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U. S. DEPARTMENT OF LABOR
BUREAU OF LABOR STATISTICS

ROYAL MEEKER, Commissioner

MONTHLY REVIEW

OF THE

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SERIES OF BULLETINS PUBLISHED BY THE BUREAU OF LABOR STATISTICS.

[The publication of the annual and special reports and of the bimonthly bulletin has been discontinued, and since July, 1912, a bulletin has been published at irregular intervals. Each number contains matter devoted to one of a series of general subjects. These bulletins are numbered consecutively in each series and also carry a consecutive whole number, beginning with No. 101. A list of the series, together with the individual bulletins falling under each, is given below. A list of the reports and bulletins of the bureau issued prior to July 1, 1912, will be furnished on application.]

Wholesale Prices.

- No. 1. Wholesale prices, 1890 to 1912. (Bul. No. 114.)
- No. 2. Wholesale prices, 1890 to 1913. (Bul. No. 149.)
- No. 3. Index numbers of wholesale prices in the United States and foreign countries. (Bul. No. 173.)
- No. 4. Wholesale prices, 1890 to 1914. (Bul. No. 181.)
- No. 5. Wholesale prices, 1890 to 1915. (Bul. No. 200.) [In press.]

Retail Prices and Cost of Living.

- No. 1. Retail prices, 1890 to 1911: Part I. (Bul. No. 105: Part I.)
Retail prices, 1890 to 1911: Part II—General tables. (Bul. No. 105: Part II.)
- No. 2. Retail prices, 1890 to June, 1912: Part I. (Bul. No. 106: Part I.)
Retail prices, 1890 to June, 1912: Part II—General tables. (Bul. No. 106: Part II.)
- No. 3. Retail prices, 1890 to August, 1912. (Bul. No. 108.)
- No. 4. Retail prices, 1890 to October, 1912. (Bul. No. 110.)
- No. 5. Retail prices, 1890 to December, 1912. (Bul. No. 113.)
- No. 6. Retail prices, 1890 to February, 1913. (Bul. No. 115.)
- No. 7. Sugar prices, from refiner to consumer. (Bul. No. 121.)
- No. 8. Retail prices, 1890 to April, 1913. (Bul. No. 125.)
- No. 9. Wheat and flour prices, from farmer to consumer. (Bul. No. 130.)
- No. 10. Retail prices, 1890 to June, 1913. (Bul. No. 132.)
- No. 11. Retail prices, 1890 to August, 1913. (Bul. No. 135.)
- No. 12. Retail prices, 1890 to October, 1913. (Bul. No. 138.)
- No. 13. Retail prices, 1890 to December, 1913. (Bul. No. 140.)
- No. 14. Retail prices, 1907 to December, 1914. (Bul. No. 156.)
- No. 15. Butter prices, from producer to consumer. (Bul. No. 164.)
- No. 16. Retail prices, 1907 to June, 1915. (Bul. No. 184.)
- No. 17. Retail prices, 1907 to December, 1915. (Bul. No. 197.) [In press.]

Wages and Hours of Labor.

- No. 1. Wages and hours of labor in the cotton, woolen, and silk industries, 1890 to 1912. (Bul. No. 128.)
- No. 2. Wages and hours of labor in lumber, millwork, and furniture industries, 1890 to 1912. (Bul. 129.)
- No. 3. Union scale of wages and hours of labor, 1907 to 1912. (Bul. No. 131.)
- No. 4. Wages and hours in boot and shoe and hosiery and knit goods industries, 1890 to 1912. (Bul. No. 134.)
- No. 5. Wages and hours of labor in the cigar and clothing industries, 1911 and 1912. (Bul. No. 135.)
- No. 6. Wages and hours in building and repairing of steam railroad cars, 1890 to 1912. (Bul. No. 137.)
- No. 7. Union scale of wages and hours of labor, May 15, 1913. (Bul. No. 143.)
- No. 8. Wages and regularity of employment in dress and waist industry, New York City. (Bul. 146.)
- No. 9. Wages and regularity of employment in the cloak, suit, and skirt industry. (Bul. No. 147.)
- No. 10. Wages and hours of labor in the cotton, woolen, and silk industries, 1907 to 1913. (Bul. 150.)
- No. 11. Wages and hours of labor in iron and steel industry in U. S., 1907 to 1912. (Bul. No. 151.)
- No. 12. Wages and hours in lumber, millwork, and furniture industries, 1907 to 1913. (Bul. No. 153.)
- No. 13. Wages and hours in boot and shoe and hosiery and underwear industries, 1907 to 1913. (Bul. No. 154.)
- No. 14. Wages and hours of labor in the clothing and cigar industries, 1911 to 1913. (Bul. No. 161.)
- No. 15. Wages and hours in building and repairing of steam railroad cars, 1907 to 1913. (Bul. 163.)
- No. 16. Wages and hours of labor in iron and steel industry in U. S., 1907 to 1913. (Bul. No. 168.)
- No. 17. Union scale of wages and hours of labor, May 1, 1914. (Bul. No. 171.)
- No. 18. Wages and hours of labor in the hosiery and underwear industry, 1907 to 1914. (Bul. No. 177.)
- No. 19. Wages and hours of labor in the boot and shoe industry, 1907 to 1914. (Bul. No. 178.)
- No. 20. Wages and hours of labor in the men's clothing industry, 1911 to 1914. (Bul. No. 187.)
- No. 21. Wages and hours of labor in the cotton, woolen, and silk industries, 1907 to 1914. (Bul. No. 190.)
- No. 22. Union scale of wages and hours of labor, May 1, 1915. (Bul. No. 194.)

Employment and Unemployment.

- No. 1. Proceedings of the American Association of Public Employment Offices. (Bul. No. 192.)
- No. 2. Unemployment in the United States. (Bul. No. 195.) [In press.]
- No. 3. Proceedings of Employment Managers' Conference. (Bul. No. 196.)

For material relating to these subjects, but not included in this series, see Miscellaneous series, Nos. 1, 10, 12 (Buls. Nos. 109, 172, 183).

Women in Industry.

- No. 1. Hours, earnings, and duration of employment of wage-earning women in selected industries in the District of Columbia. (Bul. No. 116.)
- No. 2. Working hours of women in the pea canneries of Wisconsin. (Bul. No. 119.)
- No. 3. Employment of women in power laundries in Milwaukee. (Bul. No. 122.)
- No. 4. Hours, earnings, and conditions of labor of women in Indiana mercantile establishments and garment factories. (Bul. No. 160.)
- No. 5. Summary of report on condition of woman and child wage earners in U. S. (Bul. No. 175.)
- No. 6. Effect of minimum-wage determinations in Oregon. (Bul. No. 176.)
- No. 7. Women in the boot and shoe industry in Massachusetts. (Bul. No. 180.)
- No. 8. Unemployment among women in department and other retail stores of Boston, Mass. (Bul. No. 182.)
- No. 9. Dressmaking as a trade for women. (Bul. No. 193.) [In press.]

For material relating to this subject, but not included in this series, see Miscellaneous series, Nos. 2, 3, 5 (Buls. Nos. 117, 138, 167).

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Workmen's Insurance and Compensation (including laws relating thereto).

- No. 1. Care of tuberculous wage earners in Germany. (Bul. 101.)
- No. 2. British National Insurance Act, 1911. (Bul. 102.)
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- No. 5. Workmen's compensation laws of the United States and foreign countries. (Bul. 126.)
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Conciliation and Arbitration (including strikes and lockouts).

- No. 1. Conciliation and arbitration in the building trades of Greater New York. (Bul. 124.)
- No. 2. Report of the industrial council of the British Board of Trade on its inquiry into industrial agreements. (Bul. 133.)
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- No. 4. Industrial court of the cloak, suit, and skirt industry of New York City. (Bul. 144.)
- No. 5. Conciliation, arbitration, and sanitation in the dress and waist industry of New York City. (Bul. 145.)
- No. 6. Collective bargaining in the anthracite coal industry. (Bul. 191.)
- No. 7. Collective agreements in the men's clothing industry. (Bul. 193.) [In press.]

Labor Laws of the United States (including decisions of courts relating to labor).

- No. 1. Labor legislation of 1912. (Bul. 111.)
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- No. 13. Report of the Minneapolis survey for vocational education. (Bul. 199.) [In press.]

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INDUSTRIAL ANILIN POISONING IN THE UNITED STATES.¹

BY REY VINCENT LUCE, M. D., AKRON, OHIO, AND ALICE HAMILTON, M. D., CHICAGO.

Industrial poisoning from anilin and substances closely allied to it has long been recognized in Germany, where the manufacture of anilin dyes is an enormously important industry, and the possible effect on the workmen of the various substances used or evolved during such manufacture has there been a subject of study since the sixties. More recently the growth of the dye industry in Great Britain has led to reports in that country concerning cases of anilin and of nitrobenzene poisoning.² As we know, there was no attempt in this country to compete with Germany in the manufacture of anilin colors or of anilin itself till the war shut off the supply and forced us to begin to make for ourselves what had heretofore been obtained from Germany. Uncertainty as to the duration of the war and lack of skill in these complicated processes delayed for many months the equipment of American factories, but once started, the movement has gained great impetus, and it is said that there are already more than a dozen factories for the production of anilin from benzene and of anilin dyes, and undoubtedly more will be constructed during the present year.

The sudden introduction of these industries brings new problems before physicians and sanitarians. Making anilin from coal tar involves exposure to poisons that are new to us in America, and because they are unfamiliar it is most improbable that the planners of these factories and the industrial chemists in charge of the processes will have given much thought to the protection of their workmen against the dangers inherent in the industry. If the experience of one town is typical, the greater number of American practitioners

¹ From Journal of the American Medical Association, May 6, 1916. Reprinted here by courtesy of the editors.

² The earliest report quoted by Kobert (*Die Intoxikationen*, Stuttgart, 1906) is English: Letheby, in *Proc. Roy. Soc.*, 1863.

are not prepared to recognize the symptoms of poisoning from these bodies, or to estimate their seriousness. After the introduction, a couple of years ago, of anilin as a compound of rubber in the tire factories of Akron, Ohio, it was some time before the physicians of that city realized what was the cause of the peculiar illness that had appeared among rubber workers; many patients were treated for chronic cardiac disease, and others for epilepsy. Therefore it becomes a very important matter in the interests of public health that the medical profession should know the nature of these substances, their mode of entrance into the body, and the means which must be adopted to protect those exposed in the course of their work.

POISONS USED IN THE MANUFACTURE OF ANILIN AND ANILIN DYES.

A short summary of the processes used in making anilin colors will show that the workmen employed in this industry are exposed to highly poisonous volatile compounds. The process starts with coal tar, which is a mixture of benzene (C_6H_6), toluene, xylene, etc., all of them volatile poisons responsible for a fairly large number of fatal industrial cases in the literature.¹ The benzene is treated with nitric and sulphuric acids to form nitrobenzene ($C_6H_5NO_2$), a poison which, according to Lewin,² has a mortality of 39.3 per cent, and according to von Jaksch,³ of 20 per cent. Then the nitrobenzene is reduced by means of iron filings and hydrochloric acid to anilin ($C_6H_5NH_2$). The most important colors are made by the action of nitrous acid on anilin and the allied aromatic amins. There is opportunity, therefore, for poisoning from benzene, nitrobenzene, and anilin, to say nothing of the multitude of similar bodies used or produced in the various processes, such as the nitrophenols, the nitrochlorbenzenes, and the naphthylamins. Methyl alcohol is one of the reagents used.

Grandhomme,¹ who was for many years attached to the great dye works at Höchst, reported 128 cases of industrial poisoning there, 109 of which were caused by anilin. Leymann,¹ who does not name the factory with which he was connected, gives a record of 171 cases of anilin and toluidin poisoning, and 101 from nitrobenzene and its allied bodies. German rubber works also have had their share of anilin poisoning. The factory inspectors' report for 1908 tells of the occurrence of wholesale poisoning in the extraction of rubber from crude gum. In this instance the workmen, 17 in all, were working in 12-hour shifts in an atmosphere contaminated with anilin fumes. Eleven were poisoned, two being rendered unconscious and requiring hospital care. The following year two instances

¹ Rambousek: *Gewerbliche Vergiftungen*, Leipzig, 1911, p. 142.

² Lewin: *Virchows Arch. f. path. Anat.*, 1879, lxxvi, p. 443.

³ Von Jaksch: *Die Vergiftungen*, Vienna, 1912, p. 325.

are reported of anilin poisoning in the recovery of rubber from scrap. Four acute cases developed in one factory, and on examination 15 other men were found to be suffering from chronic poisoning. In the second place, where 25 men were employed, no less than 14 were overcome by the fumes, and 10 of them were ill for more than 10 days.

ANILIN IN INDUSTRY IN THE UNITED STATES.

Aside from the production of anilin colors, the oil is used in this country in the compounding of rubber, especially for tires, and in reclaiming rubber from scrap, for which purposes it has come into increasing demand during the last few years. When the war suddenly shut off the supply from Germany, some rubber manufacturers gave up using it, but others set themselves to provide it by home manufacture, so that now we must add to the men exposed to anilism in rubber manufacture those who are engaged in producing the anilin. Industrial anilin poisoning, which a few years ago was negligible in this country, has suddenly assumed decided importance. So far the making of dyes is too new to have furnished any reported cases; those which are on record come from the rubber industry and from the use of a wash for printers' ink which has anilin as one of its ingredients.

It is impossible to say how much of this substance is used in the United States, or even to say how many plants use it, for the making of rubber, and even more the reclaiming of rubber is an industry fairly hedged about with trade secrets. That is why it was so difficult for Akron physicians to trace this kind of poisoning to its source. It is, however, well known in Akron now, and common enough for the victims to be familiarly known as "blue boys," from the cyanosis which is so prominent a symptom. Since the discovery of the cause of the trouble, the rubber manufacturers have taken measures for the protection of their men, either by installing exhaust ventilators, or simply by warning them to seek the open air as soon as flushing of the face and violent headaches come on. It is said that there is now far less serious poisoning in Akron rubber works.

THE TOXICITY OF ANILIN.

Pure anilin has never been known to cause poisoning; but pure anilin is not used in industry. What we know under this name is a mixture of anilin (amidobenzene) with metatoluidin, paratoluidin and orthotoluidin and xyloidin in varying proportions. Every medical student is familiar with the anilin oil which he uses as a clearing fluid for stained specimens, that golden brown oil with its pleasant nutlike odor. Unlike most volatile poisons, it gives no

warning of its character, for it does not irritate the eyes and throat and is apparently as harmless as cedar oil. Yet according to the researches of K. B. Lehmann,¹ anilin is toxic in even smaller doses than are benzene, chloroform, or carbon disulphid. Toxic symptoms follow the inhaling of from 0.1 to 0.25 gram of anilin, while it takes from 1 to 1.1 gram of carbon disulphid to produce symptoms of poisoning. Anilin volatilizes at room temperature; the boiling point is high, 182 C.

Krause² has reported two instances of poisoning from insignificant quantities of anilin. The men were working in the Zeiss Optical Works in Jena, testing the clarity of rock crystals by dipping them in small receptacles containing anilin, and then holding them up to the light. One man worked alone in a small room, and he felt the effects at the end of his second two-hour shift, complaining of nervousness and exhibiting a marked cyanosis of the skin and mucous membranes. The second was in a larger room in which the fumes were more diluted, and he worked almost four hours before becoming cyanosed. The blue color increased in intensity after a second day's work.

Still more striking in this connection is a nonindustrial case related by Trespe, of a little boy who breathed what must have been a very slight quantity of fume and developed marked symptoms. He slept in the same bed with an older brother who just before going to bed had rubbed some anilin on his frost-bitten fingers, with the result that he himself was severely poisoned and the little fellow moderately poisoned.

SYMPTOMS OF ANILIN POISONING.

These are common to the whole group, including nitrobenzene and its derivatives, though there are minor variations which serve to distinguish anilin poisoning in a typical case. The first symptom noted is weariness, or sleepiness, flushing of the face, a sense of fullness in the head, and even of slight mental confusion, dryness of the throat, and difficulty in swallowing. The color of the face changes from red to livid blue, which may increase to a deep purple. The pulse is rapid and weak, the temperature subnormal. Headache comes on early and is often violent, accompanied by dizziness and nausea, and in the more serious cases there is decided dyspnea, increasing mental confusion, and finally loss of consciousness. Sometimes this occurs suddenly, sometimes not till some hours after the man has left the poisoned atmosphere. The urine at first is usually normal; later it becomes smoky in appearance.

¹ Lehmann, K. B., quoted in Kobert: *Lehrbuch der Intoxikationen*, Stuttgart, ii, 1109.

² Krause: *Med. Klin.*, 1908, iv, 10.

In some cases the subjective symptoms are slight and the man seeks advice because of his livid or blue color, which is alarming to his family. This was true of two cases reported by G. Apfelbach and described further on. Usually industrial cases do not exhibit the severest symptoms, but we have records of instances of epileptoid convulsions and of protracted coma, which sometimes have proved very puzzling to the attending physician. One of these is interesting, illustrating as it does the vasomotor depression which is a feature of this poison.

The patient, who was chief chemist in one of the large rubber companies, was found by his physician suffering from violent headache and nausea. He was profoundly cyanotic. Soon after the physician arrived, a convulsion epileptoid in character came on—the man never had a convulsion before this—and after it he was greatly prostrated. The physician, not knowing that it was a case of anilin poisoning, administered inhalations of amyl nitrite, which very much aggravated the symptoms, and for a while after the patient's condition was most precarious.

Recovery in the milder cases is prompt, the men returning to work on the following day as a usual thing, though the cyanosis often persists for several days more. Severer cases may incapacitate for work during several weeks. Some men are said to establish a tolerance to the poison, and do not suffer a second attack; but it is more usual to find an increased susceptibility following an acute poisoning. Thus in one of the Akron plants in which anilin is being manufactured a foreign workman, who incidentally is said to have been a heavy drinker, was told to fill a drum with anilin, and while doing this he lost consciousness and had to be taken home. The next day he came back to work, but as soon as he entered the room where the oil was being poured into drums he again fainted.

Chronic anilism is described by von Jaksch as a condition resulting from repeated doses of the poison so small as not to set up symptoms of acute poisoning. There are more or less headache, nausea, vertigo, muscular twitchings, disturbances of vision, sense of exhaustion, and loss of strength. The skin is usually livid, or it may be jaundiced. In one instance of chronic poisoning which was reported to us in Akron the man had been treated for chronic heart disease because of his cyanotic appearance and his dyspnea on exertion. He was found to be profoundly anemic, but there was no heart lesion, and he recovered after changing to outdoor work.

We have as yet no record in this country of the occurrence of tumors of the bladder in anilin workers, such as has been described by German observers. These tumors are adenomatous or carcinomatous and are supposedly caused by the irritation by some of the products of anilin decomposition excreted by the kidneys.

MODE OF ENTRANCE OF ANILIN.

The poison may enter through the skin or the lungs, more often by both ways. Birge's¹ cases are instances of pure skin absorption.

Two painters were using anilin-black paint, applying it with a brush and then washing the surface with hot water and soap suds. There were no fumes, but both men were seized with nausea, general weakness, palpitation of the heart, then violent headache, with vomiting in one case and diarrhea in the other. Both passed dark-colored urine. The skin was very pale, the lips blue. The next day they were able to go back to work, and by wearing rubber gloves they avoided a repetition of the trouble.

On the other hand, von Jaksch² reports a case of pure respiratory origin.

A boy of 17 years had been set to work for the first time mixing anilin with other compounds in an open receptacle. Headache came on almost at once, and after four hours' work he was forced to seek the outer air. He went home, and a physician, summoned some hours later, found him in coma, deeply cyanosed, with a weak, rapid pulse and dyspnea. Edema of the lungs developed and did not clear up for four or five days. The coma lasted several hours. In this case anilin could be detected in the urine.

The greater number of industrial cases follow the spilling or splashing of anilin over clothes or skin, and doubtless both skin absorption and lung absorption play their part.

PATHOLOGY OF ANILIN POISONING.

Rambousek³ places anilin and all the nitro and amido derivatives of the aromatic series among the true blood poisons, the principal action of which is to cause the formation of methemoglobin. He attributes all the resulting symptoms to the fact that in place of oxyhemoglobin, with its easily released oxygen, there is methemoglobin, with its firmly bound oxygen, and consequently a condition of "internal suffocation" from lack of oxygen in the tissues. The headache, feeling of anxiety, oppression, weakness, dizziness, dyspnea, and finally loss of consciousness are all caused by the deprivation of oxygen. The later symptoms, icterus, methemoglobinuria, bladder irritation, and bronchitis, are caused by the elimination of the poison. Kobert⁴ lays almost equal stress on the importance of the blood changes; but, unlike Rambousek, he believes that there is also a direct effect on the central nervous system. Curschmann⁵ agrees with the latter that anilin and the anilin group are pure blood poisons, and that all the symptoms are referable to blood changes.

¹ Birge, E. G.: A Probable Case of Anilin Poisoning, *The Journal A. M. A.*, Jan. 24, 1914, p. 314.

² Von Jaksch: *Die Vergiftungen*, Vienna, 1912, p. 325.

³ Rambousek: *Gewerbliche Vergiftungen*, Leipzig, 1911, p. 142.

⁴ The earliest report quoted by Kobert (*Die Intoxikationen*, Stuttgart, 1905) is English: Letheby, in *Proc. Roy. Soc.*, 1863.

⁵ Curschmann: *Tr. Internat. Cong. Indust. Hyg.*, Brussels, 1910.

Experimental studies of these blood changes were made by Price-Jones and Boycott,¹ using anilin hydrochlorid on rabbits. This compound, which is used in rubber manufacture under the name of "anilin salt," is essentially anilin dissolved in hydrochloric acid. These authors succeeded in producing severe poisoning, the hemoglobin falling to 50 per cent. The blood was turbid and brownish, and the spectroscope showed a band almost, but not quite, corresponding to that of methemoglobin. There was a transient leucocytosis, from 30,000 to 40,000, and both the circulating blood and the bone marrow showed evidence of efforts at regeneration of the red corpuscles in the form of megaloblasts, nucleated reds, and basophilic granules. The destruction of cellular elements in the blood was sometimes accompanied by an increase in the total volume.

Malden² examined the blood of 13 men employed in an English factory where anilin dyes and nitrobenzene were made. Six of the 13 had a high red count with a low color index and many imperfectly developed reds. The spectrum of methemoglobin could be detected only when it was present in the proportion of one part to ten of oxyhemoglobin. Loss of hemoglobin ran from 5 to 50 per cent. Stained specimens showed great variations in the size of the red corpuscles, from 5 to 11 microns, the large predominating, but there were no nucleated reds. It is noteworthy that basophilic granules were found in 6 of the 13 men, and Malden believes that this is often the earliest sign of anilin poisoning, as it is of lead poisoning. In pronounced cases there may be 10 or 12 stippled cells in every field. A differential count of whites in 9 cases showed a diminution of polymorphonuclears—marked in 5—with a corresponding increase in small mononuclears. Eosinophils were increased in 3, mast cells in 6.

Malden summarizes the effect on the blood of small repeated doses of anilin thus: Reds increased in number with loss of hemoglobin; low color index; degeneration and imperfect regeneration of red corpuscles; decrease in polymorphous leucocytes, increase in lymphocytes.

DIAGNOSIS OF ANILIN POISONING.

The importance of the blood examination in the diagnosis is very evident. Curschmann advises in all doubtful chronic cases an estimation of the hemoglobin, and if this has fallen 15 or 20 per cent, the man should be kept under observation, for anemia is the earliest symptom. As we have seen, Malden would look for stippled cells first. When toxic symptoms have developed, the presence of hemoglobin in the urine should be looked for. The physician who is not equipped with an apparatus for making blood examinations will

¹ Price-Jones and Boycott: *Guy's Hosp. Rep.*, 1901, lxiii, 309.

² Malden: *Jour. Hyg.*, 1907, vii, 672.

depend on the cyanosis, the dark-colored urine, the odor of anilin in the breath, the rapid pulse of low tension, the dyspnea, and the nervous symptoms, together with the history of employment in a factory in which this group of compounds is handled.

CASES OF INDUSTRIAL ANILIN POISONING IN THE UNITED STATES.

The first cases of this sort that we have been able to discover in the literature were reported in 1913 by G. L. Apfelbach:¹

Two men were referred by factory inspectors to Dr. Apfelbach on account of the marked cyanosis of skin and mucous membranes. The first was a press feeder in a printing establishment who had been using a new sort of roller wash to remove the ink from the press rollers. It was a black oily fluid, which on analysis in the State laboratory was found to contain anilin. On the day when he was seen by the inspector, he had cleaned more rollers than usual, but he had been cyanosed before, though never so profoundly. The symptoms elicited by questioning were headache, mostly occipital, dizziness, pain in the epigastrium, dryness in the throat, and slight difficulty in swallowing, but none of these was severe enough to make him seek medical aid. It was the blue color which alarmed him. His pulse was of high tension, his blood pressure 170 mm. Hg. (the man was 47 years old), but no other abnormality was observed with the exception of the pronounced cyanosis and a slight difficulty in swallowing and in speech. The reflexes were normal. Examination of the blood revealed: Hemoglobin, 100+ per cent; red cells, 5,734,600; white count, 8,200 differential; polymorphonuclears, 72.8 per cent; large mononuclears, 0.5 per cent; small mononuclears, 20.2 per cent. The spectroscope showed methemoglobin lines. The urine was dark, smoky color, specific gravity 1.028, no albumin, no sugar, casts, etc. Employees in this printing shop had noticed the same change of complexion in other men engaged in this work, but never so severe as in this case.

Dr. Apfelbach's second patient was employed in a large dry color factory, mixing colors in an open chaser, work which he had done for several years. Occasionally he would notice that the mixture in the chaser would give off "steam" which made him sick, and this had been true just before he applied to Dr. Apfelbach for advice. The other men in the shop had alarmed him about his blue color, and he himself complained of headache, vertigo, and difficulty in swallowing. The examination in this case was negative except for the presence of methemoglobin in the blood.

Birge's cases, already quoted, were next reported in 1914; and in 1915 E. R. Hayhurst,² in the course of his investigations of Ohio industries, found anilin poisoning in printing shops and rubber works in that State. Three cases had occurred among men employed at rubber mixing mills. The inspectors were also told of more serious poisoning among printing pressmen who used a roller wash rich in anilin. In several instances the use of this had caused loss of consciousness lasting several hours and accompanied with cyanosis.

In the course of an investigation for the Federal Bureau of Labor Statistics of poisonous substances used in the rubber industry, we³

¹ Apfelbach, G. L.: Bull. Dept. Factory Inspection, State of Illinois, 1913.

² Hayhurst, E. R.: Industrial health hazards and occupational diseases in Ohio, Ohio State Board of Health, 1915.

³ Luce, R. V., and Hamilton, Alice: Bul. 179, U. S. Dept. of Labor, Bureau of Labor Statistics.

collected some evidence concerning anilin poisoning in the chief rubber city of the country—Akron, Ohio. Anilin is used as an aid and an accelerator of vulcanization in heat curing of rubber, chiefly in tire works. Five plants in Akron were known to be using it and probably several others did. "Anilin substitute"—perhaps thio-carbanilid—and "anilin salt" (the hydrochlorid) are used in other plants. The danger is found in the room in which the compounds are measured out, on the mills on which the compounds are warmed and mixed together, and even on the calenders, on which the rubber is sheeted. The odor is plainly recognizable in all these places, unless special precautions are taken to prevent fumes by providing tightly covered receptacles and by good exhaust ventilation over the mills.

As rubber reclaiming is a process carefully guarded from the public because of trade secrets, it was not possible for us to visit any of these plants; but we found reason to believe that most of the cases of anilin poisoning in Akron—as is true in Germany—come from this branch of the industry. Not only the secrecy of the processes made it difficult to collect evidence of anilin poisoning, but also the fact that foremen and superintendents are naturally unwilling to admit that there is any danger from a substance which is in use in the factory. If, however, they are no longer using it, they may be quite willing to tell of its disadvantages. In a tire factory when no more anilin could be procured, the foreman said frankly that he was thankful not to have to handle it any more, for he had had so much trouble from the fumes among the men at the mills.

An interesting case indirectly connected with the rubber industry was described by an Akron physician. An old boiler was sold by one of the rubber factories, and the boiler repairer who undertook to clean it and put it in order had a typical attack of anilin poisoning.

The manufacture of anilin from benzene had begun only a short time before our investigation in Akron, but already one factory had a daily output of about 2,500 pounds and employed about 14 men in two 12-hour shifts. In spite of a good system of exhaust ventilation which is said to have been installed, the men suffered from the fumes, and we were told that during the first four months of operation the factory lost no less than 15 men from this cause, though it was not easy at that time to find work in Akron.

Shortly before the investigation referred to above, a severe case of anilism had occurred in one of the rubber factories. In this instance the poison seems to have entered both by the skin and by the lungs.

The patient was admitted to the city hospital of Akron in a state of coma that lasted nine hours. He was deeply cyanosed, his temperature was 97.6, and pulse 116, fluttering and weak. The reflexes were normal save for a slight sluggishness of the

pupils. Urine examination was negative. The patient was put to bed and given inhalations of oxygen and heart stimulants, aromatic spirits of ammonia, camphorated oil, strychnine, and digalen. The temperature remained subnormal for six hours. After nine hours he regained consciousness and was discharged the following day, feeling a little weak and slightly nauseated, but otherwise normal.

His history was as follows: He was working in one of the rubber factories, and at about 1 p. m. he spilled a can of liquid over his clothes. He said it had a peculiar alcoholic odor, and when it came in contact with his skin it felt burning. The fumes were very noticeable, but he kept on at his work for about two hours more, though conscious that something was wrong. Then he began to have severe palpitation of the heart, he noticed that his face was flushed, he grew dizzy, and a violent headache came on, and presently nausea, and he vomited several times. He was taken to his home, where the cyanosis kept increasing in intensity, and at about 6 in the evening he lost consciousness and was brought to the hospital. Consciousness returned at about 3 in the morning. Investigation showed that the fluid he had spilled was anilin.

Since the publication of the Government report, several additional cases have been observed by one of us in connection with the rubber industry in Akron. One of them is of special interest in that we have accurate data as to the exact time of exposure to the fumes before the onset of very typical symptoms of the more intense, acute form of poisoning.

J. E. was first seen July 24, 1915. He was in profound coma, his breathing was stertorous, and his pulse was irregular and of very poor quality. He was so cyanosed that the skin over his whole body was a deep plum color. That morning at 7 he had gone to work feeling perfectly well in every way, and, according to the history obtained, he was exposed to fumes of anilin for 1 hour and 40 minutes before he began to notice any symptoms of depression. First came throbbing in the head and increasing nausea, which he thought were due to the hot weather and the poorly ventilated room. He next noticed palpitation of the heart, and then a violent headache came on, increasing in intensity and accompanied by vertigo. As he said, "I felt as if I had been standing on my head for a long time and that every ounce of blood in my body had rushed to my brain." The dizziness increased and he lost consciousness completely about 45 minutes after the onset of the first symptoms. He was picked up by the other workmen and rushed to the hospital, where oxygen was administered as well as heart stimulants, but apparently with little effect. The cyanosis persisted, the heart action was very feeble and remained so for over 16 hours, and he did not regain consciousness till the morning of July 25, a period of about 22 hours.

A catheterized specimen of urine obtained on admission showed nothing of note, but a second examination was made 18 hours later, when it was found to be smoky, specific gravity 1.022, there was a trace of albumin, no sugar, and the presence of hemoglobin was detected by the Heller test and by the Schönbein-Almèn turpentine-guaiac test, which is even more delicate than the spectroscopic. This hemoglobinuria persisted for five days.

A blood examination made on entrance gave normal findings in all respects except for a slight eosinophilia, but four days later there were stippled red cells and some irregularity in the size and shape of the reds. The hemoglobin then was 75 per cent (Sahli).

The patient suffered from severe headache for five days and complained of weakness and exhaustion for at least two weeks longer, after which he improved slowly. He was warned not to expose himself to this danger again.

The second case is cited because it is representative of the slower and much less typical forms of anilin poisoning: H. M., a chemist employed in the research laboratories of one of the large rubber companies of Akron, was seen November 1, 1915. He complained of palpitation of the heart, dizziness, marked muscular weakness, occasional nausea, and violent headaches. On close questioning it became evident that the palpitation of the heart was worse and headache was more apt to come on during active work, and that this work often consisted in the handling of a compound containing anilin. Most of the work was carried on under a hood, but he admitted that the odor of anilin was at times quite noticeable. He had been doing this sort of work for months, and said that he had never been cyanosed and never had had to lose a day from the laboratory.

An examination of the urine showed nothing abnormal. The red cell count was 5,400,000, but the hemoglobin only 68 per cent, and a stained smear showed pale, unevenly staining reds. Physical examination revealed nothing of note except a rapid heart action; the pulse was 94.

On this scanty evidence the patient was advised to give up his work and find some outdoor occupation, which he did, and as a result the symptoms disappeared entirely in six weeks.

The third patient, a lad of 18 years, was also employed in the research laboratories of one of the rubber companies. He was given a special problem to work on, which involved the grinding and mixing of certain compounds together with anilin. He did it in a corner of the room where the fumes could not spread and expose the other workmen. After working in this way for a few weeks he began to suffer from a dull headache, which persisted all day. Then one day he became conscious of a severe throbbing in his head, and his face became cyanotic. He stopped work for the day and came back the next morning feeling fairly well, but it so happened that the ventilation was unusually poor that morning and the fumes very noticeable. After just one hour's work he lost consciousness and remained in a deep coma for over 24 hours. He was very cyanotic and his heart action was weak; at times he was almost pulseless. Camphorated oil administered hypodermically seemed to exert a better effect than did the oxygen which was given continuously for 12 hours. In this case no blood examination was made; the urine was at first bright red, later a smoky black.

Examination of the histories of a large number of cases of anilin poisoning reveals interesting facts as to the varying susceptibility of men to this poison. We have already noted the increased sensitiveness of heavy drinkers. It seems also that men of dark hair and complexion are less susceptible than blonds, as has been observed in one of the large rubber works where records have been kept of over 50 cases of poisoning. Furthermore, it is found that young men are more susceptible than are the middle-aged, especially to the acute, violent form of anilism.

CONCLUSIONS.

Commercial anilin is a well-known industrial poison in Germany and in Great Britain. It is just beginning to be known in the United States, where it has already been the cause of numerous cases of poisoning among men engaged in the manufacture of rubber goods, in reclaiming rubber from scrap, in making anilin from benzene, and in using certain washes for press rollers.

It is a blood poison, causing the formation of methemoglobin with the consequent "internal suffocation."

Poisoning may take place through the skin or the lungs. Usually in industrial cases both portals of entry play a part.

Exposure to the fumes need not be excessive or long-continued to bring about serious symptoms in the susceptible.

Young men are more susceptible than the old or middle aged, blonds than dark-haired men, heavy drinkers than the temperate.

Hot, humid weather, heated rooms, and poor ventilation are important factors in the production of acute anilin poisoning.

Early recognition of anilin poisoning is of prime importance so that the sufferer may be withdrawn from the danger of further exposure to the poison.

Men working in anilin constantly seem to acquire a certain amount of tolerance to it; nevertheless, if the exposure is increased beyond the point of tolerance, there is apparently a cumulative effect, and symptoms of chronic poisoning result. After symptoms of poisoning have once manifested themselves, the patient is usually hypersensitive to the fumes.

The treatment consists in fresh air, oxygen, and heart stimulants, especially camphorated oil. Prevention of subsequent exposure is imperative.

CONCILIATION WORK OF THE DEPARTMENT OF LABOR, APRIL 16 TO MAY 15, 1916.

On the authority contained in the organic act of the department to mediate in labor disputes and to appoint commissioners of conciliation in its discretion, the Secretary of Labor, through the commissioners of conciliation, exercised his good offices in 39 labor disputes between April 16 and May 15, 1916.

The companies involved in these controversies, the number of employees affected, and the results secured, as far as available, are shown in the following statement:

NUMBER OF LABOR DISPUTES HANDLED BY THE DEPARTMENT OF LABOR, THROUGH ITS COMMISSIONERS OF CONCILIATION, APR. 16 TO MAY 15, 1916.

Name.	Workmen affected—		Result.
	Directly.	In-directly.	
J. B. Stetson Co., Philadelphia, Pa.—strike.....			Pending
Building Material Teamsters, Cleveland, Ohio—controversy.....	742	30,000	Do.
American Refractories Co., Rockdale, Ill.—strike.....	300	300	Do.
Machinists, Syracuse, N. Y.—strike.....	2,500	700	Do.
Machinists and Metal Polishers, Millers Falls, Mass.—strike.....	200	50	Adjusted.
Washington Terminal Co., Washington, D. C.—controversy.....	425		Pending.
Apperson Automobile Works, Kokomo, Ind.—lockout.....			Do.
Building Trades, Joliet, Ill.—strike.....	820	2,000	Do.
Westinghouse employees, East Pittsburgh—strike.....	36,000		Do.
Controversy between New York Boat Owners Association and Marine Engineers, New York.....	1,000	7,000	Adjusted.
California Ship Building Co., Long Beach, Cal.—controversy.....			Pending.
Western Maryland R. R. Co., Baltimore, Md.—controversy.....	451		Do.
Pittsburgh Street Railway Co., Pittsburgh, Pa.—strike.....	3,000	3,000	Adjusted.
Pittsburgh & Lake Erie R. R., Pittsburgh, Pa.—strike.....	4,000	6,000	Do.
Allen Dyeing Co., Philadelphia, Pa.—strike.....	30		Pending.
W. H. Burns Co., Philadelphia, Pa.—strike.....	20		Do.
Electric Dye Works, Philadelphia, Pa.—strike.....	12		Do.
Fairhill Bleachery, Philadelphia, Pa.—strike.....	12		Adjusted.
Victor Dye Works, Philadelphia, Pa.—strike.....	18		Pending.
Ontario Dyeing Co., Philadelphia, Pa.—strike.....	75		Do.
Charlotte Dye Works, Philadelphia, Pa.—strike.....	12		Do.
Brehm & Stehle, Philadelphia, Pa.—strike.....	100		Do.
Rainbow Dye Works, Philadelphia, Pa.—strike.....	24		Do.
Red Star Dye Works, Philadelphia, Pa.—strike.....	18		Do.
Fairhill Dye Works, Philadelphia, Pa.—strike.....	14		Do.
Hulton Dyeing & Finishing Co., Philadelphia, Pa.—strike.....	150		Do.
Oxford Dye Works, Philadelphia, Pa.—strike.....	8		Do.
Kensington Dye Works, Philadelphia, Pa.—strike.....	60		Do.
Angola Dyeing Co., Philadelphia, Pa.—strike.....	20		Adjusted.
Thos. Weinmann & Sons, Philadelphia, Pa.—strike.....	12		Pending.
American Dye Works, Philadelphia, Pa.—strike.....	8		Do.
Vienna Dye Works, Philadelphia, Pa.—strike.....	45		Do.
L. B. Luithlen Co., Philadelphia, Pa.—strike.....	30		Do.
Thomas Dawson & Co., Philadelphia, Pa.—strike.....	12		Adjusted.
Park Carpet Mills, Philadelphia, Pa.—strike.....	608		Do.
Robert Meyer, Philadelphia, Pa.—strike.....	59		Do.
Federal Dyeing Co., Philadelphia, Pa.—strike.....	260		Do.
Caledonian Dye Works, Philadelphia, Pa.—strike.....	15		Do.
New York, New Haven & Hartford R. R.—controversy between company and clerks.....			Pending.

Adjustments have been effected in the following cases which were noted in the statement submitted April 15, 1916, and printed in the May issue of the MONTHLY REVIEW:

- Hancock Knitting Mills, Philadelphia.
- Cramp Ship Building Yards, Philadelphia.
- Chicago & Alton Railroad Co.

FEDERAL EMPLOYMENT WORK OF THE DEPARTMENT OF LABOR.

During April, 1916, the Division of Information of the Bureau of Immigration of the Department of Labor placed 7,653 persons in employment as compared with 7,030 during March, 1916. As there were 13,498 applications for work, 57 per cent were placed in April as compared with 36 per cent for March. This is the largest proportion since May, 1915. The operations of the division by

months since May, 1915, when fuller reports began to be made, are contained in the following statement:

OPERATIONS OF THE DIVISION OF INFORMATION, BUREAU OF IMMIGRATION, DURING THE MONTHS OF MAY, 1915, TO APRIL, 1916.

Month.	Number of applications for help.	Number of persons applied for.	Number of applicants for places.	Number referred to employment.	Number actually employed.	Per cent of applicants placed.
1915.						
May	638	3,826	12,132	3,752	3,495	28.81
June	1,249	3,601	14,530	5,131	4,646	31.98
July	1,160	8,665	18,061	6,360	6,035	33.41
August	1,279	7,931	17,827	7,321	6,757	37.90
September	1,201	4,551	13,334	5,671	5,405	40.54
October	1,104	5,423	12,215	5,460	5,006	40.98
November	847	4,650	11,908	4,459	4,146	34.82
December	698	3,588	11,902	2,622	2,170	18.23
1916.						
January	933	5,063	15,015	4,300	3,419	22.78
February	1,423	6,413	14,257	5,036	4,185	29.35
March	3,443	10,209	19,484	8,113	7,030	36.08
April	3,805	12,104	13,498	8,843	7,653	56.70

The following statement of the employment work of the 18 separate zones of operation covering the whole country gives the usual details for March and April, 1916:

SUMMARY OF ACTIVITIES FOR THE MONTHS OF MARCH AND APRIL, 1916.

Zone.	Opportunities received.				Applications for employment.					
	Applications for help.		Persons applied for.		Applications received.		Referred to employment.		Number actually employed.	
	March.	April.	March.	April.	March.	April.	March.	April.	March.	April.
1. Boston, Mass.	2	4	50	15	73	48	10	14	6	11
Portland, Me.										
Total	2	4	50	15	73	48	10	14	6	11
2. New York, N. Y.	157	278	789	999	1,229	668	785	487	637	424
Buffalo, N. Y.	60	94	791	1,009	811	527	703	515	600	307
Total	217	372	1,580	2,088	2,040	1,195	1,488	1,002	1,237	731
3. Philadelphia, Pa.	113	133	1,371	600	413	329	384	266	230	194
Pittsburgh, Pa.	30	21	176	522	774	291	319	128	148	40
Total	143	154	1,547	1,122	1,187	620	703	394	378	234
4. Baltimore, Md.	15	16	17	18	158	94	137	87	137	87
5. Norfolk, Va.	20	22	215	50	104	69	25	124	59	79
6. Jacksonville, Fla.	2		6		16	93	1	62		13
Charleston, S. C.	3		226		52	38	54	15	28	15
Miami, Fla.	8	11	16	21	98	56	18	9	7	9
Mobile, Ala.					6	14				
Savannah, Ga.	3	4	30	22	37	55	30	22	20	17
Total	16	15	278	43	209	256	103	108	55	54
7. New Orleans, La.	3	3	5	3	214	196	17	12	2	1
Gulfport, Miss.	3	1	3	6	64	38	3	7		
Memphis, Tenn.	1		20		23		2		2	
Total	7	4	28	9	301	234	22	19	4	1

SUMMARY OF ACTIVITIES FOR THE MONTHS OF MARCH AND APRIL, 1916—Concl'd.

