (10 States[38]), or the presumption of dependency may be destroyed (California).

In 8 States,[39] nonresident aliens are placed on the same footing as residents, while in 10[40] they are not mentioned. In 4 of these latter (Indiana, Massachusetts, North Dakota, and Rhode Island) they have been included by administrative or court action, as is the case with the Federal employees' statute.

A number of States except residents of Canada from their discriminatory provisions, or declare such provisions subject to conflicting terms of any treaty, or deny all benefits to aliens whose national laws would exclude citizens of the United States in like circumstances.

The Supreme Court of Kansas held a provision of the State law that limited benefits to $750 except to residents of Canada to be in conflict with the treaty with Italy, and also with the equal protection clause of the fourteenth amendment, so that it could not stand (Vietti *v.* Fuel Co. (1921), 109 Kans. 179, 197 Pac. 881). An inferior court of Pennsylvania found the law of that State restricting benefits to two-thirds the normal award also in conflict with the treaty with Italy, and therefore ineffective. The Supreme Court of the State upheld the law, however (Liberato *v.* Royer (1924), 281 Pa. 227, 126 Atl. 257); and this decision was affirmed by the Supreme Court of the United States (Idem (1926), 46 Sup. Ct. 373), on the ground that the treaty dealt only with remedies for injuries and death due to the employer's negligence, a factor not involved in compensation legislation; and as the act providing compensation is elective and the workman had accepted, there was no conflict with the treaty in question. A now abrogated provision of the law of New Jersey excluded nonresident aliens, and was so enforced (Gregutis *v.* Waclark Wire Works, 91 Atl. 98, 92 Atl. 354).

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[35] Alabama, Hawaii, New Mexico, and South Dakota.
[36] Alaska, Arizona, Colorado, Delaware, Georgia, Idaho, Iowa, Kentucky, Maine, Montana, Nevada, Pennsylvania, Utah, Virginia, Washington, and Wyoming.
[37] Maryland, Nebraska, and New York.
[38] Delaware, Kentucky, Maryland, Nebraska, New York, Oregon, Pennsylvania, Washington, West Virginia, and Wyoming.
[39] Connecticut, Illinois, Michigan, Minnesota, Ohio, Tennessee, Texas, and Wisconsin.
[40] Indiana, Louisiana, Massachusetts, Missouri, New Hampshire, New Jersey, North Dakota, Porto Rico, Rhode Island, and Vermont.

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WAGES AND HOURS OF LABOR

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Wage Studies of the Bureau of Labor Statistics

THE question that most concerns the workingman in his industrial life is his wage rate. Close upon this item follow his hours of labor, the amount of employment available, and what his wage will buy. Further, wages constitute the most important factor in the cost of production. There is a great and constant demand, therefore, for information concerning wages, as well as employment and prices, and this demand comes from all sources—employers, employees, legislators, economists, and the general public.

The Bureau of Labor Statistics devotes a large part of its efforts to supplying information on these several subjects, as is indicated by the wage material presented in this volume, and also by the list of wage publications of the bureau. In the very important field of union wage scales a study is made each year. This inquiry is limited to the general trades wherein the workers are paid at time rates. The organized workers in these trades usually have a standard minimum rate, which is the prevailing rate for the trade in the locality. Piece rates are so great in number and so little understood by those not in the industry that they are not included in the union wage inquiry. In the most important manufacturing industries and in coal mining a wage study is made about every two years. It is recognized that a yearly study should be made in all of the most important industries, but funds are not available therefor.

Wage statistics are difficult to collect. To be of the greatest service they must be assembled by occupations. Establishments seldom compile wage statistics for their own purposes. They know their own wage rates, of course, but do not put them in tabular form. Further, very few employers' organizations collect and compile figures from their membership.

It is not often that wage data can be obtained from employers by correspondence. The questionnaire method is satisfactory in some lines of inquiry, but not in the collection of wage data. Except in rare instances, it has been found that the only satisfactory method is to send special agents to compile the statistics from the employers' pay rolls, and this is the usual method pursued by the bureau. In many industries a large proportion of the employees are paid at piece rates and no record is kept of the time worked by them. In such industries it is necessary to arrange with the employers, and sometimes with the employees as well, to keep a special record of the hours worked during the pay period studied.

A complete census of wages in all establishments in an industry in the United States is prohibitive because of cost. Hence the sampling method must be used. Selection is first made of typical representative plants from which to request wage data. These must be selected with care, so as to insure a geographical representation as well as a wage representation for the locality. All employees are included in the report obtained from a plant, except in the case of a very few

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large plants, where to cover all employees would distort the representative character of the total data collected in the locality. A sufficient number of plants is taken to insure a fair cross-section of the country as a whole. In some instances 20 per cent of all wage earners in the industry in the county may be covered, in other instances as high as 30 per cent or 40 per cent.

As soon as possible after the data are collected summary figures are prepared and published in the Labor Review. Later the information is published in greater detail in bulletin form.

Not only is a complete wage census for all establishments prohibitive because of cost but a compilation of wage data for a full year, even in the representative plants taken, is prohibitive for the same reason. There is fluctuation in employment and considerable turnover of labor in all industries, and a story of yearly earnings is for general statistical purposes impossible.

The Bureau of Labor Statistics has probably the greatest fund of wage statistics in the world. Its many studies have been made possible by the cooperation of employers in opening their records and assisting in the transcribing of the data. All data are held strictly confidential and the final figures are published in such a manner that the identity of no plant is revealed.

In the following pages of this section there are presented summaries of all the wage studies made by the Bureau of Labor Statistics of sufficiently recent date to be of present value. There are also added summaries of wage studies made by other official agencies for certain industries not covered by the bureau's studies.

Union Scale of Wages for Time Workers, 1926[1]

THE Bureau of Labor Statistics collects each year, as of May 15, date regarding the wage scales of organized workers, employed on time rates, in representative cities. The 1926 study covered 66 cities and 78 trades or subdivisions of trades, distributed in the following groups: All of the several building trades; chauffeurs, teamsters, and drivers; granite and stone cutters; laundry workers; linemen; longshoremen; the printing and publishing trades; and street-railway motormen and conductors. Data were obtained for 824,313 members of organized trades, including 59,717 street-railway motormen and conductors, who are treated separately in the following tabulation for reasons explained below.

It should be particularly noted that these surveys include only time workers, and thus do not include by any means all the organized workers in the country, a very great number of whom work on piece-rate systems which do not lend themselves readily to tabulation.

The 1926 survey showed that the hourly average rates for the organized workers covered (excluding street-railway motormen and conductors) increased 5.2 per cent over 1925, the average rate of wages per hour being $1.148 in 1926 as against $1.091 in 1925. During the same period, the average hourly rates of street-railway motormen and conductors increased 0.2 per cent.

[1] For complete report, see Bureau of Labor Statistics Bul. No. 431.

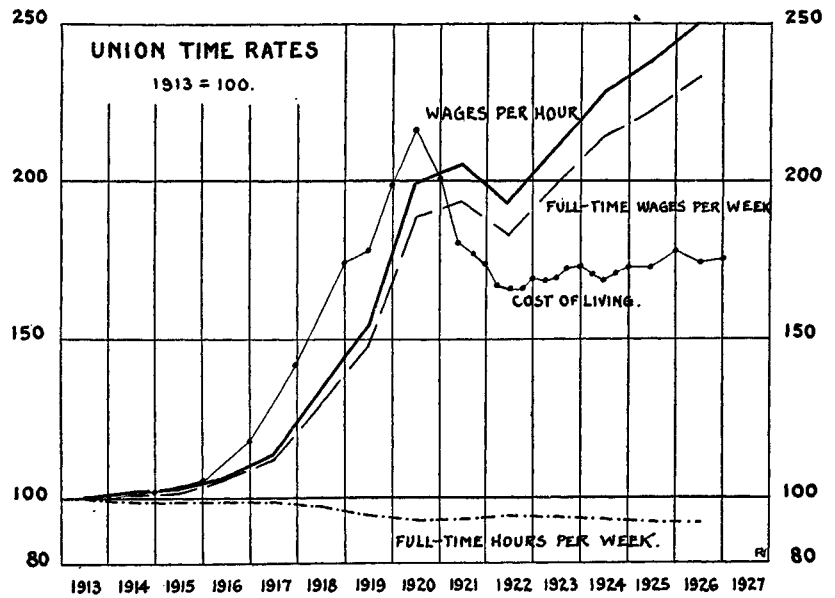
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Table 1 and the accompanying chart show by index numbers the change in union wage rates and hours of labor from 1907 to 1926. The base (100) is 1913. These index numbers include all trades in all cities that were covered in preceding years, except the street-railway employees, for whom rates of wages per hour were obtained, but whose hours of labor are so variable that no attempt was made to report them. These street-railway occupations are omitted from all three columns of the index numbers below, as of necessity they could not be included in the second and third columns. Since 1907 there have been some variations as to trades and cities included in the index numbers.

TABLE 1.—INDEX NUMBERS OF UNION WAGE RATES AND HOURS OF LABOR IN THE UNITED STATES AS OF MAY EACH YEAR, 1907 TO 1926

[1913=100.0]

Year	Index numbers of—			Year	Index numbers of—		
	Rate of wages per hour	Full-time hours per week	Rate of wages per week, full time		Rate of wages per hour	Full-time hours per week	Rate of wages per week, full time
1907	89.7	102.6	91.5	1917	114.2	98.4	112.4
1908	91.0	102.1	92.5	1918	132.7	97.0	129.6
1909	91.9	101.9	93.3	1919	154.5	94.7	147.8
1910	94.4	101.1	95.2	1920	199.0	93.8	188.5
1911	96.0	100.7	96.5	1921	205.3	93.9	193.3
1912	97.6	100.3	97.7	1922	193.1	94.4	183.0
1913	100.0	100.0	100.0	1923	210.6	94.3	198.6
1914	101.9	99.6	101.6	1924	228.1	93.9	214.3
1915	102.8	99.4	102.3	1925	237.9	93.0	222.3
1916	107.2	98.8	106.2	1926	250.3	92.8	233.4



The index numbers reveal that beginning with 1907 there was a steady advance each year in rate of wages per hour up to 1922 when there was a falling off as compared with 1921. The year 1923

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showed quite an advance over 1921, and thereafter a continuous advance took place each year. In 1926 union-wage rates per hour as a whole were two and one-half times as great as in 1913 and 2.79 per cent as much as in 1907.

Full-time hours of labor per week decreased 7.2 per cent in 1926 as compared with 1913 and 9.6 per cent as compared with 1907. Because of the reduction in hours, the index numbers for rates of wages per full week do not run so high as the index numbers for rates of wages per hour.

The table below shows the average union wage rates per hour, average full-time working hours per week, the number of quotations on which 1926 averages are based, and index numbers of hourly rates for selected years 1913 to 1926. The index numbers for other years back to 1907 may be found in Bulletin 404 of this bureau but are omitted here for want of space. For some trades data were not collected as early as 1913, hence no index numbers could be computed for them on a 1913 base.

In computing an average rate, each rate quoted is multiplied by the number of union members having that rate. The products are added and the sum divided by the grand total of membership; in other words the rates are weighted by the number of union members. The membership data are furnished the bureau for this sole purpose and are held strictly confidential.

A city may enter into an average one year because the trade has an effective wage scale, but that city may drop out the next year because the trade can not enforce its scale or because the union has disbanded. Hence the grand average may vary to a greater extent than the rate in any city reporting for both years. The index numbers are computed from these averages. Index numbers have not been computed for the several industry groups, except for the building trades shown on page 710.

In the table below only hourly rates are included. Equivalent weekly rates do not exactly parallel hourly rates because of changes in working hours.

TABLE 2.—AVERAGE WAGE RATES PER HOUR, AVERAGE FULL-TIME HOURS PER WEEK, AND INDEX NUMBERS OF HOURLY RATES FOR SELECTED YEARS

Trade	Number of quotations, May, 1926	Average rate of wages per hour		Index numbers of rates of wages per hour (1913=100)						Average hours per week, 1926
		May, 1925	May, 1926	May, 1921	May, 1922	May, 1923	May, 1924	May, 1925	May, 1926	
Bakery trades										
Bakers	291	$0.979	$0.925	275.7	267.0	276.0	283.5	293.4	277.2	47.8
Building trades										
Asbestos workers	35	1.166	1.247	(1)	(1)	(1)	(1)	(1)	(1)	44.0
Bricklayers	67	1.475	1.565	172.7	168.4	191.1	202.2	213.4	226.4	44.0
Sewer, tunnel, and caisson	13	1.798	1.914	153.2	149.0	159.6	167.3	187.1	199.2	44.0
Building laborers	45	.773	.851	227.7	213.9	218.1	242.4	231.6	254.9	44.7
Carpenters	63	1,184	1,267	197.8	183.1	204.0	218.3	222.8	238.4	44.0
Millwrights	13	1.174	1.207	(1)	(1)	(1)	(1)	(1)	(1)	44.2
Parquetry-floor layers	18	1.226	1.439	219.6	220.6	222.0	222.0	215.7	253.1	43.8
Wharf and bridge	13	1.175	1.255	(1)	(1)	(1)	(1)	(1)	(1)	44.0
Cement finishers	56	1.238	1.321	188.4	174.7	191.2	211.4	212.6	226.9	44.1
Helpers	3	.940	1.038	226.2	216.7	223.4	248.3	260.8	288.0	44.0

[1] No data for 1913.

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TABLE 2.—AVERAGE WAGE RATES PER HOUR, AVERAGE FULL-TIME HOURS PER WEEK, AND INDEX NUMBERS OF HOURLY RATES FOR SELECTED YEARS—Con.

Trade	Number of quotations, May, 1926	Average rate of wages per hour		Index numbers of rates of wages per hour (1913=100)						Average hours per week, 1926
		May, 1925	May, 1926	May, 1921	May, 1922	May, 1923	May, 1924	May, 1925	May, 1926	
Building trades—Continued										
Composition roofers	35	$1.165	$1.267	(1)	(1)	(1)	(1)	(1)	(1)	44.0
Helpers	5	.760	.932	(1)	(1)	(1)	(1)	(1)	(1)	44.0
Elevator constructors	44	1.312	1.382	(1)	(1)	(1)	(1)	(1)	(1)	44.0
Helpers	44	.930	1.002	(1)	(1)	(1)	(1)	(1)	(1)	44.0
Engineers, portable and hoisting	101	1.265	1.336	178.2	168.0	185.5	197.2	205.7	217.2	44.3
Glaziers	28	1.222	1.239	(1)	(1)	(1)	(1)	(1)	(1)	44.0
Hod carriers	42	.920	1.002	237.8	197.1	215.4	224.9	251.5	273.8	44.1
Inside wiremen	61	1.272	1.339	201.9	190.4	197.1	220.5	232.4	244.6	43.9
Fixture hangers	11	1.144	1.216	202.5	192.2	205.6	221.8	220.8	234.7	44.1
Lathers:										
Piece work	20	[2] 8.200	[2] 7.230	(1)	(1)	(1)	(1)	(1)	(1)	43.4
Time work	57	1.398	1.434	192.1	180.5	199.3	215.1	234.5	240.6	43.7
Marble setters	51	1.268	1.417	160.6	157.3	178.0	186.1	190.0	212.3	44.0
Helpers	11	.898	.996	215.3	200.1	216.2	234.3	222.5	246.7	44.0
Mosaic and terrazzo workers	14	1.215	1.240	(1)	(1)	(1)	(1)	(1)	(1)	44.0
Painters	66	1.232	1.305	212.8	199.1	218.7	230.5	243.1	257.5	42.8
Fresco	10	1.198	1.199	207.1	197.2	206.5	194.1	220.0	220.1	42.1
Sign	44	1.530	1.523	196.1	194.3	210.0	239.2	241.5	240.4	43.4
Plasterers	64	1.485	1.595	180.5	173.5	193.2	216.1	219.8	236.1	42.3
Laborers	35	1.000	1.058	219.1	192.6	212.0	227.8	243.1	257.2	42.3
Plumbers and gas fitters	63	1.281	1.381	181.1	168.2	185.6	202.4	206.6	222.7	44.0
Plumbers' laborers	8	.954	.957	(1)	(1)	(1)	(1)	(1)	(1)	44.5
Sheet-metal workers	50	1.209	1.291	202.3	187.5	201.9	221.7	229.3	244.8	44.1
Ship carpenters	9	.889	.969	(1)	(1)	(1)	(1)	(1)	(1)	44.2
Slate and tile roofers	19	1.419	1.466	(1)	(1)	(1)	(1)	(1)	(1)	44.0
Steam and sprinkler fitters	75	1.271	1.376	171.3	167.6	175.6	201.5	212.2	229.7	43.9
Helpers	39	.856	.906	220.3	226.1	240.1	266.0	273.7	289.7	43.9
Stonemasons	54	1.401	1.545	193.0	179.7	212.5	225.2	229.5	253.1	44.1
Structural-iron workers	73	1.271	1.358	184.0	166.6	178.4	202.5	204.5	218.5	44.0
Finishers	40	1.230	1.372	183.0	168.2	174.7	193.7	197.9	220.7	44.0
Tile layers	58	1.325	1.389	161.9	159.2	174.0	197.5	202.3	212.0	44.0
Helpers	16	.893	.968	231.6	217.4	222.4	242.2	248.9	269.8	44.0
Average	1,573	1.199	1.278							43.8
Chauffeurs and teamsters and drivers										
Chauffeurs	325	.649	.657	202.5	191.2	197.7	205.6	223.5	226.3	55.1
Teamsters and drivers	189	.667	.673	223.0	212.7	224.9	244.7	254.3	256.6	56.2
Average	514	.656	.663							55.5
Granite and stone trades										
Granite cutters	60	1.110	1.250	209.0	208.6	212.7	214.2	216.8	244.1	43.9
Stonecutters	50	1.288	1.404	189.5	181.8	198.3	212.9	221.9	241.9	44.0
Average	110	1.193	1.330							44.0
Miscellaneous										
Laundry workers	50	.444	.441	(1)	(1)	(1)	(1)	(1)	(1)	47.8
Linemen	39	.935	.993	(1)	(1)	(1)	(1)	(1)	(1)	46.0
Longshoremen	37	.828	.835	236.8	195.9	209.2	238.5	239.9	242.0	45.3
Printing and publishing: Book and job										
Bindery women	50	.520	.489	241.3	233.6	244.2	247.6	250.5	235.6	45.1
Bookbinders	82	.958	.975	220.1	211.2	224.0	233.9	236.6	240.8	44.8
Compositors	72	1.064	1.085	219.6	223.4	228.5	238.5	237.4	242.1	44.0
Electrotypers	64	1.197	1.209	223.1	227.4	241.6	250.6	249.7	252.2	45.4
Machine operators:										
Piece work	1	[3] .150	[3] .160	98.7	98.7	101.4	101.4	101.4	108.1	44.0
Time work	64	1.103	1.121	200.6	200.0	203.8	212.9	211.7	215.2	43.9
Machine tenders (machinists)	24	1.143	1.195	198.2	198.4	200.2	214.4	210.4	219.9	42.6
Machinist operators	37	1.112	1.085	161.0	167.0	169.8	171.6	183.7	179.2	44.0

[1] No data for 1913. [2] Per 1,000 laths. [3] Per 1,000 ems.

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TABLE 2.—AVERAGE WAGE RATES PER HOUR, AVERAGE FULL-TIME HOURS PER WEEK, AND INDEX NUMBERS OF HOURLY RATES FOR SELECTED YEARS—Con.

Trade	Number of quotations, May, 1926	Average rate of wages per hour		Index numbers of rates of wages per hour (1913=100)						Average hours per week, 1926
		May, 1925	May, 1926	May, 1921	May, 1922	May, 1923	May, 1924	May, 1925	May, 1926	
Printing and publishing: Book and job—Continued										
Photo-engravers	46	$1.144	$1.218	(1)	(1)	(1)	(1)	(1)	(1)	44.0
Press assistants and feeders	153	.818	.827	245.8	238.0	266.2	263.8	278.8	281.9	44.3
Pressmen:										
Cylinder	151	1.097	1.119	205.5	200.8	216.7	223.1	225.9	230.5	44.4
Platen	112	.900	.932	231.7	226.5	235.8	242.9	244.3	255.8	44.4
Average	856	.975	.997							44.3
Printing and publishing: Newspaper										
Compositors:										
Day work	85	1.103	1.120	174.9	176.3	177.9	189.0	193.9	196.7	45.9
Night work	71	1.210	1.249	171.7	176.2	178.2	187.5	187.4	193.4	45.6
Machine operators, day work:										
Piece work	11	[3].151	[3].154	119.6	120.5	125.0	117.8	135.8	138.5	44.5
Time work	81	1.115	1.135	175.5	180.6	183.1	193.4	198.0	201.6	45.4
Machine operators, night work:										
Piece work	10	[3].162	[3].169	104.6	106.0	112.3	110.9	113.7	118.6	44.2
Time work	70	1.220	1.260	169.9	174.1	175.5	186.4	189.5	195.7	44.8
Machine tenders (machinists):										
Day work	68	1.090	1.089	178.5	180.2	180.9	191.5	185.3	185.2	45.9
Night work	56	1.216	1.203	170.8	172.4	173.0	183.0	178.4	176.5	45.6
Machinist operators:										
Day work	11	1.079	1.038	163.8	165.5	166.8	180.7	178.7	171.9	46.8
Night work	8	1.079	1.109	153.9	160.4	151.1	164.5	156.8	161.1	46.2
Photo-engravers:										
Day work	40	1.176	1.213	(1)	(1)	(1)	(1)	(1)	(1)	44.1
Night work	34	1.383	1.557	(1)	(1)	(1)	(1)	(1)	(1)	41.5
Pressmen, web presses:										
Day work	128	.994	1.013	184.1	180.3	182.4	199.4	208.2	212.2	47.0
Night work	107	1.167	1.155	184.9	167.7	169.6	193.2	200.6	198.5	42.8
Stereotypers:										
Day work	61	.973	.992	173.9	171.8	174.9	180.4	184.5	188.1	47.3
Night work	55	1.141	1.138	176.3	172.7	178.6	182.8	188.4	187.9	42.6
Average	896	1.130	1.155							45.3
Motormen and conductors	204	.661	.662							(4)
Average, all trades [5]	4,570	1.091	1.148	228.8	215.3	234.7	254.2	265.1	279.0	45.4

[1] No data for 1913.
[3] Per 1,000 ems.
[4] Not reported.
[5] Not including street railway motormen and conductors.

Table 3 shows the per cent of increase in weekly wage rates in 1926 as compared with specified years, beginning with 1907, the earliest year for which data are available. (Lack of space compelled the omission of certain years intervening between 1907 and 1925.) The figures are not index numbers but may be converted into index numbers. The first line of the table shows that the weekly rate of bakers in 1926 was 194.2 per cent higher than in 1907. This means that the rate was nearly three times as much in 1926 as in 1907. Read as index numbers, the 1907 figure would be 100, and that for 1926 would be 294.2.

In all the trades appearing, weekly rates more than doubled between 1907 and 1926.

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TABLE 3.—PER CENT OF INCREASE IN FULL-TIME RATES OF WAGES PER WEEK IN 1926 AS COMPARED WITH SPECIFIED PRECEDING YEARS

Occupation	Per cent of increase in full-time rates of wages per week in 1926 as compared with—									
	1907	1913	1917	1919	1920	1921	1922	1923	1924	1925
Bakery trades										
Bakers	194.2	150.3	119.2	45.3	5.2	0.7	4.0	1.3	[1] 1.6	[1] 4.3
Building trades										
Asbestos workers	[2]	[2]	111.6	57.8	21.5	20.2	28.6	24.1	11.1	6.9
Bricklayers	131.4	123.5	110.1	76.3	29.5	31.0	34.3	18.4	12.4	6.1
Sewer, tunnel, and caisson	[2]	99.0	92.4	75.6	30.7	30.0	33.6	24.7	19.0	6.4
Building laborers	151.4	135.0	110.5	61.7	12.7	12.1	20.0	16.9	5.8	10.4
Carpenters	156.9	135.6	105.5	64.2	22.8	21.0	29.1	16.8	9.1	7.0
Millwrights	[2]	[2]	81.1	39.6	10.9	8.8	14.3	4.5	[1] 2.7	3.7
Parquetry-floor layers	[2]	138.6	104.9	68.6	15.5	15.3	15.1	14.6	15.0	18.3
Wharf and bridge	[2]	[2]	118.4	86.1	14.5	27.5	43.1	26.2	17.2	6.9
Cement finishers	134.3	117.3	104.5	67.2	23.7	20.0	29.5	18.4	7.1	6.6
Helpers	226.9	186.0	171.1	104.6	27.5	27.4	33.0	29.0	16.0	10.4
Composition roofers	[2]	[2]	133.1	85.6	30.8	25.7	31.4	22.7	12.0	8.6
Helpers	[2]	[2]	126.1	87.0	30.4	33.3	37.4	34.0	29.3	22.6
Elevator constructors	[2]	[2]	105.1	66.8	30.1	22.9	31.6	23.8	10.3	5.4
Helpers	[2]	[3]	131.6	80.4	28.8	23.9	30.2	24.1	12.7	7.7
Engineers, portable and hoisting	[2]	107.4	95.5	60.0	24.1	21.5	29.6	17.9	10.8	5.8
Glaziers	[3]	[2]	[2]	78.6	24.0	26.1	25.6	19.1	12.7	1.8
Hod carriers	180.0	171.9	133.0	71.1	17.9	15.2	38.9	26.9	21.7	9.0
Inside wiremen	164.0	136.9	111.8	67.5	27.4	21.0	28.4	24.0	10.9	5.2
Fixture hangers	[2]	125.2	97.1	62.5	21.3	16.0	21.7	14.2	6.3	6.0
Lathers	[2]	134.5	115.6	80.3	26.9	24.9	32.5	19.9	11.3	2.1
Marble setters	130.3	110.5	106.1	77.1	34.1	32.1	35.0	19.3	14.1	11.8
Helpers	[2]	146.6	130.9	93.4	14.4	14.6	23.2	14.1	5.3	10.9
Mosaic and terrazzo workers	[3]	[3]	114.6	91.3	29.2	26.1	29.9	26.7	7.3	2.0
Painters:										
Building	181.3	145.3	111.6	64.7	25.1	21.1	28.7	17.4	11.5	5.2
Fresco	[2]	110.5	81.6	49.4	11.2	10.3	14.9	9.8	13.4	2.8
Sign	[2]	133.1	120.0	67.8	24.3	20.5	21.5	14.9	3.1	1.9
Plasterers	133.0	124.1	111.9	74.6	34.0	27.2	32.2	18.0	5.5	4.0
Laborers	165.7	143.5	119.2	67.3	15.4	12.9	28.6	16.6	8.7	1.7
Plumbers and gas fitters	141.4	118.6	107.2	67.2	29.2	23.1	30.0	20.1	10.1	7.8
Laborers	[3]	[3]	[3]	55.0	14.2	13.6	13.9	8.9	[1] 1.3	.5
Sheet-metal workers	173.6	138.7	115.9	69.1	26.3	21.0	30.5	21.2	10.5	6.8
Ship carpenters	[2]	[2]	58.0	17.4	3.6	5.8	15.3	2.8	[1] 6.2	9.4
Slate and tile roofers	[2]	[2]	124.6	80.9	39.9	27.5	33.5	19.7	8.0	3.3
Steam and sprinkler fitters	155.6	123.5	105.5	69.0	28.1	34.1	36.9	30.8	14.0	8.2
Helpers	235.0	183.8	152.6	84.4	27.3	31.5	28.0	20.5	8.7	5.7
Stone masons	164.5	150.2	129.0	87.5	34.6	31.0	40.7	19.0	12.5	10.4
Structural-iron workers	139.9	115.9	97.9	53.3	21.8	18.8	31.1	22.5	7.9	6.9
Finishers	[2]	121.1	103.9	61.6	22.4	20.6	31.1	26.4	14.0	12.4
Tile layers	[2]	109.9	98.0	76.9	31.8	32.2	34.7	22.9	8.2	5.7
Helpers	[2]	163.4	143.6	96.3	19.9	17.4	25.2	21.3	11.4	8.4
Chauffeurs and teamsters and drivers										
Chauffeurs	[2]	92.4	76.2	32.1	11.0	10.3	15.4	10.9	6.3	[1] .1
Teamsters and drivers	[2]	129.7	104.5	45.7	17.5	15.1	19.5	13.9	6.3	3.0
Granite and stone trades										
Granite cutters	164.0	143.1	123.1	58.6	28.7	16.9	18.0	15.1	13.9	12.4
Stonecutters	148.0	138.7	116.8	72.5	31.6	27.5	33.0	22.0	13.5	8.8
Miscellaneous										
Laundry workers	[2]	[2]	75.6	35.4	10.5	5.8	5.1	5.9	5.9	[1] 1.0
Linemen	[2]	[2]	[2]	[2]	11.1	5.1	13.6	8.8	4.3	4.6
Longshoremen	[2]	86.4	56.7	25.0	4.4	3.0	16.1	8.6	[1] 4.7	[3]
Printing and publishing: Book and job										
Bindery women	[2]	[2]	105.9	42.7	3.1	[1] 3.5	.9	[1] 3.0	[1] 4.4	[1] 5.3
Bookbinders	140.4	124.3	107.2	44.6	10.0	8.0	13.4	7.5	3.2	1.8
Compositors	150.1	122.3	107.0	53.4	16.6	7.7	7.8	6.3	1.6	1.9
Electrotypers	171.4	144.2	115.9	79.3	24.8	13.4	13.0	5.1	1.6	1.0
Machine operators	115.5	98.1	90.1	44.8	13.3	7.0	7.1	5.4	1.5	1.3

[1] Decrease. [2] No data. [3] Decrease of less than one-tenth of 1 per cent.

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TABLE 3.—PER CENT OF INCREASE IN FULL-TIME RATES OF WAGES PER WEEK IN 1926 AS COMPARED WITH SPECIFIED PRECEDING YEARS—Continued

Occupation	Per cent of increase in full-time rates of wages per week in 1926 as compared with—									
	1907	1913	1917	1919	1920	1921	1922	1923	1924	1925
Printing and publishing: Book and job—Contd.										
Machine tenders (machinists)	[2]	96.3	89.4	40.4	12.2	7.2	7.3	6.6	[1] 1.3	1.4
Machinist-operators	[2]	69.9	63.8	37.8	11.5	8.8	7.1	6.0	4.9	[1] 2.5
Photo-engravers	[2]	[2]	98.3	61.0	26.3	18.9	17.8	16.8	9.0	6.2
Press assistants and feeders	189.5	159.3	135.4	56.6	14.1	12.9	17.2	5.5	5.2	1.0
Pressmen:										
Cylinder	140.5	112.3	100.7	49.9	15.4	9.9	13.7	5.9	2.9	2.0
Platen	157.1	135.5	115.6	59.6	17.9	7.9	8.0	7.7	4.4	3.8
Printing and publishing: Newspaper										
Compositors:										
Day work	118.2	95.8	87.2	49.4	21.9	12.3	9.9	9.1	1.3	1.4
Night work	107.2	93.1	86.5	48.2	22.3	12.7	8.2	7.0	3.1	3.0
Machine operators:										
Day work	117.7	99.0	89.7	49.7	19.6	14.3	9.8	8.3	3.9	1.5
Night work	107.7	94.7	86.7	47.6	20.1	14.6	9.7	8.7	4.3	3.0
Machine tenders (machinists):										
Day work	[2]	85.3	80.9	34.5	8.4	4.1	2.5	2.0	[1] 3.0	[1] .3
Night work	[2]	76.4	73.0	30.8	6.8	3.3	1.6	1.3	[1] 3.6	[1] 1.4
Machinist operators:										
Day work	[2]	70.5	64.2	52.4	38.1	5.8	4.9	4.0	[1] 3.4	1.3
Night work	[2]	68.3	63.6	42.1	18.2	5.4	1.5	7.1	[1] .7	2.8
Photo-engravers:										
Day work	[2]	[2]	88.7	52.8	29.3	14.8	10.2	11.3	6.7	3.1
Night work	[2]	[2]	110.3	64.3	47.1	26.0	18.5	18.6	14.1	11.4
Pressmen, web presses:										
Day work	137.2	111.4	102.6	54.2	24.2	14.8	14.8	13.6	6.0	2.0
Night work	117.6	107.2	100.8	49.6	22.5	13.1	12.1	11.6	4.1	.2
Stereotypers:										
Day work	113.6	87.1	78.5	52.4	25.5	10.3	9.3	7.4	4.3	2.0
Night work	104.1	85.9	78.1	51.9	24.9	8.8	8.4	5.6	3.0	1.2

[1] Decrease. [2] No data.

Because of the wide interest in building operations and the resultant inquiries to the bureau for wage changes in building trades as a group the table below is published:

TABLE 4.—INDEX NUMBERS OF UNION RATES OF WAGES PER HOUR IN THE BUILDING TRADES

[1913=100]

Year	Index numbers	Year	Index numbers
1913	100	1920	197
1914	102	1921	200
1915	103	1922	187
1916	106	1923	207
1917	113	1924	224
1918	126	1925	233
1919	145	1926	248

Hours and Earnings in Anthracite Mining, 1924

THE bureau made a study of wages and hours of labor in the anthracite industry in Pennsylvania in 1922 and again in 1924.[2] The data were taken from pay rolls and other records of the companies for a half-month pay period. The 1924 data are mostly as of

[2] For full report see Bul. No. 416.

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the second half of October and the first half of November, and cover 34,136 underground or inside employees and 10,364 surface or outside workers, employed at 56 of the principal collieries of the district. The employees for whom data were obtained represent about 28 per cent of the 160,000 anthracite mine workers reported by the United States Geological Survey for 1924.

Table 1 shows the average number of starts and average hours and earnings for each occupation of material importance. By start is meant a day on which work was done, regardless of whether or not the employee worked a full day. Of the 56 collieries included in the study, one was in operation on 8 days in the half month covered, and thus afforded its employees the opportunity to work on that many days; two were in operation on 9 days; twelve on 10 days; five on 11 days; three on 12 days; twenty-eight on 13 days; and five on 14 days.

The two major occupation groups of the industry are those of miners and miners' laborers, each in turn subdivided as indicated by the table. For each of these occupations the table gives average hours and earnings based on (1) time at the face or seam of coal, excluding time for lunch; on (2) time at the face, including time for lunch; and on (3) total time in the colliery, including time for lunch and time of travel in colliery from shaft to face and return. The average hours and earnings for other inside occupations and for all outside occupations are based on actual working time.

TABLE 1.—AVERAGE NUMBER OF STARTS AND AVERAGE HOURS AND EARNINGS OF MINE EMPLOYEES, BY OCCUPATIONS, 1922 AND 1924

Inside work

Occupation	Year	Number of—		Average number of starts (days) in half-month pay-roll period	Average hours—					
					In half-month pay-roll period, based on—			Per start based on—		
					Time at face		Time in collieries	Time at face		Time in collieries
		Collieries	Employees		Excluding lunch	Including lunch		Excluding lunch	Including lunch	
Miners:										
Company	1922	25	775	11.1	90.6	96.1	103.2	8.2	8.7	9.3
	1924	47	1,735	10.3	84.5	89.8	96.7	8.2	8.7	9.3
Consideration	1922	12	626	12.9	98.5	104.8	110.5	7.7	8.1	8.6
	1924	22	961	10.9	84.7	90.1	96.3	7.8	8.3	8.9
Contract	1922	29	6,209	11.5	73.8	79.6	87.4	6.4	6.9	7.6
	1924	55	11,778	10.8	68.5	73.9	81.4	6.3	6.8	7.5
Laborers:										
Company miners'	1922	25	774	11.2	91.7	97.5	105.1	8.2	8.7	9.4
	1924	47	1,699	10.2	84.1	89.4	96.5	8.2	8.7	9.4
Consideration miners'	1922	11	339	11.4	90.0	96.3	103.0	7.9	8.4	9.0
	1924	22	748	10.6	86.1	91.4	97.7	8.1	8.6	9.2
Contract miners'	1922	29	3,383	9.8	65.3	70.0	76.2	6.7	7.2	7.8
	1924	53	6,794	10.1	67.3	72.4	79.1	6.7	7.2	7.8

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TABLE 1.—AVERAGE NUMBER OF STARTS AND AVERAGE HOURS AND EARNINGS OF MINE EMPLOYEES, BY OCCUPATIONS, 1922 AND 1924—Continued.

Inside work—Continued

Occupation	Year	Average rate of wages per hour at face, excluding lunch	Average earnings—				
			Per hour, based on—			Per start (day)	In half-month pay-roll period
			Time at face		Time in collieries		
			Excluding lunch	Including lunch			
Miners:							
Company	1922	$0.683	$0.697	$0.657	$0.612	$5.71	$63.17
	1924	.757	.795	.747	.694	6.49	67.15
Consideration	1922	.755	.883	.831	.787	6.76	87.04
	1924	.861	.933	.876	.820	7.26	78.99
Contract	1922	----------	1.173	1.088	.991	7.53	86.60
	1924	----------	1.432	1.327	1.204	9.07	98.07
Laborers:							
Company miners'	1922	.621	.629	.592	.549	5.15	57.66
	1924	.686	.696	.655	.607	5.72	58.57
Consideration miners'	1922	.655	.654	.611	.572	5.16	58.87
	1924	.765	.767	.722	.676	6.21	65.98
Contract miners'	1922	----------	.829	.773	.711	5.55	54.15
	1924	----------	.971	.903	.826	6.47	65.39

Occupation	Year	Number of—		Average number of starts (days) in half-month pay-roll period	Average hours worked		Average earnings—		
		Collieries	Employees		In half-month pay-roll period	Per start (day)	In half-month pay-roll period	Per start (day)	Per hour at face, excluding lunch
Blacksmiths	1922	12	23	12.7	115.5	9.1	$79.08	$6.21	$0.685
	1924	23	48	10.8	97.0	9.0	75.18	6.98	.775
Bratticemen	1922	21	136	12.0	100.6	8.4	66.06	5.53	.657
	1924	43	260	11.5	97.2	8.4	68.87	5.99	.709
Cagers	1922	28	196	12.2	119.3	9.8	72.04	5.90	.604
	1924	54	627	11.5	107.2	9.3	71.41	6.20	.666
Car runners	1922	22	402	12.2	105.4	8.7	62.35	5.12	.592
	1924	43	745	11.5	100.6	8.7	65.25	5.66	.649
Door tenders (boys)	1922	26	190	11.7	95.2	8.2	32.56	2.79	.342
	1924	47	368	11.4	93.5	8.2	35.64	3.13	.381
Drivers	1922	27	539	11.6	95.5	8.2	55.39	4.78	.580
	1924	52	1,054	11.3	97.8	8.6	61.83	5.46	.632
Engineers	1922	24	152	13.9	117.7	8.5	76.14	5.49	.647
	1924	49	296	12.7	112.5	8.8	77.93	6.13	.692
Laborers	1922	29	1,426	11.8	99.3	8.4	60.39	5.10	.608
	1924	55	2,388	11.1	95.0	8.6	63.05	5.68	.664
Machinists	1922	15	31	14.0	120.9	8.6	82.03	5.85	.678
	1924	26	52	13.5	123.5	9.2	89.89	6.67	.728
Masons	1922	16	51	12.9	105.8	8.2	71.65	5.54	.677
	1924	28	104	12.1	98.9	8.2	72.04	5.96	.728
Motormen	1922	27	327	12.8	120.9	9.5	78.37	6.14	.648
	1924	50	733	11.4	107.2	9.4	75.32	6.60	.703
Motor brakemen	1922	27	310	12.1	110.6	9.1	64.64	5.33	.585
	1924	51	724	11.2	99.9	9.0	63.87	5.72	.639
Pumpmen	1922	26	180	15.9	129.6	8.2	81.29	5.12	.627
	1924	51	350	14.8	126.9	8.6	87.52	5.90	.690
Timbermen	1922	20	161	10.9	89.1	8.2	60.31	5.52	.677
	1924	48	370	10.9	90.1	8.2	69.75	6.38	.774
Trackmen	1922	27	177	13.0	110.1	8.5	74.29	5.71	.675
	1924	55	406	12.0	104.5	8.7	77.39	6.47	.741
Other employees	1922	29	713	13.0	116.7	9.0	69.60	5.37	.596
	1924	55	1,896	12.0	106.8	8.9	80.43	6.70	.753

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TABLE 1.—AVERAGE NUMBER OF STARTS AND AVERAGE HOURS AND EARNINGS OF MINE EMPLOYEES, BY OCCUPATIONS, 1922 AND 1924—Continued

Outside work

Occupation	Year	Number of—		Average number of starts (days) in half-month pay-roll period	Average hours worked		Average earnings—		
		Collieries	Employees		In half-month pay-roll period	Per start (day)	In half-month pay-roll period	Per start (day)	Per hour at face, excluding lunch
Ashmen	1922	25	67	15.4	135.7	8.8	$71.25	$4.63	$0.525
	1924	41	94	14.4	124.3	8.6	73.73	5.11	.593
Blacksmiths	1922	29	64	13.5	120.5	8.9	80.38	5.96	.667
	1924	55	142	12.5	113.4	9.1	84.45	6.75	.745
Cagers	1922	26	100	12.8	120.3	9.4	64.48	5.05	.536
	1924	52	234	12.1	112.4	9.3	67.29	5.57	.599
Carpenters	1922	26	221	12.8	113.9	8.9	75.29	5.88	.661
	1924	56	607	12.3	109.0	8.9	78.53	6.40	.720
Car runners	1922	22	87	12.3	106.5	8.6	56.36	4.57	.529
	1924	41	231	10.9	97.2	8.9	56.75	5.19	.584
Dumpers	1922	26	85	12.2	111.0	9.1	58.82	4.82	.530
	1924	55	197	12.0	108.0	9.0	63.24	5.28	.586
Engineers	1922	29	203	15.0	129.1	8.6	83.39	5.58	.646
	1924	52	441	14.2	122.7	8.6	87.71	6.17	.715
Firemen	1922	29	249	15.7	127.8	8.1	76.05	4.84	.595
	1924	51	413	14.7	123.6	8.4	80.66	5.50	.653
Jig runners	1922	23	109	13.2	124.1	9.4	62.96	4.77	.507
	1924	47	282	11.9	114.5	9.6	65.50	5.51	.572
Laborers	1922	29	1,349	12.1	105.9	8.8	55.77	4.62	.527
	1924	55	2,612	12.0	109.3	9.1	63.10	5.24	.577
Loaders	1922	27	187	12.9	113.8	8.8	60.37	4.69	.531
	1924	54	381	11.7	104.4	8.9	61.01	5.20	.584
Machinists	1922	27	89	13.7	127.1	9.3	83.20	6.09	.655
	1924	51	244	13.2	122.5	9.3	86.98	6.60	.710
Oilers	1922	28	69	13.2	122.9	9.3	64.58	4.90	.525
	1924	50	134	11.8	112.8	9.5	65.64	5.55	.582
Platemen	1922	25	181	12.5	106.0	8.5	56.15	4.49	.530
	1924	45	366	11.1	96.1	8.6	54.37	4.89	.566
Repairmen	1922	14	94	13.7	116.7	8.5	68.26	4.98	.585
	1924	38	182	11.9	105.9	8.9	66.86	5.61	.631
Slaters (boys)	1922	26	410	12.2	98.7	8.1	32.91	2.69	.333
	1924	53	1,103	11.6	96.2	8.3	35.68	3.08	.371
Timber cutters	1922	28	181	12.3	106.3	8.7	57.10	4.66	.537
	1924	46	240	11.4	96.7	8.5	58.47	5.15	.605
Trackmen	1922	22	60	12.1	98.6	8.2	54.13	4.49	.549
	1924	42	127	11.2	100.7	9.0	61.77	5.49	.613
Other employees	1922	29	1,074	13.5	127.7	9.5	67.30	5.00	.527
	1924	56	2,334	12.7	113.6	8.9	71.47	5.63	.629

In this table it is seen that in the half month for which data are presented, the 11,778 contract miners covered in 1924 worked an average of 10.8 starts, that is, on 10.8 calendar days; that they were at the face or seam of coal an average of 68.5 hours, excluding time for lunch, and at the face 73.9 hours, including time for lunch; that they were in the colliery an average of 81.4 hours, including time for lunch and time of travel from shaft to the face and return. Their average hours per start were 6.3 based on time at face, excluding time for lunch, 6.8 based on time at face, including time for lunch, and 7.5 based on total time in colliery. They earned an average of $1.432 per hour based on time at the face, excluding time for lunch, $1.327 based on time at the face, including time for lunch, and $1.204 based on total time in mine. Their earnings averaged $9.07 per start, and $98.07 for the half month covered in this study.

Comparing averages for contract miners, it will be observed that average starts and hours were less and average earnings more in

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1924 than in 1922. The increase in average earnings is due in part to the September, 1923, increase of 10 per cent in wage rates, and in part apparently, as is usually the case with tonnage or piece workers when the opportunity for work is less, to speeding up in 1924 resulting in greater production per man per hour than in 1922.

Company miners, company miners' laborers, consideration miners, and consideration miners' laborers are time workers at a specified rate per hour or day. At times they may do other work or be paid piece rates, earning more per hour than their regular rate per hour, this often occurring with consideration miners, who are shown as having an average *rate* of $0.861 per hour, compared with an average *earning* of $0.933 per hour, based on time at face, excluding time for lunch. Average rate of wages per hour are, therefore, shown for these occupations in order that the average rate of wages per hour may be compared with the average earnings per hour. As contract miners and contract miners' laborers are tonnage workers, average rates of wages per hour are not shown for them; their tonnage rates are variable.

In number of employees, earnings, and actual performance contract mining forms the basic occupation in anthracite mining. The 11,778 employees in this occupation constitute a little over 26 per cent of the 44,500 employees in the 56 collieries studied. Contract miners were not employed in one of the collieries, the work usually done by them being performed by consideration miners. The contract miners, assisted by their laborers, drill holes into the seams of coal by hand or by electric or compressed air coal-mining machines, load the holes with explosives, and shoot or blast the coal from the seams. For this they are paid a tonnage rate or its equivalent, the unit of pay usually being a mine car of specified capacity, as 1½, 2, 2½, or 3 tons of 2,240 pounds.

Classified earnings per hour are given in Table 2.

As before stated, average earnings per hour on the basis of time spent at the face are greater than on the basis of hours spent in the colliery, since the latter include the unproductive time spent in travel. Of the 11,778 contract miners covered in 1924, it is seen that, based on the time at the face, including time for lunch, 112, or 1 per cent, earned 50 and under 60 cents per hour, but based on the total time in colliery, including time for lunch and travel, 168 of them, or 1 per cent as a round figure, were in this earnings group. Based on time at the face, 23 per cent earned less than $1 per hour, but based on total time in the colliery, 33 per cent earned less than $1 per hour. Based on the time at the face, 98 per cent, and based on the total time in the colliery 99 per cent of them earned less than $3 per hour.

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TABLE 2.—NUMBER AND PER CENT OF CONTRACT MINERS AND CONTRACT MINERS' LABORERS EARNING EACH CLASSIFIED AMOUNT PER HOUR, 1922 AND 1924

[Data are for 29 collieries covered in 1922 and 55 in 1924; the 55 in 1924 include 24 of the 29 covered in the 1922 study]

Classified earnings per hour	Number based on—				Per cent							
					Actual, based on—				Cumulative, based on—			
	Time at face including lunch		Time in colliery including lunch and travel		Time at face including lunch		Time in colliery including lunch and travel		Time at face including lunch		Time in colliery including lunch and travel	
	1922	1924	1922	1924	1922	1924	1922	1924	1922	1924	1922	1924
	Contract miners											
Under $0.30	15	15	21	20	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
$0.30 and under $0.40	43	27	73	44	1	(1)	1	(1)	1	(1)	2	1
$0.40 and under $0.50	87	74	117	104	1	1	2	1	2	1	3	1
$0.50 and under $0.60	177	112	309	168	3	1	5	1	5	2	8	3
$0.60 and under $0.70	357	195	572	375	6	2	9	3	11	4	18	6
$0.70 and under $0.80	612	435	833	718	10	4	13	6	21	7	31	12
$0.80 and under $0.90	832	787	900	1,143	13	7	14	10	34	14	45	22
$0.90 and under $1.00	801	1,056	759	1,332	13	9	12	11	47	23	58	33
$1.00 and under $1.10	684	1,132	608	1,386	11	10	10	12	58	33	68	45
$1.10 and under $1.20	546	1,257	493	1,297	9	11	8	11	67	43	75	56
$1.20 and under $1.30	441	1,228	436	1,137	7	10	7	10	74	54	82	66
$1.30 and under $1.40	403	1,050	260	937	6	9	4	8	80	63	87	74
$1.40 and under $1.50	280	883	227	669	5	7	4	6	85	70	90	79
$1.50 and under $1.60	232	711	146	505	4	6	2	4	89	76	93	84
$1.60 and under $1.70	152	565	122	353	2	5	2	3	91	81	95	87
$1.70 and under $1.80	126	409	84	303	2	3	1	3	93	84	96	89
$1.80 and under $1.90	93	327	49	208	1	3	1	2	95	87	97	91
$1.90 and under $2.00	60	249	39	195	1	2	1	2	96	89	97	92
$2.00 and under $2.50	196	692	129	549	3	6	2	5	99	95	99	97
$2.50 and under $3.00	48	363	25	246	1	3	(1)	2	100	98	100	99
$3.00 and over	24	211	7	89	(1)	2	(1)	1	-----	100	-----	100
Total	6,209	11,778	6,209	11,778	100	100	100	100	-----	-----	-----	-----
	Contract miners' laborers											
Under $0.30	13	-------	22	1	(1)	-----	1	(1)	(1)	-----	1	(1)
$0.30 and under $0.40	37	2	52	10	1	(1)	2	(1)	1	(1)	2	(1)
$0.40 and under $0.50	116	30	184	50	3	(1)	5	1	5	(1)	8	1
$0.50 and under $0.60	252	80	406	156	7	1	12	2	12	2	20	3
$0.60 and under $0.70	695	278	1,067	693	21	4	32	10	33	6	51	13
$0.70 and under $0.80	1,033	1,283	964	2,259	31	19	28	33	63	25	80	47
$0.80 and under $0.90	645	2,147	340	2,147	19	32	10	32	83	56	90	78
$0.90 and under $1.00	290	1,504	160	808	9	22	5	12	91	78	94	90
$1.00 and under $1.10	133	720	86	348	4	11	3	5	95	89	97	95
$1.10 and under $1.20	75	394	57	116	2	6	2	2	97	95	99	97
$1.20 and under $1.30	45	130	19	83	1	2	1	1	99	97	99	98
$1.30 and under $1.40	20	82	11	48	1	1	(1)	1	99	98	100	99
$1.40 and under $1.50	9	45	9	23	(1)	1	(1)	(1)	99	99	-----	99
$1.50 and under $1.60	9	33	1	20	(1)	(1)	(1)	(1)	100	99	-----	100
$1.60 and under $1.70	3	18	1	11	(1)	(1)	(1)	(1)	-----	99	-----	-----
$1.70 and under $1.80	3	16	1	1	(1)	(1)	(1)	(1)	-----	100	-----	-----
$1.80 and under $1.90	-----	9	1	6	-----	(1)	(1)	(1)	-----	-----	-----	-----
$1.90 and under $2.00	1	1	-----	7	(1)	(1)	-----	(1)	-----	-----	-----	-----
$2.00 and under $2.50	3	15	2	3	(1)	(1)	(1)	(1)	-----	-----	-----	-----
$2.50 and under $3.00	1	6	-----	3	(1)	(1)	-----	(1)	-----	-----	-----	-----
$3.00 and over	-----	1	-----	1	-----	(1)	-----	(1)	-----	-----	-----	-----
Total	3,383	6,794	3,383	6,794	100	100	100	100	-----	-----	-----	-----

[1] Less than 1 per cent.

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The per cent of increase in tonnage rates of contract miners is shown in the table below on the basis of the 1902 piece rates as 100. Explosives and labor are paid for from the miners' gross earnings. As these expenses may not have changed during the years 1902 to 1923 in the same proportion as the rates have changed, the index numbers should not be construed as representing exact changes in net earnings or rates. It is assumed, however, that they approximately represent the trend of rates and earnings of contract miners.

TABLE 3.—PERIOD OF WAGE AGREEMENT AND INDEX NUMBERS OF PIECE OR TONNAGE RATES OF CONTRACT MINERS

[1902=100.00]

Period of wage agreement	Index numbers	Period of wage agreement	Index numbers
1902	100.00	Apr. 1, 1913, to Mar. 31, 1914	121.00
Apr. 1, 1903, to Mar. 31, 1904	[1] 114.40	Apr. 1, 1914, to Mar. 31, 1915	121.00
Apr. 1, 1904, to Mar. 31, 1905	[1] 114.95	Apr. 1, 1915, to Mar. 31, 1916	121.00
Apr. 1, 1905, to Mar. 31, 1906	[1] 114.31	May, 1916, to May, 1917	129.47
Apr. 1, 1906, to Mar. 31, 1907	[1] 114.58	May, 1917, to November, 1917	142.42
Apr. 1, 1907, to Mar. 31, 1908	[1] 114.22	November, 1917, to November, 1918	161.84
Apr. 1, 1908, to Mar. 31, 1909	[1] 114.40	November, 1918, to November, 1919	181.26
Apr. 1, 1909, to Mar. 31, 1910	[1] 114.49	November, 1919, to Mar. 31, 1920	181.26
Apr. 1, 1910, to Mar. 31, 1911	[1] 114.40	April, 1920, to Sept. 1, 1923	213.63
Apr. 1, 1911, to May, 1912	[1] 114.95	Sept. 1, 1923 [2]	234.99
May, 1912, to Mar. 31, 1913	121.00		

[1] Average for period, adjustments made monthly. [2] Still in effect January, 1927.

The rates paid in 1902 differed from mine to mine and often even within a mine, on account of varying conditions. In 1903 the Anthracite Coal Commission made an award by which contract miners were given an increase of 10 per cent over the 1902 rates, making a base index of 110 for 1903, and also provided for an additional increase of 1 per cent of the 1903 rate for each 5-cent advance in the wholesale price of coal at New York City, above $4.50 per ton. This award continued in effect 9 years. During these years the 10 per cent increase plus the 1 per cent increase caused by the advance in the wholesale price of coal at New York City over the April, 1903, price resulted in increases varying from an average of 14.22 per cent in 1907 to 14.95 per cent in 1904 and 1911.

The May, 1912, agreement eliminated the 1 per cent increase for each 5-cent advance in the wholesale price of coal at New York City, and increased the 1903 rate (index 110) 10 per cent, thus making the index 121 for 1912, which continued in effect four years or to March 31, 1916.

