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EMPLOYMENT OF WOMEN IN POWER
LAUNDRIES IN MILWAUKEE

A STUDY OF WORKING CONDITIONS
AND OF THE PHYSICAL DEMANDS OF
THE VARIOUS LAUNDRY OCCUPATIONS



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EMPLOYMENT OF WOMEN IN POWER LAUNDRIES IN MILWAUKEE; A STUDY OF WORKING CONDITIONS AND OF THE PHYSICAL DEMANDS OF THE VARIOUS LAUNDRY OCCUPATIONS.¹

BY MARIE L. OBENAUER.

INTRODUCTION AND SUMMARY.

To measure the physical demands which the various power-laundry occupations make upon women workers was the special purpose of this study. To accomplish this purpose an intensive investigation was made into the occupational conditions—including also hours and earnings—which prevailed in the power laundries of Milwaukee, Wis.

Milwaukee was chosen as the place to make this study chiefly because it is more representative of the industry as a whole than the big seaport towns or great railway centers where the ebb and flow of traffic by water and rail cause a fluctuation in the current of trade which does not characterize the industry generally. Unlike many other industries, the laundry business is not massed in certain sections or cities from which the whole country is served. It is distributed throughout the land in large and small towns and in cities of all sizes, the consumers in all of them, except in the large seaport cities and railway centers, constituting a fairly steady and close-range patronage from individuals, private families, restaurants, and such hotels as do not maintain their own laundries. While Milwaukee is not unduly affected by water or rail traffic, it is large enough to sustain 31 power laundries, showing the whole range of normal laundry equipment.

The material upon which this report is based comes from a study of the 31 power laundries in Milwaukee. These laundries employed a total of 970 persons, of whom 852, or nearly 88 per cent, were

¹ This report may be regarded as supplemental to a previous report (Report on Condition of Woman and Child Wage-Earners in the United States, Vol. XII: Employment of Women in Laundries) which was based largely upon the symptomatic diagnoses of the health of individual laundry workers. That report indicated the need for a closer study of power-laundry equipment and administration in the interest of the laundry workers. A part of the information upon which this report is based was furnished by the State Industrial Commission of Wisconsin. In the preparation of the report valuable assistance was given by Miss Anna Herkner and Miss Bertha von der Nienberg.

women and 118 men. From 554 of the women, or 65 per cent of the whole number, detailed individual information was secured.

All but 8 of the 31 laundries were located in boarding and lodging house sections, cheaper residence districts, or on outlying business streets. Some of the objectionable features, therefore, which often characterize the approaches to establishments in manufacturing districts were removed.

Eighteen, or more than 58 per cent, of the 31 laundries were housed in store buildings or reconstructed dwellings, the importance of which lies in the fact that such structures are not often adapted to the installation of heavy machinery and frequently present difficult problems in drainage and ventilation because of the volume of water and steam used in power laundries.

The other 13¹ power laundries, which were housed in buildings especially constructed for the purpose, employed 70 per cent of all the power-laundry workers in Milwaukee and did approximately 80 per cent of all the laundry work done in the city.

The women were chiefly engaged in marking soiled clothes, in shaking and straightening out flat work for the ironers, in operating flat-work ironers, in receiving and folding ironed linen from the machines, in starching and dampening, in machine and hand ironing, and in assembling the laundered articles for delivery.

The wash rooms presented the most serious problems of drainage and ventilation because of the volume of water and steam used in the washing processes. In 27 of the 31 laundries the wash-room floors were of cement. The other four had floors of wood, which were not capable of effective sanitation, as the presence of wet rot proved. Twenty-seven of the laundries had gutters in the wash-room floors running directly from washing machines to the sewers. In the other establishments the machines were connected with the sewer by pipes, or discharged their contents into boxed or grated manholes. Nineteen of the 31 laundries had no exhaust systems in the wash rooms to reduce the heat or humidity.

The occupations involving more than ordinary physical exertion were the operation of the foot-treadle press and ironing machines, all of which required constant standing and some of which required a foot pressure of over 100 pounds. About 21 per cent of the 554 women scheduled operated such machines. In a number of cases the excessive pressure requirements were due to faulty adjustment of the machine or bad repair.

The occupations involving exposure to heat, sometimes reaching 95 degrees, even when outside temperatures were moderate, were the starching and ironing occupations, nearly all of which in Milwaukee laundries were performed while operators stood, though in practically

¹ In addition to these 13, 3 firms had buildings in process of construction.

all machine occupations, barring the operation of the foot-treadle machines, there was no apparent reason why the work could not have been done if the operator sat. The principal heat reducers were exhaust fans, and in some establishments heat deflectors on flat-work ironers. In many instances the exhaust systems were rendered valueless to the operators because of such a faulty placing of the machines that the heat from one was thrown directly on the operator of another machine. In the six cases where flat-work ironing machines were well placed and properly equipped with exhaust systems, the temperature in the working zones of operators averaged approximately 6° lower than in the 26 instances where the machines were not so placed or equipped, the range of difference in one instance between two sets of machines of the same radiating surface being 21°.