Zone.	Opportunities received.				Applications for employment.					
	Applications for help.		Persons applied for.		Applications received.		Referred to employment.		Number actually employed.	
	March.	April.	March.	April.	March.	April.	March.	April.	March.	April.
8. Galveston, Tex.	3	1	9	2	64	59	13	21	8	3
Amarillo, Tex.										
Brownsville, Tex.						1		1		
Eagle Pass, Tex.					1					
Albuquerque, N. Mex.						5				
Houston, Tex.	1		1		78	35		1		1
Laredo, Tex.										
San Angelo, Tex.	1		1		5		1			
Total	5	1	11	2	148	100	14	23	8	4
9. Cleveland, Ohio	90	26	100	34	113	96	88	62	34	25
10. Chicago, Ill.	138	128	952	2,086	6,152	2,138	950	1,134	924	1,118
Detroit, Mich.	158	160	523	824	376	402	288	396	288	396
Indianapolis, Ind.	51	103	225	498	257	590	247	522	247	522
Saulte Ste. Marie, Mich.	5	15	33	78	64	47	46	43	42	43
Total	352	406	1,733	3,486	6,849	3,177	1,531	2,095	1,501	2,079
11. Minneapolis, Minn.	156	68	164	76	162	64	69	51	69	51
12. St. Louis, Mo.	29	26	610	158	227	179	61	110	49	89
Kansas City, Mo.	61	190	125	309	591	698	203	315	97	185
Total	90	216	735	467	818	877	264	425	146	274
13. Denver, Colo.	12	11	15	29	70	21	40	18	7	7
Salt Lake City, Utah.						2				
Total	12	11	15	29	70	23	40	18	7	7
14. Helena, Mont.	3	6	4	6	11	3	7	2		2
Moscow, Idaho.		3		3		4		5		3
Total	3	9	4	9	11	7	7	7		5
15. Seattle, Wash.	72	65	120	132	512	808	110	129	101	123
Aberdeen, Wash.	33	22	98	65	230	245	98	65	98	64
Bellingham, Wash.	26	41	63	96	179	129	59	86	50	78
Everett, Wash.	15	5	21	14	53	48	21	20	16	14
North Yakima, Wash.	352	351	563	504	980	957	542	481	512	470
Spokane, Wash.	81	75	110	145	139	225	100	132	97	132
Takoma, Wash.	162	205	465	479	1,421	620	465	479	465	471
Walla Walla, Wash.	138	167	235	228	343	218	180	177	179	176
Total	879	911	1,675	1,663	3,857	3,250	1,575	1,569	1,518	1,528
16. Portland, Oreg.	946	982	1,043	1,900	783	1,115	910	1,584	906	1,484
17. San Francisco, Cal.	216	277	281	475	1,286	1,113	305	426	248	308
Fresno, Cal.										
Total	216	277	281	475	1,286	1,113	305	426	248	308
18. Los Angeles Cal.	1		2		557	343	1		1	
Bakersfield, Cal.		1		6	3	8		5		5
San Diego, Cal.	273	310	731	692	753	809	821	830	716	686
Tucson, Ariz.					2					
Total	274	311	733	698	1,315	1,160	822	835	717	691
Total for month	3,443	3,805	10,209	12,104	19,484	13,498	8,113	8,843	7,030	7,653

WORK OF STATE AND MUNICIPAL EMPLOYMENT BUREAUS.

In the following table data are presented relative to the operations of free public employment offices. The table furnishes information for State employment bureaus in 14 States, municipal employment bureaus in 8 States, a State-city employment bureau in 1 State, a city-private employment bureau in 1 State, and a Federal-municipal employment bureau in 1 State. Figures are given for both April, 1915, and April, 1916, in cases where reports have been received for both periods; in other cases the only information reported was for April, 1916.

OPERATIONS OF FREE PUBLIC EMPLOYMENT OFFICES, APRIL, 1915 AND 1916.

State and city.	Number of—					Positions filled.
	Applications from employers.	Persons asked for by employers.	Persons applying for work.		Persons referred to positions.	
			New registrations.	Re-novels.		
<i>California (municipal).</i>						
Berkeley:						
April, 1915.....	191	222	134	703	222	222
April, 1916.....	205	218	61	307	215	215
Sacramento:						
April, 1915.....	218	240	84	(1)	240	240
April, 1916.....	217	355	56	(1)	355	355
<i>California (State).</i>						
Oakland: April, 1916.....	524	692	680	154	788	590
Sacramento: April, 1916.....	214	481	553	38	431	384
San Francisco: April, 1916.....	760	1,971	2,127	299	1,785	1,513
<i>Colorado (State).</i>						
Colorado Springs:						
April, 1915.....	(1)	500	(1)	(1)	(1)	464
April, 1916.....	(1)	617	718	(1)	556	(1)
Denver, No. 1:						
April, 1915.....	(1)	209	(1)	(1)	(1)	186
April, 1916.....	(1)	297	257	(1)	185	(1)
Denver, No. 2:						
April, 1915.....	(1)	227	(1)	(1)	(1)	190
April, 1916.....	(1)	316	376	(1)	267	(1)
Pueblo:						
April, 1915.....	(1)	72	(1)	(1)	(1)	72
April, 1916.....	(1)	485	394	(1)	353	(1)
<i>Connecticut (State).</i>						
Bridgeport:						
April, 1915.....	321	(1)	(1)	(1)	(1)	292
April, 1916.....	741	(1)	(1)	(1)	(1)	674
Hartford:						
April, 1915.....	230	(1)	(1)	(1)	(1)	200
April, 1916.....	830	(1)	(1)	(1)	(1)	546
New Haven:						
April, 1915.....	256	(1)	(1)	(1)	(1)	204
April, 1916.....	565	(1)	(1)	(1)	(1)	436
Norwich:						
April, 1915.....	38	(1)	(1)	(1)	(1)	31
April, 1916.....	273	(1)	(1)	(1)	(1)	259
Waterbury:						
April, 1915.....	158	(1)	(1)	(1)	(1)	127
April, 1916.....	204	(1)	(1)	(1)	(1)	153
<i>Illinois (municipal).</i>						
Chicago: April, 1916.....	2 58	2,030	500	(1)	2,030	778

¹ Not reported.

² Number of requisitions.

OPERATIONS OF FREE PUBLIC EMPLOYMENT OFFICES, APRIL, 1915 AND 1916—Contd.

State and city.	Number of—					Positions filled.
	Applications from employers.	Persons asked for by employers.	Persons applying for work.		Persons referred to positions.	
			New registrations.	Renewals.		
<i>Illinois (State).</i>						
Chicago:						
April, 1915.....	2,045	(1)	(1)	(1)	(1)	1,550
April, 1916.....	6,536	(1)	(1)	(1)	(1)	5,841
East St. Louis:						
April, 1915.....	421	(1)	(1)	(1)	(1)	421
April, 1916.....	1,603	(1)	(1)	(1)	(1)	1,220
Peoria:						
April, 1915.....	614	(1)	(1)	(1)	(1)	610
April, 1916.....	1,345	(1)	(1)	(1)	(1)	1,002
Rock Island-Moline:						
April, 1915.....	230	(1)	(1)	(1)	(1)	230
April, 1916.....	781	(1)	(1)	(1)	(1)	637
Rockford:						
April, 1915.....	436	(1)	(1)	(1)	(1)	410
April, 1916.....	1,152	(1)	(1)	(1)	(1)	831
Springfield:						
April, 1915.....	249	(1)	(1)	(1)	(1)	248
April, 1916.....	605	(1)	(1)	(1)	(1)	512
<i>Indiana (State).</i>						
Evansville:						
April, 1915.....	(1)	148	2 226	(1)	140	134
April, 1916.....	(1)	153	2 207	(1)	142	134
Fort Wayne:						
April, 1915.....	(1)	213	2 221	(1)	216	206
April, 1916.....	(1)	463	2 360	(1)	330	306
Indianapolis:						
April, 1915.....	(1)	230	2 375	(1)	240	217
April, 1916.....	183	654	2 720	(1)	628	548
South Bend:						
April, 1915.....	(1)	271	2 483	(1)	247	231
April, 1916.....	(1)	731	2 549	(1)	480	447
<i>Kansas (State).</i>						
Topeka:						
April, 1915.....	20	25	60	6	32	17
April, 1916.....	38	51	114	1	64	43
<i>Kentucky (city-private).</i>						
Louisville:						
April, 1915.....	(1)	92	322	862	93	61
April, 1916.....	(1)	285	405	735	213	124
<i>Kentucky (State).</i>						
Louisville:						
April, 1915.....	64	64	260	(3)	64	64
April, 1916.....	139	139	268	(3)	139	139
<i>Massachusetts (State).</i>						
Boston:						
April, 1915.....	1,327	1,534	4 925	(1)	5 2,646	1,276
April, 1916.....	2,561	2,870	4 1,262	(1)	5 3,724	1,743
Fall River:						
April, 1915.....	107	113	4 17	(1)	5 99	88
April, 1916.....	147	151	4 27	(1)	5 142	129
Springfield:						
April, 1915.....	596	622	4 228	(1)	5 773	496
April, 1916.....	1,036	1,258	4 512	(1)	5 1,400	913
Worcester:						
April, 1915.....	604	717	4 568	(1)	5 1,009	487
April, 1916.....	1,247	1,710	4 698	(1)	5 1,553	779
<i>Michigan (State).</i>						
Detroit:						
April, 1915.....	1,129	3,147	(1)	(1)	(1)	2,841
April, 1916.....	1,336	6,372	(1)	(1)	(1)	5,717
Kalamazoo:						
April, 1915.....	(1)	(1)	2 318	(1)	(1)	(1)
April, 1916.....	415	415	2 380	(1)	451	(1)
Saginaw: April, 1916.....	126	868	2 741	(1)	741	741

¹ Not reported.

² Number applying for work.

³ Every applicant must register each month.

⁴ Number who were registered.

⁵ Number of offers of positions.

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OPERATIONS OF FREE PUBLIC EMPLOYMENT OFFICES, APRIL, 1915 AND 1916—Contd.

State and city.	Number of—					Positions filled.
	Applications from employers.	Persons asked for by employers.	Persons applying for work.		Persons referred to positions.	
			New registrations.	Re-novels.		
<i>Minnesota (State).</i>						
Duluth:						
April, 1915.....	(1)	(1)	(1)	(1)	(1)	686
April, 1916.....	(1)	(1)	(1)	(1)	(1)	976
Minneapolis:						
April, 1915.....	(1)	(1)	(1)	(1)	(1)	2,406
April, 1916.....	2,347	(1)	(1)	(1)	(1)	2,245
St. Paul:						
April, 1915.....	(1)	(1)	(1)	(1)	(1)	1,235
April, 1916.....	(1)	(1)	(1)	(1)	(1)	1,394
<i>Montana (municipal).</i>						
Butte:						
April, 1915.....	200	(1)	220	(1)	220	494
April, 1916.....	404	(1)	548	(1)	194	371
<i>New York (municipal).</i>						
New York City:						
April, 1915.....	317	379	1,861	(1)	717	299
April, 1916.....	2,248	2,509	2,094	(1)	2,988	1,871
<i>New York (State).</i>						
Albany: April, 1916.....	507	649	464	250	638	312
Brooklyn: April, 1916.....	1,422	2,126	1,456	349	2,093	1,164
Buffalo: April, 1916.....	909	1,152	466	251	1,029	673
Rochester: April, 1916.....	1,204	1,814	808	280	1,473	751
Syracuse: April, 1916.....	893	1,093	599	102	996	716
<i>Ohio (State-city).</i>						
Akron:						
April, 1915.....	(1)	813	1,359	2,548	748	593
April, 1916.....	(1)	1,905	556	1,226	1,384	1,141
Cincinnati:						
April, 1915.....	(1)	2,942	1,531	4,762	² 1,116	² 712
April, 1916.....	(1)	2,410	1,695	2,933	2,061	1,312
Cleveland:						
April, 1915.....	(1)	³ 4,477	2,347	10,840	³ 4,182	³ 3,626
April, 1916.....	(1)	9,258	2,208	7,079	6,651	5,511
Columbus:						
April, 1915.....	(1)	1,649	744	3,474	1,544	1,384
April, 1916.....	(1)	2,819	745	2,297	2,437	2,011
Dayton:						
April, 1915.....	(1)	728	716	1,963	683	603
April, 1916.....	(1)	1,258	717	1,195	1,041	893
Toledo:						
April, 1915.....	(1)	1,050	1,237	2,605	939	898
April, 1916.....	(1)	3,764	1,103	2,118	2,516	2,176
Youngstown:						
April, 1915.....	(1)	573	1,070	1,695	552	477
April, 1916.....	(1)	1,267	648	918	1,112	974
<i>Oklahoma (State).</i>						
Enid:						
April, 1915.....	(1)	(1)	(1)	(1)	(1)	83
April, 1916.....	105	(1)	⁴ 132	(1)	(1)	99
Muskogee:						
April, 1915.....	(1)	(1)	(1)	(1)	(1)	74
April, 1916.....	163	(1)	⁴ 187	(1)	(1)	170
Oklahoma City:						
April, 1915.....	(1)	(1)	(1)	(1)	(1)	144
April, 1916.....	311	(1)	⁴ 283	(1)	(1)	247
Tulsa:						
April, 1915.....	(1)	(1)	(1)	(1)	(1)	(1)
April, 1916.....	337	(1)	⁴ 324	(1)	(1)	246

¹ Not reported.

² Including 1 on city work.

³ Including 251 on city work and 260 on emergency work in parks.

⁴ Number applying for work.

OPERATIONS OF FREE PUBLIC EMPLOYMENT OFFICES, APRIL, 1915 AND 1916—Concl'd.

State and city.	Number of—					
	Applica- tions from employ- ers.	Persons asked for by employ- ers.	Persons applying for work.		Persons referred to posi- tions.	Posi- tions filled.
			New registra- tions.	Re- newa.l's.		
<i>Oregon (municipal).</i>						
Portland:						
April, 1916.....	(1)	1,655	795	.....	(1)	1,345
<i>Pennsylvania (State).</i>						
Altoona: April, 1916.....	(1)	213	103	(1)	67	
Harrisburg: April, 1916.....	(1)	436	146	46	286	53
Johnstown: April, 1916.....	(1)	306	117	79	101	246
Philadelphia: April, 1916.....	(1)	438	709	119	366	44
Pittsburgh: April, 1916.....	(1)	1,488	612	11	495	243
						455
<i>Rhode Island (State).</i>						
Providence:						
April, 1915.....	525	594	404	134	(1)	594
April, 1916.....	359	456	294	283	(1)	456
<i>Texas (municipal).</i>						
Dallas:						
April, 1915.....	61	67	103	40	195	67
April, 1916.....	144	195	45	.....	218	195
Fort Worth:						
April, 1915.....	74	89	² 844	(1)	94	85
April, 1916.....	82	115	127	63	93	88
<i>Virginia (municipal).</i>						
Richmond:						
April, 1915.....	123	240	² 673	(1)	296	254
April, 1916.....	198	359	572	(1)	387	159
<i>Washington (Federal-municipal).</i>						
Tacoma:						
April, 1915.....	176	228	(1)	(1)	229	228
April, 1916.....	501	1,003	525	230	919	901
<i>Washington (municipal).</i>						
Everett:						
April, 1915.....	(1)	(1)	(1)	(1)	(1)	172
April, 1916.....	(1)	(1)	(1)	(1)	(1)	408
Seattle: April, 1916.....	2,898	4,993	(1)	(1)	5,126	4,589
Spokane:						
April, 1915.....	(1)	(1)	(1)	(1)	885	803
April, 1916.....	2,460	2,460	40	.....	2,154	2,154
<i>Wisconsin (State).</i>						
La Crosse:						
April, 1915.....	174	209	³ 392	(1)	194	123
April, 1916.....	192	254	³ 299	(1)	225	112
Milwaukee:						
April, 1915.....	1,630	1,924	³ 2,859	(1)	2,107	1,304
April, 1916.....	2,239	3,901	³ 2,840	(1)	3,014	2,110
Oshkosh:						
April, 1915.....	199	226	³ 395	(1)	181	159
April, 1916.....	256	324	³ 296	(1)	234	180
Superior:						
April, 1915.....	359	420	³ 662	(1)	486	323
April, 1916.....	325	443	³ 557	(1)	473	300

¹ Not reported.

² Number applying for work.

³ Registrations.

EMPLOYMENT IN SELECTED INDUSTRIES IN APRIL, 1916.

Two tables are here presented showing the changes in the amount of employment in nearly 500 representative establishments in 10 manufacturing industries between March, 1916, and April, 1916, and between April, 1915, and April, 1916.

From an examination of the first table, it will be seen that the number of employees in April, 1916, was greater than in April, 1915, in all industries except cotton manufacturing. The greatest increase shown was in car building and repairing, in which industry the increase was 62.4 per cent. More money was paid out in wages in all the industries covered in April, 1916, than in April, 1915. The greatest increase in the amount of the pay roll was in the car-building and repairing industry, where the increase was 85.6 per cent. The smallest increase shown is 7.4 per cent for the cotton manufacturing industry.

COMPARISON OF EMPLOYMENT IN IDENTICAL ESTABLISHMENTS IN APRIL, 1915, AND APRIL, 1916.

Industry.	Es- tab- lish- ments to which in- quiries were sent.	Es- tab- lish- ments re- port- ing for April, both years.	Period of pay roll.	Number on pay roll in April—		Per cent of in- crease (+) or de- crease (-).	Amount of pay roll in April—		Per cent of in- crease (+) or de- crease (-).
				1915	1916		1915	1916	
Boots and shoes.....	86	66	1 week...	39,905	51,143	+28.2	\$416,288	\$658,510	+58.2
Cotton manufacturing.....	92	60	...do....	55,451	55,755	- 1.2	462,255	496,250	+ 7.4
Cotton finishing.....	19	17	...do....	13,107	13,772	+ 5.1	142,051	159,675	+12.4
Hosiery and underwear.....	82	55	...do....	26,307	29,240	+11.1	220,308	280,104	+27.1
Woolen.....	56	49	...do....	37,313	41,574	+11.4	386,933	487,720	+26.0
Silk.....	64	48	2 weeks	15,307	17,075	+11.6	282,434	360,234	+27.5
Men's ready-made cloth- ing.....	86	37	1 week..	13,627	16,474	+20.9	141,856	214,553	+51.2
Iron and steel.....	142	96	½ month.	107,099	139,920	+30.6	3,312,324	5,052,726	+52.5
Car building and repairing.	80	37	...do....	27,727	45,036	+62.4	804,562	1,493,026	+85.6
Cigar manufacturing.....	107	68	1 week..	22,384	23,052	+ 3.0	207,663	226,859	+ 9.2

In the second table comparing March, 1916, and April, 1916, half of the industries listed show an increase in April over March in the number of employees on the pay roll, and the other half show a reduction. The greatest reduction was 4.7 per cent in the cotton-finishing industry. As to the money paid in wages to employees, half of the industries again show an increase and the other half a reduction. It should be noted that the industries do not in all cases fall in the same group as to increase or decrease in money paid and as to increase or reduction in the number of employees on the pay roll.

COMPARISON OF EMPLOYMENT IN IDENTICAL ESTABLISHMENTS IN MARCH, 1916,
AND APRIL, 1916.

Industry.	Es- tab- lish- ments to which in- qui- ries were sent.	Es- tab- lish- ments re- port- ing for March and April.	Period of pay roll.	Number on pay roll in—		Per cent of in- crease (+) or de- crease (-).	Amount of pay roll in—		Per cent of in- crease (+) or de- crease (-).
				March, 1916.	April, 1916.		March, 1916.	April, 1916.	
Boots and shoes.....	86	63	1 week...	49,713	49,134	-1.2	\$662,886	\$635,645	-4.1
Cotton manufacturing.....	92	59	...do....	55,113	55,105	-(1)	489,027	494,908	+1.2
Cotton finishing.....	19	17	...do....	14,451	13,772	-4.7	165,538	159,675	-3.5
Hosiery and underwear.....	82	57	...do....	30,155	30,423	+ .9	287,349	287,947	+ .2
Woolen.....	56	14	...do....	17,606	17,324	+1.6	191,889	194,682	+1.5
Silk.....	64	47	2 weeks..	16,766	16,934	+1.0	357,698	354,750	-.8
Men's ready-made cloth- ing.....	86	35	1 week... 16,175	16,175	16,084	-.6	209,730	208,560	-.6
Iron and steel.....	142	99	½ month.	140,748	140,467	-.2	5,053,783	5,055,585	+(1)
Car building and repairing.	80	37	...do....	45,271	45,298	+ .1	1,480,787	1,500,156	+1.3
Cigar manufacturing.....	107	64	1 week..	21,550	22,303	+3.5	216,970	212,786	-1.9

¹ Less than one-tenth of 1 per cent.

In addition to the data presented in the above tables concerning the number of employees on the pay roll, 76 plants in the iron and steel industry reported 108,582 employees actually working on the last full day of the pay period reported for in April, 1916, against 86,025 in the reported pay period in April, 1915, an increase of 26.2 per cent. Figures furnished by 87 plants in the same industry show that 112,572 employees were actually working on the last full day of the pay period reported for in April, 1916, against 115,632 for the reported period in March, 1916, a decrease of 2.6 per cent.

EMPLOYMENT IN THE STATE OF NEW YORK IN APRIL, 1916.

A statement concerning manufacturing activity in the State of New York in April issued by the New York State Industrial Commission is here reproduced.

A record volume of business was transacted during April by the factories of New York State, the number of employees being 21 per cent greater and wages paid being 37 per cent greater than one year ago. Business was more active in April than in March, April pay rolls carrying 3 per cent more operatives and 5 per cent more wages than in the previous month. These facts are brought out * * * from reports submitted by over 1,300 representative manufacturers with nearly a half million employees scattered throughout the State.

The most important increases in activity over the preceding month, measured by amount of wages paid, were in the chemicals, oils, and paints group, in the stone, clay, and glass products group, and in the metals, machinery, and conveyances group, each of which showed a gain of approximately one-tenth. The largest increases in

activity over last year were shown in April by the metals, machinery, and conveyances group and by the furs, leather, and rubber goods group.

The stone, clay, and glass group was a tenth more active in April than in March. This increase was largely seasonal; the greatest improvement was in the brick, tile, and pottery industry. The glass industry in April did only 90 per cent as much business as in March. The group as a whole, however, did a third larger April business this year than last. The wood manufactures group, although showing no change in volume of business between March and April, is doing a fifth more business than last year.

The metals, machinery, and conveyances group employed 6 per cent more operatives and paid 7 per cent more in wages in April than in March. The most important increases were in the brass, copper, and aluminum industry, in the sheet metal and hardware industry, in the cutlery, tools, and firearms industry, in the cooking, heating, and ventilating apparatus industry, and in the machinery industry. The metal-working group as a whole employed 40 per cent more operatives and paid 56 per cent more wages in April than one year ago. The brass, copper, and aluminum industry, the cutlery, tools, and firearms industry, boat and ship building concerns, railway repair shops and manufacturers of railway equipment did an April business, as measured by wages paid, from 75 to 95 per cent greater than one year ago.

The furs, leather, and rubber goods group, although recording but slight improvement between March and April, employed 25 per cent more operatives and paid 47 per cent more in wages in April of this year than one year ago. The most favorable comparison with last year was shown by the boot and shoe industry.

The chemicals, oils, and paints group employed 6 per cent more operatives and paid 10 per cent more wages in April than in March. The most striking improvement was shown by the drug and chemical industry and by oil refineries and allied industries. The group as a whole did an April business nearly a third greater than in 1915.

The paper-making industry improved between March and April and is now paying a fourth more in wages than last year. In the printing and paper goods group April business was about 1 per cent less than March business. However, the group is employing a twelfth more operatives and paying an eighth more in wages than last year.

The textiles group showed only slight improvement between March and April. The only striking increases were among knit goods concerns and manufacturers and finishers of miscellaneous textiles. The group as a whole, however, is employing a seventh more operatives and paying a third more wages than last year. The clothing, millinery, and laundering group employed 3 per cent more operatives and paid 4 per cent more in wages in April than in March. Less activity was shown by the women's clothing industry and millinery establishments. The group as a whole employed 10 per cent more operatives and paid 25 per cent more in wages in April of 1916 than in April of 1915.

The food, liquors, and tobacco group of industries, although showing no decided changes between March and April, employed 5 per cent more operatives and paid 14 per cent more in wages in April than last year.

New York City factories are enlarging the volume of their business less rapidly than establishments in the remainder of the State. In April the factories of the metropolis paid 22 per cent more in wages than in the corresponding month of last year, whereas up-State factory pay rolls showed an increase of 46 per cent.

SHORTER HOURS FOR MEN AS A PUBLIC WELFARE MEASURE.

The right of the State legislature to limit the hours of labor which may be exacted from any worker has been gradually established by a series of court decisions. The fourteenth amendment was supposed to give everyone the right to contract for as many hours of labor a day as he chose, and only step by step, as it could be shown that each measure was demanded by the public welfare, has it been possible to restrict that right in the interests of the community as a whole. The right to limit hours of work for children was early recognized; the community's interest in the physical and mental development of the next generation was admitted. Then the right to limit hours in dangerous occupations, as a safety measure, was reluctantly conceded. Limitation of hours of labor for women came next. This was fought long and bitterly and its final winning was largely due to the services of the Consumers' League, which, when a case involving the constitutionality of a 10-hour law for women came up, set itself to prove the actual harmfulness to the health and morals of women involved in long working hours and the consequent need of restricting women's hours of labor in the public interest. The brief upholding this thesis,¹ prepared by Miss Josephine Goldmark, with the advice and cooperation of Louis D. Brandeis, won the case and has since been used as a storehouse of information concerning the effects of fatigue upon women and through them upon the community.

Now the final step in the process of regulating hours has been taken, its constitutionality is before the courts, and the method of defense found successful in 1908 is again in use. In 1913 Oregon passed a law limiting the period of work in mills, factories, and manufacturing establishments to 10 hours a day. The peculiarity of the law is that it applies to all workers, not to women and children only. That is, it limits men's work sharply and does so on the declared ground that "the working of any person more than 10 hours in one day, in any mill, factory, or manufacturing establishment is injurious to the physical health and well-being of such person and tends to prevent him from acquiring that degree of intelligence that is necessary to make him a useful and desirable citizen of the State." The State soon had occasion to prosecute a violator of this law, whose subsequent conviction was affirmed by the Oregon Supreme Court. The case was then carried to the United States Supreme Court, where on April 10 last it was set for argument.

¹ Supreme Court of the United States, October term, 1907. Curt Muller, plaintiff in error, v. The State of Oregon. Brief for defendant in error. 113 pp. [1908.]

The brief presented by the defendant in error in the case¹ was prepared by Miss Goldmark, under the direction of Mr. Brandeis until the latter was forced to withdraw from the case by his nomination to the Supreme Court, when his place was taken by Mr. Felix Frankfurter. Comparatively little space is devoted to whether the State has the right to regulate hours of labor, though decisions are quoted to show that such a right is recognized as constitutional when it is exercised in the interests of the public welfare. The main purpose of the brief, therefore, is to show that the Oregon law is in the public interest and that the State is justified in thinking that work for more than 10 hours a day is inconsistent with a man's "health and physical well-being and ability to promote the general welfare by his increasing usefulness as a healthy and intelligent citizen."

For this purpose the authors of the brief have brought together a mass of data showing what legislation limiting the working hours of men is already in force and the world's experience upon which this legislation is based. A brief summary of existing legislation is followed by eight chapters in which the evils of long, and the benefits of short, working hours are discussed from various aspects. The titles of the eight chapters are:

1. Menaces to national vitality.
2. The dangers of long hours.
3. Benefits of short hours.
4. Shorter hours the only protection.
5. Economic aspect of reducing hours.
6. Uniformity of restriction needed for justice to competing employers.
7. Progress of the shorter day.
8. Need of legislation; instances of excessive hours of labor.

The menaces to national vitality are the reported increase in the so-called degenerative diseases of the heart, blood vessels, and kidneys, in cancer, and in the apparently weakened power of resistance to such diseases in the middle-aged. The brief brings together some 50 pages of data, statements, and opinions to show that while the death rate of children and young people is being cut down the rate for those who have reached middle age is increasing unduly; that in this respect the tendency in the United States is contrary to that of European countries; that the difference is not improbably due to the greater stress and strain of life, especially of industrial life here; and

¹ Supreme Court of the United States, October term, 1915. No. 228. Franklin O. Bunting, plaintiff in error, *v.* The State of Oregon, defendant in error. In error to the Supreme Court of the State of Oregon. Brief for the defendant in error. Vol. I, pp. 1-470; Vol. II, pp. 471-984. This brief has been reprinted under the title of "The case for the shorter workday," and can be obtained from the National Consumers' League, 289 Fourth Avenue, New York City. Charge for postage only.

that working conditions, including under that term such factors as hours, environment, dusts, fumes or vapors produced by the work, and the like, by affecting the resistance to disease, have much to do with what appears to be a much increased mortality from preventable diseases.

The second chapter, which forms about two-fifths of the whole brief, is devoted to the ill effects of long hours on health, safety, and morals, with especial attention to the nature of fatigue and its relation to health. A great body of experience is cited to show that workers in the dangerous trades who are overfatigued are more susceptible to occupational diseases and to any deleterious influences connected with their work. But even more emphasis is placed on showing that not only in the dangerous trades but in all industries a permanent predisposition to disease and premature death exists in the common phenomenon of fatigue and exhaustion.

In ordinary factory work, where no special occupational diseases threaten, fatigue in itself constitutes the most imminent danger to the health of the workers because, if unrepaired, it undermines vitality and thus lays the foundations for many diseases.

Special attention is given to the health hazards peculiar to modern industry, such as speed and monotony, and the effect of bad air, humidity, extremes of temperature and the like, as well as special occupational risks. The danger of injury from any or all of these causes, it is contended, is greatly increased when the worker is fatigued. Evidence is given to show the reciprocal action of these two sets of influences. The general incidents of factory life just mentioned increase the tendency to fatigue, while fatigue, reducing the worker's power of resistance, renders these accompaniments of his work more harmful. Long hours naturally intensify the evil.

Declaring that fatigue is a chemical process, and that an over-tired person is literally a person poisoned by his own waste products, the brief suggests the absolute necessity of limiting the length of working hours in order that the dangers to health as a result of work performed after fatigue has set in may not be correspondingly increased and that the individual worker may maintain himself in a state of full efficiency by virtue of the fact that fatigue developed on one day is completely repaired before the next:

The daily supply of energy required for daily labor must be gained by sufficiently long periods of rest and economical use of strength, and must not exceed the expenditure of energy required by the accelerated pace of industry.

Additional reasons for limiting hours are found in the increased danger of accidents arising from the varying effects of fatigue, and in the general loss of moral restraint and the increase of intemperance due to the same cause. In support of these contentions the experience of foreign countries is offered in exhaustive detail.

Fatigue affects the family life and the community, says the brief:

The loss of moral restraints and intellectual ambition on the part of workers exhausted by excessive labor is a social loss. Family life, essential for the welfare of the Nation, is destroyed. After overlong hours, the workers scarcely see their young children, and have neither leisure nor energy after working hours to share the family interests. * * * The deterioration of any large portion of the population inevitably lowers the entire community, physically, mentally, and morally.

Turning from the evils of long hours, the authors of the brief try to impress upon the court the physical and moral benefits and the good effect on the general welfare produced by short hours. Fortified by experience in this and other countries, the brief asserts that the good effect of short hours is reflected in the growth of temperance, an improvement in the general standards of living, with consequent benefit to society, and a greater inclination on the part of the workers, because of increased periods of leisure, to take advantage of opportunities for self-improvement and legitimate enjoyment. Emphasis is laid upon the fact that the welfare and safety of democracy rest upon the character and intelligence of its citizens, that for the development of morals and intelligence, leisure is needed, and that it is therefore in the interest of the State to limit industrial labor so that the worker shall not be too much exhausted to make use of that leisure which should be provided outside of working hours.

It is pointed out that the foreign born who come to this country must be Americanized; that is, given opportunity for acquiring the ability to speak the English language and to become acquainted with American institutions.

Ignorance of the English language is the greatest obstacle to industrial advancement. It prevents the distribution of congested immigrant populations. It increases the dangers of industrial accidents, injuries, and occupational diseases, owing to the immigrants' inability to understand orders or hygienic regulations printed or orally given in industrial establishments. * * * This whole program of Americanization is impossible unless sufficient leisure is provided after working hours to enable the workers to take advantage of the opportunities offered. The task of teaching adult foreigners a new language is rendered almost hopeless unless they can come to be taught with some freshness of mind. The project of Americanization is defeated when working hours are so long that no evening leisure is left or the immigrant workers are too much exhausted to make use of it.

The policy of shorter hours is believed to be the only protection to the worker, because "industries not intrinsically dangerous and conducted under good sanitary conditions may become harmful through sheer lengthening of the working hours. Even the lightest work becomes totally exhausting when carried on for excessive length of time," and a decrease of the intensity of exertion in industry is not believed to be feasible. The universal experience of those manufacturing countries which have longest had the short working day seems to indicate that commercial prosperity is not hampered by the

curtailment of hours, but, on the contrary, the increased efficiency of the workers due to shorter working hours, together with general improvement of industrial communities in physique and morals, reacts favorably upon output. In support of this position, an abundance of testimony, covering experience in the United States, Great Britain, Germany, France, Switzerland, and Belgium, is offered tending to show that shorter hours heighten efficiency, which springs from improved physical health and energy, together with a change of attitude toward work and employers. The curtailment of hours, it is asserted, has also acted as a stimulus to heightened efficiency on the part of employers, leading them to lessen or eliminate "lost time" by securing a steadier flow of work and materials through the factory.

To refute the impression held by some that the short working day has tended to increase the cost of production, two facts are stated: First, the labor cost is only one item, and often a small item, in the total cost of manufacture; and, second, heightened efficiency of both employers and workers under shorter hours stimulates output and thus tends to equalize or even decrease the total costs. One instance may be cited:

In 1894 the hours of labor of about 43,000 workpeople were reduced to an average of 48 hours per week. * * * It is stated * * * that it is clear that no extra cost has been incurred by the public on account of the reduction of hours, nor has the output of work been diminished. On the other hand, the majority of workmen being on piecework, the average weekly earnings per man have not been sensibly altered, although piecework prices have not been increased. The dayworkers received an increased hourly rate of pay to make their earnings per week of 48 hours equal to those per week of 54 hours. It was not found necessary to increase the number of dayworkers.¹

Short hours bear a definite and favorable relation to wages, according to the evidence included in the brief, which tends to show that wages in industries in which the short workday has been established are almost universally higher than they are in wholly unregulated trades. "Moreover, even when the shorter day has resulted in a slight temporary decrease in wages, the majority of workers have willingly suffered the reduction, in order to gain the increased health and leisure consequent upon shorter hours of labor."

Regularity of employment is stated to be another benefit derived from shorter hours, for "in place of alternating periods of intense overwork and periods of idleness, employers have found it possible to distribute work more evenly throughout the year." Considerable statistical evidence is presented showing that in certain important manufacturing industries a trend toward shorter hours of labor is manifest, and the spread of the tendency to reduce hours in the

¹ Great Britain, Board of Trade Labor Gazette, July, 1905, p. 196.

United States during 1915 is indicated by definite reference to many establishments which have inaugurated the eight-hour day.

The need for further legislation along this line is strongly urged in a chapter enumerating instances of excessive hours of labor. "Since collective bargaining has proved ineffectual in checking these abuses, the need of legislation to limit such excessive hours of labor is unmistakable."

There has already been a great deal of legislation regulating hours of labor for men. The brief contains a reference list showing that the length of the working day, as regulated by law in certain private businesses, railroads, street railways, work done in private business for national, State, and municipal governments, and public employment, is as follows:

Eight-hour day.

- Blast furnaces: Arizona, 1913; Colorado, 1913.
 Coke ovens: Alaska, 1913; Arizona, 1913; Colorado, 1913.
 Electric light and power plants: Arizona, 1913.
 Compressed air, work in: New Jersey, 1914; New York, 1909.
 Irrigation works: Montana, 1907.
 Miners: Alaska, 1913; Arizona, 1912; California, 1913; Colorado, 1905; Idaho, 1909; Missouri, 1909; Montana, 1889; Nevada, 1912; Oklahoma, 1910; Oregon, 1910; Pennsylvania, 1911; Utah, 1907; Washington, 1910; Wyoming, 1910.
 Plaster and cement mills: Nevada, 1912; Arizona, 1913 (cement mills only).
 Plate glass works: Missouri, 1909.
 Public employment and work done in private business for national, State, or municipal governments: Alaska, 1913; Arizona, 1910; California, 1902, 1906; Colorado, 1908; Connecticut,¹ 1911; District of Columbia, 1892; Hawaii, 1905; Idaho, 1889, 1911; Indiana, 1894; Kansas, 1909; Kentucky, 1910; Maryland, 1888 (applies only to Baltimore); Massachusetts, 1909; Minnesota, 1905; Missouri, 1913 (applies only to cities of the second class); Montana, 1889; Nevada, 1912; New Jersey, 1911; New Mexico, 1910; New York, 1909; Ohio, 1912; Oklahoma, 1907; Oregon, 1910, 1913; Pennsylvania, 1897; Porto Rico, 1911; Texas, 1913; United States, 1892; Utah, 1895; Washington, 1910; West Virginia, 1899; Wisconsin, 1911; Wyoming, 1889, 1913.
 Railroads:² Arkansas, 1907; Connecticut, 1909; Maryland, 1911; Nevada, 1913; New York, 1909; Texas, 1911; West Virginia, 1907; Wisconsin, 1911.
 Rolling mills, rod mills, stamp mills: Alaska, 1913; Arizona, 1913; Colorado, 1913; Idaho, 1909; Wyoming, 1910.
 Smelters, reduction works, etc.: Alaska, 1913; Arizona, 1912; California, 1913; Colorado, 1913; Idaho, 1909; Missouri, 1909; Montana, 1889; Utah, 1907; Wyoming, 1910.
 Tunnels: Arizona, 1913; California, 1913; Montana, 1907.

Nine-hour day.

- Railroads:² Missouri, 1913; Nebraska, 1913; North Carolina, 1913; Oregon, 1911; United States and District of Columbia, 1906-7.
 Street railways: Massachusetts, 1912.
 Telephone operators: Montana, 1909.

¹ Public employment only.

² Legislation applies to telegraph and telephone operators, dispatchers, signal men, etc., but not to train crews.

Ten-hour day.

Bakeries: New Jersey, 1912.
 Brickyards, New York, 1909.
 Cotton and woolen mills: Georgia, 1910; Maryland, 1911.¹
 Drug stores: California, 1907; New York, 1909.
 Manufacturing establishments: Mississippi, 1912.
 Mines: Maryland, 1888 (Allegany and Garrett Counties only).
 Railroads²: Michigan, 1897; New York, 1909.
 Saw and planing mills: Arkansas, 1905.
 Street railways: Louisiana, 1886; Michigan, 1897; New York, 1909; Rhode Island, 1909; Washington, 1910.

Eleven-hour day.

Factories: North Carolina, 1915.
 Grocery stores: New York, 1915.

Twelve-hour day.

Street railways: California, 1906; Maryland, 1898; New Jersey, 1910; Pennsylvania, 1894; South Carolina, 1912.

WAGES AND HOURS OF LABOR OF EMPLOYEES OF PUBLIC UTILITY COMPANIES, NEW YORK.

A memorandum, under date of April 1, 1916,³ addressed by the National Consumers' League to the joint legislative committee investigating the New York public service commissions, on the need of legislation empowering the commissions to regulate the hours of work and wages of employees of public utility companies, maintains that "it is to the interest of the whole community that the workers in all public utilities shall be justly compensated for their labor," or in other words, that "labor should share fairly in the profits that are a result of its toil." At the outset the attention of the committee is called to a number of examples of alleged unfair conditions of labor, involving hours and wages, permitted by New York public service companies which operate under franchises and by contractors who are building improvements for the State and municipality. Responsible investigations, declares the memorandum, have shown that hundreds of laborers working on the city's system of subways have been, within the past six months, receiving \$1.50 to \$1.60 a day; that girls employed 8 to 12 hours as ticket sellers in certain elevated railway stations were receiving \$7.20 and \$8.64 a week, until a few months ago when the wages were raised to \$8.16 and \$10.60 a week; that women employed 12 hours a day as news girls at subways stations were receiving in January, 1914, as low as \$7 a week. Such conditions, it is urged, are against the public welfare.

¹ Except in contracts for work by hour.

² Train crews.

³ Memorandum addressed to the joint legislative committee investigating the New York public service commissions. National Consumers' League, 289 Fourth Avenue, New York City, April 1, 1916. 47 pp.

Reference is made to the action of the commission in ordering a reduction in telephone rates and in the price of electric current in New York City, which actions were taken after exhaustive investigations during which it is asserted no consideration was given to hours of work or wages. What the memorandum asks is that the commission should give the conditions of labor under franchise companies as thorough consideration as it gives to examining all the charges included under operating expenses. The telephone company itself has recognized the justice of this contention, for in its annual report for 1915 it stated that—

Where earnings are controlled, where surplus operating revenue after a reasonable return on capital goes back to the public in reduction of charges, in construction of plants for which no capital securities are issued, in improvements in quality or quantity of service, wages also should be controlled.

In view of these facts the need of a labor clause is urged in the following words:

We submit that before taking action of such far-reaching importance as the reduction of rates, it should be made by statute the duty of public service commissions to gather all possible information as to existing wage schedules and hours of work, to give an opportunity for full public discussion, and in its final decision to take cognizance of these two items as equal in importance to the other recognized charges. It is, therefore, urgent that commissions' powers should be broad enough to allow them to make such regulations.

Three general principles are argued. In the first place it is maintained that since the work performed by public utilities is of a public character which the State itself could do, the State has the right to regulate the wages and hours of work of employees of public utility companies. In support of this the decision of the United States Supreme Court in the employers' liability cases, upholding the constitutionality of the regulation of the rights between the employer and the employees, is cited. The court said:

It is difficult to conceive how legislation may effectively control the business if it can not regulate the conduct of those engaged in the business, while engaged in the business, in every act which is performed in the conduct of the business. * * * It would seem, therefore, that when persons are employed in interstate or foreign commerce, its terms and conditions and the rights and duties which grow out of it are under the control of Congress subject only to the limits on the exercise of that control prescribed by the Constitution.

Also in *Atkin v. Kansas* (191 U. S., 207) the court said:

It belongs to the State, as guardian and trustee for its people and having control of its affairs, to prescribe the conditions upon which it will permit public work to be done in its behalf, or on behalf of its municipalities.

It is pointed out that while public utilities are private property, they serve the community and have special privileges from the com-

munity and are therefore affected by a general interest which brings them likewise under State control.

The memorandum declares that the State should authorize public service commissions in regulating rates to fix the hours of work and wages of employees. It is pointed out that these commissions now have power to require of franchise companies "safe and adequate service and just and reasonable charges." These are guaranteed to the consumer, and capital is guaranteed a fair return on its investments, but "labor is only theoretically protected." The presumption appears to be that by allowing the companies themselves to determine rates of pay and hours of work, and to include them in the cost of operating expenses, the employees are sufficiently provided for. But "this assumes that the employer realizes his interest in insuring a fair return to the employee and in maintaining him in health and working efficiency, or it assumes the ability of the employees themselves to enforce recognition of their needs. Either presumption is without sound basis of fact." It is believed that regulation should specifically protect the workers' interests. "A decent living wage to employees of a public utility company should be the sine qua non of the operation of such utility; and regulation which ignores that factor is incomplete and unsatisfactory."

The third argument suggested is that the courts have recognized the right of the State to protect employees in public or quasi public employments for the good of the service itself, in the interest of safety and for the general welfare of the employees. In *People v. Erie R. R.* (198 N. Y., 369) the eight-hour law was upheld specifically for the reason that long hours of work might result in accidents. The court said:

It is not at all inconceivable that such an employee [in control of dangerous agencies] subjected to too long hours of duty and confinement might become physically fatigued and mentally inert and make mistakes which would lead to the destruction of life. This being so it was permissible for the legislature to pass a statute limiting the hours of labor, and it can not be said that there is no reason or argument to support its judgment that eight hours was a proper limit.

The same principle was affirmed by the United States Supreme Court in the case of the *Baltimore & Ohio R. R. v. Interstate Commerce Commission*, 1911 (221 U. S., 612; 31 S. C. R., 621). The court said in part:

Congress was not limited to the enactment of laws relating to mechanical appliances, but it was also competent to consider, and to endeavor to reduce, the dangers incident to the strain of excessive hours of duty on the part of engineers, conductors, train dispatchers, telegraphers, and the persons embraced within the class defined by the act.