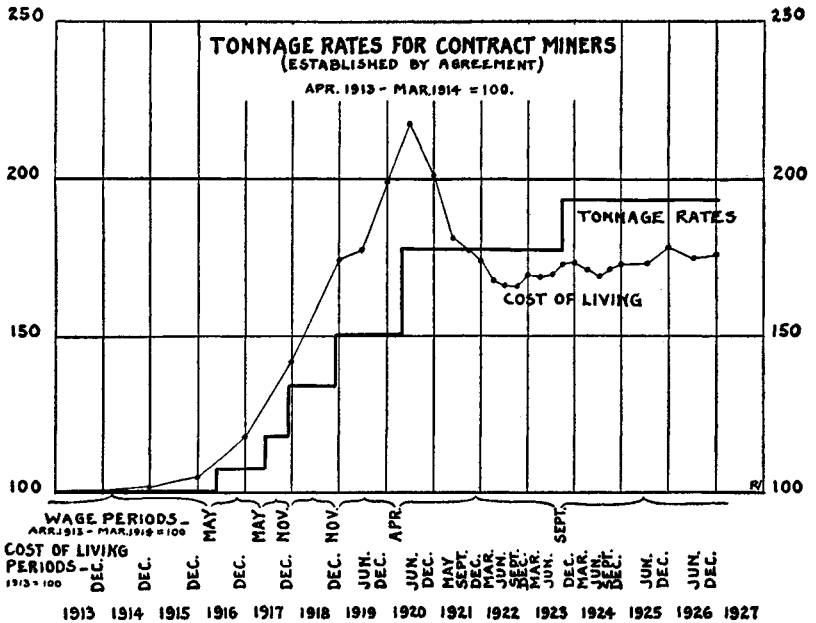
The May, 1916, agreement increased this rate 7 per cent, making the index 129.47. The May, 1916, rate was increased by the agreement of May, 1917, by 10 per cent, to an index of 142.42; by that of November, 1917, by 25 per cent, to an index of 161.84; by that of November, 1918 (which continued in force until April, 1920) by 40 per cent, to an index of 181.26; and by the August, 1920, award of the Anthracite Coal Commission by 65 per cent, to an index of 213.63. This award continued in effect until September, 1923, when the strike of that year was settled, at which time the rate made by the award was increased 10 per cent to an index of 234.99, or a little more than two and one-third times the 1902 rate. By agreement

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made in February, 1926, at the end of the strike which began September 1, 1925, the September, 1923, rates were continued in effect.

The chart below shows graphically the above information.

Time workers have a specified hour for beginning and quitting work and for lunch. The vast majority of these workers at the 56 collieries studied begin work at 7 a. m., work 4½ or 5 hours in the morning, take 30 minutes for lunch, work 3 or 3½ hours in the afternoon, and quit work at 3.30 p. m. The full-time hours of these employees are therefore eight per day, exclusive of lunch time. As they are paid by the day or hour, the hours worked are recorded on the pay rolls of the companies. A few pumpmen, engineers, firemen, motormen, car runners, cagers, and others work more than eight hours per day, and a very few also work on Sunday. Both overtime and Sunday work are paid for at the regular rate.



The hours of contract miners and of contract miners' laborers are presumed or expected to be the same as those of the time workers, but in actual practice their hours are usually more or less irregular. Some of them enter the collieries as early as 6 or 6.30 a. m., begin work immediately on arrival at the face, and work throughout the day, eating their lunch while waiting for mine cars or material; some quit for the day at or near noon; while others enter the collieries around 7 a. m., take as much time for lunch as they desire, and often quit work before the mine as a whole ceases operation.

The 9-hour day and 54-hour week established by the 1903 award of the Anthracite Coal Strike Commission became 8 hours per day and 48 hours per week under the May, 1916, agreement. The 8-hour day as defined by the 1916 agreement is as follows:

An 8-hour day means eight (8) hours of actual work for all classes of labor at the usual working place, exclusive of noontime, for six (6) days per week, if

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the operator desires to work his mines to that extent, excluding legal holidays. The time required in going and coming from place of employment in and about the mine shall not include any part of the day's labor.

The basic 8-hour day established in 1916 has not been changed.

The number of days of operation and the number of days the mines were closed, by causes, during the 12 months ending October 31, 1924, were reported for 51 of the 56 collieries, and during the 12 months ending December 31, 1924, for 5 collieries. One colliery was in operation only 47 days; one, 183 days; one, 251 days; one, 255 days; one, 259 days; one, 269 days; six, 271 to 279 days; twenty-five, 280 to 289 days; sixteen, 290 to 299 days; two, 302 days; and one, 303 days.

The average number of days of operation of the 56 collieries, based on the days of operation of each colliery during the year, weighted by the number of miners of each type and their laborers, of each colliery, was 286.7.

The average earnings per start of the 23,715 employees in these occupations, as a group, during the half-month pay period covered in 1924, were $7.77. On the basis of the 286.7 average days of operation, this gives a possible or theoretical average yearly earning of $2,228 for the employees in these occupations. The Geological Survey reports 274 as the weighted average days of operation in anthracite mining in 1923, which, with the $7.77 average per start or day, gives possibly yearly earnings of $2,129 for the men who worked full time.

One colliery was closed 254 days because of lack of market or of orders, and 10 days because of mine disability; it was also shut down 52 Sundays and 3 holidays. One was closed 40 days on account of lack of railroad cars, 25 days on account of transportation disability, 50 days on account of strikes, on 52 Sundays and 10 holidays, and on 6 days by other causes. Of the other 54 collieries, the reasons for closing were as follows:

No market or lack of orders, 17 collieries, 1 to 41 days.
Strikes, 26 collieries, 1 to 42 days.
Mine disability, 22 collieries, 1 to 20 days.
Lack of railroad cars, 4 collieries, 1 or 2 days.
Sundays, 54 collieries, 52 days.
Holidays, 54 collieries, 6 to 12 days.
Other causes, 53 collieries, 1 to 25 days.

Hours and Earnings in Bituminous Coal Mining, 1924-25

THE bureau made a study of hours and earnings of employees in bituminous coal mines in 1922 and in the winter of 1924–25.[3] A like study was started late in 1926, but the results are not available at the time this Handbook goes to press.

The 1924–25 material here summarized is shown in comparison with like figures for 1922. These data were obtained from pay rolls and other records of mines in all of the principal bituminous-coal producing States. In most instances the data were obtained personally by special agents of the bureau. In a few cases only, the companies preferred to compile the returns.

[3] For detailed data see Labor Review for February, 1926, and Bul. No. 416.

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The three basic occupations in bituminous coal mining are those of hand or pick miners, machine miners, and hand loaders. These men are usually paid a rate per 2,000-pound ton of run-of-mine coal; that is, coal just as mined, including "slack."

The machine miners undercut the coal by machine. The hand loaders shovel the coal into cars from the floor of the mine after it has been undercut by the machine miners and blasted from the seam of coal by the loaders or by shot firers. The hand or pick miners undercut the coal with a pick, blast it from the seam, and shovel it from the floor of the mine into mine cars.

Loaders and miners are usually paid tonnage rates. All other employees inside and outside the mines are usually paid time rates—that is, rates per hour, day, or week.

The 1924 data are for 124,691 underground or "inside" wage earners and 16,028 surface or "outside" employees, a total of 140,719, or 23 per cent of the 620,000 bituminous coal mine workers reported in 1924 by the United States Geological Survey. Based on information as to employment conditions obtained by agents during the time covered by the 1924 study, it is estimated that the 140,719 formed much more than 23 per cent of the total number actually at work at the time of the study.

In several of the States, especially Indiana, Kansas, and Ohio, so many mines were closed on account of lack of market that the agents had to canvass practically all companies in operation in order to get a satisfactory volume of data. Therefore, as a whole, the figures are a good representation of the conditions as to hours and earnings in the industry in the period taken.

Table 1 shows for each State and for all States combined, for 1922 and for 1924, average number of starts in a half-month pay period and average hours and earnings for the miners and the loaders—that is, for employees who actually do the digging and the loading of coal into mine cars. The term "starts" means the number of days on which employees worked, regardless of whether or not a full day's work was done. The table presents average hours and earnings for each of the six specified occupations based on (1) time at the face, including time for lunch, and (2) total time in the mine, including time for lunch and time of travel in mine from its opening to the face and return. The term "face" means the surface of the seam of coal on which the men are working, or, broadly, their place of work in the mine. The time for lunch, as reported, was usually about 30 minutes, and the time of travel in the different mines ranged from 10 minutes per day for the mine with the shortest travel to 2 hours for the one with the longest time of travel. The average time was 40 minutes per day for the round trip or 20 minutes each way.

Reading Table 1, it is seen that 1924 data are presented for 61,936 hand loaders, 21,424 pick or hand miners, 6,499 machine miners, 170 contract loaders, 102 machine loaders, and 1,036 gang miners, and that the average hours and earnings in the half month were less in 1924 than in 1922. The average hours per start, however, were somewhat more in 1924 than in 1922.

In the half-monthly pay period in 1924 hand loaders worked an average of 8.1 starts, the average in the different States ranging from 6 in Indiana to 8.9 in Pennsylvania. Based on time at the face,

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including time for lunch, loaders worked an average of 63.3 hours, the average in different States ranging from 45.3 in Indiana to 72.3 in Pennsylvania. These employees earned an average of 81.1 cents per hour based on time at the face, including time for lunch, the average by States ranging from 49.2 cents in Alabama to $1.092 in Illinois. They earned an average of $6.32 per start or day, the average by States ranging from $3.85 in Tennessee to $8.76 in Illinois. The figures for other occupations may be compared in like manner.

The earnings per hour of the two predominant occupations—hand loaders and hand miners—were practically the same in 1924, being approximately 81 cents per hour for time at the face and 75 cents per hour for time in the mine. Machine miners earned $1.163 per hour at the face and $1.079 per hour in the mines.

TABLE 1.—AVERAGE NUMBER OF STARTS (DAYS OR PARTS OF DAYS) AND AVERAGE HOURS AND EARNINGS OF LOADERS AND MINERS, BY STATES, 1922 AND 1924

[The data in this table are for employees who actually do the digging and loading of coal into mine cars]

Occupation and State	Year	Number of—		Average number of starts (days) in half-month pay period	Average hours—				Average earnings—			
					In half month, based on—		Per start based on—		Per hour based on—		In half-month pay period	Per start
		Mines	Employees		Time at face, including lunch	Time in mine	Time at face, including lunch	Time in mine	Time at face, including lunch	Time in mine		
Loaders, hand												
Alabama	1922	8	1,535	8.4	69.8	74.9	8.3	8.9	$0.497	$0.464	$34.73	$4.12
	1924	32	3,060	7.6	64.8	70.4	8.5	9.3	.492	.454	31.93	4.20
Colorado	1922	7	445	9.1	69.9	77.5	7.7	8.5	.927	.837	64.84	7.13
	1924	15	1,178	8.0	62.3	66.8	7.8	7.9	.858	.799	53.41	6.65
Illinois	1922	17	4,257	8.9	70.7	75.1	8.0	8.5	1.197	1.127	84.58	9.53
	1924	35	10,079	7.6	60.8	66.2	8.0	8.7	1.092	1.003	66.40	8.76
Indiana	1922	8	1,436	8.3	61.7	64.6	7.5	7.8	1.146	1.094	70.65	8.54
	1924	15	2,470	6.0	45.3	47.4	7.5	7.9	1.083	1.034	49.05	8.17
Kentucky	1922	20	2,540	8.6	63.4	67.7	7.3	7.8	.752	.704	47.64	5.51
	1924	78	7,266	8.1	63.2	67.8	7.8	8.4	.693	.646	43.78	5.40
Ohio	1922	25	3,119	8.7	65.0	70.9	7.5	8.2	.973	.893	63.32	7.29
	1924	55	6,832	7.7	59.1	64.3	7.7	8.4	.860	.791	50.87	6.63
Pennsylvania	1922	41	5,650	8.8	68.5	75.4	7.8	8.6	.739	.672	50.64	5.79
	1924	128	19,046	8.9	72.3	78.7	8.1	8.9	.743	.682	53.68	6.05
Tennessee	1924	17	860	7.5	56.5	60.1	7.6	8.1	.508	.478	28.73	3.85
Utah	1922	4	295	5.1	38.8	41.6	7.7	8.2	.939	.876	36.42	7.20
Virginia	1924	12	1,006	8.2	61.6	65.4	7.5	8.0	.604	.569	37.24	4.53
Washington [1]	1922	1	76	10.1	85.9	89.0	8.5	8.8	.893	.862	76.68	7.60
West Virginia	1922	42	2,979	8.6	60.2	64.7	7.0	7.5	.904	.841	54.40	6.33
	1924	127	10,139	8.2	56.4	61.4	6.8	7.4	.831	.764	46.91	5.69
Wyoming	1922	3	228	10.0	79.3	84.2	7.9	8.4	1.158	1.090	91.80	9.20
Total	1922	176	22,560	8.7	66.2	71.5	7.7	8.3	.902	.836	59.75	6.90
	1924	514	61,936	8.1	63.3	68.6	7.8	8.5	.811	.748	51.29	6.32
Miners, hand or pick												
Alabama	1922	8	785	8.8	66.2	74.8	7.5	8.5	.548	.485	36.28	4.11
	1924	18	1,477	8.3	69.5	75.7	8.4	9.2	.577	.529	40.07	4.84
Colorado	1922	6	564	10.2	81.3	90.1	8.0	8.8	.993	.896	80.69	7.90
	1924	11	1,146	7.9	57.4	62.9	7.3	8.0	.929	.847	53.31	6.76
Illinois	1922	11	1,864	10.3	80.3	86.2	7.8	8.4	.865	.806	69.45	6.77
	1924	28	3,921	8.1	62.9	67.6	7.8	8.4	.912	.849	57.38	7.12
Indiana	1922	7	542	8.0	55.8	59.3	7.0	7.4	.827	.779	46.19	5.75
	1924	12	799	7.1	49.9	53.5	7.0	7.5	1.087	1.014	54.28	7.60
Kansas	1924	9	1,474	9.8	64.0	69.6	6.5	7.1	.901	.829	57.70	5.90

[1] Loaders in this State also did machine mining.

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TABLE 1.—AVERAGE NUMBER OF STARTS (DAYS OR PARTS OF DAYS) AND AVERAGE HOURS AND EARNINGS OF LOADERS AND MINERS, BY STATES, 1922 AND 1924—Con.

Occupation and State	Year	Number of—		Average number of starts (days) in half-month pay period	Average hours—				Average earnings—			
					In half month, based on—		Per start based on—		Per hour based on—		In half-month pay period	Per start
		Mines	Employees		Time at face, including lunch	Time in mine	Time at face, including lunch	Time in mine	Time at face, including lunch	Time in mine		
Miners, hand or pick—Contd.												
Kentucky	1922	5	223	8.7	64.5	69.3	7.4	8.0	$0.825	$0.768	$53.21	$6.12
	1924	14	654	8.5	70.9	77.8	8.3	9.1	.776	.707	55.00	6.45
Ohio	1922	3	47	9.8	79.9	86.7	8.1	8.8	.916	.844	73.18	7.46
	1924	2	15	5.5	38.9	44.6	7.1	8.2	1.041	.910	40.54	7.42
Pennsylvania	1922	42	2,898	9.1	72.2	79.7	8.0	8.8	.767	.695	55.38	6.10
	1924	105	8,010	8.7	70.7	76.9	8.1	8.8	.777	.714	54.91	6.31
Tennessee	1924	14	869	8.0	62.1	67.0	7.7	8.3	.541	.502	33.60	4.18
Utah	1922	4	167	5.9	41.9	45.6	7.2	7.8	1.023	.941	42.92	7.33
Washington	1922	3	243	10.7	90.2	97.9	8.5	9.2	1.068	.984	96.31	9.03
West Virginia	1922	34	972	8.1	55.4	59.4	6.8	7.3	1.019	.950	56.45	6.95
	1924	77	3,046	8.5	61.6	67.4	7.2	7.9	.831	.760	51.18	5.99
Wyoming	1922	4	124	10.3	85.1	89.9	8.3	8.7	1.215	1.150	103.38	10.05
Other States	1924	1	13	9.8	81.9	86.8	8.3	8.8	.652	.615	53.38	5.42
Total	1922	127	8,429	9.2	71.0	77.5	7.7	8.4	.840	.769	59.62	6.47
	1924	291	21,424	8.5	65.6	71.2	7.7	8.4	.809	.745	53.06	6.27
Miners, machine												
Alabama	1922	6	146	9.5	79.6	83.8	8.4	8.8	0.611	0.580	48.64	5.13
	1924	27	342	8.4	75.8	81.6	9.0	9.7	.836	.775	63.29	7.56
Colorado	1922	6	85	9.3	71.4	79.3	7.7	8.5	1.493	1.344	106.59	11.48
	1924	15	119	8.8	72.3	77.5	8.2	8.8	1.336	1.246	96.56	11.01
Illinois	1922	15	369	10.0	76.4	81.5	7.6	8.1	1.500	1.407	114.68	11.46
	1924	35	1,196	7.8	60.0	65.5	7.7	8.4	1.500	1.376	90.10	11.57
Indiana	1922	8	136	8.8	66.1	69.3	7.5	7.9	1.832	1.748	121.06	13.73
	1924	15	260	6.5	49.4	51.7	7.7	8.0	1.684	1.609	83.15	12.88
Kentucky	1922	19	268	9.7	73.6	78.7	7.6	8.1	1.166	1.091	85.83	8.88
	1924	75	797	8.8	78.5	83.3	8.9	9.4	.927	.874	72.79	8.25
Ohio	1922	25	354	9.9	78.2	85.1	7.9	8.6	1.395	1.282	109.12	10.99
	1924	57	740	8.8	71.1	77.1	8.1	8.7	1.274	1.175	90.62	10.27
Pennsylvania	1922	41	703	9.3	76.7	84.3	8.2	9.0	1.090	.991	83.55	8.94
	1924	126	1,852	9.7	81.4	88.3	8.4	9.1	1.142	1.053	92.95	9.61
Tennessee	1924	16	125	8.2	68.5	73.1	8.3	8.9	.549	.514	37.56	4.58
Utah	1922	3	21	6.5	48.3	51.9	7.5	8.0	1.745	1.621	84.19	13.00
Virginia	1924	12	93	9.9	92.2	96.7	9.4	9.8	.657	.626	60.58	6.14
West Virginia	1922	35	271	9.3	74.7	80.1	8.1	8.6	1.379	1.287	103.06	11.12
	1924	107	975	9.0	73.3	78.7	8.1	8.7	1.134	1.055	83.09	9.20
Wyoming	1922	3	18	9.8	76.5	81.4	7.8	8.3	2.142	2.013	163.76	16.65
Total	1922	161	2,371	9.5	75.4	81.5	7.9	8.6	1.274	1.180	96.14	10.10
	1924	485	6,499	8.8	72.9	78.6	8.3	8.9	1.163	1.079	84.79	9.65
Loaders, contract												
Alabama	1924	10	72	8.3	70.3	73.8	8.4	8.8	.954	.909	67.06	8.03
Kentucky	1924	8	85	10.2	85.4	90.5	8.4	8.9	.878	.828	74.94	7.36
Virginia	1924	2	4	10.5	90.3	93.8	8.6	8.9	1.129	1.087	101.88	9.70
West Virginia	1924	4	9	11.8	100.4	106.5	8.5	9.0	1.127	1.063	113.14	9.61
Total	1924	24	170	9.5	79.9	84.3	8.4	8.9	.929	.881	74.26	7.82
Loaders, machine												
Ohio	1924	2	15	11.6	98.1	102.4	8.5	8.8	1.179	1.130	115.75	9.93
West Virginia	1924	5	46	10.8	99.1	106.7	9.2	9.9	.681	.633	67.48	6.23
Other States	1924	3	41	7.0	62.7	67.8	9.0	9.7	.429	.394	26.72	3.82
Total	1924	10	102	9.4	84.3	90.4	9.0	9.6	.690	.644	58.20	6.20
Miners, gang												
Illinois	1924	18	573	7.7	63.4	68.8	8.3	9.0	1.361	1.254	86.23	11.25
Indiana	1924	6	98	7.0	53.7	55.8	7.7	8.0	1.318	1.269	70.82	10.15
Pennsylvania	1924	8	282	9.2	76.2	83.5	8.3	9.1	.865	.789	65.90	7.16
West Virginia	1924	6	43	10.1	70.9	76.6	7.0	7.6	1.031	1.000	79.00	7.81
Other States	1924	2	40	5.9	45.4	48.4	7.7	8.2	1.241	1.165	56.37	9.55
Total	1924	40	1,036	8.1	65.6	71.1	8.1	8.8	1.187	1.094	77.79	9.66

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Table 2 presents for 1922 and 1924 the average number of starts or days and average hours and earnings for "inside" and "outside" occupations in which the employees are usually time workers; that is, paid at rates per hour, day, or week. The averages are based on hours actually worked.

TABLE 2.—AVERAGE NUMBER OF STARTS (DAYS OR PARTS OF DAYS) AND AVERAGE HOURS AND EARNINGS IN SPECIFIED OCCUPATIONS, 1922 AND 1924

[The data in this table are for employees of all inside and outside occupations, except loaders and miners]

Occupation	Year	Number of—		Average number of starts (days) made in half-month pay period	Average hours worked		Average earnings		
		Mines	Employees		In half-month pay period	Per start (day)	In half-month pay period	Per start (day)	Per hour
Inside work									
Brakemen	1922	181	1,333	[1] 9.4	77.3	[1] 8.2	$60.18	[1] $6.41	$0.779
	1924	547	4,259	8.9	75.0	8.4	53.25	5.96	.710
Brattice men and timbermen.	1922	181	986	[2] 10.4	85.7	[2] 8.1	70.26	[2] 6.81	.820
	1924	484	2,521	9.8	81.1	8.3	63.04	6.44	.778
Cagers	1922	83	185	[3] 10.3	89.4	[3] 8.6	77.82	[3] 7.53	.871
	1924	198	410	9.6	83.2	8.7	71.53	7.46	.860
Drivers	1922	125	2,080	[4] 9.5	78.7	[4] 8.2	64.84	[4] 6.82	.824
	1924	377	4,603	8.8	72.3	8.2	54.08	6.12	.748
Laborers	1922	181	2,967	[5] 9.9	80.8	[5] 8.0	56.30	[5] 5.73	.697
	1924	502	7,228	8.9	74.2	8.3	48.74	5.47	.657
Motormen	1922	183	1,296	[6] 10.1	84.2	[6] 8.4	68.62	[6] 6.82	.815
	1924	548	3,751	9.7	83.6	8.6	62.89	6.46	.752
Pump men	1922	157	452	13.0	110.2	8.5	80.90	6.24	.734
	1924	402	1,015	11.7	103.4	8.8	70.38	6.02	.681
Trackmen	1922	198	1,393	[7] 10.7	87.3	[7] 8.2	72.05	[7] 6.77	.826
	1924	587	4,026	9.7	81.2	8.3	59.83	6.14	.737
Trappers (boys)	1922	103	393	9.1	72.3	7.9	34.09	3.75	.472
	1924	273	925	8.3	66.7	8.0	27.24	3.27	.408
Other employees	1922	188	2,294	[8] 10.9	91.4	[8] 8.3	75.49	[8] 6.97	.826
	1924	538	4,786	10.5	89.7	8.5	73.32	6.97	.817
Outside work									
Blacksmiths	1922	191	339	[9] 11.7	102.0	[9] 8.6	87.42	[9] 7.47	.857
	1924	581	969	10.7	92.0	8.6	71.75	6.72	.780
Carpenters and car-repair men.	1922	157	427	[10] 11.1	94.7	[10] 8.4	71.23	[10] 6.42	.752
	1924	474	1,354	10.4	89.6	8.6	61.96	5.93	.691
Engineers	1922	120	267	[1] 13.9	121.3	[1] 8.7	99.50	[1] 7.21	.820
	1924	333	732	12.9	114.4	8.9	91.56	7.09	.801
Firemen	1922	79	327	[11] 13.9	117.1	[11] 8.5	87.24	[11] 6.48	.745
	1924	212	636	12.6	110.7	8.8	78.83	6.25	.712
Laborers	1922	195	2,407	[12] 10.1	84.8	[12] 8.4	55.06	[12] 5.49	.649
	1924	591	7,514	9.5	81.2	8.6	46.73	4.93	.575
Other employees	1922	193	2,242	[13] 11.8	101.3	[13] 8.5	70.02	[13] 5.96	.691
	1924	578	4,823	11.1	99.1	8.9	62.73	5.64	.633

[1] Not including data for 8 employees whose starts were not reported.
[2] Not including data for 79 employees whose starts were not reported.
[3] Not including data for 2 employees whose starts were not reported.
[4] Not including data for 89 employees whose starts were not reported.
[5] Not including data for 237 employees whose starts were not reported.
[6] Not including data for 6 employees whose starts were not reported.
[7] Not including data for 30 employees whose starts were not reported.
[8] Not including data for 137 employees whose starts were not reported.
[9] Not including data for 9 employees whose starts were not reported.
[10] Not including data for 22 employees whose starts were not reported.
[11] Not including data for 24 employees whose starts were not reported.
[12] Not including data for 51 employees whose starts were not reported.
[13] Not including data for 75 employees whose starts were not reported.

Table 3 shows for 1924 the number of the 61,936 hand loaders, 21,424 hand or pick miners, and 6,499 machine miners in each classified earnings group based on (1) the actual hours at the face or seam of coal, including time for lunch, and (2) the actual hours in the mine, including time of travel from the opening of the mine to the face and return, the working hours, and the time for lunch.

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TABLE 3.—NUMBER AND PER CENT, ACTUAL AND CUMULATIVE, OF LOADERS, HAND OR PICK MINERS, AND MACHINE MINERS EARNING EACH CLASSIFIED AMOUNT PER HOUR, 1924

Occupation and classified earnings per hour	Number of hand loaders based on—		Number of hand or pick miners based on—		Number of machine miners based on—	
	Time at face, including lunch time	Time in mine, including lunch and travel time	Time at face, including lunch time	Time in mine, including lunch and travel time	Time at face, including lunch time	Time in mine, including lunch and travel time
Under $0.30	1,158	1,604	439	620	32	37
$0.30 and under $0.40	2,847	3,823	834	1,126	84	138
$0.40 and under $0.50	5,085	6,439	1,553	2,045	222	286
$0.50 and under $0.60	6,821	8,066	2,364	2,902	392	405
$0.60 and under $0.70	7,984	9,199	2,862	3,192	301	368
$0.70 and under $0.80	8,323	8,388	3,034	3,190	375	449
$0.80 and under $0.90	7,478	7,198	2,844	2,738	567	658
$0.90 and under $1	6,381	5,686	2,389	2,010	532	583
$1 and under $1.10	5,071	4,311	1,715	1,307	504	598
$1.10 and under $1.20	3,897	2,883	1,146	886	565	544
$1.20 and under $1.30	2,603	1,804	779	511	481	459
$1.30 and under $1.40	1,708	1,066	539	311	413	452
$1.40 and under $1.50	1,007	636	289	210	452	385
$1.50 and under $1.60	649	311	205	121	349	280
$1.60 and under $1.70	339	232	137	83	242	204
$1.70 and under $1.80	227	105	96	60	272	176
$1.80 and under $1.90	130	74	63	40	154	127
$1.90 and under $2	81	36	47	21	144	116
$2 and under $2.50	117	57	70	46	343	184
$2.50 and under $3	18	11	17	5	55	42
$3 and over	12	7	2		20	8
Total	61,936	61,936	21,424	21,424	6,499	6,499

Table 4 shows for the miners and loaders of each of the States included in the study and for all of these States combined, the number of miners and loaders, average starts, average earnings per start, average days of operation, and estimated possible average annual earnings. The miners and loaders in this table include 61,936 hand loaders, 21,424 hand or pick miners, 6,499 machine miners, 170 contract loaders, 102 machine loaders, and 1,036 gang miners, a total of 91,167, or 65 per cent of the total number (140,719) of wage earners covered in this study.

The days of operation in year for *all mines of the State* are the days reported by the United States Geological Survey for the calendar year 1924, weighted by the total number of employees of all occupations in each mine. All the listed States combined averaged 172 days in the calendar year and the average for the States ranged from 136 days for Indiana to 226 for Virginia. The method of computing the average (172) is explained in a footnote of the table. The average for all bituminous mines in the United States in 1924 was 171 days.

The estimated possible average annual earnings of miners and loaders based on average earnings per start and days of operation of the mines included in the study by the bureau are $1,300. The average by States ranged from $757 for Tennessee to $1,483 for Illinois.

Many of the mines were shut down at the time of the bureau's study, although they may have worked earlier in the year. To get wage data, it was necessary to find mines in operation. This in part explains why the mines covered had a greater average number of days of operation than had all mines of the State in the calendar

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year 1924. But this condition does not affect the representative character of the published hours per start or earnings per hour; nor, probably, does it materially affect the time and earnings of a half-month pay period in the season when running. Any estimate of possible yearly earnings, however, should take all mines into consideration. Fewer days of work mean less money earned. The last column of the table shows the estimated amount the miners and loaders would have made had they worked all days their mines operated. Thus, with 172 days of work they would have earned $1,128 as against a possible $1,300 in the mines of the bureau canvass, with a range from $649 in Tennessee to $1,287 in Colorado.

TABLE 4.—ESTIMATED POSSIBLE ANNUAL EARNINGS OF MINERS AND LOADERS, 1924, BY STATES

State	Mines covered by bureau	Miners and loaders	Average starts in half month covered	Average earnings per start	Mines reporting days of operation	Average days of operation in year		Possible yearly earnings of miners and loaders	
						Mines reporting	All mines of State [1]	In mines studied [2]	In all mines of State [3]
Alabama	39	4,968	7.9	$4.57	38	231.2	220	$1,057	$1,005
Colorado	17	2,448	8.0	7.23	16	187.0	178	1,352	1,287
Illinois	46	15,769	7.7	8.55	44	173.5	148	1,483	1,265
Indiana	23	3,627	6.3	8.56	22	147.7	136	1,264	1,164
Kansas	9	1,474	9.8	5.92	9	192.9	151	1,142	894
Kentucky	79	8,802	8.2	5.63	67	200.3	174	1,128	980
Ohio	57	7,637	7.8	7.17	57	177.7	143	1,274	1,025
Pennsylvania	155	29,190	8.9	6.40	140	215.2	180	1,377	1,152
Tennessee	20	1,873	7.8	4.08	20	185.6	159	757	649
Virginia	12	1,121	8.4	4.65	10	242.5	226	1,128	1,051
West Virginia	142	14,258	8.4	6.10	126	204.4	182	1,247	1,110
Total	599	91,167	8.3	6.56	549	198.2	[1] 172	1,300	1,128

[1] As reported by U. S. Geological Survey. The average for the total is for these same States with the days for each State weighted by the number of miners and loaders shown in the table.
[2] Computed by multiplying the average earnings per start by the average days of operation in year ending Oct. 31, 1924, for mines reporting.
[3] Computed by multiplying the average earnings per start by the average days of operation in the calendar year 1924, of all mines of State.

Wages and Hours of Labor in the Boot and Shoe Industry, 1926

A STUDY of wages and hours of labor in the boot and shoe industry in the United States was made by the bureau in 1926.[4] Data were obtained for 29,925 male and 22,772 female wage earners. This survey, like those of former years, covered a representative group of establishments in each State where boot and shoe manufacturing is of material importance. These establishments were limited to those whose principal products were men's, women's, or children's shoes, made by the welt, McKay, or turn process. Data were not included from establishments whose main or entire product was nailed, or pegged shoes, or specialties such as slippers, leggings, felt or rubber footwear, etc. Wherever possible the 1926 data were obtained from the same establishments as

[4] For complete report see forthcoming bulletin.

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in 1924. In some instances, however, these plants were not operating, had moved to some other locality, or ceased to be representative.

The data for 1926 were copied by agents of the bureau directly from the pay rolls or other records of 154 establishments in 14 States. According to the 1923 United States Census of Manufactures, approximately 97 per cent of the wage earners in the industry were in these 14 States, and of the whole number of wage earners in this industry in the United States this study covers about 23 per cent.

The figures were collected as of the late summer and early autumn. Data for a few large establishments are for only a part of the total number of employees of such establishments, as the inclusion of the total number of wage earners in these establishments would have tended to impair the representative character of the averages for the States in which the establishments are located.

Table 1 and the chart on page 726 show by index numbers the changes in average full-time hours per week, in average earnings per hour, and in average full-time earnings per week for each of the years in which the bureau made studies of the industry from 1910 to 1926, inclusive. The averages for 1913 are used as the base or 100. The full-time hours per week decreased slightly over 11 per cent between 1913 and 1926, average earnings per hour increased 119.1 per cent, or considerably more than doubled, and average full-time earnings per week increased approximately 95.4 per cent during the same period. Because of the reduction in the average full-time hours per week, the average full-time earnings per week did not show the same proportion of increase as that for the average earnings per hour.

TABLE 1.—INDEX NUMBERS OF HOURS AND EARNINGS IN THE BOOT AND SHOE INDUSTRY IN SPECIFIED YEARS 1910 TO 1926

[1913=100]

Year	Index numbers of—		
	Full-time hours per week	Earnings per hour	Full-time earnings per week
1910	102.7	92.0	94.1
1911	102.4	93.9	95.8
1912	100.9	92.6	93.2
1913	100.0	100.0	100.0
1914	99.3	100.8	100.2
1916	99.1	107.5	106.6
1918	94.9	139.7	132.5
1920	88.2	232.0	203.7
1922	88.4	207.9	184.7
1924	88.9	214.1	190.9
1926	88.9	219.1	195.4

Table 2 shows for 1924 and 1926 average full-time hours per week, average earnings per hour, and average full-time earnings per week for each of the principal occupations in the industry and for the industry as a whole.

Referring to the totals at the end of the table, it is seen that the average full-time hours per week of males in all occupations combined increased from 48.9 in 1924 to 49.0 in 1926. There was no

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change in average full-time hours per week of females nor of males and females combined.

The average earnings per hour of males in all occupations combined increased from 60.2 cents in 1924 to 62.2 cents in 1926, those of females from 39.4 to 40.1 cents, and those of males and females combined, or for the industry, from 51.6 to 52.8 cents.

Average full-time earnings per week of males increased from $29.44 in 1924 to $30.48 in 1926, those of females from $19.31 to $19.65, and those of males and females combined, or for the industry, from $25.28 to $25.87.

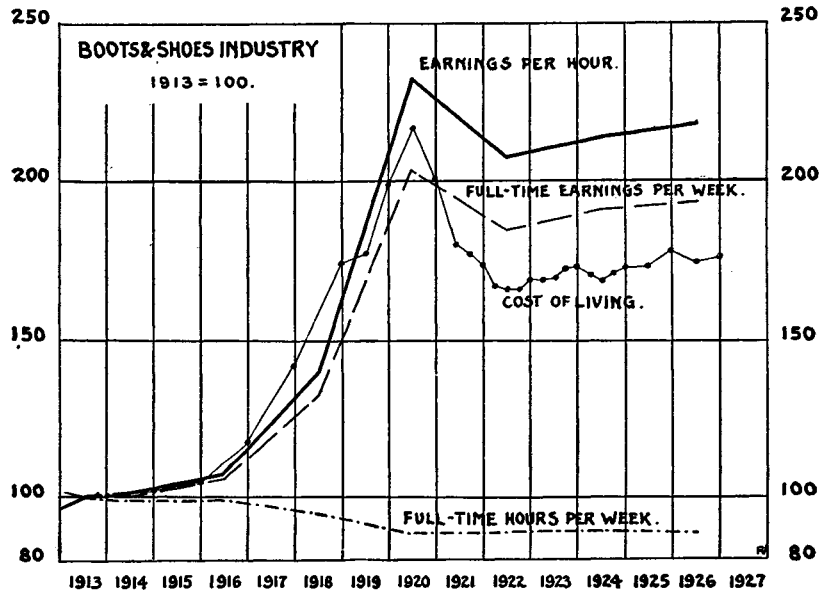


TABLE 2.—AVERAGE HOURS AND EARNINGS IN THE BOOT AND SHOE INDUSTRY, 1924 AND 1926, BY OCCUPATION AND SEX

Occupation	Sex	Year	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings
Cutting department							
Cutters, vamp and whole shoe, hand	Male	1924	88	2,009	48.4	$0.838	$40.56
	do	1926	108	2,129	48.9	.808	39.51
Cutters, vamp and whole shoe, machine	Male	1924	54	777	49.9	.687	34.28
	do	1926	54	782	49.4	.658	32.51
	Female	1924	4	45	53.2	.310	16.49
	do	1926	15	58	49.9	.501	25.00
Cutters, trimmings, hand	Male	1924	85	736	48.8	.485	23.67
	do	1926	95	837	49.3	.516	25.44
	Female	1924	6	29	52.1	.348	18.13
	do	1926	9	26	49.2	.404	19.88
Skivers, uppers	Male	1924	29	100	48.0	.619	29.71
	do	1926	37	96	48.4	.668	32.33
	Female	1924	89	474	49.0	.472	23.12
	do	1926	113	552	48.9	.486	23.77

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TABLE 2.—AVERAGE HOURS AND EARNINGS IN THE BOOT AND SHOE INDUSTRY 1924 AND 1926, BY OCCUPATION AND SEX—Continued

Occupation	Sex	Year	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings
Sole leather department							
Cutters, outsole	Male	1924	53	269	48.4	$0.731	$35.38
	do	1926	70	273	48.6	.716	34.80
Cutters, insole	do	1924	38	298	48.4	.709	34.32
	do	1926	43	217	48.8	.640	31.23
Channelers, outsole or insole	do	1924	88	207	49.1	.669	32.85
	do	1926	100	199	48.9	.709	34.67
Fitting or stitching department							
Cementers and doublers, hand and machine	Male	1924	12	24	47.8	.585	27.96
	do	1926	18	42	50.8	.374	19.00
	Female	1924	95	1,031	49.1	.328	16.10
	do	1926	118	1,426	49.3	.340	16.76
Folders, hand and machine	Male	1924	6	38	47.3	.709	33.54
	do	1926	10	61	45.0	.957	43.07
	Female	1924	93	840	48.7	.420	20.45
	do	1926	121	1,002	48.7	.453	22.06
Lining makers	do	1924	100	1,012	49.3	.369	18.19
	do	1926	124	1,170	49.3	.413	20.36
Top stitchers	Male	1924	21	78	47.9	.675	32.33
	do	1926	27	90	47.1	.773	36.41
	Female	1924	97	1,184	49.3	.462	22.77
	do	1926	121	1,469	49.3	.486	23.96
Vampers	Male	1924	49	304	48.2	.707	34.08
	do	1926	63	294	48.2	.741	35.72
	Female	1924	99	1,053	49.4	.519	25.64
	do	1926	123	1,170	49.1	.531	26.07
Fancy stitchers	Male	1926	16	46	47.4	.763	36.17
	Female	1924	86	1,467	49.1	.451	22.14
	do	1926	112	2,398	49.4	.452	22.33
Lasting department							
Assemblers for pulling-over machine	Male	1924	81	421	49.3	.554	27.31
	do	1926	113	541	49.1	.596	29.26
	Female	1924	8	33	50.0	.399	19.95
	do	1926	9	36	49.6	.422	20.93
Pullers over, machine	Male	1924	92	467	49.3	.737	36.34
Bed machine operators	do	1926	121	576	49.2	.766	37.69
	do	1924	92	1,082	49.1	.692	33.98
	do	1926	121	1,279	49.1	.700	34.37
Turn lasters, hand	do	1924	31	496	48.2	.790	38.08
	do	1926	35	726	47.7	.870	41.50
Bottoming department							
Goodyear welters	Male	1924	76	336	48.7	.929	45.24
	do	1926	92	358	48.7	.938	45.68
Goodyear stitchers	do	1924	79	505	48.8	.773	37.72
	do	1926	98	517	48.9	.776	37.95
McKay sewers	do	1924	34	104	50.3	.644	32.39
	do	1926	51	159	50.1	.687	34.42
Heelers, wood	do	1924	38	403	48.1	.690	33.19
	do	1926	73	713	48.8	.823	40.16
Edge trimmers	do	1924	102	686	49.1	.767	37.66
	do	1926	127	808	49.2	.785	38.62
Finishing department							
Buffers	Male	1924	99	361	49.4	.614	30.33
	do	1926	124	434	49.4	.640	31.62
Edge setters	do	1924	102	681	49.1	.756	37.12
	do	1926	129	765	49.1	.766	37.61
Treers	do	1924	93	948	48.8	.624	30.45
	do	1926	114	1,088	49.2	.611	30.06
	Female	1924	31	184	48.8	.431	21.03
	do	1926	43	302	49.0	.419	20.53
Repairers (not cobblers)	Male	1924	48	102	48.9	.511	24.99
	do	1926	53	128	48.2	.594	28.63
	Female	1924	77	624	48.8	.403	19.67
	do	1926	110	925	49.0	.388	19.01
All occupations	Male	1924	106	27,144	48.9	.602	29.44
	do	1926	154	29,925	49.0	.622	30.48
	Female	1924	106	18,316	49.0	.394	19.31
	do	1926	135	22,772	49.0	.401	19.65
	Both	1924	106	45,460	49.0	.516	25.28
	do	1926	154	52,697	49.0	.528	25.87

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Table 3 presents, for each State, average full-time hours per week, average earnings per hour, and average full-time weekly earnings in 15 of the most important occupations for which data are presented in Table 2. Of the 15 occupations shown here, 7 are presented for both sexes. These occupations cover 17 per cent of the males and 31 per cent of the females included in the 1926 study. The purpose of the table is to illustrate variations in hours and wages as between the several States.

TABLE 3.—AVERAGE HOURS AND EARNINGS FOR 15 SPECIFIED OCCUPATIONS IN THE BOOT AND SHOE INDUSTRY, BY SEX AND STATE, 1926

State	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings
	Cutters, vamp and whole shoe, hand, male					Cementers, and doublers, hand and machine (including reinforcers, pasters, and fitters), female				
Illinois	2	141	48.0	$0.925	$44.40	5	67	49.0	$0.344	$16.86
Maine	6	151	53.4	.556	29.69	6	140	53.8	.274	14.74
Maryland and Virginia	6	76	48.8	.615	30.01	6	48	48.9	.214	10.46
Massachusetts	27	658	48.2	.857	41.31	25	320	48.0	.386	18.53
Michigan	3	11	49.5	.657	32.52	4	12	49.8	.245	12.20
Minnesota	4	53	49.2	.557	27.40	4	18	50.3	.346	17.40
Missouri	4	103	48.0	.891	42.77	7	138	48.9	.363	17.75
New Hampshire	9	137	49.8	.676	33.66	10	112	49.5	.331	16.38
New Jersey	4	37	46.4	.763	35.40	3	29	44.6	.472	21.05
New York	19	351	47.4	.948	44.94	22	237	48.6	.365	17.74
Ohio	4	116	49.9	.975	48.65	7	109	49.8	.347	17.28
Pennsylvania	11	180	50.4	.651	32.81	10	119	50.1	.265	13.28
Wisconsin	9	115	48.9	.753	36.82	9	77	49.2	.313	15.40
Total	108	2,129	48.9	.808	39.51	118	1,426	49.3	.340	16.76
	Lining makers (including lining closers, side and top facing stitchers), female					Top stitchers (including undertrimmers and barber trimmers), female				
Illinois	5	77	48.5	$0.448	$21.73	5	85	48.9	$0.452	$22.10
Maine	6	117	53.7	.325	17.45	6	122	53.5	.379	20.28
Maryland and Virginia	5	29	49.0	.377	18.47	4	39	48.5	.364	17.65
Massachusetts	28	247	47.9	.504	24.14	27	315	47.9	.603	28.88
Michigan	4	7	49.7	.294	14.61	5	22	49.5	.357	17.67
Minnesota	4	10	49.8	.470	23.41	4	18	49.7	.469	23.31
Missouri	7	96	49.4	.342	16.89	7	161	49.4	.438	21.64
New Hampshire	10	83	49.4	.384	18.97	10	145	49.8	.416	20.72
New Jersey	4	20	46.8	.430	20.12	4	11	46.6	.490	22.83
New York	21	229	48.5	.445	21.58	19	285	48.6	.497	24.15
Ohio	7	56	49.7	.417	20.72	7	92	49.8	.596	29.68
Pennsylvania	11	135	50.8	.332	16.87	11	97	50.3	.423	21.28
Wisconsin	12	64	48.6	.423	20.56	12	77	48.6	.518	25.17
Total	124	1,170	49.3	.413	20.36	121	1,469	49.3	.486	23.96
	Vampers, female					Bed machine operators, male				
Illinois	5	102	48.5	$0.556	$26.97	4	107	48.6	$0.730	$35.48
Maine	6	47	53.1	.503	26.71	6	68	53.2	.592	31.49
Maryland and Virginia	5	36	48.9	.440	21.52	7	46	48.6	.603	29.31
Massachusetts	27	214	47.9	.635	30.42	26	315	48.2	.737	35.52
Michigan	5	18	49.9	.348	17.37	5	19	49.7	.584	29.02
Minnesota	4	15	50.0	.518	25.90	4	15	50.0	.685	34.25
Missouri	7	130	49.4	.482	23.81	7	188	49.5	.680	33.66
New Hampshire	10	87	49.2	.505	24.85	10	99	49.2	.632	31.09
New Jersey	4	18	47.2	.607	28.65	4	16	45.7	.750	34.28
New York	20	240	48.6	.525	25.52	20	211	48.2	.715	36.46
Ohio	7	82	49.9	.489	24.40	6	63	50.0	.837	41.85
Pennsylvania	11	107	51.3	.466	23.91	11	54	51.5	.603	31.05
Wisconsin	12	74	48.8	.570	27.82	11	78	49.5	.732	36.23
Total	123	1,170	49.1	.531	26.07	121	1,279	49.1	.700	34.37

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TABLE 3.—AVERAGE HOURS AND EARNINGS FOR 15 SPECIFIED OCCUPATIONS IN THE BOOT AND SHOE INDUSTRY, BY SEX AND STATE, 1926—Continued

State	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings
	Goodyear stitchers, male					Edge trimmers, male				
Illinois	2	38	48.0	$0.954	$45.79	5	54	48.6	$0.844	$41.02
Maine	4	14	52.0	.538	27.98	6	47	53.4	.571	30.49
Maryland and Virginia	7	22	48.6	.693	33.68	7	34	49.1	.672	33.00
Massachusetts	20	122	48.1	.825	39.68	28	197	48.1	.877	42.18
Michigan	4	7	49.7	.636	31.61	5	6	49.7	.810	40.26
Minnesota	3	5	48.0	.720	34.56	4	9	50.0	.598	29.90
Missouri	4	46	49.7	.678	33.70	7	87	49.4	.701	34.63
New Hampshire	6	41	48.5	.683	33.13	9	58	49.5	.719	35.59
New Jersey	3	6	46.0	.857	39.42	4	7	46.4	.886	41.11
New York	18	117	48.3	.821	39.65	23	162	48.3	.831	40.14
Ohio	6	27	49.9	.910	45.41	7	58	49.9	.807	40.27
Pennsylvania	11	36	51.4	.638	32.79	11	47	50.8	.689	35.00
Wisconsin	10	36	49.5	.738	36.53	11	42	49.6	.814	40.37
Total	98	517	48.9	.776	37.95	127	808	49.2	.785	38.62

Entrance Rates of Wages of Common Labor, 1926

TO ARRIVE at a definite wage rate for common labor presents many difficulties, the greatest being that the term "common labor" has many interpretations among different industries and even among different localities or plants in the same industry. In order that comparable data might be secured the Bureau of Labor Statistics during 1926 sent out questionnaires every three months to employers in 13 important industries which require considerable numbers of common laborers, asking for the rate per hour paid to unskilled adult male common laborers when first hired.

Many employers increase rates of pay to laborers after a few weeks of employment have demonstrated the degree of fitness for the work required, and in many cases laborers not considered fit are dropped after a certain time has elapsed. It is believed, therefore, that the only truly comparable data are entrance rates.

Some establishments report two or more rates—for example, one for an 8-hour day and one for a 10-hour day; one for white and one for colored workers; or one each for different departments. These distinctions have not been maintained in the tabulations, although it is apparent that the lowest rates shown are for those localities where there are many colored or Mexican laborers, while the highest rates shown are for localities where an 8-hour day is known to be more or less in force.

The latest report on this subject, published in 1926, was for October 1 and was based on reports covering 135,902 common laborers, distributed among the 13 industries, as follows:

	Number
Automobiles	6,197
Brick, tile, and terra cotta	3,512
Cement	1,765
Electrical machinery, apparatus, and supplies	5,035
Foundry and machine-shop products	9,481
Iron and steel	23,107
Leather	2,111
Lumber (sawmills)	12,674

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	Number
Paper and pulp	8,092
Petroleum refining	3,366
Slaughtering and meat packing	6,209
Public utilities	15,118
General contracting	39,235
Total	135,902

The distribution by geographic divisions was as follows: New England, 8,388; Middle Atlantic, 37,017; East North Central, 35,120; West North Central, 10,514; South Atlantic, 13,414; East South Central, 6,432; West South Central, 7,040; Mountain, 5,348; Pacific, 12,629.

The weighted average rate for the several industries combined was 43.4 cents, the lowest and highest rates reported being 15 cents and $1.125, respectively. The highest average rate in any of the industries, 49.5 cents, appears in general contracting, and the lowest average rate, 33.4 cents, in sawmills.

The highest rates paid in most districts were reported by general contractors, and they considerably increase the average rate for the several industries combined. The October 1 average rate, 43.4 cents, is more than one-half cent higher than the average rate of July 1, which was 42.8 cents.

By omitting the figures for general contracting, an average rate of 40.9 cents is obtained for October 1, which is the same as the average rate for the same industries on July 1. The corresponding average rates on April 1 and January 1 were 40.5 cents and 40.2 cents, respectively.

The high, low, and average rates for each of the 13 industries in the United States and in each section of the United States as of October 1, 1926, are presented in the table following:

HOURLY WAGE RATES PAID FOR COMMON LABOR, OCTOBER 1, 1926

[The rates on which this table is based are entrance rates paid for adult male common labor]

Industry	United States	Geographic divisions								
		New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific
Automobiles:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
Low	33.3	------	40.0	35.0	33.3	------	------	------	------	40.0
High	62.5	------	62.5	62.5	62.5	------	------	------	------	55.0
Average	44.3	------	42.2	46.1	39.0	------	------	------	------	48.9
Brick, tile, and terra cotta:										
Low	17.5	38.5	35.0	32.5	27.0	17.5	17.5	22.3	40.0	39.0
High	55.6	50.0	55.6	46.7	40.0	35.0	36.5	37.5	40.0	52.5
Average	38.1	39.1	47.5	38.6	33.4	27.8	21.3	28.0	40.0	41.0
Cement:										
Low	25.0	------	35.0	35.0	35.0	------	26.0	25.0	------	50.0
High	50.0	------	45.0	44.0	37.5	------	40.0	28.0	------	50.0
Average	40.1	------	43.9	42.8	35.3	------	30.1	27.3	------	50.0
Electrical machinery, apparatus, and supplies:										
Low	31.0	31.0	40.0	39.0	35.0	40.0	------	------	------	------
High	50.0	48.0	46.0	50.0	40.0	40.0	------	------	------	------
Average	45.2	44.2	41.5	48.0	37.5	40.0	------	------	------	------
Foundry and machine-shop products:										
Low	17.5	33.0	30.0	34.0	35.0	17.5	25.0	20.0	35.0	44.0
High	56.0	52.5	50.0	55.0	45.0	45.0	40.0	30.0	44.4	56.0
Average	38.9	40.5	40.6	42.7	39.7	28.4	29.9	25.2	38.1	50.1

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HOURLY WAGE RATES PAID FOR COMMON LABOR, OCTOBER 1, 1926—Continued

Industry	United States	Geographic divisions								
		New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific
Iron and steel:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
Low	22.0	40.0	30.0	35.0	35.0	22.0	23.5	------	41.0	42.5
High	50.0	45.0	50.0	50.0	35.0	44.0	31.0	------	49.0	50.0
Average	42.3	43.3	42.1	44.5	35.0	36.6	28.9	------	48.9	45.9
Leather:										
Low	17.5	48.0	33.3	35.0	-------	17.5	33.0	------	-------	44.0
High	50.0	48.0	50.0	50.0	-------	40.0	33.0	------	-------	48.8
Average	38.8	48.0	38.9	43.1	-------	32.4	33.0	------	-------	48.7
Lumber (sawmills):										
Low	15.0	33.0	30.0	30.0	32.5	15.0	16.5	20.0	25.0	29.0
High	62.5	40.0	40.0	62.5	35.0	35.0	25.0	33.0	45.0	50.0
Average	33.4	35.7	37.5	34.4	34.7	25.7	21.9	24.1	37.7	43.2
Paper and pulp:										
Low	22.5	33.3	35.0	30.0	35.0	30.0	22.5	25.0	-------	40.0
High	56.3	50.0	50.0	54.0	40.0	38.3	37.5	27.5	-------	56.3
Average	42.6	45.5	42.3	44.0	38.9	36.5	25.2	25.7	-------	42.8
Petroleum refining:										
Low	30.0	------	37.0	50.0	50.0	30.0	------	35.0	55.0	62.0
High	62.0	------	53.0	50.0	50.0	50.0	------	50.0	55.0	62.0
Average	48.4	------	48.6	50.0	50.0	44.2	------	42.3	55.0	62.0
Slaughtering and meat packing:										
Low	37.5	40.0	40.0	37.5	37.5	40.0	------	37.5	40.0	40.0
High	50.0	50.0	45.0	45.0	45.0	40.0	------	37.5	40.0	45.0
Average	41.9	43.8	44.1	41.6	42.1	40.0	------	37.5	40.0	42.4
Public utilities:[1]										
Low	20.0	40.0	30.0	32.5	30.0	20.0	25.0	25.0	35.0	33.0
High	61.3	59.5	61.3	60.0	40.0	45.0	40.0	30.0	40.0	56.3
Average	41.7	49.5	44.5	48.5	36.2	35.0	30.4	29.0	37.6	47.6
General contracting:[2]										
Low	20.0	40.0	30.0	35.0	30.0	20.0	20.0	21.0	35.0	43.8
High	112.5	78.5	112.5	100.0	80.0	50.0	40.0	50.0	62.5	62.5
Average	49.5	56.7	58.7	56.3	42.0	34.9	29.3	34.7	47.4	51.0
Total:										
Low	15.0	31.0	30.0	30.0	27.0	15.0	16.5	20.0	25.0	29.0
High	112.5	78.5	112.5	100.0	80.0	50.0	40.0	50.0	62.5	62.5
Average	43.4	47.8	46.9	47.5	40.6	33.2	27.4	30.7	44.8	46.5

[1] Including street railways, gas works, waterworks, and electric power and light plants
[2] Including building, highway, public works, and railroad construction.