Regulation for the good of the service without regard for safety, and regulation of working conditions in the interest of the employees without reference to the quality of service supplied have also been recognized. The statute itself includes at least one specific requirement based on the right of the State to safeguard the interests of employees of franchise companies, for it provides that payment of wages by "steam surface railroads" shall be semimonthly. It thus recognizes the inability of the employees to secure this right for themselves without its aid. This provision has been held constitutional.

Believing that it has established the fact that there is a growing tendency to justify regulation of working conditions in public utility companies as a matter of direct public concern, the memorandum concludes:

We therefore submit that under the rules and analogies laid down by the court, the State assuredly has the power in regulating public utility companies to establish methods of fixing wages for employees and the hours of their employment; and the power should be exercised by the State legislature. The end is legitimate. The means suggested are appropriate to correct an evil which has had in the past a very direct effect upon the ability of public utility companies to perform their duties to the State and to the public, and the means are plainly adopted to that end. On reason and authority, therefore, such legislation is within the constitutional power of the State and should be enacted.

In a chapter on regulation of labor, presenting an analysis of the power to protect employees of franchise companies at present conferred upon the commissions by statutory law, it is pointed out that authority is specifically given to "provide security" and "protect those employed in the manufacture," but it has not been interpreted, in the past, as broad enough to include the regulation of hours of work and rates of pay as essential parts of such protection. By amending the law to include these two considerations it is not thought that any conflict with other laws, such as the labor law, will result, but that it will merely enable the commissions to supplement them.

As to suggested wage determinations by the public service commissions for various classes of employees, attention is called to the fact that in all direct employments by the city, State, or municipality, and in all public improvements carried out by contractors, it has long been the custom to establish standard rates of pay by (1) classifying the employees and securing direct appropriation from the legislature for various grades of service; (2) by prescribing a legal minimum in the statute itself; (3) by fixing rates that shall "not be less than the prevailing rate for a day's work in the same trade or occupation in the locality within the State where such public work on, about, or in connection with which such labor is performed in its final or completed form is to be situated, erected, or used." In

discussing the third method the chief difficulty suggested is that payment of the "prevailing rate" has resulted in the lowest wages which workmen, underbidding each other in a period of serious unemployment, would accept. At present the only appeal for higher wages that can be made by laborers under this provision is to the State commissioner of labor, who has found great difficulty in enforcing the law. Furthermore, it has been held that the action of the commissioner of labor is not final or conclusive. To overcome these difficulties the memorandum suggests the desirability of amending the law so as to make mandatory the advertisement of minimum rates of pay in the specification of all construction work.

Whatever methods are used for determining minimum wages, public policy demands that they must be sufficient not only for the bare essentials of living, but for * * * "the normal needs of the average employee regarded as a human being living in a civilized community."

Many public franchise companies are known to earn large profits in the public service. Under the theory that a just division of profits should entitle all three interests involved—capital, consumer, and labor—to share the earnings, it is fair that labor should have some proportional benefit. Therefore capital should not be allowed higher returns, nor consumer be given lower rates by the commission, without its guaranteeing at the same time an increase in the wages paid to employees.

Twelve pages of the memorandum are devoted to suggested amendments to the public service commissions law.

WAGES AND HOURS OF LABOR IN THE MEN'S CLOTHING INDUSTRY, 1911 TO 1914.

The Bureau of Labor Statistics has recently issued, as Bulletin No. 187, a report on wages and hours of labor in the manufacture of men's ready-made clothing. Full-time weekly earnings of employees in this industry in 1914 were 1 per cent lower than in 1913, 8 per cent higher than in 1912, and 10 per cent higher than in 1911. The reduction in weekly earnings in 1914 as compared with 1913 was caused by a reduction in the regular working hours per week, which in 1914 were 1 per cent lower than in 1913, 6 per cent lower than in 1912, and 7 per cent lower than in 1911. The average rates of wages per hour in 1914 were the same as in 1913, 14 per cent higher than in 1912, and 16 per cent higher than in 1911. The report is based on returns from 277 shops, operated by 153 establishments, and covers nearly 25,000 employees.

The average full-time weekly earnings in the principal occupations in 1914 were as follows:

Basters, coat, male.....	\$13.33
Basters, coat, female.....	9.67
Bushelers and tailors, male.....	14.56
Cutters, cloth, hand, male.....	21.66
Examiners, male.....	16.18
Fitters or trimmers, coat, male.....	17.13
Hand sewers, coat, male.....	14.04
Hand sewers, coat, female.....	9.14
Hand sewers, pants, female.....	7.77
Operators, coat, male.....	16.61
Operators, coat, female.....	11.00
Operators, pants, male.....	15.37
Operators, pants, female.....	10.57
Pressers, coat, male.....	14.99
Pressers, pants, male.....	15.08

The regular full-time hours per week in 1914 ranged in the different shops from 44 to 60, the average for most of the occupations being between 51 and 53. The average hours of cutters were approximately $48\frac{1}{2}$ per week.

The busiest months in the industry in the year ending with June, 1914, were July in the summer season and December and January in the winter season. The slackest months of the year were October and April. The principal cities producing men's factory-made clothing are, in order, New York, Chicago, Baltimore, Philadelphia, Rochester, Cincinnati, and Boston.

STRIKES AND LOCKOUTS, NOVEMBER, 1915, TO APRIL, 1916.

According to data compiled from various sources by the United States Bureau of Labor Statistics, the number of strikes and lockouts during the six months, November, 1915, to April, 1916, inclusive, was 1,069.

The following table, which has been corrected for months previous to April, 1916, as reports have come in during the latter month, shows the number of strikes and lockouts begun in each of the months of November, 1915, to April, 1916, inclusive, together with 76 strikes and lockouts reported as having occurred during the period, although the month in which they began was not reported. The strikes and lockouts were distributed as follows:

NUMBER OF STRIKES AND LOCKOUTS BEGINNING IN EACH MONTH, NOVEMBER, 1915, TO APRIL, 1916, INCLUSIVE.

Kind of dispute.	Novem-ber.	Decem-ber.	Janu-ary.	Febru-ary.	March.	April. ¹	Month not stated.	Total.
Strikes.....	102	70	150	156	208	262	71	1,019
Lockouts.....	10	8	8	5	8	6	5	50
Total.....	112	78	158	161	216	268	76	1,069

¹ This column includes disputes that began in the month of April only. During this month 69 other disputes were reported, which either began in preceding months or the date of beginning was not given; the former have been distributed in the preceding columns, the latter added in the column entitled "month not stated."

More detailed accounts of the disputes reported for each month from November, 1915, to March, 1916, may be found in the numbers of the Review relating to those months.

DISPUTES REPORTED DURING APRIL, 1916.

The number of strikes reported during the month of April is exceptionally large. This seems to have been due to the great demand for labor by establishments engaged in filling war orders, resulting in a temporary shortage in all related occupations, which manufacturers have not been able to prevent because of the great decrease in immigration. This demand for labor has been accompanied by demands of working people for increased wages, the rapid and repeated granting of which during the past six months has resulted in new demands of laboring men that many employers deem excessive and are refusing to grant. The largest number of strikes were in the metal industries, strikes of machinists occurring in California, Colorado, Minnesota, Missouri, Ohio, West Virginia, Pennsylvania, New Jersey, New York, Connecticut, and Massachusetts; and strikes of molders, blacksmiths, and boiler workers in nearly all the eastern States mentioned above. Miners' strikes were confined mainly to Ohio, Pennsylvania, and West Virginia. Several strikes of seamen occurred at the ports along the Atlantic seaboard.

Large strikes which attracted especial attention were those at the plants of the International Harvester Co., at Chicago, one of shovellers in Springfield and Holyoke, Mass., the subway strike in New York City, the strike at the Westinghouse plants in Pittsburgh and vicinity, and the strike at the cable works in Hastings, N. Y.

The data in the tables which follow relate to 337 strikes and lockouts concerning which information was received by the bureau during the month of April. These include, in addition to the 262 strikes and 6 lockouts that began in April, 67 strikes and 2 lockouts which were reported during the month, but began as follows: 28 strikes and 1 lockout in March, 8 strikes and 1 lockout in February, 3 strikes in

January, and 28 strikes the dates of commencement of which were not reported, but most of which probably occurred in March or April. Inasmuch as strikes which start toward the end of a month frequently do not come to the attention of the bureau until after the report for the month has been prepared, it is probable that corrected figures for April will show a material increase over the number of strikes herein reported for that month.

Of the disputes reported during April, 10 strikes and 1 lockout occurred east of the Mississippi and south of the Ohio and Potomac, 24 west of the Mississippi, and the remaining 362 strikes and 7 lockouts in the territory north of the Ohio and Potomac and east of the Mississippi. More than one-half of these strikes occurred in the first four States shown in the following table:

STATES IN WHICH FIVE OR MORE STRIKES AND LOCKOUTS WERE REPORTED DURING APRIL, 1916.

[This and the following tables include all the disputes (337) reported in April. Of these 268, as shown in the preceding table, began in April, while 69 either began in other months or the date of beginning was not reported.]

State.	Strikes.	Lockouts.	Total.
New York.....	62		62
Massachusetts.....	53		53
Pennsylvania.....	46	1	47
Ohio.....	41	5	46
New Jersey.....	37		37
Illinois.....	11	1	12
Connecticut.....	11		11
Michigan.....	7		7
Rhode Island.....	6		6
West Virginia.....	6		6
Maryland.....	5		5
Missouri.....	5		5
22 other States.....	39	1	40
Total.....	329	8	337

Five of these strikes were confined to women and 12 included both men and women. No lockouts were reported in which women were concerned. In 33 strikes and 1 lockout the sex was not stated.

The industries in which four or more strikes and lockouts were reported were as follows:

NUMBER OF STRIKES AND LOCKOUTS IN SPECIFIED INDUSTRIES REPORTED DURING
APRIL, 1916.

Industry.	Strikes.	Lock- outs.	Total.
Metal trades.....	64	1	65
Building trades.....	36	2	38
Textile workers.....	37		37
Seamen.....	18		18
Railroads.....	16	1	17
Clothing industries.....	14		14
Iron and steel mills.....	14		14
Mining.....	14		14
Longshoremen and freight handlers.....	11		11
Chemical workers.....	9		9
Glassworkers.....	7		7
Rubber workers.....	6	1	7
Baking industry.....	5		5
Granite cutters.....	5		5
Lumber workers.....	5		5
Paper mills.....	5		5
Street railways.....	4	1	5
All others.....	59	2	61
Total.....	329	8	337

Included in the above are 32 strikes and 1 lockout of machinists, 12 strikes of molders, 13 strikes of weavers, 13 of coal miners, 10 of railroad section hands, 12 of painters, and 5 of carpenters.

In 150 strikes and 5 lockouts the employees were connected with unions; in 27 strikes and 1 lockout they were not connected with unions; and in 4 strikes they were not connected with unions at the time of striking but organized themselves into unions as a result of the strike; in the remaining strikes and lockouts it was not stated whether the strikers had union affiliations or not.

In 286 cases the causes of the strikes and lockouts were given. In 80 per cent of these the question of wages or hours or both was the leading issue. The principal causes are shown in the following table:

PRINCIPAL CAUSES OF STRIKES AND LOCKOUTS REPORTED DURING APRIL, 1916.

Cause.	Strikes.	Lock- outs.	Total.
For increase of wages.....	154	1	155
For decrease of hours.....	9		9
For increase of wages and decrease of hours.....	38	2	40
Against increase of hours and reduction of wages.....	1		1
For increase of hours.....	1		1
General conditions.....	7		7
Conditions and wages.....	4		4
Conditions, wages, and hours.....	1		1
Recognition and closed shop.....	15		15
Recognition and wages.....	12		12
Recognition and hours.....	2		2
Recognition, wages, and hours.....	5		5
Discharge of employees.....	4	3	7
Because nonunion men were employed.....	7	1	8
In regard to the agreement.....	6		6
Jurisdictional.....	2		2
Miscellaneous.....	10	1	11
Not reported.....	51		51
Total.....	329	8	337

In 164 of the strikes the number of persons involved was reported to be 148,137, an average of 903 per strike. In 20 strikes, in each of which the number involved was over 1,000, the strikes numbered 114,953 persons, thus leaving 31,384 involved in the remaining 144 strikes, or an average of 218 to each. In 3 lockouts the number of employees involved was reported as 1,595, or an average of 532 in each.

In 259 strikes and 7 lockouts only 1 employer was concerned in each disturbance; in 22 strikes the disturbance concerned more than 1 employer; and in 48 strikes and 1 lockout the number of employers was not stated.

Of 130 strikes reported as ending in April, 34 were won, 16 lost, 75 compromised, while in 5 the strikers returned to work under promise of the employer to arbitrate the matters in dispute. The duration of 70 of these strikes was given as follows: One week or less, 44; 1 to 2 weeks, 6; 2 to 3 weeks, 6; 3 to 4 weeks, 5; 5 to 10 weeks, 6; 3 months, 1; 4 months, 1; 2 years, 1. Omitting the last 3 mentioned, the duration of the remaining 67 strikes was 730 days, or an average of 11 days each.

ANTHRACITE COAL WAGE AGREEMENT OF 1916.

The anthracite coal wage agreement, as arranged by the joint conference committee in New York City on April 30, was ratified by the miners' convention of the three anthracite districts in Pottsville, Pa., on May 4 and signed in Philadelphia on May 5. Like the 1912 agreement this contract will be in effect for four years. Under its provisions the eight-hour day is established; contract miners and others receive an advance in wages of 7 per cent, while the nine-hour wage of day men who will now work eight hours is advanced 3 per cent, which means an advance of about 15.5 per cent on such labor. The following is the agreement in full:

This agreement, made this 5th day of May, 1916, between districts 1, 7, and 9, representing the anthracite mine workers' organization, parties of the first part, and the anthracite operators, parties of the second part, covering wages and conditions of employment in the anthracite region of Pennsylvania, witnesseth:

The terms and provisions of the award of the Anthracite Coal Strike Commission, and any subsequent agreement made in modification thereof and supplemental thereto, are hereby continued for a further period of four years ending March 31, 1920, except in the following particulars, to wit:

First. (a) The contract rates at each colliery shall be increased seven (7) per cent over and above the contract rates at each colliery, effective in April, 1912, as established by the agreement of May 20, 1912.

(b) The working day established by the Anthracite Coal Strike Commission shall be changed from nine (9) hours to eight (8) hours. All employees paid by the day or hour and coming within the classification of company men, except as hereinafter more specifically provided, shall be paid for a day of eight (8) hours, the rate established under the agreement of May 20, 1912, for a day of nine (9) hours, subject to an increase of three (3) per cent.

(c) All company men working on the basis of an eight-hour day prior to April 1, 1916, shall receive an increase of seven (7) per cent over and above the daily or hourly rates established for their respective occupations by the agreement of May 20, 1912, except that hoisting engineers who were granted an eight-hour day in March, 1912, shall receive an increase of three (3) per cent over and above the rates established by the agreement of May 20, 1912; it being understood, however, that where three full shifts were substituted for two shifts in March, 1912, the rate of the three hoisting engineers shall be the same and the shifts shall alternate in the manner customary where continuous employment is required.

(d) All hoisting engineers working on a nine-hour basis prior to April 1, 1916, and whose duties require that they should continue to work nine (9) hours per day, shall receive an increase of seven (7) per cent over and above the nine-hour rate established by the agreement of May 20, 1912.

(e) All company men working on a daily basis in excess of nine (9) hours per day on a monthly basis prior to April 1, 1916, shall continue to work on said basis and their wage, whether paid hourly, daily, or monthly, shall be increased seven (7) per cent over and above the rates established for their respective occupations by the agreement of May 20, 1912.

MACHINE MINING.

Second. Conditions having arisen in portions of the anthracite region necessitating the use of mining machines, the right of the operator to use such machines shall be unquestioned and the method employed shall be at the option of the operator. Where work is done by mining machines the following shall govern as the basis of payment to the several classes of labor employed in the undercutting, mining, and loading of coal.

(a) When machine mining is done on a day basis the rates paid shall not be less than the established colliery machine rates paid to the several classes of labor employed April 1, 1916; provided, that in no case shall the rate for machine miner be less than \$3.30 per day; for machine runner, \$2.70 per day; for machine miner's laborer, \$2.34 per day; and for machine runner's helper, \$2.34 per day. It being understood that these rates are agreed to as covering a new require-

ment and are applicable only to machine mining, subject, nevertheless, to three (3) per cent advance under the terms of this agreement.

(b) Where machine mining contracts cover the mining of a vein or section of a vein not heretofore mined, the contract rates shall be such as to enable the men employed in mining work to earn, on the average of all employed in each occupation, a daily wage not less than the rate established for said occupation in paragraph (a). Where mining machines replace contract miners cutting coal from the solid, the average daily earnings of the contract machine miners shall not be less than the average normal earnings of such contract miners in the territory where the mining machines are introduced and where the same vein conditions exist; provided, that where the average normal earnings of the contract miners are shown to be less than the day rate established in paragraph (a) the machine contract rates shall be so adjusted as to enable the machine miner, on average, to earn a daily wage of not less than the day rate established in paragraph (a).

(c) The operator shall be assured of the full cooperation of the machine miner in the development and maintenance of efficient operation, and the day's earnings shall be based on a work day of eight (8) hours at the face as now provided in section 3 hereof.

EIGHT-HOUR DAY.

Third. An eight-hour day means eight (8) hours of actual work for all classes of labor, at the usual working place, exclusive of noon-time, for six (6) days per week, if the operator desires to work his mines to that extent, excepting only legal holidays. The time required in going to and coming from the place of employment in or about the mine shall not include any part of the day's labor. Drivers shall take their mules from the stables to the usual working place before starting time and shall return them to the stables after quitting time, compensation for such service being included in the day rates established for this class of labor. If, because of breakdowns, repairs, or the requirements of transportation, or other causes essential to efficient operation, it is found necessary to extend the normal workday of any employee, or any class of employees, the operator may do so at his option, paying for overtime a proportional rate per hour as determined from the rates established under section 1 hereof.

Fourth. All grievances referred to the board of conciliation shall be heard and a decision rendered within 60 days from the date of reference to the board; provided that said period may be extended for such time as may be mutually agreed upon by the operators' representative and the mine workers' representative in the district in which said grievance originates. If no decision is reached within 60 days after reference, or within the extension period thereafter, the board

shall submit the case forthwith to the umpire for final decision as provided in the award of the Anthracite Coal Strike Commission.

Fifth. The present prices of powder and miners' supplies, as established at the several collieries in the region, shall be continued without change throughout the term of this agreement.

Sixth. Under paragraph (d) of the agreement of May 20, 1912, the duty of the grievance committee shall be confined solely to the adjustment of disputes in cases where the foreman and employee have been unable to agree, and in the discharge of this duty they shall strictly comply with the provisions of said paragraph.

Under paragraph (f) of the agreement of May 20, 1912, the grievance committee is given the sole authority of joining with the company officials in recording the rates existent April 1, 1902, as well as the rates established under the agreement of May 20, 1912.

Seventh. The board of conciliation is empowered to hear complaints relating to day rates appearing on colliery rate sheets as effective April 1, 1912, but which may be claimed to be obsolete of that date on account of being supplanted by other rates. The board of conciliation may at its discretion, in case the rates are shown to have been manifestly obsolete, order such rates erased.

Ninth. Neither party to this agreement shall initiate or encourage legislation that would in any manner affect the obligations of this contract or impair any of its provisions.

On behalf of the anthracite operators:

W. L. CONNELL.
S. D. WARRINGER.
W. J. RICHARDS.
MORRIS WILLIAMS.

On behalf of the anthracite mine workers' organization:

JOHN T. DEMPSEY,
President District No. 1.
THOMAS KENNEDY,
President District No. 7.
JAMES MATTHEWS,
President District No. 9.
JOHN P. WHITE,
President of United Mine Workers of America, Representing Anthracite Mine Workers' Organization.

Attest:

ALVAN MARKLE,
Chairman.
JAMES A. GORMAN,
Secretary.

RETAIL PRICES OF FOOD IN THE UNITED STATES IN FEBRUARY AND MARCH.

Returns to the Bureau of Labor Statistics from representative retail dealers in the United States covering the prices of the principal staple articles of food show that as a whole the retail price of food increased approximately 1 per cent between February 15, 1916, and March 15, 1916. The first table presented below shows the average retail price of each of the several articles of food covered by the inquiry on February 15 and March 15, 1916, together with relative retail prices, which indicate the per cent the average prices in each month were of the average prices for the year 1915. All meats showed an increase in the month, the greatest increase being in pork chops; sugar showed a marked increase. The only articles showing a decrease in the month were eggs, milk, flour, and potatoes. Seven articles showed no change in the average price on the two dates compared.

AVERAGE MONEY RETAIL PRICES AND RELATIVE RETAIL PRICES OF FOOD ON
FEB. 15 AND MAR. 15, 1916.

[The relative price shows the per cent that the average price on the 15th of each month was of the average price for the year 1915.]

Article.	Unit.	Average money price—		Relative price (average price for the year 1915=100)—	
		Feb. 15, 1916.	Mar. 15, 1916.	Feb. 15, 1916.	Mar. 15, 1916.
Sirloin steak.....	Pound.....	\$0.255	\$0.263	100	103
Round steak.....	do.....	.226	.233	99	102
Rib roast.....	do.....	.200	.204	100	102
Chuck roast.....	do.....	.159	.164	99	102
Plate boiling beef.....	do.....	.122	.124	100	102
Pork chops.....	do.....	.195	.219	96	108
Bacon, smoked.....	do.....	.276	.281	101	103
Ham, smoked.....	do.....	.271	.276	105	107
Lard, pure.....	do.....	.148	.152	100	103
Hens.....	do.....	.223	.229	107	110
Salmon, canned.....	do.....	.200	.202	100	101
Eggs, strictly fresh.....	Dozen.....	.342	.281	102	84
Butter, creamery.....	Pound.....	.382	.407	106	113
Cheese.....	do.....	.247	.249	107	108
Milk, fresh.....	Quart.....	.091	.090	101	100
Flour, wheat.....	$\frac{1}{2}$ -barrel bag.....	.993	.953	99	95
Corn meal.....	Pound.....	.031	.031	99	99
Rice.....	do.....	.091	.091	100	100
Potatoes.....	Peck.....	.362	.360	158	157
Onions.....	Pound.....	.044	.045	127	128
Beans, navy.....	do.....	.092	.092	119	119
Prunes.....	do.....	.131	.131	98	98
Raisins, seeded.....	do.....	.127	.127	101	101
Sugar, granulated.....	do.....	.069	.075	104	114
Coffee.....	do.....	.302	.302	100	100
Tea.....	do.....	.552	.552	100	100
All articles combined.....	.....	.....	.....	104	105

The next table compares the prices on March 15 each year from 1912 to 1916.

AVERAGE MONEY RETAIL PRICES AND RELATIVE RETAIL PRICES OF FOOD ON MAR. 15 OF EACH YEAR, 1912 TO 1916.

[The relative price shows the per cent that the average price on the 15th of March in each year was of the average price of the year 1915.]

Article.	Unit.	Average money price, Mar. 15—					Relative price, Mar. 15 (average for the year 1915=100)—				
		1912	1913	1914	1915	1916	1912	1913	1914	1915	1916
Sirloin steak.....	Pound.....	\$0.212	\$0.245	\$0.252	\$0.245	\$0.263	83	96	99	96	103
Round steak.....	do.....	.180	.212	.228	.219	.233	79	93	100	96	102
Rib roast.....	do.....	.172	.194	.200	.194	.204	86	97	100	97	102
Chuck roast.....	do.....	.....	.....	.166	.158	.164	.....	.....	103	98	102
Plate boiling beef.....	do.....	.....	.....	.124	.121	.124	.....	.....	102	99	102
Pork chops.....	do.....	.173	.203	.209	.179	.219	85	100	103	88	108
Bacon, smoked.....	do.....	.232	.265	.270	.268	.281	85	97	99	98	103
Ham, smoked.....	do.....	.230	.258	.263	.253	.276	89	100	102	98	107
Lard, pure.....	do.....	.136	.157	.157	.152	.152	92	106	106	103	103
Hens.....	do.....	.202	.214	.225	.212	.229	97	103	108	102	110
Salmon, canned.....	do.....	.....	.....	.200	.202	.....	.....	.....	100	101	.....
Eggs, strictly fresh.....	Dozen.....	.271	.261	.305	.251	.281	81	78	91	75	84
Butter, creamery.....	Pound.....	.371	.418	.353	.360	.407	103	116	98	100	113
Cheese.....	do.....	.....	.....	.....	.233	.249	.....	.....	101	108	.....
Milk, fresh.....	Quart.....	.088	.091	.092	.090	.090	98	101	102	100	100
Flour, wheat.....	½-barrel bag.....	.832	.802	.792	1.083	.953	83	80	79	108	95
Corn meal.....	Pound.....	.029	.028	.030	.032	.031	91	90	95	101	99
Rice.....	do.....	.....	.....	.....	.091	.091	.....	.....	100	100	.....
Potatoes.....	Peck.....	.419	.227	.277	.213	.360	183	99	121	93	157
Onions.....	Pound.....	.....	.....	.....	.033	.045	.....	.....	.....	95	128
Beans, navy.....	do.....	.....	.....	.....	.075	.092	.....	.....	.....	98	119
Prunes.....	do.....	.....	.....	.....	.135	.131	.....	.....	.....	101	98
Raisins, seeded.....	do.....	.....	.....	.....	.126	.127	.....	.....	.....	100	101
Sugar, granulated.....	do.....	.067	.055	.051	.066	.075	102	83	78	100	114
Coffee.....	do.....	.....	.....	.....	.302	.302	.....	.....	.....	100	100
Tea.....	do.....	.....	.....	.....	.552	.552	.....	.....	.....	100	100
All articles combined.....	.....	.....	.....	.....	.....	.....	93	95	97	96	105

All articles for which figures are available were higher on March 15, 1916, than on March 15, 1912, with one exception—potatoes.

Comparing March 15 this year with March 15 a year ago 18 articles, including all meats, show an increase; 5 articles retained the same average price, and 3 articles only show a decrease. The greatest per cent of increase was in potatoes. As a whole food advanced a little over 9 per cent between March 15, 1915, and March 15, 1916, and on March 15, 1916, the average price was 5 per cent above the average for the year 1915. The last line of the table shows by the relative number for all articles combined the increase in March, 1913, and 1914, the slight reduction in March, 1915, and the decided increase between March, 1915, and March, 1916.

RETAIL PRICES OF FOOD AND PURCHASING POWER OF THE DOLLAR IN THE UNITED STATES, 1890 TO 1915.

Changes in retail prices of certain specified food commodities and the purchasing power of the dollar in terms of each commodity are shown in the following table covering each of the 26 years from 1890 to 1915, inclusive. The figures are based on statistics presented in various reports and bulletins of this Bureau. Average retail prices for each of the 26 years and for December, 1915, are shown for each commodity included in the table except sirloin steak and rib roast, for which data were available only for the years 1907 to 1915. In Bulletin 197, Retail Prices, 1907 to December, 1915, which will shortly be published, appears a more detailed table showing similar figures for each geographical division of the United States.

AVERAGE RETAIL PRICES OF FOOD AND AMOUNT THAT COULD BE BOUGHT FOR \$1, IN THE UNITED STATES, BY YEARS, 1890 TO 1915, AND IN DECEMBER, 1915.

Year.	Sirloin steak.		Round steak.		Rib roast.		Pork chops.		Smoked bacon.	
	Average retail price per pound.	Amount bought for \$1 (pounds).	Average retail price per pound.	Amount bought for \$1 (pounds).	Average retail price per pound.	Amount bought for \$1 (pounds).	Average retail price per pound.	Amount bought for \$1 (pounds).	Average retail price per pound.	Amount bought for \$1 (pounds).
1890.....	(1)	(1)	\$.123	8.1	(1)	(1)	\$.107	9.3	\$.125	8.0
1891.....	(1)	(1)	.124	8.1	(1)	(1)	.109	9.2	.126	7.9
1892.....	(1)	(1)	.124	8.1	(1)	(1)	.111	9.0	.129	7.8
1893.....	(1)	(1)	.124	8.1	(1)	(1)	.118	8.5	.142	7.0
1894.....	(1)	(1)	.122	8.2	(1)	(1)	.112	8.9	.135	7.4
1895.....	(1)	(1)	.123	8.1	(1)	(1)	.110	9.1	.130	7.7
1896.....	(1)	(1)	.124	8.1	(1)	(1)	.107	9.3	.126	7.9
1897.....	(1)	(1)	.125	8.0	(1)	(1)	.108	9.3	.127	7.9
1898.....	(1)	(1)	.127	7.9	(1)	(1)	.109	9.2	.131	7.6
1899.....	(1)	(1)	.129	7.8	(1)	(1)	.112	8.9	.134	7.5
1900.....	(1)	(1)	.132	7.6	(1)	(1)	.119	8.4	.143	7.0
1901.....	(1)	(1)	.138	7.2	(1)	(1)	.130	7.7	.158	6.3
1902.....	(1)	(1)	.147	6.8	(1)	(1)	.141	7.1	.177	5.6
1903.....	(1)	(1)	.140	7.1	(1)	(1)	.140	7.1	.182	5.5
1904.....	(1)	(1)	.141	7.1	(1)	(1)	.137	7.3	.180	5.6
1905.....	(1)	(1)	.140	7.1	(1)	(1)	.139	7.2	.181	5.5
1906.....	(1)	(1)	.145	6.9	(1)	(1)	.152	6.6	.196	5.1
1907.....	\$.181	5.5	.150	6.7	\$.150	6.7	.157	6.4	.205	4.9
1908.....	.186	5.4	.157	6.4	.154	6.5	.161	6.2	.210	4.8
1909.....	.194	5.2	.162	6.2	.160	6.3	.175	5.7	.227	4.4
1910.....	.202	5.0	.173	5.8	.166	6.0	.193	5.2	.260	3.8
1911.....	.204	4.9	.173	5.8	.168	6.0	.179	5.6	.251	4.0
1912.....	.230	4.3	.198	5.1	.184	5.4	.193	5.2	.249	4.0
1913.....	.253	4.0	.221	4.5	.198	5.1	.211	4.7	.273	3.7
1914.....	.258	3.9	.234	4.3	.204	4.9	.222	4.5	.279	3.6
1915.....	.255	3.9	.228	4.4	.200	5.0	.203	4.9	.273	3.7
December, 1915.	.250	4.0	.223	4.5	.198	5.1	.185	5.4	.276	3.6

¹ Data not available.

AVERAGE RETAIL PRICES OF FOOD AND AMOUNT THAT COULD BE BOUGHT FOR \$1, IN THE UNITED STATES, BY YEARS, 1890 TO 1915, AND IN DECEMBER, 1915—Concluded.

Year.	Smoked ham.		Lard, pure.		Hens.		Eggs.		Butter.	
	Average retail price per pound.	Amount bought for \$1 (pounds).	Average retail price per pound.	Amount bought for \$1 (pounds).	Average retail price per pound.	Amount bought for \$1 (pounds).	Average retail price per dozen.	Amount bought for \$1 (dozens).	Average retail price per pound.	Amount bought for \$1 (pounds).
1890.....	\$0.152	6.6	\$0.093	10.8	\$0.135	7.4	\$0.208	4.8	\$0.255	3.9
1891.....	.153	6.5	.094	10.6	.139	7.2	.221	4.5	.274	3.6
1892.....	.157	6.4	.098	10.2	.138	7.2	.221	4.5	.275	3.6
1893.....	.168	6.0	.112	8.9	.139	7.2	.224	4.5	.285	3.5
1894.....	.157	6.4	.101	9.9	.131	7.6	.199	5.0	.261	3.8
1895.....	.152	6.6	.095	10.5	.131	7.6	.206	4.9	.249	4.0
1896.....	.150	6.7	.088	11.4	.129	7.8	.192	5.2	.238	4.2
1897.....	.151	6.6	.085	11.8	.125	8.0	.189	5.3	.239	4.2
1898.....	.146	6.8	.089	11.2	.129	7.8	.199	5.0	.244	4.1
1899.....	.153	6.5	.092	10.9	.136	7.4	.209	4.8	.251	4.0
1900.....	.162	6.2	.099	10.1	.134	7.5	.207	4.8	.261	3.8
1901.....	.169	5.9	.112	8.9	.137	7.3	.219	4.6	.265	3.8
1902.....	.184	5.4	.127	7.9	.151	6.6	.247	4.0	.287	3.5
1903.....	.187	5.3	.120	8.3	.158	6.3	.259	3.9	.285	3.5
1904.....	.182	5.5	.111	9.0	.161	6.2	.271	3.7	.280	3.6
1905.....	.182	5.5	.110	9.1	.165	6.1	.272	3.7	.290	3.4
1906.....	.196	5.1	.121	8.3	.172	5.8	.278	3.6	.304	3.3
1907.....	.201	5.0	.127	7.9	.175	5.7	.285	3.5	.328	3.0
1908.....	.207	4.8	.127	7.9	.177	5.6	.291	3.4	.331	3.0
1909.....	.217	4.6	.142	7.0	.189	5.3	.315	3.2	.349	2.9
1910.....	.243	4.1	.164	6.1	.200	5.0	.332	3.0	.364	2.7
1911.....	.238	4.2	.141	7.1	.194	5.2	.318	3.1	.339	2.9
1912.....	.240	4.2	.148	6.8	.200	5.0	.335	3.0	.378	2.6
1913.....	.266	3.8	.158	6.3	.214	4.7	.338	3.0	.385	2.6
1914.....	.271	3.7	.157	6.4	.219	4.6	.348	2.9	.364	2.7
1915.....	.258	3.9	.148	6.8	.208	4.8	.335	3.0	.360	2.8
December, 1915.	.266	3.8	.145	6.9	.204	4.9	.459	2.2	.389	2.6

Year.	Fresh milk.		Flour, wheat.		Corn meal.		Potatoes, Irish.		Sugar, granulated.	
	Average retail price per quart.	Amount bought for \$1 (quarts).	Average retail price per barrel sack.	Amount bought for \$1 (sacks).	Average retail price per pound.	Amount bought for \$1 (pounds).	Average retail price per peck.	Amount bought for \$1 (pecks).	Average retail price per pound.	Amount bought for \$1 (pounds).
1890.....	\$0.068	14.7	\$0.711	1.41	\$0.019	52.6	\$0.247	4.0	\$0.069	14.5
1891.....	.058	14.7	.729	1.37	.021	47.6	.264	3.8	.060	16.7
1892.....	.068	14.7	.681	1.47	.020	50.0	.217	4.6	.066	17.9
1893.....	.068	14.7	.623	1.61	.020	50.0	.254	3.9	.059	16.9
1894.....	.068	14.7	.575	1.74	.019	52.6	.232	4.3	.055	18.2
1895.....	.068	14.7	.577	1.73	.019	52.6	.208	4.8	.053	18.9
1896.....	.068	14.7	.601	1.66	.018	55.6	.174	5.7	.056	17.9
1897.....	.067	14.9	.676	1.48	.018	55.6	.211	4.7	.056	17.9
1898.....	.067	14.9	.696	1.44	.018	55.6	.239	4.2	.059	16.9
1899.....	.067	14.9	.613	1.63	.018	55.6	.218	4.6	.059	16.9
1900.....	.068	14.7	.611	1.64	.019	52.6	.212	4.7	.061	16.4
1901.....	.068	14.7	.612	1.63	.020	50.0	.264	3.8	.060	16.7
1902.....	.070	14.3	.615	1.63	.023	43.5	.265	3.8	.066	17.9
1903.....	.072	13.9	.656	1.52	.023	43.5	.260	3.8	.056	17.9
1904.....	.072	13.9	.777	1.29	.023	43.5	.275	3.6	.059	16.9
1905.....	.072	13.9	.777	1.29	.023	43.5	.249	4.0	.060	16.7
1906.....	.074	13.5	.701	1.43	.023	43.5	.259	3.9	.057	17.5
1907.....	.079	12.7	.763	1.31	.025	40.0	.273	3.7	.053	17.2
1908.....	.081	12.3	.813	1.23	.027	37.0	.286	3.5	.059	16.9
1909.....	.083	12.0	.873	1.15	.027	37.0	.289	3.5	.059	16.9
1910.....	.086	11.6	.863	1.16	.028	35.7	.261	3.8	.060	16.7
1911.....	.086	11.6	.813	1.23	.027	37.0	.337	3.0	.061	16.4
1912.....	.088	11.4	.843	1.19	.026	38.5	.341	2.9	.063	15.9
1913.....	.091	11.0	.803	1.25	.029	34.5	.259	3.9	.055	18.2
1914.....	.091	11.0	.833	1.20	.030	33.3	.280	3.6	.059	16.9
1915.....	.090	11.1	1.003	1.00	.031	32.3	.229	4.4	.066	15.2
December, 1915.	.090	11.1	.913	1.10	.031	32.3	.275	3.6	.068	14.7

PROFIT SHARING IN THE UNITED STATES.

A recent report on profit sharing by the welfare department of the National Civic Federation¹ summarizes the past and present experiences of employers in the application of the profit-sharing principle for the benefit of their employees. It also presents in a summary fashion some types of profit-sharing plans in operation in France and England.

Compilation of this report was undertaken for the purpose of presenting "an accurate and unbiased statement of the facts," because profit sharing "has been regarded by many employers and a few eminent students of industrial tendencies as forecasting a final solution of the labor problem." The descriptions of the individual plans, however, which take up by far the largest part of the report, are "based almost wholly upon data furnished by the companies." The opinions of employers and the attitude of trade-unions on the problem of profit sharing are based upon statements especially formulated for the report by well-known representatives of employers as well as by representatives of organized labor.

The general nature of the report may be judged, to some extent, by the headings of its principal sections which are as follows: Definition; Some French types; Experience in England; American Systems; Opinions of American employers; Attitude of trade-unionists; and Difficulties of profit sharing.

The report notes that the term "profit sharing" has been misused, or used somewhat indiscriminately to denote schemes bearing no definite relation to the profits of the enterprise. For purposes of clarification the author of the report classifies the different American profit-sharing plans examined—about 200 in all—into three general groups: (1) Plans under which a specific proportion of the net profits, fixed in advance, is distributed; (2) Plans involving distribution of gratuities, voluntarily made by employers from time to time; (3) Stock ownership plans under which employees purchase stock in the employing corporation on especially favorable terms. Attention is also given to certain exceptional plans which have obtained publicity as profit-sharing plans although not essentially so.

The earliest American plan cited by the report is that of the Bay State Shoe & Leather Co., adopted in 1867. Under this plan employees received 25 per cent of the net profits of the company. The plan continued in operation for six years and was abandoned because the employees struck for higher wages. Other early plans were those of the A. S. Cameron Co., of Jersey City, N. J., established in 1869; of the Brewster Co., a New York firm of carriage builders,

¹ Profit sharing by American employers. New York City [1916]. 261 pp.

adopted in 1870; of the Peace Dale Manufacturing Co., of Peace Dale, R. I., adopted in 1878; of the Rand, McNally & Co., in 1879 and still in force; of the N. O. Nelson Manufacturing Co., in 1886 and still operative; and of the Procter & Gamble Co., in 1887 and still operative.

Summing up the results of the study the author states that of the 200 plans that have been analyzed a great many "have been abandoned as acknowledged failures." The relatively large proportion of "dubious" results, however, ought not to lead one to the conclusion that profit sharing is "worthless," because other plans of the same kind, from the standpoint of special local conditions, or by contrast with some previous order of things, "no doubt show a net improvement in the welfare of the employees affected and the morale of the plants."

The views of a considerable number of labor leaders on the question of profit sharing were sought and obtained. All of these informants, without exception, voiced their emphatic opposition to the principle as well as to its application, on the grounds that such plans invariably result in discouraging collective bargaining, have a tendency to hinder the development of labor organizations, and in their actual application are confined to employees of higher grades, excluding from their benefits the rank and file of the workers. The latter assertion, the report states, "is borne out by the statistics of many of these experiments."

With reference to the attitude of employers the report states that a large number of the companies whose plans have been analyzed in the body of the report, stated that they "considered profit sharing a success" and that others "presumably hold the same view from the fact that they continue the experiments from year to year." Employers having profit-sharing plans in operation think that the application of the principle "promotes more continuous service, reduces the cost of production, secures more regular attendance at work, builds up confidence, and creates a spirit of cooperation."

But while most of the objections to profit sharing come from the side of organized labor, some employers who have had experience on the subject "are by no means a unit as to its practical value." Some of these employers express disappointment that their efforts were not appreciated by their employees, that the latter "seemed to prefer their total earnings in fixed wages, that they were suspicious of their employers' motives, that they insisted upon joining unions and presenting demands in spite of the companies' effort to give them a share in the extra gains of the business."

To the report there are appended three signed articles, one on "The difficulties of profit sharing," by J. W. Sullivan; another on

"Should wage earners invest in corporation stocks?" by R. M. Easley; and one on "The legal status of employer and employee," by Francis X. Butler.

Profit sharing will be the subject of a forthcoming bulletin of the Bureau of Labor Statistics, based on a study of the experience and records of a large number of employers.

PROFIT SHARING IN GREAT BRITAIN.

On June 30, 1915, 153 firms in Great Britain maintained some form of profit sharing in connection with their business. This is three less than the number operated on June 30, 1914. These figures are given by the British Board of Trade Labor Gazette for November, 1915, based on inquiries which have been made annually by the board of trade since the publication of its report on profit sharing in the United Kingdom in 1912. Seven profit-sharing schemes were reported to the British office since publication of its annual statistics for 1913-14. Three of the schemes reported at that time have been definitely abandoned, while three, on account of the war, have been temporarily suspended.

Of the seven newly established plans, three have been started by gas companies, "the most important group in which profit sharing is in force." The scheme involving the largest number of employees (3,580) was that reported by a firm of retail grocery and provision merchants.

In explanation of the decline of the number of profit-sharing schemes reported to the board of trade during this year, it is stated that many firms have abandoned attempts at profit sharing on account of conditions arising out of the war.

Concerning the three firms reported to have abandoned profit sharing one is in liquidation, one reported that a limited liability company had been formed in which some of the employees had been encouraged to take shares, while another firm gave as a reason for its abandonment of the profit-sharing idea, "incompatibility with trade-union ideas."

The average number of persons in the permanent employ of the 153 firms known to have profit-sharing schemes on June 30, 1915, was 141,112 applicable for the 12 months preceding the declaration of profits in 1914.

The following table shows by classified percentages the ratio of the bonus to wages, as based on 121 reports during 1914:

RATIO OF BONUS TO WAGES IN 1914.

Ratio of bonus to wages of participants in 1914.	Number of declarations of bonus reported upon.	Total number of permanent employees.	Number of participating employees.
Nil.....	18	4,342	12,107
Under 1 per cent.....	1	380	235
1 and under 2 per cent.....	4	578	502
2 and under 3 per cent.....	9	28,772	4,362
3 and under 4 per cent.....	9	1,993	1,851
4 and under 5 per cent.....	11	2,598	1,690
5 and under 6 per cent.....	23	18,975	15,654
6 and under 8 per cent.....	24	30,012	25,758
8 and under 10 per cent.....	10	10,481	9,375
10 and under 12 per cent.....	2	1,461	218
12 and under 16 per cent.....	5	9,751	6,336
16 and under 20 per cent.....	2	1,434	1,147
Over 20 per cent.....	3	186	76

Taking into account all cases the amounts allowed to employees under the 121 declarations of bonuses added 6.7 per cent to the total wages paid to employees participating in such schemes. If there are excluded those cases in which no profit sharing bonus was paid, the increase amounted to 6.9 per cent. Reports from 127 firms showed that the total amount paid in bonuses came to £370,246 (\$1,801,802) distributed among 71,268 employees (including 567 not permanently employed), or an average of £5 3s. 11d. (\$25.28) for each participating employee.

THIRD ANNUAL MEETING OF COMPENSATION COMMISSIONERS.¹

The Third Annual Meeting of the International Association of Industrial Accident Boards and Commissioners was held at Columbus, April 25 to 28, inclusive, delegates from 19 States, one Canadian Province, the United States Bureau of Labor Statistics, and the American Museum of Safety being in attendance. Addresses of timely interest in connection with workmen's compensation, accident prevention, and kindred subjects were made. As a part of the meeting, the first session of the newly authorized medical section was held, and a safety committee was organized to form the nucleus of a proposed safety section, later indorsed by the association, to advance the promotion of accident prevention.