Wages and Hours of Labor in the Cotton Goods Industry, 1926

A SUMMARY of the 1926 study of wages and hours of labor of employees in the cotton goods manufacturing industry in the United States, which was recently completed by the Bureau of Labor Statistics, is presented in this article.[4] The data given show average full-time hours per week, earnings per hour, and full-time earnings per week, by occupation and sex, for 46,879 males and 36,103 females. Comparative figures for 1924, covering 45,056 males and 32,939 females, are also given.

The 1926 averages were compiled from the pay rolls and other records of 151 cotton mills in 12 States. According to the 1923 United States census of manufactures, 92 per cent of the wage earners in the industry were in these 12 States.

[4] For complete report see forthcoming bulletin.

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Data were obtained for a representative pay period of one week for all occupations except weavers, for whom a two-week pay period was taken. With few exceptions the pay periods covered occurred within the interval from June to September.

Index numbers of average full-time hours per week, earnings per hour, and full-time earnings per week are presented in Table 1 for the industry as a whole for each year from 1910 to 1926, for which the bureau has made studies of the industry, with the 1913 average taken as the base or 100. Index numbers are not shown for 1915 nor for subsequent odd years because data were not collected in such years.

Between 1913 and 1920 average full-time hours per week decreased 10 per cent, earnings per hour increased 224 per cent, and full-time earnings per week increased 192 per cent. Average full-time earnings per week did not increase in the same proportion as average earnings per hour because of the reduction in average full-time hours per week.

Average full-time hours per week increased from an index of 89.8 in 1920 to 92.4 in 1926, or 3 per cent; average earnings per hour decreased from 324.3 to 221.6, or 32 per cent; and average full-time earnings per week decreased from 291.8 to 205.2, or 30 per cent.

The peak in average earnings per hour and in average full-time earnings per week in cotton goods manufacturing was reached in 1920. The greatest increase in average earnings per hour in any 2-year period was made between 1918 and 1920, when they rose from 180.4 to 324.3, or 80 per cent. The greatest decrease in any 2-year period occurred between 1920 and 1922—from 324.3 to 223.0, or 31 per cent. The index rose from 223.0 in 1922 to 251.4 in 1924 (13 per cent), but fell again in 1926 to 221.6 (12 per cent).

TABLE 1.—INDEX NUMBERS OF HOURS AND EARNINGS IN THE COTTON GOODS INDUSTRY, IN SPECIFIED YEARS, 1910 TO 1926

Year	Index numbers of average—		
	Full-time hours per week	Earnings per hour	Full-time earnings per week
1910	102.1	87.8	89.4
1911	101.9	90.5	91.7
1912	100.2	99.3	93.7
1913	100.0	100.0	100.0
1914	98.4	103.4	101.3
1916	98.6	120.9	118.3
1918	97.1	180.4	175.5
1920	89.8	324.3	291.8
1922	91.5	223.0	204.5
1924	91.9	251.4	231.5
1926	92.4	221.6	205.2

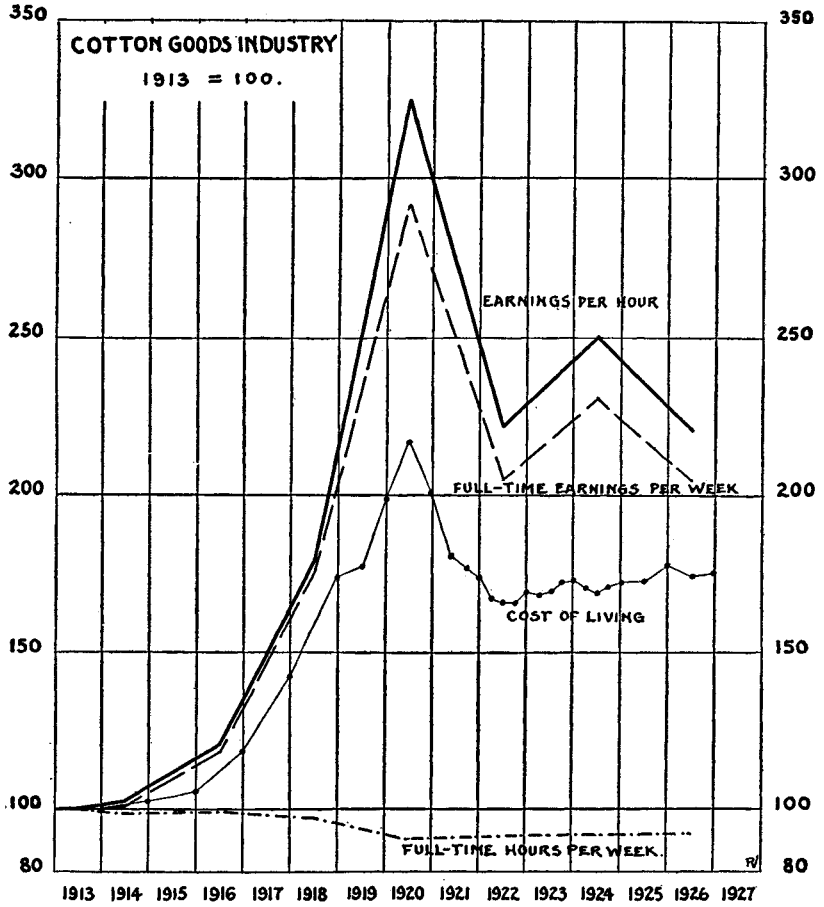
Table 2 shows, for the years 1924 and 1926, average full-time hours per week, earnings per hour, and full-time earnings per week for each of the principal occupations in the industry.

From 1924 to 1926 average full-time hours per week of males in all occupations combined increased from 53.5 to 53.8, those of females from 52.3 to 52.8, and those of males and females combined, or the industry, from 53 to 53.3.

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In the same period average earnings per hour of males decreased from 39 to 34.7 cents, those of females from 34.7 to 30.1 cents, and those of males and females combined from 37.2 to 32.8 cents. Average full-time earnings per week of males decreased from $20.87 in 1924 to $18.67 in 1926, those of females from $18.15 to $15.89, and earnings in the industry as a whole from $19.72 to $17.48.

In 1924 the highest average earnings per hour of males in any occupation were those of mule spinners (74.6 cents), and the lowest



were those of spooler tenders (19.2 cents). For females the hourly earnings ranged from 44.8 cents, earned by slubber tenders and beamer tenders, to 26.8 cents, earned by trimmers or inspectors. In 1926 hourly earnings of males ranged from 65.6 cents, for mule spinners, to 19 cents, for spooler tenders; and those of female workers from 41.1 cents, for beamer tenders, to 24.6 cents, for spooler tenders and trimmers or inspectors.

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TABLE 2.—AVERAGE HOURS AND EARNINGS IN THE COTTON-GOODS INDUSTRY, BY OCCUPATIONS, AND SEX, 1924 AND 1926

Occupation	Sex	Year	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time earnings per week
Picker tenders	Male	1924	114	1,048	53.6	$0.331	$17.74
		1926	151	964	54.1	.297	16.07
Card tenders and strippers	do	1924	114	1,367	53.6	.356	19.08
		1926	151	1,644	54.1	.322	17.42
Card grinders	do	1924	111	418	52.9	.470	24.86
		1926	147	475	53.7	.414	22.23
Drawing frame tenders	do	1924	96	762	54.9	.295	16.20
		1926	123	822	55.0	.279	15.35
	Female	1924	55	653	51.3	.311	15.95
		1926	68	682	51.9	.281	14.58
Slubber tenders	Male	1924	112	859	53.5	.421	22.52
		1926	148	1,091	54.3	.377	20.47
	Female	1924	9	37	50.8	.448	22.76
		1926	11	52	50.1	.398	19.94
Speeder tenders	Male	1924	109	2,177	54.3	.394	21.39
		1926	139	2,545	55.1	.343	18.90
	Female	1924	105	2,703	51.2	.411	21.04
		1926	124	2,950	51.0	.368	18.77
Spinners, mule	Male	1924	8	186	49.1	.746	36.63
		1926	8	200	48.4	.656	31.75
Spinners, frame	do	1924	64	906	53.2	.369	19.63
		1926	54	561	55.1	.289	15.92
	Female	1924	114	8,314	53.1	.319	16.94
		1926	151	9,684	53.5	.282	15.09
Doffers	Male	1924	109	3,133	54.0	.334	18.04
		1926	146	3,657	54.2	.307	16.64
	Female	1924	27	478	50.9	.380	19.34
		1926	32	502	51.4	.344	17.68
Spooler tenders	Male	1924	8	37	55.0	.192	10.56
		1926	6	24	59.2	.190	11.25
	Female	1924	113	3,646	53.3	.285	15.19
		1926	151	4,136	53.6	.246	13.19
Creelers or tiers-in	Male	1924	21	59	55.5	.298	16.54
		1926	21	49	55.1	.274	15.10
	Female	1924	84	543	53.0	.272	14.42
		1926	117	640	53.7	.249	13.37
Warper tenders	Male	1924	41	133	54.7	.388	21.22
		1926	48	157	55.3	.348	19.24
	Female	1924	93	544	52.2	.391	20.41
		1926	118	581	52.6	.347	18.25
Beamer tenders	Male	1924	27	331	51.7	.621	32.11
		1926	43	269	53.0	.493	26.13
	Female	1924	7	108	51.9	.448	23.25
		1926	5	32	49.8	.411	20.47
Slasher tenders	Male	1924	114	636	53.0	.467	24.75
		1926	146	751	53.3	.411	21.91
Drawers-in	do	1921	18	61	55.5	.339	18.81
		1926	19	44	55.1	.330	18.18
	Female	1924	91	726	51.8	.383	19.84
		1926	116	947	52.1	.357	18.60
Warp-tying machine tenders	Male	1924	91	221	53.5	.452	24.18
		1926	113	278	54.0	.422	22.79
Loom fixers	do	1924	114	2,962	52.9	.553	29.25
		1926	151	3,329	53.5	.489	26.16
Weavers	do	1924	114	9,024	52.8	.449	23.71
		1926	151	8,603	53.2	.396	21.07
	Female	1924	114	8,493	51.8	.429	22.22
		1926	151	7,596	51.9	.375	19.46
Trimmers or inspectors	Male	1924	36	158	55.3	.304	16.81
		1926	45	190	53.0	.295	15.64
	Female	1924	92	1,602	52.7	.268	14.12
		1926	132	1,932	52.6	.246	12.94
Other employees	Male	1924	114	20,578	53.7	.347	18.63
		1926	151	21,226	53.8	.308	16.57
	Female	1924	110	5,092	51.9	.292	15.15
		1926	149	6,369	53.1	.252	13.38
All employees	Male	1924	114	45,056	53.5	.390	20.87
		1926	151	46,879	53.8	.347	18.67
	Female	1924	114	32,939	52,3	,347	18.15
		1926	151	36,103	52.8	.301	15.89
All employees, male and female		1924	114	77,995	53.0	.372	19.72
		1926	151	82,982	53.3	.328	17.48

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Table 3 shows for each of seven specified occupations and for each State, the 1926 average full-time hours per week, earnings per hour, and full-time earnings per week.

TABLE 3.—AVERAGE HOURS AND EARNINGS FOR SEVEN SELECTED OCCUPATIONS IN THE COTTON-GOODS INDUSTRY, BY SEX AND STATE, 1926

Occupation, sex, and State	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time earnings per week
Picker tenders, male:					
Alabama	6	85	56.6	$0.219	$12.40
Connecticut	6	25	51.9	.363	18.84
Georgia	15	128	56.8	.215	12.21
Maine	5	41	54.0	.353	19.06
Massachusetts	23	143	49.1	.394	19.35
New Hampshire	6	69	54.2	.388	21.03
New York	3	28	48.4	.387	18.73
North Carolina	47	224	55.7	.264	14.70
Pennsylvania	3	12	53.3	.421	22.44
Rhode Island	12	51	50.5	.388	19.59
South Carolina	22	134	55.0	.251	13.81
Virginia	3	24	55.4	.250	13.85
Total	151	964	54.1	.297	16.07
Card tenders and strippers, male:					
Alabama	6	125	54.8	.231	12.66
Connecticut	6	49	51.1	.362	18.50
Georgia	15	252	57.2	.232	13.27
Maine	5	54	53.6	.370	19.83
Massachusetts	23	255	49.3	.431	21.25
New Hampshire	6	163	54.2	.418	22.66
New York	3	33	48.7	.459	22.35
North Carolina	47	343	55.9	.277	15.48
Pennsylvania	3	19	52.9	.420	22.22
Rhode Island	12	72	51.5	.431	22.20
South Carolina	22	226	55.0	.244	13.42
Virginia	3	53	55.2	.284	15.68
Total	151	1,644	54.1	.322	17.42
Speeder tenders, male:					
Alabama	6	153	54.9	.293	16.09
Connecticut	6	42	51.2	.451	23.09
Georgia	15	430	57.4	.291	16.70
Maine	5	21	53.6	.467	25.03
Massachusetts	16	228	51.1	.460	23.51
New Hampshire	5	58	54.1	.467	25.26
New York	3	36	49.0	.495	24.26
North Carolina	47	832	56.0	.333	18.65
Rhode Island	11	76	51.3	.462	23.70
South Carolina	22	558	55.0	.294	16.17
Virginia	3	111	55.3	.378	20.90
Total	139	2,545	55.1	.343	18.90
Speeder tenders, female:					
Alabama	6	124	55.0	.251	13.81
Connecticut	6	190	50.0	.381	19.05
Georgia	10	135	56.1	.278	15.60
Maine	5	240	53.6	.393	21.06
Massachusetts	23	1,079	48.0	.390	18.72
New Hampshire	6	216	53.3	.446	23.77
New York	3	194	48.5	.392	19.01
North Carolina	26	117	55.9	.300	16.77
Pennsylvania	3	45	53.1	.365	19.38
Rhode Island	12	348	50.5	.386	19.49
South Carolina	21	229	55.0	.267	14.69
Virginia	3	33	55.2	.327	18.05
Total	124	2,950	51.0	.368	18.77

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TABLE 3.—AVERAGE HOURS AND EARNINGS FOR SEVEN SELECTED OCCUPATIONS IN THE COTTON-GOODS INDUSTRY, BY SEX AND STATE, 1926—Continued

Occupation, sex, and State	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time earnings per week
Spinners, frame, male:					
Connecticut	2	12	55.0	$0.331	$18.21
Georgia	6	90	56.6	.225	12.74
Massachusetts	11	128	53.4	.442	23.60
New Hampshire	4	24	54.0	.449	24.25
New York	3	15	49.6	.417	20.68
North Carolina	8	83	58.0	.159	9.22
South Carolina	16	165	55.0	.207	11.39
Other States	4	44	54.8	.242	13.26
Total	54	561	55.1	.289	15.92
Spinners, frame, female:					
Alabama	6	598	54.5	.209	11.39
Connecticut	6	227	51.4	.356	18.30
Georgia	15	1,093	57.0	.220	12.54
Maine	5	380	53.9	.295	15.90
Massachusetts	23	1,576	48.0	.378	18.14
New Hampshire	6	582	53.5	.409	21.88
New York	3	273	48.7	.404	19.67
North Carolina	47	2,077	56.0	.230	12.88
Pennsylvania	3	60	52.6	.401	21.09
Rhode Island	12	610	50.0	.362	18.10
South Carolina	22	1,983	55.0	.213	11.72
Virginia	3	225	55.2	.277	15.29
Total	151	9,684	53.5	.282	15.09
Slasher tenders, male:					
Alabama	6	36	55.0	.279	15.35
Connecticut	6	21	51.7	.501	25.90
Georgia	15	86	56.3	.306	17.23
Maine	5	31	54.0	.507	27.38
Massachusetts	23	159	48.4	.549	26.57
New Hampshire	6	51	54.0	.544	29.38
New York	3	19	48.9	.513	25.09
North Carolina	43	159	55.5	.355	19.70
Pennsylvania	2	8	51.5	.507	26.11
Rhode Island	12	38	50.4	.540	27.22
South Carolina	22	122	55.0	.280	15.40
Virginia	3	21	56.1	.361	20.25
Total	146	751	53.3	.411	21.91
Loom fixers, male:					
Alabama	6	206	54.9	.394	21.63
Connecticut	6	119	51.2	.610	31.23
Georgia	15	354	57.6	.372	21.43
Maine	5	141	54.1	.600	32.46
Massachusetts	23	638	48.3	.620	29.95
New Hampshire	6	174	54.2	.667	36.15
New York	3	98	50.0	.657	32.85
North Carolina	47	727	55.7	.411	22.89
Pennsylvania	3	19	51.9	.586	30.41
Rhode Island	12	216	50.0	.623	31.15
South Carolina	22	554	55.3	.377	20.85
Virginia	3	83	55.2	.468	25.83
Total	151	3,329	53.5	.489	26.16
Weavers, male:					
Alabama	6	449	54.9	.298	16.36
Connecticut	6	542	50.4	.434	21.87
Georgia	15	824	57.3	.297	17.02
Maine	5	239	54.1	.485	26.24
Massachusetts	23	2,056	49.0	.459	22.49
New Hampshire	6	298	54.4	.514	27.96
New York	3	183	50.4	.523	26.36
North Carolina	47	2,257	55.6	.353	19.63
Pennsylvania	3	18	51.1	.507	25.91
Rhode Island	12	589	50.1	.494	24.75
South Carolina	22	898	55.0	.314	17.27
Virginia	3	250	55.2	.390	21.53
Total	151	8,603	53.2	.396	21.07

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TABLE 3.—AVERAGE HOURS AND EARNINGS FOR SEVEN SELECTED OCCUPATIONS IN THE COTTON-GOODS INDUSTRY, BY SEX AND STATE, 1926—Continued

Occupation, sex, and State	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time earnings per week
Weavers, female:					
Alabama	6	394	54.7	$0.278	$15.21
Connecticut	6	425	50.2	.382	19.18
Georgia	15	560	57.0	.284	16.19
Maine	5	182	54.0	.449	24.25
Massachusetts	23	2,628	48.0	.420	20.16
New Hampshire	6	342	53.3	.488	26.01
New York	3	185	49.2	.464	22.83
North Carolina	47	1,419	55.5	.316	17.54
Pennsylvania	3	76	52.7	.441	23.24
Rhode Island	12	558	50.3	.455	22.89
South Carolina	22	684	55.0	.276	15.18
Virginia	3	143	55.3	.346	19.13
Total	151	7,596	51.9	.375	19.46

Wage Rates of Farm Labor, 1910 to January, 1927

THE United States Department of Agriculture compiles quarterly the current wage rates of hired farm labor. Data are compiled separately for workers employed by the month and by the day, and separation is also made between wage rates which include board and those which do not include board. Wage rates by the day without board are, of course, the more nearly comparable with the wage rates of industrial workers.

Table 1 shows, for the United States as a whole, average farm wage rates and index numbers thereof, from 1910 to January, 1927. From 1923 to January, 1927, the details are also given for the months of January, April, July, and October. It will be noted that the wage rates for October are regularly the highest of any of the months reported.

The averages in Table 1 are, as noted, for the United States as a whole. There are wide variations between the several States. This is brought out in Table 2 which gives the average wages, by geographical divisions and States, for October, 1925, and October, 1926.

TABLE 1.—FARM WAGE RATES AND INDEX NUMBERS, 1910 TO JANUARY, 1927

Year	Average yearly farm wage [1]				Weighted average wage rate per month [2]	Index numbers of farm wages (1910–1914=100)
	Per month—		Per day—			
	With board	Without board	With board	Without board		
1910	$19.58	$28.04	$1.07	$1.40	$23.08	97
1911	19.85	28.33	1.07	1.40	23.25	97
1912	20.46	29.14	1.12	1.44	24.01	101
1913	21.27	30.21	1.15	1.48	24.83	104
1914	20.90	29.72	1.11	1.44	24.26	101

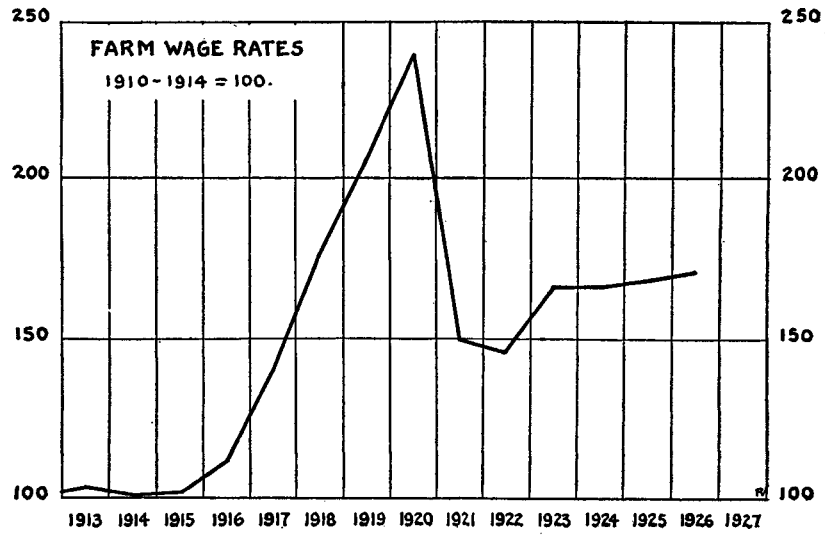
[1] Yearly averages are from reports by crop reporters, giving average wages for the year in their localities except for 1924 and 1925, when the wage rates per month are a straight average of quarterly rates, April July, October of the current year, and January of the following year; and the wage rates per day are a weighted average of quarterly rates, April (weight 1), July (weight 5), October (weight 5), January of the following year (weight 1).

[2] This column has significance only as an essential step in computing the wage index.

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TABLE 1.—FARM WAGE RATES AND INDEX NUMBERS, 1910 TO JANUARY, 1927—Con.

Year	Average yearly farm wage				Weighted average wage rate per month	Index numbers of farm wages (1910–1914=100)
	Per month—		Per day—			
	With board	Without board	With board	Without board		
1915	$21.08	$29.97	$1.12	$1.45	$24.46	102
1916	23.04	32.58	1.24	1.60	26.83	112
1917	28.64	40.19	1.56	2.00	33.42	140
1918	35.12	49.13	2.05	2.61	42.12	176
1919	40.14	56.77	2.44	3.10	49.11	206
1920	47.24	65.05	2.84	3.56	57.01	239
1921	30.25	43.58	1.66	2.17	35.77	150
1922	29.31	42.09	1.64	2.14	34.91	146
1923	33.09	46.74	1.91	2.45	39.64	166
1924	33.34	47.22	1.88	2.44	39.67	166
1925	33.88	47.80	1.89	2.46	40.12	168
1926	34.86	48.86	1.91	2.49	40.92	171
1923—January	27.87	40.50	1.46	1.97	32.61	137
April	30.90	44.41	1.55	2.09	35.42	148
July	34.64	48.61	1.84	2.44	40.30	169
October	34.56	48.42	2.02	2.58	41.52	174
1924—January	31.55	45.53	1.79	2.38	38.01	159
April	33.57	47.38	1.77	2.34	38.95	163
July	34.34	48.02	1.87	2.43	40.15	168
October	34.38	48.46	1.93	2.51	40.81	171
1925—January	31.07	45.04	1.74	2.31	37.24	156
April	33.86	47.40	1.77	2.33	39.04	163
July	34.94	48.55	1.89	2.44	40.62	170
October	34.91	48.99	1.95	2.53	41.28	173
1926—January	31.82	46.26	1.76	2.33	37.94	159
April	34.38	48.40	1.78	2.35	39.56	166
July	36.10	49.89	1.91	2.48	41.59	174
October	36.00	50.10	1.97	2.55	42.10	176
1927—January	32.94	47.07	1.79	2.36	38.79	162



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TABLE 2.—AVERAGE WAGES PAID TO HIRED FARM LABOR, BY GEOGRAPHICAL DIVISIONS AND STATES, OCTOBER, 1925 AND 1926

State and division	Per month, with board		Per month, without board		Per day, with board		Per day, without board	
	1925	1926	1925	1926	1925	1926	1925	1926
Maine	$43.00	$45.00	$63.00	$64.00	$2.50	$2.60	$3.30	$3.25
New Hampshire	46.00	50.00	71.00	76.00	2.60	2.50	3.30	3.30
Vermont	46.00	36.00	66.00	65.00	2.50	2.60	3.20	3.20
Massachusetts	50.00	52.00	78.00	79.00	2.90	2.75	3.65	3.80
Rhode Island	50.00	51.00	72.00	78.00	2.80	2.80	3.65	3.60
Connecticut	51.00	54.00	76.00	80.00	2.70	2.85	3.70	3.80
New York	48.00	50.50	69.00	70.25	3.05	3.10	3.80	3.90
New Jersey	46.00	54.00	72.00	77.00	2.65	2.90	3.65	3.75
Pennsylvania	39.50	41.75	58.50	60.00	2.60	2.60	3.40	3.35
North Atlantic	45.29	47.75	66.88	68.67	2.78	2.82	3.58	3.62
Ohio	38.00	39.00	53.00	55.00	2.55	2.55	3.25	3.25
Indiana	35.00	37.00	48.00	50.00	2.20	2.25	2.85	2.85
Illinois	42.00	42.00	55.00	55.00	2.35	2.35	3.05	3.05
Michigan	41.00	43.50	58.00	61.50	2.65	2.75	3.35	3.50
Wisconsin	46.50	48.50	64.00	66.00	2.50	2.45	3.25	3.15
Minnesota	45.00	46.75	61.00	62.00	2.85	2.80	3.50	3.40
Iowa	45.50	46.25	57.00	56.75	2.50	2.50	3.15	3.10
Missouri	32.00	34.00	43.00	44.00	1.75	1.70	2.30	2.20
North Dakota	49.50	49.50	68.50	69.50	3.80	3.35	4.50	4.20
South Dakota	46.50	43.75	61.50	60.00	2.85	2.45	3.75	3.25
Nebraska	40.00	40.00	54.50	53.50	2.35	2.25	3.15	3.00
Kansas	36.00	37.00	50.00	51.00	2.20	2.20	2.90	2.90
North Central	40.80	41.91	55.10	56.12	2.45	2.41	3.14	3.08
Delaware	32.00	35.00	48.00	48.00	2.75	2.50	3.30	3.10
Maryland	34.50	35.75	50.75	51.00	2.35	2.25	3.10	2.95
Virginia	30.00	30.00	42.00	43.00	1.60	1.65	2.10	2.15
West Virginia	36.50	34.75	52.25	49.50	1.95	1.80	2.55	2.50
North Carolina	29.00	30.00	40.00	41.00	1.50	1.50	2.00	1.90
South Carolina	21.25	21.00	30.00	29.50	1.05	1.05	1.35	1.40
Georgia	20.50	21.50	28.75	29.50	1.10	1.10	1.35	1.45
Florida	26.00	28.00	38.00	42.50	1.35	1.50	1.85	2.00
South Atlantic	26.20	26.76	36.84	37.58	1.42	1.42	1.84	1.86
Kentucky	27.25	28.50	38.25	39.75	1.45	1.60	1.95	2.05
Tennessee	25.50	24.75	35.25	33.00	1.20	1.20	1.50	1.60
Alabama	26.00	22.50	34.00	31.50	1.20	1.25	1.55	1.60
Mississippi	22.00	23.75	32.00	33.70	1.25	1.25	1.70	1.65
Arkansas	25.00	30.00	35.00	37.50	1.25	1.25	1.75	1.70
Louisiana	23.00	24.00	34.75	36.00	1.40	1.35	1.65	1.80
Oklahoma	29.50	31.50	42.00	45.00	1.80	1.85	2.35	2.50
Texas	29.00	30.00	42.00	44.00	1.55	1.70	2.05	2.20
South Central	26.32	27.14	37.25	38.15	1.40	1.46	1.83	1.91
Montana	56.50	52.50	76.25	75.00	3.25	3.20	3.85	3.85
Idaho	54.50	56.00	76.00	77.00	2.85	2.85	3.70	3.65
Wyoming	47.00	49.00	69.00	70.00	2.55	2.50	3.40	3.40
Colorado	40.00	41.30	59.00	63.80	2.20	2.40	3.00	3.20
New Mexico	33.00	34.00	49.00	50.00	1.60	1.70	2.15	2.20
Arizona	44.50	45.00	73.50	65.00	1.95	1.75	2.65	2.50
Utah	56.50	54.50	76.50	75.00	2.65	2.40	2.90	3.10
Nevada	55.50	59.25	71.75	81.50	2.40	2.55	3.15	2.95
Washington	52.00	51.00	76.00	75.00	2.80	2.90	3.70	3.60
Oregon	45.00	51.00	65.00	76.00	2.40	2.50	3.10	3.25
California	60.00	63.00	87.00	90.00	2.55	2.55	3.60	3.65
Western	52.02	53.61	75.19	77.31	2.49	2.51	3.33	3.37
United States	34.91	36.00	48.99	50.10	1.95	1.97	2.53	2.55

Foundries and Machine Shops, 1925

THE Bureau of Labor Statistics in recent years has made two studies of wages and hours of labor in these closely related industries, one in 1923 and another in 1925.[5]

Owing to the almost unlimited variety of products manufactured in machine shops and the special machinery necessary in the manufacture of a large number of those products, the bureau deemed it

[5] For complete report see Bul. No. 422.

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advisable in 1925, as in 1923, to limit the study to those plants in which the machinery used was fairly comparable. The machine shops covered in this article were engaged in machining parts for and assembling or constructing engines and machinery used in various kinds of factories, mills, mines, construction operations, etc. While the machines used in the establishments covered vary in type and size with the product manufactured, they are similar in nature and the operations are essentially the same. The foundries included were mainly engaged in casting parts for the same class of product. In a large number of cases a foundry and a machine shop were in the same plant.

The data are for one representative pay-roll period each year. The 1925 data are as of the spring and summer, and were obtained from 413 foundries and 511 machine shops in 28 States.

Table 1 shows average earnings per hour, average full-time hours per week, and average full-time weekly earnings for 11 of the principal foundry occupations and for a group of "other employees" which includes all foundry occupations not shown separately; and for 21 machine-shop occupations, including two groups of miscellaneous employees grouped under "other skilled machine-shop occupations" and "other employees." Averages for all foundry employees combined and for all machine-shop employees combined are also shown. These averages are brought into comparison with those for 1923 for all occupations for which information is available.

TABLE 1.—AVERAGE HOURS AND EARNINGS FOR PRINCIPAL OCCUPATIONS IN FOUNDRIES AND MACHINE SHOPS, 1923 AND 1925, BY SEX AND YEAR

Foundries

Occupation	Sex	Year	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings
Chippers and rough grinders	Male	1923	319	2,923	52.5	$0.465	$24.41
	do	1925	383	4,110	51.5	.521	26.83
Core makers	do	1923	345	2,526	51.4	.690	35.47
	do	1925	393	3,067	50.3	.734	36.92
	Female	1923	22	240	49.2	.431	21.21
	do	1925	39	353	48.6	.444	21.58
Crane operators	Male	1923	197	593	53.5	.522	27.93
	do	1925	236	772	52.7	.562	29.62
Cupola tenders	do	1923	342	556	52.4	.546	28.61
	do	1925	380	567	51.9	.635	32.96
Laborers	do	1923	343	9,265	53.5	.428	22.90
	do	1925	389	10,931	52.5	.481	25.25
	Female	1923	8	68	49.4	.316	15.61
	do	1925	17	125	50.2	.382	19.18
Molders, hand, bench	Male	1923	262	2,379	51.3	.687	35.24
	do	1925	325	2,363	50.2	.768	38.55
Molders, hand, floor	do	1923	346	4,904	51.2	.729	37.32
	do	1925	401	5,612	50.4	.802	40.42
Molders, machine	do	1923	161	1,993	51.9	.678	35.19
	do	1925	229	3,140	50.1	.733	36.72
Molder's helpers, floor	do	1923	234	1,986	52.2	.433	22.60
	do	1925	285	2,642	51.8	.460	23.83
Pattern makers	do	1923	283	1,314	51.1	.750	38.38
	do	1925	346	1,827	50.4	.804	40.52
Rough carpenters	do	1923	261	680	52.0	.534	27.77
	do	1925	293	634	51.1	.591	30.20
Other foundry employees	do	1923	304	2,737	53.6	.503	26.96
	do	1925	378	4,250	52.7	.576	30.36
	Female[1]	1923	2	2	51.0	.205	10.46
All occupations	Male	1923	351	31,856	52.4	.560	29.34
	do	1925	413	39,915	51.5	.612	31.52
	Female	1923	22	310	49.3	.404	19.92
	do	1925	39	478	49.0	.427	20.92
All occupations, male and female		1923	351	32,166	52.4	.558	29.24
		1925	413	40,393	51.5	.610	31.42

[1] A few employees classed as "other employees" in 1923 were included with laborers in 1925.

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TABLE 1.—AVERAGE HOURS AND EARNINGS FOR PRINCIPAL OCCUPATIONS IN FOUNDRIES AND MACHINE SHOPS, 1923 AND 1925, BY SEX AND YEAR—Continued

Machine shops

Occupation	Sex	Year	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings
Assemblers	Male	1923	310	5,681	50.6	$0.575	$29.10
	do	1925	306	7,151	49.6	.634	31.45
	Female	1923	6	54	50.2	.350	17.57
	do	1925	9	150	50.7	.444	22.51
Blacksmiths	Male	1923	345	797	50.8	.678	34.44
	do	1925	395	885	50.2	.717	35.99
Blacksmith's helpers	do	1923	282	945	50.8	.489	24.84
	do	1925	298	857	50.5	.504	25.45
Boring mill hands and operators	do	1923	271	1,455	50.8	.660	33.53
	do	1925	341	2,135	50.4	.688	34.68
Crane operators	do	1923	167	525	51.1	.501	25.60
	do	1925	214	754	50.7	.524	26.57
Drill press hands and operators	do	1923	350	3,634	50.8	.527	26.77
	do	1925	423	5,012	50.4	.579	29.18
	Female	1923	5	33	49.5	.410	20.30
	do	1925	16	93	49.0	.477	23.37
Fitters and bench hands	Male	1923	271	4,721	49.9	.616	30.74
	do	1925	388	8,157	49.8	.643	32.02
	Female	1923	4	60	49.0	.420	20.58
	do	1925	14	146	49.3	.468	23.07
Grinding machine hands and operators	Male	1923	221	1,255	50.5	.586	29.59
	do	1925	267	2,016	50.3	.637	32.04
	Female[1]	1923	2	2	52.0	.310	16.12
Laborers	Male	1923	375	8,355	51.1	.418	21.35
	do	1925	439	9,833	50.6	.456	23.07
Laborers (packers for shipping)	Female[1]	1923	5	30	48.2	.323	15.57
Lathe hands and operators, engine	Male	1923	347	4,421	50.9	.633	32.22
	do	1925	401	5,856	50.3	.663	33.35
Lathe hands and operators, turret	do	1923	251	2,147	50.5	.610	30.81
	do	1925	328	3,393	50.2	.647	32.48
	Female[2]	1925	3	27	49.9	.488	24.35
Machinists	Male	1923	331	2,952	50.0	.683	34.15
	do	1925	374	3,820	49.9	.702	35.03
Machinist's and toolmaker's helpers	do	1923	251	1,616	50.4	.464	23.39
	do	1925	262	1,641	49.8	.494	24.60
Milling-machine hands and operators	do	1923	268	1,938	50.0	.605	30.25
	do	1925	339	2,925	49.7	.653	32.45
	Female[2]	1925	6	32	49.4	.497	24.55
Packers and craters	Male [2]	1925	274	1,488	50.5	.520	26.26
	Female[2]	1925	10	68	49.7	.354	17.59
Planer hands and operators	Male	1923	272	1,339	50.6	.663	33.55
	do	1925	327	1,838	50.2	.705	35.39
Screw-machine hands and operators	Male	1923	177	1,047	50.6	.564	28.54
	do	1925	215	1,482	49.8	.643	32.02
Other machine hands and operators	do	1923	289	2,670	50.5	.556	28.08
	do	1925	371	4,066	50.5	.630	31.82
	Female	1923	6	76	48.2	.422	20.34
	do	1925	16	201	48.8	.441	21.52
Toolmakers	Male	1923	274	1,661	50.4	.693	34.93
	do	1925	346	2,573	50.0	.727	36.35
Other skilled machine-shop occupations	do	1923	356	5,312	50.9	.618	31.46
	do	1925	458	9,602	50.4	.647	32.61
	Female	1923	4	36	51.3	.313	16.06
	do	1925	13	215	48.9	.372	18.19
Other machine-shop employees	Male	1923	386	6,035	52.0	.459	23.87
	do	1925	498	9,715	52.5	.514	26.99
	Female	1923	8	117	48.7	.325	15.83
	do[3]	1925	23	143	49.2	.352	17.32
All occupations	Male	1923	429	58,506	50.8	.560	28.45
	do	1925	511	85,199	50.4	.604	30.44
	Female	1923	19	408	49.1	.366	17.97
	do	1925	36	1,075	49.3	.420	20.71
All occupations, male and female		1923	429	58,914	50.8	.559	28.40
		1925	511	86,274	50.4	.602	30.34

[1] Included with "Other employees" in 1925.
[2] Not shown separately in 1923 report.
[3] Includes employees in some other occupations shown separately for males.

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Comparing the 1925 averages for employees in *foundries* with those for 1923, as shown by Table 1, a slight reduction in working time accompanied by an increase in hourly earnings is shown for every occupation for which separate figures are given except female laborers, in which occupation hourly earnings show an increase of almost 7 cents per hour, but full-time hours per week also increased 0.8 hour.

The general decrease in full-time weekly hours was more than offset by the increase in hourly earnings, and full-time weekly earnings show an increase in every instance. The reduction in full-time weekly hours is due not so much to a shortening of the hours per day as it is to the recent practice in some foundries of eliminating entirely work on Saturday. The largest reduction took place in the occupation of machine molders. The average full-time hours per week of this occupation were 51.9 in 1923, but were reduced to 50.1 in 1925. The decrease for all occupations combined was 0.9 hour, or from 52.4 hours in 1923 to 51.5 in 1925.

Increases in earnings per hour in foundries varied from 1.3 cents for female core makers to 8.9 cents for male cupola tenders. Considering all employees the increase amounted to 5.2 cents or from 55.8 cents in 1923 to 61.0 cents in 1925.

Average full-time hours per week for *machine shops* show a decrease as between 1923 and 1925 for practically every occupation. The decrease in almost every instance, however, was less than one hour and amounted to an average of only 0.4 hour for all occupations combined.

Average earnings per hour in machine shops increased for each occupation, resulting in increases in weekly earnings in every case. Female assemblers received the highest increase in hourly earnings, or 9.4 cents per hour, and blacksmiths' helpers the least, or 1.5 cents. Among the male employees screw-machine hands and operators received the largest increase, 7.9 cents per hour. The average increase for all employees was 4.3 cents—from 55.9 cents per hour in 1923 to 60.2 cents in 1925.

While Table 1 is valuable in summing up the situation in the industry in the United States as a whole, it does not show the variation within the occupations among the several States. Space does not permit a showing by States for all occupations, but four typical foundry occupations and four typical machine-shop occupations have been selected to illustrate the variation. The same kind of averages are shown by States in Table 2 for these eight occupations as are shown for all occupations in the preceding table, except that they are shown for 1925 only.

Taking the occupation of male laborers in foundries, for example, the averages for the 10,931 employees covered in the study are 52.5 hours per week, 48.1 cents per hour, and $25.25 per full-time week. When the averages for the occupation in the various States are considered, however, wide differences in hours and earnings are noted. Laborers in Oregon averaged only 46 hours per full-time week, while laborers in Minnesota averaged almost 58 hours. Five States had average full-time hours per week of less than 50. Likewise, laborers in Georgia averaged only 25.8 cents per hour, while those in Washington received more than twice that amount, or an average of 55.4 cents per hour. Seven States had an average of less than 40 cents

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per hour, and seven had an average of 50 cents or over. Full-time weekly earnings of laborers ranged from $14.37 in Georgia to $28.67 in Illinois. The seven other occupations show similar variations.

TABLE 2.—AVERAGE HOURS AND EARNINGS FOR EIGHT SELECTED OCCUPATIONS IN FOUNDRIES AND MACHINE SHOPS, 1925, BY SEX AND STATE

Foundries

State	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings
	Laborers, male					Molders, hand, floor, male				
Alabama	5	54	56.1	$0.274	$15.37	5	48	51.5	$0.688	$35.43
California	11	131	48.7	.496	24.16	13	166	46.9	.873	40.94
Colorado	4	73	53.8	.425	22.87	4	59	51.2	.809	41.42
Connecticut	16	403	51.9	.482	25.02	16	302	49.9	.770	38.42
Georgia	10	127	55.7	.258	14.37	11	79	53.2	.651	34.63
Illinois	30	959	52.8	.543	28.67	30	384	50.9	.857	43.62
Indiana	13	443	53.5	.449	24.02	13	212	50.7	.766	38.84
Iowa	13	349	55.8	.437	24.38	13	181	53.3	.761	40.56
Kansas	8	43	55.5	.357	19.81	9	70	53.8	.658	35.40
Kentucky	6	38	56.2	.401	22.54	9	48	48.2	.719	34.66
Louisiana	5	63	52.4	.334	17.50	5	48	49.4	.711	35.12
Maine	3	33	54.5	.462	25.18	4	54	47.4	.719	34.08
Maryland	7	94	55.8	.385	21.48	7	103	49.1	.763	37.46
Massachusetts	21	687	49.1	.502	24.65	21	373	47.9	.975	46.70
Michigan	37	1,475	51.0	.522	26.62	34	391	49.2	.781	38.43
Minnesota	5	157	57.9	.457	26.46	6	77	53.0	.708	37.52
Missouri	14	190	54.1	.413	22.34	15	172	52.1	.745	38.81
New Hampshire	7	67	48.8	.492	24.01	7	33	49.4	.771	38.09
New Jersey	19	659	53.6	.464	24.87	18	262	50.6	.860	43.52
New York	23	975	51.6	.500	25.80	23	339	49.1	.843	41.39
Ohio	45	1,489	54.5	.465	25.34	45	881	51.6	.800	41.28
Oregon	7	51	46.0	.507	23.32	8	38	47.1	.845	39.80
Pennsylvania	41	1,416	51.5	.476	24.51	41	792	50.3	.808	40.69
Rhode Island	8	252	52.5	.484	25.41	8	114	50.3	.817	41.10
Tennessee	5	81	53.6	.294	15.76	7	83	48.6	.685	33.29
Texas	6	51	54.9	.329	18.06	9	83	50.2	.635	31.88
Washington	6	72	48.0	.554	26.59	7	75	47.9	.808	38.70
Wisconsin	14	499	53.1	.510	27.08	13	145	52.4	.740	38.78
Total	389	10,931	52.5	.481	25.25	401	5,612	50.4	.802	40.42
	Molders, machine, male					Pattern makers, male				
Alabama	(1)	(1)	(1)	(1)	(1)	5	20	53.4	$0.738	$39.41
California	4	11	50.2	$0.755	$37.90	9	39	46.5	.935	43.48
Colorado	2	7	52.3	.610	31.90	3	8	46.3	.945	43.75
Connecticut	8	101	52.2	.681	35.55	11	81	49.6	.767	38.04
Georgia	(1)	(1)	(1)	(1)	(1)	11	23	52.9	.719	38.04
Illinois	14	267	51.9	.669	34.72	26	95	50.0	.843	42.15
Indiana	11	231	45.4	.747	33.91	13	87	50.0	.867	43.35
Iowa	9	86	51.8	.677	35.07	8	23	53.6	.662	35.48
Kansas	2	7	54.0	.598	32.29	8	10	54.3	.766	41.59
Kentucky	3	6	53.0	.540	28.62	5	10	50.6	.728	36.84
Louisiana	2	3	49.3	.702	34.61	5	15	49.7	.807	40.11
Maine	2	41	50.0	.754	37.70	4	17	48.0	.694	33.31
Maryland	5	26	52.8	.622	32.84	6	14	50.2	.738	37.05
Massachusetts	16	248	48.8	.810	39.53	17	127	48.7	.726	35.36
Michigan	24	410	49.2	.773	38.03	31	185	51.8	.812	42.06
Minnesota	6	37	52.8	.674	35.59	5	42	49.7	.696	34.59
Missouri	4	27	54.8	.703	38.52	10	32	49.6	.857	42.51
New Hampshire	3	17	48.9	.918	44.89	5	14	50.7	.778	39.44
New Jersey	14	174	51.8	.736	38.12	18	115	49.2	.853	41.97
New York	16	261	49.5	.785	38.86	21	178	49.6	.832	41.27
Ohio	24	335	51.5	.709	36.51	37	217	52.1	.804	41.89
Oregon						6	11	47.0	.908	42.68
Pennsylvania	31	452	49.3	.727	35.84	40	243	51.3	.809	41.50
Rhode Island	8	131	50.7	.759	38.48	8	53	50.7	.695	35.24
Tennessee	2	3	48.7	.586	28.54	6	12	48.8	.782	38.16
Texas	3	21	54.0	.537	29.00	9	23	50.2	.801	40.21
Washington	2	10	48.0	.756	36.29	6	24	47.9	.992	47.52
Wisconsin	12	201	51.4	.737	37.88	12	66	51.3	.682	34.99
Other States	2	27	51.1	.487	24.89					
Total	229	3,140	50.1	.733	36.72	345	1,784	50.5	.800	40.40

[1] Included under "Other States."

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TABLE 2.—AVERAGE HOURS AND EARNINGS FOR EIGHT SELECTED OCCUPATIONS IN FOUNDRIES AND MACHINE SHOPS, 1925, BY SEX AND STATE—Continued

Machine shops

State	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings
	Fitters and bench hands, male					Laborers, male				
Alabama	4	12	53.3	$0.590	$31.45	6	40	53.8	$0.285	$15.33
California	13	246	45.5	.793	36.08	9	75	46.2	.548	25.32
Colorado	2	11	48.0	.632	30.34	2	30	48.1	.429	20.63
Connecticut	10	97	51.6	.564	29.10	17	312	50.7	.453	22.97
Georgia	2	6	51.0	.496	25.30	9	58	53.3	.221	11.78
Illinois	28	622	49.4	.686	33.89	35	1,149	50.1	.505	25.30
Indiana	15	312	52.0	.577	30.00	15	424	52.4	.432	22.64
Iowa	5	22	51.4	.516	26.52	5	115	53.7	.386	20.73
Kansas	3	26	58.8	.503	29.58	6	39	57.2	.356	20.36
Kentucky	8	52	48.9	.613	29.98	7	33	52.6	.393	20.67
Louisiana	2	9	59.4	.471	27.98	5	34	48.3	.371	17.92
Maine	3	54	45.5	.497	22.61	4	59	48.9	.429	20.98
Maryland	3	15	48.1	.688	33.09	8	79	49.9	.443	22.11
Massachusetts	33	673	48.8	.647	31.57	38	955	49.2	.484	23.81
Michigan	27	406	51.6	.610	31.48	27	557	51.5	.467	24.05
Minnesota	7	78	49.9	.636	31.74	7	124	50.4	.434	21.87
Missouri	11	72	54.0	.538	29.05	13	112	53.6	.372	19.94
New Hampshire	7	133	48.7	.661	32.19	8	55	50.7	.464	23.52
New Jersey	26	317	48.9	.661	32.32	28	401	50.1	.482	24.15
New York	19	1,332	48.1	.710	34.15	21	1,034	48.6	.449	21.82
Ohio	67	1,134	49.7	.589	29.27	71	1,518	51.2	.448	22.94
Oregon	4	24	48.0	.740	35.52	3	10	48.0	.443	21.26
Pennsylvania	45	1,339	51.0	.647	33.00	47	1,607	50.7	.449	22.76
Rhode Island	10	378	50.4	.589	29.69	12	354	53.6	.434	23.26
Tennessee	5	30	48.4	.611	29.57	6	38	49.8	.307	15.29
Texas	8	87	50.4	.526	26.51	11	80	52.9	.389	20.58
Washington	5	98	47.6	.754	35.89	3	21	48.0	.503	24.14
Wisconsin	16	572	51.9	.625	32.44	16	520	51.5	.461	23.74
Total	388	8,157	49.8	.643	32.02	439	9,833	50.6	.456	23.07
	Toolmakers, male					Lathe hands and operators, engine, male				
Alabama	2	2	52.5	$0.775	$40.69	5	32	53.7	$0.662	$35.55
California	9	36	46.3	.873	40.42	12	218	46.6	.807	37.61
Colorado	2	3	48.1	.734	35.31	2	22	48.1	.658	31.65
Connecticut	16	107	51.0	.702	35.80	18	247	50.3	.644	32.39
Georgia	5	6	52.9	.703	37.19	5	23	52.4	.496	25.99
Illinois	26	198	50.8	.780	39.62	36	633	50.2	.720	36.14
Indiana	14	124	52.6	.677	35.61	15	155	52.4	.628	32.91
Iowa	4	27	53.9	.632	34.06	4	75	54.7	.517	28.28
Kansas	2	3	46.7	.828	38.67	4	19	54.9	.524	28.77
Kentucky	4	6	47.7	.733	34.96	7	27	49.1	.601	29.51
Louisiana	2	2	52.0	.688	35.78	2	7	56.4	.471	26.56
Maine	4	14	49.6	.620	30.75	4	67	48.3	.562	27.14
Maryland	4	37	48.1	.706	33.96	5	49	48.5	.661	32.06
Massachusetts	34	236	49.3	.705	34.76	33	534	49.7	.607	30.17
Michigan	28	193	50.8	.754	38.30	21	231	52.5	.629	33.02
Minnesota	4	21	49.9	.682	34.03	5	67	50.6	.646	32.69
Missouri	10	32	52.7	.686	36.15	11	119	51.4	.628	32.28
New Hampshire	4	29	48.8	.748	36.50	7	74	50.0	.647	32.35
New Jersey	18	104	49.1	.794	38.99	26	236	49.0	.716	35.08
New York	21	397	48.1	.781	37.57	21	516	48.5	.705	34.19
Ohio	61	439	50.1	.691	34.62	68	867	50.5	.636	32.12
Oregon	2	3	48.0	.915	43.92	5	49	48.0	.724	34.75
Pennsylvania	35	243	49.4	.729	36.01	45	907	51.0	.677	34.53
Rhode Island	10	124	50.5	.687	34.69	9	174	50.5	.602	30.40
Tennessee	2	6	48.7	.696	33.90	3	23	49.8	.655	32.62
Texas	4	10	51.5	.729	37.54	7	79	50.5	.628	31.71
Washington	3	6	47.7	.803	38.30	5	70	47.7	.768	36.63
Wisconsin	16	165	51.9	.683	35.45	16	336	51.8	.656	33.98
Total	346	2,573	50.0	.727	36.35	401	5,856	50.3	.663	33.35

A total of 410 of the 413 foundries covered in the study reported the days of operation during the year ending December 31, 1924. One plant reported only 70 days operated while one reported 312 days; the average for all was 285 days. The 410 plants were closed an average of 82 days due to the following reasons: Sundays

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52, Saturdays 5, vacations and holidays 9, inventories and plant disability 1, business depression or lack of orders 14, and other causes 1.

The days of operation of 505 of the 511 machine shops covered ranged from 214 to 340, and the average was 298 days. No data were available for 6 of the plants. The 505 plants were closed an average of 67.9 days throughout the year due to the following reasons: Sundays, 52 days; Saturdays, 1 day; vacations and holidays, 7 days; inventory and plant disability, 1 day; business depression or lack of orders, 6 days; and other causes, less than 1 day.

Wages and Hours of Labor in the Hosiery and Underwear Industry, 1926 [4]

The bureau has made several wage studies in the hosiery and underwear industry, the latest one for which data are available having been made in 1926. In hosiery manufacture this study covered 10,250 male wage earners and 20,296 female wage earners employed in 105 representative establishments in 18 States, while in underwear manufacture it covered 2,860 male wage earners and 12,188 female wage earners in 85 representative establishments in 15 States. According to the 1923 census of manufactures, the States represented contain 94 and 93 per cent, respectively, of the wage earners employed in the manufacture of hosiery and underwear. The two industries combined cover 13,110 male wage earners and 32,484 female wage earners, from which figures it will be noticed that nearly three-fourths of the employees in these industries are females.

The data presented were taken by agents of the bureau directly from the pay rolls and other records of the establishments, mainly as of the last quarter of 1926.

Index numbers for average earnings per hour, average full-time hours per week, and average full-time earnings per week for the two closely related industries combined are presented in Table 1. The same data are shown graphically in the chart on page 746.

TABLE 1.—INDEX NUMBERS OF CUSTOMARY HOURS AND EARNINGS IN THE HOSIERY AND UNDERWEAR INDUSTRY FOR SPECIFIED YEARS, 1910 TO 1926

[1913=100]

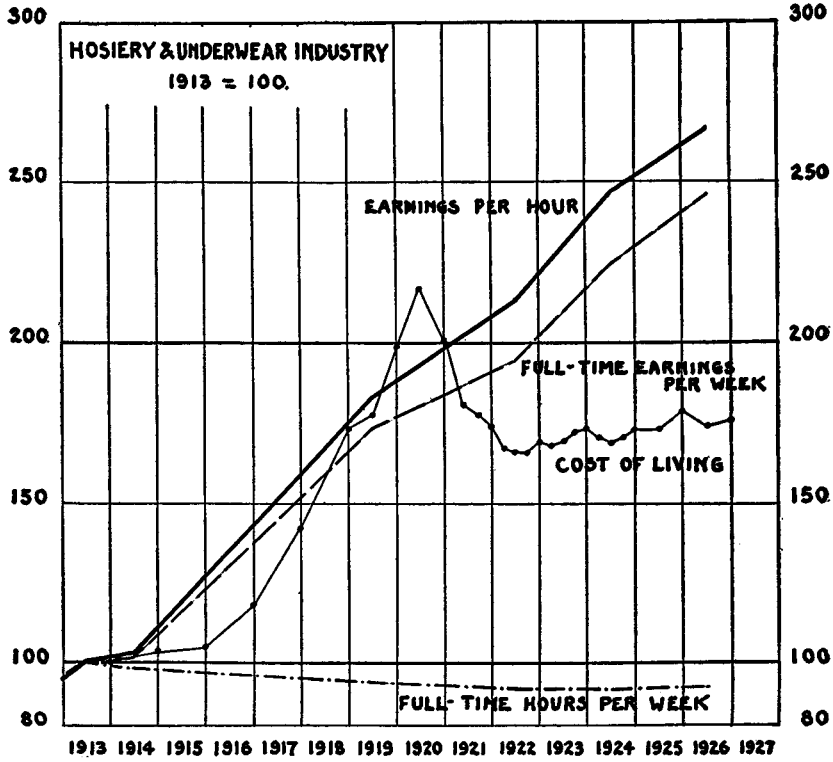
Year	Average full-time hours per week	Average earnings per hour	Average full-time earnings per week	Year	Average full-time hours per week	Average earnings per hour	Average full-time earnings per week
1910	104.2	82.0	85.2	1919	94.2	183.1	172.9
1911	103.8	83.7	87.1	1922	91.9	213.0	195.0
1912	102.0	89.0	90.6	1924	91.3	246.1	224.1
1913	100.0	100.0	100.0	1926	92.4	266.6	245.6
1914	98.7	103.5	102.0				

Table 2 shows the average full-time weekly hours, hourly earnings, and full-time weekly earnings for 1924 and 1926 for the principal occupations, the averages for males and females being presented separately. In the 1926 study, the data for hosiery and for underwear were kept separate. In previous studies these two closely related

[4] For full report see forthcoming bulletin.

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industries had been treated as one industry. There are several occupations which are common to both industries and for these occupations the combined figures for 1924 are shown in comparison



with the figures for each industry for 1926. The task of segregating the data for each industry in earlier years in the common occupations was too great to warrant such action.

TABLE 2.—AVERAGE HOURS AND EARNINGS IN THE HOSIERY AND UNDERWEAR INDUSTRY, 1924 AND 1926, BY OCCUPATION AND SEX

Occupation	Sex	Year	Number of—		Average full-time hours per week	Average earnings per hour	Average full-time earnings per week
			Establishments	Employees			
Boarders, hosiery	M.	1924	49	1,118	51.9	$0.531	$27.56
	M.	1926	82	1,598	53.4	.481	25.69
	F.	1924	26	313	50.4	.442	22.28
	F.	1926	32	483	50.0	.479	23.95
Buttonhole makers, underwear	F.	1924	66	404	50.2	.357	17.92
	F.	1926	73	364	50.2	.354	17.77
Button sewers, underwear	F.	1924	65	380	50.3	.336	16.90
	F.	1926	69	365	50.5	.338	17.07
Cutters, hand, layers up and markers, underwear	M.	1924	35	217	50.9	.483	24.58
	M.	1926	43	229	50.3	.513	25.80
	F.	1924	50	655	49.8	.363	18.08
	F.	1926	52	429	50.2	.367	18.42
Cutters, power, underwear	M.	1924	46	129	51.0	.543	27.69
	M.	1926	61	121	50.8	.550	27.94
	F.	1924	11	29	49.0	.463	22.69
	F.	1926	12	31	49.0	.432	21.17
Finishers, underwear	F.	1924	67	3,295	49.8	.377	18.77
	F.	1926	84	3,221	50.3	.358	18.01

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TABLE 2.—AVERAGE HOURS AND EARNINGS IN THE HOSIERY AND UNDERWEAR INDUSTRY, 1924 AND 1926, BY OCCUPATION AND SEX—Continued

Occupation	Sex	Year	Number of—		Average full-time hours per week	Average earnings per hour	Average full-time earnings per week
			Establishments	Employees			
Folders, hosiery and underwear	F.	1924	118	1,116	50.8	$0.346	$17.58
hosiery	F.	1926	82	803	52.2	.343	17.90
underwear	F.	1926	61	463	50.4	.365	18.40
Inspectors, hosiery and underwear	F.	1924	134	2,459	50.4	.322	16.23
hosiery	F.	1926	100	1,988	52.6	.292	15.36
underwear	F.	1926	80	1,056	50.0	.306	15.30
Knitters, transfer, hosiery	M.	1924	18	175	51.1	.437	22.33
	M.	1926	27	330	54.1	.336	18.18
	F.	1924	55	2,939	50.8	.344	17.48
	F.	1926	72	3,058	52.5	.298	15.65
Knitters, full-fashioned, hosiery	M.	1924	26	1,728	50.5	1.099	55.50
full-fashioned, leggers, hosiery	M.	1926	28	1,897	51.1	1.286	65.71
full-fashioned, footers, hosiery	M.	1926	27	696	51.0	1.511	77.06
helpers, full or fashioned, hosiery	M.	1926	17	973	51.7	.355	18.35
lady hose string work, hosiery	M.	1924	24	382	53.2	.421	22.40
	M.	1926	36	564	54.4	.448	24.37
	F.	1924	17	191	50.2	.413	20.73
	F.	1926	24	272	51.6	.399	20.59
Knitters, rib, hosiery	M.	1924	34	123	53.1	.435	23.10
	M.	1926	43	152	53.6	.365	19.56
	F.	1924	21	121	52.0	.346	17.99
	F.	1926	27	76	51.4	.352	18.09
Knitters, cuff or ankle, underwear	M.	1926	32	55	50.2	.550	27.61
	F.	1926	5	6	50.2	.376	18.88
Knitters, web or tube, underwear	M.	1924	55	454	51.3	.528	27.09
	M.	1926	67	393	52.0	.534	27.77
	F.	1924	34	290	49.0	.390	19.11
	F.	1926	47	275	49.6	.379	18.80
Loopers, hosiery	F.	1924	80	2,832	50.8	.384	19.51
	F.	1926	101	3,753	52.4	.371	19.44
Machine fixers, hosiery and underwear	M.	1924	126	736	51.1	.706	36.08
hosiery	M.	1926	97	871	53.6	.713	38.22
underwear	M.	1926	73	229	49.9	.717	35.78
Menders, hosiery and underwear	F.	1924	126	1,598	50.6	.367	18.57
hosiery	F.	1926	98	1,362	50.8	.389	19.76
underwear	F.	1926	57	246	50.3	.313	15.74
Pairers or maters, hosiery	F.	1926	80	1,301	51.8	.358	18.54
Pressers, hosiery and underwear	M.	1924	69	190	51.0	.448	22.85
underwear	M.	1926	38	92	50.3	.455	22.89
hosiery and underwear	F.	1924	33	141	49.1	.347	17.04
underwear	F.	1926	50	236	50.3	.346	17.40
Press hands, hosiery and underwear	M.	1924	11	60	53.4	.500	26.70
underwear	M.	1926	11	22	50.3	.392	19.72
hosiery and underwear	F.	1924	20	140	49.5	.351	17.37
underwear	F.	1926	20	118	49.6	.287	14.24
Seamers, underwear	F.	1924	67	2,200	50.3	.372	18.71
	F.	1926	84	2,377	50.2	.374	18.77
full-fashioned hosiery	F.	1924	26	563	50.5	.484	24.44
	F.	1926	28	927	50.5	.515	26.01
Toppers, full-fashioned hosiery	F.	1924	26	1,166	50.6	.472	23.88
	F.	1926	28	1,372	50.3	.563	28.32
Welters, hosiery and underwear	F.	1924	57	263	51.1	.356	18.19
hosiery	F.	1926	39	219	52.2	.325	16.97
Hemmers, underwear	F.	1926	43	223	49.2	.379	18.65
Winders, hosiery and underwear	M.	1924	21	86	53.8	.410	22.06
hosiery	M.	1926	19	114	53.5	.406	21.72
underwear	M.	1926	17	38	55.7	.458	25.51
hosiery and underwear	F.	1924	106	1,315	50.0	.402	20.10
hosiery	F.	1926	84	1,069	50.9	.378	19.24
underwear	F.	1926	62	859	50.0	.398	19.90
Other employees, hosiery and underwear	M.	1924	138	4,682	51.9	.379	19.67
hosiery	M.	1926	102	3,055	52.7	.397	20.92
underwear	M.	1926	82	1,681	51.0	.420	21.42
hosiery and underwear	F.	1924	143	5,993	50.5	.292	14.75
hosiery	F.	1926	102	3,613	50.3	.279	14.03
underwear	F.	1926	84	1,919	49.8	.314	15.64
All occupations, hosiery and underwear	M.	1924	143	10,146	51.6	.558	28.79
hosiery	M.	1926	105	10,250	52.6	.675	35.51
underwear	M.	1926	85	2,860	51.0	.477	24.33
hosiery and underwear	F.	1924	143	28,403	50.4	.356	17.94
hosiery	F.	1926	105	20,296	51.5	.358	18.44
underwear	F.	1926	85	12,188	50.1	.352	17.64
hosiery and underwear	M. and F.	1924	143	38,549	50.7	.409	20.74
hosiery	M. and F.	1926	105	30,546	51.9	.472	24.50
underwear	M. and F.	1926	85	15,048	50.3	.378	19.01

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Table 3 shows the number of establishments, number of employees, average earnings per hour, average full-time hours per week, and average full-time earnings per week, by States, in 1926 for all occupations combined.

It will be noted that the average earnings per hour range from 21.5 cents in Alabama and Louisiana to 79.7 cents in New Jersey; the average full-time hours per week from 47.6 in New Jersey to 55.2 in North Carolina; and the average full-time earnings per week from $11.83 in Alabama and Louisiana to $37.94 in New Jersey.

TABLE 3.—AVERAGE HOURS AND EARNINGS IN THE HOSIERY AND UNDERWEAR INDUSTRY, BY STATES, 1926

State	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time earnings per week
Alabama and Louisiana	4	1,161	55.0	$0.215	$11.83
Connecticut	4	437	51.3	.386	19.80
Georgia	9	1,338	55.1	.258	14.22
Illinois	9	1,222	53.1	.352	18.69
Indiana	4	1,700	49.2	.489	24.06
Massachusetts	7	2,666	48.1	.407	19.58
Michigan	7	1,031	51.5	.330	17.00
Minnesota and Wisconsin	9	3,611	49.4	.533	26.33
New Hampshire and Vermont	9	1,536	48.9	.390	19.07
New Jersey	4	1,011	47.6	.797	37.94
New York	33	6,376	49.9	.448	22.36
North Carolina	15	3,190	55.2	.328	18.11
Ohio	6	686	50.0	.370	18.50
Pennsylvania	45	13,121	51.2	.560	28.67
Rhode Island	5	671	51.3	.364	18.67
Tennessee	17	4,520	54.2	.291	15.77
Virginia	3	817	52.2	.246	12.84
All States	190	45,594	51.3	.443	22.73

Data for five fairly representative occupations are tabulated by States in Table 4:

TABLE 4.—AVERAGE HOURS AND EARNINGS IN FIVE SELECTED OCCUPATIONS OF THE HOSIERY AND UNDERWEAR INDUSTRY, 1926, BY SEX AND STATE

Occupation	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time earnings per week
Hosiery					
Knitters, transfer, female:					
Alabama and Louisiana	3	297	55.3	$0.197	$10.89
Georgia	7	302	55.0	.212	11.66
Illinois	3	85	51.6	.267	13.78
Massachusetts	2	102	48.0	.297	14.26
Michigan	3	61	50.6	.394	19.94
New Hampshire and Vermont	6	122	48.0	.368	17.66
North Carolina	10	293	55.8	.263	14.68
Ohio	3	65	49.9	.333	16.62
Pennsylvania	12	671	50.8	.425	21.59
Rhode Island	3	62	50.8	.318	16.15
Tennessee	11	637	53.9	.236	12.72
Virginia	3	191	51.4	.226	11.62
Wisconsin	5	136	49.6	.417	20.68
Other States	1	34	49.5	.325	16.09
All States	72	3,058	52.5	.298	15.65

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TABLE 4.—AVERAGE HOURS AND EARNINGS IN FIVE SELECTED OCCUPATIONS OF THE HOSIERY AND UNDERWEAR INDUSTRY, 1926, BY SEX AND STATE—Contd.

Occupation	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time earnings per week
Hosiery—Continued					
Knitters, full-fashioned, leggers, male:					
New Jersey	4	216	48.9	$1.427	$69.78
New York	4	171	48.6	1.413	68.67
North Carolina	2	90	47.8	.534	25.53
Pennsylvania	14	1,096	52.5	1.313	68.93
Wisconsin	3	239	50.9	1.265	64.39
Other States	1	85	49.0	1.102	54.00
All States	28	1,897	51.1	1.286	65.71
Loopers, female:					
Alabama and Louisiana	4	121	54.9	.230	12.63
Georgia	7	295	55.3	.268	14.82
Illinois	5	162	55.6	.283	15.73
Indiana	2	115	49.8	.485	24.15
Massachusetts	3	128	48.0	.352	16.90
Michigan	2	25	45.4	.518	23.52
New Hampshire and Vermont	6	127	48.4	.365	17.67
New Jersey	4	102	46.2	.521	24.07
New York	4	81	49.3	.537	26.47
North Carolina	14	566	55.7	.283	15.76
Ohio	3	26	49.9	.403	20.11
Pennsylvania	22	1,015	51.3	.478	24.52
Rhode Island	3	37	51.9	.365	18.94
Tennessee	14	553	54.2	.276	14.96
Virginia	3	144	51.8	.226	11.71
Wisconsin	5	256	49.5	.498	24.65
All States	101	3,753	52.4	.371	19.44
Underwear					
Knitters, web or tube, male:					
Connecticut	2	2	49.5	.404	20.00
Georgia	2	5	57.2	.251	14.34
Illinois	3	6	48.1	.542	26.07
Indiana	2	15	53.6	.529	28.35
Massachusetts	3	37	49.0	.641	31.41
Michigan	3	7	54.3	.431	23.40
Minnesota and Wisconsin	3	16	54.9	.520	28.55
New Hampshire and Vermont	2	33	49.8	.524	26.11
New York	22	159	51.0	.597	30.45
Ohio	2	11	52.2	.382	19.94
Pennsylvania	18	61	54.7	.461	25.22
Rhode Island	2	11	52.4	.467	24.47
Tennessee	3	30	55.0	.436	23.98
All States	67	393	52.0	.534	27.77
Seamers, female:					
Connecticut	4	44	50.8	.393	19.96
Georgia	2	36	57.4	.191	10.96
Illinois	3	36	45.7	.562	25.68
Indiana	2	108	47.9	.381	18.25
Massachusetts	4	209	48.0	.420	20.16
Michigan	4	127	51.6	.321	16.56
Minnesota and Wisconsin	4	181	48.7	.443	21.57
New Hampshire and Vermont	3	114	49.4	.401	19.81
New York	28	895	49.9	.378	18.86
Ohio	3	77	49.7	.375	18.64
Pennsylvania	22	374	52.0	.352	18.30
Rhode Island	2	58	50.9	.366	18.63
Tennessee	3	118	54.3	.273	14.82
All States	84	2,377	50.2	.374	18.77

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Wages and Hours of Labor in the Iron and Steel Industry, 1926

A STUDY of wages and hours of labor in the iron and steel industry was made by the Bureau of Labor Statistics early in 1926.[5] Similar studies had been made at different intervals in preceding years. Ten of the principal departments were covered in the 1926 inquiry and data were obtained from a sufficient number of plants to insure the figures being fairly representative.

Table 1 consists of index numbers showing the changes between 1913 and 1926 in average full-time hours per week, earnings per hour, and full-time weekly earnings for the industry as a whole and for each department for the years covered by the bureau's studies. In one instance, puddling mills, the index number starts with 1914, as no figures for this department are available for 1913. Although in 1913 data were collected for the principal occupations only, beginning with 1914 data have been collected for all occupations in the years appearing in the table.

The change in the rates of the principal productive occupations combined closely followed the change in all occupations as between 1914 and 1915, and as it is highly desirable to have index numbers for the industry based on 1913, the year selected as the base for many of the bureau's index numbers, the very small change between 1913 and 1914 has been assumed to be the same for all occupations combined, as worked out from the change in the principal productive occupations. From 1914 onward, the index for each year appearing in the table is based on a combination of employees in all occupations of the plants reported.

Earnings per hour and per week reached their highest point in 1920. It is known that there was a great reduction in 1921, although the bureau did not collect data that year, and this reduction continued into 1922. Since that year there has been a considerable increase, and in 1926 earnings per hour were two and one-eighth times the earnings of 1913. There were variations in the different departments, however.

Between 1924 and 1926 there was a decrease of about 1 per cent in hourly earnings in the industry as a whole, and in the same interval hours of labor decreased a little more than 2 per cent. The average hourly earnings of all employees in six of the departments increased, averages in four departments decreased, the decrease in the blast-furnace department being very slight. The increases were due to increased production rather than to any particular changes in basic rates of pay, while the decreases were due primarily to reductions in rates. As indicated above, for the industry as a whole the decreases more than offset the increases.

From 1913 to 1922 there was a decrease in average hours of 4 per cent. Later, in 1923, a very material decrease was made, and this is indicated in the 1924 index number, which was 84 for the industry as a whole. In 1926 the index was 82, meaning that average full-time hours per week in the industry generally were reduced 18 per cent from 1913 to 1926.

[5] For complete report see forthcoming bulletin.

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TABLE 1.—INDEX NUMBERS OF HOURS AND EARNINGS IN THE IRON AND STEEL INDUSTRY IN SPECIFIED YEARS, 1913 TO 1926

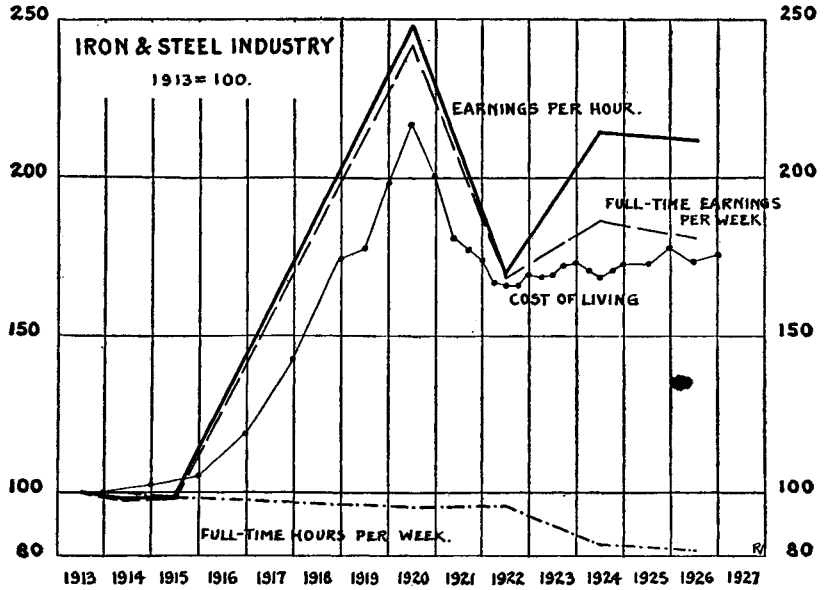
Department and year	Index numbers of—		
	Full-time hours per week	Earnings per hour	Full-time earnings per week
All departments:			
1913	100	100	100
1914	98	100	98
1915	99	99	99
1920	95	248	242
1922	96	170	168
1924	84	214	186
1926	82	212	182
Blast furnaces:			
1913	100	100	100
1914	97	100	98
1915	97	101	98
1920	94	279	261
1922	94	194	183
1924	78	254	197
1926	78	252	196
Bessemer converters:			
1913	100	100	100
1914	98	90	88
1915	98	93	91
1920	100	238	239
1922	98	165	162
1924	75	220	164
1926	75	226	170
Open-hearth furnaces:			
1913	100	100	100
1914	97	100	97
1915	97	104	101
1920	90	283	254
1922	92	203	187
1924	76	268	203
1926	74	286	213
Puddling mills:			
1914	100	100	100
1915	98	96	94
1920	101	270	273
1922	98	151	148
1924	105	220	230
1926	98	200	196
Blooming mills:			
1913	100	100	100
1914	97	102	98
1915	97	101	98
1920	92	249	230
Blooming mills—Con.			
1922	93	178	166
1924	75	231	173
1926	74	237	176
Plate mills:			
1913	100	100	100
1914	99	101	100
1915	98	106	104
1920	98	263	259
1922	95	187	177
1924	82	220	180
1926	80	238	190
Bar mills:			
1913	100	100	100
1914	100	97	97
1915	100	92	92
1920	100	248	249
1922	100	169	168
1924	90	203	184
1926	89	205	183
Standard rail mills:			
1913	100	100	100
1914	99	99	98
1915	100	97	97
1920	86	249	215
1922	87	185	161
1924	81	226	183
1926	78	234	183
Sheet mills:			
1913	100	100	100
1914	100	101	101
1915	100	93	93
1920	96	215	207
1922	98	144	140
1924	96	167	161
1926	93	157	147
Tin-plate mills:			
1913	100	100	100
1914	100	102	102
1915	109	103	112
1920	110	228	250
1922	108	156	169
1924	106	191	202
1926	104	169	176

The 1926 study shows that most of the departments in the industry are operated largely on a 3-shift 8-hour basis. The 12-hour shift is rapidly disappearing, although the 10-hour shift is quite common in some departments. While the working time within each department varied but little as between 1924 and 1926, the average full-time hours per week vary considerably between the several departments. In tin-plate mills in 1926 employees worked an average of 48.1 hours per week, while in blast furnaces the average was 59.8 hours. This difference is largely due to Sunday work. From the nature of the blast-furnace process, Sunday work is necessary and many employees work 7 days per week. Also in the open-hearth department a considerable amount of Sunday work is done and a majority of the employees work on Sunday at least once every two or three weeks. It is not customary to operate the other departments on

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Sunday, and the 7-day work in these departments is usually confined to "fix-up" or repair work.

While there was a reduction in hourly earnings, as shown by the wage study, the bureau's employment figures indicate that there was steadier work throughout the year 1926, which produced higher annual earnings per capita than in 1924 or 1925.



The number of plants and the number of employees covered in each department in 1924 and 1926, together with the average earnings per hour for all employees, are shown in the following table:

TABLE 2.—NUMBER OF PLANTS AND EMPLOYEES AND AVERAGE HOURLY EARNINGS IN THE IRON AND STEEL INDUSTRY, BY DEPARTMENTS, 1924 AND 1926

Department	Year	Number of—		Average earnings per hour
		Plants	Employees	
Blast furnaces	1924	36	15,540	$0.520
	1926	37	15,329	.517
Bessemer converters	1924	11	3,457	.624
	1926	11	2,948	.641
Open-hearth furnaces	1924	26	11,611	.635
	1926	31	13,424	.677
Puddling mills	1924	17	3,428	.721
	1926	13	2,488	.657
Blooming mills	1924	25	5,649	.613
	1926	26	6,188	.627
Plate mills	1924	13	4,234	.562
	1926	17	4,202	.606
Standard rail mills	1924	7	3,382	.573
	1926	7	3,280	.595
Bar mills	1924	31	6,564	.585
	1926	35	7,605	.591
Sheet mills	1924	14	9,690	.809
	1926	14	10,753	.759
Tin-plate mills	1924	9	10,549	.795
	1926	8	8,892	.704

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Average full-time hours per week, earnings per hour, and earnings per full week in 1924 and in 1926 are shown in the following table for the major occupations in each department.

"Common labor" is a very important occupation in this industry. It is of importance even beyond the limits of the occupation proper, for this basic labor rate is used to a large extent to determine the rates for other occupations requiring little skill. Quite a large percentage of the force is semiskilled at best, and there are many occupations for which the requirements are very little different from those of ordinary labor. However, in this survey the term "common labor" has been used to cover as far as possible only the wholly unskilled laborers working in and about the mill proper but upon whose work the mill is not primarily dependent for operation.

TABLE 3.—AVERAGE CUSTOMARY HOURS AND EARNINGS IN THE IRON AND STEEL INDUSTRY, 1924 AND 1926, BY DEPARTMENT AND OCCUPATION

Blast furnaces

Occupation	Year	Number of plants	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings
Stockers	1924	36	1,774	60.5	$0.465	$28.10
	1926	37	1,174	60.1	.465	27.95
Bottom fillers	1924	6	341	54.2	.480	26.01
	1926	4	344	53.5	.426	22.79
Top fillers	1924	7	111	56.8	.544	30.40
	1926	4	65	53.8	.500	26.90
Larry men	1924	32	502	57.7	.548	31.48
	1926	34	422	57.9	.551	31.90
Larry men's helpers	1924	26	627	57.1	.485	27.38
	1926	26	389	56.9	.493	28.05
Skip operators	1924	30	320	57.5	.543	30.98
	1926	32	267	58.4	.545	31.83
Blowers	1924	36	262	58.3	.889	51.73
	1926	37	241	58.5	.902	52.77
Blowing engineers	1924	36	244	58.7	.661	38.65
	1926	37	197	59.5	.658	39.15
Blowing engineers' assistants	1924	26	307	56.2	.584	32.74
	1926	29	231	56.6	.579	32.77
Stove tenders	1924	36	473	57.5	.545	31.36
	1926	37	362	57.5	.548	31.51
Keepers	1924	36	466	57.1	.579	32.79
	1926	37	380	57.4	.577	33.12
Keepers' helpers	1924	36	1,654	58.6	.475	27.85
	1926	37	1,516	59.1	.471	27.84
Iron handlers and loaders	1924	7	283	65.7	.345	22.67
	1926	7	181	69.2	.349	24.15
Pig-machine men	1924	26	534	57.5	.515	29.52
	1926	29	506	59.4	.501	29.76
Cinder men	1924	22	364	59.7	.483	28.71
	1926	22	183	59.2	.484	28.65
Laborers	1924	36	2,059	62.4	.401	25.15
	1926	36	1,600	62.4	.389	24.34

Open-hearth furnaces

Stockers	1924	26	781	58.2	$0.540	$31.37
	1926	30	687	57.8	.535	30.92
Stock cranemen	1924	25	228	57.3	.647	36.97
	1926	28	220	57.5	.682	39.22
Charging-machine operators	1924	26	203	56.3	.863	48.43
	1926	31	221	55.7	.951	52.97
Door operators	1924	16	346	55.0	.381	21.22
	1926	17	222	54.9	.374	20.53
Melters' helpers, first	1924	26	885	55.5	1.064	59.16
	1926	31	924	55.3	1.170	64.70
Melters' helpers, second	1924	26	1,072	55.3	.758	41.98
	1926	31	923	55.0	.827	45.49
Melters' helpers, third	1924	26	1,329	55.5	.601	33.39
	1926	31	1,161	55.2	.630	34.72

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TABLE 3.—AVERAGE CUSTOMARY HOURS AND EARNINGS IN THE IRON AND STEEL INDUSTRY, 1924 AND 1926, BY DEPARTMENT AND OCCUPATION—Continued

Open-hearth furnaces—Continued

Occupation	Year	Number of plants	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings
Stopper setters	1924	21	123	55.1	$0.763	$42.07
	1926	25	119	54.4	.860	46.78
Steel pourers	1924	25	147	56.5	.837	47.38
	1926	31	148	55.6	.889	49.43
Mold cappers	1924	7	86	55.0	.609	34.21
	1926	7	70	50.9	.620	31.56
Ladle cranemen	1924	25	239	55.2	.832	46.06
	1926	28	239	54.9	.900	49.41
Ingot strippers	1924	20	98	57.8	.726	42.11
	1926	26	126	56.0	.767	42.95
Engineers, locomotive	1924	23	325	55.4	.700	38.73
	1926	28	363	54.7	.772	42.23
Switchmen	1924	23	406	56.0	.586	32.80
	1926	28	413	54.8	.616	33.76
Laborers	1924	25	2,037	59.0	.434	25.73
	1926	30	1,537	59.2	.429	25.40

Bessemer converters

Stockers	1924	10	437	48.3	$0.613	$29.59
	1926	10	317	48.3	.638	31.82
Cupola melters	1924	5	19	49.3	.856	42.12
	1926	4	10	49.2	.888	43.69
Cupola tappers	1924	4	30	49.7	.723	36.04
	1926	5	21	49.3	.762	37.57
Blowers	1924	11	36	48.9	1.274	62.25
	1926	11	31	49.7	1.351	67.14
Regulators, first	1924	11	41	50.1	.919	46.05
	1926	10	28	51.8	.949	49.16
Regulators, second	1924	9	43	48.7	.926	45.39
	1926	8	31	48.9	.945	46.21
Vessel men	1924	11	45	51.4	1.166	59.93
	1926	11	29	51.8	1.271	65.84
Vessel men's helpers	1924	11	86	50.6	.889	44.72
	1926	11	59	50.9	.897	45.66
Cinder pitmen	1924	10	180	49.4	.556	27.46
	1926	11	122	51.4	.543	27.91
Bottom makers	1924	11	38	52.3	.777	40.59
	1926	11	27	51.3	.826	42.37
Bottom makers' helpers	1924	11	71	53.4	.605	32.19
	1926	11	44	52.3	.647	33.84
Ladle liners	1924	11	44	49.7	.851	42.60
	1926	11	31	50.6	.893	45.19
Ladle liners' helpers	1924	11	86	52.0	.604	31.38
	1926	10	54	51.2	.631	32.31
Stopper makers	1924	11	19	56.6	.573	32.26
	1926	11	12	56.6	.594	33.62
Stopper setters	1924	11	53	48.8	.977	47.65
	1926	11	40	49.5	1.014	50.19
Steel pourers	1924	11	46	48.8	1.073	52.16
	1926	9	27	48.0	1.210	58.08
Mold cappers	1924	9	66	48.4	.728	35.19
	1926	7	33	47.7	.782	37.30
Ingot strippers	1924	11	47	51.0	.804	40.88
	1926	8	26	50.0	.801	40.05
Laborers	1924	11	593	58.0	.448	25.87
	1926	11	201	59.4	.443	26.31

Puddling mills

Stockers	1924	17	188	57.4	$0.480	$27.50
	1926	13	134	51.1	.527	26.93
Puddlers	1924	11	293	52.8	.912	48.10
	1926	8	185	53.5	.767	41.03
Puddlers, level handed	1924	16	1,275	45.7	1.051	48.39
	1926	11	922	49.3	.877	43.24
Puddlers' helpers	1924	11	259	53.2	.590	31.28
	1926	8	200	53.4	.648	34.60

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TABLE 3.—AVERAGE CUSTOMARY HOURS AND EARNINGS IN THE IRON AND STEEL INDUSTRY, 1924 AND 1926, BY DEPARTMENT AND OCCUPATION—Continued

Puddling mills—Continued

Occupation	Year	Number of plants	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings
Bushelers	1924	4	25	46.3	$1.148	$53.85
	1926	3	13	46.4	.883	40.97
Bushelers, level handed	1924	11	161	45.6	1.257	57.41
	1926	5	48	44.2	.996	44.02
Bushelers' helpers	1924	6	51	43.7	.674	29.76
	1926	2	13	46.5	.479	22.27
Heaters	1924	4	11	52.8	1.349	72.36
	1926	4	12	54.2	1.236	66.99
Heaters' helpers	1924	4	20	54.3	.583	31.59
	1926	4	14	54.3	.595	32.31
Bloom boys	1924	14	36	51.7	.525	26.34
	1926	9	20	51.2	.531	27.19
Roll engineers	1924	14	31	64.7	.531	34.45
	1926	10	20	62.3	.574	35.76
Rollers	1924	16	42	51.2	1.252	63.66
	1926	11	24	50.9	1.200	61.08
Roughers	1924	12	45	50.4	.877	43.35
	1926	9	32	48.7	.748	36.43
Catchers	1924	16	69	50.9	.856	42.75
	1926	11	41	50.9	.698	35.53
Hook-ups	1924	16	54	51.9	.638	33.02
	1926	12	43	50.1	.539	27.00
Roll hands, other	1924	5	15	53.9	.559	30.12
	1926	4	6	51.9	.439	22.78
Hotbed men	1924	15	84	52.5	.539	30.01
	1926	10	65	51.2	.571	27.60
Shearman	1924	16	36	52.6	.570	29.80
	1926	12	23	52.8	.638	33.69
Shearmen's helpers	1924	16	96	50.5	.513	25.77
	1926	13	54	50.6	.588	29.75
Laborers	1924	17	341	59.5	.355	21.31
	1926	12	151	57.1	.357	20.38

Blooming mills

Pit cranemen	1924	25	189	54.8	$0.803	$43.89
	1926	27	201	54.3	.855	46.43
Heaters	1924	25	139	55.2	1.192	65.66
	1926	27	122	54.4	1.244	67.67
Heaters' helpers	1924	17	108	55.2	.827	45.76
	1926	18	81	54.9	.864	47.43
Bottom makers	1924	23	162	53.3	.769	40.99
	1926	25	128	53.9	.791	42.63
Bottom-makers' helpers	1924	20	231	53.3	.632	33.69
	1926	21	171	54.4	.634	34.49
Roll engineers	1924	23	76	55.2	.928	51.60
	1926	25	76	54.6	.978	53.40
Rollers	1924	25	90	52.1	1.400	72.99
	1926	27	78	52.0	1.498	77.90
Manipulators	1924	25	102	52.9	.842	44.57
	1926	27	87	52.6	.901	47.39
Table men	1924	14	58	51.6	.659	34.31
	1926	14	45	52.6	.643	33.82
Shearmen	1924	24	96	51.7	.777	40.23
	1926	26	84	51.5	.812	41.82
Shearmen's helpers	1924	23	254	52.5	.590	30.57
	1926	23	168	52.2	.601	31.37
Laborers	1924	24	742	57.4	.462	26.51
	1926	22	429	56.3	.451	25.39

Bar mills

Stockers	1924	25	298	56.0	$0.502	$28.20
	1926	25	305	54.2	.519	28.13
Heaters	1924	28	181	55.3	.949	53.03
	1926	33	181	54.4	.957	52.06
Heaters' helpers	1924	28	312	54.7	.630	34.86
	1926	33	273	54.3	.632	34.32

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TABLE 3.—AVERAGE CUSTOMARY HOURS AND EARNINGS IN THE IRON AND STEEL INDUSTRY, 1924 AND 1926, BY DEPARTMENT AND OCCUPATION—Continued

Bar mills—Continued

Occupation	Year	Number of plants	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings
Chargers and helpers	1924	26	295	54.9	$0.540	$29.58
	1926	28	234	53.5	.551	29.48
Drag downs	1924	26	187	55.2	.560	31.12
	1926	27	142	55.3	.593	32.79
Roll engineers	1924	24	106	60.9	.569	34.55
	1926	26	112	58.0	.581	33.70
Rollers	1924	30	126	53.9	1.577	85.28
	1926	35	134	53.2	1.699	90.39
Roughers	1924	31	263	54.7	.810	44.61
	1926	35	259	53.2	.847	45.06
Catchers	1924	31	215	54.8	.818	45.12
	1926	35	208	53.3	.865	46.10
Stranders	1924	29	427	53.0	.700	36.92
	1926	33	389	51.8	.741	38.38
Finishers	1924	30	185	54.0	.749	40.35
	1926	33	159	53.0	.848	44.94
Hook-ups	1924	29	317	54.8	.601	33.30
	1926	29	207	54.8	.623	34.41
Roll hands, other	1924	24	304	53.2	.702	37.52
	1926	25	230	52.9	.683	36.13
Hot-bed men	1924	30	679	53.8	.538	28.97
	1926	33	532	53.0	.564	29.89
Shearmen	1924	28	181	53.4	.631	34.10
	1926	32	176	52.4	.616	32.28
Shearmens' helpers	1924	27	500	52.9	.524	27.92
	1926	31	601	52.3	.522	27.30
Bundlers	1924	11	184	45.9	.526	24.16
	1926	14	99	49.7	.552	27.43
Laborers	1924	30	936	57.5	.392	23.06
	1926	34	854	55.0	.411	22.61

Sheet mills

Pair heaters	1924	14	536	43.4	$1.027	$44.50
	1926	13	478	43.3	.925	40.05
Rollers	1924	14	478	43.4	2.148	93.35
	1926	14	492	43.3	1.956	84.69
Rollers, level handed	1924	7	114	42.9	1.345	57.69
	1926	4	27	43.3	1.162	50.31
Rollers' helpers or finishers	1924	11	437	43.0	.865	37.78
	1926	12	392	43.0	.787	33.84
Roughers	1924	14	533	43.4	1.150	49.94
	1926	14	510	43.3	1.037	44.90
Catchers	1924	14	570	43.4	1.099	47.70
	1926	14	527	43.3	.989	42.82
Matchers	1924	14	639	43.4	.932	40.42
	1926	10	400	43.5	.829	36.06
Doublers	1924	14	661	43.4	.909	39.42
	1926	10	422	43.5	.804	34.97
Sheet heaters	1924	14	470	43.4	1.559	67.68
	1926	14	478	43.3	1.404	60.79
Sheet heaters, level handed	1924	7	115	42.9	1.088	46.29
	1926	7	48	43.2	.978	42.25
Sheet heaters' helpers	1924	13	408	42.9	.894	38.51
	1926	13	422	42.9	.803	34.45
Shearmen	1924	10	159	43.7	1.289	56.26
	1926	12	198	43.6	1.222	53.28
Shearmen's helpers	1924	8	203	43.8	.736	32.11
	1926	12	207	43.6	.683	29.78
Openers	1924	9	284	43.5	.806	34.99
	1926	11	287	43.5	.741	32.23
Openers, level handed	1924	4	52	42.7	.629	26.86
	1926	5	96	44.0	.651	28.64
Picklers	1924	12	150	63.6	.555	35.48
	1926	11	127	56.9	.631	35.90
Feeders	1924	8	101	53.1	.578	30.72
	1926	8	93	45.3	.647	29.31
Laborers	1924	13	757	64.6	.420	27.15
	1926	14	493	56.6	.475	26.89

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TABLE 3.—AVERAGE CUSTOMARY HOURS AND EARNINGS IN THE IRON AND STEEL INDUSTRY, 1924 AND 1926, BY DEPARTMENT AND OCCUPATION—Continued

Plate mills

Occupation	Year	Number of plants	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings
Charging-crane and charging-machine operators	1924	13	87	57.1	$0.679	$37.79
	1926	16	88	56.4	.711	40.10
Heaters	1924	13	90	56.5	.961	52.52
	1926	17	85	55.5	1.103	61.22
Heaters' helpers	1924	12	126	61.6	.538	32.84
	1926	15	118	62.4	.580	36.19
Roll engineers	1924	12	46	63.3	.614	38.99
	1926	14	35	63.0	.651	41.01
Rollers, sheared-plate mills	1924	10	34	56.5	1.300	71.62
	1926	13	30	57.0	1.364	77.75
Screw men, sheared-plate mills	1924	8	33	54.7	1.052	56.78
	1926	10	26	55.0	1.088	59.84
Table operators, sheared-plate mills	1924	10	40	56.5	.730	39.48
	1926	12	32	56.1	.804	45.10
Hook men, sheared-plate mills	1924	10	105	56.0	.644	35.05
	1926	12	83	56.1	.693	38.88
Roll hands, other, sheared-plate mills	1924	10	61	58.4	.555	31.08
	1926	10	36	55.5	.725	40.24
Rollers, universal mills	1924	6	13	56.4	1.251	70.34
	1926	5	13	56.3	1.383	77.86
Screw men, main rolls, universal mills	1924	6	15	56.0	.841	48.45
	1926	6	17	57.1	.937	53.50
Screw men, side rolls, universal mills	1924	6	17	56.6	.642	37.31
	1926	6	18	57.5	.709	40.77
Roll hands, other, universal mills	1924	6	19	56.7	.555	32.27
	1926	5	20	58.2	.601	34.98
Shearman	1924	13	108	55.8	.793	43.15
	1926	17	101	56.3	.836	47.07
Shearmen's helpers	1924	13	767	55.5	.529	28.85
	1926	17	674	55.1	.579	31.90
Laborers	1924	11	640	56.8	.432	24.20
	1926	16	304	56.1	.425	23.84

Tin-plate mills

Rollers	1924	9	414	42.7	$2.099	$89.36
	1926	8	371	42.7	1.635	69.81
Rollers, level handed	1924	6	166	42.7	1.080	46.16
	1926	4	35	42.7	.952	40.65
Roughers	1924	9	465	42.7	1.150	49.11
	1926	8	383	42.7	.902	38.52
Catchers	1924	9	465	42.7	1.003	42.83
	1926	8	398	42.7	.806	34.42
Screw boys	1924	9	484	42.7	.840	36.15
	1926	8	412	42.7	.633	27.03
Doublers	1924	8	345	42.7	1.243	53.07
	1926	8	332	42.7	.787	33.60
Doublers, level handed	1924	7	303	42.7	1.133	48.38
	1926	5	116	42.7	.800	34.16
Doublers' helpers	1924	9	337	42.7	.855	36.45
	1926	8	324	42.7	.663	28.31
Heaters	1924	8	152	42.7	1.449	61.80
	1926	6	113	42.7	1.046	44.66
Heaters, level handed	1924	9	720	42.7	1.229	52.46
	1926	8	588	42.7	.917	39.16
Heaters' helpers	1924	8	252	42.7	.981	41.88
	1926	6	196	42.7	.772	32.96
Shearmen	1924	8	123	43.4	1.137	49.35
	1926	7	111	43.1	1.024	44.13
Shearmen's helpers	1924	2	26	45.5	.469	21.34
	1926	3	26	58.3	.510	29.73
Openers, male	1924	6	224	55.3	.721	39.87
	1926	6	239	51.8	.795	41.18
Tinners	1924	6	361	43.4	.976	42.39
	1926	5	225	43.5	.840	36.54
Redippers	1924	2	38	43.0	1.235	53.11
	1926	2	25	42.9	1.154	49.51
Risers	1924	2	39	42.9	.703	30.16
	1926	2	34	42.9	.638	27.37
Branners, male	1924	6	73	52.2	.536	26.36
	1926	5	64	52.2	.505	16.50
Assorters, female	1924	6	291	43.6	.422	18.40
	1926	4	250	43.4	.384	16.67
Laborers	1924	9	197	56.9	.439	24.99
	1926	8	188	60.3	.426	25.69

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TABLE 3.—AVERAGE CUSTOMARY HOURS AND EARNINGS IN THE IRON AND STEEL INDUSTRY, 1924 AND 1926, BY DEPARTMENT AND OCCUPATION—Continued

Standard rail mills

Occupation	Year	Number of plants	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings
Charging-machine operators	1924	3	23	54.8	$0.595	$32.61
	1926	2	20	54.8	.713	39.07
Reheaters	1924	3	10	59.0	.897	52.95
	1926	3	9	53.1	1.034	54.91
Reheaters' helpers	1924	2	8	54.8	.521	28.56
	1926	3	14	53.6	.627	33.61
Roll engineers	1924	6	24	57.0	.747	42.57
	1926	5	19	57.4	.757	43.45
Rollers	1924	5	12	55.8	1.783	99.49
	1926	5	11	54.2	1.888	102.33
Assistant rollers	1924	6	18	56.5	.982	55.49
	1926	6	14	55.3	1.015	56.13
Table lever men	1924	7	83	54.8	.750	41.09
	1926	7	66	53.5	.747	39.96
Table men	1924	4	30	59.6	.650	38.76
	1926	3	21	58.3	.687	40.05
Guide setters	1924	7	37	57.1	.810	46.27
	1926	7	31	56.9	.836	47.57
Hot-saw men	1924	7	27	55.7	.636	35.45
	1926	7	22	54.5	.696	37.93
Hot-saw helpers	1924	6	88	55.9	.511	28.54
	1926	6	56	56.6	.509	28.81
Hotbed lever men	1924	7	64	54.3	.595	32.28
	1926	7	51	54.1	.564	30.51
Hotbed men	1924	6	64	54.2	.467	25.33
	1926	6	78	54.1	.518	28.02
Straighteners	1924	7	158	53.7	1.142	61.33
	1926	7	138	53.0	1.233	65.35
Straighteners' helpers	1924	7	300	56.9	.556	31.65
	1926	7	214	53.7	.590	31.68
Chippers	1924	7	193	54.9	.689	37.82
	1926	7	145	55.3	.695	38.43
Drillers and punchers	1924	7	347	57.5	.595	34.21
	1926	7	233	55.4	.675	37.40
Cold-saw men	1924	7	24	55.5	.497	27.59
	1926	7	20	53.2	.540	28.73
Cold-saw helpers	1924	6	141	55.7	.443	24.69
	1026	6	122	54.6	.447	24.41
Inspectors	1924	7	95	57.9	.530	30.71
	1926	7	85	55.2	.591	32.62
Laborers	1924	7	404	63.6	.385	24.51
	1926	6	234	56.6	.421	23.83

Hours and Earnings in the Men's Clothing Industry, 1926

STUDIES of wages and hours of labor in factories making men's ready-made clothing have been made by the Bureau of Labor Statistics at various intervals since 1911. Such a study was made in 1926,[6] when data were gathered for 33,659 wage earners employed by 198 establishments operating 359 shops in the most important clothing centers. The wage earners covered formed 27 per cent of the wage earners in the industry in the localities visited. The 1926 data are as of midsummer.

"Establishment," as here used, includes one or more shops in a city or locality under one ownership. Some establishments do all the cutting but do not make the various garments, that work being done by coat, pants, or vest contractors; other establishments not only do all the cutting but also make one or all of the different articles of clothing, letting contracts for such garments as they do

[6] For complete report see Bul. No. 435.

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not manufacture in their own shops. A contractor's shop is regarded in this article as a separate establishment; each shop of a manufacturer is counted as a separate shop.

For a few very large establishments the data cover only a part of the total number of employees or shops of such establishments, as the inclusion of the total number of wage earners in these establishments would have tended to impair the representative character of the averages for the cities in which these establishments and shops are located.

Table 1 presents index numbers showing the relative change in full-time hours per week, earnings per week, and full-time weekly earnings, with 1913 taken as 100. The same data are shown graphically in the chart on page 760.

TABLE 1.—INDEX NUMBERS OF HOURS AND EARNINGS IN THE MEN'S CLOTHING INDUSTRY FOR SPECIFIED YEARS, 1911 TO 1926

[1913=100]

Year	Index numbers of—		
	Full-time hours per week	Earnings per hour	Full-time earnings per week
1911	104.6	86.7	90.2
1912	105.2	87.5	91.6
1913	100.0	100.0	100.0
1914	99.2	99.6	98.8
1919	92.6	173.5	159.5
1922	85.3	283.2	241.4
1924	85.3	295.7	253.6
1926	85.7	291.8	251.4

From 1911 to 1926 there was a drop of 18 per cent in the full-time hours in this industry. Except for a slight recession in 1914, earnings per hour increased each year from 1911 to 1924. There was a slight falling off in 1926, yet hourly earnings even in that year were nearly three times as much as in 1913 and more than 3⅓ times as great as in 1911. Because of reduced hours, full-time weekly earnings did not advance so much as hourly earnings. However, in 1926 weekly earnings were 2½ times those of 1913.

Table 2 shows both 1924 and 1926 averages for each occupation and for the industry.

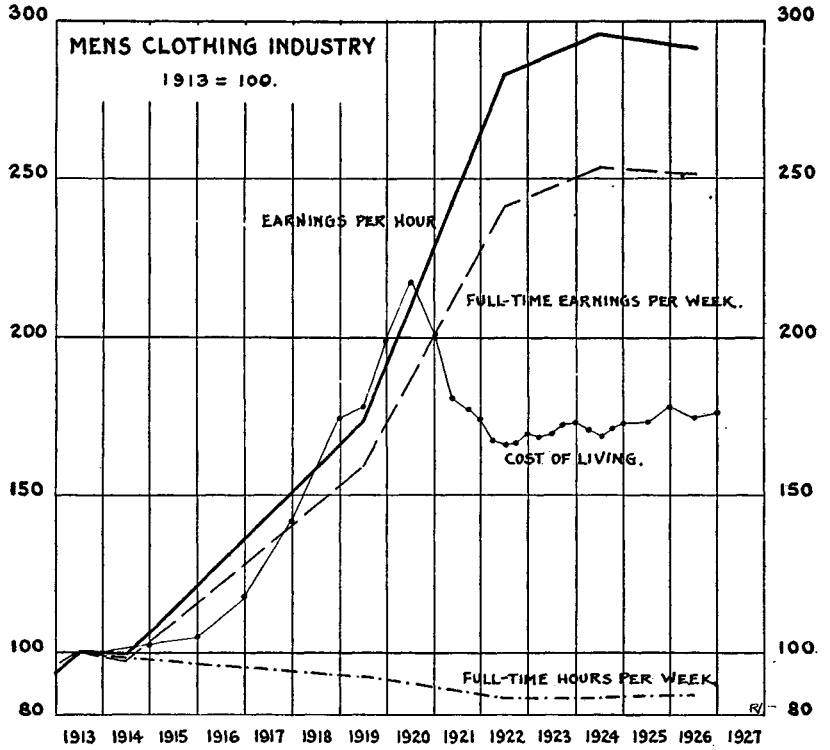
Average earnings per hour of males in all occupations combined increased from 93.1 cents per hour in 1924 to 93.7 cents per hour in 1926, and those of females from 54.4 to 54.8 cents. Paradoxically, however, the average earnings for the industry as a whole, both sexes combined, decreased in the same time from 76 to 75 cents per hour. This decrease for the industry was due to a larger percentage of females being included in the 1926 study than in that of 1924.

The average full-time earnings per week of males in all occupations increased from $41.15 in 1924 to $41.51 in 1926, those of females increased from $23.94 to $24.28, and those of males and females combined decreased from $33.52 to $33.23. Average full-time hours per week for the industry increased from 44.1 in 1924 to 44.3 in 1926.

In 1924 the highest occupational average earnings per hour for males were $1.111 for cloth cutters, and the lowest (other employees

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excepted) 85.6 cents for hand sewers on coats. In 1926 the highest average earnings per hour for males were those of cloth cutters, $1.123, and the lowest (other employees excepted), 85.1 cents, for examiners in the shop and stock room. The earnings of females in



1924 (other employees excepted) ranged from 44.7 cents per hour for hand sewers on pants, to 63.8 cents for basters on vests, and in 1926 ranged from 41 cents per hour for coat fitters and trimmers to 63.8 cents for operators working on coats.

TABLE 2.—AVERAGE HOURS AND EARNINGS IN THE MEN'S CLOTHING INDUSTRY, 1924 AND 1926, BY OCCUPATION AND SEX

Occupation	Sex	Year	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings
Basters, coat	Male	1924	60	1,541	44.4	$0.889	$39.47
	do	1926	78	1,710	44.3	.925	40.98
	Female	1924	53	1,168	43.2	.592	25.57
	do	1926	74	1,436	43.8	.580	25.40
Basters, pants	do	1924	29	103	44.0	.550	24.20
	do	1926	31	103	44.3	.469	20.78
Basters, vest	do	1924	54	299	43.9	.638	28.01
	do	1926	61	304	44.5	.612	27.23
All basters	do	1924	101	1,570	43.4	.597	25.91
	do	1926	125	1,843	44.0	.578	25.43

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TABLE 2.—AVERAGE HOURS AND EARNINGS IN THE MEN'S CLOTHING INDUSTRY, 1924 AND 1926, BY OCCUPATION AND SEX—Continued

Occupation	Sex	Year	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings
Bushelers and tailors	Male	1924	77	586	44.1	$0.879	$38.76
	do	1926	104	553	44.3	.856	37.92
Cutters, cloth	do	1924	57	1,984	44.2	1.111	49.11
	do	1926	82	1,880	44.2	1.123	49.64
Examiners, shop and stock room	do	1924	82	494	44.2	.874	38.63
	do	1926	103	681	44.3	.851	37.70
	Female	1924	27	165	43.9	.506	22.21
	do	1926	35	205	44.4	.497	22.07
Fitters and trimmers, coat	Male	1924	52	146	44.3	1.096	48.55
	do	1926	80	228	44.4	1.069	47.46
	Female	1926	13	38	44.5	.410	18.25
Hand sewers, coat	Male	1924	24	140	44.0	.856	37.66
	do	1926	24	211	44.3	.888	39.34
	Female	1924	67	2,968	44.1	.555	24.48
	do	1926	100	3,973	44.4	.545	24.20
Hand sewers, pants	do	1924	71	581	44.3	.447	19.80
	do	1926	82	858	44.2	.451	19.93
Hand sewers, vest	do	1924	59	734	44.0	.569	25.04
	do	1926	68	842	44.1	.578	25.49
All hand sewers	do	1924	142	4,283	44.1	.543	23.95
	do	1926	185	5,673	44.3	.536	23.74
Operators, coat	Male	1924	61	1,911	44.1	1.033	45.56
	do	1926	92	2,363	44.1	1.034	45.60
	Female	1924	50	2,126	43.6	.614	26.77
	do	1926	77	2,599	44.4	.638	28.33
Operators, pants	Male	1924	69	1,262	44.2	.965	42.65
	do	1926	75	1,533	44.3	.961	42.57
	Female	1924	62	1,603	44.7	.556	24.85
	do	1926	80	2,317	44.7	.576	25.75
Operators, vest	Male	1924	48	438	44.1	1.034	45.60
	do	1926	55	511	44.1	1.062	46.83
	Female	1924	46	738	43.8	.600	26.28
	do	1926	58	940	44.5	.630	28.04
All operators	Male	1924	134	3,611	44.1	1.010	44.54
	do	1926	175	4,407	44.2	1.012	44.73
	Female	1924	113	4,467	44.0	.591	26.00
	do	1926	149	5,856	44.6	.612	27.30
Pressers, coat	Male	1924	66	2,673	44.2	.934	41.28
	do	1926	100	3,296	44.3	.933	41.33
	Female	1926	6	174	44.8	.470	21.06
Presser, pants	Male	1924	79	728	44.4	.890	39.52
	do	1926	92	872	44.6	.904	40.32
	Female	1926	4	69	44.0	.529	23.28
Pressers, vest	Male	1924	61	373	44.1	.971	42.82
	do	1926	72	453	44.4	.941	41.78
	Female	1924	12	50	44.4	.507	22.51
	do	1926	13	61	44.5	.532	23.67
All pressers	Male	1924	149	3,774	44.2	.930	41.11
	do	1926	193	4,621	44.4	.928	41.20
	Female	1926	18	304	44.6	.495	22.08
Shapers, coat	Male	1924	61	233	44.1	1.033	45.56
	do	1926	92	258	44.2	1.041	46.01
	Female	1926	6	20	45.2	.473	21.36
Other employees	Male	1924	122	2,370	44.4	.699	31.04
	do	1926	158	2,499	44.4	.716	31.79
	Female	1924	96	2,267	44.0	.424	18.66
	do	1926	148	2,672	44.0	.429	18.88
All occupations	Male	1924	152	14,879	44.2	.931	41.15
	do	1926	198	17,048	44.3	.937	41.51
	Female	1924	149	12,802	44.0	.544	23.94
	do	1926	196	16,611	44.3	.548	24.28
All occupations, male and female.		1924	152	27,681	44.1	.760	33.52
		1926	198	33,659	44.3	.750	33.23

Average hours and earnings are shown in Table 3 for each city for certain of the most important occupations for which data are presented in Table 2. These occupations cover 71 per cent of the males and 68 per cent of the females included in the 1926 study.