The first session was called to order by the vice president, Wallace D. Yapple, who outlined the growth of the workmen's compensation idea in the various States. Floyd L. Daggett, of Washington, president of the association, was not present, but his response and opening address was read by Dudley M. Holman, of Massachusetts. In the

¹ Bulletin No. 201 (in press) of the United States Bureau of Labor Statistics contains in full the proceedings of these meetings.

evening Gov. Frank B. Willis welcomed the delegates in behalf of the State, and spoke in support of the workmen's compensation idea in general and of the Ohio plan in particular. During the convention papers were read as follows:

"The right of appeal under workmen's compensation laws; the constitutional necessity therefor and the most appropriate method of taking the same," by Fred M. Wilcox, member of the Industrial Commission of Wisconsin.

"Conflicts between Federal and State jurisdictions in commerce cases," by A. J. Pillsbury, chairman of the Industrial Accident Commission of California.

"Merit rating in workmen's compensation insurance," by Emile E. Watson, actuary, Industrial Commission of Ohio.

"Compulsory investigation of industrial disputes," by Wayne C. Williams, member of the Industrial Commission of Colorado.

"The why and how of uniform industrial accident statistics for the United States," by Royal Meeker, Commissioner of the United States Bureau of Labor Statistics.

"The use of accident statistics for accident prevention," a paper prepared by W. H. Burhop, statistician of the Industrial Commission of Wisconsin, and read by L. A. Tarrell, chief examiner of the Wisconsin Commission.

"Educational work in accident prevention," by Dudley M. Holman, member of the Industrial Accident Board of Massachusetts.

"The theory and practice of compensation," by Wm. C. Archer, deputy commissioner of the State Industrial Commission of New York.

"A comparison of the methods of dealing with permanent partial disability cases," by George A. Kingston, commissioner of the Workmen's Compensation Board of Ontario.

"Ohio's experience with State insurance," by Thos. J. Duffy, member of the Industrial Commission of Ohio.

"The relation of workmen's compensation to old age, health, and unemployment insurance," by Royal Meeker, Commissioner of the United States Bureau of Labor Statistics.

A paper prepared by Will J. French, member of the Industrial Accident Commission of California, on "Cooperative methods to promote industrial safety," was not read but was ordered published in the proceedings.

The report of the committee on statistics and compensation insurance cost was presented by E. H. Downey, special deputy, Insurance Department of Pennsylvania, and adopted by the association.¹ The committee which prepared the report was continued, its members being as follows: E. H. Downey, special deputy, Insurance Department of Pennsylvania, chairman; Royal Meeker, Commissioner, United States Bureau of Labor Statistics; E. E. Watson, actuary, Industrial Commission of Ohio; L. W. Hatch, chief statistician, Industrial Commission of New York; W. H. Burhop, chief statistician, Industrial Commission of Wisconsin; Don D. Lescohier, chief statistician, Minnesota Department of Labor; Mr. Broderick, statistician, Industrial Accident Board of Massachusetts; F. C. Croxton, chief statistician, Industrial Commission of Ohio.

¹ Uniform classification of industries, injuries, and accident causes, as presented by this committee, are included in Bulletin No. 201 (in press) of the United States Bureau of Labor Statistics.

Resolutions were adopted by the association as follows:

Indorsing the bill in Congress to extend second-class mail privileges to publications of the State departments of agriculture and of industry and labor.

Requiring a synopsis of all addresses to be forwarded for printing and promulgation at least two months prior to each meeting.

Requesting Mr. John Mitchell, chairman of the Industrial Commission of New York, to prepare a paper on the subject of "The physical examination of employees," to be published with the proceedings of the convention; also requesting Dr. Sidney M. McCurdy to submit for publication, as a part of the proceedings, his remarks in connection with the discussion of this subject.

Recommending a single term for the presidency of the association.

Suggesting a special conference on social insurance, under the auspices of the Industrial Accident Boards and Commissions, to be called to meet at Washington, D. C., in September or October of this year, to hear the proponents and opponents of various plans of social insurance, and this in order that the association constantly may be apprised of the relation of such proposed legislation to workmen's compensation; that invitations be issued freely to all interested parties to participate; and that the program for such meeting be arranged by a committee to be appointed by the chairman to be elected for the ensuing year. The following committee was named: Hon. Royal Meeker, of Washington, D. C., chairman; Dudley M. Holman, of Massachusetts; Fred M. Wilcox, of Wisconsin; J. B. Vaughn, of Illinois; and Wallace D. Yaple, of Ohio.

Authorizing the medical delegates to organize a separate section, which section shall remain an integral part of the organization, this in order that such delegates may at conventions devote their entire time to medical questions of common interest. The medical section organized by electing Dr. Raphael Lewy, of New York, president; Dr. Francis D. Donoghue, of Massachusetts, vice president; Dr. W. H. White, of Ohio, secretary-treasurer.

Recognizing the interstate safety committee, comprising delegates from eight States as organized at Columbus on April 26, as a safety and health promotion section, and recognizing the chairman of such organization as the committee chairman of this section. Victor T. Noonan, safety director of the Industrial Commission of Ohio, was elected committee chairman.

Requesting the Federal Bureau of Labor Statistics to publish from this time the proceedings of the conventions and conferences of the association.

Memorializing Congress to amend the employers' liability act of 1908-1910, and any Federal compensation law that may be enacted, so as to exempt from the operation of such law or act all States and

Territories of the United States having in operation compulsory compensation laws competent to afford adequate protection to employees engaged in transportation by railroad, whether in interstate or intrastate commerce, and to permit railroads and their employees to elect to operate under compensation laws in States in which such laws are elective, thereby divesting injuries sustained in transportation by railroad of their interstate character in all such States while retaining under Federal jurisdiction all States and Territories which do not enact and enforce laws providing for compensation to injured workmen without regard to negligence.

Boston was selected as the place of the next meeting, during the third week in August, 1917. The following officers were elected: Wallace D. Yaple, of Ohio, president; Fred M. Wilcox, of Wisconsin, vice president; the Commissioner of the United States Bureau of Labor Statistics, Washington, D. C., secretary-treasurer. Believing that the president should be from Massachusetts, in which State the next meeting is to be held, Mr. Yaple offered his resignation as president and Dudley M. Holman, of the Industrial Accident Board of Massachusetts, was elected in his stead. The executive committee was instructed to revise the constitution and by-laws before the next meeting. The following delegates were in attendance:

Name.	Address.	Office.
A. J. Pillsbury.....	San Francisco, Cal.....	Chairman, Industrial Accident Commission.
Wayne C. Williams.....	Denver, Colo.....	Member, Industrial Commission.
J. B. Vaughn.....	Chicago, Ill.....	Chairman, Industrial Board.
Edgar A. Perkins.....	Indianapolis, Ind.....	Chairman, Industrial Board.
Chas. R. Hughes.....	Indianapolis, Ind.....	Member, Industrial Board.
A. B. Funk.....	Des Moines, Iowa.....	Industrial Commissioner.
E. S. Montell.....	Baltimore, Md.....	Manager, Industrial Accident Commission.
Dr. Robt. P. Bay.....	Baltimore, Md.....	Chief medical examiner, Industrial Accident Commission.
Dudley M. Holman.....	Boston, Mass.....	Member, Industrial Accident Board.
Dr. Francis Donoghue.....	Boston, Mass.....	Chief medical examiner, Industrial Accident Board.
C. A. Durand.....	Lansing, Mich.....	Manager, State accident fund.
Dr. Don. D. Lescohier.....	St. Paul, Minn.....	Statistician, Department of Labor and Industry.
W. J. Swindlehurst.....	Helena, Mont.....	Commissioner of Labor.
John Roach.....	Trenton, N. J.....	Acting Chief, Bureau of Hygiene and Safety.
Wm. C. Archer.....	New York City.....	Deputy Commissioner, State Industrial Commission.
Dr. Raphael Lewy.....	New York City.....	Chief medical examiner, State Industrial Commission.
L. W. Hatch.....	Albany, N. Y.....	Statistician, State Industrial Commission.

W. L. Blessing.....	Oklahoma City, Okla.....	Member, Industrial Commission.
Geo. A. Kingston.....	Toronto, Ontario.....	Member, Workmen's Compensation Board.
T. N. Dean.....	Toronto, Ontario.....	Statistician, Workmen's Compensation Board.
Carle Abrams.....	Salem, Oreg.....	Member, Industrial Accident Commission.
Dr. F. H. Thompson.....	Salem, Oreg.....	Chief medical examiner, Industrial Accident Commission.
E. H. Downey.....	Harrisburg, Pa.....	Special deputy, State Insurance Department.
Lee Ott.....	Charleston, W. Va.....	Workmen's Compensation Commissioner.
Fred M. Wilcox.....	Madison, Wis.....	Member, Industrial Commission.
Geo. P. Hambrecht.....	Madison, Wis.....	Member, Industrial Commission.
L. A. Tarrell.....	Madison, Wis.....	Chief examiner, Industrial Commission.
Herman B. Gates.....	Cheyenne, Wyo.....	State treasurer.
Royal Meeker.....	Washington, D. C.....	U. S. Commissioner of Labor Statistics.
C. H. Verrill.....	Washington, D. C.....	U. S. Bureau of Labor Statistics.
Dr. William H. Tolman.....	New York City.....	Director, American Museum of Safety.
Wallace D. Yaple.....	Columbus, Ohio.....	Chairman, Industrial Commission.
Thos. J. Duffy.....	Columbus, Ohio.....	Member, Industrial Commission.
Geo. L. Stoughton.....	Columbus, Ohio.....	Secretary, Industrial Commission.
Lloyd D. Teeters.....	Columbus, Ohio.....	Assistant secretary, Industrial Commission.
Harold D. Sites.....	Columbus, Ohio.....	Assistant secretary, Industrial Commission.
H. H. Hamm.....	Columbus, Ohio.....	Director of claims, Industrial Commission.
H. W. Putnam.....	Columbus, Ohio.....	Chief auditor, Industrial Commission.
Emile E. Watson.....	Columbus, Ohio.....	Actuary, Industrial Commission.
Dr. W. H. White.....	Columbus, Ohio.....	Chief medical examiner, Industrial Commission.
Fred C. Croxton.....	Columbus, Ohio.....	Chief statistician, Industrial Commission.
Victor T. Noonan.....	Columbus, Ohio.....	Safety director, Industrial Commission.
F. M. Secrest.....	Cleveland, Ohio.....	Deputy, Industrial Commission.
S. S. Stewart.....	Cincinnati, Ohio.....	Deputy, Industrial Commission.
Arnold S. Althoff.....	Dayton, Ohio.....	Deputy, Industrial Commission.

WORKMEN'S COMPENSATION LAWS AS APPLIED TO RAILROAD EMPLOYEES.

Synopsis of a paper entitled "Conflicts between Federal and State jurisdictions in commerce cases," read by A. J. Pillsbury, chairman of Industrial Accident Commission of California, at the Third Annual Meeting of the International Association of Industrial Accident Boards and Commissions, Columbus, Ohio, April 26, 1916:

There are conflicts of jurisdiction between the Federal Government and States having compensation laws dependent upon whether or not, at the instant of the injury, the employee was engaged in interstate or intrastate commerce.

This conflict often makes it necessary to try cases, first, to determine the jurisdiction, and afterwards to find out whether or not applicant is entitled to recover.

There are in the United States approximately 2,000,000 railroad employees more or less subject to the costs, annoyances, and uncertainties of this conflict on the division of jurisdiction.

For the year ending June 30, 1915, 2,195 railroad employees were killed in the United States and 139,550 injured.

The Federal employers' liability law of 1908-1910 was, when it was enacted, a great advance on what the States had done for the indemnification of railroad men for injuries received in the course of their employment, but since then 31 States have enacted compensation laws far in advance of the liability law of 1908.

The liability law was based on negligence, but with old, drastic, common-law conditions greatly modified. The compensation laws are without regard to negligence.

The courts have been able to lay down no rule for determining, without a hearing, whether or not an injury happened in interstate or intrastate commerce.

The Federal laws have exclusive jurisdiction over all injuries happening while the employee is engaged in interstate commerce, and in cases where it is impossible to determine whether or not the injury happened in interstate or intrastate commerce.

The Federal law has, and can have, no jurisdiction over injuries happening in intrastate commerce, thereby making it impossible for Congress to enact a uniform liability or compensation law covering all injuries sustained in commerce by railroad.

The well-being of railroad employees, and efficiency in administration or execution of such laws, requires that all such cases within a State be under one jurisdiction.

It would be preferable, were it possible, for the whole subject matter to be under the jurisdiction of the Federal Government.

Inasmuch as, according to the decisions of the Supreme Court of the United States, such a consummation is not possible, the next best thing is for the Federal Government to relinquish the whole subject matter to the jurisdiction of States having adequate compensation laws.

The best interests of railroad employees working in States not having adequate compensation laws require that the Federal authority maintain its jurisdiction over such States.

The crucial question involved is as to whether or not Congress can constitutionally enact an ununiform liability or compensation law—that is, a law operative in some States and not in others.

There is no specific requirement in the Constitution of the United States that all laws shall be uniform, but only that all shall be entitled to the equal protection of the law.

The Webb-Kenyon liquor law has declared it unlawful to transport liquors into any State to be consumed in any manner contrary to the laws of such prohibition State. In other words, Congress has divested liquors of their interstate character as to prohibition States.

May not Congress likewise divest injuries received in the operation of railroads of their interstate character whenever they happen in States having adequate compensation laws?

Injuries sustained in the operation of railroads are not proximately of concern to the Nation, but to the States and their political subdivisions which must care for those crippled, widowed, or orphaned as results of such injuries.

The interests of the Nation in the subject matter are relatively remote and inconsequential.

Two States of the Union, New York and New Jersey, have recently denied that there is any conflict between the Nation and such States in relation to compensation.

The Federal law fixes liability only where there is negligence on the part of the carrier or the fellow servants of an injured employee. State compensation laws fix liability without regard to negligence. It is claimed that the two jurisdictions do not relate to the same field and therefore can not conflict. The issue is now before the Supreme Court of the United States for determination.

The crux of the issue has been missed by both sides to the controversy.

That crux is that compensation for industrial injuries, however and wherever suffered, has, and should have, no essential, constitutional connection with commerce, either interstate or intrastate, but belongs to the realm of local, domestic, social insurance against the hazards of poverty, with which the Federal Government should have only a general concern.

"Compensation" is one factor in a forthcoming general scheme of social insurance, and, as such, differs in no important particular from insurance against the hazards of sickness, unemployment, old age, premature death, invalidity, maternity.

Could a railroad company plead for exemption from the operation of a sickness or unemployment insurance law of a State on the ground that its employees were engaged in interstate commerce? If not, then why against insurance against the consequences of industrial accident?

Why is this power of the Federal Government asserted only in relation to industrial injuries and not in relation to taxation, the compulsory insurance of passengers against injury, their baggage against loss, freight against destruction, and farmers' crops against fire caused by sparks from locomotives—all without regard to negligence?

A Federal compensation law would be impracticable, because:

- (a) It can not occupy the whole field, interstate and intrastate.
- (b) The jury system is constitutionally requisite, but wholly unsuited to compensation cases.
- (c) Courts are little better fitted for this service than juries.
- (d) A national commission covering all States would culminate in a huge and undesirable bureaucracy.

Recommendations.

1. Ask Congress to so amend the employers' liability act as to divest injuries of their interstate character when they happen in States having compulsory compensation laws covering injuries to railroad employees.
2. Include the same provision in any Federal compensation law that may be enacted.
3. Permit railroads in States having elective compensation laws to accept such acts in lieu of Federal laws on the same subject.

KENTUCKY WORKMEN'S COMPENSATION LAW.

In the April number of the MONTHLY REVIEW some account was given of the report of a voluntary commission of the State of Kentucky which undertook to draft a workmen's compensation law for the consideration of the session of the legislature of the State recently closed. The bill drafted by the commission did not become law, but an act embodying its principal features was passed and received the approval of the governor on March 23, 1916, to take effect August 1 following. The system provided is one of elective compensation, with provision for positive choice of the measure by the employer by filing a written statement with the State Workmen's Compensation Board and posting a notice of the fact in his establishment. The employee must also file with his employer a signed notice of his acceptance of the act. Employers failing to accept the act are deprived of the common-law defenses of contributory negligence, fellow service, and assumed risks. This method of inducement does not extend to domestic and farm labor nor to establishments in which less than five persons are employed; these classes may, however, accept the act by joint application of employer and employee.

The compensation is on a 65 per cent basis, with provision for funeral expenses not in excess of \$75, and medical and surgical aid during the first 90 days, the cost not to exceed \$100. Death benefits may not exceed \$12 weekly nor be less than \$5 for a period of 335 weeks, the total not to exceed \$4,000. For total disability the same maximum and minimum amounts are fixed to run for a period of 8 years, the total not to exceed \$5,000. Where disability is partial, compensation is determined by the wage loss, subject to \$12 maximum for not more than 335 weeks and not more than \$4,000 in amount. A schedule of fixed periods of compensation is provided for specified injuries.

Public employees are included at their own election.

The administration of the act rests with a workmen's compensation board, and the State is divided into three districts for convenience of administration. Employers accepting the act must insure their liability in a stock or mutual company or in a special organization created by the act under the title "State Employees' Insurance Association," or they may be relieved of this obligation on giving proof of financial ability. Self-insurers must, however, furnish bond or other security.

Payments to a widow or widower cease on remarriage, and to a child on reaching the age of 16 unless incapacitated for wage earning.

WORK OF MASSACHUSETTS MINIMUM WAGE COMMISSION.

The report of the Massachusetts Minimum Wage Commission for 1915 is a pamphlet of 35 pages, containing a brief review of the activities of the commission, some proposed legislation intended to increase its efficiency, the text of the law creating the commission, and minimum wage decrees affecting the brush industry, laundries, and retail stores. To the close of 1915 the commission investigated occupations containing more than 50,000 female employees and established wage boards to deal with occupations containing nearly 40,000 female employees. Since its organization, in 1913, it has inquired into the wages paid to women in nine industries, the facts set forth in the following table, prepared by the State bureau of statistics, being offered to justify the commission in believing that wages were too low in these occupations:

NUMBER OF EMPLOYEES AND PER CENT OF FEMALES EARNING UNDER \$6 AND UNDER \$8 WEEKLY IN EACH SPECIFIED INDUSTRY IN MASSACHUSETTS, 1913.

Industry. ¹	Number of establishments.	Average number of employees.		Per cent of females with weekly earnings— ²	
		Males.	Females.	Under \$6.	Under \$8.
Brushes.....	27	771	795	25.4	66.6
Corsets.....	11	326	2,651	21.9	49.9
Confectionery.....	121	1,882	5,343	31.5	71.2
Laundries.....	377	2,831	5,329	14.4	59.7
Boxes, fancy and paper.....	95	1,488	2,807	18.4	47.7
Clothing, women's.....	184	1,425	4,627	13.6	39.6
Hosiery and knit goods.....	65	2,932	7,807	16.7	46.5
Clothing, men's.....	206	2,634	3,179	13.5	42.8

¹ Figures for women employed in retail stores are not furnished by the bureau of statistics.

² This includes only females 18 years of age or over for the week of employment of the greatest number, and shows their rates of payment. This showing is therefore much more favorable than would be the actual average weekly earnings of all females, or the same females for the whole year.

Under the Massachusetts minimum wage law, the commission is given authority to establish minimum wage boards, and this power was exercised in seven instances:

These wage boards are directed by law to take into consideration the needs of employees and the financial condition of the occupation and the probable effect thereon of any increase in the minimum wages paid, and to endeavor to determine the minimum wage suitable for a female employee of ordinary ability in the occupation in question, and also suitable minimum wages for learners and apprentices and for minors below the age of 18 years. When a majority of the members of a wage board agree upon minimum wage determinations, they are to report such determinations to the commission, together with the reasons therefor and the facts relating thereto.

Four wage boards reported. The brush makers' board recommended a minimum wage for experienced workers of 15½ cents per hour. The candy board recommended a minimum rate of \$8.75 a week; the laundry board \$8, and the retail store board \$8.50 a week.

Lower rates were recommended for inexperienced workers. The determinations reported by these wage boards were approved by the commission and are in effect.¹ The differences in the minimum rates recommended by the various boards are due to the fact that the rates are fixed with regard to the financial conditions of the industries and the probable effect thereon of any increase in the minimum wages paid.

The effect of the minimum wage determination in the brush industry was made the subject of a special investigation by the commission which found (1) that the establishment of the minimum wage has been followed by a remarkable increase in the earnings of women employees in that industry, (2) that the employment of women at ruinously low rates was practically stopped, (3) that the proportion of women employed at more than the prescribed minimum rate has more than doubled, and (4) that all this has been accomplished without putting an unreasonable financial burden upon the industry.²

In order that the commission may be able to know definitely whether low earnings are the result of unreasonably low rates of wages or of irregular employment at rates in themselves not unreasonably low, the commission has recommended that legislation be enacted requiring every employer to keep a record of the number of hours each week for which women and minors in their employ are paid. An act to provide for the filling of vacancies on wage boards is also deemed necessary. The experience of the commission seemed to show that further powers of enforcement are necessary to insure proper publicity for its decrees, and it therefore recommends the passage of an act requiring employers to post all bulletins issued by the commission regarding the minimum rates of wages for female employees, with provision for a fine in case of violation.

The appropriation for the fiscal year ending November 30, 1915, was \$17,900 and the commission believes that more money is necessary to enable it to investigate other industries containing about 30,000 female employees and to support the work of wage boards. It is stated that the total number of girls and women over 18 years of age employed in Massachusetts in 1913 was 189,743. This does not include establishments with less than \$5,000 value of product, nor girls in laundries, retail stores and several other important occupations in which women are employed.

¹ The determination affecting the candy industry was to have been effective on October 1, 1915, but the matter is in abeyance pending legal proceedings involving the organization of the candy maker's wage board.

² Bulletin No. 7, September, 1915: The effect of the minimum wage decrees on the brush industry in Massachusetts. For digest of this bulletin see MONTHLY REVIEW for December, 1915, p. 33.

SPECIAL INVESTIGATIONS BY THE COMMISSION.

Bulletin No. 8 and Bulletin No. 10 of the minimum wage commission present, respectively, a report on wages of women in the paper-box factories¹ and the hosiery and knit-goods factories.² The history and growth of each industry in the United States are briefly traced, and it is stated that in 1909 Massachusetts occupied third place in the manufacture both of paper boxes and knit goods, the value of its product in the former case being 10.6 per cent of the total, and the value of its knit goods products being 7.4 per cent of the total. The following figures, gathered by the State bureau of statistics in 1913, indicate the importance of these industries:

IMPORTANCE OF THE MANUFACTURE OF PAPER BOXES AND HOSIERY AND KNIT GOODS IN MASSACHUSETTS, 1913.

Item.	Paper-box factories.	Hosiery and knit-goods factories.
Number of establishments.....	95	65
Capital.....	\$4,054,193	\$14,660,406
Value of products.....	\$6,898,723	\$16,693,510
Wages.....	\$1,953,130	\$4,813,407
Employees:		
Males, 18 years of age and over.....	1,413	2,671
Females, 18 years of age and over.....	2,308	6,758
Females under 18 years of age.....	599	1,264

During February, March, and April, 1915, the minimum wage commission made a study of wages and rates for the various occupations in the paper-box industry, and during September, October, and November, following, a similar study was made of the hosiery and knit-goods industry. In these investigations consideration of such subjects as sanitation, overtime, accidents, living arrangements and expenses of the women employees was omitted. Twenty-four paper-box factories and 27 knit-goods factories situated in 15 cities and towns were studied, and a transcript of the pay roll for each female employed was taken for a period of 52 weeks preceding the date of the initiation of the inquiry. Four paper-box factories and 18 hosiery and knit-goods factories kept records of the number of hours worked by the female employees, and these were also transcribed. All records of persons who appeared on the pay roll for less than four weeks were disregarded. The procedure adopted by the commission in computing weekly earnings and hours of work each week for individual workers was as follows:

The sum of all payments made during the 52-week period—that is, the girl's total income from her work for the year—was found. This sum was divided by the number of weeks during which she was actually at work, as indicated by the number of weekly

¹ Massachusetts. Minimum Wage Commission. Bul. No. 8. Wages of women in the paper-box factories, Boston, 1915. 38 pp.

² Massachusetts. Minimum Wage Commission. Bul. No. 10. Wages of women in hosiery and knit-goods factories. Boston, 1916. 37 pp.

payments made to her. When the weekly payment was for a paid vacation, the vacation week was counted as a week actually worked. In this way her average weekly earnings for the time she was at work in the occupation under consideration was ascertained. A corresponding procedure was adopted in treating hours of work.

In the paper-box industry the records of 2,178 women were obtained, and a summary of the results of this investigation shows that 970, or 44.5 per cent, earned less than \$6 a week, and that 350, or 16.1 per cent, earned less than \$4 a week. More than three-fourths, 75.7 per cent, earned less than \$8 a week. It will be noted in the following table, which presents the weekly wages received and the weekly rates at which workers are scheduled to be paid, that the per cent scheduled to receive less than \$6 a week (55 per cent) was somewhat higher than the per cent actually earning less than \$6. The report attempts to account for this by suggesting that many high paid workers, who are largely all pieceworkers, could not be included in the rate table and this table therefore represents mainly low-paid timeworkers. Less than one-third (31.1 per cent) of the workers did not receive as much as \$100 in the course of the year, and more than one-half (53.7 per cent) earned less than \$250. It was found that weekly earnings differed widely in different factories; for instance, in three factories studied more than one-half of the women employees were paid less than \$5 a week, while in two other factories no woman employed averaged less than that amount.

In the hosiery and knit-goods factories the records of 3,460 women were obtained. It appears from the table that 40.7 per cent earned less than \$6 a week and that 11.8 per cent earned less than \$4 a week. Slightly more than 74 per cent earned less than \$8. Nearly a thousand workers, 944, or 27.3 per cent, earned less than \$100 in the course of the year.

WEEKLY EARNINGS AND WEEKLY RATES AT WHICH WORKERS ARE SCHEDULED TO BE PAID IN PAPER-BOX FACTORIES, AND WEEKLY EARNINGS IN THE HOSEIERY AND KNIT-GOODS FACTORIES, IN MASSACHUSETTS.

Wages.	Paper-box factories.				Hosiery and knit-goods factories. ¹		
	Weekly rates.		Weekly earnings.		Weekly earnings.		
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.	
Under \$3.....			99	4.6	146	4.2	
\$3 and under \$4.....	17	3.7	251	11.5	263	7.6	
\$4 and under \$5.....	118	25.3	308	14.1	420	12.2	
\$5 and under \$6.....	121	26.0	312	14.3	579	16.7	
\$6 and under \$7.....	51	10.9	346	15.9	633	18.3	
\$7 and under \$8.....	48	10.3	333	15.3	531	15.4	
\$8 and under \$9.....	40	8.6	212	9.7	423	12.2	
\$9 and over.....	71	15.2	317	14.6	465	13.4	
Total.....		² 466	100.0	2,178	100.0	3,460	100.0

¹ The weekly rates for women employees in these factories were not obtained.

² Pieceworkers and all timeworkers whose rates were not available are excluded

The commission found a wide divergence in actual earnings not only in the different branches of the hosiery and knit-goods industry, but also between different establishments manufacturing the same lines and grades of goods. In general, the firms manufacturing underwear paid higher wages than those making hosiery, sweaters, and miscellaneous products. This is indicated in the following table:

PER CENT (CUMULATIVE) OF WORKERS EARNING INDICATED AVERAGE WEEKLY WAGES IN EACH SPECIFIED KIND OF FACTORY IN THE HOSE AND KNIT-GOODS INDUSTRY IN MASSACHUSETTS.

Product.	Under \$3.	Under \$4.	Under \$5.	Under \$6.	Under \$7.	Under \$8.	Under \$9.	\$9 and over.
Hosiery.....	5.1	14.6	28.8	48.4	67.8	84.0	94.1	5.9
Underwear.....	2.2	6.0	14.0	26.0	41.3	57.5	73.6	26.4
Sweaters, athletic goods, and miscellaneous products.....	6.1	16.0	31.3	49.4	71.2	81.7	91.8	8.2
Total.....	4.2	11.8	24.0	40.7	59.0	74.3	86.6	13.4

Based on the records of 282 box makers, the report states that the majority averaged between 42 and 50 hours a week. A table showing fluctuation of employment reveals the fact that of the 2,178 women scheduled, only 6.8 per cent worked as much as 12 months, 37.2 per cent worked as much as 11 months, while 86.1 per cent worked only 2 months and 78.7 per cent worked 3 months. It is explained that the greater instability is among the comparatively unskilled and low paid occupations, and also that the figures presented in this connection do not purport to portray the extent of unemployment for the industry as a whole, but merely to give a summary of the pay rolls of the 24 factories studied.

The commission found a tendency for wages in fairly skilled occupations to vary directly with age until middle life is passed. Of 886 for whom records were obtained, 592, or 66.8 per cent, were less than 25 years of age, and of these, 357, or 60.3 per cent, were earning less than \$7 a week. Of the 294 over 25 years of age, 117, or 39.8 per cent, were earning over \$9 a week. A study of the living arrangements of 893 women disclosed that 84.1 per cent were living at home and that of those receiving less than \$6 a week 90.4 per cent were living at home, the percentage decreasing to 77.8 in the case of those who earned \$9 and over. About 48 per cent of the girls living at home were less than 21 years of age, and approximately 72 per cent were less than 25 years of age.

In the hosiery and knit-goods industry it was found that in general the establishments having the largest number of female employees who received average wages of less than \$6 are recorded as having the highest average running time, whereas the establishments paying

the highest wages worked their employees the longest number of hours. The records show a low average for hours of employment, 56.7 per cent working less than 42 hours a week. That the industry is not markedly seasonal in character is shown by the fact that 51.9 per cent had employment for over 9 months in the year; 7.5 per cent of the women included in the study worked the entire 12 months. In the underwear factories, 43.8 per cent worked over 11 months and 61.8 per cent over 9 months. The commission found a general tendency to employ women between the ages of 16 and 35; of the 1,680 women for whom this information was available, 1,390, or 82.7 per cent, were between these ages. As to living conditions of these workers, 10.6 per cent were living away from home; 33.7 per cent of the girls living at home were earning under \$6 a week, while only 24.5 per cent of those away from home were included in these wage groups.

A brief statement of accident hazard, based on the report of the Massachusetts Industrial Accident Board, is included in the bulletin on wages of women in the paper-box factories. The principal danger to which these employees are subjected is connected with machinery peculiar to the industry, particularly the older type of staying machines by which the corners of the boxes are secured. From July 1, 1912, to June 30, 1913, 266 nonfatal accidents (no fatal) were reported, the percentage of accidents to the number employed being 6.3. About 43 per cent of the injured employees were women and the majority were less than 30 years of age. Approximately 62 per cent of those injured were disabled for less than 2 weeks.

Each bulletin gives a brief description of the processes involved in the industry considered.

MINIMUM WAGE IN THE BOX-MAKING INDUSTRY IN GREAT BRITAIN.¹

The Ratan Tata Foundation (University of London) was instituted to promote the study and further the knowledge of methods of preventing and relieving poverty and destitution. To this end it "conducts inquiries into wages and the cost of living, methods of preventing and diminishing unemployment, measures affecting the health and well-being of workers, public and private agencies for the relief of destitution, and kindred matters." Resulting from its study of minimum rate determinations, including the working of the trade boards organized under the trade boards act of 1909, three publications have been issued, the most recent setting out the effect, so far as could be ascertained, of the minimum rates fixed for workers

¹ Minimum Rates in the Box-making Industry, by M. E. Bulkley. Ratan Tata Foundation, University of London. London, 1915. 95 pp.

engaged in the manufacture of paper, cardboard, and chip boxes.¹ This report is based on information collected between March, 1913, and July, 1914, and is the result of personal interviews with some 30 or 40 factory workers, 370 home workers, mostly in London, inspectors and others having knowledge of the working of the trade boards act, and 110 employers in London, Birmingham, Leicestershire, Northamptonshire, Nottingham, Norwich, and in a few other parts of the country, the firms visited covering every branch of the industry, which employs approximately 30,000 persons. The trade board in the box-making industry consists of 19 representatives each of employers and employees, and 3 members of the Board of Trade. Subordinate to this trade board are nine district committees, whose duty is to recommend minimum time rates and minimum piece rates applicable to the trade in their area.

Box making is done by hand and by machinery, in the factory, the workshop, and the home. Most of the employees are pieceworkers,² and piece rates vary considerably from one firm to another. In the fixing of rates two important principles had to be determined: (1) Should there be universal minimum time rates or varying rates according to the different circumstances of different localities, and (2) should general minimum piece rates be fixed or only general minimum time rates. The number of different varieties of boxes was so large and the processes of making them were so numerous and varied so much from one firm to another that it was considered impracticable to fix general minimum piece rates, and the trade board accordingly decided to establish a minimum time rate only. The report suggests that the workers' representatives would have welcomed the fixing of general minimum piece rates, the establishment of which would have greatly simplified the task of administration and reduced the opportunities for evasion of the act. A universal minimum time rate for female workers was finally fixed at 3d. (6.1 cents)³ an hour, which rate became obligatory on September 12, 1912, and a universal minimum time rate for males was fixed at 6d. (12.2 cents), this rate becoming effective on July 7, 1913.

It is provided in the trade boards act, in cases where persons are employed on piecework, and where a minimum time rate, but no general or special minimum piece rate, has been fixed, that "an employer shall * * * be deemed to pay wages at less than the minimum rate * * * unless he shows that the piece rate of

¹ The other two publications are *The Establishment of Minimum Rates in the Chain-making Industry, 1914*, and *The Establishment of Minimum Rates in the Tailoring Industry, 1915*.

² According to the report on earnings and hours of labor in 1906, of the 2,934 women about whom particulars were obtained, 2,052, or 69.9 per cent, were on piecework; of the 1,701 girls under 18 years of age, 645, or 37.9 per cent, were on piecework; of the 1,107 men and boys, all but 3 per cent were on timework.

³ The report states that a "proposal to vary" has been made (May, 1915), by which the rate for adult women is to be 3½d. (6.6 cents) and rates for learners at the later periods are to be altered in accordance.

wages paid would yield, in the circumstances of the case, to the ordinary worker, at least the same amount of money as the minimum time rate." In order to facilitate administration it was necessary to determine what proportion of workers might be expected to be "sub-ordinary," and to this end a general rule, for the guidance of the employers and not legally binding nor to be rigidly applied, was laid down by the board providing that an employer should be held *prima facie* to be complying with the board's determination if 85 per cent of his workers were earning 3d. (6.1 cents) or more an hour.

According to the census of 1911, about 30 per cent of the 4,068 males engaged in cardboard-box making were under 21, and 29.5 per cent of the 26,501 females were under 18 years of age. In view of this proportion the determination of a minimum wage for learners was deemed important. For females the rates were based on length of service and age of the learner, the period of learnership varying from one to four years or more and the rate from 4s. to 10s. 6d. (97.3 cents to \$2.56) for a 52-hour week. These rates became effective on March 11, 1912. For male learners the rates, based only upon age, after January 6, 1913, ranged from 4s. 6d. to 21s. (\$1.10 to \$5.11).

Following this brief outline of the establishment of minimum rates, the remainder of the volume is devoted to a discussion of the effect on employment, on wages, on conditions of labor, and on earnings and employment of home workers, with a chapter on the economic reactions of the minimum rates.

Increases of wages, it is stated, may be brought about in two ways, either by a rise in piece rates (or by an increase in the weekly wages if workers are employed on daywork) or by the improved methods of management without any change in the piece rates. The returns as to the effect on wages of women are somewhat inadequate, only 108 firms being represented with no statement as to the number of persons employed, but they indicate no general increase in wages, although 65 of the 108 firms found it necessary to raise piece rates or the weekly wages of timeworkers, or otherwise increase the earnings of all women workers. As indicating the tendency to raise wages the report says:

In one firm the wages of inworkers have been raised 2s. 3d. [54.8 cents] since the act; in another they have been raised by 2s. or 3s. [48.7 cents or 73 cents]; in a third the wages of the women ranged from 9s. to 15s. [\$2.19 to \$3.65] and now range from 13s. to 15s. [\$3.16 to \$3.65]. In a fourth, women's wages have increased all around; whereas they used to earn from 10s. to 15s. [\$2.43 to \$3.65] a week, they now earn from 13s. to 17s. [\$3.16 to \$4.14]. In a fifth the average wage for girls over 21 years was 11s. [\$2.68], no timeworkers getting more than 2½d. [5.1 cents] an hour; they now earn at the rate of 3d. or 3½d. [6.1 cents or 7.1 cents] an hour. In a firm in the northwest of England, out of 183 women and girls (including learners), 89 had to have their wages increased when the minimum rates were fixed, by amounts varying from 6d. to 5s. 5d. [12.2 cents to \$1.32] a week; the wage bill was increased by about 10 per cent. The weekly wage

bills of two other firms have been increased by 20 per cent and 30 per cent, respectively. In many cases employers have been obliged to refund arrears of wages to their workers. The arrears ordered to be repaid in the nine months from October 1, 1913, to June 30, 1914, amounted to £477 [\$2,321.32].

These details, suggests the report, seem to indicate that the trade board's determination has been of great benefit to the more poorly paid section of women workers. In 1906, for which year figures are available, it is pointed out that about 1,960 women, or approximately 66.8 per cent, were earning less than 13s. 4d. (\$3.24) a week, which is given as the weekly earnings for an average of 53.4 hours, under the minimum rate of 3d. (6.1 cents), thus indicating the probable proportion of workers directly affected by the new rate.

As to wages of female learners it is stated that the trade board's determination had led to a fairly general increase over the whole country. Of 67 firms from whom information was obtained, 40, or 59.7 per cent, had raised the wages of their learners, 21, or 31.3 per cent, had made no change, while in 6, or 9 per cent, the earnings had been reduced.

Owing to the comparatively small number of men and boys in this industry, and also to the fact that the minimum rates had been in effect but for a short period at the time of the inquiry, the data obtained as to increases in their wages is stated to be quite unsatisfactory. Of 68 firms reporting, 26 (38.2 per cent) raised wages, and from all the information collected, together with objections filed by employers when the minimum rate was established, the conclusion is reached that a marked advance in the wages of men, particularly unskilled workers, has resulted. Referring again to the statistics collected in 1906, the report shows that one Bristol firm had been paying far below 6d. (12.2 cents) an hour and that none of its workers therein had received more than 20s. to 25s. (\$4.87 to \$6.08) for a week of 50 hours. Instances are cited where the wages of unskilled male workers, before the minimum rates were fixed, were only 15s. or 16s. (\$3.65 or \$3.89). Based on an average of 53.4 hours a week, 339, or 47 per cent of the 726 men tabulated at that time, were earning less than 26s. 8½d. (\$6.50), which is the weekly earnings at the established minimum rate of 6d. (12.2 cents) an hour.

It appears from the report that minimum rates have not encouraged organization among workers. The indirect effect of these new rates upon wages is indicated by the action of one firm which posted a notice stating that any advance in such of the rates as were below the trade-board minimum would be followed by a reduction in the rates which were above it. As to the effect upon conditions of labor it is pointed out that in some cases the hours have been reduced, while a frequent result has been the readjustment of the work so as to avoid waste of time. Greater application and greater

punctuality seem to be insisted upon and methods of speeding up of workers instead of raising piece rates appear to have been resorted to in some instances.

One of the arguments advanced against the establishment of the minimum wage was that the increased cost of production consequent on a larger wage bill would naturally lead to a rise in prices, which would inevitably restrict the demand. It is explained that a general rise in the cost of boxes during the last few years has been due almost entirely to causes not connected with the trade board, that an increased wage bill does not necessarily mean an increase in the cost of production, that the necessity of paying higher wages has led employers to make closer scrutiny of their business in order to effect economies through training of workers, organization, and machinery, and that the falling off in the demand has come about more through foreign competition than because of a rise in the prices of boxes.

In discussing the effect of minimum rates on employment, the report notes a tendency to dispense with the services of learners, to dismiss some of the less efficient adults, and to reduce the number of home workers. Although the figures collected by the trade board in the spring of 1914, showing length of service of female learners who left the box-making industry, either by their own volition or because they were dismissed, between March, 1912, and May, 1914, indicate that 67 per cent had been in the trade for less than one year and 80 per cent for less than 18 months, the report suggests that the number of dismissals can not be large since the total number of learners in the trade increased during the period mentioned from 7,972 to 9,065, or 13.7 per cent. A reduction in the number of male learners aged 18 to 21 years is indicated. As to the dismissal of adults information was received from 96 firms employing 6,800 female workers. Of these firms only 32 reported that they had dismissed any of their women, the number affected being not more than 300, or about 4.4 per cent. Several instances are given of large proportions of workers being dismissed, but it is believed that the establishment of minimum rates has not led to any large displacement of female labor. Owing to the sudden rise in the rate to be paid boys at the age of 21, it appears that many upon attaining that age have been dismissed, although out of 88 firms employing about 900 men, only 5 stated that they had discharged any, and that the number affected was not more than 2 per cent. Admitting that a certain number of adult workers have been dismissed, the report asserts that unemployment on a serious scale, as a result of minimum rates, has not taken place and is not likely to take place in the future.

To a considerable extent box making is done by home workers, the number so engaged being approximately 2,000, confined mostly to London and Birmingham. Of 1,579 such employees in London on March 31, 1914, only 1 was a male. The minimum rate established by the trade board does not appear to have affected materially the fancy-box makers, but has meant a very considerable rise in the earnings of match-box makers. About 33 per cent of the 330 home workers interviewed in London were more than 45 years of age, and 78.2 per cent were married. Of 291, 29.9 per cent were entirely dependent on their own earnings, and approximately 35 per cent were partly dependent on their own work. The difficulty of finding out how many hours the home worker works and of deciding whether or not she may be classed as an "ordinary" worker is suggested as a factor which makes the enforcement of the payment of a minimum time rate extremely hard. It was found that as to 330 workers about whom information was obtained, all piece rates had been raised in 143 instances (43.3 per cent), while in 93 cases (28.2 per cent) no change is noted. Although this would indicate that a large proportion had benefited by the trade board's determination, it is pointed out that the benefit may be considered only apparent, since of 300 workers, 126, or 42 per cent, even though piece rates had been raised, were not able to earn the minimum time rate, while 39 others, or 13 per cent, were able to earn it only on some kinds of work. It is believed, however, that although the trade board's determination can not yet be said to be universally observed, there is no doubt that it has caused a very considerable increase in the earnings of home workers. In fact, it is stated that 50 per cent of those who gave information had had their piece rates raised on all kinds of boxes, and another 16 per cent had experienced a rise in rates on some kinds of work; the match-box makers had all had their rates raised. Against this must be set a slight contraction of employment more especially in the case of match-box makers, but this is due, it is believed, only in a small measure to the fixing of a minimum wage. A table is presented showing that the number of home workers employed by firms in London and Birmingham making complete returns, on March 31, 1914, was 28.4 per cent less than the number so employed on March 31, 1912, while the number of indoor female workers increased 5.9 per cent in the 2-year period, indicating a tendency to require more work to be done in the factory.

The report suggests the difficulty of administering the minimum rate provision of the trade boards act owing to the fact that the industry is so widely scattered and includes many types of organizations, from large factories to small workshops. It is stated that 90 per cent of the home workers interviewed had never been visited by

an inspector and some had never heard of the trade board. The main difficulty of administration is the absence of minimum piece lists, thus making it hard for an inspector with only a minimum time rate fixed to determine whether the piece rates paid by an employer are such as to yield the minimum time rate to the "ordinary worker." A certain amount of evasion of the board's determinations is suggested, more particularly among smaller employers and employers of home workers. Of 336 visited it was found that irregularities existed to a greater or less degree in 205 places (61 per cent). Only two prosecutions have been undertaken in this industry since the minimum rates were fixed. To render the enforcement of minimum rates more effective it is suggested that the staff of inspectors be greatly increased, that the work be decentralized and district offices established, and that the term "ordinary workers" should be defined with greater precision.