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TABLE 3.—AVERAGE HOURS AND EARNINGS FOR NINE SELECTED OCCUPATIONS IN THE MEN'S CLOTHING INDUSTRY, BY SEX AND CITY, 1926

City	Basters, coat, male					Basters, coat, female				
	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings
Baltimore	2	77	44.0	$0.889	$39.12	4	160	44.4	$0.468	$20.78
Boston	7	108	44.0	.827	36.39	7	58	44.0	.475	20.90
Buffalo	(1)	(1)	(1)	(1)	(1)	4	72	44.0	.539	23.72
Chicago	4	397	44.0	1.017	44.75	4	261	44.0	.828	36.43
Cincinnati	4	11	43.3	.745	32.26	5	192	38.4	.536	20.58
Cleveland	(1)	(1)	(1)	(1)	(1)	3	154	45.6	.594	27.09
New York	44	890	44.4	.918	40.76	27	97	44.9	.629	28.24
Philadelphia	5	99	44.0	.849	37.36	5	73	44.0	.520	22.88
Eastern Pennsylvania [2]	5	8	50.4	.725	36.54	6	75	50.1	.358	17.94
Rochester	3	85	44.0	.962	42.33	4	266	44.0	.580	25.52
St. Louis	2	4	44.0	.541	23.80	5	28	44.2	.395	17.46
Buffalo and Cleveland	2	31	48.1	.856	41.17					
Total	78	1,710	44.3	.925	40.98	74	1,436	43.8	.580	25.40
	Cutters, cloth, male					Hand sewers, coat, female				
Baltimore	4	143	44.1	$1.034	$45.60	4	414	44.2	$0.405	$17.90
Boston	8	97	44.5	1.009	44.90	7	265	44.0	.495	21.78
Buffalo	4	49	44.0	1.047	46.07	4	111	44.0	.496	21.82
Chicago	4	488	44.0	1.101	48.44	4	931	44.0	.695	30.58
Cincinnati	5	121	42.2	1.163	49.08	5	140	42.2	.500	21.10
Cleveland	3	82	46.3	1.039	48.11	3	209	46.8	.547	25.60
New York	30	473	44.3	1.242	55.02	47	1,083	44.7	.544	24.32
Philadelphia	4	84	44.0	1.166	51.30	5	154	44.0	.443	19.49
Eastern Pennsylvania [2]	5	23	53.1	.641	34.04	6	69	50.1	.292	14.63
Rochester	4	237	44.0	1.119	49.24	4	426	44.0	.604	26.58
St. Louis	11	83	44.1	1.053	46.44	11	171	44.1	.388	17.11
Total	82	1,880	44.2	1.123	49.64	100	3,973	44.4	.545	24.20
	Operators, coat, male					Operators, coat, female				
Baltimore	2	136	44.0	$0.887	$39.03	4	363	44.4	$0.461	$20.47
Boston	7	132	44.0	1.037	45.63	7	71	44.0	.570	25.08
Buffalo	4	14	44.0	.957	42.11	4	86	44.0	.665	29.26
Chicago	4	404	44.0	1.181	51.96	4	563	44.0	.941	41.40
Cincinnati	4	63	41.4	.914	37.84	5	256	40.0	.632	25.28
Cleveland	(1)	(1)	(1)	(1)	(1)	3	411	46.3	.614	28.43
New York	47	1,357	44.3	1.035	45.85	24	119	45.2	.644	29.11
Philadelphia	5	127	44.0	.952	41.89	5	97	44.0	.588	25.87
Eastern Pennsylvania [2]	5	13	51.5	.637	32.81	6	148	50.2	.377	18.93
Rochester	4	65	44.0	1.102	48.49	4	277	44.0	.682	30.01
St. Louis	(1)	(1)	(1)	(1)	(1)	11	208	44.2	.449	19.85
Cleveland and St. Louis	10	52	44.2	.721	31.87					
Total	92	2,363	44.1	1.034	45.60	77	2,599	44.4	.638	28.33
	Operators, pants, male					Operators, pants, female				
Baltimore	3	113	44.0	$0.882	$38.81	4	201	44.0	$0.444	$19.54
Boston	9	56	44.1	.872	38.46	8	66	44.2	.518	22.90
Buffalo	(1)	(1)	(1)	(1)	(1)	4	88	44.0	.479	21.08
Chicago	4	230	44.0	1.047	46.07	4	482	44.0	.851	37.44
Cincinnati	3	17	41.4	.941	38.96	6	203	40.9	.558	22.82
Cleveland						3	334	45.4	.546	24.79
New York	34	934	44.2	.984	43.49	23	133	44.5	.659	29.33
Philadelphia	12	142	45.7	.854	39.03	11	106	44.2	.519	22.94
Eastern Pennsylvania [2]	3	10	49.3	.459	22.63	6	292	49.3	.403	19.87
Rochester	(1)	(1)	(1)	(1)	(1)	4	305	44.7	.626	27.98
St. Louis	3	22	44.0	.795	34.98	7	107	44.1	.413	18.21
Buffalo and Rochester	4	9	44.0	.843	37.09					
Total	75	1,533	44.3	.961	42.57	80	2,317	44.7	.576	25.75

[1] Data which were obtained for but one establishment were combined with data for one or more other cities, to avoid publishing data for a single establishment.
[2] Exclusive of Philadelphia.

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TABLE 3.—AVERAGE HOURS AND EARNINGS FOR NINE SELECTED OCCUPATIONS IN THE MEN'S CLOTHING INDUSTRY, BY SEX AND CITY, 1926—Continued

City	Operators, vest, female					Pressers, coat, male				
	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings
Baltimore	4	91	44.0	$0.399	$17.56	3	178	44.0	$0.919	$40.44
Boston	5	14	44.0	.605	26.62	7	158	44.0	.888	39.07
Buffalo	4	33	44.0	.527	23.19	4	67	44.0	.776	34.14
Chicago	4	210	44.0	.811	35.68	4	779	44.0	1.013	44.57
Cincinnati	4	77	39.2	.558	21.87	5	118	42.4	.817	34.64
Cleveland	3	104	46.5	.724	33.67	3	119	47.1	.955	44.98
New York	15	51	44.0	.737	32.43	48	1,152	44.4	.991	44.00
Philadelphia	8	68	46.1	.517	23.83	5	209	44.0	.811	35.68
Eastern Pennsylvania [1]	3	54	48.8	.381	18.59	6	66	50.8	.560	28.45
Rochester	4	202	44.7	.674	30.13	4	364	44.0	.888	39.07
St. Louis	4	36	44.2	.411	18.17	11	86	44.2	.621	27.45
Total	58	940	44.5	.630	28.04	100	3,296	44.3	.933	41.33
	Pressers, pants, male					Pressers, vest, male				
Baltimore	3	46	44.0	$0.834	$36.70	3	21	44.0	$0.776	$34.14
Boston	9	36	44.1	.876	38.63	8	17	43.8	.900	39.42
Buffalo	4	20	44.0	.716	31.50	4	14	44.0	.629	27.68
Chicago	4	176	44.0	1.124	49.46	4	99	44.0	1.074	47.26
Cincinnati	6	55	42.5	.760	32.30	4	18	42.2	.704	29.71
Cleveland	3	44	46.3	.803	37.18	3	22	46.0	1.037	47.70
New York	34	290	44.2	.951	42.03	26	140	44.0	1.095	48.18
Philadelphia	12	54	45.4	.856	38.86	9	34	45.6	.719	32.79
Eastern Pennsylvania [1]	6	52	49.2	.550	27.06	3	18	48.5	.523	25.37
Rochester	4	74	44.6	.946	42.19	4	64	44.8	.889	39.83
St. Louis	7	25	44.2	.655	28.95	4	6	44.5	.555	24.70
Total	92	872	44.6	.904	40.32	72	453	44.4	.941	41.78

[1] Exclusive of Philadelphia.

Wages and Hours of Motor-Bus Operators, 1926

THE use of the motor bus in urban and interurban transportation has increased with remarkable rapidity in recent years. No official census of the industry has been made, but data compiled by the National Automobile Chamber of Commerce and published under the title of "Facts and Figures of the Automobile Industry, 1926 Edition," indicate roughly the present importance of motor-bus transportation. According to this source there were, in January, 1926, a total of 69,425 motor buses in operation in the United States, of which 37,500 were operating as common carriers and covering a total route mileage approximately as great as the steam-railroad mileage of the country.

The development of this new industry has had an important influence upon the existing transportation agencies, and, in addition, it has created an extensive field of employment for labor. The total number of motor-bus operators in the United States is not known, but as there are approximately 70,000 buses in operation, many of

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which carry a conductor as well as a driver and many that operate more than one shift per day, it is evident that the total number of bus operators is now very large.

In order to throw some light on the working conditions of this large and growing number of bus operators, the Bureau of Labor Statistics in 1926 has made a preliminary survey of the wages and hours of labor of employees in the cities of Chicago and New York. The results are shown in detail in the accompanying table. The data collected cover 1,557 employees in Chicago and 1,580 in New York. In both cities the services represented were partly urban and partly interurban.

As indicated in the table, both wage rates and working hours are extremely variable. In Chicago the hourly rates varied from 42.9 to 87.5 cents and the full-time weekly rates from $25 to $52.50. The regular hours of work ranged from an 8-hour day and a 6-day week to an 11⅔-hour day and a 7-day week. In New York the variations in wages and hours were similarly wide.

WAGE RATES AND HOURS OF WORK OF AUTO-BUS OPERATORS, MAY, 1926

City, company, and occupation	Rate of wages					Hours: Full day; Saturday; full week
	Per hour	Per week, full time	For overtime	For Sundays	For holidays	
Chicago			*Regular rate multiplied by—*			
Company No. 1:						
Drivers, first 3 months	$0.550	$36.58	1	1	1	[1] 9½–9½–66½
Drivers, second 3 months	.600	39.90	1	1	1	[1] 9½–9½–66½
Drivers, third 3 months	.650	43.23	1	1	1	[1] 9½–9½–66½
Drivers, tenth to fifteenth month	.700	46.55	1	1	1	[1] 9½–9½–66½
Drivers, sixteenth to twenty-first month	.750	49.88	1	1	1	[1] 9½–9½–66½
Conductors	.700	46.55	1	1	1	[1] 9½–9½–66½
Company No. 2:						
Drivers	.625	[2] 35.00	([3])	1	1	[1] 8 – 8 –56
Conductors and lecturers	.446	[2] 25.00	([4])	1	1	[1] 8 – 8 –56
Company No. 3:						
Drivers, first 6 months	.670	46.90	1½	1	1	[5] 10 –10 –70
Drivers, second 6 months	.680	47.60	1½	1	1	[5] 10 –10 –70
Drivers, second year	.690	48.30	1½	1	1	[5] 10 –10 –70
Drivers, third year	.710	49.70	1½	1	1	[5] 10 –10 –70
Drivers, fourth year	.730	51.10	1½	1	1	[5] 10 –10 –70
Drivers, after fourth year	.750	52.50	1½	1	1	[5] 10 –10 –70
Conductors, first 6 months	.600	42.00	1½	1	1	[5] 10 –10 –70
Conductors, second 6 months	.610	42.70	1½	1	1	[5] 10 –10 –70
Conductors, second year	.620	43.40	1½	1	1	[5] 10 –10 –70
Conductors, third year	.640	44.80	1½	1	1	[5] 10 –10 –70
Conductors, fourth year	.660	46.20	1½	1	1	[5] 10 –10 –70
Conductors, after fourth year	.680	47.60	1½	1	1	[5] 10 –10 –70
Company No. 4:						
Drivers, first 6 months	.545	36.00	1½	1½	1½	11 –11 –66
Drivers, after 6 months	.568	37.50	1½	1½	1½	11 –11 –66
Company No. 5:						
Drivers [6]	.526	30.00	1	1	1	9½–9½–57
Drivers [6]	.561	32.00	1	1	1	9½–9½–57
Drivers [6]	.614	35.00	1	1	1	9½–9½–57
Company No. 6:						
Drivers	.500	35.00	1	1	1	10 –10 –70
Conductors, long-distance tours	.500	35.00	1	1	1	10 –10 –70
Conductors, sight-seeing coaches	.429	30.00	1	1	1	10 –10 –70
Company No. 7: Drivers	.610	38.43	[7] 1½	1	1	9 – 9 –63
Company No. 8: Drivers	.479	31.15	65¢	[8] 1	1	[5] 10 –10 –65

[1] Estimated average.
[2] And tips.
[3] $2.50 each extra trip.
[4] $1 each extra trip.
[5] Maximum, after which overtime rate is paid.
[6] Rated according to ability, regardless of length of service.
[7] Overtime for extra drivers 61 cents per hour.
[8] Every other Sunday off with pay.

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WAGE RATES AND HOURS OF WORK OF AUTO-BUS OPERATORS, MAY, 1926—Con.

City, company, and occupation	Rate of wages					Hours: Full day; Saturday; full week
	Per hour	Per week, full time	For overtime	For Sundays	For holidays	
Chicago—Continued			*Regular rate multiplied by—*			
Company No. 9:						
Drivers	[9]	[10] $35.00				[9]
Conductors and lecturers	[9]	[10] 25.00				[9]
Company No. 10: Drivers	[11] $0.875	[11] 42.00	1	1	1	8 – 8 –48
Company No. 11: Drivers	.500	35.00	1	1	1	[12] 11¾–11¾–70
Company No. 12: Drivers	.658	37.50	90¢	1	1	9½– 9½–57
Company No. 13: Drivers	.778	42.00	1	1	1	9 – 9 –54
Company No. 14: Drivers	.615	30.00	[13] 80¢			9¾– 0 –48¾
New York City						
Company No. 1:						
Drivers, first 2 months	[14] .455	35.00				[15] 11 –11 –77
Drivers, first 2 months	[15] .588	35.00				[14] 8½–8½–59½
Drivers, after 2 months	[14] .519	40.00				[15] 11 –11 –77
Drivers, after 2 months	[15] .672	40.00				[14] 8½– 8½–59½
Company No. 2: Drivers	.765	39.00	1½	1	1	8½– 8½–51½
Company No. 3: Drivers	[16]	50.00	1	1	1	[16]
Company No. 4:						
Drivers, first year	.690	[14] 38.64	[17] 1½	1	1	[14] 8 – 8 –56
Drivers, first year	.690	[15] 48.30	[17] 1½	1	1	[15] 10 –10 –70
Drivers, second year	.700	[14] 39.20	[17] 1½	1	1	[14] 8 – 8 –56
Drivers, second year	.700	[15] 49.00	[17] 1½	1	1	[15] 10 –10 –70
Drivers, third year	.730	[14] 40.88	[17] 1½	1	1	[14] 8 – 8 –56
Drivers, third year	.730	[15] 51.10	[17] 1½	1	1	[15] 10 –10 –70
Drivers, fourth year	.740	[14] 41.44	[17] 1½	1	1	[14] 8 – 8 –56
Drivers, fourth year	.740	[15] 51.80	[17] 1½	1	1	[15] 10 –10 –70
Drivers, after 4 years	.750	[14] 42.00	[17] 1½	1	1	[14] 8 – 8 –56
Drivers, after 4 years	.750	[15] 52.50	[17] 1½	1	1	[15] 10 –10 –70
Conductors, first year	.620	[14] 34.72	[17] 1½	1	1	[14] 8 – 8 –56
Conductors, first year	.620	[15] 43.40	[17] 1½	1	1	[15] 10 –10 –70
Conductors, second year	.630	[14] 35.28	[17] 1½	1	1	[14] 8 – 8 –56
Conductors, second year	.630	[15] 44.10	[17] 1½	1	1	[15] 10 –10 –70
Conductors, third year	.660	[14] 36.96	[17] 1½	1	1	[14] 8 – 8 –56
Conductors, third year	.660	[15] 46.20	[17] 1½	1	1	[15] 10 –10 –70
Conductors, fourth year	.670	[14] 37.52	[17] 1½	1	1	[14] 8 – 8 –56
Conductors, fourth year	.670	[15] 46.90	[17] 1½	1	1	[15] 10 –10 –70
Conductors, after 4 years	.680	[14] 38.08	[17] 1½	1	1	[14] 8 – 8 –56
Conductors, after 4 years	.680	[15] 47.60	[17] 1½	1	1	[15] 10 –10 –70
Company No. 5: Drivers	[18] .556	[18] 35.00	[19]	1	1	[20] 9 – 9 –58½
Company No. 6: Drivers	.595	[21] 50.00				12 –12 –84
Company No. 7:						
Drivers, first 3 months	[15] .833	35.00				[14] 6 – 6 –42
Drivers, first 3 months	[14] .556	35.00				[15] 9 – 9 –63
Drivers, after 3 months	[15] .952	40.00				[14] 6 – 6 –42
Drivers, after 3 months	[14] .635	40.00				[15] 9 – 9 –63
Company No. 8:						
Drivers, first 6 months	.556	35.00	1	1	1	[22] 9 – 9 –63
Drivers, second 6 months	.611	38.50	1	1	1	[22] 9 – 9 –63
Drivers, third 6 months	.667	42.00	1	1	1	[22] 9 – 9 –63
Drivers, fourth 6 months	.694	43.75	1	1	1	[22] 9 – 9 –63
Drivers, fifth 6 months	.722	45.50	1	1	1	[22] 9 – 9 –63
Drivers, sixth 6 months	.750	47.25	1	1	1	[22] 9 – 9 –63
Drivers, after 3 years	.778	49.00	1	1	1	[22] 9 – 9 –63
Drivers, interstate	.643	[23] 45.00	1	1	1	[23] 10 –10 –70
Company No. 9:						
Drivers [6]	.614	[24] 35.00	[25]	1	1	9½– 9½–57
Drivers [6]	.658	[24] 37.50	[25]	1	1	9½– 9½–57
Drivers [6]	.702	[24] 40.00	[25]	1	1	9½– 9½–57
Company No. 10:						
Drivers	.670	[14] 36.18	1	1	1	[14] 9 – 9 –54
Drivers	.670	[15] 40.20	1	1	1	[15] 10 –10 –60

[6] Rated according to ability, regardless of length of service.
[9] No hourly rate; hours vary from 3 to 15 per day.
[10] Minimum rate; majority are paid higher salary and all receive tips.
[11] Changed June 1, 1926, to $7.50 per day of 8 hours.
[12] Every seventh and eighth day off with pay.
[13] For time on other than school bus.
[14] Minimum.
[15] Maximum.
[16] Indefinite (interurban route).
[17] After completion of regular runs.
[18] $40 per week, June 21 to Labor Day.
[19] Varies $1 to $7 per trip.
[20] One day off every two weeks.
[21] And bonus.
[22] One Sunday off per month.
[23] One day off every 15 days.
[24] And $10 per week bonus June to October, inclusive.
[25] $3 per trip.

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Earnings and Hours in the Motor-Vehicle Industry, 1925

THE Bureau of Labor Statistics made a study of wages and hours of labor in the motor-vehicle industry (including passenger automobiles and trucks) in 1922 and again in 1925.[7]

Many companies make nearly all of the several parts of a vehicle, and also assemble the vehicle as a whole. Other companies buy many parts and are engaged mainly in assembling the vehicle and placing it on the market. In the bureau's studies the attempt has been to cover the manufacture of the entire machine, and data were therefore obtained not only from factories turning out finished machines but also from those making bodies, motors, sheet-metal stampings, radiators, forgings, transmissions, gears, and axles.

The data are for one representative pay period in the year. The 1925 figures are as of the late fall and winter and were obtained from 99 establishments. The study covers practically all of the employees engaged in the manufacturing process in each of the several plants, beginning with the employees who receive the raw material and ending with those who load the finished product. Executives, powerhouse employees, office clerks, persons engaged in drafting or experimental work, and building-construction employees are not included.

For a few large plants only a representative part of the total number of employees was taken, as the inclusion of the total number of wage earners therein would have tended to impair the representative character of the averages for the States in which the plants are located.

Table 1 below shows, for each occupation and for the industry, average full-time hours per week, average earnings per hour, and average full-time weekly earnings in 1922 and 1925. The employment of women is so common in the industry that their wages are shown separately in many occupations.

The average earnings of males in all occupations combined increased from 66.2 cents per hour in 1922 to 72.9 cents per hour in 1925, those of females from 43.8 to 46.7 cents, and the average for the industry as a whole from 65.7 to 72.3 cents, an increase of 10 per cent. It is also seen that the average full-time earnings per week of males in all occupations increased from $33.19 in 1922 to $36.67 in 1925, those of females from $22.05 to $23.40, and those of males and females combined from $32.92 to $36.37.

The average full-time hours per week for the industry increased from 50.1 in 1922 to 50.3 per week in 1925.

In 1922 the highest average earnings per hour for males were 93.1 cents for "letterers, stripers, and varnishers," and the lowest, "apprentices" excepted, 49.5 cents for "laborers." In 1925 "dingmen" made the highest average earnings per hour ($1.037), and "laborers" earned the lowest average per hour (57 cents). The earnings of females in 1922 ranged from 35.2 cents for "inspectors" to 68 cents per hour for "other skilled occupations," and in 1925 ranged from 36.1 cents per hour for "inspectors" to 69.6 cents for "lathe operators."

[7] For complete report see Bul. No. 438.

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TABLE 1.—AVERAGE HOURS AND EARNINGS IN THE MOTOR-VEHICLE INDUSTRY, BY OCCUPATION AND SEX, 1922 AND 1925

Occupation	Sex	Year	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings
Apprentices	Male	1922	19	300	52.5	$0.385	$20.21
	do	1925	45	544	50.0	.512	25.60
Assemblers, axle	do	1922	30	763	49.8	.675	33.62
	do	1925	45	1,922	50.3	.729	36.67
	Female	1925	2	24	50.0	.496	24.80
Assemblers, body frame [1]	Male	1925	49	3,091	50.8	.739	37.54
Assemblers, chassis	do	1922	41	1,357	50.2	.647	32.48
	do	1925	54	2,902	49.9	.694	34.63
	Female	1925	3	34	50.0	.520	26.00
Assemblers, final	Male	1922	46	3,108	50.3	.672	33.82
	do	1925	74	7,400	50.1	.731	36.62
	Female	1922	7	170	49.1	.621	30.52
	do	1925	18	318	49.8	.507	25.25
Assemblers, frame	Male	1922	29	364	49.0	.673	33.01
	do	1925	47	1,115	50.0	.753	37.65
Assemblers, motor	do	1922	41	2,147	50.0	.661	33.03
	do	1925	61	4,851	49.8	.747	37.20
	Female	1922	2	2	52.5	.485	25.47
	do	1925	6	48	50.0	.489	24.45
Automatic operators (lathe and screw-machine)	Male	1922	34	1,673	50.2	.688	34.56
	do	1925	65	2,622	49.7	.764	37.97
	Female	1925	4	6	49.7	.493	24.50
Bench hands, machine shop	Male	1922	35	2,176	50.0	.670	33.47
	do	1925	70	2,439	50.2	.716	35.94
	Female	1922	4	14	49.6	.546	27.10
	do	1925	8	35	49.3	.568	28.00
Blacksmiths	Male	1922	34	388	50.0	.810	40.54
	do	1925	80	1,040	49.6	.957	47.47
Body builders	do	1922	26	1,604	50.7	.718	36.41
Boring-mill operators	do	1922	30	392	50.2	.701	35.22
	do	1925	53	828	50.6	.765	38.71
Bumpers [2]	do	1925	35	323	49.8	.945	47.06
Crane operators [3]	do	1925	29	145	49.7	.726	36.08
Cutters, cloth and leather [4]	do	1925	44	219	50.5	.803	40.55
	Female	1925	5	18	51.8	.517	26.78
Die setters (sheet metal) [5]	Male	1925	19	274	49.9	.797	39.77
Dingmen [2]	do	1925	32	209	50.6	1.037	52.47
Door hangers [1]	do	1925	32	659	51.2	.827	42.34
Drill-press operators	Male	1922	42	3,443	49.6	.644	31.96
	do	1925	84	8,688	50.3	.712	35.81
	Female	1922	5	44	51.4	.447	22.99
	do	1925	17	99	49.8	.573	28.54
Forge-shop helpers	Male	1922	34	656	49.6	.698	34.62
	do	1925	55	1,661	51.0	.753	38.40
Gear-cutter operators	do	1922	30	497	50.2	.678	34.07
	do	1925	48	1,331	50.6	.746	37.75
Grinding-machine operators	do	1922	38	2,574	50.0	.710	35.47
	do	1925	69	5,422	50.1	.765	38.33
	Female	1922	2	3	52.9	.572	30.28
	do	1925	3	9	49.9	.471	23.50
Hardeners	Male	1922	29	667	51.7	.676	34.97
	do	1925	54	945	53.7	.725	38.93
Helpers	do	1922	43	1,042	50.8	.531	26.95
	do	1925	81	3,019	50.9	.603	30.69
	Female	1925	2	25	50.0	.491	24.55
Inspectors	Male	1922	44	2,808	50.1	.608	30.45
	do	1925	93	7,676	50.1	.682	34.17
	Female	1922	7	197	51.2	.352	18.03
	do	1925	24	437	49.6	.361	17.91
Laborers	Male	1922	47	5,982	50.2	.495	24.86
	do	1925	97	16,592	50.4	.570	28.73
	Female	1922	5	46	50.5	.385	19.46
	do	1925	13	105	50.2	.403	20.23
Lacquer rubbers [5]	Male	1925	38	709	50.2	.871	43.72
Lathe operators	do	1922	41	2,950	49.5	.689	34.13
	do	1925	72	6,260	50.0	.762	38.10
	Female	1922	3	12	52.0	.463	24.07
	do	1925	5	41	49.8	.696	34.66

[1] Included in body builders in 1922.
[2] Included in sheet-metal workers, skilled, in 1922.
[3] Included in other skilled occupations or in other employees in 1922.
[4] Included in trim bench hands in 1922.
[5] Not found in 1922; process developed since.

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TABLE 1.—AVERAGE HOURS AND EARNINGS IN THE MOTOR-VEHICLE INDUSTRY, BY OCCUPATION AND SEX, 1922 AND 1925—Continued

Occupation	Sex	Year	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings
Letterers, stripers, and varnishers	Male	1922	37	762	50.8	$0.931	$47.26
	do	1925	56	990	50.1	.996	49.90
Machinists	do	1922	41	1,291	50.0	.715	35.78
	do	1925	73	3,604	50.0	.806	40.30
Metal finishers [1]	do	1925	36	3,397	50.6	.851	43.06
Metal panelers [1]	do	1925	32	1,655	51.5	.770	39.66
Milling-machine operators	do	1922	39	1,591	50.0	.659	32.94
	do	1925	74	3,549	50.4	.737	37.14
	Female	1922	3	14	50.7	.394	19.98
	do	1925	4	20	48.7	.469	22.84
Molders (belt and drip) [1]	Male	1925	19	266	51.0	.823	41.97
Painters, general	do	1922	47	2,114	50.7	.733	37.17
	do	1925	77	1,934	50.6	.776	39.27
	Female	1925	5	16	47.8	.519	24.81
Paint sprayers	Male	1922	34	177	50.6	.723	36.56
	do	1925	69	993	50.0	.850	42.50
Planer and shaper operators	do	1922	21	165	49.3	.738	36.40
	do	1925	32	308	49.7	.786	39.06
Platers [3]	do	1925	27	181	50.1	.734	36.77
Polishers and buffers	do	1922	28	564	50.4	.756	38.08
	do	1925	35	1,095	50.4	.908	45.76
Punch-press operators	do	1922	27	1,096	49.4	.715	35.31
	do	1925	61	4,416	49.6	.718	35.61
	Female	1925	6	103	50.0	.457	22.85
Sandblasters, etc	Male	1922	32	480	50.6	.618	31.29
	do	1925	51	954	50.8	.680	34.54
Sanders and rough-stuff rubbers [6]	do	1925	44	1,937	50.5	.843	42.57
Sewing-machine operators	do	1922	11	101	49.0	.748	36.65
	do	1925	14	378	48.4	.718	34.75
	Female	1922	27	505	50.5	.442	22.32
	do	1925	48	1,113	50.7	.472	23.93
Sheet-metal workers, skilled	Male	1922	32	779	50.7	.780	39.53
Sheet-metal workers	do	1922	35	1,304	50.2	.656	32.92
	do	1925	60	3,111	50.3	.783	39.38
	Female	1925	3	39	49.5	.490	24.26
Straighteners [3]	Male	1925	42	628	50.9	.753	38.33
Testers, final and road	do	1922	41	666	50.5	.610	30.80
	do	1925	45	741	50.8	.639	32.46
Testers, motor	Male	1922	38	489	51.2	.633	32.43
	do	1925	48	1,433	50.5	.712	35.96
Tool and die makers	do	1922	40	1,097	50.0	.769	38.47
	do	1925	80	3,689	50.2	.875	43.93
Top builders	do	1922	36	1,410	50.8	.778	39.55
	do	1925	64	4,415	50.6	.808	40.88
	Female	1922	5	18	51.8	.468	24.26
	do	1925	14	155	51.4	.481	24.72
Trim bench hands	Male	1922	19	182	49.4	.595	29.40
	do	1925	35	473	49.2	.754	37.10
	Female	1922	18	202	50.6	.438	22.14
	do	1925	26	474	49.7	.479	23.81
Varnish rubbers	Male	1922	25	501	50.9	.870	44.27
	do	1925	34	553	50.3	.901	45.32
Welders and braziers [3]	do	1925	68	783	50.3	.810	40.74
Welders, spot and butt [3]	do	1925	33	677	50.2	.792	39.76
Woodworking-machine operators [1]	do	1925	42	1,942	51.2	.674	34.51
Other skilled occupations	do	1922	37	1,659	49.5	.710	35.15
	do	1925	91	3,771	50.0	.774	38.70
	Female	1922	3	15	49.0	.680	33.34
	do	1925	3	8	50.0	.536	26.80
Other employees	Male	1922	47	3,611	49.9	.644	32.13
	do	1925	97	10,171	49.9	.692	34.53
	Female	1922	11	137	49.0	.461	22.59
	do	1925	26	305	49.6	.450	22.32
All occupations	Male	1922	49	54,930	50.1	.662	33.19
	do	1925	99	140,930	50.3	.729	36.67
	Female	1922	29	1,379	50.3	.438	22.05
	do	1925	59	3,432	50.1	.467	23.40
All occupations, male and female		1922	49	56,309	50.1	.657	32.92
		1925	99	144,362	50.3	.723	36.37

[1] Included in body builders in 1922.
[3] Included in other skilled occupations or in other employees in 1922.
[6] Included in painters, general, in 1922.

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Average hours and earnings in 1925 are shown in Table 2 for each State for 18 of the most important occupations for which data are shown in Table 1. In these 18 occupations are found 55.5 per cent of the male workers and 69.4 per cent of the female workers included in the 1925 study. It will be observed that all of the important automobile manufacturing States appear in the table, and further that figures are given separately for females in several of the occupations.

TABLE 2.—AVERAGE HOURS AND EARNINGS FOR 18 SELECTED OCCUPATIONS IN THE MOTOR-VEHICLE INDUSTRY, BY SEX AND STATE, 1925

State	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings
	Assemblers, axle, male					Assemblers, body frame, male				
Illinois	3	53	53.7	$0.662	$35.55	3	172	50.0	$0.821	$41.05
Indiana	7	109	51.2	.686	35.12	7	625	50.7	.716	36.30
Michigan	15	1,147	50.9	.755	38.43	11	1,039	51.1	.746	38.12
New Jersey	(1)	(1)	(1)	(1)	(1)	3	389	48.8	.710	34.65
New York	4	171	49.5	.634	31.38	9	287	51.7	.771	39.86
Ohio	(1)	(1)	(1)	(1)	(1)	9	280	49.7	.750	37.28
Pennsylvania	3	34	49.9	.598	29.84	4	109	49.6	.734	36.41
Wisconsin	3	71	50.7	.709	35.95	3	190	55.0	.690	37.95
New Jersey and Ohio	10	337	48.0	.730	35.04					
Total	45	1,922	50.3	.729	36.67	49	3,091	50.8	.739	37.54
	Assemblers, chassis, male					Assemblers, frame, male				
Illinois	5	168	49.2	$0.661	$32.52	3	19	49.7	$0.609	$30.27
Indiana	7	167	49.4	.646	31.91	6	106	50.3	.821	41.30
Michigan	16	1,461	49.9	.740	36.93	14	539	50.0	.807	40.35
New Jersey	2	112	48.8	.718	35.04	2	47	49.6	.740	36.70
New York	6	273	51.4	.634	29.34	4	35	53.2	.675	35.91
Ohio	11	458	48.9	.652	31.88	10	185	48.3	.765	36.95
Pennsylvania	3	131	50.0	.600	30.00	5	164	51.1	.576	29.43
Wisconsin	4	132	52.2	.637	33.25	3	20	53.5	.602	32.21
Total	54	2,902	49.9	.694	34.63	47	1,115	50.0	.753	37.65
	Assemblers, motor, male					Automatic operators (lathe and screw-machine), male				
Illinois	4	127	52.0	$0.718	$37.34	6	75	52.8	$0.650	$34.32
Indiana	10	242	51.0	.727	37.08	10	312	50.7	.667	33.82
Michigan	18	3,025	49.5	.770	38.12	22	1,451	49.4	.813	40.16
New Jersey	4	188	48.2	.812	39.14	3	49	50.0	.840	42.00
New York	6	258	50.4	.711	35.83	8	339	50.3	.699	35.16
Ohio	11	710	48.9	.693	33.89	7	241	47.9	.802	38.42
Pennsylvania	4	135	52.9	.636	33.64	4	110	50.7	.593	30.07
Wisconsin	4	166	52.3	.694	36.30	5	45	53.2	.644	34.26
Total	61	4,851	49.8	.747	37.20	65	2,622	49.7	.764	37.97
	Drill-press operators, male					Drill-press operators, female				
Illinois	7	215	52.5	$0.621	$32.60	(1)	(1)	(1)	(1)	(1)
Indiana	12	538	50.8	.636	32.31	2	16	50.0	$0.531	$26.55
Michigan	24	5,594	50.3	.743	37.37	9	59	49.5	.604	29.90
New Jersey	4	150	50.1	.735	36.82	2	6	50.0	.660	33.00
New York	9	428	50.5	.652	32.93	2	10	49.2	.483	23.76
Ohio	15	901	47.4	.720	34.13	(1)	(1)	(1)	(1)	(1)
Pennsylvania	7	450	52.7	.555	29.25					
Wisconsin	6	412	53.4	.642	34.28					
Illinois and Ohio						2	8	52.9	.480	25.39
Total	84	8,688	50.3	.712	35.81	17	99	49.8	.573	28.54

[1] Data which were obtained in this occupation for but one establishment in a State were combined with data for one or more other States, averages for which were approximately the same, to avoid publishing data for a single plant.

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TABLE 2.—AVERAGE HOURS AND EARNINGS FOR 18 SELECTED OCCUPATIONS IN THE MOTOR-VEHICLE INDUSTRY, BY SEX AND STATE, 1925—Continued

State	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings
	Grinding-machine operators, male					Inspectors, male				
Illinois	7	129	52.7	$0.653	$34.41	9	158	51.9	$0.656	$34.05
Indiana	7	343	50.6	.655	33.14	11	486	49.4	.580	28.65
Michigan	24	3,461	50.2	.793	39.81	28	4,544	50.1	.711	35.62
New Jersey	2	114	50.0	.791	39.55	6	249	51.1	.697	35.62
New York	7	515	50.3	.712	35.81	13	713	50.4	.623	31.40
Ohio	10	506	46.9	.806	37.80	13	982	48.6	.708	34.41
Pennsylvania	7	202	53.4	.596	31.83	7	362	52.2	.576	30.07
Wisconsin	5	152	52.1	.715	37.25	6	182	52.7	.558	29.41
Total	69	5,422	50.1	.765	38.33	93	7,676	50.1	.682	34.17
	Inspectors, female					Laborers, male				
Illinois	(1)	(1)	(1)	(1)	(1)	9	337	52.1	$0.487	$25.37
Indiana	2	35	50.0	$0.313	$15.65	12	1,074	50.9	.472	24.02
Michigan	15	347	49.8	.364	18.13	29	10,200	50.1	.604	30.26
New Jersey						6	807	50.0	.553	27.65
New York	(1)	(1)	(1)	(1)	(1)	14	1,185	51.3	.522	26.78
Ohio	2	19	46.0	.429	19.73	13	1,783	48.9	.558	27.29
Pennsylvania	2	22	50.8	.349	17.73	8	807	53.9	.450	24.26
Wisconsin	(1)	(1)	(1)	(1)	(1)	6	399	53.4	.511	27.29
Illinois, New York, and Wisconsin	3	14	48.7	.340	16.56					
Total	24	437	49.6	.361	17.91	97	16,592	50.4	.570	28.73
	Laborers, female					Lathe operators, male				
Illinois						6	111	52.1	$0.644	$33.55
Indiana	2	12	50.8	$0.388	$19.71	6	253	51.0	.701	35.75
Michigan	9	79	51.4	.395	20.30	24	3,888	50.1	.782	39.18
New Jersey						4	309	50.1	.762	38.18
New York						10	468	50.5	.711	35.91
Ohio	2	14	42.8	.463	19.82	12	724	46.4	.809	37.54
Pennsylvania						5	239	52.1	.620	32.30
Wisconsin						5	268	53.1	.673	35.74
Total	13	105	50.2	.403	20.23	72	6,260	50.0	.762	38.10
	Letterers, stripers, and varnishers, male					Machinists, male				
Illinois	2	34	50.0	$0.941	$47.05	6	82	52.1	$0.638	$33.24
Indiana	9	111	50.9	.822	41.84	4	89	50.5	.705	35.60
Michigan	18	471	50.0	1.017	50.85	26	2,463	49.9	.847	42.27
New Jersey	4	36	48.6	.932	45.30	5	54	50.1	.764	38.28
New York	9	120	52.4	.936	49.05	12	326	50.3	.715	35.96
Ohio	(1)	(1)	(1)	(1)	(1)	11	302	48.2	.765	36.87
Pennsylvania	(1)	(1)	(1)	(1)	(1)	6	223	51.9	.678	35.19
Wisconsin	3	14	51.8	.966	50.04	3	65	51.3	.719	36.88
Ohio and Pennsylvania	11	204	48.6	1.098	53.36					
Total	56	990	50.1	.996	49.90	73	3,604	50.0	.806	40.30

[1] Data which were obtained in this occupation for but one establishment in a State were combined with data for one or more other States, averages for which were approximately the same, to avoid publishing data for a single plant.

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TABLE 2.—AVERAGE HOURS AND EARNINGS FOR 18 SELECTED OCCUPATIONS IN THE MOTOR-VEHICLE INDUSTRY, BY SEX AND STATE, 1925—Continued

State	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time weekly earnings
	Milling-machine operators, male					Sewing-machine operators, male				
Illinois	7	84	51.2	$0.645	$33.02	(1)	(1)	(1)	(1)	(1)
Indiana	8	208	51.3	.635	32.58	(1)	(1)	(1)	(1)	(1)
Michigan	25	2,216	50.4	.775	39.06	5	329	48.4	$0.715	$34.61
New Jersey	3	109	50.0	.748	37.40	2	16	48.1	.763	36.70
New York	7	180	51.0	.680	34.68	4	10	49.3	.728	35.89
Ohio	12	421	47.6	.734	34.94	(1)	(1)	(1)	(1)	(1)
Pennsylvania	7	209	52.8	.570	30.10					
Wisconsin	5	122	53.4	.656	35.03					
Illinois, Indiana, and Ohio						3	23	48.1	.725	34.87
Total	74	3,549	50.4	.737	37.14	14	378	48.4	.718	34.75
	Sewing-machine operators, female					Tool and die makers, male				
Illinois	3	11	50.0	$0.400	$20.00	7	103	52.0	$0.754	$39.21
Indiana	7	117	50.0	.492	24.60	10	149	51.2	.739	37.84
Michigan	16	653	51.7	.471	24.35	26	2,451	49.8	.920	45.82
New Jersey	2	72	49.7	.445	22.12	5	123	51.1	.788	40.27
New York	7	38	51.3	.487	24.98	9	297	50.9	.770	39.19
Ohio	8	165	48.6	.480	23.33	11	390	49.4	.870	42.98
Pennsylvania	2	18	49.7	.461	22.91	6	114	52.6	.678	35.66
Wisconsin	3	39	47.8	.471	22.51	6	62	54.8	.675	36.99
Total	48	1,113	50.7	.472	23.93	80	3,689	50.2	.875	43.93
	Top builders, male					Top builders, female				
Illinois	4	129	50.1	$0.733	$36.72					
Indiana	9	261	51.0	.837	42.69	3	27	50.0	$0.503	$25.15
Michigan	20	2,367	50.1	.807	40.43	8	119	51.8	.473	24.50
New Jersey	4	332	49.0	.773	37.88	(1)	(1)	(1)	(1)	(1)
New York	9	287	51.4	.862	44.31	(1)	(1)	(1)	(1)	(1)
Ohio	11	499	49.3	.877	43.24					
Pennsylvania	4	45	49.8	.645	32.12					
Wisconsin	3	495	54.6	.753	41.11					
New Jersey and New York						3	9	50.9	.511	26.01
Total	64	4,415	50.6	.808	40.88	14	155	51.4	.481	24.72
	Trim bench hands, male					Trim bench hands, female				
Illinois	3	22	49.6	$0.684	$33.93	(1)	(1)	(1)	(1)	(1)
Indiana	7	43	51.6	.726	37.46	2	34	49.6	$0.544	$26.98
Michigan	7	65	48.8	.752	36.70	11	266	50.1	.484	24.25
New Jersey	3	33	48.2	.679	32.73	(1)	(1)	(1)	(1)	(1)
New York	(1)	(1)	(1)	(1)	(1)	3	15	52.0	.591	30.73
Ohio	5	273	48.9	.770	37.65	4	121	48.7	.456	22.21
Pennsylvania	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Wisconsin	3	5	53.0	.731	38.74	3	16	47.5	.386	18.34
Illinois, New Jersey, and Pennsylvania						3	22	49.6	.441	21.87
New York and Pennsylvania	7	32	50.2	.785	39.41					
Total	35	473	49.2	.754	37.10	26	474	49.7	.479	23.81

[1] Data which were obtained in this occupation for but one establishment in a State were combined with data for one or more other States, averages for which were approximately the same, to avoid publishing data for a single plant.

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Regular Hours of Operation

THE regular or customary hours of an establishment are the normal hours of work as established by a fixed time for beginning work and for quitting work, less the time off duty for lunch or dinner. Regular hours per day in different plants may vary and yet the full-time hours per week be the same; that is, one plant may operate all departments three 8-hour shifts on each of six days; another may operate only a day shift of 8½ hours Monday to Friday and 5½ hours on Saturday. In either of these cases the full-time hours per week are 48. Also, the regular hours of one department in an establishment may differ from the regular hours of other departments in the same establishment. Such variations as to hours of operation were found in all but a few of the plants covered. Allowance was made for these variations in computing average full-time hours of the employees in each occupation.

Overtime Work

OVERTIME work is usually regarded as work performed outside of the regular hours of operation, and in most automobile plants is expected at certain seasons of the year. In 1925 a few plants, on account of heavy orders, were operated overtime almost every week in the year. Regular hours of operation were to be resumed, however, as soon as sufficient building space could be added to increase the production capacity.

The straight or regular rate for all overtime was paid by 41 of the 99 plants covered in 1925. An increase over the straight rate was paid to all employees by 38 plants and to the time workers by 9 plants for overtime and for work on Sunday or holidays, usually at the rate of time and a half. One plant paid one and one-fifth times the regular rate to the employees in one occupation. Two plants paid extra for Sunday and holiday work only. The remaining 8 plants limited extra pay for overtime to the employees of a department, or of a few occupations, or by a specified time or number of hours per day, after which extra pay began.

Wages of Civil Employees Under the United States Naval Establishment, 1927 [8]

IN DECEMBER, 1926, the Navy Department published a schedule of wages covering all civil employees in the Naval Establishment and in the field service of the United States Marine Corps. This schedule became effective January 1, 1927, and is to remain in force the remainder of the calendar year.

The schedule has been very materially abridged both as to occupations and localities for publication below. It is believed that the abridged statement, however, covers most of the items that are of

[8] U. S. Navy Department. Schedule of wages for civil employees under the Naval Establishment for the calendar year 1927. Washington, 1926.

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general interest. The rates published are maximum rates. The minimum rate is 10 cents under this maximum rate and there is an intermediate rate 5 cents under the maximum rate.

TABLE 1.—HOURLY WAGE RATES IN CLOTHING WORKERS' SERVICE

Navy Supply Depot, Brooklyn, N. Y.

Occupation	Rate per hour	Occupation	Rate per hour
Assistant custom cutter	$0.85	Double-needle operator	$0.70
Baster	.85	Dress-coat maker	.95
Bushelman	.80	Finish presser	.95
Canvas maker	.65	Fitter	.85
Chopper	.75	General tailor	.85
Cloth sponger	.75	Head custom cutter	1.35
Clothing examiner	.75	Head buttonhole maker	.80
Coat finisher	.55	Operator (female)	.50
Coat maker	.90	Pocket maker	1.00
Coat operator	1.00	Trimmer	.60
Collar maker	.90	Trouser finisher	.55
Custom cutter	1.25	Trouser maker	.80
Cutting-machine operator	.90	Trouser operator	.90
Cutter and marker	.85	Underpresser	.80
Die-machine operator	.75	Vest maker	.75

Depot of Supplies, United States Marine Corps, Philadelphia, Pa.

Baster	$0.83	Examiner, clothing	$0.73
Coat fitter	.83	Finisher	.40
Coat maker	.90	Operator (female)	.51
Coat operator	.98	Presser	.73
Custom cutter	1.20	Sponger	.51
Cutter	.83	Tailor, first class	.83
Cutter and marker	.83	Tailor, second class	.73
Designer, embroideress	.65	Trimmer	.40
Embroideress	.48		

TABLE 2.—HOURLY RATES OF WAGES IN THE LABORER, HELPER, AND MECHANICAL SERVICE

Trade or occupation	Boston	New York	Philadelphia	Washington	Norfolk	Charleston	New Orleans	Mare Island	Puget Sound	Great Lakes
Group I										
Laborer, common	$0.55	$0.55	$0.52	[1] $0.52	$0.45	$0.33	$0.34	$0.55	$0.55	$0.56
Group II										
Hammer runner:										
Heavy	.65	.65	.62	.62	.56	.56	------	.66	.66	------
Others	.59	.61	.57	.57	.51	.51	------	.61	.61	------
Helper:										
Blacksmith's—										
Heavy fires	.63	.63	.61	.61	.58	.55	------	.64	.64	------
Other fires	.60	.60	.56	.56	.53	.50	------	.60	.60	------
Boilermaker's	.60	.60	.56	.56	.53	.50	------	.60	.60	------
Coppersmith's	.60	.60	.56	.56	.53	.50	------	.60	.60	------
Electrician's	.62	.62	.58	.58	.55	.50	------	.62	.62	.60
Flange turner's	.63	.63	.61	------	.58	.55	------	.64	.64	------
Forgers', heavy	.63	.63	.61	------	.58	.55	------	.64	.64	------
General	.60	.60	.56	.56	.53	.50	.50	.60	.60	.58
Machinist's	.60	.60	.56	.56	.53	.50	.50	.60	.60	.58
Molder's	.60	.60	.56	.56	.55	.50	------	.60	.60	------

[1] Rate for laborer, common, at Naval Powder Factory, Indianhead, Md., and Naval Proving Ground, Dahlgren, Va., $0.50 per hour.

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TABLE 2.—HOURLY RATES OF WAGES IN THE LABORER, HELPER, AND MECHANICAL SERVICE—Continued

Trade or occupation	Boston	New York	Philadelphia	Washington	Norfolk	Charleston	New Orleans	Mare Island	Puget Sound	Great Lakes
Group II—Continued.										
Helper—Continued										
Pipefitter's	$0.62	$0.62	$0.58	$0.58	$0.53	$0.50	$0.50	$0.62	$0.62	$0.60
Sheet-metal worker's	.60	.60	.56	.56	.53	.50	------	.60	.60	------
Shipfitter's	.60	.60	.56	------	.53	.50	------	.60	.60	------
Woodworker's	.62	.62	.58	.58	.56	.50	------	.62	.62	------
Hodcarrier	------	.63	.61	.61	.55	.55	------	.63	.63	------
Holder-on	.64	.64	.64	------	.61	.58	------	.65	.65	------
Laborer, classified	.55	.55	.52	[2] .52	.45	.35	.34	.55	.55	.56
Oiler	.74	.75	.68	.68	.68	.66	------	.70	.70	------
Rivet heater	.58	.58	.56	------	.45	.35	------	.58	.58	------
Sandblaster	.70	.70	.70	.70	.65	.65	------	.70	.70	------
Stablekeeper	.58	.58	.56	.56	.45	------	------	.58	.58	------
Stevedore	.66	.67	.64	------	.52	.52	------	.70	.70	------
Teamster	.58	.62	.56	.56	.48	------	.35	.62	.62	.62
Group III										
Anglesmith:										
Heavy fires	.94	.98	.92	------	.92	.88	------	1.00	1.00	------
Other fires	.84	.88	.82	------	.82	.78	------	.90	.90	------
Blacksmith:										
Heavy fires	.94	.98	.92	.92	.92	.88	------	1.00	1.00	------
Other fires	.84	.88	.82	.82	.82	.78	------	.90	.90	------
Boat builder	.87	.90	.85	------	.85	------	------	.95	.95	------
Boilermaker	.85	.90	.83	.83	.83	.81	------	.90	.90	.86
Box maker	.62	.65	.60	.60	.58	.58	------	.65	.65	.63
Brakemen	.75	.75	.75	.75	.75	.75	------	.80	.80	------
Buffer and polisher	.82	.82	.82	.82	.82	.82	------	.88	.88	------
Butcher	.73	.73	.73	.73	.73	------	------	.70	.70	------
Calker, wood	.82	.87	.82	.82	.82	.78	.75	.90	.90	------
Calker and chipper, iron	.84	.87	.82	------	.82	.80	.75	.90	.90	------
Cement finisher	.90	.93	.88	.88	.86	.86	.82	.96	.96	.91
Cement worker	.62	.62	.60	.60	.50	.40	------	.60	.60	------
Chauffeur	.66	.70	.63	.63	.60	.55	.57	.73	.73	.68
Conductor, railroad	------	.81	.81	.81	.81	------	------	.83	.83	------
Cooper	.72	.75	.70	------	.68	------	------	.78	.78	------
Coppersmith	.90	.95	.90	.90	.90	.83	.82	.93	.93	------
Craneman, electric (under 20 tons)	.72	.75	.70	.70	.75	.68	------	.78	.78	------
Cupola tender	.77	.80	.75	.75	.75	------	------	.83	.83	------
Diesinker	.96	1.00	.95	.95	.95	------	------	1.01	1.01	------
Diver	1.86	1.86	1.86	------	1.86	1.86	1.86	1.86	1.86	------
Driller	.71	.74	.67	------	.67	.67	------	.77	.77	------
Electricians	.92	.95	.90	.90	.90	.85	.84	.98	.98	.93
Electroplater	.87	.92	.85	.85	.85	.85	------	.95	.95	------
Engineman	.86	.90	.83	.83	.83	.81	.80	.93	.93	.88
Locomotive	.86	.90	.83	.83	.83	.81	------	.93	.93	------
Hoisting and portable	.86	.90	.83	.83	.83	------	------	.93	.93	------
Steam shovel	------	1.05	.98	.98	.98	------	------	1.06	1.06	------
Fireman	.70	.73	.68	.68	.68	.66	.65	.76	.76	.73
Flange turner	.87	.92	.85	.85	.85	.85	------	.93	.93	------
Forger:										
Drop	.82	.90	.80	.80	.80	------	------	.88	.88	------
Heavy	1.32	1.35	1.30	1.30	1.30	1.30	------	1.38	1.38	------
Foundry chipper	.63	.70	.64	.64	.64	------	------	.65	.65	------
Frame bender	.87	.92	.85	------	.85	.85	------	.93	.93	------
Furnace man:										
Angle work	------	.70	.65	------	.58	------	------	.68	.68	------
Foundry	------	.70	.65	.62	.60	.60	------	.72	.72	------
Heater	------	.70	.65	.62	.60	.60	------	.68	.68	------
Heavy forge, heater	.72	.80	.75	.70	.70	.70	------	.75	.75	------
Other forge	.62	.70	.65	.62	.60	.60	------	.68	------	------
Galvanizer	.69	.70	.64	------	.64	.64	------	.77	.77	------
Gardener	.62	.62	.62	.62	.62	.62	.62	.72	.72	.62
Instrument maker	.89	.92	.87	.87	.87	.87	------	.95	.95	------
Joiner	.87	.90	.85	.85	.85	.85	.77	.95	.95	.90
Ladle man, foundry	.62	.70	.65	.65	.58	------	------	.68	.68	------
Lead burner	1.05	1.05	1.05	1.05	1.05	1.05	------	1.08	1.08	------
Leather worker	.72	.75	.70	.70	.68	------	------	.78	.78	------
Letterer and grainer	.92	.95	.90	.90	.90	.85	------	.98	.98	.93
Loftsman	.90	.92	.90	------	.90	.90	------	.95	.95	------
Machine operator	.67	.70	.65	.65	.65	------	------	.75	.75	------
Machinist	.84	.90	.84	.84	.84	.80	.77	.91	.91	.89
Mason, brick or stone	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.15	1.15	1.12
Melter	.77	.80	.75	.75	.75	------	------	.83	.83	------
Electric	------	1.05	1.05	------	1.05	------	------	1.05	1.05	------
Open hearth	------	------	------	1.10	------	------	------	------	------	------
Millman	.87	.90	.85	.85	.85	.85	------	.95	.95	------
Molder	.92	1.00	.94	.94	.94	.88	------	1.00	1.00	------

[2] Rate for laborer, classified, at Naval Powder Factory, Indianhead, Md., and Naval Proving Ground, Dahlgren, Va., $0.50 per hour.