The final chapter is a summary and conclusions and briefly sets forth the findings as to minimum rates, as follows:

1. **Women's wages.**—According to the report of the board of trade on earnings and hours of labor in 1906, some 67 per cent of the women employed in making boxes of cardboard, etc., were earning less than 3d. [6.1 cents] an hour. Probably there was little, if any, increase in wages between this date and the fixing of the minimum rates. As the trade board has laid down that at least 85 per cent of the workers in any factory ought now to earn not less than this amount, it would appear that some 52 per cent of the workers must have experienced an increase of wages, provided that the trade board's determination is being observed. The increase has not taken place equally all over the country. * * * In a few cases where piece rates have been readjusted some rates have been cut down and occasionally timework has been substituted for piecework; but there is no general tendency for the minimum to become the maximum. On the contrary, the more highly paid workers have often demanded an increase to correspond with the rise granted to the worse paid, and when piece rates are raised the quicker workers naturally gain as well as the slower.

2. **Men's wages.**—It would seem that the trade board's determination has made little difference to the skilled men. But a large proportion of the men employed in box making are engaged on unskilled work, and these were, before the fixing of the minimum rate, in many instances being paid at rates far below 6d. [12.2 cents] an hour.

3. **Learner's wages.**—The minimum rates fixed for learners have led to a fairly general increase over the whole country in the wages paid to girls. Young boys under 18 have been little affected, but the wages of youths of from 18 to 20 have often had to be raised.

4. **Trade-unionism.**—The establishment of the trade board gave at first a great impetus to the voluntary organization of the workers, and numbers of women joined a trade-union. This increased membership, however, has not been maintained.

5. **Conditions of employment.**—The trade board has led employers to organize their work more carefully, so that there is less waste of time. The workers are now less often kept waiting for work. In a few cases hours have been reduced. On the other hand, supervision is stricter and greater punctuality is insisted on. In some cases employers have driven their workers to earn the minimum on inadequate piece rates by excessive speeding up.

6. **Prices.**—There has in the last two or three years been a rise in the price of boxes. But it has been due principally to the cost of raw materials and can be attributed to only a very small extent to the trade board.

7. **Effect of the minimum rates on the industry.**—Certain branches of the trade, particularly the manufacture of some kinds of match boxes, appear to have suffered from increased foreign competition. On the other hand, the advance in wages has led in many cases to an increased output on the part of the workers and to closer attention on the part of the employers to questions of training, organization, and machinery. These changes together have tended to keep down the cost of production.

8. **Employment.**—There has been a tendency to dispense with the services of learners, and to dismiss some of the less efficient adult workers, as a result of the minimum rates. There is no sign, however, of unemployment on a serious scale having taken place or being likely to take place. Many of the women who lost their work when the minimum rates were fixed were later taken on by other firms.

9. **Home work.**—Of 287 home workers who gave information, 50 per cent had had their piece rates raised on all kinds of boxes that they made, and another 16 per cent had experienced a rise in the rates on some kinds of work. A considerable number appear still to be unable to earn the minimum. Of those questioned on this point, 42 per cent stated that they could not earn 3d. [6.1 cents] an hour, while another 13 per cent could only earn it on some kinds of work. There has been a slight decrease in the number of home workers employed, owing partly to the trade board, but partly also, and probably to a greater extent, to the insurance act and to the increasing use of machinery which has been taking place for some years, irrespective of the establishment of a minimum wage. This decline of home work is seen especially in the case of the common match-box makers; with regard to other box makers the change has been more gradual.

10. **Administration.**—There is a certain amount of evasion of the trade board's determinations, more particularly among the smaller employers and those who employ home workers. This is mainly due to the inadequacy of the staff of investigating officers.

EMPLOYMENT OF WOMEN IN MUNITIONS MAKING IN FRANCE.¹

This report, issued under the direction of the ministry of munitions, Great Britain, covers the findings of the mission appointed to visit the industrial district in France to ascertain "the causes which have contributed to the enormous increase which has taken place in the production of munitions in that country, notwithstanding that one-eighth of the country and five-eighths of the former metallurgical productivity are in the hands of the enemy." In December, 1915, the mission visited 23 establishments engaged in the production of munitions and found three factors contributing to the increased output: (1) Increasing intensity of production; (2) erection and equipment of new factories and extension of existing munition factories; and (3) adaptation of existing factories to the manufacture of munitions.

As to increasing intensity of production it was found that women as well as men are working "with a good will which is most impressive"; that "the men have apparently welcomed the introduction of women into the factories and are doing everything they can to instruct

¹ Great Britain. Ministry of Munitions. Report by mission appointed by the director general of recruiting for munitions work on the output of munitions in France. London, 1916. 8 pp.

and cooperate with them in increasing the output of munitions," and that "this feature is important and is worthy of careful notice in view of the fact that not only have the women been introduced for the purpose of increasing the supply of labor but also of freeing the men for service in the army." The erection and equipment of new factories entirely by private enterprise and not subsidized by the Government is noted, and the mission comments upon the success which has apparently attended the efforts of a number of employers who have abandoned their normal manufacture and adapted their machinery for the output of munitions. One feature of the French system noted by the mission is the fostering of the small producer—of whom there are about 1,800 in the Paris district—for machine operations, these subcontractors receiving the same price for their output as the main contractor receives from the Government. Practically all the factories run night and day shifts; in some cases three shifts are operated. In most cases the shifts change over every fortnight, and on the change the workpeople get 24 hours off. The hours of work on Saturdays are the same as on other days, and on Sunday no work is done in the afternoon in some cases.

As a rule the women work the same hours as the men, but up to the time of the investigation very few had been employed on night shifts. The only processes confined to men were found to be setting up and tool making, although a few instances were noted where women were actually grinding the edges of cutting tools for machines. The production on the night shift appears to be equal to that on the day shift. In some cases it is better, owing, it is suggested, to there being less interruptions at night.

Specialization of output, or at least a small range of products, in most factories is given as a consideration which has made the employment of unskilled male and female labor satisfactory, because the repetitive nature of the work is increased and the tool room and inspection work is proportionately decreased. The opinion in the French factories seems to be that the output of females on small work equals and in some cases excels that of men, and that in the case of heavier work, within certain limitations, women are of practically the same value as men. Nearly all the work, except tool-room work, setting up and floor laboring, is done on piece, and it is stated that the premium bonus system is not known. In the case of women there does not appear to be any recognized time rate other than that paid during the period of training; these rates are usually recognized as guaranteed minimum rates. The same piece rates are paid to women as to men. Apparently no arrangements are made by the Government for technical instruction of unskilled men or of women, this work being done in each factory. It was found that the introduction of unskilled male and female labor has not presented the difficulties

experienced in England, and it was ascertained from representatives of the trade-union movement in France that trade-union conditions as regards wages and labor have been practically suspended. No recognized system of apprenticeship seems to exist in France, except in the higher branches of the engineering trade. Labor seems to be specialized and workpeople are permitted to specialize in more skilled operations as they show ability.

The committee suggests that a remarkable feature in the French factories is the almost entire absence of lost time, not exceeding on the average 1 per cent of the total time. The usual penalty for lost time in the case of civilians is a reprimand for the first offense; in some cases a fine for the second offense, but generally the workman is dismissed. Military workers, of whom there are a large number, are dealt with under military law.

No applications for general advance in wages have been made by the workpeople since the commencement of the war, and no strikes have occurred.

The mission found no evidence of industrial fatigue due to long hours either on day or night shifts. The extent to which owners of factories have been able to import machinery available for munitions work from the United States, Great Britain, and Switzerland, much impressed the mission. The general conclusions at which the mission arrived are:

1. The people of France realize that they are at war.
2. The one idea in the mind of all is to bring the war to a successful issue.
3. The spirit which dominates the nation has prevented difficulties arising in the manufacture of war material.
4. Loss of time is practically negligible.
5. No trade-union restrictions exist at the moment.
6. Everything is done to increase production.
7. No limitation of profits exists and no question in this respect has been raised by the workpeople.
8. The manner in which the employers in France have been able to acquire machinery and the initiative and energy displayed by them are beyond all praise.
9. In conclusion, it appears to the mission that the increase of production in France is due to one cause and one only, and that is the patriotic enthusiasm which exists there.

Appendixes to the pamphlet contain a representative list of operations undertaken by female labor in munition factories and a statement showing the present and former occupations of women employed in one munition factory. These appendixes are as follows:

Representative list of operations undertaken by female labor in munition factories in France.

- (a) Hand operations.
- Assembling.
 - Bogey running.
 - Brazing water jackets of motors.
 - Cartridge (rifle), complete.

(a) Hand operations—Concluded.

Checking.

Compressing powder in rings on time fuses.

Core making.

Filing.

Filling shrapnel with resin and bullets.

General survey, for information of management, of quality of articles made.

Gauging shell, cartridge cases, fuses, rifle cartridges, etc.

Loading rifle cartridges.

Making up powder charges in bags.

Molding (sand).

Oxyacetylene welding.

Screwing on shrapnel caps.

Setting up.

Sights:

Filing and finishing.

Finishing and assembling optical work.

Soldering (electric iron).

Sound testing of shell.

Testing fuse taps.

Water-pressure testing of shell.

(b) Machine operations.

Boring, including finish boring of shell.

Centering.

Chamfering.

Cleveland machines—four bars (one woman working two machines).

Drilling.

Grinding:

General.

Turning tools (jigs supplied).

Lathes:

Center—power and hand.

Shell—four tools on one rest and base faced by tool on back rest, all on one operation.

Shell—two tools on one rest.

Rifle barrels—two tools on two rests.

Turning copper bands.

Finishing shell—back and front rest and former—hand filing for finishing to gauge (one operation).

Shell—combination boring.

Fuse bodies filed on lathes to make them concentric with thread.

Machines—two and three worked by a woman according to length of operation.

Milling—hand fed—in some cases not straight work.

Thread-milling machine for case and shell.

Narling recess for copper bands.

Painting shell.

Recessing for copper bands.

Rectification of shell (machine).

Rifle barrels:

Boring—one woman working two boring machines, two barrels to each machine.

Turning, two tools—two rests.

Milling, except milling for foresight.

Stamping studs—hot metal.

(c) Special instances of complete manufacture.

75 mm. shell, complete.

120 mm. shell, complete.

Fuses, complete.

Rifle cartridges, complete, including loading, but not loading of caps.

STATEMENT SHOWING PRESENT AND FORMER OCCUPATIONS OF WOMEN EMPLOYED IN ONE OF THE MUNITION FACTORIES IN FRANCE.

Department.	Number of work-women.	Occupation in factory.	Former occupation.
Boring.....	41	Vertical boring.....	15 housewives; 1 corsetière; 20 factory girls; 4 mechanics; 1 florist.
Hardening.....	39	30 inspectors; 9 laborers.....	29 housewives; 1 shirt maker; 1 cutter out; 1 domestic; 1 clerk; 6 factory girls.
Finishing.....	337	337 turners.....	30 dressmakers; 30 children's nurses; 1 hospital nurse; 36 domestics; 6 lace-makers; 68 housewives; 46 clerks; 120 factory girls.
Inspection room....	255	255 inspectors.....	56 housewives; 60 dressmakers; 4 shorthand writers; 40 clerks; 14 embroiderers; 30 breeches makers; 4 florists; 27 no occupation; 20 factory girls.
General inspection..	209	209 inspectors.....	67 housewives; 4 domestics; 3 artists; 2 hair-dressers; 2 cashiers; 4 florists; 4 embroiderers; 18 dressmakers; 8 typists; 2 school-mistresses; 15 children's nurses; 20 clerks; 60 factory girls.
Fuses.....	848	110 drillers; 70 turners; 55 correctors; 45 dressers; 45 setters up; 40 greasers; 35 markers; 30 screw t a p makers; 30 inspectors; 363 gaugers; 25 various.	470 breeches makers, seamstresses, and milliners; 125 clerks; 125 housewives; 58 no profession; 75 factory girls.
Gaines.....	158	62 inspectors; 40 turners; 56 laborers.	30 dressmakers; 6 furniture polishers; 10 florists; 4 bread carriers; 16 children's nurses; 10 weavers; 40 housewives; 16 tulle makers; 16 cardboard-box makers; 10 factory girls.

The average earnings of the workers in munition factories, based upon the mean of the earnings in each factory without regard to the proportion of the workpeople employed at the various rates in each shop, are as follows:

The average earnings per day of male workers in the munition factories in France were found to be as follows: Laborers, \$1.16; machine men, \$2.01; skilled, \$2.36.

The minimum daily wage for female workers was 68 cents; their average daily wage was \$1.15.

LABOR CONDITIONS IN MUNITIONS MAKING IN GREAT BRITAIN.¹

Two features of the reports recently issued by the British health of munition workers committee are of more than ordinary interest to labor. These are the extensive employment of women, many of

¹ Great Britain. Ministry of Munitions. Health of munition workers committee. Memorandum No. 4, Employment of women; Memorandum No. 5, Hours of work; Memorandum No. 6, Canteen construction and equipment; Memorandum No. 7, Industrial fatigue and its causes; Memorandum No. 8, Special industrial diseases; Memorandum No. 9, Ventilation and lighting of munition factories and workshops; Memorandum No. 10, Sickness and injury. London, 1916. 7 pamphlets. 49 pp.

them new to wage-earning employments, in occupations in which women have never before been employed, and the emphatic conclusion of the committee that overtime work, when measured in terms of output, does not pay and can not be made to pay for any considerable period even with the best cooperation on the part of the employees. The committee's conclusions are worthy of greater consideration because of the high qualifications of the members for the task to which they were assigned. The committee consists of Sir George Newman, M. D., chairman; Sir Thomas Barlow, Bart., K. C. V. O., F. R. S., M. D.; G. Bellhouse, factory department, Home Office; Prof. A. E. Boycott, M. D., F. R. S.; J. R. Clynes, M. P.; E. L. Collis, M. B., factory department, Home Office; W. M. Fletcher, M. D., F. R. S., secretary of medical research committee; Leonard E. Hill, M. B., F. R. S.; Samuel Osborn, J. P., Sheffield; Miss R. E. Squire, factory department, Home Office; Mrs. H. J. Tennant; E. H. Pelham, secretary.

The committee was appointed by the British ministry of munitions to make a careful study of hours of labor and working conditions in munition factories in order, if possible, to consider and adopt measures for developing physical efficiency to a point productive of the best possible output.

In the May number of the REVIEW three memoranda prepared by the committee were summarized—Sunday labor, welfare supervision, and industrial canteens.¹ Attention is here directed to further reports issued by this committee in January and February, 1916, including employment of women, hours of labor, industrial fatigue and its causes, ventilation and lighting of munition factories and workshops, special industrial diseases, sickness and injury, and canteen construction and equipment.

EMPLOYMENT OF WOMEN.

In its study of employment of women in munition factories the committee considered five matters which, apart from questions of wages, concern the health and industrial output of the workers: (1) the period of employment (including nightwork, length of hours, overtime, etc.); (2) rest pauses and provisions of meals; (3) sanitary conditions of the factory; (4) physical condition of women workers; and (5) questions of management and supervision. Recognizing that the night employment of women in factories, after almost a century of disuse, has of necessity been revived by the war, the committee directed its efforts to the consideration of those safeguards which would reduce its risks to the minimum. Evidence of the merits of continuous work as against weekly, fortnightly, or monthly change

¹ Monthly Review of the United States Bureau of Labor Statistics for May, pp. 66-70.

of shifts being somewhat conflicting, the committee concluded that the matter is one which must be largely dealt with locally on social considerations. It was stated by some managers and foremen that the last few hours of a 12-hour night shift yield little output, and inspection by the committee indicated the relative failure of these hours. It would seem that the employment of women at night calls for particular care and supervision and that adequate pauses for rest and meals are indispensable. Conditions of housing and of transit to and from work are mentioned as contributing to the fatigue of the workers, for "where home conditions are bad, as they frequently are, where a long working day is aggravated by long hours of traveling, and where, in addition, housing accommodation is inadequate, family life is defaced beyond recognition." In the opinion of the committee there should be in the matter of hours of labor for women little conflict between the interests of the home and the interests of munitions, for the hours which conduce most to a satisfactory home life and to health conduce most to output. Long hours, particularly when they are worked during the night, are perhaps the chief factors in fatigue, and the committee thinks that in the interest of output and health alike they should be restricted within proper limits, that there should be suitable pauses for rest during the working period, and that there should be adequate cessation from work at each week end in addition to periodic holidays.

The three systems of employment most commonly adopted for women in munition factories were found to be (1) one shift of 13-14 hours (the overtime system), (2) two shifts of 12 hours, and (3) three shifts of 8 hours. The last system appears to yield the best results in the long run, for "the strain of nightwork, indeed strain generally, is sensibly diminished, greater vigor and work is maintained throughout the shift, less time is lost by unpunctuality or illness, and there is less liability to accident." The flagging output which appears to characterize the last hours of a 12-hour night shift seems similarly characteristic of the last hours of overtime during the day, and it is stated that the disadvantages of the overtime system are being increasingly recognized by employers. This seems to have been forced upon some by the resultant fatigue, illness, and bad time-keeping (failure to work full time) of the workers, and upon others by some accidental shortening of the day which has shown that the loss of hours has carried with it no diminution in output. The committee recommends the adoption of the three-shift system, without overtime, wherever a sufficient supply of labor is available.

Declaring that pauses, well distributed and adapted in length to the needs of women workers, are of the highest value in averting breakdown and in giving an impetus to output, the committee is of

the opinion that a portion of Saturday and the whole of Sunday should be available for rest, and that the periodic factory holiday should not, on any account, be omitted. The advantages of well-managed industrial canteens in convenient proximity to workshops are emphasized, and facilities, especially during the night, for rest in cases of fainting and other temporary illness are urged. Considerable importance is attached to the necessity of maintaining the sanitary condition of the factory, including adequate wash rooms and toilet facilities, for "the effect upon the health and energy of women and girls which results from clean, bright, and airy work-rooms, well warmed in winter, can hardly be exaggerated. Cleanliness and good order contribute to increased output as well as to the discipline and morale of the factory." The committee believes that the nature of a woman's work should be determined with due regard to its effect on her immediate and future health, and suggests that inattention in this regard may cause, or at least accentuate, certain ailments and forms of physical disability to which women are liable, among which are noted (1) disturbances of digestion, (2) anemia, (3) headaches, (4) nervous exhaustion, (5) muscular pain and weakness, flat-foot, etc., (6) derangement of special physiological functions. With a view to the detection of minor ailments and incipient or actual disease, provision for the examination by a medical woman of all applicants for employment is recommended.

The committee received abundant evidence of the necessity of wise and suitable arrangements for the management and supervision of women's labor, leading it to conclude that there is hardly a condition of greater importance than this in respect both of smooth working and of maximum output. It is therefore recommended that in all cases where women are employed consideration be given by the management to the appointment of forewomen, nurses, and welfare supervisors whose position and status should be properly assured and whose duties should be prescribed. In conclusion the committee suggests that—

If the present long hours, the lack of helpful and sympathetic oversight, the inability to obtain good, wholesome food, and the great difficulties of traveling are allowed to continue, it will be impracticable to secure or maintain for an extended period the high maximum output of which women are undoubtedly capable. The committee recognize that emergency conditions must obtain in many cases, but they are satisfied that every effort should be made to organize women's labor effectively and promptly. It may be that in the entanglement of problems new and old the coming of the new and their imperative claim for solution will help the solving of the old. * * * There is need for the work of women in industry; there is need also for safeguarding that service. Happily there is manifest a public spirit and a devotion able to overcome difficulties and solve problems. There is also a fuller recognition of the claims of women and of their children and of their vital importance to the State, which is reward for the sacrifice and courage of those women now working steadfastly in the ranks of labor.

HOURS OF WORK.

In the preparation of the memorandum on hours of work in munition factories, the committee seemed to be influenced by consideration of what is immediately practicable regarding the health of the worker in relation to a maximum output, in view of exceptional conditions entailed by the war. It is suggested that an increased number of hours may be obtained by overtime or by a system of shifts and that the committee greatly prefers the latter, although recognizing that it is impracticable to establish shifts universally. It is noted that as the most highly skilled workers (tool and gauge makers, tool setters, etc.) are the most difficult to obtain, they have been most generally employed on overtime, and it is believed that the shift system should be extended to this branch of industry as rapidly as possible. Briefly stated, the objections presented to overtime are: (1) It is liable to impose too severe a strain upon the workers, which adversely affects the rate of production and quality of output during the whole period of work as well as during the hours of overtime; (2) it frequently results in a large amount of lost time, which is attributed to workers becoming exhausted and taking a rest, and also to sickness; (3) it imposes a very serious strain upon the management, the executive staff, and foremen, since they can not take days off, like the ordinary worker; (4) it is liable to curtail unduly the period of rest and sleep available for those who have to travel long distances to and from their work, a matter of special importance in the case of young persons; (5) the fatigue entailed increases the temptation to men to indulge in the consumption of alcohol. Although the committee found no evidence of any serious breakdown among workers as a result of the strain of long hours, it is satisfied "that if men are asked to work for 15 hours a day for weeks and months on end (as is the case now in certain areas) one of two results must follow; either the health of the workers will break down or they will not work at full pressure. In either case output must suffer."

Admitting that overtime must continue, definite restrictions to govern it are suggested. For adult male workers the committee recommends:

1. The average weekly hours (exclusive of meals) should not exceed 65 to 67, including overtime. Hours in excess of 65 should only be worked for short periods and to meet sudden and unexpected circumstances. It may be desirable to differentiate to some extent between different kinds of work, and to fix a rather lower limit of hours for work requiring close individual attention.

2. Where practicable, the overtime should be concentrated within three or four days in the week, which should preferably not be consecutive.

3. Where overtime is worked, it is specially important that there should be no Sunday work.

4. The practice prevailing in certain districts of working from Friday morning, all through Friday night, and until noon on Saturday should be discontinued. Such hours may be permissible for short spells, but can not be satisfactory from the point of view either of health or output if continued for indefinite periods.

As respects women, the committee expresses the belief that the strain of long hours is serious and that conditions of work in excess of the normal legal limit of 60 hours a week ought to be discontinued as soon as practicable, although little objection is seen to such moderate overtime during the week as can be compensated for by an earlier stop on Saturdays. The committee feels that the need for overtime among women and girls is much less pressing than it is for men, and that wherever practicable the system should be abandoned in favor of shifts. Although it is recommended that boys should be allowed to be employed on overtime up to the maximum suggested for men, it is thought that every effort should be made not to work boys under 16 more than 60 hours a week.

The reasons which actuated the committee in announcing a preference for shifts are that they involve less strain on foremen and workers, enable the machinery to be used the whole 24 hours, and produce a better and more uniform rate of output. Under the 8-hour shifts system these benefits seem to be emphasized, and it is therefore preferred to the double-shift system. However, it is admitted that a shortage of workmen and the difficulty of supervision, as well as the problems of housing and transit, to a large extent exclude the 8-hour shifts from practical consideration so far as male workers are concerned. Most of these workers are employed on double shifts and the committee sees no reason to suggest a change. The employment of women on 8-hour shifts was found to be increasingly common; the 12-hour shift for women is deplored. No change is suggested for the boys who are, like the men, employed generally on 12-hour shifts. Although work on shifts involves nightwork, the committee makes it clear that nightwork is not to be regarded as a good thing in itself, and offers the following objections to the system:

1. It is uneconomical. Though wages are paid at a higher rate, the rate of output, more particularly during the last two or three hours of the 12-hour shift, is generally lower.
2. Supervision is frequently unsatisfactory.
3. Conditions of lighting are seldom so good as in daytime, and make fine work more difficult.
4. Workers experience great difficulty in sleeping by day.
5. The unfamiliar meal hour makes it difficult for the workers to consume substantial food, and their digestion is liable to become deranged.

The committee was unable to arrive at any definite conclusion as to how long the workers should remain on the night shift at any one time, the evidence indicating reasons for fortnightly and monthly

changes as well as continuous service. As suggested in the discussion on employment of women, it is believed that much is to be said for infrequent changes, but that the matter must be settled locally, largely on social considerations, and should be left to individual employers to determine in consultation with their workpeople. Existing arrangements for spells and breaks in the work were found to be generally satisfactory, but the committee considers it most important that the ordinary factory holidays should not be interfered with.

INDUSTRIAL FATIGUE AND ITS CAUSES.

In the pamphlet on industrial fatigue and its causes, fatigue is defined as the sum of the results of activity which show themselves in diminished capacity for doing work. The performance of work, it is pointed out, depends upon the activities of the complex nervous mechanisms of the brain and spinal cord which are concerned in the initiation and distribution of impulses to action; second, the nerves which conduct the impulses to the muscles; and third, the muscles themselves, which by contracting finally perform external work. The problems of industrial fatigue, it is stated, are primarily and almost wholly problems of fatigue in the nervous system and of its direct and indirect effects. The committee discusses the necessary time relation between an action and the rest needed for complete repair. "For every acting element a given rhythm of activity will allow exact recovery after each act, and will maintain the balance between action and repair throughout a long series." Thus, after explaining that bodily fatigue is primarily nervous fatigue, the committee asserts that "for work in which severe muscular effort is required it seems probable that the maximum output over the day's work and the best conditions for the workers' comfort and maintained health will be secured by giving short spells of strenuous activity broken by longer spells of rest, the time ratio of rest to action being here, for maximal efficiency, greater than that for the employments in which nervous activity is more prominent or more complicated than in the processes involved during familiar muscular work." As an illustration of this it is stated that two officers at the front recently, for a friendly wager, competed in making equal lengths of a certain trench, each with an equal squad of men. One let his men work as they pleased, but as hard as possible. The other divided his men into three sets, to work in rotation, each set digging their hardest for 5 minutes and then resting for 10, till their spell of labor came again. The latter team won easily.

For practical purposes in industrial management two chief characters of nervous fatigue must be observed. First, during the continued performance of work the objective results of nervous fatigue precede in their onset the subjective symptoms of fatigue. Without obvious sign and without his knowing it himself a man's capacity

for work may diminish owing to his unrecognized fatigue. His time beyond a certain point then begins to be uneconomically spent, and it is for scientific management to determine this point and to determine further the arrangement of periods of rest in relation to spells of work that will give the best development over the day and the year of the worker's capacity. Second, the results of fatigue which advances beyond physiological limits ("overstrain") not only reduce capacity at the moment, but do damage of a more permanent kind which will affect capacity for periods far beyond the next normal period of rest. It will plainly be uneconomical to allow this damage to be done.

For these reasons, chief among others, it will be important to detect latent fatigue, and since sensations of fatigue are unpunctual and untrustworthy, means must be sought of observing the onset of fatigue objectively.

The committee declares that the true sign of fatigue is diminished capacity and that measurement of output in work will give the most direct test of fatigue. The direct and injurious effect of fatigue upon output is suggested. In indicating the methods for measuring output, the committee emphasizes the importance of carrying on experiments under the ordinary conditions of the work, unknown to the workers, and with proper allowance for variable factors. They should be extended over successive short periods and over long periods to show the onset of fatigue over the whole day or the whole week and under particular seasonal or other conditions in order to detect and measure the results of accumulating fatigue. Measurements of output must also be recorded at so much for each individual or each unit group.

In addition to this direct measurement certain secondary symptoms are indicated. Thus, one important sign of fatigue in the nervous centers appears to be a want of coordination and failure in the power of concentration, finding expression in an increased frequency of trifling accidents and spoiled work. The sickness returns and the returns of lost time are other indications of the effects of fatigue in munition factories. Many workers were found to complain of feeling "done up," and the evidence seems to show that this state of "staleness" is becoming increasingly common and obvious. This is attributed almost wholly to persistent long hours and the deprivation of weekly rest.

Proper attention earlier in the war to the need for weekly rest would have prevented a large part of the diminished capacity of this kind that has been allowed to appear, and would have averted much costly and wasteful expenditure upon imperfect work. But stress must be laid here on a further point. For the avoidance of staleness in conditions of strenuous labor it is not enough to treat workmen in the bulk and to regulate daily and weekly rests upon a physiological basis devised for the average. If that be done, widespread evils like those too commonly present now may be avoided, but good management will consider always the individual workman as well. The committee have no doubt that in very many cases, perhaps in almost all, in which staleness is well marked or has even advanced to definite sickness, a single "day off," given occasionally at the right time, would have avoided much wasteful reduction of capacity and in the worst cases the total loss of many days of work.

One of several examples cited in the report, showing intelligent management and emphasizing the importance of regular rest periods, may be given:

At another large munitions factory men engaged in the heavy work of molding are required by the management to rest 15 minutes in every hour of work. The manager was satisfied that this was an arrangement good for the men and for the output. But the men objected to this long spell of rest in each hour because the work was piece-work and they thought the production would be lessened by it. The manager accordingly found it necessary to set a foreman to watch and to make the hourly rest compulsory. When this was done the output per hour was found to be actually increased.

Taking the country as a whole, the committee feels that the munition workers in general have been allowed to reach a state of reduced efficiency and lowered health which might have been avoided without reduction in output by attention to the details of daily and weekly rests.

VENTILATION AND LIGHTING OF MUNITION FACTORIES AND WORKSHOPS.

The inquiries of the committee led it to believe that the attention paid to ventilation and heating in the majority of workshops is insufficient, and that the means of securing them are in consequence ill-directed or altogether neglected. At the present time the importance of proper and effective methods of ventilation would seem to be intensified not only by the increase in number of workers but by the continuous occupation of shops by day and night, thus allowing no interval in which natural ventilation can restore a vitiated atmosphere, so that each shift must succeed to the bad conditions left by its predecessor. It is declared that the object which ventilation seeks to secure is two-fold: (1) The removal of foul, exhausted, or polluted air, and (2) the supplying of air which is pure and clean. The impurities which are liable to be added to the air inside the workshop are: (1) Carbonic-acid gas given off in the breath of human beings and by fires, gas lights, or any other form of open combustion; (2) various ill-defined volatile substances arising from human beings, from the skin and alimentary canal, especially when personal cleanliness is absent and sweating profuse; (3) bacteria coming from human beings, forming a more definite and more directly harmful sort of impurity; and (4) industrial processes giving rise to dust, fumes, etc. Although small crowded shops require more flushing of outside air than large sheds with few persons in them, it is asserted that the conclusion that a workshop with a large cubic capacity in relation to the number of workpeople does not require any definite ventilation is wholly false. Laboratory experiments have indicated that the desirable atmosphere is characterized by being cool rather than hot, dry rather than damp, diverse in its temperature in different parts and at different times

rather than uniform and monotonous, and (which is intimately connected with this diversity) moving rather than still. Because of the close connection between temperature and the stimulating factors of an atmosphere, the committee believes that the question of warmth and cold in workshops must receive attention. "For a shop to be too hot is a disadvantage from every point of view, but the stimulation of too cold an air may be more than counterbalanced by the physical depression which results, and it is not difficult in cold weather for efficiency to deteriorate because the worker becomes uncomfortably chilled." To indicate what temperature should be maintained in a factory is thought to be undesirable, since it depends largely upon variations in the character of the work and the habits of the workers. It is, however, suggested that where the air is stagnant the temperature should not exceed 60° F., although it may be somewhat higher where the air is kept in motion.

The committee suggests that it is of the utmost importance that those responsible for planning the means of ventilation of any building should realize that each workshop provides separate problems and that there is no uniform and stereotyped method which will give satisfactory results everywhere. Three means by which satisfactory natural ventilation is to be obtained are indicated in the report:

1. Local sources of impurity and heat production should be dealt with by the provision of hoods, exhausts, flues, etc.; smoke and fumes from neighboring workshops and chimneys may require attention. Workers should be so arranged in relation to each other that they do not cough and sneeze in one another's faces.

2. Definite openings communicating with the outside air should be provided in every workshop, and the committee would again emphasize the fact that the largest shop requires some system of ventilation. The form and nature of such openings can not be defined in a general way, but it appears to the committee that the average machine shop and all similar one-story shops should be provided with louvers along the roof ridges and in many cases also with narrow openings where the roof meets the walls. Such louvers should be permanently open, and will generally insure that the atmosphere will at least not be grossly bad.

3. Such fixed openings do not, however, allow of the flexibility required to meet varying internal and external conditions, and should be supplemented by the use of doors, windows (which will open), and fans. Fans are especially valuable to meet emergencies and abnormal conditions, and provide for a thorough cleaning of the air during meal times.

As to the means of heating shops, the committee found that the ideal form is by radiant heat, but suggests that the most complete installation for ventilation and heat may be rendered ineffective by injudicious management or failure in proper and continuous maintenance. Rapid changes of climate, different times of day, varying circumstances of use and occupation, all require appropriate treatment.

The essentials of good lighting¹ are stated to be—

1. Adequacy.
2. A reasonable degree of constancy and uniformity of illumination over the necessary area of work.
3. The placing or shading of lamps so that light from them does not fall directly on the eyes of an operator when engaged on his work or when looking horizontally across the workroom.
4. The placing of lights so as to avoid the casting of extraneous shadows on the work.

The committee is of the opinion that natural lighting is to be preferred to artificial lighting on the ground of health as well as economy, and that roof lighting is better than lateral lighting. The importance of the question of artificial lighting, in view of the general adoption of nightwork and the fact that women and boys are employed in large numbers, is recognized, for "bad lighting affects output unfavorably, not only by making good and rapid work more difficult, but by causing headaches and other effects of eyestrain; the difficulties of supervision, which are always considerable, are further increased if the general lighting of the workshops is insufficient." The pamphlet contains an appendix giving the essentials of localized exhaust ventilation and the principles underlying effective action in each case.

SPECIAL INDUSTRIAL DISEASES.

The necessity of adopting measures to protect munition workers against exposure to lead, tetrachloride of ethane, and nitrous fumes, each of which may cause serious and possible fatal illness, and against contact with trinitrotoluol, tetryl, fulminate of mercury, and certain lubricating and cooling fluids used in metal turning, which may result in the occurrence of troublesome skin affections (dermatitis), prompted the committee to make a study of these special industrial diseases and indicate means of preventing the dangerous effects arising therefrom.

Under industrial conditions lead gains access to the body principally by the inhalation of lead fumes or dust, and careful investigations have established that a daily dose of as little as 2 milligrams must be regarded as capable, when inhaled as fumes or dust, of setting up chronic poisoning. Lead may also enter the system through the digestive tract, by eating with unclean hands, or by putting pipes or other articles into the mouth while the hands are soiled with lead. It is stated that inhalation of lead in the form of fumes or dust can be avoided with certainty only by preventing the production of dust and by insuring that lead fumes do not escape into any place in which work is carried on, but it is recognized that the nature of certain processes may render this impossible. Under such conditions

¹ This question has been treated in the report of the departmental committee on lighting in factories and workshops, a brief digest of which appeared in the December, 1915, issue of the REVIEW, p. 88.

localized exhaust ventilation is recommended. It is believed that few of the respirators obtainable are effective. The existence of a blue line at the edge of the gums is an indication of lead absorption, and headache, colic, constipation, and marked paleness are early manifestations of poisoning. To prevent lead entering the system through the digestive tract the following special steps are recommended:

1. Smoking should be prohibited in all places where lead is manipulated.
2. No person should be allowed to take a meal or to remain during the times allowed for meals in any room where lead is used.
3. Special provision should be made to enable the workers to take their meals elsewhere.
4. Special washing facilities should be provided. These will only be effective if a sufficient supply of clean towels, soap, and nailbrushes is always available.

The Home Office regulations require employers to have persons engaged in various lead industries examined periodically by a surgeon who is intrusted with powers of suspension from work, and this form of medical supervision has been found to be of such value, it is stated, that the committee urges its adoption in all factories where the use of lead oxide or other of its many compounds may have recently been introduced in the manufacture of munitions.

Trinitrotoluol is a substance used extensively in the manufacture of high explosive munitions, which fact brought its poisonous properties into prominence. It may be absorbed by inhalation of vapor or dust through the skin, and through the digestive tract. Operatives employed in its manufacture and in loading it, either pure or mixed with other substances, into munitions have been found affected with unusual drowsiness, frontal headache, eczema, and loss of appetite. Exceptional cases may occur with sudden collapse after a few hours' work on a hot day, but generally the symptoms are at first slight, and if exposure ceases quickly disappear. If, however, the exposure be continued, the symptoms tend to become more severe and may be associated with cyanosis (ashen gray and livid color of the lips), shortness of breath, vomiting, anemia, palpitation, bile-strained urine, constipation, rapid weak pulse, pains in the limbs, and jaundice; while in a few cases profound jaundice, with danger to life, has supervened, and even death has resulted. The committee recommends that the following preventive measures be taken:

1. Every possible step should be taken to prevent the production of dust and the escape of fumes into the air of work places. Persons employed in packing trinitrotoluol, or at other processes in which the production of dust is unavoidable, should be called upon to wear respirators. When melted, trinitrotoluol gives off fumes, and arrangements should be made by localized exhaust ventilation for all fumes to be discharged into the outside air without escaping into the work place. * * *
2. To protect the skin overalls should be worn; the sleeves of the overall should fasten at the neck and the wrist and have no opening in the cuff. Gloves of leather,

strongly sewn, have been recommended, and, if worn, the cuff of the glove should be inside, that is under, the sleeve of the overall. Where women are employed head coverings should be worn.

3. To prevent absorption through the mouth the same preventive measures should be taken as in the case of lead; the provision and maintenance of adequate washing accommodation is specially important. Output has been so urgently required that at some factories work has commenced before building has been completed; at one such factory many cases of troublesome dermatitis (eczema¹) occurred and caused considerable interference with work, but as soon as suitable lavatories were completed the trouble ceased.

4. The period of exposure should be reduced to a minimum and should not be prolonged by overtime.

Here again periodical medical examination with power of suspending from work any person who is affected, is considered very important.

Manipulation of tetryl (tetra-nitro-methyl-anilin), which is an explosive, produces a light dust which may cause troublesome eczema. Apparently individuals vary in their susceptibility. The parts most frequently affected are the conjunctivæ, the openings of the nostrils, and the chin. The hands and arms are less often affected, and in this the eczema caused by tetryl differs from that due to trinitrotoluol, which usually affects the forearms and hands. Operatives manipulating tetryl may also suffer from headache, drowsiness, and lack of appetite in various degrees of intensity; but the committee understands that no case of illness endangering life has come to the notice of the Home Office. The principal measures to be taken consist in:

1. Avoiding the escape of dust by carrying out manipulations in glass cupboards with armholes for introduction of the hands.
2. Providing light gauze veils to protect the faces of the workers.
3. Supplying, if veils are not worn, some simple powder (such as a mixture of one part zinc oxide to two parts starch) for applying to the face before beginning work.
4. Providing adequate washing accommodation and encouraging the use after washing of an application for the skin.
5. Excluding workers who show special susceptibility or idiosyncrasy.

Apart from its tendency to cause eczema, tetryl stains the skin and hair; in order to prevent this, overalls and gloves, similar to those recommended for workers manipulating trinitrotoluol, should be worn, and, where women are employed, suitable head coverings should be used.

Mercurial poisoning and eczema are caused by the use of fulminate of mercury. While it is suggested that the symptoms are seldom marked, a blue line may be seen on the gums, appetite may be impaired, headache may be present, and there may be nervousness and depression. The last symptom is believed to be important not merely as a sign of illness, but as an indication that the operative

¹ An application found of value to prevent eczema is a mixture of two parts of castor oil to one part of lanolin; this mixture, which should be rubbed into the skin after washing on leaving work, should be placed in the lavatories for general use.

should be removed from dangerous work, which calls for a steady hand and clear head. Eczema of the hands, forearms, and face occur and may cause serious disability. To prevent these evil effects it is suggested that provision of overalls and of adequate washing accommodation should be made, that those specially affected should be transferred to other work, and that where exposure is marked, periodical medical examination should be provided.

Tetrachloride of ethane is a noninflammable liquid and a solvent for acetate of cellulose. It has formed an ingredient of the "dope" varnish applied to the canvas covering and tapes of aeroplane wings and to aeroplane bodies, in order, by impregnating them with cellulose, to render them impervious to moisture and air. This liquid is volatile at ordinary temperatures; its vapor smells like chloroform, is a powerful anesthetic, and being twice as heavy as air, tends to sink to the floor. The poisonous effect of the vapor depends not only upon the amount of vapor in the air but also upon the time during which the air is breathed. Inhalation of this vapor even in small amounts, when spread over prolonged periods, has caused drowsiness, loss of appetite, constipation and pains in the stomach; and in more serious cases, jaundice, liver destruction, coma and death. The committee offers the following suggestions for preventive measures:

1. The number of workers exposed to the vapor should be reduced to a minimum; all processes of "doping" should be in a separate place where no other work is undertaken. * * *
2. Adequate exhaust ventilation must be arranged for; if ventilation is to be adequate and sufficient to sweep away the heavy vapor, the entire air contents of the workroom should be extracted (preferably by volume or propeller fans), at or near the floor level, about 30 times every hour; while for admitting fresh air supply there should be high up in the room numerous hopper openings, the combined superficial area of which should be at least three times that of the area of the exhaust openings.
3. Operatives should not be allowed to remain in the work place during meal hours.
4. The process of "doping" should as far as possible be alternated with other work.
5. The period of exposure should be reduced to a minimum, and not prolonged by overtime. Ventilation on the lines suggested above is only adequate to bring the amount of vapor inhaled within safe limits for ordinary hours of work. Undue extension of these hours not only lengthens the exposure, but lengthens it for individuals who being already tired are less able to resist it.
6. Periodical medical examination should be provided for, with power to suspend from employment any persons affected.

The committee emphasizes the fact that it is absolutely necessary for those working with these poisons to maintain good health. It is thought undesirable for workers to commence work without having taken food, for the evidence apparently shows that hungry and ill-fed workers succumb more readily than others. Half a pint of milk or cocoa before starting work in the morning is recommended, and it is

stated that this practice has been followed with excellent results for many years in certain factories where there is danger from lead poisoning. It is also suggested that workers who are to be exposed to poisonous substances should be carefully chosen, only healthy and temperate persons being employed.

The danger from nitrous fumes, growing out of the demand for explosives, nearly all of which are products of nitration, is especially recognized. A memorandum issued by the Home Office and indorsed by the committee, states that the full effect of the inhalation of these fumes is not felt immediately, and unless workers are warned of the danger, they may continue at work and unwittingly inhale a fatal dose. In such cases, continues the memorandum, the affected person develops an irritating cough, which becomes steadily worse until, three or four hours after exposure, he becomes seriously ill, suffering from marked dyspnea and collapse; sometimes these symptoms come on after leaving work on the way home. The secretion of mucus now becomes profuse and vomiting, which helps to clear the air passages, may occur. The congestion of the bronchioles and alveoli progresses, and, if the case survives 48 hours, definite pneumonic consolidation may develop. More frequently a fatal issue results in about 30 hours, the patient remaining conscious until near the end. It is stated that every case exhibiting the initial symptoms does not progress to a fatal termination, and recovery has occurred even after marked collapse and dyspnea.

The posting of notices warning those employed of the danger of remaining in an atmosphere containing these fumes is considered advisable, and emergency helmets provided with a fresh supply of air from without are recommended. As a routine method of treatment pending the arrival of a physician, who should be sent for at once, it is suggested that the patient should be made to lie down, that he should be kept warm, and that he should be given plenty of fresh air. If he is blue in the face oxygen should be administered, and if he has not been sick he should be given a drink of 1 ounce of salt in 10 ounces of lukewarm water, the dose being repeated until he is sick. Persons even apparently slightly affected must not be allowed to walk home until permitted to do so by the doctor.

Aside from exposure to trinitrotoluol and tetryl, eczema is liable to occur among munition workers employed in engineering work who come in contact with certain fluids used to lubricate and to cool metals. Two forms of inflammation of the skin are indicated: (1) yellow pustules and boils, and (2) more general inflammation, which, in marked cases, develops into typical weeping eczema. Clean overalls, it is suggested, and the use of suitable washing accommodation with hot water, go far to prevent these pustules and boils. The

committee has observed that reasonable facilities for personal cleaning after work are seldom provided in engineering factories, and believes that apart from questions of health, the provision of such facilities should be considered a necessary part of the equipment of every factory. Experience has apparently shown that if lubricating and cooling fluids contain a small amount of some antiseptic, say, carbolic acid up to 1 per cent, or other coal-tar antiseptic, cases of eczema do not occur. It is stated that so-called antiseptic lubricants and cooling fluids are rapidly coming into general use in engineering shops, and that cases of eczema are less prevalent than formerly. Good washing facilities are recommended as a powerful preventive.

The committee concludes that facilities for the prompt treatment of all cases of sickness and injury are of special importance in factories where poisonous substances are used.

SICKNESS AND INJURY.

Following a brief introduction outlining the accumulated experience showing the effect of industrial occupations upon the health of workers, the committee, in its report on sickness and injury, proceeds to list certain injurious conditions or influences affecting health, industrial efficiency and output, in order that employers and their workpeople may guard against them or mitigate their evil effects. Attention is directed to the following points:

1. Excessively long hours of work, particularly by night, if continued, produce fatigue, irritation, and sickness.
2. Cramped and constrained attitudes or postures during work, which prevent the healthy action of lungs and heart.
3. Prolonged or excessive muscular strain, e. g., the lifting of heavy weights, prolonged standing, may produce rupture or varicose veins.
4. Machinery accidents.
5. Working in unventilated or insufficiently ventilated workshops predisposes to disease and gravely interferes with individual energy and physical capacity. The effect of continuously working in a stagnant or polluted atmosphere is not trifling or insignificant.
6. The air, even if fresh, may be too hot or too cold, too humid or too dry; either extreme should be avoided to insure reasonable bodily comfort and the most efficient work.
7. Imperfect lighting, whether by day or night, conduces to eyestrain and headaches.
8. Working with or in the presence of gases, vapors, poisons, and irritating substances (e. g., "doping") may lead to direct poisoning.
9. Dust produced in certain industries, unless effectually safeguarded, may induce lung diseases.
10. The manufacture and use of high explosives involve risk to the workman.

As important as any of these occupational influences, but inseparable from them, it is suggested, is the predisposition to disease arising from an absence of personal hygiene.

The committee points out that indications of sickness in a factory fall into four groups of facts which come before the management: (1) Absence, broken time, irregular time-keeping, or diminished output of the individual worker; (2) the ordinary signs of ill health; (3) the sickness register; (4) death certificates. The subject of the sickness rate is stated to be the most important of these, and as an illustration the report cites a certain munition factory which increased its employees from 14,000 in July, 1914, to more than 36,000 in March, 1915. In the former month the per cent of sickness was 2.9, in December it was 2.4, and in the first quarter of 1915 it exceeded 4 per cent. During this period the accident rate also showed some increase. In two departments the sickness rate among men on overtime was 5.5, as against 3.7 among those on double shifts. In one of these departments the sickness rate reached 8 per cent. The medical officer of the works attributed the increase of sickness and injury in the factory as a whole to a large increase of employees (many new hands), overtime, and nightwork.

Bearing in mind that prevention is better than cure and that for treatment to be most effective it must deal with the beginnings of disease, the committee suggests that the preliminary safeguard is to provide for the medical examination of all workers on their admission to the factory in order to secure as far as may be their initial physical fitness for employment. This being assured, two further duties of the management are suggested. "First, they must reduce to a minimum any unfavorable conditions obtaining in their works—providing proper sanitary conditions and accommodation, safeguarding machinery, controlling hours of labor, furnishing canteen facilities, and securing sufficiently warmed, lighted, and ventilated workrooms; secondly, they must make arrangements for an adequate medical and nursing scheme. The duties of a factory nurse may include (a) supervision of the health of the workers, (b) superintendence of the rest room for those who are temporarily indisposed, (c) following up cases of sickness at home, (d) taking charge of first-aid treatment of injuries, and (e) in the absence of medical advice, observing and controlling in its initial stages any threatened outbreak of the influenza type of sickness, which if it extends may temporarily paralyze output. Wherever nurses have been appointed the committee have found that the scope of their services has extended in many useful directions, and they have no hesitation in recommending such appointments."

Owing to the introduction of new labor, in conjunction with the need for speed and pressure, overtime, and nightwork, the committee anticipated a somewhat formidable rate of accidents in munitions factories, which include not only metal and engineering, in which branches a large number of accidents have always occurred, but also

certain dangerous trades and the manufacture of explosives. The injuries in a typical munition works are not only open wounds, contusions and abrasions, injuries to the eye, sprains, simple and compound fractures, and injured limbs, but also scratches, cuts, burns, and other minor injuries which may readily lead to more serious conditions by neglect.

It is obvious that much can be done by adopting various methods of prevention, such as the proper and effective guarding of machinery, the adoption of safety appliances, the proper regulation of dangerous processes, the adequate lighting of the factory, and the more careful cleaning of machinery. But whatever means be adopted the avoidance of accidents must largely depend on the intelligent cooperation of operatives and foremen in the maintenance and use of the appliances provided, and the committee would be glad to see an extension of the practice of forming committees of workers intrusted with the duty of investigating every accident which occurs in their own work place. In spite, however, of the most perfect regulations and precautions accidents will happen, and the committee desire, while drawing attention to the importance of prevention, to emphasize also the pressing need for the provision of suitable means of treatment, and particularly of what may be thought of as first-aid treatment for minor injuries. * * *

This plan for the protection of workers and the treatment of injuries in factories may be developed, it is believed, by the adoption of the following methods of advising and instructing employees:

1. Intelligent and vigilant supervision by the foreman.
2. A training in the essentials of first aid of a sufficient number of workers to provide that in each shop there are at least one or two persons who know how to render first aid in cases of injury; such instruction may well include some lessons on the value of ventilation and the importance of using the means provided to secure it; unfortunately, long hours of work and the difficulty of obtaining competent teachers make training difficult to organize at present, and more use must therefore be made of method 1.
3. The distribution of leaflets or placards of instruction and advice.

It is noted that some provision is made in the majority of factories for the treatment of injuries, but the need for improvement along this line is suggested. What is required, in the opinion of the committee, is an adequate though simple organization which provides (1) a local dressing station or aid post in each work place for minor injuries, and (2) a central dressing station or surgery for more serious cases or cases requiring continuous treatment. A brief outline of how these should be conducted, and the equipment required is presented. Emphasis is laid upon the necessity of keeping a full and accurate register of all cases of sickness and accidents, with particulars of dressing and redressing and treatment. Based upon evidence and reports received from all parts of the country of the economic and industrial value of the proper organization of a medical service within the factory, the committee is convinced that the adoption of this plan is essential to prevent loss of time and efficiency among the workers. Provision for organized treatment in every munition factory is recommended.

CANTEEN CONSTRUCTION AND EQUIPMENT.

Memorandum No. 6, dealing with canteen construction and equipment, is issued as an appendix to Memorandum No. 3, Industrial Canteens, noted in the May number of the REVIEW. It contains detailed suggestions and specifications for the erection of these buildings, including ventilation, lighting and heating, external and internal material to be used, cooking apparatus and kitchen and catering equipment. Drawings for two types of canteen are included as inserts.

EMPLOYMENT OF WOMEN IN GREAT BRITAIN AS AFFECTING LABOR CONDITIONS AFTER THE WAR.¹

A conference committee of the British Association for the Advancement of Science appointed to investigate outlets for labor after the war began its inquiry early in June, 1915, and confined its activities to the following terms of reference: (1) To investigate the replacement of men by women in industry during the war, and (2) the permanent effects of this after the war. Primarily the investigation dealt with industries in which the extra employment of women since the war has been most marked as well as those industries in which there were possibilities of an extension of women's work, with special reference to those trades localized in the London, Manchester, Leeds, and Birmingham districts. The interim report of this conference, submitted at the meeting of the British association held in Manchester in September, 1915, is a pamphlet of 82 pages setting forth the extent of the employment of women during the year August, 1914, to August, 1915, some general features of the labor market arising out of the new conditions of women's employment during the year, possible limitations to the industrial employability of women, wages, and their relation to the employment of women, the probable outstanding features of women's employment after the war, and a great mass of detail relating to the employment of women in specified trades or branches of industry.

Tables are presented showing the state of employment for industry as a whole, in September, October, and December, 1914, and in February, 1915, compared with employment in July, 1914, and the state of employment for those industries most affecting women's labor. The following table summarizes the general situation and indicates the number and per cent of males and females employed in the months indicated compared with the approximate numbers in

¹ Great Britain. British Association for the Advancement of Science. Draft interim report of the conference to investigate into outlets for labor after the war. 1915. 82 pp.

industrial occupations in July, 1914, based on the census of 1911, namely, 6,500,000 males and 2,500,000 females:

STATE OF EMPLOYMENT IN SPECIFIED MONTHS SINCE THE OUTBREAK OF THE WAR
COMPARED WITH JULY, 1914.

[Percentages are based upon the approximate industrial population, July, 1914: 6,500,000 males and 2,500,000 females.]

Item.	Males.							
	September, 1914.	Per cent.	October, 1914.	Per cent.	December, 1914.	Per cent.	February, 1915.	Per cent.
Total employment.....	5,837,000	89.8	5,804,500	89.3	5,791,500	89.1	5,733,000	88.2
Contraction of employment... Known by employers to have joined the forces.....	663,000	10.2	695,500	10.7	708,500	10.9	767,000	11.8
Net displacement.....	572,000	8.8	680,000	10.6	864,500	13.3	1,010,000	15.4
Net replacement ¹	91,000	1.4	6,500	.1	156,000	2.4	243,000	3.6

Item.	Females.							
	September, 1914.	Per cent.	October, 1914.	Per cent.	December, 1914.	Per cent.	February, 1915.	Per cent.
Total employment.....	2,290,000	91.6	2,345,000	93.8	2,420,000	96.8	2,462,500	98.5
Contraction of employment...	210,000	8.4	155,000	6.2	80,000	3.2	37,500	1.5
Net displacement.....	210,000	8.4	155,000	6.2	80,000	3.2	37,500	1.5

¹ This does not necessarily mean that men were replaced entirely by women. In many cases there was a replacement by employment of men and boys previously unemployed or unoccupied.

The following table indicates the contraction and expansion of employment in specified months compared with July, 1914, in industries most affecting women's labor.

PER CENT OF CONTRACTION AND EXPANSION OF EMPLOYMENT, SEPTEMBER, OCTOBER, AND DECEMBER, 1914, AND FEBRUARY, 1915, COMPARED WITH JULY, 1914, IN TRADE GROUPS MOST AFFECTING FEMALE LABOR.

Trade group.	Approximate industrial population, July, 1914. ¹	Contraction of employment.				Expansion of employment.			
		Sept., 1914.	Oct., 1914.	Dec., 1914.	Feb., 1915.	Sept., 1914.	Oct., 1914.	Dec., 1914.	Feb., 1915.
Chemicals, including explosives.....	29,000	1.1	(²)	(²)	.....	.....	.....	.....	38.0
Leather, leather goods, etc.....	19,000	11.8	.....	.....	.....	2.0	10.1	.....	36.6
Engineering.....	21,000	.5	.....	.....	.....	.....	2.2	12.3	26.4
Hosiery.....	52,000	.....	.....	.....	.....	0.3	5.2	.....	10.4
Wool and worsted.....	158,000	4.3	1.9	.....	.....	.....	3.1	.....	2.1
Boat and shoe.....	49,000	.3	1.7	1.0	.....	.....	.....	.....	1.3
Clothing.....	995,000	8.6	5.2	3.2	0.6	.....	.....	.....	.....
Cotton.....	400,000	14.9	14.0	9.3	3.0	.....	.....	.....	.....
Linen, jute, hemp, and other textiles.....	107,700	1.0	.8	1.4	3.5	.....	.....	.....	.....
China, pottery, and glass.....	34,000	5.3	4.8	1.9	5.6	.....	.....	.....	.....
Paper and stationery.....	49,000	4.4	6.2	6.0	8.3	.....	.....	.....	.....
Food and tobacco.....	100,000	13.6	11.8	8.3	9.6	.....	.....	.....	.....
Furniture.....	23,000	13.1	12.7	8.4	9.9	.....	.....	.....	.....
Cycle, motor, wagon, and carriage building.....	11,000	8.5	12.4	5.1	10.7	.....	.....	.....	.....

¹ The approximate industrial population in July, 1914, is assumed to be the same as that indicated by the census of 1911.

² No figures available.

It is frankly admitted that at the time the report was prepared (August, 1915) it was not possible to determine with precision the extent of the replacement of men by women. During the early months of the war many industries employing women were greatly depressed, but later the Government came into the market as chief buyer and between September and December, 1914, over 130,000 women poured into those trades—leather, tailoring, metal trades, chemicals and explosives, hosiery, and the wool and worsted industry—which had been suddenly revived by the placing of large orders by the allied Governments. Eighty thousand unemployed women remained, however, in spite of the natural shortage of men, which amounted to about a quarter of a million. "Fortunately," declares the report, "the new demand was to a large extent for that class of goods in the production of which female labor normally predominates." As enlistments increased trades dependent upon the work of skilled men found it necessary to employ women, the most noteworthy increase in this respect being in chemicals and in the metal and engineering trades included in the munitions group.

It is clear that the year has seen an enormous upheaval in industry; factories have been adapted to meet new demands and to facilitate women's employment; trade-union and Home Office restrictions have been relaxed; women are replacing men; experiments are being made and knowledge gained which may well revolutionize many branches of industry. The one great factor upon which industry as a whole now depends is the volume of Government contracts. At the end of the war these will substantially decline and industry will begin to resume its normal course. But every transference of labor, every youth put into a man's place, every woman who has received training because of the war adds something to the bewildering chaos of those industrial problems which will have to be grappled with when peace is declared.

In outlining the general position it is suggested that three features of the labor market stand out in special prominence: (1) The serious shortage of skilled workpeople; (2) the considerable extension of women's employment; (3) the limited extent to which women have replaced men in the sense that women are now doing work previously done by men.

It appears that not only has the majority of women, owing to their lack of training, found it impossible to take up skilled work in these trades but the absence of skilled workers among them has in turn proved an almost insuperable obstacle to the employment of any but a small proportion of the great waiting army of willing but unskilled female labor. "This shortage of skilled labor is the cardinal feature of the industrial position with which the nation is now faced." The trades in industry proper in which the extension of women's employment has been most marked are engineering, chemical trades (explosives), leather work, tailoring,¹ meat preserving and grain

¹ The table on p. 92 indicates a contraction in employment in these trades. This difference is not explained.

milling, basket (shell) making, elastic webbing, scientific instrument making, brush making, electrical engineering, canvas sack and net making, leather tanning, rubber work, hosiery, hardware, wire drawing, tobacco,¹ boot and shoe trade, shirt making, wool and worsted, silk, and the jute¹ trade. Excluding the munitions branch of engineering, the extra employment of women in these trades at the date of the report probably did not exceed 100,000 and four months previously was little more than half that compared with the same month in 1914. It seems that the extra employment of women in any branch of industry proper has been effected by transference from trades that are depressed or from branches of the same trade which are slack to those that are brisk and does not necessarily indicate the extent to which men have been replaced. A marked acceleration in women's employment is indicated in nonindustrial occupations, such as shop assistants, bank clerks, miscellaneous clerical work, waitresses in hotels and elsewhere, and to a limited extent on certain forms of railway work. In these occupations it would seem that women have probably replaced men in the sense of doing men's work to a greater extent than in industry proper. In certain employments the relaxing of trade union and Home Office restrictions has had the effect of extending women's employment. In leather, engineering, metal trades, wool and worsted trades, etc., the trade-unions have agreed with employers that for the period of the war only women may work on processes which were previously done wholly or partially by men, on the condition that the wage rates paid to the women shall be the same as those paid to the men.

From the fact that fewer men and more women are now in industry, as indicated in the table above, the report suggests that there is a prima facie case for supposing that women have replaced men in the sense that they are now doing processes which before the war were done by men. This, however, does not appear to be borne out by the evidence presented, for the report states that it is inaccurate, save in special instances and to a limited degree, universally to interpret in this manner figures indicating the increased employment of women. A large part of the Government demand for goods seems to be in those branches of trades in which a larger proportion of women are employed than in the trades as a whole. The report cites as an example the tailoring trade, which normally employs about 130,000 women, together with a large casual fringe of women who come into the trade in times of seasonal pressure. Here the medium branches, in which the clothing of a soldier is made, have drawn women and girls from its other branches and from its fringe of casual labor, as well as from other trades in which there was a surplus of female labor.

¹ The table on p. 92 indicates a contraction in employment in these trades. This difference is not explained.

The trade thus shows a great increase of female labor since the war which has been drawn in not to undertake work previously done by men, but merely to cope with a huge increase of orders in that branch of trade in which a larger proportion of women than men is normally employed. So in industry proper, the report seems to indicate that much of the extension of women's employment during the war has been in work which is normally done by women and in which the necessities of war have created an unprecedented demand. Work done by women in other trades, as in the munition factories, has been exceptional work which is expected to decline with the advent of peace. However, it was found to be a fact that women have been undertaking processes in many trades which were previously thought just above the line of their strength and skill, this being particularly noticeable in leather, engineering, and the wool and worsted trades, in pottery, cotton, and the printing trade. In nonindustrial occupations, such as clerical work, certain forms of railway work, tram and bus conducting, in various forms of retail distributive work, and in warehouse work, women appear to have replaced men, in the sense of doing work previously done by men, to a much greater extent than has occurred in industry proper. Employers have made an effort to readjust their work in order to facilitate the employment of women.

One of the most serious dangers revealed by the present crisis is declared to be an insufficient supply of skilled labor among women, which has emphasized the importance of industrial training both in its immediate and permanent aspects. To meet this demand experiments in the training of women are being made, this training being dependent upon (1) circumstances, common both to men and women, relating to the organization of industrial training, and (2) psychological, physical, and other conditions in which men and women differ. The report indicates three main directions in which development is to be desired:

1. The further establishment of full-time technical and trades schools, working in close cooperation with the trades concerned and making a special study of the most recent developments in technique and the future prospects of the several trade processes.

2. The development of part-time continuation schools, and of the practice of permitting young employees to attend during working hours, in view of the generally admitted failure of evening instruction at the end of a day's work.

3. A workshop training systematized and reduced to the shortest period compatible with efficiency. In some trades this might take the form of a modified apprenticeship adapted to the needs of the time. * * * In some trades, however, systematic promotion from one department to another would probably be possible without formal apprenticeship.

In a few of the trades, especially metal working, all of the highly skilled workers have been men, and an effort was made by the committee to determine whether women are capable of becoming highly

skilled workers, and if so, whether they would in normal times be preferred to men. Recognizing that this depends upon a variety of circumstances, physical, psychological, economic, and social, and suggesting that employers differed as to the possibility of training women to become as skillful and efficient as men, the committee concludes that experience arising out of necessity is teaching that, given the opportunity, women can produce work which, in spite of their lack of industrial experience, compares favorably with similar work done by men. Several instances are cited indicating something of the possibilities of the replacement of men by women, especially in munitions, where women are increasingly needed.

The report reviews some possible limitations to the industrial employability of women, many of which, it is suggested, will always remain, but some of which will undoubtedly be considerably modified, especially if the women concerned are sufficiently anxious to overcome them and to enter and remain in industry on more equal terms with men. The limitations enumerated include:

1. Women's lack of physical strength and staying power as compared with men.
2. Certain forms of work are believed to be bad for women's character or debasing to her taste, so as to make her less fit to care for and train the next generation. Here the problem is more difficult, and where these difficulties are real probably improvements could sometimes be made in conditions and hours of work.
3. The comparative shortness of women's industrial career has led employers to regard time given to the acquisition of technical knowledge by women as wasted.
4. Women in the main do not regard their occupation as their life's work.

The committee admits the difficulty of prophesying the future attitude of women toward industry, but expresses the opinion that it is not incorrect to say that heavy work and work requiring great physical strain are debarred to woman because of her lesser physical strength and stamina. Her attitude toward marriage is also believed to be essentially one of the realities to be faced, for whether woman comes into industry on greater terms of equality with man as far as training and continuity of employment are concerned depends upon her own inclination in the matter, though changed economic and social circumstances may force a still larger proportion of women into the labor market. How far she is able to compete then with men would appear to be determined by her own will and the natural disabilities which press all too unfairly upon her in competing with men in industrial life.

The committee recognized the controversial and complicated character of the question of wages as related to the employment of women. On the average they receive from 50 to 75 per cent of the wages paid to men in the same occupations, but it is made clear that a mere statement of comparative wages of men and women, without mention of the attendant circumstances, is useless. The limitations to women's

employability, already mentioned, must be borne in mind in a consideration of the question of wages, as they have a direct bearing upon the question of women's output as compared with men. The reasons given by employers for the lower wages of women are divided into two groups, the first including the following causes:

1. Women can perform only the lighter processes.
2. The output of women is less than that of men.
3. Women are less skilled and experienced than men and are rarely willing to devote much time to training even if employers thought (as they rarely do) that the shorter duration of their industrial life justified a long training.
4. Some conditions, such as nightwork, are more objectionable in the case of women than of men.

The second group of reasons advanced by employers is said to depend more upon custom and social outlook. The evidence gathered by the committee seems to show that the difference between wages of men and women is often more than can be justified by any difference in efficiency, and that this results in making it profitable for firms to introduce the largest possible amount of female labor. Whether payment of lower wages to a woman be unjust to her or not, the trade-unions maintain that it is unjust to the man whom she is thus able to underbid. The report states that the evidence of many employers tends to show that where they have replaced men by women their wages bills for the same output were greater than when they employed men only, which bears out the contention of some that low-paid, inefficient labor is by no means "cheap" labor. The committee admits that there are exceptions to the general contention that men are more efficient industrial workers than women and suggests that it is in those occupations and processes which demand the peculiar qualities of women that an extension of women's employment, under conditions and at wages not less favorable than men's, is most likely to occur in the future rather than in industry as a whole. Several instances are cited in support of the conclusion that the fair-wages clause included in all Government contract agreements does not sufficiently safeguard the standard of wages paid to women and secure to them fair wages.

In considering the status of the woman worker after the war the committee found that employers almost unanimously intend to take back those of their former employees who express a desire to return, although it is known from past experience that a large number of those returning will not care to take up their former work.¹ While indicating a general feeling on the part of employers that the women workers will have to be dispensed with, the committee expresses the opinion that many who left trades depressed by the war or who

¹ One large drapery store from which many men went during the South African war stated that of those who returned to England only 6 per cent wished to return to their former occupation.

transferred from other branches of the same trade in which work was slack, to take places left vacant by men, will probably return after their trades revive. In nonindustrial occupations, with the exception of railways, a large number of women are likely to remain after the war. In these occupations the probability of a permanent increase in the employment of women is recognized. In spite of the attitude of employers indicated above, the report anticipates that after the war the proportion of women in industry will be greater than before, and that the competition of men and women will increase. Where female labor is either underpaid or is obviously superior to male labor, a special inducement offers itself to employers to retain women, and it is believed that this will result in a number of the women remaining after the war. In order to minimize the bad effects which it is thought this situation may produce, the following measures are suggested:

1. The extensive emigration of women. It is expected that considerable proportion of the men discharged from the army at the close of the war will have acquired a taste for an open-air life, and will prefer the prospects offered by the colonies to those in these islands. Unless, therefore, the respective sexes are to be distributed over the Empire even more unevenly than at present, steps must be taken to insure the emigration of women in something like the same proportion as that of men.

2. The better technical training of both boys and girls. * * * It is the experience of all trades that except in processes which have been superseded by others, the supply of highly skilled workers is usually less than the demand. * * * There are signs that the trade unions are entering upon the policy of preventing the undercutting of men by women rather by regulating women's wages than by excluding them entirely from the more skilled processes. The highly paid skilled workers as a class are not likely to be detrimentally affected by the augmentation of their numbers, whether the recruits come from one sex or both. It is the reserve of cheap unskilled or semi-skilled labor which hitherto has seemed almost inexhaustible which is their real danger. * * *

3. An extension of the policy of equal pay for equal work having regard to the realities of the case, and, as a corollary, a minimum wage for unskilled labor both male and female. This policy should be so framed as to prevent the employment of unskilled labor from being more profitable than skilled in those forms of production in which they can be alternatively employed, e. g., engineering. * * *

4. The abolition of "half-timers" in those industries which still employ this form of child labor.

5. The withdrawal of widows with young children from the labor market by the institution of an adequate pension scheme, at the same time introducing further restrictions with regard to home work.

More than two-thirds of the report is devoted to detailed statements giving the position of each trade owing to the war and the nature of the increased employment of women, especially with reference to those processes in which they have replaced or are likely to replace men. As to the retail distributive trades the evidence collected by the committee prompted the following conclusions:

1. The replacement of men by women has occurred to a larger extent in the distributive trades, and especially in grocery, than in most other trades and occupations.

Practically the only limitations to women's employment in these trades have been in work requiring physical strength or technical knowledge.

2. The movement of labor into these trades has been from trades which are depressed owing to the war, such as millinery, dressmaking, and luxury trades generally. Girls from 15 to 18 years of age, mostly from secondary schools, and women from comparatively well-to-do families hit by the war, have also been absorbed to a considerable extent. The movement into the heavier branches of the trades has been largely from lower-paid occupations, such as some kind of factory work, domestic service, and laundry work. In few cases have married women returned.

3. In the opinion of the majority of employers, the actual value of a woman as a worker is about 30 per cent below that of an average man employed in the same capacity, the difference being due partly to physical strength and partly to incapacity of continued employment because of marriage.

4. A minority of employers, however, find that, with improved organization and greater subdivision of processes, many places can be found for women in which their economic value is equal to that of an average man.

5. The actual wages of women tend to be lower in proportion to those of men employed in similar capacities than would be justified even by a less favorable estimate of their economic value. This discrepancy appears to be due to custom and to the inferior economic status of women as workers.

It is stated that approximately 90,000 men (about 14 per cent) employed on railways have enlisted, thus creating a demand for women chiefly to fill places as carriage cleaners, ticket collectors, and checkers. At the time the report was prepared women were receiving considerably less wages than men, but under an agreement reached between the railway companies and the National Union of Railwaymen, the pay of women and conditions of labor during the war are to be the same as for men. Conditions in the railway service are said by trade-unionists to have become increasingly favorable of recent years to the employment of women in clerical positions, and it is believed that such employment is more likely to be permanent than that on the operative side, and in certain branches may be even further extended.

The disabilities of women as compared with men in several branches of the clerical service, and the fact that the harder and less pleasant work and the early and late turns must continue to be performed by men, constitute a strong argument in the men's favor, and the right policy seems to be to insist on the higher value of the men's service and to demand the maintenance of their present rates of pay rather than to demand what is less justified by the facts, the raising of women's rates to an equality with those paid to men.

The chief objections to the employment of women in railway work are stated to be—

1. Limitation to woman's sphere of activity.
2. Isolation of railway clerks in outlying offices.
3. Mobile character of the work, frequently involving transference from one district to another.
4. The difficulty of a practical early training.
5. Women have the easier work, while men take the nightwork and late evening and early morning turns.

Since the war women have been increasingly employed as conductors on trams and motor busses. They have been employed usually at the same rates of wages as men, but generally work six hours instead of eight. The report notes briefly the increased employment of women in miscellaneous clerical positions, in banks, insurance, under local authorities, and in the civil service.

A large increase in the employment of women was found in the metal trades, notably in the manufacture of small arms, scientific and optical instruments, hardware, and wire drawing and chain making. In munition factories many women are actually doing work previously done by men. It is thought that the work which women are doing in these factories will be of a temporary character. Taking the industry as a whole there appears to be little definite evidence of the actual displacement of men by women; the increase in the number of women is mainly due to a temporary increase of production.

The following table shows the state of employment in the engineering and metal trades, including munitions:

STATE OF EMPLOYMENT IN ENGINEERING AND METAL TRADES (INCLUDING MUNITIONS) IN FEBRUARY, 1915, AS COMPARED WITH JULY, 1914.¹

Trade.	Males.		Females.	
	Approximate industrial population, July, 1914. ¹	Per cent decrease in February, 1915.	Approximate industrial population, July, 1914. ¹	Per cent increase in February, 1915.
Small arms.....	6,000	6.6	21,200	4.4
Scientific instruments.....	27,000	³ 1.2	5,000	8.5
Wire drawing, chain, etc.....	45,000	6.6	15,000	4.4
Hardware.....	103,000	14.1	23,000	2.7
Musical instruments.....	28,000	17.6	6,000	2.5
Tin plate.....	23,000	14.2	3,000	1.4
Iron and steel.....	311,000	5.7	2,000	.2
Cutlery, tools, etc.....	54,000	9.1	17,000	⁴ 5.4
Other metals.....	104,000	8.8	20,000	⁴ 6.5
Jewelry, watch, and clock making.....	44,000	27.9	12,000	⁴ 12.8

¹ For the purpose of this table the approximate industrial population in July, 1914, is considered the same as that indicated by the census of 1911.

² The 1911 census shows only 300 women in this trade, but employers' returns show 1,200 occupied in July, 1914.

³ Increase.

⁴ Decrease.

It was found that the women were receiving considerably lower wages than men would be paid for the same work. Girls under 18 years of age are said in some instances to be receiving as little as 9s. (\$2.19) a week and those over 21 years 15s. (\$3.65) a week for work on which men have formerly received a minimum of 26s. (\$6.33). However, "no comprehensive consideration of the question is yet possible owing to the difficulty of obtaining complete evidence in a

trade which is undergoing considerable change and into which women are still pouring in very considerable numbers."

The report states that in no other trade, save those connected with the manufacture of munitions, has the increased employment of women been more marked than in the leather and tailoring trades, but this apparently has been due to the enormous increase in the amount of work to be done rather than to the necessity of replacing men. Most of the women are employed in work normally done by women. As to the employment of women after the war, it is believed that in the leather trade there will be a great deal of unemployment owing to diminution in demand for leather goods, while in the tailoring trade much will depend upon the introduction of machinery.

The report indicates a steady increase in employment in the chemical trade since the outbreak of the war. The number of women in explosives in July, 1914, was about 8,000 and this has considerably increased. There appears to be no question of women working on processes previously done by men. Very little, if any, substitution of women for men was found in the cotton and wool and worsted industries, hosiery, silk, food, and tobacco trades, and a contraction in the numbers employed is indicated in the food, cotton, and tobacco trades.

CIVIL-SERVICE RETIREMENT AND OLD-AGE PENSIONS.

The problem of retiring from the civil service of the Federal Government the superannuated employees has again come up for considerable discussion in the present session of Congress. In 1910 the bureau issued reports on civil-service retirement in Great Britain, New Zealand, and Australia, and for one of the States of the last named (New South Wales). In response to a resolution dating from January 11, 1910, it also submitted to the Senate on October 20, 1914, a report on civil-service retirement in Canada, a report which has, however, not yet been printed by that body. Other material also has been collected by the bureau in response to requests for information.

At present four States of the Union have legislation of more or less comprehensive character providing for the retirement from their civil service of superannuated and incapacitated employees with the payment of a moderate pension. These States are Illinois, Massachusetts, New Jersey, and Pennsylvania. In addition, 159 cities of the United States have inaugurated such a system for all or some of their municipal employees. Under these systems policemen and firemen are more generally included. Fifty of the cities having a population of more than 100,000; 44 of those having a population of from 50,000 to 100,000, and 65 of those cities which have from 25,000 to 50,000 population have some form of pension plan covering some

part of their employees. The list of these cities together with their population is set forth in an accompanying tabular statement, based upon information furnished by the New York City Commission on Pensions for a report by the National Civic Federation.¹

The bureau has collected a list of 32 foreign countries, not including subordinate States within those countries, which have organized schemes of retirement for their civil employees. This list probably is not complete.

The principal features of the civil-service retirement legislation in some of the more important countries are set forth in the accompanying tabular statements. In spite of the diversity of the provisions of this legislation, certain uniformity of principles is apparent. Provision is generally made for a voluntary and a compulsory age of retirement. A certain number of years of service are required on the part of the employee, ranging generally from a minimum of 10 years to a maximum of 30 years, although New Zealand requires 40 years. Most of the countries here noted place some burden of the support of the system upon the employees, but Belgium, Germany, and Great Britain are conspicuous for the fact that the system is wholly supported by the Government. The amount of payment is usually dependent upon the salary and years of service. Survivors are in some measure generally included. Disability, as well as old age, is also recognized as a factor in the problem.

What is probably only a partial list of the old-age pension schemes adopted by corporations of various kinds in the United States and numbering over 100 has been compiled by the bureau and is printed here. Great diversity exists in the manner of determining the amount of pension which the large corporations and business concerns have put into effect in the interest of their employees. Nineteen plans have been tabulated as follows:²

1. One-half of the yearly salary for the average of the 10 years preceding retirement, not to exceed \$500 per annum.
2. For each year of service 1 per cent of the average wage for 10 years preceding retirement, minimum being \$240 per annum.
3. One-half of the annual salary, not to exceed \$3,600 per annum.
4. One-half of the average earnings during the preceding year, with an additional 5 per cent for each year of service after 25 years.
5. One dollar per day flat rate.
6. One-half of the annual pay for the average of the preceding 10 years, not to exceed \$500 per year nor less than \$20 per month.
7. For each year of service 2 per cent of the annual wage paid at the time of enrollment in pension system.

¹ The Problem of Pensions, Federal, State, Municipal, and Industrial. New York, National Civic Federation, 1916. 15 pp. Folded tables.

² Report of the Commission to Investigate Pensions for State and Municipal Officers and Employees Pursuant to Senate Joint Resolution No. 4, P. L. 1915; Tabulation of Pension Laws of New Jersey; With Additional New Jersey Pension Laws. [No place; no date.] 14 pp.

8. One-half of the average pay for the preceding 10 years, not to exceed \$500 per annum.
9. For each year of service, $1\frac{1}{2}$ per cent of the average annual pay during the consecutive five years when pay was highest.
10. For each year of service, 1 per cent of the annual wage paid at the time of enrollment in pension system.
11. One per cent of the last average wage for each year of service.
12. Two per cent of the average yearly pay for the 10 years preceding retirement, payable monthly; also sick and death benefits.
13. For each year of service, 1 per cent of the average annual pay for the preceding 10 years, plus \$10 per month.
14. For each year of service, $1\frac{1}{4}$ per cent of the highest pay during any consecutive 10 years up to \$50 per month, and three-quarters per cent of any excess over \$50.
15. A pension system classified according to years of service.
 - Class 1—20 to 24 years' service, 50 per cent of the average annual pay for the preceding 5 years.
 - Class 2—25 to 29 years' service, 55 per cent of the average annual pay for the preceding 5 years.
 - Class 3—30 years' service or over, 60 per cent of the average annual pay for the preceding 5 years.
16. For each year of service, 1 per cent of the average annual pay during the 10 years preceding retirement, not to exceed \$100 per month, or less than \$21 per month.
17. A graduated scale of pensions running from 30 to 50 per cent of the monthly wages, minimum being from \$25 to \$80 per month.
18. Old or incapacitated employees at one-half pay.
19. Superannuation fund, to which corporation and employees contribute.

COUNTRIES AND STATES HAVING CIVIL-SERVICE RETIREMENT LEGISLATION.

Argentina.	Germany—Concluded.
Australia:	Hamburg.
New South Wales.	(Probably all other German Federated States.)
Queensland.	Great Britain.
South Australia.	Greece.
Tasmania.	Hungary.
Victoria.	Iceland.
Western Australia.	Italy.
Austria.	Japan.
Belgium.	Luxemburg.
Bolivia.	Mexico (department of public instruction).
Brazil.	The Netherlands.
British India.	New Zealand.
Canada.	Norway.
China.	Persia.
Cuba.	Philippine Islands.
Denmark.	Portugal.
Egypt.	Russia.
France.	South Africa:
Germany:	Cape of Good Hope.
Bavaria.	Natal.
Prussia.	Sweden.
Saxony.	Switzerland (separate Cantons).
Wurttemberg.	
Baden.	

PRINCIPAL FEATURES OF CIVIL SERVICE RETIREMENT

Countries.	Pension system.	Age of retirement.		Years of service required.	Burden of payment.
		Voluntary.	Compulsory.		
	1	2	3	4	5
Argentina.....	Compulsory for those not otherwise provided for; elective for others; contributory.	55 years.....	.....	20-30.....	Employees 5 per cent of salary; one-half first month's salary; one month's increase at time of promotion; balance by State.
Australia (Commonwealth).	Compulsory life insurance at time of entrance into service; contributory.	60 years.....	65 years, but at discretion of authorities.	.....	Employee.....
New South Wales.	Compulsory endowment insurance; contributory.	60 years.....	65 years (certain exceptions).	.....	do.....
New Zealand..	Voluntary for those in service at adoption; compulsory for those subsequently joining; contributory.	65 years; females,	55 years.....	40; females, 30.	Employee; contributions vary with age of entrance from 5 to 10 per cent of salary; Government contributes amounts for those retired whose contributions not sufficient, or retired before operation of act.
Canada.....	Contributory.....	60 years.....	.....	10.....	Employee; 3½ per cent of salary if \$600 or over; 3 per cent if less than \$600 during 35 years of service; repayable at rate not to exceed 5 per cent, at discretion of Governor General.
Great Britain..	Noncontributory..	60 years.....	65 to 70, at discretion of Government.	10.....	Government.....
Austria.....	Compulsory; contributory.	60 years.....	70 years for teachers only.	10.....	State and employees; employees of Class I to III, 3.5 per cent; Class IV to XI, 4.3 per cent; State servants without rank of officials, 1.6 per cent of salaries; during fixed period all classes also pay service tax.

LEGISLATION IN REPRESENTATIVE COUNTRIES.

Amount of pension.	Maximum pension.	Survivors' pensions.		Disability pensions.
		Widows.	Orphans.	
6	7	8	9	10
2.7 per cent of average salary of last 5 years multiplied by years of service.	95 per cent of basic salary.	One-half regular pension, for 15 years or until marriage of widow or daughter, or attainment of 20 years of age for son.		2.4 per cent of average salary of last 5 yrs multiplied by years of service.
Dependent upon salary and ability to pay premiums.				
Fixed by regulation in proportion to salary.				
10/60 of average salary of last 3 years for each year of service.	2/3 salary, or £300 (\$1,459.95).	£18 (\$87.60) per annum to widow during widowhood.	£13 (\$63.26) per annum for each child under 14 years.	Same as service or old age.
10/50 of average salary of last 3 years; increase 1/50 for each year over 10 years of service.	35/50 of last 3 years' average salary.	Provided for by State life insurance; minimum \$1,000, maximum \$2,000.		One month's pay for each year of service if leaving before 10 years' service; otherwise same as old-age pension.
1/80 of average salary for each year of service, plus 1/30 of average annual salary as lump sum, if retired after 2 years' service.	1/2 average salary.	Last year's salary upon death at any time after 5 years' service to legal representative.		For permanent incapacity same as regular pension.
After 10 years' service, 40 per cent of last salary, and in Class IV to XI additions, 2.4 per cent of salary, etc., so that after 35 years' service pension equals full salary; in few occupations 2 per cent added for each year after first 10 years.	100 per cent of last salary; minimum 800 crowns (\$162.40) for officials; 400 crowns (\$81.20) for State servants.	Fixed according to rank of husband; minimum 800 crowns (\$162.40) and maximum 6,000 crowns (\$1,218); widows of State servants receive 1/3 of last salary of husband and minimum of 400 crowns (\$81.20).	For each child through 24 years of age 1/5 of widow's pension, not to exceed 600 crowns (\$121.80); sum of pensions to children not to exceed widows' pension; orphans receive 1/2 of widows' pension; orphans of State servants receive minimum of 210 crowns (\$42.63).	40 per cent of salary if disabled after 5 and less than 10 years' service; 25 per cent if disabled after less than 5 years' service; after 10 years' service, regular pension.

PRINCIPAL FEATURES OF CIVIL SERVICE RETIREMENT

Countries.	Pension system.	Age of retirement.		Years of service required.	Burden of payment.
		Voluntary.	Compulsory.		
	1	2	3	4	5
Belgium.....	Noncontributory..	65 years.....	.....	30.....	State; for widows and orphans' pensions employees contribute to special funds.
France.....	Compulsory; contributory.	60 years for sedentary occupations; 55 years for active occupations.	.....	30; 25 if 15 were spent in active occupation.	State and employees, the latter paying 5 per cent of their salaries, and 1/12 of their salaries on appointment or reinstatement, as well as 1/12 of all salary increases.
German Empire.	Noncontributory..	65 years.....	65 years at discretion of Government.	10.....	Empire.....
Prussia.....	.....do.....	.....do.....	.....do.....	.....do.....	State.....
Bavaria.....	.....do.....	.....do.....	.....do.....	After status is permanent (after 3-10 years).	.....do.....
Wurtemberg.	.....do.....	.....do.....	.....do.....	9.....	.....do.....
Saxony.....	.....do.....	65 years or after 40 years of service.	.....do.....	10.....	.....do.....

LEGISLATION IN REPRESENTATIVE COUNTRIES—Concluded.

Amount of pension.	Maximum pension.	Survivors' pensions.		Disability pensions.
		Widows.	Orphans.	
6	7	8	9	10
1/60 of average salary for last 5 years, 1/50 in employment of "active service," for each year of service; 3/4 of salary if pension does not equal 300 francs (\$47.90).	75 per cent of basic salary; maximum 7,500 francs (\$1,447.50).	Based on average of husband's salary for last 5 years and on years of participation in survivors' pension fund; not exceeding husbands' pension, nor 1/2 of his last salary, nor 4,000 francs (\$772).	For each child under 18, widow's pension augmented by 2 per cent of average salary of husband for last 5 years; increase not to exceed 10 per cent.	For permanent disability; permanent disability in discharge of duty, pension equals 1/4 of last salary augmented by 1/60 of salary for each year of service in excess of 5 years.
1/60 of last 6 years' average salary for sedentary occupations and 1/50 for active occupations for each year of service.	3/4 of salary for those receiving less than 1,000 francs (\$193) salary, and 2/3 for higher salaries, with absolute maxima, graded according to salary, up to 6,000 francs (\$1,158).	1/3 of pension of husband.	If the mother is dead, 1/3 of the father's pension for all orphans combined without regard to their number, up to 21 years of age.	Without respect to age if disability caused by sickness or injury in performance of duties.
20/60 of last salary after 10 years of service plus 1/60 for each additional year up to 30 years, 1/20 for each year after 30.	45/60 of last salary.	40 per cent of pension of husband, minimum 300 marks (\$71.40), maximum 5,000 marks (\$1,190).	1/5 of the widow's pension to each fatherless child and 1/3 of the widow's pension to each orphan up to 21 years of age.	After 10 years' service; at any period of service if disability caused by sickness or injury in performance of duties.
do.	do.	do.	do.	Do.
35 per cent of last salary, first 10 years of service plus 2 per cent for each additional year up to 20 years, and 1 per cent for each year after 20.	75 per cent of last salary.	do.	do.	After status is permanent.
For first 10 years of service 40 per cent of last salary, plus each year through 40 years of service 1 1/2 per cent of salary up to 2,400 marks (\$571.20); 1 1/2 per cent of salary in excess of 2,400 marks (\$571.20).	8,000 marks (\$1,904)	50 per cent of pension of husband; minimum 350 marks (\$83.30); maximum 4,000 marks (\$952).	1/5 of the widow's pension to each fatherless child and 1/3 of the widow's pension to each orphan up to 18 years of age.	After 9 years' service; for disability caused by sickness or injury in performance of duties.
After 10 years and not more than 15 years' service 30 per cent of last salary with increases until after 39 years' service pension amounts to 80 per cent of salary. The law (Dec. 24, 1908) provided that pensions of 1,500 marks (\$357) or less be increased 12.5 per cent, of 1,501-3,000 marks (\$357.24-\$714) 10 per cent, and of over 3,000 marks (\$714) 7.5 per cent.	80 per cent of salaries in excess of 12,000 marks (\$2,856), full pension computed for 12,000 marks and for excess only half the pension.	1/5 of last salary of husband.	1/5 of the widow's pension to each fatherless child and 3/10 of the widow's pension to each orphan up to 18 years of age.	After 10 years' service; if permanently and totally disabled by accident in performance of duties 66 2/3 per cent of last salary; proportionate deductions for partial disability.