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TABLE 2.—HOURLY RATES OF WAGES IN THE LABORER, HELPER, AND MECHANICAL SERVICE—Continued

Trade or occupation	Boston	New York	Philadelphia	Washington	Norfolk	Charleston	New Orleans	Mare Island	Puget Sound	Great Lakes
Ordnance man	$0.75	$0.75	$0.75	$0.75	$0.75	$0.75	------	$0.80	$0.83	------
Packer	.65	.68	.63	.63	.63	.63	------	.75	.75	$0.70
Painter	.87	.90	.85	.85	.85	.80	$0.79	.93	.93	.88
Pattern maker	.95	1.03	1.00	1.00	1.00	.90	------	1.08	1.08	------
Pipe coverer and insulator	.85	.88	.85	.85	.85	.83	------	.88	.88	------
Pipefitter	.92	.95	.90	.90	.90	.85	.84	.98	.98	.93
Plasterer	1.12	1.12	1.12	1.12	1.12	1.12	------	1.15	1.15	1.12
Plumber	.92	.95	.90	.90	.90	.88	.87	.98	.98	.93
Printer, job	.86	.89	.84	.84	.84	.82	------	.92	.92	------
Puncher and shearer	.64	.73	.60	------	.60	.58	------	.70	.70	------
Rigger	.87	.90	.83	.83	.83	.81	.77	.91	.91	.83
Riveter	.87	.90	.85	------	.83	.80	------	.90	.90	------
Rodman	.60	.60	.60	.60	.60	.60	------	.60	.60	------
Sailmaker	.84	.87	.82	.82	.82	.82	------	.90	.90	------
Sawfiler	.95	1.02	.93	.93	.93	.93	------	.98	.98	------
Sewer	.57	.57	.55	.55	.55	.45	------	.55	.55	.50
Sheet-metal worker	.92	.95	.90	.90	.90	.88	------	.98	.98	.93
Shipfitter	.82	.87	.82	.82	.82	.82	------	.90	.90	------
Shipwright	.87	.90	.85	.85	.85	.85	------	.95	.95	------
Tile and plate setter	.85	.88	.83	------	.81	.81	------	.88	.88	------
Toolmaker	.90	.94	.90	.90	.90	.87	------	.96	.96	------
Trackman	.62	.62	.60	.60	.55	.55	------	.62	.62	.62
Upholsterer	.87	.90	.85	.85	.83	.83	------	.93	.93	------
Water tender	.74	.77	.72	.72	.72	.70	------	.80	.80	------
Welder:										
Electric	.87	.90	.85	.85	.85	.83	.83	.91	.91	------
Gas	.85	.85	.83	.83	.83	.80	.77	.88	.88	------
Wharf builder	.87	.90	.85	.85	.85	.85	------	.95	.95	------
Group IVb										
Apprentice:										
First class	.60	.60	.60	.60	.60	.60	------	.60	.60	------
Second class	.48	.48	.48	.48	.48	.48	------	.48	.48	------
Third class	.35	.35	.35	.35	.35	.35	------	.35	.35	------
Fourth class	.25	.25	.25	.25	.25	.25	------	.25	.25	------

Wages and Hours of Labor in the Paper Box-Board Industry, 1925

THE Bureau of Labor Statistics collected data concerning wages and hours of labor in this industry in 1925 from 70 establishments in 21 States.[9] The figures for each establishment are for a representative pay period of two weeks, during the spring or summer.

To avoid identification of plants certain States were grouped. The "Other New England" group includes Maine, New Hampshire, and Vermont. Group 1 of the Southern States includes Virginia and West Virginia, and Group 2 consists of Alabama, Georgia, Louisiana, South Carolina, and Tennessee.

The days of operation for the 12 months ending December 31, 1924, for 68 of the 70 establishments covered, ranged from 63 to 311, the average for those reporting being 270 days. The difference between this average and the possible full time of 366 days was due to the following conditions: 62 establishments did not operate on any Sunday, 5 establishments were closed from 42 to 51 Sundays, and 1 was closed on 11 Sundays.

Six establishments were closed on all Saturdays, 1 was closed on all except 2, 14 from 35 to 48, and 15 from 1 to 28 Saturdays. Sixty-seven establishments were closed for holidays, from 2 to 13 days; 49 were closed on account of market conditions, from 2 to 80 days;

[9] For complete report see Bul. No. 407.

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and 19 establishments were closed for repairs, from one-half day to 231 days. Seven establishments were closed from 1 to 7 days for such causes as no fuel oil, high or low water, electrical trouble, fire, and vacation.

Between January 1, 1924, and the period of this survey a number of changes took place in both wage rates and hours of labor. Twelve establishments reported changes in wage rates which affected all the productive employees. In these establishments the increases in hourly rates ranged from 5 to 50 per cent, depending on the occupation. Three of the establishments reported that since their plant changed to 5-day operation, employees working 4 nights or more received an additional 13 hours' pay—that is, the same pay for 5 nights that was previously received for 6. Two of the 12 establishments reported decreases to tour bosses only, ranging from 14 to 17 per cent of their weekly earnings.

Twenty-four establishments reported a decrease in the weekly hours of labor. These reductions affected the tour workers in 23 of these establishments, while in one establishment the working time of yard employees only was reduced 1 hour a day. In 19 plants the days of operation were reduced from 6 days to 5 days a week, the regular weekly hours thereby being decreased from 72 to 60 hours in 8 establishments, from 48 to 40 hours in 7 establishments, from 72 to 40 hours in 3 establishments, and from 65½ to 40 hours in 1 establishment. Three other plants that had previously been operating 5 days a week reduced their hours from 60 to 40, and another establishment reduced its weekly hours from 72 to 48.

A summary by States showing average full-time hours, earnings per hour, and full-time earnings is shown below. It will be noted that the average full-time hours for two weeks range from 98.8 in Massachusetts to 137.8 in Group 2 of the Southern States, the average for all States being 108.6. The average earnings per hour range from 30.1 cents in Group 2 of the Southern States to 62.3. cents in Massachusetts, which exactly reverses the standing of the States, as compared with average full-time hours. The average full-time earnings for two weeks range from $41.48 in Group 2 of the Southern States to $62.70 in New Jersey and Pennsylvania, the average for all States being $56.25.

TABLE 1.—AVERAGE HOURS AND EARNINGS IN THE PAPER BOX-BOARD INDUSTRY, BY STATES, 1925, MALE EMPLOYEES ONLY

State	Number of—		Average full-time hours per 2 weeks	Average earnings per hour	Average full-time earnings per 2 weeks
	Establishments	Employees			
Massachusetts	4	436	98.8	$0.623	$61.55
Connecticut	5	721	105.4	.529	55.76
Other New England States	3	334	102.1	.481	49.11
New York	9	1,166	109.9	.545	59.90
New Jersey and Pennsylvania	8	1,076	110.2	.569	62.70
Ohio	7	1,395	106.1	.558	59.20
Indiana	5	403	130.8	.448	58.60
Illinois	6	872	101.6	.558	56.69
Michigan	8	1,909	98.9	.558	55.19
Minnesota and Wisconsin	5	666	106.9	.506	54.09
Southern States:					
Group 1	3	182	128.2	.343	43.97
Group 2	7	772	137.8	.301	41.48
Total	70	9,932	108.6	.518	56.25

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The following table shows similar data for each occupation. A study of the table shows that the average full-time hours per two weeks range from 97.8 for finisher's helpers to 117.0 for rewinders, finishing room, the average for all occupations being 108.6. The average earnings per hour range from 28.3 cents for other employees, female, to 79.9 cents for machine tenders, the average for all occupations being 51.7 cents. The average full-time earnings for two weeks range from $30.51 for other employees, female, to $83.42 for machine tenders, the average for all occupations being $56.15.

The averages in both this and the preceding table are computed from full-time hours per week, hours actually worked, and earnings actually received by each employee during the representative pay period used. "Full-time hours" as used in these tables means the number of hours fixed by the establishments as constituting the regular working hours for the period specified.

TABLE 2.—AVERAGE HOURS AND EARNINGS IN THE PAPER BOX-BOARD INDUSTRY, 1925, BY OCCUPATION AND SEX

Occupation and sex	Number of—		Average full-time hours per 2 weeks	Average earnings per hour	Average full-time earnings per 2 weeks
	Establishments	Employees			
Male					
Head beatermen	70	227	105.2	$0.669	$70.38
Assistant head beatermen	20	69	109.7	.520	57.04
Plug pullers	24	118	98.8	.511	50.49
Jordan men	17	76	100.4	.530	53.21
Beater helpers	70	1,873	101.1	.462	46.71
Machine tenders	70	300	104.4	.799	83.42
Back tenders	70	307	104.0	.582	60.53
Third hands	34	154	100.4	.519	52.11
Finishers	34	215	99.7	[1].501	49.95
Windermen	16	66	114.8	.449	51.55
Finishers' helpers	11	71	97.8	[1].512	50.07
Weighers	6	20	113.2	.458	51.85
Cutter boys	57	775	100.1	.446	44.64
Broke boys	39	187	108.1	.438	47.35
Screenmen	52	231	99.5	.472	46.96
Felt checkers	19	57	115.9	.435	50.42
Finishers, finishing room	25	208	113.3	.531	60.16
Cutters, finishing room	18	38	110.3	.514	56.69
Rewinders, finishing room	13	28	117.0	.493	57.68
Laborers	70	1,459	113.4	.423	47.97
Other employees	70	3,453	115.3	.564	65.03
All occupations, male	70	9,932	108.6	.518	56.25
Female					
Other employees	9	53	107.8	.283	30.51
All occupations, male and female	70	9,985	108.6	.517	56.15

[1] It will be noted that finishers' helpers are shown to have received a slightly higher average rate per hour than finishers. This is due to the fact that in the 11 establishments employing both finishers and finishers' helpers the average earnings per hour of the latter are higher than those of finishers in establishments where only finishers are employed.

Wages and Hours of Labor in the Pottery Industry, 1925

DURING the summer and early fall of 1925 the Bureau of Labor Statistics, with the cooperation of the manufacturers and the wage earners, made a study of wages, hours, and earnings and other conditions in the general-ware pottery industry in the United States.[10] General-ware pottery includes table ware and such other

[10] For complete report see Bul. No. 412.

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articles as may be made incidentally therewith. The study did not cover other sanitary ware or any industrial porcelain. Data were obtained for 10,323 wage earners in 46 potteries making semivitreous ware, and for 2,684 wage earners in potteries making vitreous ware. The study was limited to a representative two-week pay period.

To avoid identification and to meet the request of many of the potteries, the data are presented in six groups of establishments, these groups being specified in the prefatory note at the top of Table 1. Space does not permit giving in this article figures for all occupations; therefore, only representative occupations appear in the table.

Averages are shown also for each class of ware for all males and all females, and for all employees of both sexes combined. Comparing averages for semivitreous ware it is seen that the employees of each sex worked approximately the same number of days and hours, that all males collectively earned an average of $52.44 in two weeks, $5.70 per day and 70.5 cents per hour, and that females earned $26.54 in two weeks, $2.99 per day, and 38.5 cents per hour. In comparing these general figures it must be borne in mind that there is much difference in the character and class of the work performed by males and by females in a pottery. The averages for both sexes in semivitreous potteries show 9.1 days or 72.5 hours worked in two weeks, and 8 hours per day, and $43.27 earned in two weeks, $4.76 per day, and 59.6 cents per hour.

In two weeks there are 12 working-days. As stated above, the employees of semivitreous potteries worked an average of 9.1 days. The loss of 2.9 days in two weeks was due principally to the fact that a very large majority of the potteries were not operated on Saturday, thus accounting for approximately 2 days of lost time. Several potteries were operated less than 5 days per week or less than 10 days in two weeks, and frequently work was not available for some employees even though the pottery was operating. On the other hand a few employees did not work the full time available because of sickness or personal business or because of entering or leaving employment in the pottery. This has its influence on earnings. Most of the potteries, especially the semivitreous, complained that business conditions were poor.

The normal or customary hours of operation of the great majority of the potteries included in the study are 9 per day and 54 per week. Working hours in a pottery, however, are more nominal than normal, as so many employees are pieceworkers and to quite an extent determine their own time. In actual practice a very considerable percentage of the employees, especially those in the clay shop, kilns, and dipping room, work considerably less than 9 hours per day or 54 per week—some not more than 6, 6½, or 7 hours per day. This condition was quite pronounced in the period under study.

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TABLE 1.—AVERAGE DAYS, HOURS, AND EARNINGS IN THE POTTERY INDUSTRY, BY OCCUPATION, SEX, AND GROUP OF PLANTS, 1925

[Groups 1, 2, 3, 4, and 5 are semivitreous plants. Group 1 includes 11 plants of 4 large companies, 5 of which are located in East Liverpool, Ohio, and 6 in near-by West Virginia. Group 2 includes 11 plants of other companies in East Liverpool. Group 3 includes 15 plants in Ohio outside East Liverpool, 2 in Pennsylvania, and 1 in West Virginia; Group 4 includes 3 plants in Trenton. Group 5 includes 3 plants, 1 each in Maryland, Tennessee, and Virginia. Group 6 includes 7 vitreous plants, 3 in New York, 2 in Pennsylvania, and 1 each in New Jersey and West Virginia]

Occupation, sex, and group	Number of—		Average number of days worked in two weeks	Average hours worked		Average earnings		
	Establishments	Employees		In two weeks	Per day	In two weeks	Per day	Per hour
Semivitreous ware—Groups 1 to 5								
Slip makers, male:								
Group 1	11	15	9.1	84.0	9.3	$68.91	$7.60	$0.820
Group 2	11	14	7.8	66.7	8.6	45.52	5.85	.682
Group 3	18	19	10.2	92.2	9.0	68.57	6.72	.743
Group 4	3	3	8.7	69.7	8.0	57.76	6.67	.828
Group 5	3	3	12.0	121.8	10.2	75.97	6.33	.624
Total	46	54	9.3	83.7	9.0	62.50	6.74	.746
Laborers, slip house, male:								
Group 1	11	49	8.1	69.3	8.5	41.30	5.08	.596
Group 2	11	25	8.0	68.7	8.5	40.31	5.01	.587
Group 3	18	50	9.9	85.7	8.7	49.50	5.01	.577
Group 4	3	5	6.8	49.4	7.3	36.15	5.32	.732
Group 5	3	7	12.0	117.1	9.8	46.68	3.89	.398
Total	46	136	8.9	76.9	8.6	44.22	4.96	.575
Batters-out, male:								
Group 1	11	117	7.9	65.7	8.3	39.71	5.01	.604
Group 2	11	56	7.4	63.5	8.5	36.47	4.91	.574
Group 3	18	162	8.4	65.7	7.9	36.03	4.30	.548
Group 4	3	8	5.6	51.7	9.2	29.56	5.26	.572
Group 5	3	14	10.3	82.6	8.0	35.55	3.46	.430
Total	46	357	8.1	65.7	8.1	37.14	4.59	.565
Jigger men:								
Group 1	11	156	8.2	67.0	8.2	63.97	7.80	.955
Group 2	11	87	7.8	65.3	8.4	54.58	7.03	.836
Group 3	18	211	9.0	70.1	7.8	63.76	7.08	.909
Group 4	3	19	7.3	63.9	8.8	57.01	7.85	.892
Group 5	3	27	11.3	93.6	8.3	74.32	6.56	.794
Total	46	500	8.6	69.3	8.1	62.54	7.27	.902
Mold runners, male:								
Group 1	11	137	7.8	64.0	8.2	35.22	4.50	.551
Group 2	11	64	7.6	63.3	8.3	33.55	4.41	.530
Group 3	14	102	8.2	61.0	7.4	25.30	3.07	.415
Group 4	3	10	5.6	48.2	8.6	19.45	3.47	.404
Group 5	3	31	11.3	88.2	7.8	23.63	2.09	.268
Total	42	344	8.2	64.7	7.9	30.47	3.73	.471
Finishers, female:								
Group 1	11	108	8.0	61.9	7.8	34.39	4.32	.556
Group 2	11	52	7.6	60.8	8.0	29.46	3.87	.485
Group 3	16	113	8.3	56.2	6.8	29.28	3.54	.521
Group 4	3	10	5.8	48.8	8.4	20.80	3.59	.427
Group 5	3	8	10.9	79.3	7.3	39.35	3.62	.496
Total	44	291	8.0	59.5	7.4	31.19	3.89	.524
Turners, male:								
Group 1	11	69	8.0	65.3	8.2	60.63	7.58	.928
Group 2	11	29	7.7	58.9	7.6	54.34	7.04	.922
Group 3	18	51	9.1	72.5	8.0	71.14	7.85	.982
Group 4	3	7	8.9	66.8	7.5	40.24	4.54	.602
Group 5	3	6	11.0	78.9	7.2	92.21	8.38	1.169
Total	46	162	8.4	67.0	7.9	63.10	7.48	.942
Handlers, male:								
Group 1	11	47	8.2	69.7	8.5	66.51	8.10	.954
Group 2	11	24	7.5	59.9	8.0	62.35	8.31	1.041
Group 3	18	51	9.2	75.9	8.2	73.82	7.99	.972
Group 4	3	6	9.0	72.2	8.0	43.92	4.88	.609
Group 5	3	7	11.4	87.5	7.7	77.61	6.79	.887
Total	46	135	8.7	71.3	8.2	68.10	7.85	.955

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TABLE 1.—AVERAGE DAYS, HOURS, AND EARNINGS IN THE POTTERY INDUSTRY, BY OCCUPATION, SEX, AND GROUP OF PLANTS, 1925—Continued

Occupation, sex, and group	Number of—		Average number of days worked in two weeks	Average hours worked		Average earnings		
	Establishments	Employees		In two weeks	Per day	In two weeks	Per day	Per hour
Semivitreous ware—Groups 1 to 5—Contd.								
Casters, male:								
Group 1	11	84	8.1	75.9	9.4	$67.43	$8.35	$0.889
Group 2	11	41	9.0	83.3	9.3	65.43	7.27	.785
Group 3	18	107	9.3	79.4	8.5	78.70	8.44	.991
Group 4	3	9	9.4	84.1	8.9	52.02	5.51	.618
Group 5	3	9	11.9	108.3	9.1	92.96	7.82	.858
Total	46	250	8.9	80.1	9.0	72.29	8.08	.903
Sagger makers, hand, male:								
Group 1	11	33	8.6	67.2	7.8	68.06	7.88	1.013
Group 2	10	18	7.9	67.6	8.6	57.96	7.35	.858
Group 3	18	40	8.7	74.0	8.5	73.24	8.44	.990
Group 4	3	4	6.8	59.4	8.8	53.13	7.87	.895
Group 5	2	3	11.3	110.3	9.7	86.56	7.64	.785
Total	44	98	8.5	71.0	8.3	68.27	8.01	.961
Sagger makers, machine, male: [1]								
Group 1	6	14	9.1	79.5	8.7	48.21	5.27	.606
Group 2	3	6	4.7	39.8	8.5	24.51	5.25	.616
Group 3	7	15	9.5	78.8	8.3	48.20	5.06	.611
Group 5	1	1	12.0	124.5	10.4	128.67	10.72	1.033
Total	17	36	8.6	73.9	8.5	46.49	5.38	.629
Kiln placers, bisque, male:								
Group 1	11	69	9.0	57.5	6.4	60.78	6.79	1.057
Group 2	11	34	8.5	54.4	6.4	58.32	6.89	1.073
Group 3	18	76	9.4	64.2	6.9	66.62	7.11	1.037
Group 4	3	10	7.0	49.4	7.1	47.29	6.76	.958
Group 5	3	8	11.3	71.3	6.3	82.81	7.36	1.162
Total	46	197	9.0	59.7	6.6	62.82	6.96	1.052
Kiln drawers, bisque and glost, male:								
Group 1	11	108	8.3	49.8	6.0	38.44	4.65	.771
Group 2	11	80	6.4	31.0	4.9	22.62	3.54	.730
Group 3	18	152	8.3	47.7	5.8	36.31	4.38	.761
Group 4	3	35	6.7	47.9	7.1	32.47	4.84	.678
Group 5	3	31	9.9	76.3	7.7	36.90	3.74	.484
Total	46	406	7.9	47.2	6.0	33.89	4.29	.718
Drawers (in warehouse), bisque and glost, female:								
Group 1	11	58	8.7	55.4	6.3	27.58	3.16	.498
Group 2	11	44	5.9	30.7	5.2	13.69	2.31	.447
Group 3	18	89	8.3	48.1	5.8	22.40	2.71	.465
Group 4	3	11	7.5	52.9	7.1	18.63	2.50	.352
Group 5	2	8	11.6	84.0	7.2	29.33	2.52	.349
Total	45	210	8.0	48.1	6.0	22.07	2.76	.459
Brushers, female:								
Group 1	11	170	8.9	69.1	7.8	22.58	2.55	.327
Group 2	10	74	7.6	59.0	7.7	18.90	2.48	.320
Group 3	18	199	8.8	65.3	7.5	21.02	2.40	.322
Group 4	3	19	9.2	77.3	8.4	22.58	2.45	.292
Group 5	3	25	8.4	69.5	8.3	19.10	2.27	.275
Total	45	487	8.6	66.3	7.7	21.21	2.46	.320
Dippers, male:								
Group 1	11	45	9.0	58.5	6.5	76.56	8.49	1.310
Group 2	11	20	8.1	48.4	6.0	67.50	8.38	1.394
Group 3	18	52	9.4	65.7	7.0	73.48	7.81	1.119
Group 4	3	4	9.8	64.1	6.6	65.10	6.68	1.016
Group 5	3	5	11.6	79.1	6.8	115.27	9.94	1.458
Total	46	126	9.2	60.8	6.6	75.02	8.20	1.233

[1] Include operators, weighers, and finishers as found in various potteries.

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TABLE 1.—AVERAGE DAYS, HOURS, AND EARNINGS IN THE POTTERY INDUSTRY, BY OCCUPATION, SEX, AND GROUP OF PLANTS, 1925—Continued

Occupation, sex, and group	Number of—		Average number of days worked in two weeks	Average hours worked		Average earnings		
	Establishments	Employees		In two weeks	Per day	In two weeks	Per day	Per hour
Semivitreous ware—Group 1 to 5—Contd.								
Dippers' helpers, female:								
Group 1	11	98	8.2	52.7	6.4	$21.25	$2.58	$0.403
Group 2	11	43	7.2	43.7	6.1	18.24	2.55	.417
Group 3	18	109	8.5	59.8	7.0	21.70	2.55	.363
Group 5	2	11	9.5	66.3	7.0	23.21	2.46	.350
Total	42	261	8.2	54.8	6.7	21.03	2.56	.384
Kiln placers, glost, male:								
Group 1	11	158	9.3	60.6	6.5	65.16	7.00	1.076
Group 2	10	64	8.1	56.0	6.9	54.73	6.72	.978
Group 3	18	173	9.3	65.2	7.0	65.99	7.10	1.012
Group 4	3	14	6.7	48.2	7.2	54.31	8.09	1.127
Group 5	3	23	10.8	76.9	7.1	88.71	8.19	1.154
Total	45	432	9.1	62.2	6.8	64.85	7.10	1.042
Dressers, female:								
Group 1	11	97	8.5	69.8	8.2	28.28	3.31	.405
Group 2	11	43	8.2	67.1	8.2	21.58	2.63	.322
Group 3	18	161	8.6	65.0	7.6	21.87	2.54	.336
Group 4	3	10	8.8	76.3	8.7	23.26	2.64	.305
Group 5	3	24	10.5	79.3	7.5	20.98	2.00	.265
Total	46	335	8.7	68.0	7.8	23.67	2.73	.348
Warehousemen:								
Group 1	11	148	9.8	86.8	8.9	51.02	5.21	.588
Group 2	11	52	10.4	91.0	8.8	54.37	5.24	.598
Group 3	18	189	10.3	89.7	8.7	52.53	5.09	.580
Group 4	1	3	5.7	49.7	8.8	23.28	4.11	.469
Group 5	3	15	12.0	106.5	8.9	55.34	4.61	.520
Total	44	407	10.2	89.1	8.8	52.11	5.12	.585
Gilders and liners, male:								
Group 1	11	115	9.8	79.7	8.1	64.92	6.62	.814
Group 2	11	37	10.6	75.1	7.1	55.40	5.22	.738
Group 3	16	83	8.8	72.0	8.2	49.59	5.65	.688
Group 4	1	2	9.5	80.2	8.4	37.72	3.97	.471
Group 5	2	12	11.3	89.2	7.9	68.87	6.08	.772
Total	41	249	9.7	76.9	8.0	58.37	6.05	.759
Gilders, and liners, female:								
Group 1	11	50	9.5	72.9	7.7	43.07	4.52	.591
Group 2	9	29	11.0	79.9	7.3	53.30	4.86	.667
Group 3	17	238	9.3	68.5	7.3	34.53	3.70	.504
Group 4	2	19	8.1	61.0	7.6	34.51	4.29	.566
Group 5	3	20	10.7	95.9	9.0	39.97	3.75	.417
Total	42	356	9.5	71.2	7.5	37.56	3.95	.528
Transferrers, decalcomania and print, female:								
Group 1	11	277	9.0	74.8	8.3	32.41	3.58	.433
Group 2	11	168	9.7	78.0	8.0	33.05	3.41	.424
Group 3	18	487	9.2	76.4	8.3	25.77	2.79	.337
Group 4	3	29	7.4	57.4	7.8	23.32	3.16	.406
Group 5	3	61	10.4	87.6	8.5	24.63	2.38	.281
Total	46	1,022	9.3	76.4	8.2	28.63	3.09	.375
Kiln placers and drawers, decorating, male:								
Group 1	11	43	9.7	76.4	7.9	69.34	7.15	.908
Group 2	11	21	10.8	81.0	7.5	60.16	5.57	.742
Group 3	18	76	9.0	71.7	7.9	53.16	5.88	.741
Group 4	3	3	10.0	92.0	9.2	59.86	5.99	.651
Group 5	3	9	10.9	87.2	8.0	45.29	4.16	.520
Total	46	152	9.6	75.6	7.9	58.37	6.08	.772

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TABLE 1.—AVERAGE DAYS, HOURS, AND EARNINGS IN THE POTTERY INDUSTRY, BY OCCUPATION, SEX, AND GROUP OF PLANTS, 1925—Continued

Occupation, sex, and group	Number of—		Average number of days worked in two weeks	Average hours worked		Average earnings		
	Establishments	Employees		In two weeks	Per day	In two weeks	Per day	Per hour
Semivitreous ware—Group 1 to 5—Contd.								
Packers, male:								
Group 1	11	46	9.3	67.1	7.2	$56.64	$6.06	$0.844
Group 2	11	23	8.4	61.1	7.3	50.94	6.07	.833
Group 3	18	57	10.4	75.2	7.2	65.32	6.29	.869
Group 4	3	5	10.0	75.4	7.5	65.89	6.59	.874
Group 5	3	4	11.5	87.7	7.6	65.85	5.73	.751
Total	46	135	9.7	70.4	7.2	59.95	6.17	.851
Total, male:								
Group 1	11	2,194	9.0	72.8	8.1	54.02	6.02	.742
Group 2	11	1,037	8.6	67.3	7.8	48.56	5.64	.721
Group 3	18	2,794	9.4	76.6	8.1	53.62	5.68	.700
Group 4	3	228	8.0	65.1	8.1	43.36	5.40	.666
Group 5	3	4.13	10.9	90.5	8.3	50.89	4.68	.562
Total	46	6,666	9.2	74.4	8.1	52.44	5.70	.705
Total, female:								
Group 1	11	1,083	8.8	69.8	7.9	28.85	3.26	.413
Group 2	11	531	8.6	65.7	7.7	27.21	3.18	.414
Group 3	18	1,729	8.9	68.1	7.7	25.07	2.82	.368
Group 4	3	121	8.2	66.1	8.0	24.89	3.03	.377
Group 5	3	193	10.3	83.6	8.1	25.94	2.53	.310
Total	46	3,657	8.9	69.0	7.8	26.54	2.99	.385
Total, male and female:								
Group 1	11	3,277	8.9	71.8	8.0	45.70	5.12	.636
Group 2	11	1,568	8.6	66.8	7.8	41.23	4.81	.619
Group 3	18	4,523	9.2	73.3	8.0	42.71	4.63	.582
Group 4	3	349	8.1	65.5	8.1	36.95	4.57	.565
Group 5	3	606	10.7	88.3	8.3	42.95	4.02	.486
Total	46	10,323	9.1	72.5	8.0	43.27	4.76	.596
Vitreous ware—Group 6								
Slip makers, male	6	6	11.5	106.1	9.2	77.16	6.71	.727
Laborers, slip house, male	7	42	9.9	88.1	8.9	44.59	4.52	.506
Batters-out, male	7	81	9.4	78.4	8.4	32.42	3.46	.414
Jigger men	7	101	9.9	82.1	8.3	72.70	7.41	.898
Mold runners, male	5	48	9.2	71.2	7.7	28.31	3.08	.398
Finishers, female	7	79	9.7	77.2	7.9	30.49	3.14	.395
Turners, male	7	37	9.7	77.5	8.0	66.38	6.84	.857
Handlers, male	7	23	10.6	89.2	8.4	82.24	7.75	.922
Casters, male	6	35	10.1	89.5	8.9	72.94	7.23	.815
Laborers, sagger shop, male	6	71	10.5	90.0	8.6	43.34	4.12	.481
Sagger makers, hand, male	6	16	8.4	65.2	7.8	65.85	7.86	1.010
Sagger makers, machine, male	3	8	11.3	83.4	7.4	77.98	6.93	.935
Kiln placers, bisque, male	7	68	9.6	62.9	6.6	63.07	6.57	1.002
Kiln drawers, bisque and glost, male	5	48	10.6	72.6	6.9	49.26	4.65	.678
Drawers (in warehouse), bisque and glost, female	5	42	10.7	73.6	6.9	22.04	2.05	.300
Brushers, female	5	38	10.2	79.7	7.8	22.70	2.24	.285
Dippers, male	7	28	10.6	79.6	7.5	72.97	6.88	.917
Dippers' helpers, male	7	44	9.7	75.6	7.8	27.93	2.89	.369
Kiln placers, glost, male	7	73	10.2	71.3	7.0	68.73	6.73	.964
Dressers, male	5	39	11.1	89.9	8.1	45.23	4.06	.503
Dressers, female	7	84	9.3	70.8	7.6	18.66	2.01	.263
Warehousemen	6	35	10.9	94.7	8.7	50.30	4.62	.531
Gilders and liners, male	6	66	10.7	83.1	7.8	74.25	6.94	.893
Gilders and liners, female	7	54	9.4	71.4	7.6	45.28	4.80	.634
Transferers, decalcomania and print, female	7	474	9.9	77.7	7.8	25.77	2.59	.332
Printers, male	7	42	10.1	79.7	7.9	61.10	6.07	.766
Kiln placers and drawers, decorating, male	6	17	10.6	86.4	8.1	53.52	5.03	.619
Packers, male	7	21	10.4	86.4	8.3	56.45	5.41	.654
All occupations, male	7	1,619	10.2	83.5	8.2	53.25	5.25	.638
All occupations, female	7	1,065	10.0	77.4	7.7	25.47	2.55	.329
All occupations, male and female	7	2,684	10.1	81.1	8.0	42.23	4.19	.521

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The number of glost kilns drawn by the pottery industry as a whole during a specified period of time and the amount of the pay-roll totals are each indicative of the general trend of business and of employment during that period.

To obtain an index of production and thus be able to show approximately the trend of the pottery industry, the bureau obtained the number of glost kilns drawn each month, January, 1923, to September, 1925, whenever available, from the records from each of the potteries included in the study. Glost kilns drawn do not of course perfectly represent the amount of employment in a pottery as a whole, as stock may accumulate preparatory to firing or the glost kiln may be unusually active for a short time and draw on accumulated stock. Index numbers based on the aggregate number of glost kilns drawn appear in Table 2 together with index numbers of wages paid as taken from pay-roll totals.

The bureau for several years has been receiving monthly reports as to the number of employees and pay-roll totals for the pay period of each month that ends nearest the 15th, from a large number of manufacturing establishments, including the majority of the potteries covered in this wage study. During the wage study pay-roll totals were obtained from most of the other potteries visited.

Nearly all potteries have a two-week pay roll; thus the employment reports in the main speak for the first half of each month. The bureau in its employment study has felt that it could not ask for a report for every pay period during the year. When pay rolls are assembled in large numbers the one pay period of the month is considered fairly representative of the month as a whole.

In this wage study it was not deemed expedient to ask the potteries to go back through old records to get out pay-roll data to furnish full-month pay-roll figures. Thus, the glost kilns drawn represented the full month with its variable number of working days while the pay-roll totals roughly represent the first half of each month. However, with this limitation, the trend of the figures through the 33-month period fairly represent production and employment conditions of the industry. No wage adjustments of any importance were made during the period covered.

During the wage study the semivitreous potteries especially generally complained of the depressed conditions of their industry as compared with 1923 and the early part of 1924 and also as compared with the busy years preceding the depression of 1921. Figures of this table confirm the general statement as to low business since the summer of 1924. The employers in a few vitreous plants spoke in a little more hopeful way, which their figures appear to warrant.

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TABLE 2.—INDEX NUMBERS OF PRODUCTION AND OF EMPLOYMENT IN THE POTTERY INDUSTRY, JANUARY, 1923, TO SEPTEMBER, 1925

[January, 1923=100.0]

Year and month	Index numbers				Year and month	Index numbers			
	Semivitreous		Vitreous			Semivitreous		Vitreous	
	Glost kilns drawn	Amount of pay rolls	Glost kilns drawn	Amount of pay rolls		Glost kilns drawn	Amount of pay rolls	Glost kilns drawn	Amount of pay rolls
1923					1924				
January	100.0	100.0	100.0	100.0	June	102.0	110.8	114.9	138.8
February	94.5	103.6	96.2	102.8	July	71.3	62.2	98.6	108.2
March	114.6	105.3	111.5	112.2	August	94.9	100.4	89.5	124.7
April	107.7	111.9	106.4	114.1	September	91.7	99.2	100.7	127.1
May	114.4	112.1	106.4	115.6	October	93.4	102.1	103.7	122.7
June	109.3	111.2	109.0	120.5	November	81.6	90.4	90.5	125.7
July	84.8	87.0	91.0	108.6	December	81.5	103.4	94.6	124.5
August	110.8	109.6	102.6	120.6	1925				
September	108.0	110.2	103.9	125.2	January	88.9	94.4	77.3	117.4
October	112.7	114.5	114.1	132.1	February	96.4	107.6	83.4	120.7
November	112.4	119.3	109.0	129.3	March	99.2	108.9	93.6	121.9
December	97.6	122.9	107.7	138.9	April	95.8	104.8	95.6	116.8
1924					May	93.8	100.4	85.4	116.6
January	112.1	111.6	111.5	136.5	June	83.3	91.1	101.7	121.3
February	114.2	122.5	105.1	140.1	July	64.6	46.7	87.5	106.9
March	118.7	123.8	118.0	138.9	August	87.4	97.6	84.4	122.2
April	115.6	124.2	119.0	142.5	September	87.8	92.6	94.6	117.5
May	116.5	120.9	118.0	139.0					

Earnings of Steam Railroad Employees, 1926

EACH year the Interstate Commerce Commission publishes a summary of wage statistics of Class I steam roads in the United States, including switching and terminal companies. The report for the year 1926 covered 1,805,780 employees. The following table has been drawn from the summary for the two years stated. "Total time worked," as shown in the table, includes both straight time and overtime.

EARNINGS OF STEAM RAILROAD EMPLOYEES IN 1925 AND 1926

[D=days; H=hours]

Occupation	1926					1925: Average earnings per day or hour
	Average number of employees	Average time worked per employee (days or hours) during year		Average earnings per employee		
		Unit	Total time [1]	Per year	Per day or hour	
I. Executives, officials, and staff assistants						
Executives, general officers, and assistants	7,442	D	307	$7,039	$22.93	$22.48
Division officers, assistants, and staff assistants	9,406	D	321	4,003	12.47	12.42
Total	16,848	D	315	5,344	16.97	16.81
II. Professional, clerical, and general						
Architectural, chemical, and engineering assistants (A)	3,091	D	305	2,953	9.68	9.56
Architectural, chemical, and engineering assistants (B)	4,254	D	303	2,245	7.41	7.36

[1] Includes both regular and overtime.

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EARNINGS OF STEAM RAILROAD EMPLOYEES IN 1925 AND 1926—Continued

Occupation	1926					1925: Average earnings per day or hour
	Average number of employees	Average time worked per employee (days or hours) during year		Average earnings per employee		
		Unit	Total time	Per year	Per day or hour	
II. Professional, clerical, and general—Continued						
Subprofessional engineering and laboratory assistants	3,906	D	305	$1,627	$5.33	$5.34
Professional and subprofessional legal assistants	565	D	305	2,782	9.12	8.81
Supervisory or chief clerks (major departments)	5,099	D	307	2,856	9.30	9.21
Chief clerks (minor departments) and assistants	13,175	D	304	2,226	7.32	7.25
Clerks and clerical specialists (A)	13,520	H	2,361	1,959	.830	.818
Clerks (B)	135,273	H	2,410	1,561	.648	.643
Clerks (C)	18,847	H	2,440	1,244	.510	.506
Mechanical device operators (office)	8,443	H	2,220	1,315	.592	.586
Stenographers and secretaries (A)	3,619	H	2,367	1,844	.779	.766
Stenographers and typists (B)	21,820	H	2,277	1,414	.621	.616
Storekeepers, sales agents, and buyers	3,248	H	2,500	2,072	.829	.823
Ticket agents and assistant ticket agents	1,675	H	2,679	2,139	.798	.783
Traveling auditors or accountants	1,996	D	300	2,552	8.51	8.40
Switchboard operators and office assistants	5,228	H	2,292	921	.402	.398
Messengers and office boys	6,634	D	306	702	2.29	2.28
Elevator operators and other attendants	1,274	H	2,563	1,012	.395	.393
Lieutenants and sergeants of police	2,473	D	346	2,059	5.95	5.91
Patrolmen	5,888	H	3,218	1,772	.551	.550
Watchmen (without police authority)	3,281	H	3,039	1,238	.407	.406
Supervising traffic agents	1,660	D	305	3,654	11.98	11.83
Traffic, advertising, and development agents	6,915	D	305	2,615	8.57	8.47
Fire and time-service inspectors and office superintendents	431	D	319	2,457	7.70	7.50
Claim agents and investigators	1,809	D	301	2,611	8.67	8.57
Real estate and tax agents and investigators	399	D	300	2,759	9.20	8.99
Examiners, instructors, and special investigators	569	D	316	2,802	8.87	8.83
Miscellaneous trades workers (other than plumbers)	710	H	2,357	1,719	.729	.727
Motor-vehicle operators	1,514	H	2,592	1,332	.514	.512
Teamsters and stablemen	127	H	2,513	1,473	.586	.544
Janitors and cleaners	7,896	H	2,514	940	.374	.370
Total: Daily basis	52,976	D	306	2,227	7.28	7.20
Hourly basis	232,363	H	2,425	1,513	.624	.618
III. Maintenance of way and structures						
Roadmasters and general foremen	3,363	D	319	2,981	9.34	9.33
Assistant general foremen	356	D	317	2,655	8.38	8.34
Supervising and scale inspectors	340	H	2,470	2,264	.917	.906
Inspectors	680	H	2,528	2,146	.849	.848
Bridge and building workers:						
Gang foremen (skilled labor)	5,610	H	2,528	2,049	.811	.807
Carpenters	23,489	H	2,434	1,476	.606	.603
Ironworkers	1,075	H	2,441	1,752	.718	.711
Painters	3,341	H	2,338	1,423	.609	.604
Masons, bricklayers, plasterers, and plumbers	2,345	H	2,518	1,833	.728	.724
Skilled trades helpers	11,333	H	2,394	1,175	.491	.489
Regular apprentices	61	H	2,471	1,071	.433	.421
Portable steam equipment operators	2,453	H	2,843	2,000	.703	.692
Portable steam equipment operators' helpers	908	H	2,939	1,416	.482	.477
Pumping equipment operators	5,469	H	2,992	1,007	.337	.334
Gang foremen:						
Extra gang and work-train laborers	4,665	H	2,709	1,709	.631	.623
Bridge and building, signal and telegraph laborers	610	H	2,592	2,050	.791	.787
Gang or section foremen	39,695	H	2,558	1,525	.596	.591
Laborers:						
Extra gang and work-train	67,517	H	2,552	943	.370	.366
Track and roadway section	213,389	H	2,470	884	.358	.356
Other than track and roadway	9,180	H	2,444	918	.376	.371
Signal, telegraph, and electrical transmission:						
General foremen and supervising inspectors	539	D	319	3,043	9.54	9.51
Assistant general foremen and inspectors	649	D	314	2,636	8.39	8.43
Gang foremen (signal and telegraph skilled trades)	1,520	H	2,566	2,383	.929	.929
Linemen and groundmen	2,668	H	2,513	1,803	.717	.707
Signal men and maintainers	9,244	H	2,529	1,923	.760	.754
Signal men and maintainer helpers	4,293	H	2,422	1,219	.503	.496
Assistant signal men and maintainers	3,376	H	2,427	1,445	.595	.597
Total: Daily basis	4,907	D	318	2,918	9.18	9.17
Hourly basis	413,261	H	2,501	1,092	.437	.435

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EARNINGS OF STEAM RAILROAD EMPLOYEES IN 1925 AND 1926—Continued

Occupation	1926					1925: Average earnings per day or hour
	Average number of employees	Average time worked per employee (days or hours) during year		Average earnings per employee		
		Unit	Total time	Per year	Per day or hour	
IV. Maintenance of equipment and stores						
General foremen (maintenance)	1,464	D	329	$3,622	$11.01	$10.96
Assistant general foremen and department foremen (maintenance)	11,338	D	329	3,113	9.46	9.43
General foremen (stores)	302	D	310	2,139	6.90	6.81
Assistant general foremen (stores)	172	D	305	1,991	6.53	6.53
Equipment, shop, and electrical inspectors (maintenance)	1,731	D	312	2,618	8.39	8.39
Material and supplies inspectors	1,994	D	306	2,139	6.99	6.88
Gang foremen and gang leaders (skilled labor)	11,737	H	2,782	2,631	.946	.939
Blacksmiths	9,042	H	2,316	1,850	.799	.786
Boilermakers	19,329	H	2,409	1,925	.799	.787
Carmen (A)	22,084	H	2,376	1,814	.763	.754
Carmen (B)	4,356	H	2,267	1,780	.785	.773
Carmen (C)	84,446	H	2,475	1,749	.707	.696
Carmen (D)	2,237	H	2,258	1,608	.712	.703
Electrical workers (A)	7,185	H	2,577	1,987	.771	.762
Electrical workers (B)	2,777	H	2,568	1,827	.711	.706
Electrical workers (C)	311	H	2,930	2,020	.689	.667
Machinists	60,874	H	2,407	1,898	.789	.778
Molders	1,260	H	2,181	1,872	.858	.836
Sheet-metal workers	11,636	H	2,412	1,897	.786	.776
Skilled trades helpers	114,574	H	2,425	1,322	.545	.536
Helper apprentices	7,594	H	2,298	1,320	.574	.567
Regular apprentices	14,011	H	2,248	963	.428	.405
Shops, engine houses, power plants, and stores:						
Gang foremen laborers	4,186	H	2,682	1,626	.606	.597
Laborers	43,146	H	2,796	1,135	.406	.404
Common laborers	60,459	H	2,408	974	.404	.402
Coach cleaners	12,896	H	2,730	1,121	.411	.404
Stationary engineers (steam)	2,532	H	2,881	1,944	.675	.670
Stationary firemen and oilers (steam and electrical plants)	5,580	H	2,876	1,582	.550	.548
Coal passers and water tenders (steam station boiler rooms)	599	H	2,852	1,360	.477	.476
Total: Daily basis	17,001	D	324	2,964	9.15	9.15
Hourly basis	502,851	H	2,476	1,517	.613	.604
V. Transportation (other than train, engine, and yard)						
Chief train dispatchers, and train dispatchers and directors	5,418	H	2,626	3,233	1.231	1.223
Station agents:						
Supervisory, major station, nontelegraphers	2,496	D	323	3,031	9.38	9.28
Supervisory, smaller stations, nontelegraphers	5,431	H	2,664	2,101	.789	.775
Nonsupervisory, smaller stations, nontelegraphers	3,584	H	2,545	1,226	.482	.473
Telegraphers and telephoners	19,170	H	2,737	1,753	.640	.634
Chief telegraphers and telephoners or wire chiefs	845	H	2,815	2,427	.862	852
Clerk-telegraphers and clerk-telephoners	13,836	H	2,793	1,736	.622	613
Telegraphers, telephoners, and towermen	25,656	H	2,803	1,803	.643	632
Station masters and assistants	517	D	349	2,455	7.03	6.96
Supervising baggage agents	133	D	332	2,144	6.46	6.41
Baggage agents and assistants	772	H	2,884	1,677	.581	.574
Baggage, parcel room, and station attendants	9,416	H	2,696	1,225	.454	450
Freight stations, warehouses, grain elevators, and docks:						
General foremen	553	H	2,580	2,181	.845	.840
Assistant general foremen	442	H	2,557	1,951	.763	.753
Gang foremen	3,623	H	2,584	1,715	.664	.660
Callers, loaders, scalers, sealers, perishable freight inspectors	15,810	H	2,468	1,297	526	.524
Truckers (stations, warehouses, and platforms)	39,256	H	2,474	1,110	449	.447
Laborers:						
Coal and ore docks and grain elevators	1,781	H	2,853	1,508	.529	.527
Stations, warehouses, platforms, and grain elevators	4,203	H	2,636	1,101	.418	.413

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EARNINGS OF STEAM RAILROAD EMPLOYEES IN 1925 AND 1926—Continued

Occupation	1926					1925: Average earnings per day or hour
	Average number of employees	Average time worked per employee (days or hours) during year		Average earnings per employee		
		Unit	Total time	Per year	Per day or hour	
V. Transportation (other than train, engine, and yard)—Continued						
Stewards, restaurant, etc., managers, and dining-car supervisors	1,723	H	3,216	$2,016	$0.627	$0.622
Chefs and first cooks (dining cars and restaurants)	1,643	H	3,194	1,750	.548	.542
Second and third cooks (dining cars and restaurants)	2,959	H	3,172	1,207	.381	.379
Waiters and lodging-house attendants	6,998	H	3,188	828	.260	.258
Camp and crew cooks and kitchen helpers	3,844	H	2,941	920	.313	.308
Barge, lighter, etc., officers and workers	2,145	H	3,411	1,890	.554	.546
Ferryboats and towing vessels:						
Deck officers	932	H	2,804	2,485	.886	.889
Engine-room officers	899	H	2,794	2,439	.873	.870
Deck and engine-room workers	4,478	H	2,754	1,548	.562	.562
Deck and engine-room officers and workers (steamers)	1,296	H	2,804	949	.338	.349
Floating-equipment shore workers and attendants	986	H	2,718	1,366	.503	.496
Transportation and dining service inspectors	918	D	309	2,451	7.93	7.81
Parlor and sleeping car conductors	59	H	3,099	2,149	.693	.688
Train attendants	3,567	H	2,675	1,156	.432	.427
Bridge operators and helpers	1,363	H	2,996	1,338	.447	.442
Crossing and bridge flagmen and gatemen	22,315	D	360	903	2.51	2.48
Foremen (laundry) and laundry workers	401	H	2,523	1,032	.409	.407
Total: Daily basis	26,379	D	355	1,195	3.37	3.32
Hourly basis	183,089	H	2,702	1,505	.557	.552
VI. (a) Transportation (yardmasters, switch tenders, and hostlers)						
Yardmasters and assistants	7,159	D	349	3,119	8.94	8.91
Switch tenders	5,771	H	2,787	1,694	.608	.603
Outside hostlers	2,606	H	2,960	2,254	.761	.759
Inside hostlers	6,677	H	2,769	1,897	.685	.684
Outside hostler helpers	2,023	H	2,892	1,755	.607	.602
Total: Daily basis	7,159	D	349	3,119	8.94	8.91
Hourly basis	17,077	H	2,819	1,866	.662	.659
VI. (b) Transportation (train and engine)						
Road passenger service:						
Conductors	10,481	H	2,395	2,973	1.241	1.219
Assistant conductors and ticket collectors	1,229	H	2,455	2,481	1.011	1.009
Baggagemen	5,768	H	2,467	2,239	.908	.891
Brakemen and flagmen	14,072	H	2,268	2,015	.888	.869
Engineers and motormen	13,027	H	2,143	3,211	1.498	1.471
Firemen and helpers	12,496	H	2,063	2,409	1.168	1.140
Road freight service:						
Conductors (through freight)	16,196	H	2,856	2,785	.975	.969
Conductors (local and way freight)	9,537					
Brakemen and flagmen (through freight)	37,494	H	2,704	2,090	.773	.767
Brakemen and flagmen (local and way freight)	24,082					
Engineers and motormen (through freight)	21,903	H	2,742	3,201	1.167	1.156
Engineers and motormen (local and way freight)	9,660					
Firemen and helpers (through freight)	23,714	H	2,571	2,270	.883	.873
Firemen and helpers (local and way freight)	9,830					
Yard service:						
Conductors and foremen	22,066	H	2,721	2,420	.889	.884
Brakemen and helpers	55,334	H	2,513	2,057	.819	.814
Engineers and motormen	22,253	H	2,680	2,512	.937	.933
Firemen and helpers	22,727	H	2,602	1,898	.729	.726
Total	331,869	H	2,587	2,384	.922	.915
Grand total: Daily basis	125,270	D	323	2,607	.806	.794
Hourly basis	1,680,510	H	2,525	1,585	.628	.624

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Wages and Hours of Labor in Sawmills, 1925

A SURVEY of hours of labor and earnings in the lumber manufacturing industry in the United States was made during the summer of 1925 and covered 23 States.[11] Schedules were obtained from 299 representative sawmills, the data being copied directly from the establishment pay rolls. The number of employees scheduled was 61,193, approximately 20 per cent of the wage earners in the industry as shown by the United States Census report of 1919. Of the total number of employees scheduled, 38 were women found working in a common-labor capacity in 5 mills in 4 States and were not included in the following tables. Owing to the fact that some employees were found working at more than one occupation during the pay period scheduled, some duplications were necessary in order to show each occupation separately.

The comparative changes in wage rates and hours in the industry as a whole are shown by the following table of index numbers for the years indicated, from 1910 to 1925, on the basis of 1913 as 100:

TABLE 1.—INDEX NUMBERS OF HOURS AND EARNINGS IN SAWMILLS IN SPECIFIED YEARS, 1910 TO 1925

[1913=100]

Year	Full-time hours per week	Earnings per hour	Full-time earnings per week
1910	100	97	98
1911	100	95	96
1912	101	96	97
1913	100	100	100
1915	100	91	91
1919	92	194	179
1921	94	166	156
1923	94	180	170
1925	94	178	168

The customary hours worked by the industry were quite uniform from 1910 to 1915. During the war period the hours were reduced 8 per cent from the 1913 hours, as shown by the index number 92 for 1919; from 1921 to 1925 the hours worked were 6 per cent less than in 1913.

The earnings per hour fluctuated somewhat from 1910 to 1915, ranging from an index of 91 in 1915 to 100 in 1913. In 1919 the rate jumped sharply, increasing 94 per cent over the 1913 earnings. In 1921 the rate dropped about 14 per cent from 1919, as indicated by the index 166. In 1923 it increased to 180 and dropped back only 2 points in 1925. Full-time earnings per week showed about the same relative fluctuations as the earnings per hour.

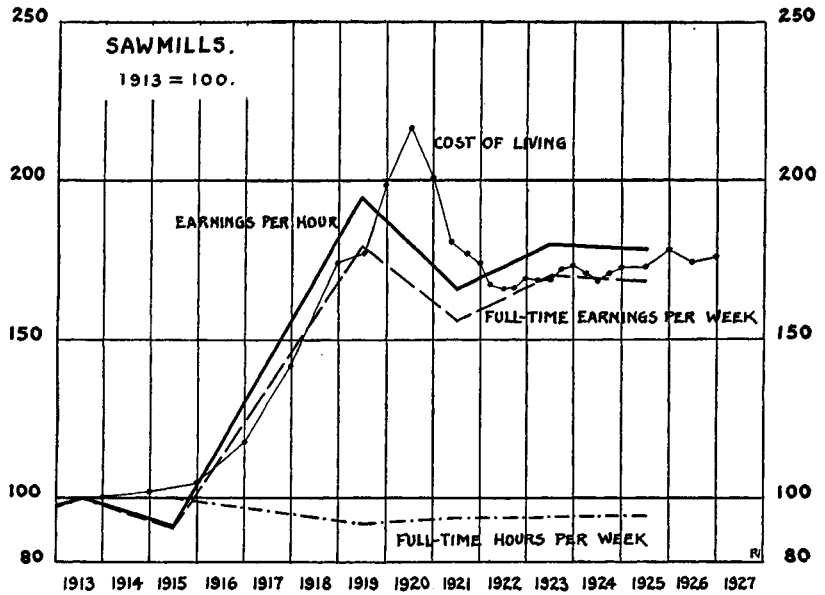
Table 2 shows average full-time hours per week, average earnings per hour, and average full-time weekly earnings for the employees in 11 selected occupations in 1925. All of the remaining employees are grouped under "Other employees." Comparative figures are also shown for 1923.

The figures for 1925 show an increase in full-time hours, when compared with 1923, in each of 8 occupations and a decrease in 1 occupation. In 2 occupations no change occurs.

[11] For complete report see Bul. No. 413.

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In comparing the earnings per hour for the years 1923 and 1925 a decrease is shown in 10 occupations and an increase in 1 occupation. Full-time earnings per week show decreases in 8 occupations and increases in 3 occupations.



In the group of "Other employees," hours and earnings both increased between 1923 and 1925.