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LIST OF AMERICAN CITIES PROVIDING FOR MUNICIPAL PENSIONS.

[The Problem of Pensions, Federal, State, Municipal, and Industrial. New York, The National Civic Federation, 1916. p. 15.]

POPULATION 300,000 AND OVER.

City.	Population, 1910.	Employees covered.
New York.....	4,766,883	Policemen, firemen, teachers, municipal employees, and justices.
Chicago.....	2,185,233	Policemen, firemen, teachers, municipal employees, employees of house of correction, employees at the public library, and public school employees other than teachers.
Philadelphia.....	1,549,008	Policemen, firemen, teachers, and municipal employees.
St. Louis.....	687,029	Policemen, firemen, and teachers.
Boston.....	670,585	Policemen, firemen, teachers, and municipal employees.
Cleveland.....	560,663	Policemen, firemen, teachers, and sanitary police.
Baltimore.....	558,445	Policemen, firemen, and teachers.
Pittsburgh.....	533,905	Policemen, firemen, teachers, and municipal employees.
Detroit.....	465,766	Policemen, firemen, and teachers.
Buffalo.....	423,715	Do.
San Francisco.....	416,912	Policemen and firemen (teachers' pensions provided by State).
Milwaukee.....	373,857	Policemen, firemen, and teachers.
Cincinnati.....	363,591	Do.
Newark.....	347,469	Policemen and firemen (teachers and health-department employees' pensions provided by the State).
New Orleans.....	339,075	Policemen, firemen, and teachers.
Washington.....	331,069	Do.
Los Angeles.....	319,198	Policemen and firemen (teachers' pensions provided by State).
Minneapolis.....	301,408	Policemen, firemen, and teachers.

POPULATION 200,000 TO 300,000.

Jersey City.....	267,779	Policemen, firemen, and municipal employees.
Kansas City, Mo.....	248,381	Policemen and firemen.
Seattle.....	237,194	Policemen, firemen, and teachers.
Indianapolis.....	233,650	Do.
Providence.....	224,326	Do.
Louisville.....	223,928	Do.
Rochester.....	218,149	Do.
St. Paul.....	214,744	Do.
Denver.....	213,381	Do.
Portland, Oreg.....	207,214	Do.

POPULATION 100,000 TO 200,000.

Columbus.....	181,511	Policemen, firemen, and teachers.
Toledo.....	168,497	Do.
Atlanta.....	154,839	Municipal employees.
Oakland.....	150,174	Policemen, firemen, and municipal employees (teachers' pensions provided by the State.)
Worcester.....	145,986	Policemen and firemen (teachers' pensions provided by the State).
Syracuse.....	137,249	Policemen, firemen, and teachers.
New Haven.....	133,605	Policemen, firemen, teachers, and public-school employees.
Birmingham.....	132,683	Policemen and firemen.
Memphis.....	131,105	Pensions authorized, not established.
Scranton.....	129,867	Policemen, firemen, and teachers.
Richmond.....	127,628	Policemen, firemen, and municipal employees.
Paterson.....	125,600	Policemen and firemen (teachers' pensions provided by the State).
Omaha.....	124,096	Policemen, firemen, teachers, and public-library employees.
Fall River, Mass.....	119,295	Policemen.
Dayton.....	116,577	Policemen, firemen, and teachers.
Grand Rapids.....	112,571	Policemen and firemen.
Nashville.....	110,364	Do.
Lowell.....	106,294	Policemen, firemen, and municipal employees (teachers' pensions provided by the State).
Cambridge.....	104,839	Policemen and firemen (teachers' pensions provided by the State).
Spokane.....	104,402	Policemen and firemen.
Bridgeport.....	102,054	Do.
Albany.....	100,253	Policemen, firemen, and teachers.

POPULATION 50,000 TO 100,000.

Hartford.....	98,915	Policemen and firemen.
Trenton.....	96,815	Policemen, firemen, and teachers.
New Bedford.....	96,652	Policemen and firemen.

LIST OF AMERICAN CITIES PROVIDING FOR MUNICIPAL PENSIONS—Continued.

POPULATION 50,000 TO 100,000—Concluded.

City.	Population, 1910.	Employees covered.
San Antonio.....	96,614	No fund.
Reading.....	96,071	Teachers.
Camden.....	94,538	Policemen and firemen.
Salt Lake City.....	92,777	Teachers.
Dallas.....	92,104	Pensions authorized, not established.
Lynn.....	89,336	Policemen, firemen, teachers, and municipal employees.
Springfield, Mass.....	88,926	Policemen, firemen, and municipal employees.
Wilmington, Del.....	87,411	Policemen and teachers.
Des Moines.....	86,368	Policemen and firemen.
Tacoma.....	83,743	Do.
Yonkers.....	79,803	Policemen, firemen, teachers, and municipal employees.
Youngstown.....	79,066	Policemen and firemen.
Duluth.....	78,466	Policemen, firemen, and teachers.
St. Joseph, Mo.....	77,403	Firemen.
Troy.....	76,813	Policemen, firemen and teachers.
Utica.....	74,419	Do.
Elizabeth, N. J.....	73,409	Policemen and firemen.
Waterbury.....	73,141	Do.
Hoboken.....	70,324	Policemen, firemen, and teachers.
Akron.....	69,067	Policemen and firemen.
Wilkes-Barre.....	67,105	Teachers.
Peoria.....	66,950	Policemen and firemen.
Savannah.....	65,064	Do.
Oklahoma City.....	64,205	Firemen.
Harrisburg.....	64,186	Teachers.
Fort Wayne.....	63,933	Policemen and firemen.
Charleston.....	58,883	Policemen, firemen and teachers.
Portland, Me.....	58,571	Policemen and firemen.
Terre Haute.....	58,157	Policemen, firemen, and teachers.
Holyoke.....	57,730	Policemen and firemen.
Jacksonville.....	57,699	Policemen.
Brockton.....	56,878	Policemen, firemen, and municipal employees.
Bayonne, N. J.....	55,545	Firemen.
Passaic.....	54,773	Policemen, firemen, and teachers.
South Bend.....	53,684	Do.
Altoona.....	52,127	Teachers.
Allentown.....	51,913	Firemen.
Springfield, Ill.....	51,678	Policemen and firemen.
Pawtucket.....	51,622	Policemen.
Mobile.....	51,521	Policemen and firemen.
Saginaw.....	50,510	Do.

POPULATION 25,000 TO 50,000.

Binghamton.....	48,443	Firemen.
Sioux City.....	47,828	Policemen and firemen.
Lancaster, Pa.....	47,227	Firemen and teachers.
Springfield, Ohio.....	46,921	Policemen and firemen.
Atlantic City.....	46,150	Do.
Rockford, Ill.....	45,401	Do.
Bay City, Mich.....	45,166	Firemen.
York.....	44,750	Do.
Sacramento.....	44,696	Policemen and firemen.
Chattanooga.....	44,604	Do.
Malden, Mass.....	44,404	Firemen and municipal employees.
Haverhill.....	44,115	Policemen, firemen, and public-library employees.
New Britain, Conn.....	43,916	Policemen and firemen.
Salem, Mass.....	43,697	Policemen, firemen, and municipal employees.
Topeka.....	43,684	Policemen.
Davenport.....	43,028	Policemen and firemen.
Augusta, Ga.....	41,040	Do.
Berkeley.....	40,434	Do.
Superior.....	40,384	Do.
Newton, Mass.....	39,806	Policemen, firemen, and municipal employees.
San Diego.....	39,578	Policemen.
Chelsea.....	38,537	Policemen, firemen, and municipal employees.
Dubuque.....	38,494	Policemen and firemen.
Montgomery.....	38,136	Firemen.
Woonsocket, R. I.....	38,125	Policemen.
Racine.....	38,002	Policemen and firemen.
Fitchburg, Mass.....	37,826	Municipal employees.
Elmira.....	37,176	Policemen, firemen, and teachers.
Galveston.....	36,981	Policemen and firemen.
Quincy, Ill.....	36,557	Policemen.
Hamilton.....	35,279	Policemen, firemen, and teachers.
Joliet.....	34,670	Firemen.

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LIST OF AMERICAN CITIES PROVIDING FOR MUNICIPAL PENSIONS—Concluded.

POPULATION 25,000 TO 50,000—Concluded.

City.	Population, 1910.	Employees covered.
Auburn, N. Y.....	34,668	Policemen, firemen, and teachers.
East Orange.....	34,371	Policemen and firemen.
Cedar Rapids.....	32,811	Do.
Perth Amboy.....	32,121	Policemen and teachers.
Pittsfield.....	32,121	Do.
Jackson, Mich.....	31,433	Policemen and firemen.
Jamestown, N. Y.....	31,297	Firemen.
Mt. Vernon, N. Y.....	30,919	Policemen, firemen, and teachers.
Lima, Ohio.....	30,508	Firemen.
Niagara Falls.....	30,445	Policemen, firemen, and teachers.
La Crosse.....	30,417	Do.
Newport, Ky.....	30,309	Policemen and teachers.
Aurora, Ill.....	29,807	Policemen and firemen.
Council Bluffs.....	29,292	Do.
Colorado Springs.....	29,078	Do.
Lorain, Ohio.....	28,883	Do.
New Rochelle.....	28,867	Policemen, firemen, and teachers.
Zanesville.....	28,026	Policemen and firemen.
Shreveport, La.....	28,015	Firemen.
Poughkeepsie.....	27,936	Policemen and teachers.
Waltham.....	27,834	Policemen, firemen, teachers, and municipal employees.
Newburgh, N. Y.....	27,805	Policemen and teachers.
Brookline.....	27,792	Policemen, firemen, teachers, and municipal employees.
Meriden, Conn.....	27,265	Policemen.
Watertown, N. Y.....	26,730	Policemen, firemen, and teachers.
Waterloo, Iowa.....	26,693	Policemen and firemen.
Elgin, Ill.....	25,976	Do.
Kingston, N. Y.....	25,908	Policemen.
Bloomington.....	25,768	Policemen and firemen.
Clinton.....	25,577	Do.
Madison, Wis.....	25,531	Do.
Chicopee, Mass.....	25,401	Policemen.
Stamford.....	25,138	Policemen and firemen.

PRIVATE COMPANIES IN THE UNITED STATES HAVING OLD-AGE PENSION SYSTEMS.

Railroad and transportation companies.

- Atchison, Topeka & Santa Fe Railway Co., Chicago, Ill.
- Atlantic Coast Line Railroad Co., Wilmington, N. C.
- Baltimore & Ohio Railroad, Baltimore, Md.
- Boston & Maine Railroad, Boston, Mass.
- Buffalo, Rochester & Pittsburgh Railway Co., Rochester, N. Y.
- Canadian Pacific Railway Co., Montreal, Canada.
- Chicago & North Western Railway Co., Chicago, Ill.
- Chicago, Burlington & Quincy Railroad Co., Chicago, Ill.
- Chicago, Milwaukee & St. Paul Railway, Chicago, Ill.
- Chicago, St. Paul, Minneapolis & Omaha Railway Co., St. Paul, Minn.
- Delaware, Lackawanna & Western Railroad Co., New York, N. Y.
- Grand Trunk Railway System, Montreal, Canada.
- Houston & Texas Central Railroad, Houston, Texas.
- Illinois Central Railroad Co., Chicago, Ill.
- New York Central System, New York, N. Y.
- New York, Chicago & St. Louis Railroad Co., Cleveland, Ohio.
- New York, New Haven & Hartford Railroad Co., New Haven, Conn.
- Oregon Short Line Railroad Co., Salt Lake City, Utah.
- Oregon-Washington Railroad & Navigation Co., Portland, Oreg.
- Pennsylvania Railroad Co., Philadelphia, Pa.
- Philadelphia & Reading Railway Co., Philadelphia, Pa.

Pittsburgh Steamship Co., Pittsburgh, Pa.
 Pullman Co., Chicago, Ill.
 Rock Island Lines, Chicago, Ill.
 San Antonio & Aransas Pass Railway Co., San Antonio, Tex.
 Southern Pacific Co., San Francisco, Cal.
 Union Pacific Railroad Co., Omaha, Nebr.

Telephone and telegraph companies.

American Telephone & Telegraph Co., New York, N. Y.
 Cincinnati & Suburban Telephone Co., Cincinnati, Ohio.
 New England Telephone & Telegraph Co., Boston, Mass.
 Postal Telegraph Co., New York, N. Y.
 Western Union Telegraph Co., New York, N. Y.

Other public service companies.

Boston Consolidated Gas Co.
 Chicopee Gas Light Co.
 Consolidated Gas Co., New York.
 Exeter & Hampton Electric Co.
 Exeter, Hampton & Amesbury Street Railway.
 Exeter Railway & Lighting Co.
 Fitchburg Gas & Electric Co.
 Haverhill Electric Co.
 Lehigh Valley Transit Co., Allentown, Pa.
 Malden & Melrose Gas Light Co.
 Malden Electric Co.
 New York Railways Co., New York, N. Y.
 Niagara Falls Power Co., Niagara Falls, N. Y.
 People's Gas & Electric Co.
 Philadelphia Electric Co.
 Salem Electric Light Co.
 Springfield Gas-Light Co.
 Suburban Gas & Electric Co.
 Washington-Virginia Railway Co., Washington, D. C.

Banks.

First National Bank, Chicago, Ill.
 Guaranty Trust Co., New York City.
 National Bank of Commerce, New York City.
 National City Bank, New York City.

Insurance companies.

Equitable Life Assurance Society, New York, N. Y.
 Metropolitan Life Insurance Co., New York, N. Y.
 Prudential Insurance Co. of America, Newark, N. J.

Manufacturing and miscellaneous companies.

Allis-Chalmers Manufacturing Co., Milwaukee, Wis.
 American Brass Co., Waterbury, Conn.
 American Express Co., New York, N. Y.
 American Sugar Refining Co., New York, N. Y.
 American Tar Co.
 Armour & Co., Chicago, Ill.
 Bancroft, Jos., & Sons Co., Wilmington, Del.
 Blount Plow Works, Evansville, Ind.
 Brill, J. G., Co., Philadelphia, Pa.

Butler Bros., Chicago, Ill.
 Calumet & Hecla Mining Co., Calumet, Mich.
 Cambria Steel Co., Johnstown, Pa. (consolidated with Midvale Steel Co., 1915).
 Case, J. I., Threshing Machine Co., Racine, Wis.
 Cheney Bros., South Manchester, Conn.
 Chicopee Manufacturing Co., Boston, Mass.
 Cleveland-Clipp Iron Co., Ishpeming, Mich.
 Crane Co., Chicago, Ill.
 Cumberland Mills, Westbrook, Me.
 Deere & Co., Moline, Ill.
 Dolge, Alfred C., & Son, Dolgeville, N. Y.
 Du Pont de Nemours Powder Co., Wilmington, Del.
 Filer & Stowell Co., Milwaukee, Wis.
 General Electric Co., Schenectady, N. Y.
 General Fire Extinguisher Co., Providence, R. I.
 Gilbert & Barker Mfg. Co., Springfield, Mass.
 Goodrich, B. F., Tire & Rubber Co., Akron, Ohio.)
 Gorham Manufacturing Co., Providence, R. I.
 Hibbard, Spencer, Bartlett & Co., Chicago, Ill.
 Huyck, F. C., & Sons, Albany, N. Y.
 International Harvester Co., Chicago, Ill.
 Kimberly-Clark Co., Appleton, Wis.
 La Crosse Plow Co., La Crosse, Wis.
 Midvale Steel Co., Philadelphia, Pa.
 Morris & Co., Chicago, Ill.
 Murphy Varnish Co., Newark, N. J.
 National Carbon Co., Cleveland, Ohio.
 National Lead Co., New York, N. Y.
 North Star Mines Co., New York, N. Y.
 Pittsburgh Coal Co., Pittsburgh, Pa.
 Procter & Gamble Co., Cincinnati, Ohio.
 Rhode Island Co. (The), Providence, R. I.
 Sherwin-Williams Co., Cleveland, Ohio.
 Simonds Manufacturing Co., Pittsfield, Mass.
 Standard Oil Co., New York, N. Y.
 Talbot Mills, North Billerica, Mass.
 Tenney & Co., Chas. H., Boston, Mass.
 United Cigar Stores Co., New York, N. Y.
 United States Brewers' Association, New York, N. Y.
 United States Steel Corporation, New York, N. Y.
 Van Brunt Manufacturing Co., Horicon, Wis.
 Vermont Marble Co., Proctor, Vt.
 Victor Talking Machine Co., Camden, N. J.
 Virginia Bridge & Iron Co. (The), Roanoke, Va.
 Wells, Fargo & Co., New York, N. Y.
 Western Electric Co., New York, N. Y.
 Westinghouse Air Brake Co., East Pittsburgh, Pa.
 Williams, J. H., & Co., Brooklyn, N. Y.
 Winchester Repeating Arms Co., New Haven, Conn.
 Witherbee, Sherman & Co. (Inc.), Port Henry, N. Y.

CIVIL-SERVICE RETIREMENT IN MASSACHUSETTS.

INTRODUCTION.

The State of Massachusetts in 1909 took special cognizance of the problem of retiring its civil-service employees by the appointment of a commission which reported in 1910. The result of that commission's report was the enactment, in 1911, of a measure providing for retirement of superannuated employees. Again in 1914¹ a commission was appointed which considered the problem in the light of developments under the existing legislation. This commission characterized the large number and variety of pension and retirement laws in force in the State at that time as startling. These laws were found to differ in administrative features and application, and even in fundamental principles. The commission recommended a drastic overhauling of these laws, particularly with a view to consolidating the different administrative features.

The Massachusetts law relating to the retirement of civil employees in the State service was enacted in 1911 and became applicable on June 1, 1912. The act is based upon the principle of compulsory savings on the part of the employee, and of the State being economically benefited by the withdrawal from the service of superannuated or incapacitated employees. The plan is therefore partially a contributory one and partially a straight pension scheme, each party providing an equal amount of the retirement allowance.

The system is compulsory for all employees of the Commonwealth who enter the service after the establishment of the act, and elective to persons who were employees before its establishment.

THE RETIREMENT ASSOCIATION.

All permanent and regular State employees are enrolled by a special board of retirement as members of a State retirement association. But employees of the State who are provided for by special pension legislation are excluded from membership, as are all employees who enter the service of the State after having passed the age of 55 years, and also officers elected by popular vote. Members become such upon completing 90 days of permanent service following the six months' probationary period to which all civil-service employees are subject. The board has given the term "permanent and regular employees" explicit definition, and has held that no person will be permitted to remain in the continuous employ of one State department over one year without becoming a member of the retirement association. Temporary and provisional employees become members of the association at the end of one year of continuous

¹ Report of the Massachusetts Commission on Pensions, Mar. 16, 1914. Boston [1914]. 345 pp.

service; all employees who do not work through the whole year, but are employed only recurrently for a substantial part of the year, become members of the association one year from the date of first employment; and officials appointed by the governor for a definite term are considered permanent and regular employees and become members of the association if service by the State is their "only or principal" employment.¹

BOARD OF RETIREMENT.

The State board of retirement is composed of three members, the State treasurer, one member elected by the members of the retirement association, and a third elected by these two. The board is unpaid, but is authorized to secure and pay for adequate clerical help. It makes all necessary rules and regulations; it may determine the percentage of salary which an employee shall contribute, subject only to maximum and minimum amounts provided in the law.

FUNDS OF THE SYSTEM.

Two funds are created to meet the expenses of the system: (1) Expense and contingent fund appropriated annually by the legislature to defray the expenses of administration; (2) annuity and pension fund consisting of deductions from salaries of employees and amounts contributed by the Commonwealth in an equal sum.

The State treasurer has charge of the funds subject to the approval of the board of retirement, while the insurance commissioner prescribes and supervises the methods of bookkeeping, and inspects and examines accounts so as to secure compliance with the law.

CONTRIBUTIONS OF MEMBERS.

The board of retirement is authorized by law to deduct not less than 1 per cent nor more than 5 per cent of the wages or salary of members of the association for the purchase of their retiring allowances. Employees who receive in excess of \$30 a week can not be assessed for contributions on the excess above that amount. Although the board was given power to fix a maximum and minimum amount and to classify the employees and to establish different rates for different classes, it has nevertheless fixed a uniform rate of 3 per cent for deductions from salaries, unless the employee elects to contribute 5 per cent.

The amount contributed by each employee is deducted from each month's salary and paid over to the State treasurer. Wages are held to include only cash receipts.

¹ The Retirement System for Employees of the Commonwealth. Circular explanatory of the provisions of ch. 532, acts of the year 1911, and acts in amendment thereof and addition thereto. Boston, 1914. p. 6.

If an employee leaves the service before becoming eligible to a retirement allowance, his contributions are returned to him with interest at 3 per cent. If he dies before retirement a refund is made to his legal representative or other person appearing to be entitled to it.

CONDITIONS OF RETIREMENT.

Voluntary retirement is permitted to an employee at the age of 60 after 15 years of continuous service; compulsory retirement may take place at the age of 70 years; regardless of age, retirement is allowed after 35 years of continuous service or for permanent disability after 15 years of service. In the case of members of the association related as husband and wife, if one of the two retires, or is retired, the other has the right also to retire. Any employee of the State on January 1, 1912, who did not elect to become a member of the association and who had reached the age of 55 years on June 1, 1912, may, under an amendment, be retired for the good of the service at any time upon the minimum pension of \$200 per year.

ANNUITIES AND PENSIONS.

The retirement allowance consists of two parts: (1) A life annuity payable monthly in such amounts as the sum of the deposits with regular interest have produced at the time of retirement; (2) a pension for life payable monthly out of the fund contributed by the State and equal to the above annuity. A person retired may receive less than this amount with the provision that upon his death the difference with interest between what he might have received and what he actually received will be paid to his legal representative. A supplementary pension may be paid upon certain conditions, namely, if an employee is retired at the age of 60 years or later, after 15 years of continuous service, or at this same age without 15 years of service, provided he was 55 years old at the time of the establishment of the system, or if he retires or is retired after 35 years of continuous service without regard to his age. This supplementary or extra pension continues for life and is equal to the amount of the annuity and the pension to which he would have been entitled if the retirement system had been in operation when he entered the service, and if he had contributed from that date to the date of its establishment at the same rate as that adopted by the board of retirement.

An employee who elected not to become a member of the association, but having reached the age of 55 years at the time of the establishment of the system, may be retired on the minimum pension of \$200.

The maximum pension is fixed at one-half the amount of the average salary or wages received by the retired employee during the last 10 years of his service. If by his rate of contribution an employee

has accumulated a sum more than sufficient to obtain an annuity equal to one-fourth of his average salary or wages, which with the addition of an equal amount by the State would produce an annuity and pension combined in excess of the legal maximum, he is paid such excess in a lump sum at the time of the first payment on his retirement allowance.

MISCELLANEOUS PROVISIONS.

The actuarial features of the system, the prescribing of mortality tables, the establishment of rates of interest in connection therewith, methods of bookkeeping, etc., are intrusted to the insurance commissioner, and to this officer is also assigned the general supervision of the system, and the observance of the law by the board of retirement.

The funds of the system are exempt from taxation and the rights of a member to any part of such funds are exempt from taxation, the operation of bankruptcy laws, adjustments of law, or any court process, and can not be assigned by such member.

AMENDMENTS AND REFORMS PROPOSED.

It has taken four years for the State to build up this system of retirement legislation as applicable only to a restricted class of employees in the State government. In 1912, one year after the passage of the original act, the system was amended in some of its most important features, such, for instance, as in the matter of computing of continuous service, by extending the time of election for members to come in under the act, by providing for those who were employed partly by a county and partly by the State, by providing for the payment of the excess beyond the amount required to secure an annuity in the amount fixed by the law, by changing the form of investment of the funds, and by providing for the retirement of husband and wife at the same time if both are members. The amendments of 1913 were minor amendments, while an amendment in 1914 provided for the retirement of persons permanently disabled in the service, but only after 15 years of continuous service.

The commission on pensions of 1914, after an extended analysis of the existing legislation, and an actuarial study of the Boston pension funds in particular, recommended the repeal of all pension laws in force in the State except that for supreme court justices, and drafted a bill in pursuance of that purpose, drawing the administration of the whole pension system of the State under one head. It hoped thereby that concealed taxation would be avoided and equality established among all public servants. Referring to the fact that about 100 new bills relating to pensions were introduced into the legislature in Massachusetts in 1914, it stated that "if the solution is not furnished new pension legislation will complicate the situation year by year, making future effort for sound economic legislation well-nigh hopeless."

STATISTICS OF OPERATION.

Since the law became operative, on June 1, 1912, according to the latest report of the State board of retirement¹ 133 employees have been retired; but retirement allowances were being paid at that time to 119 employees, 13 annuitants and 1 nonmember having died since retirement. Of the number in question 43 had been retired at the age of 70 or over, 3 for permanent disability, and 1 nonmember for the good of the service upon the request of the department in which he was employed, while 72 had retired of their own desire.

The amount paid to retired employees during the year ending December 1, 1915, as pensions, was \$30,433.91, as compared with \$24,918.58 during the preceding fiscal year; the largest yearly amount payable to any individual was \$905.14. Of the 119 retired employees, 54 were in receipt of the maximum retirement allowance, namely, one-half of the average cash salary for the 10 years preceding retirement. The average annual retirement allowance paid during the year was \$284.79, which is \$84.79 above the minimum payable.

The amount refunded to members who had left the service was \$23,057.30, and the amount refunded to the heirs or the estates of deceased members was \$2,674.81.

The investments of the funds which support the retirement allowances earned an average rate of income, during the year, of 4.17 per cent.

In an earlier report² the board emphasizes the benefit of the compulsory savings feature of the act, noting that the significance of this feature will become more and more evident as the system continues in operation. The board stated in this connection:

Evidence constantly reaches the board that members look upon this feature of the retirement system with favor, and are gratified that they have been compelled to adopt habits of saving before unknown to them. Among the benefits of the retirement system this is by no means the least, and its value is bound to be increasingly felt as the size of the individual accounts increases with the age of the association.

IMMIGRATION IN MARCH, 1916.

During the month of March there were 27,586 immigrant aliens admitted to the United States, being 2,846, or 11.5 per cent, more than in the preceding month. Compared with March, 1915, there was an increase of 8,323, or 43.2 per cent, in the number admitted; but there were 65,035, or 70.2 per cent, fewer persons admitted than in March, 1914. The following table shows the total number of immigrant aliens admitted during January, February, March, and April for 1914, 1915, and 1916.

¹ Report of the State Board of Retirement, January, 1916. Boston, 1916. p. 8.

² Report of the State Board of Retirement, January, 1915. Boston, 1915. p. 11.

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IMMIGRANT ALIENS ADMITTED INTO THE UNITED STATES IN SPECIFIED MONTHS,
1914, 1915, AND 1916.

Month.	1914	1915	1916
January.....	44,708	15,481	17,293
February.....	46,873	13,873	24,740
March.....	92,621	19,263	27,586
April.....	119,885	24,532	30,560

It is noted that the largest number of immigrants for some months past came from Italy, England, Mexico, and the Scandinavian countries, in the order named.

Classified by races, the immigrant aliens admitted into and emigrant aliens departing from the United States during March, 1915 and 1916, were as follows:

IMMIGRANT ALIENS ADMITTED INTO AND EMIGRANT ALIENS DEPARTING FROM
THE UNITED STATES, MARCH, 1915 AND 1916.

Race.	Admitted.		Departed.	
	March, 1915.	March, 1916.	March, 1915.	March, 1916.
African (black).....	159	148	69	97
Armenian.....	63	139	18	6
Bohemian and Moravian.....	81	56	1	3
Bulgarian, Servian, Montenegrin.....	316	342	145	1
Chinese.....	135	126	86	169
Croatian and Slavonian.....	53	92	7	8
Cuban.....	85	98	113	78
Dalmatian, Bosnian, and Herzegovinian.....	2	5	.....	.....
Dutch and Flemish.....	499	456	67	40
East Indian.....	5	4	9	2
English.....	2,243	2,584	538	413
Finnish.....	250	547	55	27
French.....	820	1,909	173	175
German.....	928	1,070	71	49
Greek.....	1,488	2,913	555	338
Hebrew.....	733	1,210	142	3
Irish.....	1,097	1,131	39	114
Italian (north).....	670	426	350	97
Italian (south).....	3,118	3,810	2,388	312
Japanese.....	662	647	52	53
Korean.....	5	23	1	2
Lithuanian.....	57	64	7	.....
Magyar.....	30	95	17	39
Mexican.....	996	2,299	20	24
Pacific Islander.....	.....	.....	.....	.....
Polish.....	163	457	118	10
Portuguese.....	434	1,107	90	135
Roumanian.....	41	100	9	5
Russian.....	155	539	607	202
Ruthenian (Russniak).....	124	69	2	1
Scandinavian.....	1,885	2,033	159	207
Scotch.....	943	989	199	101
Slovak.....	6	46	8	5
Spanish.....	435	904	773	176
Spanish-American.....	173	148	39	38
Syrian.....	76	39	9	16
Turkish.....	7	5	3	1
Welsh.....	96	61	17	11
West Indian (except Cuban).....	55	36	17	12
Other peoples.....	175	839	49	42
Not specified.....	.....	.....	733	473
Total.....	19,263	27,586	7,755	3,485
Per cent increase, 1916.....	.....	43.2	.....	55.1

¹ Decrease.

OFFICIAL REPORTS RELATING TO LABOR.

UNITED STATES.

Alabama.—*Inspector of coal mines. Annual report of coal mines, State of Alabama, 1914. Birmingham [1915]. 100 pp.*

During the year 263 mines were in operation, employing 15,887 miners, 4,987 inside day men and 3,053 outside men, a total of 23,927. Of the mines 104 were operated by slopes, 12 by shafts, and 147 by drifts; 165 were pick mines and 40 were machine mines. The total tonnage was 15,525,903. Picked coal represented 73.7 per cent of the total output. There were 126 fatalities due to accidents, being 5.26 for each 1,000 men employed and 1 to every 123,222 tons of coal raised.

A description of methods, ventilation, precautionary measures employed, and conditions of each mine is given in detail.

A safety association was formed in 1914 for the purpose among others of instructing the workers in their occupation, improving rescue work, securing systematic inspection, and improving working conditions in the mines.

Arizona.—*State Mine Inspector. Fourth annual report for the year ending September 30, 1915. [Phoenix, 1916?] 72 pp.*

"According to the reports received by the inspector of mines, and presented in this paper, the number of men killed in and about the mines in the State of Arizona during the year 1915 was 49, as compared with 62 in 1914. The number of men employed in and about the mines during 1915 was 13,598 as compared with 9,422 in 1914. The fatality rate for 1915 was 3.6 per 1,000 men employed. It will be noticed that the fatal accidents have been greatly decreased when compared with 1914."

Arkansas.—*Bureau of Mines, Manufactures, and Agriculture. Eleventh biennial report, 1913, 1914. [No place, no date.] 366 pp.*

A report dealing with the mineral, industrial, and agricultural resources of the State. The first 64 pages are also printed separately.

California.—*Laws of interest to women and children; supplement 1913-1915. Compiled by the California State Library. Sacramento, 1916. 96 pp.*

The preface makes clear the nature of this booklet:

"This volume supplements, and should be used in connection with the first one on the subject published by the California State Library in 1912. The order of contents is that followed in the original volume. All amendments to the laws which come within the scope of the compilation and which were passed at the 1913 and 1915 sessions of the legislature are included, as well as several new enactments. These are of unusual interest to the women of the State as they were instrumental in having some of these laws, at least, placed on the statute books."

Kentucky.—*Department of Mines. Annual report for 1915, part 3: Methods of mining and preparation of coals for market in inspection district No. 3. [Frankfort, 1916.] 108 pp., plates.*

A description of mines in operation and a report on systems of mining, ventilation, drainage, roof protection, prevention of dust and gas accumulation and of fires; methods of mining, haulage, use of electricity, coal raising, tipples, grading and screening; and the preparation of so-called Elkhorn by-product coal, etc.

Massachusetts.—*Board of Retirement. Report of the State Board of Retirement, January, 1916. Boston, 1916. 12 pp.*

Contains the reports of the operations of the board in the payment of retirement allowances to superannuated employes of certain of the State departments during the year 1915. The report has been used in connection with a short article on civil-service retirement in Massachusetts on pages 113 to 117 of this number of the REVIEW.

Massachusetts.—*Minimum Wage Commission. Third annual report for the year ending December 31, 1915.* Boston, 1916. 143 pp.

The summary of this document will be found on page 57 of this number of the REVIEW.

————— *Wages of women in hosiery and knit-goods factories in Massachusetts.* Boston, 1916. 37 pp. (Bulletin No. 10, January, 1916.)

————— *Wages of women in paper-box factories in Massachusetts.* Boston, 1915. 38 pp. (Bulletin No. 8, September, 1915.)

The data contained in these two bulletins have been used in connection with an article on page 59 in this number of the REVIEW.

Michigan.—*Inspector of Mines. Dickinson County. Annual report from September 30, 1914, to September 30, 1915.* [No place, no date.] 27 pp.

————— *Gogebic County. Annual reports, September 1, 1913, to September 1, 1914; September 1, 1914, to September 1, 1915.* [No place, no date.] 68 pp.

These reports are principally descriptions of particular mine accidents in these counties. The report for Gogebic County contains instructions for the prevention of accidents.

New Jersey.—*Commission to investigate pensions for State and municipal officers and employees. Report; tabulation of pension laws of New Jersey, with additional New Jersey pension laws.* [No place, no date.] 14 pp.

"We agree with the findings of the Massachusetts commission [of 1914] that the retirement of the superannuated is necessary to improve the efficiency of the public service and that this can be the only legal justification for a pension system."

The commission did not recommend the enactment of any law for a pension system, but presented certain principles for future pension legislation: (1) that pensions be based on the average compensation of employees during at least the last 10 years of service; (2) that age of retirement be not less than 65 years except in cases of firemen and policemen; (3) that a minimum service of 20 years be required; and (4) that disability be compensated separately under the workmen's compensation act.

New Mexico.—*Department of Industrial Education. Annual report of the State director of industrial education to the superintendent of public instruction, 1915.* East Las Vegas, N. Mex. 218 pp., illus.

This constitutes the second annual report of the State director of industrial education and covers the period January 1, 1914, to June 30, 1915. The report consists of an account of the development and present status of industrial education, the organization of an industrial club, and other related subjects.

————— *State Mine Inspector. Fourth annual report for the year ending October 31, 1915.* Gallup. 46 pp.

The number of mines in operation was 53, employing 4,609 persons and producing 3,858,554 tons of coal. There were 980 coke ovens in operation, employing 255 persons. The approximate value of production was \$6,716,327, of which \$1,199,777 was of coke. There were 21 fatal and 185 nonfatal accidents reported for the year.

The report contains a reproduction of the mining laws of the State.

New York City.—*Commission on Pensions. Report on the teachers' retirement fund.* New York, 1915. 177 pp.

An outline of the history of the teacher's pension system and the development of the fund, present conditions, and recommendations for establishing an equitable and financially sound retirement fund.

The city has to meet obligations legally incurred for the retirement of 10,000 policemen and 5,000 firemen and assist in financing funds for the retirement of several other groups of employees, besides concerning itself in the retirement of 20,000 teachers; and there still remains unprovided for the great bulk of the city employees whose pensions are paid from the public funds upon incapacity after 30 years of service. If under these conditions the entire burden of teacher's retirement be placed upon the city, the cost would become burdensome and endanger the proposed benefits to be derived from the undertaking.

The following table is presented to show the relation of pensions to salaries as indicated by the city's experience with different retirement funds, 1905 to 1914:

GROWTH OF PENSION DEMANDS.

Pension fund.	Year established.	Proportion of pensions to pay roll during the years indicated.									
		1905	1906	1907	1908	1909	1910	1911	1912	1913	1914
Police.....	1857	11.35	11.31	12.11	12.09	12.17	12.35	13.04	14.46	15.73	16.16
Fire department.....	1871	11.81	11.32	11.33	11.29	11.59	12.09	13.05	14.38	13.85	14.08
Teachers' retirement.....	1894	.....	3.65	3.87	3.82	3.92	4.02	4.09	3.82	4.10	4.15
Health department.....	1894	1.60	1.50	2.33	2.31	2.62	2.69	2.82	3.25	3.86	5.92
Street-cleaning department.....	1911	.....	.....	.....	.....	.....	.....	.....	.38	2.44	3.49

The present plan of 1 per cent contribution from teachers' salaries will be utterly inadequate to meet the requirements of the system now in existence. The fund has been in existence for 21 years, with an ever-increasing deficiency. An appraisal made on the basis of the 1,521 pensions already in force and the value of prospective pensions to the teachers in the service on the close of the year June 30, 1914, showed a deficiency of \$54,743,320; that is to say, a reserve of that amount at 4 per cent compound interest would be required, together with other forms of income, in order to meet the prospective payments.

Attention is called to the necessity of an immediate reorganization and recommendations to that effect are made.

Actuarial tables were prepared covering all important phases of a retirement scheme.

The commission recommends the assessing of contributions, upon persons now in the service, ranging from 2.63 to 8 per cent, based upon age, sex, and length of service; upon new entrants, of from 2.52 to 4.53 per cent, based upon age and sex; and a permanent subsidy by the city of 3 per cent on annual pay rolls, together with an annual deficiency appropriation of \$1,233,220 for the next 60 years to wipe out the present deficiency.

Ohio (Cleveland).—*Department of Public Welfare. Annual report of the division of employment and immigration, department of public welfare of the city of Cleveland, for the year ending December 31, 1914. [Cleveland, 1915.] 31 pp.*

— *Report, 1915. [Cleveland, 1916.] Typewritten letterhead.*

The division of employment and immigration within the department of public welfare consists of the bureau of immigration, bureau of employment, and the bureau of vocational guidance. It is a consolidation of previously existing private and public agencies. The employment bureau is better known as the labor exchange, which is a State-city free employment bureau. The report for 1915 here listed covers only the work of the immigration bureau within the division.

"The real work of this division of employment is now just beginning, for it must work out the problem of how to organize the labor market to save the great loss of money and time to both employer and employee because of our present disorganized method of handling labor. In addition to this, the exchange will be compelled to study the great seasonal industries, to find wherein the mass of labor which each industry has shall be so regulated that it may not become a burden on the community when these seasonal trades close. Through not only its study but its efficient handling of men the State-city labor exchange is destined to become a powerful factor for good in community life—not during special crises, when the number of men employed is large, but during ordinary times, when business is normal. Through its records of the individual men who are given employment it will raise the type of labor to a marked degree, each man knowing that when he receives good marks from his former employer this will mean that a position will be more easily secured the next time he is out of work. This has been found to work out now in a practical way and will work out to a greater degree in the future as the records become more accurate and the references of the different men are looked up more thoroughly."

The vocational bureau is making special effort to direct young people into lines of employment which should have a future for them, and the employment bureau has been a factor in solving the problem of unemployment. A separate office has been opened for women and girls.

During its five months of existence 47,858 applications, including reregistrations, for work have been received by the exchange, 8,092 calls for help have been filed, and work secured for 6,608 persons. In the last four months the girls' division has placed 356 persons 16 to 21 years of age.

The immigration bureau meets arriving immigrants, assists them in adopting the best method of reaching their destinations, securing employment, etc., and maintains educational and citizenship classes, among other activities.

Pennsylvania.—*Penal Commission. Employment and compensation of prisoners in Pennsylvania. Report of the penal commission appointed under authority of an act approved July 25, 1915. Harrisburg, 1915. 112 pp.*

The commission was created to inquire into the advisability of amending the penal laws of Pennsylvania so as to provide for the employment of all inmates of all penal institutions, to consider the question of compensating prisoners for their work, and to report on the question of utilizing the products in the penal and charitable institutions of the State.

The commission submitted its report February 15, 1915, and in conclusion suggested the desirability of continuing its work for two years longer because of the limited time at its disposal.

The commission embodied its recommendations in a series of draft laws printed as Part II of its report. These draft laws provide for:

(1) Employment under the State-use system of the inmates of the Eastern Penitentiary, Western Penitentiary, and the Pennsylvania Industrial Reformatory at Huntingdon; (2) purchase of a moderate-sized farm to be used in connection with the Eastern Penitentiary; (3) opportunity for the county to employ the inmates at its institutions in the production of goods for the use of such county institutions or their inmates; (4) creation of six industrial farms for misdemeanants and the employment and compensation of the inmates; (5) modification of the existing wage system, as far as it is applicable to the Eastern Penitentiary, the Western Penitentiary, and the Huntingdon Reformatory, in such manner that the prisoner shall be credited with wages for the time he is actually engaged in work (the rate is to be regulated by the prison labor commission, but not to be less, in any case, than 10 cents nor over 50 cents for each day's work; three-fourths of the amount credited to a prisoner is to constitute a relief fund for such prisoner or his dependents); (6) creation of the administrative machinery necessary in the form of a penal labor commission for the introduction of the State-use system in the three institutions already mentioned.

Panama Canal Zone.—*Manual of information concerning employees for the Panama Canal service, revised April 27, 1916. Washington, 1916. 30 pp.*

Porto Rico.—*Department of Labor, Charities, and Correction. Fourth annual report. San Juan, 1916. 41 pp.*

A summary of the legislation enacted in 1913, 1914, and 1915, and of the agricultural strikes of 1915 and 1916, with recommendations of needed legislation on the following subjects: Homesteads; workmen's compensation; boiler inspection; minimum wages for women; legal protection for wages of workers; arbitration of labor disputes; housing of workmen and a minimum wage law for common labor on public works; right of organization; subsidy and tax exemption to encourage the establishment of a textile mill.

Activities of the inspection service and the results of investigations of complaints of refusal of employer to pay the wages are also given. Employment agency reports for the year ending December 31, 1915, show 473 applications for work and 217 persons recommended for positions, 72 having received employment.

The establishment of industrial schools is separately recommended.

United States.—*Bureau of Mines (Department of the Interior). Coal-mine fatalities in the United States, 1915. Washington, 1916. 80 pp.*

In addition to statistics of coal-mine fatalities in 1915 with comparisons for former years, this pamphlet contains a list of permissible explosives, lamps, and motors tested prior to January 1, 1916. A digest of its contents will appear in a future number of the REVIEW.

— *Department of Agriculture Yearbook, 1915. Washington, 1916. 616 pp.*

Contains principally a collection of monographs on different agricultural topics which have been of more or less importance during the year. In connection with its statistical tables, contained in the appendix, this volume introduces a table, prepared for the first time, showing the number of persons engaged in agriculture in various countries.

NUMBER OF PERSONS ENGAGED IN AGRICULTURE IN VARIOUS COUNTRIES.