TABLE 2.—AVERAGE HOURS AND EARNINGS FOR 11 SELECTED OCCUPATIONS IN SAWMILLS, 1923 AND 1925

[1913=100]

Occupation	Year	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time earnings per week
Sawyers, head, band	1923	230	529	57.0	$0.883	$50.33
	1925	274	644	57.7	.877	50.60
Sawyers, head, circular	1923	35	45	58.2	.862	50.17
	1925	42	57	58.2	.816	47.49
Doggers	1923	238	1,008	57.6	.343	19.76
	1925	285	1,170	58.2	.332	19.32
Setters	1923	251	706	57.0	.474	27.02
	1925	299	832	57.5	.458	26.34
Saw tailers, head saw	1923	252	677	57.0	.364	20.75
	1925	299	786	57.3	.349	20.00
Sawyers, gang	1923	55	80	56.1	.584	32.76
	1925	75	110	57.9	.581	33.64
Sawyers, resaw	1923	131	259	55.7	.493	27.46
	1925	152	296	55.9	.489	27.34
Edgermen	1923	252	738	57.1	.492	28.09
	1925	298	911	57.8	.468	27.05
Trimmer operators	1923	252	504	56.9	.430	24.47
	1925	299	600	57.7	.409	23.60
Machine feeders, planing mill	1923	143	900	57.6	.355	20.45
	1925	217	1,535	55.8	.390	21.76
Laborers	1923	252	25,316	57.5	.310	17.83
	1925	299	36,698	57.5	.309	17.77
Other employees	1923	252	14,306	59.4	.417	24.77
	1925	299	17,516	59.6	.419	24.97
All employees	1923	252	45,068	58.1	.362	21.03
	1925	299	61,193	58.1	.357	20.74

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Average full-time hours per week, average earnings per hour, and average full-time earnings per week as of 1925 are shown by States for laborers and head band sawyers in Table 3. These two occupations are shown in detail, as one represents the great mass of unskilled employees and the other represents the most highly skilled and the highest paid employees in the industry.

Of the 299 establishments, 257 reported head sawyers on band saws, 25 reported head sawyers on circular saws, and 17 reported head sawyers on both band and circular saws. The full-time hours per week of head sawyers, band, ranged from 48 hours in the States of Idaho, Oregon, and Washington to 62.1 hours in South Carolina; the average for all States combined was 57.7 hours. Average earnings per hour in this occupation ranged from 66.9 cents in Pennsylvania to $1.14 in Washington; and the average for all States combined was 87.7 cents. Average full-time weekly earnings ranged from $39.67 in Pennsylvania to $63.54 in Florida. Although Washington leads in average hourly earnings, Florida exceeds her in average weekly earnings by $8.82. This difference is caused by the much smaller number of hours worked in Washington. The average full-time earnings for all States combined was $50.60 per week.

About 60 per cent (36,698) of all employees reported are classified as laborers. Their full-time hours per week ranged from 48 hours in Idaho and Oregon to 60.7 hours in Louisiana; the average for all States combined was 57.5 hours. Average hourly earnings showed a very wide range, the average for South Carolina being 17.3 cents, while in Oregon it was 48.6 cents; the average for all States combined was 30.9 cents. Full-time weekly earnings ranged from $10.48 in South Carolina to $25.27 in California, with an average in all States of $17.77.

TABLE 3.—AVERAGE HOURS AND EARNINGS OF SAWYERS, HEAD, BAND, AND OF LABORERS, BY STATES, 1925

Sawyers, head, band

State	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time earnings per week
Alabama	14	23	60.3	$0.881	$53.12
Arkansas	19	46	60.9	.864	52.62
California	9	36	55.8	1.041	58.09
Florida	12	26	60.0	1.059	63.54
Georgia	9	17	59.8	.828	49.51
Idaho	4	22	48.0	.939	45.07
Kentucky	13	20	58.8	.714	41.98
Louisiana	17	55	60.1	.911	54.75
Maine	9	11	57.6	.718	41.36
Michigan	13	30	59.3	.744	44.12
Minnesota	4	32	60.0	.829	49.74
Mississippi	16	45	59.2	.883	52.27
Montana	4	16	51.3	.990	50.79
North Carolina	18	27	60.7	.711	43.16
Oregon	9	31	48.0	1.131	54.29
Pennsylvania	6	15	59.3	.669	39.67
South Carolina	9	19	62.1	.824	51.17
Tennessee	20	26	58.0	.797	46.23
Texas	9	29	59.7	.866	51.70
Virginia	12	27	59.4	.686	40.75
Washington	20	39	48.0	1.140	54.72
West Virginia	14	25	59.8	.764	45.69
Wisconsin	14	27	59.5	.759	45.16
Total	274	644	57.7	.877	50.60

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TABLE 3.—AVERAGE HOURS AND EARNINGS OF SAWYERS, HEAD, BAND, AND OF LABORERS, BY STATES, 1925—Continued

Laborers

State	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time earnings per week
Alabama	18	2,239	60.4	$0.201	$12.14
Arkansas	19	3,613	60.3	.251	15.14
California	9	1,488	56.4	.448	25.27
Florida	14	1,763	60.0	.242	14.52
Georgia	14	1,101	60.2	.188	11.32
Idaho	4	536	48.0	.468	22.46
Kentucky	14	590	59.0	.286	16.87
Louisiana	20	3,716	60.7	.243	14.75
Maine	12	680	57.4	.315	18.08
Michigan	14	990	59.7	.351	20.95
Minnesota	4	1,119	60.1	.358	21.52
Mississippi	16	2,865	59.7	.240	14.33
Montana	4	518	49.9	.453	22.60
North Carolina	19	1,386	60.2	.213	12.82
Oregon	10	2,470	48.0	.486	23.33
Pennsylvania	6	520	59.2	.372	22.02
South Carolina	11	1,258	60.6	.173	10.48
Tennessee	20	1,193	57.9	.263	15.23
Texas	9	1,610	60.3	.259	15.62
Virginia	12	1,035	59.9	.246	14.74
Washington	22	3,618	48.1	.478	22.99
West Virginia	14	771	59.9	.361	21.62
Wisconsin	14	1,619	59.4	.349	20.73
Total	299	36,698	57.5	.309	17.77

Wages of Seamen, 1926

THE Bureau of Navigation of the United States Department of Commerce compiles detailed data, including wage rates, of seamen in the American merchant marine, with comparative wage rates of other countries. The tables below are compiled from its publication, Merchant Marine Statistics, 1926.

All wages shown in these tables, except American, are taken from consular reports. The American figures are averages taken from reports of shipping commissioners. The wages on foreign vessels are stated in the United States equivalents of the foreign values, taken at the exchange rate on January 1 of the year named. When more than one rate has been reported for foreign vessels, due to length of service or other conditions, the highest is usually given in the table. The wages on American motor ships average about 10 per cent more than on steamships.

Table 1 gives a summary view of the average monthly wage rates of four typical classes of seamen, as of January 1, 1926, for the United States and for certain important foreign countries.

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TABLE 1.—AVERAGE MONTHLY WAGES OF CERTAIN CLASSES OF AMERICAN AND FOREIGN SEAMEN ON STEAM AND MOTOR CARGO VESSELS OF 5,000 GROSS TONS OR OVER, JANUARY 1, 1926

Nationality	Able seamen	Carpenters	Chief engineers	Firemen
American:				
Private	$60	$75	$270	$62
United States Shipping Board	62	72	263	66
British	44	75	152	[1] 50
Danish	48	54	183	49
Dutch	40	46	151	42
French	17	20	127	18
German	22	27	98	[1] 24
Italian	20	23	69	21
Norwegian	[2] 38	[2] 43	[3] 81	[2] 39
Spanish	21	-----	113	21
Swedish	40	46	148	40

[1] 1925.
[2] Wages were somewhat reduced by an agreement in force from May 15, 1926, to Feb. 1, 1927
[3] 1924.

Table 2 gives detailed data, similar to the above, for all classes of seamen and for the three years 1924, 1925, and 1926.

TABLE 2.—AVERAGE MONTHLY WAGES OF AMERICAN AND FOREIGN SEAMEN ON STEAM AND MOTOR CARGO VESSELS OF 5,000 GROSS TONS AND OVER ON JANUARY 1, 1924, 1925, AND 1926

Position	American						British			Danish			Dutch		
	Private			U. S. Shipping Board											
	1924	1925	1926	1924	1925	1926	1924	1925	1926	1924	1925	1926	1924	1925	1926
Deck department:															
First mate	$182	$176	$174	$192	$192	$184	$107	$119	$111	$99	$125	$151	$104	$110	$111
Second mate	159	137	151	168	166	163	73	84	79	77	99	116	79	84	84
Third mate	141	135	135	153	150	149	54	64	58	43	83	66	51	54	54
Fourth mate	122	118	115	145	146	150	45	57	51	-----	78	66	-----	-----	-----
Boatswain	74	72	73	75	74	74	45	55	51	34	-----	54	43	46	46
Carpenter	78	74	75	80	78	72	67	68	75	34	49	54	43	46	46
Seaman, able-bodied	60	59	60	63	62	62	39	48	44	30	43	48	38	40	40
Seaman, ordinary	45	44	45	48	47	47	27	-----	28	15	21	23	19	20	20
Engineer department:															
Chief engineer	285	275	270	272	274	263	142	155	152	120	157	183	142	150	151
Second engineer	184	176	174	192	192	183	107	119	114	86	111	132	96	102	103
Third engineer	160	151	151	168	166	162	73	84	79	63	86	98	68	72	72
Fourth engineer	142	135	136	153	150	147	54	64	58	50	74	77	47	50	46
Junior engineer	-----	-----	-----	-----	130	-----	-----	57	51	-----	40	64	-----	-----	-----
Fireman	63	62	62	65	65	66	45	50	-----	31	38	49	40	42	42
Greaser	70	67	69	73	71	72	45	52	-----	34	-----	49	40	46	46
Water tender	69	68	69	73	73	72	43	52	49	34	42	54	-----	-----	-----
Coal passer or wiper	54	52	53	58	58	58	39	-----	44	21	25	33	32	34	34
Steward department:															
Chief steward	127	131	124	129	130	122	67	78	75	59	63	89	28	-----	-----
Second steward	108	98	100	113	108	100	49	60	61	-----	-----	-----	-----	-----	-----
Cook	108	111	102	111	109	100	62	73	70	43	63	66	55	58	-----
Second cook	84	82	80	90	85	81	41	50	46	21	25	32	-----	52	-----
Mess steward	48	48	49	47	47	47	35	44	40	-----	-----	-----	-----	-----	-----
Mess boy	42	42	41	43	42	42	-----	15	-----	7	13	-----	11	10	-----

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TABLE 2.—AVERAGE MONTHLY WAGES OF AMERICAN AND FOREIGN SEAMEN ON STEAM AND MOTOR CARGO VESSELS OF 5,000 GROSS TONS AND OVER ON JANUARY 1, 1924, 1925, AND 1926—Continued

Position	French			German [1]		Italian [1]		Norwegian			Spanish			Swedish [1]	
	1924	1925	1926	1925	1926	1925	1926	1924	1925	1926 [2]	1924	1925	1926	1925	1926
Deck department:															
First mate	$19	-----	$72	$64	$67	$49	$49	$64	-----	-----	$90	$98	$99	$100	$100
Second mate	19	-----	60	50	53	40	41	53	-----	-----	64	70	71	74	74
Third mate	-----	-----	48	38	40	36	35	38	-----	-----	38	42	42	59	59
Fourth mate	-----	-----	35	30	31	32	-----	-----	-----	-----	-----	-----	-----	-----	-----
Boatswain	-----	$24	20	26	27	26	25	28	$32	$43	26	28	28	46	46
Carpenter	19	24	20	26	27	26	23	28	32	43	-----	-----	-----	46	46
Seaman, able-bodied	17	21	17	19	22	21	20	25	28	38	19	21	21	40	40
Seaman, ordinary	15	18	15	11	12	13	-----	14	15	20	15	17	17	33	33
Engineer department:															
Chief engineer	100	-----	127	93	98	63	69	81	-----	-----	102	112	113	148	148
Second engineer	63	-----	72	64	67	40	41	59	-----	-----	64	70	71	90	90
Third engineer	46	-----	61	50	53	35	35	48	-----	-----	45	49	49	72	72
Fourth engineer	41	-----	50	38	40	-----	-----	-----	-----	-----	-----	-----	-----	55	55
Junior engineer	33	-----	-----	-----	26	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Fireman	19	23	18	24	-----	22	21	25	29	39	19	21	21	40	40
Greaser	19	24	20	25	26	-----	-----	-----	-----	-----	-----	-----	-----	43	43
Water tender	19	24	18	25	26	-----	-----	-----	-----	-----	26	28	28	-----	-----
Coal passer or wiper	17	21	17	19	-----	21	20	15	17	22	18	20	20	28	28
Steward department:															
Chief steward	28	-----	-----	20	24	26	25	48	-----	-----	26	28	28	73	73
Second steward	23	-----	-----	-----	-----	21	22	-----	-----	-----	-----	-----	-----	-----	-----
Cook	30	-----	-----	26	28	23	-----	30	-----	-----	-----	28	28	48	48
Second cook	25	-----	-----	-----	-----	22	-----	-----	-----	-----	-----	-----	-----	32	32
Mess steward	20	-----	-----	11	12	26	25	-----	-----	-----	10	10	11	-----	-----
Mess boy	-----	-----	-----	6	6	12	-----	-----	-----	-----	6	7	7	-----	-----

[1] No report for 1924.
[2] The wages for the positions given below were somewhat reduced by an agreement in force from May 15, 1926, to Feb. 1, 1927.

Table 3 shows the variations in the wage rates of seamen, according to the destination of the vessels.

TABLE 3.—AVERAGE MONTHLY WAGES PAID ON AMERICAN MERCHANT VESSELS OF 500 GROSS TONS AND OVER, 1926, AS REPORTED BY THE SHIPPING COMMISSIONERS

Destination	Steam vessels						
	Able seamen	Boatswains	Carpenters	First mates	Second mates	Firemen	Trimmers
Great Britain	$62	$74	$78	$184	$151	$66	$58
Continental Europe	61	73	78	181	160	65	58
South America	61	73	78	178	157	64	55
West Indies, Mexico, and Central America	61	74	76	173	150	64	56
Atlantic and Gulf coasting trade	62	74	79	170	148	64	55
Asia and Australia	61	74	78	181	159	64	57
Pacific coasting trade	64	92	76	162	141	64	58
Africa	75	74	79	179	158	63	57
Atlantic to Pacific ports, and vice versa	60	72	76	176	152	63	55

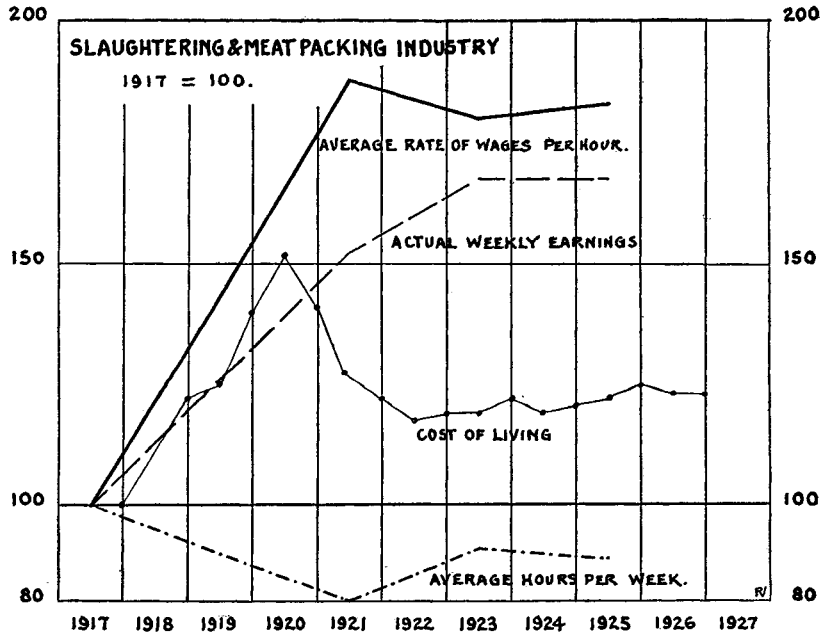
Destination	Steam vessels—Continued		Sailing vessels				
	First engineers	Second engineers	Able seamen	Boatswains	Carpenters	First mates	Second mates
Great Britain	$251	$180	$60	$70	-----	$85	-----
Continental Europe	243	176	60	70	-----	85	-----
South America	245	174	60	70	-----	87	-----
West Indies, Mexico, and Central America	239	167	60	68	-----	84	$70
Atlantic and Gulf coasting trade	228	164	59	69	$70	85	74
Asia and Australia	257	178	63	95	-----	125	-----
Pacific coasting trade	214	157	90	-----	-----	130	110
Africa	241	174	60	75	-----	90	-----
Atlantic to Pacific ports, and vice versa	243	171	68	90	-----	128	115

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Wages and Hours of Labor in the Slaughtering and Meat-Packing Industry, 1925 [12]

THE Bureau of Labor Statistics made studies as to wages and hours of labor in the slaughtering and meat-packing industry in 1917, 1921, 1923, and 1925. Summary figures for 1925 are shown here in comparison with similar figures for the preceding years named. Separate statements are given for the following departments: Cattle killing; hog killing; sheep and calf killing; offal; hide; casing; cutting of fresh beef; cutting of fresh pork; lard and oleo oil; sausage; cured meat; canning; and maintenance and repair.

Data are not collected for the employees in certain of the minor departments in the industry. The groups excluded are : Officials;



office clerks; salesmen; power-house employees; foremen; employees of box, brush, cooper, tin, or other shops in which the products are entirely new; the employees of butterine, mincemeat, produce, extract, soap, curled hair, wool, bone or fertilizer departments.

The 1925 study covered 52,702 males in 86 establishments and 6,595 females in 78 establishments.

The average wage rate per hour for the industry, both sexes combined, was 26.2 cents in 1917; in 1921 it had advanced to 48.9 cents and in 1925 it was 48.3 cents, or 84 per cent higher than in 1917. Because of a temporary shift to another occupation or because of an increased rate for overtime, however, an employee's earnings per hour may differ slightly from the rate for his regular occupation.

[12] For full report see Bul. No. 421.

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Thus in 1925, while the average rate was 48.3 cents per hour, the average earnings per hour were 49.2 cents.

The average rate of wages per hour for all males included in the studies was 27.1 cents in 1917, 50.4 cents in 1921, 48.7 cents in 1923, and 50.1 cents in 1925; and for all females, 17.9 cents in 1917, 36.2 cents in 1921, 35.6 cents in 1923, and 34.7 cents in 1925. The average hourly rates, as also the averages of earnings per hour, full-time hours per week, full-time earnings per week, days and hours worked in one week, and earnings received in one week are shown in Table 1. Part of the same data are shown graphically in the chart on page 794.

TABLE 1.—HOURS, RATES, AND EARNINGS IN THE SLAUGHTERING AND MEAT-PACKING INDUSTRY, 1917, 1921, 1923, AND 1925

Sex and year	Number of establishments	Number of employees	Wages per hour		Average earnings per hour	Average days worked in one week	Average hours per week		Average earnings per week	
			Average rate	Index numbers (1917=100)			Basic or regular	Actually worked	Full time	Actually received
Males:										
1917	66	55,089	$0.271	100	$0.271			54.3		$14.73
1921	34	30,075	.504	189	[1] .511	[1] 5.5	48.4	[1] 43.2	$24.39	[1] 22.10
1923	38	45,083	.487	180	.499	5.6	52.2	49.1	25.42	24.55
1925	86	52,702	.501	183	.507	5.7	50.2	48.2	25.15	24.45
Females:										
1917	51	6,576	.179	100	.178			53.4		9.51
1921	31	3,329	.362	202	[1] .365	[1] 5.7	48.3	[1] 44.3	17.48	[1] 16.17
1923	37	6,112	.356	199	.361	5.5	52.8	45.1	18.80	16.28
1925	78	6,595	.347	194	.359	5.6	49.4	44.7	17.14	16.04
Total:										
1917	66	61,665	.262	100	.262			52.4		14.07
1921	34	33,404	.489	187	[1] .497	[1] 5.5	48.4	[1] 43.1	23.67	[1] 21.45
1923	38	51,195	.472	180	.484	5.6	52.3	48.7	24.63	23.55
1925	86	59,297	.483	184	.492	5.7	50.1	47.8	24.20	23.52

[1] Not including data for one establishment in which employees were paid biweekly.

Hours of labor.—The regular or customary full-time hours per day and per week of each establishment included in the report are as determined by a specified time of beginning work in the morning on each day of the week, for the midday meal, and of quitting work on each day of the week. The hours per day and week may be the same for the employees of two or more occupations or establishments, even though there be a difference in the time of beginning and quitting work. The hours of employees of different establishments may and often do differ on account of difference in time of beginning and quitting work, of the amount of time taken at noon for the midday meal, of a short Saturday, and on account of other causes. The average full-time hours per week for the employees of an occupation are the hours per week of the employees of an occupation weighted by the number of employees in the occupation.

In the 1917 study it was found that each of the 83 packing plants covered in that year had what was then called regular working hours per day and per week. The hours of each plant were established by a time of beginning and quitting work on each day of the week. In actual practice, however, the hours of work at that time varied so much from day to day and week to week that no effort was made to

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compute averages for that year for any occupation or for the industry. The nominal hours of the 83 plants covered in 1917 as fixed by time of beginning and quitting work were 60 per week in 73 plants, 55 in 4 plants, and from 52½ to 57½ per week in 6 plants.

The average full-time hours per week of males in all occupations and departments combined were 48.4 in 1921, 52.2 in 1923, and 50.2 in 1925, and the hours of females were 48.3 in 1921, 52.8 in 1923, and 49.4 in 1925. The approximate 10-hour day in 1917 was reduced to an approximate 8-hour day in 1918 by Judge Samuel Alschuler, of Chicago, who at that time, as United States administrator, was adjusting differences between employers and employees in the slaughtering and meat-packing industry. In July, 1922, however, the 9-hour day and 54-hour week was inaugurated by many of the plants covered in 1921 and 1923, a fact which affected the average full-time hours of all employees combined, shown above.

Guaranteed hours of pay.—Of the 86 plants covered in the 1925 study, the employees in a few of the important occupations in 3 plants and in a few of the important departments in 9 plants, and all of the employees of 43 plants have by agreement or promise, the assurance of pay for a specified number of hours per day or week. This assures to these employees pay at their regular rate for the specified number of hours whenever the hours of work are less than the guaranteed hours of pay. To be entitled to pay it is necessary for the employee to report for duty and work all the hours of operation on each day or in each week. The guaranty by 51 plants is 40 hours per week. A few of these guarantee 6⅔ hours' pay for each day the employee reports for duty and does any work. One plant guarantees 30 hours, one 45, one 48, and one 57¾ hours per week. There is no guaranty, however, in 31 of the 86 plants included in the study.

Overtime.—Overtime is generally understood to mean any time worked by employees on any regular workday or in any full week in excess of the regular or customary full-time hours per day or per week as determined by the regular time of beginning work on each day, minus the regular time taken for lunch. Many (38) of the plants in this industry covered in 1925, report that the overtime rate of time and a half begins not with the completion of the regular hours per day or week, but after the completion of a fixed number of hours. Thus, for instance, 14 plants whose full-time hours are 8 per day and 48 per week pay extra for overtime only after 10 hours per day or 54 hours per week.

Fourteen plants pay time and a half for all overtime, while 34 plants pay only the regular rate.

Work on Sundays and holidays.—In this industry work on Sundays and holidays is limited to a very small per cent of the employees of a plant and usually to only a small per cent of the mechanics in the maintenance and repair department who repair buildings and equipment. Work on holidays is not frequent. Provision is made for payment of double the regular rate for this work by 21 of the plants, of 1½ times the regular rate by 32 plants, and for payment of the regular rate by 33 plants.

Table 2 shows the hours, rates, and earnings of employees in several of the principal occupations in five departments in the years 1923 and 1925, by sex. The list of occupations is long, and figures

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for all of them are shown in the Labor Review for May, 1926, and in Bulletin No. 421, but to conserve space in this publication only a few occupations in each department can be presented.

TABLE 2.—HOURS, RATES, AND EARNINGS IN THE SLAUGHTERING AND MEAT PACKING INDUSTRY, 1923 AND 1925, BY DEPARTMENT, SEX, AND SPECIFIED OCCUPATION

Cattle-killing department

Sex and occupation	Year	Number of establishments	Number of employees	Average rate of wages per hour	Average earnings per hour	Average days worked in one week	Average hours per week		Average earnings per week	
							Basic or regular	Actually worked	Full-time	Actually received
Males										
Drivers and penners	1923	30	87	$0.447	$0.458	5.7	53.0	50.7	$23.69	$23.22
	1925	58	178	.468	.473	5.8	51.7	52.1	24.20	24.64
Knockers	1923	29	48	.504	.525	5.5	52.4	48.5	26.41	25.47
	1925	53	79	.516	.537	5.6	49.2	49.3	25.39	26.47
Headers	1923	28	79	.615	.627	5.7	52.1	45.7	32.04	28.65
	1925	51	120	.632	.641	5.5	50.0	48.1	31.60	30.80
Foot skinners	1923	28	92	.492	.498	5.7	52.4	45.7	25.78	22.74
	1925	44	117	.495	.515	5.4	49.6	46.7	24.55	24.01
Leg breakers	1923	30	117	.532	.529	5.6	52.8	43.8	28.09	23.20
	1925	55	181	.556	.558	5.4	49.9	46.3	27.74	25.83
Floormen or siders	1923	34	195	.849	.849	5.7	52.6	46.0	44.66	39.09
	1925	62	272	.849	.856	5.6	49.9	48.1	42.37	41.12
Hoisters	1923	27	96	.467	.476	5.6	52.1	46.9	24.33	22.34
	1925	40	158	.475	.494	5.4	49.4	45.5	23.47	22.48
Backers	1923	31	85	.773	.778	5.6	52.5	45.1	40.58	35.09
	1925	51	108	.773	.782	5.6	49.8	48.7	38.50	38.08
Gutters and bung droppers	1923	33	94	.545	.554	5.8	52.5	47.5	28.61	26.33
	1925	55	121	.556	.575	5.5	50.1	47.1	27.86	27.05
Hide droppers	1923	32	107	.660	.652	5.6	52.6	46.6	34.72	30.41
	1925	54	139	.663	.655	5.6	49.8	48.4	33.02	31.74
Tail sawyers	1923	27	106	.535	.552	5.5	52.4	45.6	28.03	25.13
	1925	46	114	.540	.547	5.7	50.2	49.8	27.11	27.59
Splitters	1923	33	108	.837	.857	5.8	52.5	47.9	43.94	41.08
	1925	57	149	.852	.855	5.7	50.0	49.3	42.60	42.14
Trimmers (bruises, rounds, skirts, and tails).	1923	25	166	.458	.465	5.8	52.6	47.4	24.09	22.06
	1925	35	152	.479	.496	5.7	49.5	49.9	23.71	24.74
Washers and wipers	1923	31	320	.424	.458	5.6	52.5	42.7	22.26	19.59
	1925	61	264	.423	.440	5.3	50.1	45.9	21.19	20.18
Laborers	1923	32	587	.427	.436	5.5	52.2	45.3	22.29	19.77
	1925	63	949	.424	.442	5.5	50.2	48.1	21.28	21.32
Truckers	1923	24	131	.423	.433	5.2	51.8	43.9	21.91	19.04
	1925	45	121	.435	.455	5.2	50.4	45.9	21.92	20.89
Females										
Carcass wipers, bruise and tail trimmers, neck-rag inserters, and laborers.	1923	5	27	.316	.321	6.0	53.8	50.6	17.00	16.24
	1925	4	25	.341	.348	5.7	49.2	50.0	16.78	17.39

Hog-killing department

Males										
Laborers [1]	1923	33	820	$0.428	$0.444	5.5	52.2	48.5	$22.34	$21.54
	1925	65	829	.426	.433	5.5	51.7	45.2	22.02	19.56
Shacklers	1923	31	125	.535	.549	5.6	52.0	51.8	27.82	28.43
	1925	63	143	.548	.548	5.6	52.0	45.2	28.50	24.75
Stickers	1923	33	44	.621	.652	5.8	53.0	53.2	32.91	34.69
	1925	65	79	.623	.627	5.7	51.8	46.4	32.32	29.08
Scalders [2]	1923	34	273	.479	.496	5.5	52.1	49.7	24.96	24.61
	1925	68	304	.503	.514	5.5	51.9	45.8	26.11	23.53
Hookers-on [3]	1923	33	146	.473	.490	5.6	52.5	49.9	24.83	24.48
	1925	59	214	.463	.470	5.7	51.6	45.2	23.89	21.26
Shavers and scrapers	1923	34	587	.485	.497	5.5	52.5	49.3	25.46	24.49
	1925	66	705	.513	.523	5.5	51.4	43.8	26.37	22.89
Headers	1923	31	67	.577	.598	5.7	52.6	51.0	30.35	30.53
	1925	61	102	.581	.592	5.7	52.0	45.8	30.21	27.12

[1] Includes drivers, penners, steamers, singers, washers, and aitchbone breakers and toe pullers.
[2] Includes tubmen, droppers, gamb cutters, polemen, and duckers.
[3] Includes hookers-off, hangers-off, straighteners, and chain feeders.

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TABLE 2.—HOURS, RATES, AND EARNINGS IN THE SLAUGHTERING AND MEAT-PACKING INDUSTRY, 1923 AND 1925, BY DEPARTMENT, SEX, AND SPECIFIED OCCUPATION—Continued

Hog-killing department—Continued

Sex and occupation	Year	Number of establishments	Number of employees	Average rate of wages per hour	Average earnings per hour	Average days worked in one week	Average hours per week		Average earnings per week	
							Basic or regular	Actually worked	Full-time	Actually received
Males—Continued										
Gutters [1]	1923	32	172	$0.555	$0.572	5.6	52.4	49.6	$29.08	$28.41
	1925	64	242	.578	.590	5.6	51.9	45.1	30.00	26.64
Splitters	1923	33	119	.610	.627	5.9	52.3	53.5	31.90	33.54
	1925	68	170	.623	.635	5.7	51.5	47.1	32.08	29.89
Leaf-lard pullers	1923	30	97	.504	.521	5.6	53.0	51.5	26.71	26.84
	1925	57	101	.504	.512	5.7	51.9	45.4	26.16	23.27
Bruise trimmers, head removers, and kidney pullers	1923	28	125	.465	.479	5.5	52.5	48.6	24.41	23.26
	1925	50	135	.487	.494	5.6	51.6	45.7	25.13	22.58
Truckers	1923	24	136	.429	.440	5.4	52.2	48.2	22.39	21.22
	1925	35	109	.423	.436	5.6	52.4	44.7	22.17	19.49
Females										
Kidney pullers, shavers, singers, neck brushers, and spreaders.	1923	12	27	.331	.341	5.1	51.4	41.7	17.01	14.23
	1925	17	88	.337	.343	5.3	50.5	38.2	17.02	13.12

Casing department

Males										
Casing pullers or runners	1923	34	548	$0.507	$0.518	5.7	52.3	49.5	$26.52	$25.67
	1925	69	620	.506	.521	5.7	50.1	46.8	25.35	24.37
Strippers	1923	32	313	.464	.474	5.6	52.7	48.7	24.45	23.07
	1925	55	270	.489	.499	5.6	50.3	47.2	24.60	23.55
Fatters and shiners	1923	29	427	.551	.611	5.6	52.9	48.7	29.15	29.77
	1925	61	558	.535	.556	5.6	50.0	48.4	26.75	26.92
Turners	1923	26	128	.474	.479	5.5	52.6	47.4	24.72	22.73
	1925	44	173	.475	.490	5.7	49.9	48.7	23.70	23.86
Blowers, graders, and inspectors	1923	27	130	.472	.484	5.5	52.8	49.4	24.92	23.88
	1925	45	164	.474	.489	5.6	49.8	49.3	23.61	24.07
Salters and packers	1923	30	158	.473	.479	5.8	52.6	51.8	24.88	24.79
	1925	51	219	.480	.501	5.6	49.9	48.5	23.95	24.30
Trimmers and casings	1923	32	213	.501	.508	5.8	52.0	50.1	26.05	25.46
	1925	55	240	.494	.511	5.7	50.1	48.8	24.75	24.98
Laborers	1923	27	165	.409	.418	5.3	52.6	45.5	21.51	19.01
	1925	41	217	.423	.433	5.5	49.7	45.7	21.02	19.78
Females										
Casing pullers or runners	1923	6	39	.374	.378	5.6	51.1	48.0	19.11	18.15
	1925	10	75	.389	.386	5.7	51.0	42.9	19.84	16.56
Blowers, graders, and inspectors.	1923	15	190	.342	.348	5.6	52.6	47.1	17.99	16.37
	1925	29	197	.351	.364	5.6	49.2	44.1	17.27	16.07
Trimmers of casings	1923	12	71	.374	.378	5.8	52.6	48.8	19.67	18.44
	1925	15	75	.379	.386	5.7	50.3	50.4	19.06	19.47

Sausage department

Males										
Truckers and forkers	1923	24	481	$0.422	$0.424	5.6	52.7	47.1	$22.24	$19.98
	1925	46	300	.415	.421	5.7	50.6	49.5	21.00	20.84
Machine tenders (choppers, grinders, mixers, curers, feeders, and cutters).	1923	35	329	.490	.499	5.8	52.6	50.8	25.77	25.35
	1925	75	418	.492	.510	5.8	50.5	52.6	24.85	26.82
Casing workers (washers, turners, returners, measurers, cutters, tiers, and fatters).	1923	22	75	.451	.457	5.8	51.3	52.1	23.14	23.82
	1925	32	107	.441	.450	5.9	49.5	51.4	21.83	23.10
Stuffers	1923	36	316	.532	.541	5.7	52.6	49.3	27.98	26.67
	1925	74	406	.543	.566	5.8	50.8	50.7	27.58	28.74

[1] Includes bung droppers and rippers-open.

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TABLE 2.—HOURS, RATES, AND EARNINGS IN THE SLAUGHTERING AND MEAT-PACKING INDUSTRY, 1923 AND 1925, BY DEPARTMENT, SEX, AND SPECIFIED OCCUPATION—Continued

Sausage department—Continued

Sex and occupation	Year	Number of establishments	Number of employees	Average rate of wages per hour	Average earnings per hour	Average days worked in one week	Average hours per week		Average earnings per week	
							Basic or regular	Actually worked	Full-time	Actually received
Males—Continued										
Linkers, twisters, tiers, and hangers.	1923	17	138	$0.458	$0.465	5.7	52.4	51.0	$24.00	$23.70
	1925	25	172	.461	.467	5.8	51.2	51.2	23.60	23.91
Laborers [5]	1923	33	777	.422	.428	5.6	52.4	48.1	22.11	20.62
	1925	78	989	.417	.425	5.7	50.2	49.7	20.93	21.12
Cooks	1923	33	139	.474	.485	5.9	52.2	52.0	24.74	25.19
	1925	64	168	.491	.499	5.9	50.8	53.7	24.94	26.79
Smokers	1923	33	114	.507	.529	6.0	52.8	54.0	26.77	28.59
	1925	68	170	.505	.517	6.0	51.2	55.5	25.86	28.74
Inspectors, packers, scalers, shippers, and mailers.	1923	33	328	.447	.453	5.9	52.9	49.8	23.65	22.56
	1925	65	418	.445	.454	5.8	50.5	50.1	22.47	22.71
Females										
Casing workers (washers, turners, returners, measurers, cutters, tierers, and fatters).	1923	27	353	.339	.341	5.5	52.8	44.6	17.90	15.23
	1925	57	360	.334	.348	5.7	49.9	46.0	16.67	16.02
Linkers, twisters, tierers, and hangers.	1923	34	821	.355	.359	5.5	52.4	45.2	18.60	16.21
	1925	75	1,105	.362	.372	5.6	49.9	46.6	18.06	17.34
Packers (wrappers, inspectors, labelers, taggers, tierers), and packers' helpers.	1923	28	398	.304	.308	5.6	52.5	43.8	15.96	13.47
	1925	56	616	.313	.319	5.7	49.4	47.2	15.46	15.06

Canning department

Males										
Steam tenders, process men and retort men.	1923	6	33	$0.447	$0.464	5.5	53.6	51.4	$23.96	$23.87
	1925	9	25	.453	.468	5.8	48.5	55.1	21.97	25.78
Passers and pilers, cans	1923	5	133	.439	.442	5.6	53.9	48.6	23.66	21.52
	1925	8	40	.432	.467	5.6	47.5	47.0	20.52	21.92
Machine tenders (preparing and stuffing meat into cans.	1923	16	79	.442	.467	5.6	53.1	52.7	23.47	24.61
	1925	27	112	.454	.476	5.7	49.2	48.8	22.34	23.21
Packers and mailers	1923	11	92	.425	.431	5.7	53.2	49.0	22.61	21.12
	1925	13	74	.439	.467	5.4	48.7	45.5	21.38	21.24
Truckers	1923	14	426	.424	.431	5.5	53.4	48.2	22.64	20.76
	1925	13	238	.426	.447	5.5	47.6	46.5	20.18	20.78
Laborers	1923	9	226	.430	.444	5.1	53.7	47.1	23.84	20.90
	1925	13	196	.427	.443	5.7	49.6	50.8	21.18	22.52
Females										
Machine tenders (preparing and stuffing meat into cans).	1923	8	25	.313	.314	5.9	52.3	45.3	16.37	14.22
	1925	10	62	.329	.355	5.7	46.5	43.7	15.30	15.52
Stuffers (meat into cans by hand).	1923	3	91	.334	.347	5.6	54.0	47.3	18.04	16.42
	1925	6	62	.306	.311	5.5	51.2	44.8	15.67	13.93
Packers (sliced bacon and chipped dried beef in cans, glass jars, or cartons, by hand).	1923	15	228	.352	.352	5.6	51.8	44.1	18.23	15.51
	1925	31	387	.326	.337	5.5	49.3	42.6	16.07	14.35
Cappers	1923	4	45	.328	.365	5.7	53.7	46.2	17.61	16.85
	1925	6	41	.312	.350	5.7	46.3	44.3	14.45	15.50
Labelers and wrappers	1923	12	237	.360	.372	5.3	53.1	45.7	19.12	17.01
	1925	13	145	.343	.386	5.2	47.9	41.5	16.43	15.96
Weighers (filled cans)	1923	4	68	.324	.364	5.5	53.6	42.1	17.37	15.33
	1925	17	101	.321	.358	5.7	47.8	44.2	15.34	15.82
Passers and pilers, cans	1923	5	135	.337	.367	5.2	54.1	42.9	18.23	15.77
	1925	5	90	.300	.335	5.5	46.3	43.1	13.89	14.42
Trimmers, meat (by hand)	1923	5	115	.356	.353	5.7	53.2	46.9	18.94	16.57
	1925	6	61	.323	.381	5.4	47.3	42.5	15.28	16.19

[5] Including roustabouts, ham-cylinder washers, cleaners-up, ham pressers, hangers, cooks' helpers, and smokers' helpers.

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Table 3 shows 1925 averages, by department and geographical district, for 3 of the representative occupations in the cattle-killing department, 3 in the hog-killing department, 2 in the casing department, 2 in the sausage department, and 2 in the canning department. These figures indicate the variations between the several districts.

TABLE 3.—AVERAGE HOURS, RATES, AND EARNINGS IN THE SLAUGHTERING AND MEAT-PACKING INDUSTRY, 1925, BY OCCUPATION, DEPARTMENT, SEX, AND DISTRICT

[District 1 includes 14 plants in Chicago; district 2 includes 14 plants in Kansas City, Omaha, St. Joseph, East St. Louis, and St. Louis; district 3 includes 16 plants in Kansas Iowa, Minnesota, South Dakota, and Wisconsin; district 4 includes 6 plants in Oklahoma and Texas; district 5 includes 13 plants in Indiana, Michigan, Ohio, western New York, and western Pennsylvania; district 6 includes 9 plants in Connecticut, Massachusetts, eastern New York, and eastern Pennsylvania; district 7 includes 5 plants in Florida and Maryland; and district 8 includes 9 plants in California, Colorado, Oregon, and Washington]

Cattle-killing department

Sex, occupation, and district	Number of establishments	Number of employees	Average rate of wages per hour	Average earnings per hour	Average days worked in one week	Average hours per week		Average earnings per week	
						Basic or regular	Actually worked	Full time	Actually received
Males									
Floormen or siders:									
District 1	10	67	$0.820	$0.859	5.7	49.9	50.1	$40.92	$43.04
District 2	13	90	.835	.849	5.6	50.0	49.8	41.75	42.27
District 3	14	39	.837	.862	5.7	50.1	48.6	41.93	41.90
District 4	5	23	.817	.816	5.5	49.0	44.7	40.03	36.51
District 5	6	17	.723	.732	5.6	52.5	48.9	37.96	35.79
District 6	3	14	1.457	1.443	4.4	48.0	30.4	69.94	43.85
District 7	2	3	.697	.697	6.0	55.0	55.0	38.34	38.35
District 8	9	19	.769	.771	5.7	48.8	46.9	37.53	36.14
Total	62	272	.849	.856	5.6	49.9	48.1	42.37	41.12
Splitters:									
District 1	9	31	.821	.851	5.9	50.8	51.9	41.71	44.17
District 2	12	49	.835	.848	5.9	49.9	53.5	41.67	45.41
District 3	13	28	.819	.838	5.6	49.6	48.4	40.62	40.60
District 4	4	11	.820	.824	5.8	48.0	49.2	39.36	40.50
District 5	6	8	.688	.695	5.6	51.3	45.9	35.29	31.93
District 6	3	9	1.452	1.427	4.4	48.0	29.8	69.70	42.50
District 7	2	3	.769	.777	6.0	55.0	58.3	42.30	45.34
District 8	8	10	.779	.821	4.9	50.1	40.0	39.03	32.84
Total	57	149	.852	.855	5.7	50.0	49.3	42.60	42.14
Laborers:									
District 1	10	181	.437	.470	5.6	50.4	51.6	22.02	24.23
District 2	13	340	.431	.440	5.7	50.3	52.1	21.68	23.06
District 3	12	142	.426	.451	6.2	50.4	46.5	21.47	20.98
District 4	6	119	.360	.364	5.1	50.5	40.5	18.18	14.74
District 5	9	51	.428	.432	5.1	52.9	45.7	22.64	19.77
District 6	3	62	.471	.547	4.9	48.4	37.5	22.70	20.53
District 7	3	13	.320	.331	4.8	57.5	44.5	18.40	14.70
District 8	7	41	.417	.415	5.2	48.7	44.7	20.31	18.58
Total	63	949	.424	.442	5.5	50.2	48.1	21.28	21.32

Hog-killing department

Males									
Laborers:[1]									
District 1	8	93	$0.449	$0.456	5.8	51.8	47.6	$23.26	$21.71
District 2	14	109	.430	.443	5.8	49.8	46.7	21.41	20.66
District 3	16	395	.412	.416	5.2	51.0	42.7	21.01	17.76
District 4	3	3	.355	.352	5.7	48.0	41.0	17.04	14.41
District 5	12	131	.443	.449	5.7	52.7	47.5	23.35	21.34
District 6	6	67	.431	.440	5.3	56.1	45.6	24.18	20.04
District 7	2	22	.441	.439	5.7	55.0	57.4	24.26	25.21
District 8	4	9	.414	.450	5.8	50.3	48.1	20.82	21.67
Total	65	829	.426	.433	5.5	51.7	45.2	22.02	19.56

[1] Includes drivers, penners, steamers, singers, washers, aitchbone breakers, and toe pullers.

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TABLE 3.—AVERAGE HOURS, RATES, AND EARNINGS IN THE SLAUGHTERING AND MEAT-PACKING INDUSTRY, 1925, BY OCCUPATION, DEPARTMENT, SEX, AND DISTRICT—Continued

Hog-killing department—Continued

Sex, occupation, and district	Number of establishments	Number of employees	Average rate of wages per hour	Average earnings per hour	Average days worked in one week	Average hours per week		Average earnings per week	
						Basic or regular	Actually worked	Full time	Actually received
Males—Continued									
Shavers and scrapers:									
District 1	7	63	$0.510	$0.529	5.5	51.8	41.9	$26.42	$22.25
District 2	14	135	.503	.514	5.6	50.2	42.3	25.25	21.78
District 3	16	247	.495	.502	5.5	50.0	43.6	25.90	21.30
District 4	4	14	.505	.562	4.9	48.0	33.5	24.24	18.85
District 5	12	145	.541	.546	5.6	53.4	45.8	28.89	25.00
District 6	5	56	.505	.513	5.2	55.2	43.8	27.88	22.46
District 7	2	22	.538	.537	5.0	55.0	50.1	29.59	26.91
District 8	6	23	.601	.610	5.8	49.8	47.6	29.93	29.04
Total	66	705	.513	.523	5.5	51.4	43.8	26.37	22.89
Gutters: [2]									
District 1	8	32	.585	.612	5.6	52.7	45.4	30.83	27.77
District 2	13	48	.567	.582	5.6	50.0	42.3	28.35	24.60
District 3	16	72	.567	.570	5.5	50.2	44.3	28.46	25.27
District 4	3	5	.574	.674	5.4	48.0	34.8	27.55	23.46
District 5	11	46	.593	.606	5.8	54.1	46.6	32.08	28.22
District 6	5	22	.543	.547	5.7	57.0	48.7	30.95	26.66
District 7	2	6	.605	.605	5.5	55.0	54.4	33.28	32.94
District 8	6	11	.662	.668	6.0	49.4	48.9	32.70	32.64
Total	64	242	.578	.590	5.6	51.9	45.1	30.00	26.64

Casing department

Males									
Casing pullers or runners:									
District 1	6	101	$0.497	$0.515	5.7	49.4	50.2	$24.55	$25.90
District 2	14	162	.510	.516	5.8	49.1	46.8	25.04	24.16
District 3	15	173	.495	.518	5.7	50.2	46.6	24.85	24.13
District 4	4	26	.481	.487	5.7	48.0	45.0	23.09	21.93
District 5	11	57	.505	.509	5.7	50.5	43.7	25.50	22.27
District 6	8	63	.559	.578	5.3	52.1	42.9	29.12	24.80
District 7	3	15	.507	.510	5.5	55.0	53.3	27.89	27.19
District 8	8	23	.499	.522	5.8	50.9	49.2	25.40	25.71
Total	69	620	.506	.521	5.7	50.1	46.8	25.35	24.37
Females									
Blowers, graders, and inspectors:									
District 1	3	54	.349	.368	5.6	49.3	46.2	17.21	16.99
District 2	7	30	.383	.391	5.8	49.0	47.8	18.77	18.70
District 3	5	60	.352	.368	5.7	49.0	44.6	17.25	16.43
Districts 4 and 5	7	34	.325	.325	5.1	49.3	37.6	16.02	12.23
District 6	4	14	.344	.343	5.4	49.0	41.3	16.86	14.17
District 8	3	5	.356	.387	6.0	49.2	45.3	17.52	17.55
Total	29	197	.351	.364	5.6	49.2	44.1	17.27	16.07

[2] Includes bung droppers and rippers-open.

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TABLE 3.—AVERAGE HOURS, RATES, AND EARNINGS IN THE SLAUGHTERING AND MEAT-PACKING INDUSTRY, 1925, BY OCCUPATION, DEPARTMENT, SEX, AND DISTRICT—Continued

Sausage department

Sex, occupation, and district	Number of establishments	Number of employees	Average rate of wages per hour	Average earnings per hour	Average days worked in one week	Average hours per week		Average earnings per week	
						Basic or regular	Actually worked	Full time	Actually received
Males									
Machine tenders: [3]									
District 1	10	74	$0.486	$0.525	5.7	49.3	50.1	$23.96	$26.31
District 2	13	104	.498	.505	5.9	50.0	52.2	24.90	26.38
District 3	16	94	.465	.489	5.8	49.1	50.2	22.83	24.53
District 4	6	29	.433	.442	5.6	49.0	51.1	21.22	22.60
District 5	13	60	.541	.548	6.0	53.4	58.4	28.89	31.98
District 6	6	26	.517	.531	6.0	56.3	58.2	29.11	30.89
District 7	3	7	.476	.472	6.0	56.4	58.8	26.85	27.73
District 8	8	24	.527	.536	6.0	49.0	50.1	25.82	26.85
Total	75	418	.492	.510	5.8	50.5	52.6	24.85	26.82
Stuffers:									
District 1	10	102	.498	.566	5.6	49.3	48.0	24.55	27.20
District 2	12	97	.602	.605	5.7	49.9	48.4	30.04	29.28
District 3	15	65	.499	.524	5.8	49.5	50.4	24.70	26.41
District 4	6	17	.723	.717	5.6	48.7	44.0	35.21	31.53
District 5	13	49	.552	.556	5.9	51.8	55.8	28.59	31.56
District 6	6	44	.524	.547	6.0	56.5	57.4	29.61	31.40
District 7	4	14	.498	.499	5.9	54.9	55.0	27.34	27.42
District 8	8	18	.511	.517	6.1	50.0	52.3	25.55	27.04
Total	74	406	.543	.566	5.8	50.8	50.7	27.58	28.74

Canning department

Females									
Packers:									
District 1	4	97	$0.368	$0.404	5.2	50.0	41.7	$18 40	$16.84
District 2	4	92	.336	.337	5.4	48.3	37.1	16.23	12.52
District 3	9	88	.289	.296	5.9	49.8	47.9	14.39	14.21
Districts 4 and 6	5	47	.285	.284	5.4	48.0	37.4	13.68	10.62
District 5	5	43	.324	.330	5.7	50.2	49.7	16.26	16.41
District 7	2	3	.293	.291	5.7	55.0	45.3	16.12	13.21
District 8	2	17	.348	.347	5.9	48.0	46.2	16.70	16.04
Total	31	387	.326	337	5.5	49.3	42.6	16.07	14.35
Labelers and wrappers:									
District 1	3	99	.340	.401	5.1	47.6	40.0	16.18	16.04
Districts 2 and 3	4	32	.371	.379	5.6	48.2	44.8	17.88	16.99
District 4	2	3	.267	.272	4.7	48.0	33.0	12.82	8.98
District 5	2	6	.305	.300	5.8	50.0	46.8	15.25	14.04
District 8	2	5	.303	.313	5 8	48.0	45.1	14.54	14.11
Total	13	145	.343	.386	5.2	47.9	41.5	16.43	15.96

[3] Includes cutters, choppers, grinders, mixers, curers, and feeders.

Wages and Hours of Labor in the Woolen and Worsted Goods Industry, 1926

IN THIS article is presented a summary of the results of a study of wages, hours, and earnings in 1926 in the woolen and worsted industry in the United States, made by the Bureau of Labor Statistics.[4] For 1926, average full-time hours per week, earnings per hour, and full-time earnings per week are shown, by occupation,

[4] For complete report, see forthcoming bulletin.

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for 22,152 males and 17,818 females. For purposes of comparison, similar data are shown for 23,248 males and 18,374 females in 1924. Index numbers, also, are given for years available from 1910 onward.

The 1926 averages cover 112 representative mills in 8 States. Data were not collected in New Jersey in 1926 because of the unsettled labor conditions in that State.

Data were obtained for a representative pay period of one week for all occupations except weavers, for whom a two-week pay period was taken. Except in two mills the pay periods taken fell within the period from June to October.

Table 1 and the chart on page 804 show, for the industry as a whole, index numbers of average full-time hours per week, earnings per hour, and full-time earnings per week, for each of the specified years, 1910 to 1926, inclusive, with the 1913 average taken as the base or 100. No figures are shown for 1915 or for subsequent odd years, as data were not collected in such years. The index numbers of earnings per hour and full-time earnings per week show a decrease of approximately 8 per cent between 1924 and 1926. Between 1913 and 1920, average full-time hours per week decreased 13.8 per cent, average earnings per hour increased 253.7 per cent, and average full-time earnings per week increased 203.6 per cent.

Between 1920 and 1926 average full-time hours per week increased from an index of 86.2 in 1920 to an index of 88 in 1926, or 2 per cent; average earnings per hour decreased from 353.7 to 276.5, or 22 per cent; and average full-time earnings per week decreased from 303.6 to 242.3, or 20.2 per cent.

Between 1913 and 1926 average full-time hours per week decreased 12 per cent, average earnings per hour increased 176.5 per cent, and average full-time earnings per week increased 142.3 per cent. The full-time weekly earnings did not increase in the same proportion as average earnings per hour because of the reduction in average full-time hours per week.

It will be observed that 1920 was the peak year for wages in woolen and worsted mills and between 1920 and 1922 there was a pronounced decrease. This was followed by an increase in 1924, and this increase followed in turn by a decrease in 1926.

TABLE 1.—INDEX NUMBERS OF HOURS AND EARNINGS IN THE WOOLEN AND WORSTED INDUSTRY IN SPECIFIED YEARS, 1910 TO 1926

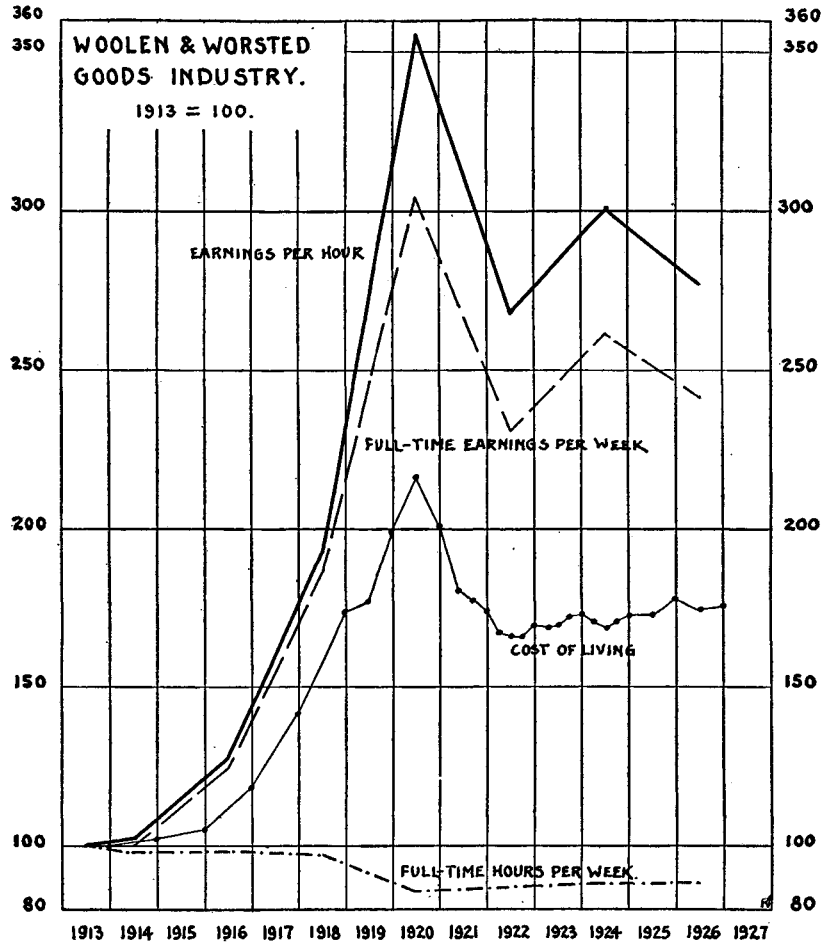
[1913=100]

Year	Index numbers of average—		
	Full-time hours per week	Earnings per hour	Full-time earnings per week
1910	101	90	91
1911	102	91	92
1912	100	102	102
1913	100	100	100
1914	98	103	100
1916	98	127	124
1918	97	193	186
1920	86	355	304
1922	87	268	231
1924	88	301	262
1926	88	277	242

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Table 2 shows for 1924 and 1926 average full-time hours per week, earnings per hour, and full-time earnings per week for each of the principal occupations in the industry.

The average full-time hours per week of males in all occupations increased from 49.2 in 1924 to 49.3 in 1926, those of females from 48.9 to 49.3, and those of males and females combined from 49.1 to 49.3.



Average earnings per hour of males in all occupations decreased from 57.8 cents in 1924 to 54.5 cents in 1926, those of females from 46.7 to 41.8 cents, and those of males and females combined from 53.3 to 49.1 cents.

Average full-time earnings per week of males in all occupations combined decreased from $28.44 in 1924 to $26.87 in 1926, those of females from $22.84 to $20.61, and those of males and females combined from $26.17 to $24.21.

In 1924 the highest average earnings per hour for males were those of loom fixers (87 cents), and the lowest were those of doffers (30.1

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cents). In 1926, also, the two extremes of average earnings per hour for males were held by these two occupations, their earnings being 80.7 and 28 cents, respectively. The average hourly earnings of females ranged in 1924 from 31.5 cents for doffers to 65.4 cents for weavers, and in 1926 from 28 cents for doffers to 69.8 cents per hour for wool sorters.

TABLE 2.—AVERAGE HOURS AND EARNINGS IN THE WOOLEN AND WORSTED INDUSTRY, BY OCCUPATION AND SEX, 1924 AND 1926

Occupation	Sex	Year	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time earnings per week
Wool sorters	Male	1924	19	359	49.5	$0.776	$38.41
		1926	30	445	50.8	.713	36.22
	Female	1924	5	65	48.2	.608	29.31
		1926	2	37	48.0	.698	33.50
Wool-washer tenders	Male	1924	20	119	49.3	.513	25.29
		1926	33	122	50.2	.463	23.24
Picker tenders	do	1924	45	275	49.3	.471	23.22
		1926	56	245	49.7	.438	21.77
Card tenders	do	1924	47	528	49.4	.473	23.37
		1926	70	531	49.8	.419	20.87
	Female	1924	12	94	48.0	.409	19.63
		1926	19	166	48.7	.365	17.78
Card strippers	Male	1924	49	368	50.6	.506	25.60
		1926	73	381	49.5	.464	22.97
Card grinders	do	1924	15	37	48.8	.602	29.38
		1926	18	36	50.9	.537	26.64
Gill-box tenders	do	1924	8	343	49.9	.439	21.91
		1926	13	209	50.1	.405	20.29
	Female	1924	14	435	49.4	.382	18.87
		1926	21	296	51.0	.326	16.63
Comber tenders	Male	1924	7	212	49.6	.522	25.89
		1926	10	171	50.5	.478	24.14
	Female	1924	10	114	49.2	.418	20.57
		1926	17	163	49.9	.378	18.86
Drawing-frame tenders	Male	1924	8	263	49.2	.439	21.60
		1926	9	271	48.8	.380	18.54
	Female	1924	15	1,885	48.9	.397	19.41
		1926	26	1,753	49.7	.352	17.49
Spinners, mule	Male	1924	47	1,290	48.9	.755	36.92
		1926	69	1,249	49.7	.695	34.54
Spinners, frame	do	1924	3	46	50.0	.421	21.05
	Female	1924	14	1,106	48.9	.417	20.39
		1926	23	1,228	49.8	.362	18.03
Doffers	Male	1924	7	214	49.9	.301	15.02
		1926	5	47	48.2	.280	13.88
	Female	1924	10	566	48.1	.315	15.15
		1926	22	701	49.9	.280	13.97
Twister tenders	do	1924	38	914	49.3	.418	20.61
		1926	65	1,117	49.7	.364	18.09
Spooler tenders	do	1924	64	1,228	48.6	.419	20.36
		1926	95	1,283	49.1	.391	19.20
Dresser tenders	Male	1924	65	467	49.3	.748	36.88
		1926	95	545	49.1	.705	34.62
Drawers-in	do	1924	10	40	51.6	.690	35.60
		1926	22	59	50.2	.666	33.43
	Female	1924	62	453	49.1	.535	26.27
		1926	84	533	48.9	.497	24.30
Loom fixers	Male	1924	68	821	49.0	.870	42.63
		1926	99	748	49.0	.807	39.54
Weavers	do	1924	68	5,725	48.8	.701	34.21
		1926	97	5,528	48.9	.652	31.88
	Female	1924	67	3,713	48.9	.654	31.98
		1926	89	2,748	49.2	.600	29.52
Cloth inspectors	Male	1924	19	246	48.7	.582	28.34
		1926	23	235	48.3	.563	27.19
	Female	1924	18	245	48.6	.484	23.52
		1926	21	103	49.6	.421	20.88
Burlers	do	1924	60	1,711	49.2	.420	20.66
		1926	90	1,722	49.3	.381	18.78
Menders	Female	1924	64	1,850	48.5	.534	25.90
		1926	91	2,121	48.6	.507	24.64
Perchers	Male	1924	61	466	49.1	.601	29.51
		1926	91	462	49.1	.559	27.45
	Female	1924	10	35	48.4	.452	21.88
		1926	16	97	48.6	.482	23.43

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TABLE 2.—AVERAGE HOURS AND EARNINGS IN THE WOOLEN AND WORSTED INDUSTRY, BY OCCUPATION AND SEX, 1924 AND 1926—Continued

Occupation	Sex	Year	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time earnings per week
Fullers	Male	1924	51	227	49.0	$0.512	$25.09
		1926	75	223	49.4	.464	22.92
Washer tenders, cloth	do	1924	60	402	49.7	.518	25.74
		1926	85	353	49.7	.442	21.97
Dryer tenders, cloth	do	1924	59	267	49.8	.506	25.20
		1926	84	222	49.9	.444	22.16
Truckers	do	1924	64	1,672	49.2	.451	22.19
		1926	93	1,236	48.9	.408	19.95
Laborers, dyehouse	do	1924	59	877	49.2	.490	24.11
		1926	82	1,008	49.4	.445	21.98
Other employees	do	1924	72	7,984	49.3	.509	25.09
		1926	112	7,826	49.4	.480	23.71
	Female	1924	68	3,939	49.1	.382	18.76
		1926	105	3,750	49.4	.346	17.09
All employees	Male	1924	72	23,248	49.2	.578	28.44
		1926	112	22,152	49.3	.545	26.87
	Female	1924	72	18,374	48.9	.467	22.84
		1926	112	17,818	49.3	.418	20.61
All employees, male and female.		1924	72	41,622	49.1	.533	26.17
		1926	112	39,970	49.3	.491	24.21

Table 3 shows, by States, for each of eight specified occupations, the 1926 average full-time hours per week, earnings per hour, and full-time earnings per week.

TABLE 3.—AVERAGE HOURS AND EARNINGS FOR EIGHT SELECTED OCCUPATIONS IN THE WOOLEN AND WORSTED INDUSTRY, BY SEX AND STATE, 1926

Occupation, sex, and State	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time earnings per week
Card tenders, male:					
Connecticut	8	50	49.2	$0.427	$21.01
Maine	13	66	49.8	.408	20.32
Massachusetts	10	172	48.0	.410	19.68
New Hampshire	3	37	49.6	.410	20.34
New York	4	35	50.9	.414	21.07
Pennsylvania	19	75	52.6	.463	24.35
Rhode Island	5	43	49.3	.395	19.47
Vermont	8	53	51.6	.421	21.72
Total	70	531	49.8	.419	20.87
Card tenders, female:					
Maine	8	29	49.9	.370	18.46
Massachusetts	5	113	48.0	.375	18.00
New Hampshire	2	13	49.4	.318	15.71
Pennsylvania	2	4	54.0	.293	15.82
Other States	2	7	51.4	.327	16.81
Total	19	166	48.7	.365	17.78
Drawing frame tenders, male:					
Massachusetts	2	221	48.0	.388	18.62
Pennsylvania	2	18	54.0	.299	16.13
Rhode Island	3	8	48.5	.467	22.65
Other States	2	24	52.0	.357	18.56
Total	9	271	48.8	.380	18.54
Drawing frame tenders, female:					
Massachusetts	5	770	48.0	.371	17.81
New York	2	90	48.0	.353	16.94
Pennsylvania	12	409	53.3	.334	17.80
Rhode Island	5	358	48.2	.342	16.48
Other States	2	126	54.0	.357	19.28
Total	26	1,753	49.7	.352	17.49

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TABLE 3.—AVERAGE HOURS AND EARNINGS FOR EIGHT SELECTED OCCUPATIONS IN THE WOOLEN AND WORSTED INDUSTRY, BY SEX AND STATE, 1926—Continued

Occupation, sex, and State	Number of establishments	Number of employees	Average full-time hours per week	Average earnings per hour	Average full-time earnings per week
Spinners, mule, male:					
Connecticut	8	149	49.3	$0.641	$31.60
Maine	14	205	50.0	.666	33.30
Massachusetts	11	375	48.0	.763	36.62
New Hampshire	5	78	49.5	.770	38.12
New York	5	119	50.4	.689	34.73
Pennsylvania	15	154	53.4	.592	31.61
Rhode Island	3	80	48.0	.755	36.24
Vermont	8	89	51.0	.619	31.57
Total	69	1,249	49.7	.695	34.54
Spooler tenders, female:					
Connecticut	9	90	49.9	.349	17.42
Maine	15	127	50.1	.438	21.94
Massachusetts	14	519	48.0	.388	18.62
New Hampshire	5	41	48.1	.550	26.46
New York	5	77	49.0	.403	19.75
Pennsylvania	27	225	51.2	.367	18.79
Rhode Island	12	174	48.1	.378	18.18
Vermont	8	30	51.1	.425	21.72
Total	95	1,283	49.1	.391	19.20
Loom fixers, male:					
Connecticut	10	48	48.9	.762	37.26
Maine	15	65	50.2	.783	39.31
Massachusetts	14	265	48.0	.839	40.27
New Hampshire	5	38	51.0	.723	36.87
New York	5	42	49.7	.750	37.28
Pennsylvania	28	115	50.2	.866	43.47
Rhode Island	14	149	48.3	.789	38.11
Vermont	8	26	50.8	.716	36.37
Total	99	748	49.0	.807	39.54
Weavers, male:					
Connecticut	10	633	49.0	.635	31.12
Maine	15	631	49.8	.611	30.43
Massachusetts	14	1,828	48.0	.678	32.54
New Hampshire	5	276	49.6	.627	31.10
New York	5	307	49.3	.665	32.78
Pennsylvania	26	634	50.5	.594	30.00
Rhode Island	14	938	48.2	.676	32.58
Vermont	8	281	50.0	.680	34.00
Total	97	5,528	48.9	.652	31.88
Weavers, female:					
Connecticut	9	194	49.2	.607	29.86
Maine	14	306	50.2	.608	30.52
Massachusetts	14	952	48.0	.647	31.06
New Hampshire	5	160	50.8	.575	29.21
New York	5	198	50.5	.633	31.97
Pennsylvania	26	475	50.2	.509	25.55
Rhode Island	8	335	48.0	.615	29.52
Vermont	8	128	51.9	.535	27.77
Total	89	2,748	49.2	.600	29.52
Burlers, female:					
Connecticut	10	85	49.0	.423	20.73
Maine	8	65	49.4	.294	14.52
Massachusetts	14	619	48.0	.376	18.05
New Hampshire	5	226	53.3	.391	20.84
New York	5	129	48.5	.531	25.75
Pennsylvania	26	274	50.2	.346	17.37
Rhode Island	14	283	48.0	.385	18.48
Vermont	8	41	51.2	.342	17.51
Total	90	1,722	49.3	.381	18.78
Menders, female:					
Connecticut	10	116	49.1	.472	23.18
Maine	15	220	50.2	.461	23.14
Massachusetts	14	769	48.0	.514	24.67
New Hampshire	5	34	48.4	.527	25.51
New York	5	119	48.6	.633	30.76
Pennsylvania	23	270	50.3	.531	26.71
Rhode Island	14	558	48.0	.496	23.81
Vermont	5	35	48.6	.398	19.34
Total	91	2,121	48.6	.507	24.64

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International Comparison of Real Wages

THE International Labor Office presents in the International Labor Review of January, 1927, a comparison of real wages in various large cities of the world as of October 1, 1926, in continuation of similar figures compiled periodically by that office.

The more significant points in this comparison are brought out in the table below. The figures given are in the form of index numbers, using London as the base or 100. In considering the figures presented it is very important to note that the wage data relate only to a very few categories of workers (building, engineering, furniture, and printing and publishing) and the price data are limited to certain articles of food and to rent. Thus, the index numbers can be taken only as a very rough indication of the relative levels of real wages of adult male workers in certain occupations and cities. In many instances, however, the figures shown indicate such wide differences between cities that they may be accepted as reflecting real differences in the level of well-being of the workers in different countries.

According to the table, Philadelphia had the highest real wage level of any of the 19 cities included, its index number, based on food only, being 183, or 83 per cent higher than London, which is used as the base. Ottawa, Canada, and Sydney, Australia, were next highest to Philadelphia, with Copenhagen the highest of the European cities. At the other extreme, cities like Rome, Italy, and Brussels, Belgium, have a wage level of one-fourth that of Philadelphia, and less than one-half that of London.

INDEX NUMBERS OF COMPARATIVE REAL WAGES IN VARIOUS CITIES, OCTOBER 1, 1926

[London, October 1, 1926=100]

City	General average index numbers		City	General average index numbers	
	Based on food only	With allowance for rent		Based on food only	With allowance for rent
Philadelphia	183	183	Warsaw [1]	55	56
Ottawa	159	157	Prague	50	53
Sydney	137	137	Riga	50	53
Copenhagen	125	125	Lodz	49	54
Dublin	100	109	Rome [3]	46	48
London	100	100	Brussels	44	47
Amsterdam	96	96	Vienna	44	50
Stockholm [1]	92	90	Tallinn	43	44
Oslo	80	82	Lisbon [3]	32	------
Berlin	69	63			

[1] The figures are based on wages in the building, furniture-making, and printing industries only. For other cities the metal industry is also included.

[2] Based on a weighted average wage. For other cities an unweighted average has been used.

[3] The figures for Lisbon and Rome are relatively low. This may be accounted for in part by the differences in the items of food consumption in the southern European countries from those ordinarily consumed in most of the other countries included in the table.

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International Comparison of Trend of Wages, 1914 to 1925

IN A report published in 1926 on "Wage changes in various countries, 1914 to 1925," [13] the International Labor Office has for the third time undertaken the difficult but interesting task of recording the movements in money wages and of estimating the changes in the real wages of the workers of the world by comparing changes in money wages with those in the general level of prices. Real wages are, in nearly every case, calculated with reference to the pre-war level. The report gives the data country by country and presents in a summary general conclusions as to the movement of wages as a whole. A digest of these summary conclusions is given below.

Wage Situation, 1920 to 1925

IN THE period 1920 to 1922 the different countries could be arranged into three fairly definite groups: Those in which real wages were definitely higher than before the war; those in which the level was about the same; and those in which the level was definitely below the pre-war level. In the first group were found most of the ex-neutral European countries; in the second group the chief western European countries and non-European countries; and in the third group the central European countries. The last-named group (Germany, Austria, Hungary, Bulgaria, Poland, Latvia, Rumania, and Finland) was distinguished by the fact that in all these countries in 1920 and 1922 there was a continual depreciating currency and steadily rising prices. This led to the phenomenon of the "time-lag," when wages were continually trying to catch up to prices, and inevitably caused a fall of real wages. On the other hand, when prices were falling, or when they became relatively stable after a period of rising prices, real wages tended to rise.

The chief factor affecting the wage situation in the years 1922–1925 was the changes in the level of prices. In many countries they fell somewhat, while in others—particularly those in which prices rose most rapidly in the years 1920 to 1922 or 1923—they became much more stable. Throughout the period prices remained relatively stable in Great Britain, Sweden, Switzerland, the Netherlands, Canada, South Africa, Australia, New Zealand, and the United States. Moreover, since 1922, the four countries (Germany, Austria, Poland, Hungary) in which currency was at that time inflated and prices were rapidly rising, have all attempted to stabilize their currency and, in general, have succeeded.

Movement of Money Wages, 1922 to 1925

THE tables of money wages given in the report indicate that in Sweden, Australia, and Canada money wages remained fairly stable after 1922; in Great Britain after 1923; and in Austria after 1924. In Denmark, rates, although showing a rise of about 5 per

[13] International Labor Office. Wage changes in various countries, 1914 to 1925. Studies and Reports, Series D (Wages and Hours), No. 16. Geneva, 1926. The first report of the International Labor Office on this subject covered the years 1914–1921 (published in 1922); and the second report covered the years 1914–1922 (published in 1923).

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cent from 1923 to 1924, were more stable in 1925 than in 1921 and 1922. In Germany money wages rose from 1923 to 1924, after a period of monetary disturbance. In Poland money rates became fairly stable in March, 1924, and remained so throughout the year. In the United States there was an increase from 1922 to 1923, and a decrease from 1923 to 1924; in 1925 the changes are not very considerable. In Norway, Greece, Finland, Rumania, Belgium, Hungary, France, and Japan wages up to 1925 had not shown any marked tendency toward stabilization.

Movement of Real Wages, 1922 to 1925

AS REGARDS real wages, several features are worth noting. It will be seen that in the countries in which the currency was seriously depreciated the stabilization of the currency was followed by a change in the wage situation. Wages were much more closely adjusted to the level of prices, and the level of real wages gradually rose.

In Germany real wages of skilled workers, which were estimated at about 50 per cent of their pre-war level in July, 1923, rose to 75 per cent in January, 1924, and 90 per cent in July, 1924, and have remained fairly stationary at this level till July, 1925. For unskilled workers the level rose from a little over 60 per cent in July, 1922, to 90 per cent in April, 1924, and 100 per cent in July, 1925.

In Austria no general average figures are available and the movement differs somewhat from one industry to another; but in every industry, however, real wages in 1924 were higher than those in 1923, although in some industries wages rose much sooner than in others.

In Poland real wages, which were apparently only 50 per cent of their pre-war value at the end of 1923, rose rapidly at the beginning of 1924 almost to their pre-war purchasing power and fell slightly during 1924, and rose again in 1925.

In Hungary wage data are not sufficiently adequate to give definite conclusions; in the engineering industry, however, real wages, which had considerably declined from the last quarter of 1923 to the first quarter of 1924 owing to the rapid rise in the cost of living, rose to about 75 per cent of their pre-war level in the autumn.

It will thus be seen that the group of countries in which, in 1922, wages were substantially below the pre-war level, are moving into the second group—countries in which real wages are at or near the pre-war level. The countries which in 1924–25 are still in the former group are Hungary and Latvia, and possibly Rumania.

A further change between 1922 and 1925 which is noticeable is that many countries have moved up from the group in which wages were at or near the pre-war level to the group in which real wages are higher than those current in 1913–14. In the United States and in Canada real wages were in 1924 and 1925 higher than in 1922, when they were about equal to the level of 1914. In Australia, Denmark, Sweden, Norway, and the Netherlands real wages in 1924 and 1925 remain, as in 1922, above the pre-war level. In France the material available is not very complete, and relates only to two dates in 1921 and 1924, and the real wages are not based on a complete cost-of-living index. The apparent rise in real wages from 1921 to 1924 must therefore be accepted with caution. In Spain, Italy, and Switzerland wages in 1924 seem to be distinctly above the pre-war level, and in Belgium, Czechoslovakia, Finland, and New Zealand wages are at about the pre-war level.

As regards Great Britain, the general situation appears to be about the same as in 1922—i. e., real wages are on the whole somewhat below pre-war level—though the disparity between the level of wages in different industries is very noticeable. In certain industries, such as coal mining, shipbuilding, and engineering, whose prosperity depends to a certain extent on their export trade, wages are depressed; while in industries such as building and printing, which do not depend on foreign trade, real wages are considerably above the level obtained before the war. As regards the remaining countries (Japan, Greece, and South Africa) the information is not sufficiently complete to enable any conclusion to be drawn.

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Comparison of Wages of Skilled and Unskilled Workers

DURING the period of rapidly rising prices, the money wages of unskilled workers in many countries increased to a greater extent than those of skilled workers, and those of low-salaried officials more than those of the higher-salaried categories.

This was partly due to the fact that increases were sometimes granted at a flat rate to all classes of workers in a given industry, which, of course, meant a greater relative increase for the lower-paid workers. This policy was doubtless prompted by the consideration that wages of unskilled workers are much nearer the subsistence minimum than those of skilled workers, and increases in wages to compensate for the increased cost of living are more urgent in their case than in the case of skilled workers.

When prices began to fall or became relatively stable, there was a tendency to a reversal of this movement.

In 1914 unskilled workers' wages were about 50 to 70 per cent of skilled workers' wages; in 1920 they were about 80 to 90 per cent. In countries in which wages and prices rose the least between 1914 and 1920–21, the ratio generally shows the least variation. Thus in the United States, Australia, and New Zealand, as well as in Great Britain, the ratio increased less than in Austria, Germany, and Poland. In Austria, unskilled workers' wages rose to about 95 per cent of the skilled, and in Germany to about 90 per cent. Since 1920 in most countries, 1922 in Germany, and 1923 in Austria, the ratio of unskilled workers' wages to those of skilled has declined, though it is still in most countries higher than the pre-war ratio. It should be noted that France and Hungary appear to be in an exceptional position, for the ratio of unskilled to skilled in 1924 is almost identical with that obtaining in 1914. In France the ratio has not apparently changed since 1914. But it seems, in spite of these two exceptions, to be a general feature of the postwar wage situation that unskilled workers are relatively better paid in comparison with skilled workers than before the war.

Relative Wages of Men and Women

IT IS a noteworthy fact that during and since the war women in general have received proportionately larger wage increases than the men. The causes of this are probably similar to those noted in the case of unskilled workers, and also perhaps to the reduced supply of male labor during and since the war, and the consequent opening of employments to women. This tendency continued in the years, 1922 to 1925.

If the real wages of male workers are compared with those of the female workers in the same industry for certain countries it will be found that except for cotton weavers in the United States and metal workers in Austria, the index numbers of real wages of female workers are in every instance higher than those of male workers.

The Five-Day Week in American Industry

NO GENERAL survey has ever been made regarding the prevalence of the 5-day week in American industry, but considerable information on the subject is available in the material obtained by the Bureau of Labor Statistics in its surveys of wages and hours of labor in various industries, in its studies of collective agreements among the organized trades, and in various items from trade journals, etc. An analysis of this material has been made with the following results.

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Summary

OF THE larger industries in the country, the regular full-time 5-day week is most prevalent in the manufacture of men's clothing. Here, according to the recent study by the Bureau of Labor Statistics, no less than 45 per cent of the establishments covered, and almost one-third of the employees, were working a 5-day week. The 40-hour week, however, was not common, the average hours being 44.3 per week.

The 5-day week has also made considerable progress in recent years in certain other branches of the clothing trades. Thus, under recent agreements, most of the fur workers (an industry employing about 14,000 persons) are working on a 5-day 40-hour week basis, but with provision for some Saturday work in the busy fall season. Similarly, the organized workers in the cloth hat and cap industry in New York and Philadelphia have agreements calling for a 5-day 44-hour week, to be reduced to a flat 40-hour week in 1927. The organized cloak, skirt, and dress makers, of Boston; waterproof garment workers, cutters, pressers, and buttonhole makers of New York; the cloak, skirt, dress, and reefer makers' unions of New York; and the ladies' tailors and custom dressmakers' local, also of New York—all have the 5-day week and in most cases the flat 40-hour week.

Among some of the building trades the 5-day week is fairly well established, more than 6 per cent of the union membership in all the trades covered by the bureau's 1926 study working on a flat 5-day week basis, the trades most affected thereby being lathers, painters, and plasterers. In addition, the 5-day week for part of the year occurs not infrequently among the granite and stone trades.

In the printing and publishing of newspapers, especially those in foreign languages, a working week of 40 hours or less, but worked variously in five or six days, is quite frequent. In total, about 5 per cent of all the newspaper printing trades covered by the bureau's 1926 study were found to be on a working basis of not over 40 hours a week. In the book and job branch of the printing industry, the 5-day 40-hour-or-less week was infrequent, but was found to occur in a few cities.

Other organized trades covered by the bureau's recent study in which the 5-day week existed to a greater or less extent were: Bakers, 1.4 per cent of those covered by the study, and laundry workers, 7.8 per cent of those covered by the study.

In the large manufacturing industries covered by the regular wages and hours surveys of the bureau the 5-day week as a regular working practice was found, to a greater or less extent, in the paper box-board industry, in foundries and machine shops, and in the iron and steel industry. In the paper box-board industry the bureau's study made in the spring of 1925 found that in 60 per cent of the establishments, employing about two-thirds of the total working force canvassed, the productive forces were working on a regular 5-day-week basis.

In the foundries and machine shops covered by the bureau's study 3.8 per cent of the plants, employing 3.5 per cent of the working force, had a regular 5-day week. In addition, about 1 per cent of

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the plants and employees covered alternated between a 5-day week and a full 6-day week as the prevailing working basis for the majority of the employees. The actual weekly hours were usually in excess of 40, although a few plants limited their working time to a flat 5-day 40-hour week.

The iron and steel industry as a whole still has many employees on rather long hours, but the 5-day week exists in certain occupations in certain plants. Thus, the 1926 survey by the bureau found that 2.1 per cent of all the employees covered worked a regular 5-day or 5-night week. Most of the 5-turn workers were in the bar mills (13 per cent of the total employees therein) and in the puddling mills (6 per cent of the total employees therein).

In addition to the adoption of the 5-day week as a regular practice in certain industrial establishments, as described above, there has been, of recent years, a significant extension of the practice of Saturday closing in the summer months. The practice is most extensive in retail stores and offices, but is known to exist also in other lines of business, although no very satisfactory data are available on this subject.

Other instances of the five-day week of which the bureau has record are more or less isolated. The following pages include references to these as well as giving in somewhat greater detail the data upon which the above summary is based.

Bakeries, Building Trades, Laundries, and Printing and Publishing

THE Bureau of Labor Statistics makes an annual survey of wage rates and hours among organized wage earners in various industrial communities. The study is limited to trades in which payment is by time rates or, if by piece rates, by some simple measure such as "ems" in the case of printers. Organized trades working on a more or less complicated piecework system are omitted from the annual survey.

The 1926 survey covered 66 cities and 824,313 union members, for 764,596 of whom regular working hours were obtainable, the street railway employees having such variable hours of labor that they were not included in the tabulations on this point. The trades covered were: Bakery; building; chauffeurs, teamsters, and drivers; granite and stone; laundry workers; linemen; longshoremen; printing and publishing—book and job, and newspaper.

Of the total of 764,596 members it was found that 35,689, or 4.7 per cent, had a regular working week of only 5 days during the whole year; 3,670, or 0.5 per cent, had a regular working week of 5 days for a part of the year; and 1,063, or 0.2 per cent, had a schedule which called for 6 days but not over 40 hours per week. In the aggregate, therefore, there were 40,422, or 5.3 per cent of the total, who worked 5 days or 40 hours or less per week for the whole or a part of the year.

The table following shows the percentage of the total membership of each trade group, so far as canvassed, falling into each of three classes: (1) Working 5 days per week the whole year, (2) working 5 days part of the year, and (3) working 6 days but 40 hours or less per week.

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TABLE 1.—PER CENT OF TRADE-UNION MEMBERS WORKING A 5-DAY OR 40-HOUR-OR-LESS WEEK, BY TRADE GROUPS

Trade group	Per cent of total number reported in each trade group working—		
	5 days per week whole of year	5 days per week part of year	6 days, but 40 hours or less per week
Bakers:			
Working 40 hours or less	1.4		
Working over 40 hours			
Total	1.4		
Building trades:			
Working 40 hours or less	6.6	0.6	
Working over 40 hours			
Total	6.6	.6	
Granite and stone trades:			
Working 40 hours or less	1.0	5.9	
Working over 40 hours			
Total	1.0	5.9	
Laundry workers:			
Working 40 hours or less			
Working over 40 hours	7.8		
Total	7.8		
Printing and publishing, book and job:			
Working 40 hours or less	.1		0.1
Working over 40 hours	(1)		
Total	.1		.1
Printing and publishing, newspaper:			
Working 40 hours or less	1.0		4.9
Working over 40 hours			
Total	1.0		4.9

[1] Less than one-tenth of 1 per cent.

The detailed data for the individual unions (published in the Labor Review for December, 1926) indicate that the straight 5-day week is most frequent among the building trades, especially the painters and plasterers. Among the granite and stone trades the short work week is rather frequent for part of the year, but with the provision that 4 hours on Saturday may be worked from March or April to October. The laundry union, reported as having a 5-day week, has a 9-hour day, and the day off is Monday instead of Saturday as in most of the trades. The short week in the printing and publishing industry occurs chiefly but not entirely among the foreign-language newspapers, the total weekly hours in a number of cases being under 40.

Men's Clothing Industry

THE bureau's study of wages, hours, and earnings in the men's clothing industry has just been completed. It covers 10 of the larger cities and a group of several small cities. The data were gathered in the summer of 1926 and were taken from the pay rolls of 198 establishments operating 359 shops and employing 33,659 wage earners. Ninety-seven of these establishments, or 45.5 per

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cent, with 10,872 workers, or 32.3 per cent of all the workers included in the survey, had a regular or customary working time of 5 days a week. The proportion of males having the 5-day week was 39.6 per cent of all males employed, and of females 24.8 per cent of all females employed in the shops covered by the study.

As between the four principal departments of the men's clothing industry, the proportion of workers having the 5-day week varied as follows: Cutting, 26.8 per cent; coat, 32.7 per cent; pants, 32.8 per cent; vest, 34.5 per cent; the total being 32.3 per cent, as above noted.

The following table shows these facts in greater detail, by cities:

TABLE 2.—NUMBER AND PROPORTION OF EMPLOYEES WORKING A 5-DAY WEEK IN MEN'S CLOTHING INDUSTRY, 1926

City	Total wage earners included in study			Wage earners having a 5-day week								
				Male		Female		Total		Hours		
	Male	Female	Total	Number	Per cent	Number	Per cent	Number	Per cent	Monday to Thursday	Friday	Per week
Baltimore	1,078	1,912	2,990	812	75.3	624	32.6	1,436	48.0	9	8	44
Boston	807	649	1,456	10	1.2	12	1.8	22	1.5	8¾	8¾	43¾
Buffalo	241	499	740									
Chicago	3,856	3,547	7,403									
Cincinnati	689	1,271	1,960	316	45.9	558	43.9	874	44.6	8	8	40
										7	7	35
Cleveland	519	1,681	2,200	31	6.0	90	5.4	121	5.5	9	8	44
										9	8	44
										8¾	9	44
New York	6,876	2,461	9,337	5,036	73.2	1,512	61.7	6,548	70.1	8⅛	8⅛	44
										8⅛	8⅜	44
										[1] 8¾	8¾	44
Philadelphia	1,121	878	1,999	28	2.5	23	2.6	51	2.6	[2] 9	9	44¾
										9	8	44
Rochester	1,152	2,143	3,295	284	24.7	738	34.4	1,022	31.0	8⅛	8⅛	44
										9⅜	9⅜	48
St. Louis	401	726	1,127	90	22.4	139	19.1	229	20.3	8⅛	8⅛	44
										8¾	8¾	44
										9	9	45
Eastern Pennsylvania [3]	308	844	1,152	142	46.1	427	50.6	569	49.4	9¾	9¾	48¾
										10	10	50
Total	17,048	16,611	33,659	6,749	39.6	4,123	24.8	10,872	32.3			

[1] Monday to Wednesday, 8¾ hours; Thursday, 9 hours.
[2] Tuesday and Thursday, 9 hours; Saturday, 8¾ hours.
[3] Exclusive of Philadelphia.

Iron and Steel Industry

ALTHOUGH in the iron and steel industry some departments operate continuously and still have many employees on rather long shifts, the five-day week exists in certain employments in certain mills. Thus, the 1926 survey of wages and hours by the Bureau of Labor Statistics in the iron and steel industry showed that 2.1 per cent of all the employees covered worked only five working turns a week, about one-half working solely on the day turn and the other half working either on the night turn or on alternating night and day turns. Most of the five-day workers were in the bar mills, where 13 per cent of the total employees worked a five-turn week, and in the puddling mills, where 6 per cent of all the employees worked a five-turn week.

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Paper Box-Board Industry

IN THE spring of 1925 the Bureau of Labor Statistics made a study of hours and wages in the paper box-board industry. The study covered 70 establishments, which employed almost 10,000 employees. In 42 of these 70 plants, or 60 per cent, the productive employees worked a five-day week. These 42 plants employed a total of 6,721, or about two-thirds of all employees covered. At the time of this study the paper box-board industry was in a period of transition as regards the matter of the length of the working week.

Foundries and Machine Shops

THE 1925 survey made by the bureau of wages and hours in foundries and machine shops covered 413 foundries, with 40,393 workers and 511 machine shops with 86,274 workers. Analysis of the data obtained shows that the five-day week for the majority of the employees prevailed in 35 of the 924 foundries and machine shops combined, or 3.8 per cent; the number of employees working in establishments where the five-day week prevailed was 4,417, or 3.5 per cent of the total number of employees in the plants covered. In addition, 9 plants with 1,082 employees (or 0.9 per cent of the total employees covered), alternated between a five-day and a six-day week, this practice growing out of arrangements by which one full day Saturday every other week is preferred to a half day every Saturday.

Other Trades and Industries

IN THE other industries covered by the Bureau of Labor Statistics periodic surveys of hours of labor, wages, and earnings, the regular full-time five-day or 40-hour week was either not reported at all or was reported only in such exceptional cases as to be of negligible importance. These industries were: Lumber, pottery, coal and metal mining, woolen and worsted, hosiery and underwear, slaughtering and meat packing, cotton goods, paper and pulp, and automobiles.

Other clothing trades.—In various branches of the clothing trades, other than men's clothing, the five-day week has made considerable progress of recent years, as indicated by the collective agreements in force. Although the bureau does not have a complete file of these agreements, the following summary of those available is of interest:

Fur workers in organized shops in New York, Chicago, Boston, and several other cities are now working under agreements which call for the 5-day 40-hour week for the greater part of the year, provision being made for some Saturday work in the rush fall season. The proportion of employees in the industry covered by this arrangement is not available but is known to be very large.

Cloth hat and cap industry.—Workers in organized shops in this industry have the 5-day 44-hour week in New York and Philadelphia, the hours to be reduced to 40, beginning July 1, 1927.

Cloak, skirt, and dress makers of Boston in organized shops have a 5-day 42-hour week.

Waterproof workers, cutters, pressers, and buttonhole makers, in the organized shops of New York City have a 5-day 40-hour week.

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Cloak, skirt, dress, and reefer makers in the organized shops of New York City have a 5-day 40-hour week.

Ladies' Tailors and Custom Dressmakers, Local No. 38 of the International Ladies' Garment Workers' Union, New York City, have recently obtained the 40-hour week, according to the union journal.

Optional Five-Day Week

SOME agreements provide for a regular week of more than 40 hours, divided into 5 working-days, but permit modification under certain conditions. Thus, the agreement between the cut sole workers' local of the Shoe Workers' Protective Union and certain employers of Haverhill, Mass., fixes a regular 5-day 45-hour week, but authorizes the agent of the local union to permit overtime at the regular rate if he deems overtime work necessary, and provides that any dispute on this point may be arbitrated.

Five-Day Week Without Reduction in Total Hours

ANOTHER type of 5-day week is that where, by arrangement between the employees and management of an establishment, the old hours per week are retained but are spread over 5 days instead of 6, thus making Saturday a holiday. There is here no question of a shortened work week, but simply of a rearrangement of working hours so as to give two consecutive free days each week end. An example of this type is referred to in the Railway Age of October 23, 1926 (p. 786).

The shop of Jenkins Bros., valve manufacturers, Bridgeport, Conn., has worked a 5-day week, as recently discussed by Henry Ford, since May 22, 1922. The plant employs about 700 men. Both proprietors and employees are said to be enthusiastic in praise of the arrangement. The employees work 48 hours a week, the same as they did when the week was spread over 6 days, but they have all day Saturday, as well as Sunday, to themselves. The usual schedule is 9½ hours a day for four days and 10 hours on the fifth day. The plan, having been under discussion for some time, was finally submitted to a vote of the employees in the month above named, and the favorable vote was almost unanimous.

The Five-Day Week in Summer

IN A large number of business concerns the 5-day week for two or three summer months has become customary. The practice is probably most extensive among retail stores and offices, but exists in other lines of business. A report of the Merchants' Association of New York on "Holiday practices of offices, stores, and factories in New York City," published in 1925, reports one or more instances of regular Saturday closing in summer among manufacturing concerns, printing and publishing, a railroad office and a railroad shop, and retail stores in the city of New York.

Resolution of American Federation of Labor on Shorter Work Week

A RESOLUTION adopted by the forty-sixth annual meeting of the American Federation of Labor in October, 1926, formally approves of a policy of progressively shortening the working hours

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and working-days per week, but does not attempt to establish a specific schedule of hours or days. The resolution in full is as follows:

Whereas under present methods of modern machine industry the workers are continually subject to the strain of mechanized processes which sap their vitality; and

Whereas if compelled to work for long hours under modern processes of production, the vitality, health, and very life of the workers is put in serious jeopardy;

Resolved, That this convention place itself on record as favoring a progressive shortening of the hours of labor and the days per week, and that the executive council be requested to inaugurate a campaign of education and organization to the end that the purpose of this resolution shall be placed into effect.

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A BIBLIOGRAPHY on the five-day week in industry was printed in the January, 1927, issue of the Labor Review.

Mr. Ford's statement regarding the proposed establishment of the five-day week in the plants with which he is associated was originally published in the World's Work for October, 1926. It is reproduced in full in the Labor Review for December, 1926.

The attitude of representative labor officials and employers toward the five-day week is summarized in the Labor Review for December, 1926.

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LIST OF BULLETINS OF THE BUREAU OF LABOR STATISTICS

The following is a list of all bulletins of the Bureau of Labor Statistics published since July, 1912, except that in the case of bulletins giving the results of periodic surveys of the bureau only the latest bulletin on any one subject is here listed.

A complete list of the reports and bulletins issued prior to July, 1912, as well as the bulletins published since that date will be furnished on application. Bulletins marked thus (*) are out of print.

Wholesale Prices.

No. 284. Index numbers of wholesale prices in the United States and foreign countries. [1921.]
No. 415. Wholesale prices, 1890 to 1925.

Retail Prices and Cost of Living.

*No. 121. Sugar prices, from refiner to consumer. [1913.]
*No. 130. Wheat and flour prices, from farmer to consumer. [1913.]
*No. 164. Butter prices, from producer to consumer. [1914.]
No. 170. Foreign food prices as affected by the war. [1915.]
No. 357. Cost of living in the United States. [1924.]
No. 369. The use of cost-of-living figures in wage adjustments. [1925.]
No. 418. Retail prices, 1890 to 1925.

Wages and Hours of Labor.

*No. 146. Wages and regularity of employment and standardization of piece rates in the dress and waist industry of New York City. [1914.]
*No. 147. Wages and regularity of employment in the cloak, suit, and skirt industry. [1914.]
No. 161. Wages and hours of labor in the clothing and cigar industries, 1911 to 1913.
No. 163. Wages and hours of labor in the building and repairing of steam-railroad cars, 1907 to 1913.
*No. 190. Wages and hours of labor in the cotton, woolen, and silk industries, 1907 to 1914.
No. 204. Street-railway employment in the United States. [1917.]
No. 225. Wages and hours of labor in the lumber, millwork, and furniture industries, 1915.
No. 265. Industrial survey in selected industries in the United States, 1919.
No. 297. Wages and hours of labor in the petroleum industry, 1920.
No. 348. Wages and hours of labor in the automobile industry, 1922.
No. 356. Productivity costs in the common-brick industry. [1924.]
No. 358. Wages and hours of labor in the automobile-tire industry, 1923.
No. 360. Time and labor costs in manufacturing 100 pairs of shoes. [1924.]
No. 365. Wages and hours of labor in the paper and pulp industry, 1923.
No. 371. Wages and hours of labor in cotton-goods manufacturing, 1924.
No. 374. Wages and hours of labor in the boot and shoe industry, 1907 to 1924.
No. 376. Wages and hours of labor in the hosiery and underwear industry, 1907 to 1924.
No. 377. Wages and hours of labor in woolen and worsted goods manufacturing, 1924.
No. 381. Wages and hours of labor in the iron and steel industry, 1907 to 1924.
No. 394. Wages and hours of labor in metalliferous mines, 1924.
No. 407. Labor cost of production and wages and hours of labor in the paper box-board industry. [1925.]
No. 412. Wages, hours, and productivity in the pottery industry, 1925.
No. 413. Wages and hours of labor in the lumber industry in the United States, 1925.
No. 416. Hours and earnings in anthracite and bituminous coal mining, 1922 and 1924.
No. 421. Wages and hours of labor in the slaughtering and meat-packing industry, 1925.
No. 422. Wages and hours of labor in foundries and machine shops, 1925.
No. 431. Union scale of wages and hours of labor, May 15, 1926.
No. 435. Wages and hours of labor in the men's clothing industry, 1911 to 1926.

Employment and Unemployment.

*No. 109. Statistics of unemployment and the work of employment offices in the United States. [1913.]
No. 172. Unemployment in New York City, N. Y. [1915.]
*No. 183. Regularity of employment in the women's ready-to-wear garment industries. [1915.]
*No. 195. Unemployment in the United States. [1916.]
No. 196. Proceedings of the Employment Managers' Conference held at Minneapolis, Minn., January, 1916.
*No. 202. Proceedings of the conference of Employment Managers' Association, Boston, Mass., held May 10, 1916.
No. 206. The British system of labor exchanges. [1916.]
*No. 227. Proceedings of the Employment Managers' Conference, Philadelphia, Pa., April 2 and 3, 1917.

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Employment and Unemployment—Continued.

No. 235. Employment system of the Lake Carriers' Association. [1918.]
*No. 241. Public employment offices in the United States. [1918.]
No. 247. Proceedings of Employment Managers' Conference, Rochester, N. Y., May 9–11, 1918.
No. 310. Industrial unemployment: A statistical study of its extent and causes. [1922.]
No. 409. Unemployment in Columbus, Ohio, 1921 to 1925.

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No. 192. First, Chicago, December 19 and 20, 1913; Second, Indianapolis, September 24 and 25, 1914; Third, Detroit, July 1 and 2, 1915.
No. 220. Fourth, Buffalo, N. Y., July 20 and 21, 1916.
No. 311. Ninth, Buffalo, N. Y., September 7–9, 1921.
No. 337. Tenth, Washington, D. C., September 11–13, 1922.
No. 355. Eleventh, Toronto, Canada, September 4–7, 1923.
No. 400. Twelfth, Chicago, Ill., May 19–23, 1924.
No. 414. Thirteenth, Rochester, N. Y., September 15–17, 1925.

Women and Children in Industry.

No. 116. Hours, earnings, and duration of employment of wage-earning women in selected industries in the District of Columbia. [1913.]
*No. 117. Prohibition of night work of young persons. [1913.]
*No. 118. Ten-hour maximum working-day for women and young persons. [1913.]
*No. 119. Working hours of women in the pea canneries of Wisconsin. [1913.]
*No. 122. Employment of women in power laundries in Milwaukee. [1913.]
No. 160. Hours, earnings, and conditions of labor of women in Indiana mercantile establishments and garment factories. [1914.]
*No. 167. Minimum wage legislation in the United States and foreign countries. [1915.]
*No. 175. Summary of the report on condition of woman and child wage earners in the United States. [1915.]
*No. 176. Effect of minimum wage determinations in Oregon. [1915.]
*No. 180. The boot and shoe industry in Massachusetts as a vocation for women. [1915.]
*No. 182. Unemployment among women in department and other retail stores of Boston, Mass. [1916.]
No. 193. Dressmaking as a trade for women in Massachusetts. [1916.]
No. 215. Industrial experience of trade-school girls in Massachusetts. [1917.]
*No. 217. Effect of workmen's compensation laws in diminishing the necessity of industrial employment of women and children. [1918.]
No. 223. Employment of women and juveniles in Great Britain during the war. [1917.]
No. 253. Women in the lead industries. [1919.]

Workmen's Insurance and Compensation (including laws relating thereto).

*No. 101. Care of tuberculous wage earners in Germany. [1912.]
*No. 102. British national insurance act, 1911.
*No. 103. Sickness and accident insurance law of Switzerland. [1912.]
No. 107. Law relating to insurance of salaried employees in Germany. [1913.]
*No. 155. Compensation for accidents to employees of the United States. [1914.]
No. 212. Proceedings of the conference on social insurance called by the International Association of Industrial Accident Boards and Commissions, Washington, D. C., December 5–9, 1916.
No. 243. Workmen's compensation legislation of the United States and foreign countries, 1917 and 1918.
No. 301. Comparison of workmen's compensation insurance and administration. [1922.]
No. 312. National health insurance in Great Britain, 1911 to 1920.
No. 379. Comparison of workmen's compensation laws of the United States as of January 1, 1925.
No. 423. Workmen's compensation legislation of the United States and Canada. [1926.]

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*No. 210. Third, Columbus, Ohio, April 25–28, 1916.
No. 248. Fourth, Boston, Mass., August 21–25, 1917.
No. 264. Fifth, Madison, Wis., September 24–27, 1918.
*No. 273. Sixth, Toronto, Canada, September 23–26, 1919.
No. 281. Seventh, San Francisco, Calif., September 20–24, 1920.
No. 304. Eighth, Chicago, Ill., September 19–23, 1921.
No. 333. Ninth, Baltimore, Md., October 9–13, 1922.
No. 359. Tenth, St. Paul, Minn., September 24–26, 1923.
No. 385. Eleventh, Halifax, Nova Scotia, August 26–28, 1924.
No. 395. Index to proceedings, 1914–1924.
No. 406. Twelfth, Salt Lake City, Utah, August 17–20, 1925.
No. 432. Thirteenth, Hartford, Conn., September 14–17, 1926. (In press.)

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*No. 104. Lead poisoning in potteries, tile works, and porcelain-enameled sanitary ware factories. [1912.]
No. 120. Hygiene of the painters' trade. [1913.]
*No. 127. Dangers to workers from dust and fumes, and methods of protection. [1913.]
*No. 141. Lead poisoning in the smelting and refining of lead. [1914.]
*No. 157. Industrial accident statistics. [1915.]
*No. 165. Lead poisoning in the manufacture of storage batteries. [1914.]
*No. 179. Industrial poisons used in the rubber industry. [1915.]

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Industrial Accidents and Hygiene—Continued.

No. 188. Report of British departmental committee on the danger in the use of lead in the painting of buildings. [1916.]
*No. 201. Report of committee on statistics and compensation-insurance cost of the International Association of Industrial Accident Boards and Commissions. [1916.]
*No. 207. Causes of death, by occupation. [1917.]
*No. 209. Hygiene of the printing trades. [1917.]
No. 219. Industrial poisons used or produced in the manufacture of explosives. [1917.]
No. 221. Hours, fatigue, and health in British munition factories. [1917.]
No. 230. Industrial efficiency and fatigue in British munition factories. [1917.]
*No. 231. Mortality from respiratory diseases in dusty trades (inorganic dusts). [1918.]
No. 234. Safety movement in the iron and steel industry, 1907 to 1917.
*No. 236. Effects of the air hammer on the hands of stonecutters. [1918.]
No. 249. Industrial health and efficiency. Final report of British Health of Munition Workers Committee. [1919.]
*No. 251. Preventable death in the cotton-manufacturing industry. [1919.]
No. 256. Accidents and accident prevention in machine building. [1919.]
No. 267. Anthrax as an occupational disease. [1920.]
No. 276. Standardization of industrial accident statistics. [1920.]
No. 280. Industrial poisoning in the making of coal-tar dyes and dye intermediates. [1921.]
No. 291. Carbon monoxide poisoning. [1921.]
No. 293. The problem of dust phthisis in the granite-stone industry. [1922.]
No. 298. Causes and prevention of accidents in the iron and steel industry, 1910 to 1919.
No. 306. Occupational hazards and diagnostic signs: A guide to impairments to be looked for in hazardous occupations. [1922.]
No. 339. Statistics of industrial accidents in the United States. [1923.]
No. 392. Survey of hygienic conditions in the printing trades. [1925.]
No. 405. Phosphorus necrosis in the manufacture of fireworks and in the preparation of phosphorus. [1926.]
No. 425. Record of industrial accidents in the United States to 1925.
No. 426. Deaths from lead poisoning. [1927.]
No. 427. Health survey of the printing trades, 1922 to 1925.
No. 428. Proceedings of the Industrial Accident Prevention Conference, held at Washington, D. C., July 14–16, 1926.

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*No. 124. Conciliation and arbitration in the building trades of Greater New York. [1913.]
*No. 133. Report of the industrial council of the British Board of Trade on its inquiry into industrial agreements. [1913.]
*No. 139. Michigan copper district strike. [1914.]
No. 144. Industrial court of the cloak, suit, and skirt industry of New York City. [1914.]
No. 145. Conciliation, arbitration, and sanitation in the dress and waist industry of New York City. [1914.]
*No. 191. Collective bargaining in the anthracite coal industry. [1916.]
*No. 198. Collective agreements in the men's clothing industry. [1916.]
No. 233. Operation of the industrial disputes investigation act of Canada. [1918.]
No. 255. Joint industrial councils in Great Britain. [1919.]
No. 283. History of the Shipbuilding Labor Adjustment Board, 1917 to 1919.
No. 287. National War Labor Board: History of its formation activities, etc. [1921.]
No. 303. Use of Federal power in settlement of railway labor disputes. [1922.]
No. 341. Trade agreement in the silk-ribbon industry of New York City. [1923.]
No. 402. Collective bargaining by actors. [1926.]
No. 419. Trade agreements, 1925.

Labor Laws of the United States (including decisions of courts relating to labor).

No. 211. Labor laws and their administration in the Pacific States. [1917.]
No. 229. Wage-payment legislation in the United States. [1917.]
No. 285. Minimum wage legislation in the United States. [1921.]
No. 321. Labor laws that have been declared unconstitutional. [1922.]
No. 322. Kansas Court of Industrial Relations. [1923.]
No. 343. Laws providing for bureaus of labor statistics, etc. [1923.]
No. 370. Labor laws of the United States, with decisions of courts relating thereto. [1925.]
No. 408. Laws relating to the payment of wages. [1926.]
No. 417. Decisions of courts and opinions affecting labor, 1925.
No. 434. Labor legislation of 1926.

Foreign Labor Laws.

*No. 142. Administration of labor laws and factory inspection in certain European countries. [1914.]

Vocational and Workers' Education.

*No. 159. Short-unit courses for wage earners, and a factory school experiment. [1915.]
*No. 162. Vocational education survey of Richmond, Va. [1915.]
No. 199. Vocational education survey of Minneapolis, Minn. [1916.]
No. 271. Adult working-class education in Great Britain and the United States. [1920.]

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Safety Codes.

No. 331. Code of lighting factories, mills, and other work places.
No. 336. Safety code for the protection of industrial workers in foundries.
No. 350. Specifications of laboratory tests for approval of electric headlighting devices for motor vehicles.
No. 351. Safety code for the construction, care, and use of ladders.
No. 364. Safety code for the mechanical power-transmission apparatus.
No. 375. Safety code for lanudry machinery and operations.
No. 378. Safety code for woodworking plants.
No. 382. Code of lighting school buildings.
No. 410. Safety code for paper and pulp mills.
No. 430. Safety code for power presses and foot and hand presses.
No. 433. Safety code for the prevention of dust explosions.
No. 436. Safety code for the use, care, and protection of abrasive wheels.

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No. 237. Industrial unrest in Great Britain. [1917.]
No. 340. Chinese migrations, with special reference to labor conditions. [1923.]
No. 349. Industrial relations in the West Coast lumber industry. [1923.]
No. 361. Labor relations in the Fairmont (W. Va.) bituminous-coal field. [1924.]
No. 380. Postwar labor conditions in Germany. [1925.]
No. 383. Works council movement in Germany. [1925.]
No. 384. Labor conditions in the shoe industry in Massachusetts, 1920 to 1924.
No. 399. Labor relations in the lace and lace-curtain industries in the United States. [1925.]

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*No. 123. Employers' welfare work. [1913.]
No. 222. Welfare work in British munitions factories. [1917.]
*No. 250. Welfare work for employees in industrial establishments in the United States. [1919.]

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No. 313. Consumers' cooperative societies in the United States in 1920.
No. 314. Cooperative credit societies in America and in foreign countries. [1922.]
No. 437. Cooperative movement in the United States in 1925 (other than agricultural).

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*No. 158. Government aid to home owning and housing of working people in foreign countries. [1914.]
No. 263. Housing by employees in the United States. [1920.]
No. 295. Building operations in representative cities in 1920.
No. 424. Building permits in the principal cities of the United States, 1925.

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No. 266. Seventh, Seattle, Wash., July 12–15, 1920.
No. 307. Eighth, New Orleans, La., May 2–6, 1921.
*No. 323. Ninth, Harrisburg, Pa., May 22–26, 1922.
No. 352. Tenth, Richmond, Va., May 1–4, 1923.
No. 389. Eleventh, Chicago, Ill., May 19–23, 1924.
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*No. 174. Subject index of the publications of the United States Bureau of Labor Statistics up to May 1, 1915.
No. 208. Profit sharing in the United States. [1916.]
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No. 254. International labor legislation and the society of nations. [1919.]
No. 268. Historical survey of international action affecting labor. [1920.]
No. 282. Mutual relief associations among Government employees in Washington, D. C. [1921.]
No. 299. Personnel research agencies. A guide to organized research in employment management, industrial relations, training, and working conditions. [1921.]
No. 319. The Bureau of Labor Statistics: Its history, activities, and organization. [1922.]
No. 326. Methods of procuring and computing statistical information of the Bureau of Labor Statistics. [1923.]
No. 342. International Seamen's Union of America: A study of its history and problems. [1923.]
No. 346. Humanity in government. [1923.]
No. 372. Convict labor in 1923.
No. 386. The cost of American almshouses. [1925.]
No. 398. Growth of legal-aid work in the United States. [1926.]
No. 401. Family allowances in foreign countries. [1926.]
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