Country.	Year.	Males.		Females.		Total persons engaged in agriculture.	
		Number.	Per cent of males in all occupations.	Number.	Per cent of females in all occupations.	Number.	Per cent of persons in all occupations.
United States ¹	1910	10,582,039	35.2	1,806,584	22.4	12,388,623	32.5
Algeria.....	1881	636,078	74.8	91,602	53.7	727,680	71.3
Argentina.....	1895	318,149	28.0	67,174	13.4	385,323	23.6
Australia.....	1901	377,626	29.5	39,029	11.1	416,655	25.6
Austria-Hungary.....	1900	8,185,250	58.5	5,935,805	70.3	14,121,055	63.0
Belgium.....	1900	533,665	23.6	163,707	17.6	697,372	21.9
Bolivia.....	1900					564,009	43.5
British India.....	1901	63,026,365	67.3	27,867,210	66.5	90,893,575	67.1
British North Borneo.....	1901					32,892	64.2
Bulgaria.....	1905	895,206	73.3	837,406	94.9	1,732,612	82.4
Canada.....	1901	707,997	45.4	8,940	3.7	716,937	39.9
Ceylon.....	1901	745,074	65.0	318,551	65.4	1,063,625	65.1
Chile.....	1907	448,546	50.3	21,877	6.2	470,423	37.7
Cuba.....	1907	364,821	52.2	3,110	4.2	367,921	47.6
Cyprus.....	1901	33,611	62.8	2,757	20.8	36,368	54.5
Denmark.....	1911	386,016	45.7	110,169	28.5	496,185	40.3
Egypt.....	1907	2,258,005	67.2	57,144	33.3	2,315,149	65.6
Federated Malay States.....	1901	115,027	28.2	52,324	82.7	167,351	35.5
Finland.....	1900	321,538	51.4	102,008	39.6	423,546	48.0
Formosa.....	1905	763,456	70.6	263,664	82.4	1,027,120	73.3
France.....	1906	5,452,392	41.9	3,324,661	43.2	8,777,053	42.4
Germany.....	1907	5,146,723	27.7	4,585,749	48.3	9,732,472	34.6
Greece.....	1907	321,120	47.3	6,972	12.2	328,092	44.6
Grenada.....	1901	8,816	57.1	7,722	49.7	16,538	53.4
Italy.....	1901	6,370,277	57.9	3,196,063	60.5	9,566,340	58.8
Jamaica.....	1911					271,493	66.1
Malta and Gozo.....	1901	10,235	13.3	3,613	15.8	13,848	13.9
Mauritius.....	1901	72,493	57.1	5,989	38.0	78,482	55.0
Netherlands.....	1899	490,694	32.9	79,584	18.4	570,278	29.6
New Zealand.....	1911	103,644	28.5	7,472	8.3	111,116	24.5
Norway.....	1910					307,528	33.4
Philippine Islands.....	1903	1,163,777	57.8	90,286	8.8	1,254,063	41.3
Porto Rico.....	1899	196,893	73.3	1,868	3.9	198,761	62.8
Portugal.....	1900	1,127,268	65.3	380,293	52.0	1,507,561	61.4
Russia:							
In Europe.....	1897	13,808,505	59.6	1,974,164	38.0	15,782,669	55.6
In Asia.....	1897	2,092,965	69.2	1,105,137	30.5	2,198,102	65.3
Total.....	1897	15,901,470	60.7	2,079,301	37.5	17,980,771	56.7
St. Lucia.....	1901					15,796	54.1
Serbia.....	1900	311,700	65.5	13,524	50.5	325,224	64.7
Sierra Leone.....	1901	8,705	28.7	4,544	21.7	13,249	25.9
Spain.....	1900	3,741,730	58.1	775,270	51.8	4,517,000	56.9
Sweden.....	1900	761,016	52.4	333,264	53.8	1,094,280	52.8
Switzerland.....	1900	392,971	37.1	80,326	16.1	473,297	30.4
Trinidad and Tobago.....	1901	51,744	54.7	25,765	39.3	77,509	48.4
Union of South Africa.....	1904	863,223	56.3	847,057	77.5	1,710,280	65.1
United Kingdom.....	1901	2,109,812	16.3	152,642	2.9	2,262,454	12.4

¹ Not including the District of Columbia. There have been deducted from the figures as given in the Thirteenth Census (vol. 4) persons engaged in forestry, lumbering, and fishing.—[Editor.]

United States.—*Geological Survey. (Department of the Interior.) Mineral resources of the United States, 1914. Washington, 1916. 2 vols. (Part I, Metals; Part II, Nonmetals.)*

Contains statistics of production, value of product, and prices in certain instances, of metal and nonmetal minerals mined in the United States during the year 1914. The data relating to coal have always been of value by reason of the labor data compiled in connection with their presentation.

The coal mines of the United States gave employment in 1914 to 763,185 men, of whom 179,679, or 23.6 per cent, were employed in the anthracite mines of Pennsylvania, and 583,506, or 76.4 per cent, in the bituminous mines. The average working time, 245 days, made by the anthracite workers was only exceeded in two other years, 1911 (246 days) and 1913 (257 days). The average time in the bituminous mines (195 days) was 37 days less than in 1913 and the lowest, except in 1908 (193 days), since 1896. The average number of days of employment for all of the coal workers in the United States was 207 days in 1914, which was 31 days less than in 1913 and the lowest since 1908. The average yearly tonnage of bituminous coal per man in 1914 was 724, as compared with 837 in 1913, and the yearly tonnage of the anthracite workers was 505, against 520 in 1913. The daily average for bituminous coal and lignite, however, was the highest on record, 3.71 tons, as compared with 3.68 in 1912, the previous high record. The daily average for anthracite, 2.06 tons, except for that of 1913 (2.02 tons), was the lowest since 1891, or in 23 years.

The apparent efficiency of the anthracite workers as indicated by these statistics has shown a tendency to decline since 1899, when the maximum of 2.50 tons per day was obtained. On the contrary, the average daily production by each employee in the bituminous mines has increased more or less uniformly through the 25 years for which these statistics have been compiled from 2.56 tons in 1890 to 3.71 in 1914, a gain in 25 years of almost 45 per cent. The apparent increase in the efficiency of the employees in the bituminous mines has been due in large measure, as shown elsewhere in this report, to the steady increase in the use of mining machines and to the increased ratio that machine-mined coal bears to the total bituminous production.

Wage agreements in the organized bituminous coal mining regions signed in 1912 expired in 1914. Strikes or suspensions occurred in nearly every district following the expiration of the old agreements, but for the most part the men returned to work pending a settlement, and, except in Ohio, these suspensions had little effect upon the total output.

— *Government Printing Office. Annual report of the Public Printer for the fiscal year ended June 30, 1915. Washington, 1915. 613 pp.*

This report contains, in addition to the annual report of the Public Printer, the twenty-first annual report of the Superintendent of Documents.

The total expenditures for maintenance, operation, and general expenses of the Government Printing Office, not including expenses of the office of the Superintendent of Documents, were \$6,155,621.25, a reduction of \$297,680.62 from the figures of the previous year.

As compared with the previous year, the average daily number of employees decreased by 126. Operating expenses and the computed value of product both decreased approximately 5 per cent.

In the emergency hospital room 2,647 medical and surgical cases were treated, and 1,166 wounds redressed in cases where the employees remained at work after being injured and did not apply for compensation. It is stated that approximately \$5,000 was expended during the fiscal year as compensation for injuries under the Federal compensation act of 1908.

A ventilating system, it is reported, was installed in the linotype section because it was realized that the employees were being endangered by the fumes and noxious gases arising from the molten metal in the linotype pots.

— *Public Health Service. Tuberculosis among industrial workers; report of an investigation made in Cincinnati, with special reference to predisposing causes. Washington, 1916. 143 pp. plates, folded tables. (Public Health Bulletin No. 73, March, 1916.)*

This bulletin will be reviewed in a future issue of the REVIEW.

FOREIGN COUNTRIES.

Cuba.—*Secretaria de Hacienda. Seccion Estadística. Inmigración y movimiento de pasajeros en el año 1915. Havana, 1916. 23 pp. folder.*

Report of the secretary of finance on immigration and passenger movement at Cuban ports, classified by sex, nationality, literacy, etc.

Ireland.—*Department of Agriculture and Technical Instruction. Agricultural statistics, Ireland, 1914: Report and tables relating to Irish agricultural laborers. London, 1915. 35, [1] pp.*

This pamphlet gives statistics of numbers employed and wages of Irish agricultural laborers in 1914.

The total number of agricultural laborers available in Ireland in 1911 was 199,900, as compared with 231,871 in 1901. For the same years the number of available general laborers was 102,099 and 79,035, respectively. The number of persons in Ireland who migrated each year for agricultural work, it is reported, has fallen off considerably in recent years. The number was approximately 13,000 in 1914, 15,000 in 1913, 16,000 in 1912, while in 1900 it was 32,000.

Weekly wages of male agricultural laborers who do not live in free cottages or receive allowances of any kind were as follows:

Plowmen, 13s. to 15s. (\$3.16 to \$3.65).

Cattlemen, 11s. 6d. to 13s. 6d. (\$2.80 to \$3.28).

General laborers, 11s. to 13s. (\$2.68 to \$3.16).

Boys, 8s. to 9s. 6d. (\$1.95 to \$2.31).

These data are applicable for the whole of Ireland, and it should be remarked that there are considerable variations as between the different counties.

The working hours for agricultural laborers during the six months, May to October, are usually from 7 a. m. to 6 p. m., with an hour's rest for dinner; in winter the working period extends from light to darkness. Plowmen and cattlemen ordinarily have the longest hours, having to come earlier and to remain longer than the less skilled workers.

Germany.—*Statistisches Amt. Bewegung der Bevölkerung im Jahre 1912. Berlin, 1916. 52, 183 pp. (Statistik des Deutschen Reichs, Band 266.)*

This volume forms the continuation of a statistical series, begun in 1872, on the movement of population in Germany. Besides statistics concerning births, deaths, and marriages during 1912, the volume contains statistics of emigration for the year 1913.

During 1913 a total of 25,843 persons, or 39 per 100,000 of population, emigrated from Germany. During the 10-year period 1904–1913 the rate of emigration varied between 28 and 51 per 100,000 of population. Of the total for the year 1913, 19,124, or 74 per cent, emigrated to the United States.

Great Britain.—*Board of Trade. Handbooks on London trades: Leather, fur, brush making, and feather trades. London, 1915. 30 pp.*

This is one of a series of handbooks issued for the information of young persons that expect to become wage earners. It aims to show the opportunities available for employment in any particular industry, and sets forth the qualifications necessary for entrance into the trade, the amount of trade training necessary for its pursuit, and other information of value to the prospective wage earner.

— — — *Statistical abstract for the United Kingdom in each of the last 15 years from 1900–1914. Sixty-sixth number. London, 1915. 431 pp.*

A summary of the principal statistical data for the United Kingdom.

— — — *Home Department. Coal Mine Organizations Committee. Second general report of the departmental committee appointed to inquire into the conditions prevailing in the coal-mining industry due to the war. London, 1916. 33 pp.*

The first general report of this committee was issued early in 1915, and a summary of it may be found in the REVIEW for July, 1915 (vol. 1, No. 1, pp. 56–58). The

second general report listed above will be discussed in a future number of the REVIEW.

Great Britain.—*India Office. Statistical abstract relating to British India. 1904-5 to 1913-14. Forty-ninth number. London, 1916. 285 pp.*

Among the statistical tables are found data relating to the number, members, financial position, etc., of cooperative societies; wage rates of postal runners and postmen; also of employees in a woolen mill in northern India; average wage rates of agricultural employees and of certain occupations in the building trades.

Wholesale and retail prices, particularly of food grains and of staple articles of export and import, are also included.

— *Local government board. Forty-fourth annual report, 1914-15. London, 1916. 2 vols.*

Part I contains an administrative report of the poor law, the unemployed-workmen act, old-age pension act, and a report on special work arising as a result of the war in the prevention and relieving of distress, care of war refugees, etc. Part II relates to housing and town planning.

Notwithstanding the situation created by the war, the report states, the total number of persons in receipt of poor relief in England and Wales was smaller at the end of the fiscal year 1915 than at the end of the preceding year—652,152, as compared with 672,120.

Likewise the operations of the so-called distress committees which furnish situations for the unemployed, as well as provide relief work, were on a smaller scale than in previous winters. The number of pensioners in the United Kingdom on March 26, 1915, was 987,238, an increase of 0.3 per cent over the preceding year.

During the year urban and rural authorities have sanctioned housing loans to the amount £1,125,176 (\$5,475,669), of which, however, a very small amount will be available during the continuance of the war. These sums provide for the purchase of 730 acres of land and the erection of 4,407 dwellings or tenements and a common lodging house, of which 245 acres of land and 1,144 houses are in rural districts.

The following table shows the amount of loans and the number of houses erected since December 3, 1909:

NUMBER AND AMOUNT OF LOANS AUTHORIZED FOR THE ERECTION OF HOUSES, 1910 TO 1915.

Year ending Mar. 31—	Urban authorities.			Rural authorities.			Total.		
	Number of author- ities.	Amount of appropri- ations.	Houses to be built.	Number of author- ities.	Amount of appropri- ations.	Houses to be built.	Number of author- ities.	Amount of appropri- ations.	Houses to be built.
1910.....	2	\$65,844	78	1	\$1,314	.....	3	\$67,158	78
1911.....	12	493,181	464	1	1,216	.....	13	494,397	464
1912.....	29	980,921	882	16	133,561	139	45	1,114,482	1,021
1913.....	46	1,634,536	1,549	22	289,834	331	68	1,924,370	1,880
1914.....	79	2,753,758	2,465	45	942,057	872	124	3,695,815	3,337
1915.....	110	4,197,069	3,264	72	1,278,600	1,144	182	5,475,669	4,408

¹ Including 1 lodging house.

— (London).—*County council. Annual report of the Council, 1914. Vol. 3: Public health (including the report of the county medical officers of health and school medical officers, main drainage, housing of the working classes). London [1916?], iii, 155, viii pp.*

That portion of the report concerning housing conditions of the working classes summarizes the work accomplished and that in progress.

Cottages capable of accommodating 191 persons were completed during 1914, at an approximated cost for building and plans of £7,701 [\$37,477]. The erection of new

cottages designed to accommodate 785 persons, and other works incidental to the development of the various estates were undertaken, the total cost of which is estimated at £33,641 [\$163,714].

The council's dwellings on December 31, 1914, contained accommodations for 57,387 persons, on the basis of two persons in a room.

The total expenditure on capital account on the council's working-class dwellings and estates up to March 31, 1915, amounted to £3,056,646 [\$14,875,168]. This does not include liabilities under contracts for buildings in course of erection. The capital expenditure during 1914-15 amounted to £34,733 [\$169,028].

A memorandum prepared by the housing manager states that 76 cottages, providing accommodations for 580 persons, were completed and opened between April 1, 1914, and March 31, 1915. Up to March 31, 1915, a total of 6,420 tenements in blocks and 3,402 cottages, containing altogether 28,252 rooms, and 1,874 cubicles in lodging houses, had been provided and opened. Accommodation was thus provided for 57,942 persons. The gross rent receivable for the year was £228,369 8s. 4d. (\$1,111,360). The surplus, after providing for interest and sinking fund charges on the capital expended, is £12,625 10d. (\$61,440), which, after adding interest on cash balances, and differences between totals of debt charges on cash and stock basis and deducting increases in salaries granted on war allowances, gives a net surplus of £16,488 17s. 7d. (\$80,243), or 7.2 per cent of gross rental. The interest and sinking fund charges amounted to 49.2 per cent of gross rental. The sinking fund which will redeem the capital expended on lands and buildings within a period of 60 years was increased by £27,174 18s. 4d. (\$132,247), and now amounts to £260,377 11s. 5d. (\$1,267,127), and the unexpected accumulations to the repairs and renewal fund amount to £67,027 17s. 3d. (\$326,191). During the year £22,400 7s. 1d. (\$109,011) was spent for repairs. A census of the council's dwellings taken in March, 1915, showed that the average number of persons per room was 1.27.

Netherlands.—*Directie van den Arbeid. De Arbeid van vrouwen en meisjes in het winkelbedrijf, benevens eenige mededeelingen omtrent dit laatste. Uitgegeven voor rekening van het Departement van landbouw, nijverheid en handel. The Hague, 1915. vii, 80 pp.*

A report of an investigation of the conditions of labor of female persons in stores and small shops in the Netherlands. The report is presented under 10 heads: General summary; hours of labor, and earnings; closing hours; food and lodging; Sunday rest and holidays; hygienic conditions; age and social position of female shop employees; general information; conditions in Rotterdam and The Hague; and conclusion.

The investigation covered 2,482 shops and stores, employing 5,855 female persons. Five groups of shops were recognized: Manufacturing shops; bakeries and confectioneries; household notion shops; books and stationery; and jewelry shops.

There were 5,133 persons working less than and 722 working more than 13 hours per day. Monthly wages were as follows:

MONTHLY EARNINGS OF FEMALE EMPLOYEES IN STORES AND SHOPS IN THE NETHERLANDS.

	Under 8 florins (\$3.22).	8 to 12 florins (\$3.22 to \$4.82).	12 to 20 florins (\$4.82 to \$8.02).	20 to 30 florins (\$8.02 to \$12.06).	30 to 40 florins (\$12.06 to \$16.08).	Over 40 florins (\$16.08).	Total.
With board.....	108	323	591	370	126	66	1,584
Without board.....	513	525	940	991	584	718	4,271
Total.....	621	848	1,531	1,361	710	784	5,855

Netherlands.—*Rijksverzekeringsbank. Verslag omtrent den staat der Rijksverzekeringsbank en hare werkzaamheden in het jaar 1914. The Hague, 1916. 239, vii pp. Folded tables and diagrams.*

This is a report for the year 1914 of the State insurance bank organized for the administration of the Dutch compensation act of 1901. Compensation is payable for accidents in the course of employment causing death or disability for over two days; the act covers practically all manufacturing, mining, quarrying, building, and engineering enterprises, and all establishments using power or handling explosive materials, together with transportation and fishing in internal waters; but agriculture is excluded. All workmen, both in private and public employment, are included. During the year 1914 there were established 75,006 accidents subject to compensation, as compared with 82,703 in 1913, 76,496 in 1912, 68,485 in 1911, and 62,963 in 1910. The total number of accidents reported was, however, larger in each year by from 4 to 5 per cent.

Of the accidents compensated in 1914 and for which compensation had terminated on July 1, 1915, 18,747 were compensated for less than 2 days, 50,488 from the second to the forty-second day, 3,888 for more than 42 days, 536 for total or temporary disability, and 293 for death; and in the case of 1,052 accidents compensation had not terminated on the above date, while in two cases final decision as to the amount and character of the compensation had not been made.

AMOUNT PAID IN BENEFITS (MEDICAL COSTS, BURIAL EXPENSES, ACCIDENT COMPENSATION TO DEPENDENTS, ETC.), CLASSIFIED BY INSURANCE CARRIERS UNDER THE DUTCH COMPENSATION ACT, 1905 TO 1914.

Year.	State insurance bank.	Employers carrying own risk.	Stock companies.	Total
1905.....	\$266,429.81	\$37,543.78	\$534,557.84	\$838,531.43
1910.....	604,290.31	46,824.67	661,634.35	1,312,749.34
1911.....	648,024.89	56,568.76	738,967.18	1,443,560.83
1912.....	709,039.21	66,074.41	840,804.88	1,615,918.50
1913.....	757,056.07	75,677.38	971,140.67	1,803,874.11
1914.....	752,866.33	83,903.18	1,003,300.88	1,840,070.39

COST OF ADMINISTRATION OF THE COMPENSATION ACT OF, 1901.

Year.	Total.	State portion.		Stock companies and associations.		State insurance bank.	
		Amount.	Percent of total.	Amount.	Percent of total.	Amount.	Percent of total.
1905.....	\$391,369	\$100,720	25.73	\$111,485	28.49	\$179,164	45.78
1910.....	492,031	185,181	37.64	160,765	32.67	146,085	29.69
1911.....	519,514	198,356	38.18	181,806	35.00	139,352	26.82
1912.....	544,539	209,952	38.55	197,804	36.33	136,783	25.12
1913.....	572,520	221,959	38.77	224,560	39.22	126,001	22.01
1914.....	583,084	226,827	38.90	239,695	41.11	116,562	19.99

New Brunswick.—*Factory Inspector. Report for the year ending December 31, 1915.*

New Zealand.—*Registrar General's Office. The New Zealand Yearbook, 1915. Twenty-fourth year of issue. Wellington, 1915. 1,004 pp.*

Contains in text and tabular form information concerning the economic, political, social, legal, and educational conditions in New Zealand. It is divided into 33 sections together with a supplement on topics of special interest. Contains considerable matter of interest to labor.

Ontario.—*Bureau of Labor. Sixteenth report for the year ending December 31, 1915. Toronto, 1916. 267 pp., illus.*

Among the subjects with which this report concerns itself are the operations of the free employment bureaus; wages and hours of labor as reported by trade-unions and by manufacturers; cooperative societies; labor legislation; trade disputes; and municipal and public utility statistics. There is also contained in the report a directory of labor organizations in Canada.

Sweden.—*Statens Livsmedelskommission. Folknäringens tryggande under rådande kris. Stockholm, 1915, 1916. 2 vols.*

These two volumes contain the report of the State commission on the conservation of the food supply during the war as affecting Sweden from the time of its organization, November 8, 1914, to December 31, 1915. A summary of the report may appear in a future number of the REVIEW.

Western Australia.—*Registrar of Friendly Societies. Report of proceedings for the year ending June 30, 1915. Perth, 1916. 27 pp.*

This is a report under the authority of various acts concerning the membership and financial data of mutual benefit societies and related associations. It includes reports under the Friendly Societies Act of 1894, Benefit Building Societies Act of 1863, Cooperative and Provident Societies Act of 1903, Workmen's Compensation Act of 1912, and the Truck Act of 1899.

OFFICIAL PERIODICAL PUBLICATIONS RELATING TO LABOR.

LABOR DEPARTMENTS AND BUREAUS.

Denmark.—*Statistiske Efterretninger udgivet af det Statistiske Department. Copenhagen.*

April 3, 1916 (Vol. 8, No. 5).—Special live stock census, February, 1916; Retail prices, March, 1916; Unemployment, January, 1916.

April 19, 1916 (Vol. 8, No. 6).—Consumption of alcohol, 1915; Production and consumption of oleomargarine, 1915; Production and import of cigarettes, 1915; Retail prices, April, 1916; Population of the Faroe Islands, February, 1916; Index number of the Economist.

Finland.—*Arbetsstatistisk Tidskrift utgivet af Industristyrelsen Finland. Helsingfors.*

No. 1, 1916.—Retail prices (text statement), 1915; Employment conditions in the lumber industry; Recent labor legislation in Norway; Reports from foreign countries; Maximum government prices, December 5–11, 1915; Tables of prices, fourth quarter, 1915.

No. 2, 1916.—Relative sphere of State factory inspection and inspection of the hand working trades by municipalities; Mutual benefit societies of workmen, 1914; Industrial accidents, 1913; Employment office placements, fourth quarter, 1915.

Germany.—*Reichs-Arbeitsblatt, herausgegeben vom Kaiserlichen Statistischen Amte, Abteilung für Arbeiterstatistik. Berlin.*

March, 1916.—Labor market in Germany, February, 1916; Labor market in foreign countries (Great Britain, Switzerland, Norway, United States); State of employment in Germany in February, 1916, according to reports from various industries and from sick funds; Unemployment in German trade-unions, February, 1916; Unemployment in foreign countries (Austria, July to October, 1915; Netherlands, December 1915); Labor market in Germany, middle of February to middle of March, 1916, according to reports of free employment offices; Activities of free employment offices, February, 1916; Social welfare work for war invalids (continued); Refunding of building loans on workmen's dwellings in the district of the State insurance institute of the Rhine Province by means of life insurance; Labor disputes in Germany, fourth quarter, 1915; Financial reports of German savings banks, 1915, January, 1916; German invalidity and survivors insurance, 1914; Decisions of industrial courts; Statistical tables of the labor market.

Great Britain.—*The Board of Trade Labor Gazette. London.*

April, 1916.—Employment chart; The labor market; Special articles on—Employment in Germany in February; Retail food prices in the United Kingdom, Berlin, Italy, and Australia; War and wages in France; Cooperation in agriculture in 1914; Small holdings and allotments societies; Industrial fatigue; Output of coal in the United Kingdom; Argentine workmen's compensation act; Labor in the British dominions oversea and in foreign countries—Canada, Australia, Russia, Austria-Hungary, Norway, Sweden, Denmark, United States; Board of trade labor exchanges; Statistical tables: Trade disputes; Changes in rates of wages; Sliding scale changes in wages; Prices of wheat, flour, and bread; Diseases of occupations; Fatal industrial accidents; Building plans; Unemployment insurance; Pauperism; Foreign trade; Distress committees. Legal cases; Recent conciliation and arbitration cases; Trade boards act, 1909; National insurance acts, 1911–1915; Appointment of certifying surgeons; Publications relating to labor received during March.

Italy.—*Bollettino dell' Ufficio del Lavoro. Ministero di Agricoltura, industria e commercio. Rome. (Monthly.)*

November–December, 1915.—Labor disputes in Italy, third quarter, 1915; Statistics of employment on public works, second quarter, 1915; Retail prices of foodstuffs and other articles of general consumption sold by cooperative stores, August, September, and October, 1915; Legislation and demands of workmen's organizations in Canada in the matter of social hygiene; A model factory (National Cash Register Co., Dayton, Ohio) from the viewpoint of industrial hygiene; Workmen's housing in Sweden; Report of the United States Commission on Industrial Relations; Court decisions affecting labor.

————— (*Semimonthly.*)

April 1, 1916.—Labor market, by localities and industries; Labor disputes, February and first half of March, 1916; Employers' and employees' associations; Congresses and conventions; Retail prices and index numbers of foodstuffs in Italian cities, first six months, 1914, and February, 1916; Retail prices of foodstuffs in foreign countries—Great Britain (increase in March, 1916, over July, 1914); Germany, Berlin (increase in January, 1916, over July, 1914). Establishment of a provincial labor office in Milan; Activities of the labor office. Legislation: Decree, March 16, 1916, providing temporary restrictions on the issuance of passports; Regulations for the application of the decree, January 2, 1916, authorizing the Government to extend military discipline to dock labor at Italian seaports; Enforcement of social legislation; Court decisions affecting labor.

April 16, 1916.—Labor market by localities and industries; Labor disputes, second half of March, 1916; Employers' and employees' organizations; Congresses and conventions; Miscellaneous announcements; Activities of the labor office; Decree, March 30, 1916, limiting during the war the production and sale of steel, iron, cast iron, and other metals; Enforcement of social legislation; Occupational diseases in England.

Netherlands.—*Maandschrift van het Central Bureau voor de Statistiek. The Hague.*

February, 1916.—Review of the labor market, January, 1916; Fisheries and dock labor, and employment of interned soldiers, February, 1916; Unemployment, and unemployment benefits, January, 1916; Unemployment in the building trades, November and December, 1915, and January, 1916; Labor exchanges, 1915 and January, 1916; Strikes and lockouts, 1915, and January, 1916; Working conditions on public works; Collective agreements; Wage increases; Employers' and employees' organizations; Wholesale prices, 1913 to February, 1916; Retail prices (index numbers), 1913 to 1915 and January, 1916; Coke prices, 1914, 1915, and January, 1916; Number and classes of passports issued; Emigration to Egypt; Court decisions. Miscellaneous reports on housing, public contracts awarded, inspection of labor on vessels in Dutch ports, accidents, invalidity pensions, etc. International: Résumé of war measures (Germany, Denmark, Great Britain, Russia, Greece, Rumania); Labor market in foreign countries (Denmark, France, Great Britain, Norway, Austria, Switzerland); Labor exchanges (Finland, Great Britain, Austria, Sweden, Switzerland); Strikes and lockouts (Great Britain, January, 1916; Italy, December, 1915). Wholesale and retail prices in foreign countries (Finland, Great Britain, Italy, Austria, Switzerland); Factory inspection in Great Britain and Ireland, 1914. Statistical tables relating to the labor market, housing, insurance, hours of labor, labor exchanges, and public finance.

New York.—*The bulletin issued monthly by the New York Industrial Commission. Albany.*

April, 1916.—Commissioner Lynch's interpretation of rule No. 2 regarding fire escapes in factories and other places of work; Annual report (summary) on workmen's compensation, 1915; Strikes mediated; Cost of accidents under the State fund;

Anthrax conference; Decisions of the Commission and of the Appellate Court affecting labor; Variations from the Code granted by the Commission; The labor market; Factory inspections.

New Zealand.—*Journal of the Department of Labor.* Wellington.

February, 1916.—Condition of employment and trade, January, 1916; Reports of the women's employment exchange branches; Reports from trade-unions; Recent legal decisions affecting labor in Great Britain; Statistics of registration of unions under the industrial conciliation and arbitration act, changes titles of unions, employment, cooperation, accidents, current retail prices, and prices for the quarter ending December, 1916; Labor conditions in other countries (Great Britain Board of Trade Labor Gazette).

March, 1916.—Conditions of employment and trade, February, 1916; Reports from the women's employment offices; Reports from trade-unions; Recent legal decisions; Legal decisions affecting labor in Great Britain; Days designated for the closing of shops for year ending February 28, 1917; Statistical tables on situations filled, cooperative works, industrial accidents, trade-unions registered, retail prices, etc.; Employment in Great Britain, 1915; Welfare supervision in munition works in Great Britain; Industrial arbitration legislation in Norway.

Norway.—*Sociale Meddelelser utgit av Socialavdelingen under Departementet for Sociale Saker, Handel, Industri og Fiskeri.* Christiania.

No. 1, 1916.—Retail prices, January and February, 1916; Increased cost of living in Christiania; Effect of recent high prices upon consumption; Labor market January and February, 1916; Public employment office placements, April to December, 1915; French minimum wage law for home workers in the clothing industry; Interior colonization in the United States.

Supplement, No. 1, 1916, prepared by the State Insurance Institute, consisting of miscellaneous reports from the institute.

Pennsylvania.—*Monthly Bulletin of the Pennsylvania Department of Labor and Industry.* Harrisburg.

March, 1916 (Vol. 3, No. 3).—Cooperation between labor and government; Occupations involving exposure to extremes of temperature, excessive moisture, and abnormal air pressure; Fire hazards from electricity. Hints for safety of employees: Timely hints on safety from fire; Timely hints for electricians; Timely hints for woodworkers; Timely hints for repairmen. Boiler explosion caused by neglected safety valve; Preventable accidents; Safeguarding structural-steel workers in office building erection; Motion pictures teach safety; A misdemeanor to carry matches into a powder mill; Conference on industrial diseases; Bureau of inspection; High record of 1916 accidents reported to the bureau of statistics and information; The division of municipal statistics of the bureau of statistics and information; Production reports; Occupations of women in Pennsylvania; Supervision of private agencies by the bureau of employment of the department of labor and industry; Schedule of merit rating as applied to Pennsylvania workmen's compensation insurance; Bulletin issued by the workmen's compensation board.

Spain.—*Boletín del Instituto de Reformas Sociales. Publicación Mensual.* Madrid.

March, 1916.—Report of the secretary's office and the special divisions: Industrial accidents occurring in 1914; Statistics of labor disputes; Conditions prevailing in the rice-growing district in the province of Valencia. Social progress; Legislation: Postal savings bank regulations; Limiting the maximum income from low-cost dwellings. War measures passed in different countries (Germany, continued); Norway, Law, August 6, 1915, providing for State intervention in industrial disputes; Germany, strikes and lockouts, August 1, 1914, to July 31, 1915; Great Britain, strikes in December, 1915.

Sweden.—*Sociala Meddelanden utgivna av K. Socialstyrelsen. Stockholm.*

No. 2, 1916.—The labor market, January, 1916; Reports on employment conditions from employers, fourth quarter, 1915; Unemployment among trade-unions, October 1, November 1, December 1, 1915; State and municipal war measures; Cost of living in Stockholm, 1904–1915; Repeal of decree of April 10, 1915, granting unemployment aid to tobacco workers; Restrictions on the sale of wines and other spirituous liquors; Activities of the factory inspectors, October to December, 1915; Fatal industrial accidents; Brief notices (mainly from foreign countries); Public employment exchanges, January, 1916; Retail prices and cost of living, 1905 to January, 1916; Live-stock prices, 1905 to January, 1916; Live-stock supply at public slaughterhouses, January, 1916; Estimated consumption from public slaughterhouses in certain localities; Fish prices in Stockholm and Gothenburg, January, 1915, 1916.

No. 3, 1916.—Labor market, February, 1916; State and municipal war measures; Public employment office reports, 1915; Working conditions, hours and wages among Swedish agricultural laborers, 1914; Building activity in the larger towns of Sweden, 1912–1915; Proposed law on the administration of the pension fund; Report of the State insurance institute, 1914; Hours of labor in barber and hair-dressing establishments; State subsidy to lecture associations for extension courses, 1916; Strikes and lockouts in Sweden, fourth quarter, 1915; Reports of labor inspectors concerning fatal industrial accidents; Reports of the State industrial commission; Collective agreements in Denmark; Labor disputes in Finland, 1913 and 1914; Employment offices for salaried employees; Housing in Gothenburg, etc.; Swedish employment office reports, February, 1916; Retail prices and cost of living, 1905 to February, 1916; Live-stock prices, 1905 to February, 1916; Live-stock supply at public slaughterhouses, February, 1916; Estimated consumption at public slaughterhouses in certain localities, February, 1916; Fish prices in Stockholm and Gothenburg, February, 1915, and February, 1916; Farm prices, November, 1915.

International Labor Office (Basel, Switzerland).—*Bulletin des Internationalen Arbeitsamtes. Jena.*

(The German edition of this bulletin, which appears also in French and English, is the earliest published and its contents are therefore here listed.)

Nos. 11 and 12, 1915.—Analyses of the text in Nos 7 to 10; Contents and index of Volume XIV, January–December, 1915; Bibliography.

Nos. 1 and 2, 1916.—National labor legislation—**France:** Decree, September 24, 1915, regulating the application of the law of July 10, 1915 (wages of female home workers in the clothing industry); Circular, October 25, 1915, of the minister of labor relating to the employment of juvenile workers under 16 years of age at circular and band saws. **French Colonies, Tunisia:** Decree, June 15, 1910, regulating labor in industrial and mercantile establishments; Decree, June 15, 1910, regulating the employment of male juvenile workers under 16 years of age in underground work in mines and quarries; Decree, June 15, 1910, regulating the payment of wages of workmen and salaried employees; Decree, June 15, 1910, promulgating the international convention on prohibition of the use of white phosphorus in the match industry. **Greece:** Law, March 26/April 8, 1914, relating to the payment of wages of workmen and salaries of employees; Royal decree, May 28/June 10, 1914, regulating the hours of labor in tobacco storage houses and factories; Royal decree, October 31/November 13, 1914, amending the preceding decree; Royal decree, December 24/January 6, 1915, amending the decree September 14/27, 1912, relating to the hours of labor in bakeries. **Luxemburg:** Resolution, June 16, 1914, conditionally abrogating in favor of German citizens articles 37 and 47 of the old-age and invalidity insurance law; Resolution, August 21, 1914, regulating the application of articles 4, 5, 6, 8, and 9 of the law of August 21, 1913, providing a weekly day of rest for workmen and

employees; Law, December 14, 1914, amending the law, May 29, 1906, relating to low-cost dwellings. **Panama:** Law No. 6, 1914, regulating the labor of workmen and mercantile employees. **Netherlands:** Law, June 19, 1915, amending the safety law; Resolution, July 2, 1915, containing the text of the amended safety law. **Sweden:** Royal decree, December 31, 1912, prohibiting the employment of minors at specified dangerous occupations. **Switzerland:** Circular, October 12, 1915, of the Federal Council to the cantonal governments relating to the provisions to be enacted by the Cantons for the application of the new factory law. **Uruguay:** Law, November 17, 1915, fixing for the entire territory of the Republic the daily hours of labor of workmen, employees, etc., at eight hours. **War measures:** German Empire, Prussia, Austria, France, Great Britain and Ireland, Greece, Luxemburg, and Switzerland.

MISCELLANEOUS.

Austria.—*Ämtliche Nachrichten des k. k. Ministeriums des Innern betreffend die Unfall- und Krankenversicherung der Arbeiter.* Vienna.

March, 1916.—Accident insurance: Accident insurance of war prisoners; Discontinuance of invalidity pensions from a miner's fund during receipt of an accident pension; Decisions of the administrative court; Decisions of the courts of arbitration of workmen's accident insurance institutes. Sickness insurance: Instructions for the annual accounting of sick funds; Decisions of the administrative court.

Germany.—*Ämtliche Nachrichten des Reichsversicherungsamts.* Berlin.

February 15, 1916.—Report of the Imperial Insurance Office for the year 1915.

March 15, 1916.—Accident insurance: Circular, December 4, 1915, of the Imperial Insurance Office to the trade accident associations containing instructions as to the method of accounting for purchases of war bonds with funds of the associations; Notice, December 20, 1915, as to approval of safety regulations during the fourth quarter, 1915; Notice, December 23, 1915, as to approval of risk tariffs during the fourth quarter, 1915; Notice, February 11, 1916, containing a list of those unions of communes which are under the jurisdiction of the State insurance offices and not under that of the Imperial Insurance Office; Decisions of the decision senates; Other decisions. Sickness, invalidity, and survivor's insurance: Notice by the imperial chancellor, December 23, 1915, as to the computation of military service and the maintenance of claims in the invalidity and survivors' insurance; Notice of the imperial chancellor, January 7, 1916, regulating the reporting of maternity benefits paid during the war by miners' sick funds; Circular, February 8, 1916, of the Imperial Insurance Office showing for each insurance carrier of the invalidity insurance system the number of annually awarded, expired, and current invalidity sickness, old-age, and survivors' pensions; Decisions on appeals; Decisions of the decisions senates; Other decisions; Disbursements of the invalidity insurance institutes, November and December, 1915, for pensions and benefits to insured persons and their survivors; Receipts from the sale of contribution stamps, December, 1915, and January, 1916.

**UNOFFICIAL PUBLICATIONS RELATING TO LABOR RECEIVED
BY THE LIBRARY OF THE BUREAU OF LABOR STATISTICS,
APRIL 1—MAY 15, 1916.**

- Alexander, Magnus W. The physician in industry. Issued by the conference board of physicians in industrial practice. [n. p.] 1916. 12 pp.
- American Federation of Labor. List of organizations affiliated with the American Federation of Labor. Mar. 10, 1916. [Washington, D. C.] 1916. 51 pp.
- Trades-union official journals and labor papers received at headquarters of the American Federation of Labor. Feb., 1916. [Washington, D. C.] 1916. 12 pp.
- Organizers, American Federation of Labor, Mar. 20, 1916. [Washington, D. C.] 1916. 43 pp.
- Metal trades dept. Proceedings of the seventh convention, San Francisco, Nov., 1915. Washington, D. C., 1915. 57 pp.
- Union label trades dept. Proceedings of eighth convention, San Francisco, Nov., 1915. Washington, D. C., 1915. 52 pp.
- American Foundrymen's Association. Committee on industrial education. Abstract of the report for 1915. 11 pp.
- Association des industriels de France contre les accidents du travail. Bulletin . . . no. 27, année 1916. Paris, 1916. 59 pp.
- British Association for the Advancement of Science. Draft interim report of the conference to investigate into outlets for labor after the war. Manchester, 1915. 82 pp. (See summary elsewhere in this issue of the REVIEW, pp. 91-101.)
- The question of fatigue from the economic standpoint. Interim report of the committee consisting of Prof. J. H. Muirhead [and others]. Manchester, 1915. 67 pp.
- Burlington (Vt.) Committee on Social Survey. A survey of the city of Burlington, its charities and housing conditions. [Burlington, 1915.] 85 pp.
- Colorado Fuel and Iron Co. Medical and sociological departments. Thirty-fourth annual report. Pueblo, Colo., 1915. 31 pp.
- Committee for immigrants in America. Professional course for service among immigrants; prepared for the use of colleges and universities, schools of civics and philanthropy, to fit men and women for service among immigrants. N. Y., Committee for immigrants in America [1915]. 24 pp.
- Commons, John R., and Andrews, John B. Principles of labor legislation. New York and London, Harper & Bros. [1916].
(An extended review of this book will appear in the July number of the REVIEW.)
- Consumers' League of Eastern Pennsylvania. Fifteenth annual report for the year ending Dec. 31, 1915. Philadelphia, 1916. 41 pp.
- Daudé-Bancel, A. Le mouvement ouvrier français et la guerre. Paris, Révière, 1915. 57 pp.
- Day, William A. Group insurance, its aims and its field. [N. Y., 1913.] 6 pp.
- Empire State Vocational Conference Bulletin. v. 1, no. 5. (Albany-Schenectady conference. Feb. 19-20, 1915.) 25 pp.
- Frankel, Lee K. Community sickness survey, Rochester, N. Y., Sept., 1915. Washington, 1916. 16 pp. (Reprint No. 326 from the Public Health Reports, Feb. 25, 1916.)

Frankfurter, Felix, and Goldmark, Josephine. *Franklin O. Bunting v. The State of Oregon*. In error to the Supreme Court of the State of Oregon. Brief for defendant in error. v. 1-2. New York [1916]. 2 v. and index.

(A review of this brief appears elsewhere in this number of the REVIEW, pp. 23-29.)

Gantt, H. L. *Industrial leadership*. New Haven, Yale Univ. press, 1916. 128 pp. Page lectures.

Suggests methods of training for industrial leadership.

Gilbreth, Frank B. *Fatigue study, the elimination of humanity's greatest unnecessary waste; a first step in motion study*. N. Y., Sturgis, 1916. 159 pp.

The book outlines methods of fatigue study and possible means of eliminating or minimizing fatigue.

Glass, Walter M. *The law of workmen's compensation*. Rochester, N. Y., The Lawyers' Cooperative Publishing Co., 1916. 566 pp.

A topical treatment of existing law on workmen's compensation; contains analysis of about 2,000 English decisions in addition to 350 decisions already rendered in this country; was prepared primarily for use as one of the annotations in the Lawyers' Reports, Annotated.

Gowin, Enoch B., and Wheatley, William A. *Occupations. A textbook in vocational guidance*. Boston, Ginn [c1916]. 357 pp.

Hudson, W. G. *Acid accidents*. [n. p., n. d.] 13 pp.

— *Further studies on acid fume poisoning*. Wilmington, Del., c1911. 10 pp.

— *Precautions against lead poisoning*. [n. p., n. d.] [4] pp.

Hughes, Florence. *Sociological work of the New Jersey Zinc Co.* [n. p.] 1914. 599 pp.

Insurance Institute of Hartford. *Accident and health insurance, a series of lectures*. Ed. by H. P. Dunham. Hartford, 1915. 155 pp.

Liverpool enquiry and employment bureau for educated women. *Eighteenth annual report, 1915*. 4 pp.

Mote, Carl H. *Industrial arbitration, a world-wide survey of natural and political agencies for social justice and industrial peace*. Indianapolis, Bobbs-Merrill Co., [c1916]. 351 pp.

A consideration of schemes now in existence, both foreign and domestic, for the prevention of industrial disputes, with a presentation of facts showing how such schemes have worked or wherein they have failed to work.

Mowery, H. W. *Some hazards and safety suggestions in connection with construction, inspection, and maintenance of public utilities*. N. Y., 1915. 20 pp.

National Civic Federation. *Welfare dept. Profit sharing by American employers*. N. Y. [1916]. 261 pp.

(See summary elsewhere in this number of the REVIEW, pp. 46-48.)

National Consumers' League. *Memorandum addressed to the joint legislative committee investigating the New York public service commissions on the need of legislation empowering the commissions to regulate hours of work and wages of employees of public utility companies*. Submitted by Pauline Goldmark. N. Y., 1916.

(See summary elsewhere in this number of the REVIEW, pp. 29-33.)

National Education Association of the United States. *Journal of proceedings and addresses of the fifty-third annual meeting, Oakland, Cal., Aug. 16-27, 1915*. Ann Arbor, The Association, 1915. 1193 pp.

In addition to general educational topics, contains important material relating to vocational education and guidance, the linking of school work with business enterprises, child welfare, and administration of compulsory attendance laws.

National Employment Exchange, New York City. *Sixth annual report for the year ending Sept. 3, 1915*. N. Y. [1915]. 20 pp.

Pearson, Robert H. Occupational diseases. New York, The Weekly Underwriter [1915.] 32 pp.

A pamphlet showing substances injurious to health that are found in industrial processes; also a list of industrial poisons with a statement of how they enter the body. Much of the material is taken from Bulletins 100, 127, and 165 of the United States Bureau of Labor Statistics.

Pierce, Paul S. Employers' welfare work in Iowa. Iowa City [1915]. 19 pp. (Iowa University. Extension Bulletin No. 13.)

Redgrave, Alexander. The factory, truck, and shop acts. Twelfth ed. London, Shaw & Sons, 1916. 519. 94 pp.

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