The machines involving risk of serious accident, aside from the danger of unguarded belts and gears, were the extractors (substitute for the wringer) and the flat-work ironers. In only four establishments did women attend the extractors. In one case one woman attended two machines, neither of which was guarded. Seventeen of the 38 flat-work ironers found in use were without finger guards. All of these 38 machines were operated by women.

The occupations calling for special care in matters of health and sanitation, aside from effective ventilation, had to do with the handling of soiled clothes. Twenty of the 31 firms took no precaution for the markers against possible infection or contagion from soiled clothes except to refuse orders from placarded houses. There was, however, a marked absence of fear of any danger in both employees and employers. Five of the 31 laundries refused orders from disorderly houses; four took no bundles from agencies, thus keeping posted on the sources of all patronage; and three made more or less ineffective efforts, such as subjecting suspicious looking bundles to a soak in a soda solution, fumigation, or separate washing in order to avoid marking.

The effect of the chemicals as used in Milwaukee laundries, according to the judgment of physicians, is not serious, though excessive use and carelessness in rinsing may cause some discomfort to the workers handling clothes in the ironing processes.

The average working hours for the women engaged in the above occupations, as well as in the lighter occupations not discussed in this summary, was approximately 52 per week, the variation for each occupational group being not more than 3 hours. The maximum weeks in most instances did not reach 60 hours, and ordinarily did not exceed 55. Only 9 women reported days in excess of 10 hours and only 1 reported maximum hours per week in excess of 60. The working hours of the operators of foot-treadle machines did not differ from the working hours of employees performing the lighter occupations.

The average earnings for all occupations, whether light or heavy, were approximately \$6.60 a week. In no occupation did the average fall below \$5, and in none except for department heads did it rise above \$8.25 a week. The earnings of the women operating the foot-treadle machines in some instances were not as high as those running machines less exacting and not requiring more skill.

The average period of employment during the 26 weeks covered by this investigation was approximately 24 weeks for the 554 women scheduled in the power laundries of Milwaukee.

From the results of this study were extracted such factors as were necessarily common to the industry as a whole. For while the data, so far as they relate to individual laundries, are limited to these 31 Milwaukee laundries, the application of the facts, showing working conditions, is far broader. Of course, individual power laundries differ in important respects, as, for example, in size of plant and number of employees, character of construction of building and suitability for use as a laundry, extent to which provision has been made to deal with sanitary conditions (as drainage, temperature, and humidity), adequacy and modernness of machine equipment, condition in which machinery equipment is maintained, and application of scientific knowledge to factory methods, yet, wholly aside from such conditions as these, the problems which affect working conditions and the comfort, health, and safety of employees are everywhere the same in power laundries wherever located or however equipped. In all cases the soiled clothing must go through the same processes and be subjected to the same manipulations; and the same general types of machines operated in much the same way are used in the work. With these common factors alone the following summary and general discussion is concerned. This is then followed in the body of the report by the detailed facts concerning working conditions found prevailing in the 31 Milwaukee power laundries which were studied.

SUMMARY OF FACTORS WHICH DETERMINE THE WORKING CONDITIONS IN POWER LAUNDRIES.

To summarize the factors common to the industry as a whole, which determine the working conditions in power laundries, it may be said that the occupational dangers which demand special attention arise from—

1. Contagion or infection during the handling of soiled clothes. Under ordinary circumstances reasonable protection against this danger can be secured in a careful supervision of the collection, marking, and sorting departments, and in ample provisions of washing facilities.

2. Indiscriminate and excessive use of chemicals. While the physicians consulted indicated only a probable discomfort and not

more than a possible danger from this source, an adequate protection against both is to be found in a rigid system of weights, measures, and time schedules.

3. Humidity, which can be controlled only by proper floor drainage and the installation of exhaust or other scientific ventilating facilities.

4. Heat. This can not always be controlled with entire satisfaction but can be reduced to a reasonably safe degree by the use of exhaust systems, paddle fans, or other ventilating devices, and by care in distributing the heat radiating machines.

5. Accidents, principally from flat-work ironers, water extractors, and exposed gearing, against which there are guards within the reach of every laundryman.

6. Excessive fatigue, principally from exacting foot-treadle machines. This danger can be materially reduced by the elimination of old and heavy-running machinery, by careful repair, by proper equipment with heat guards, by adequate instruction of operators, and by a discriminating assignment of exacting machines.

Upon the extent to which the employer controls the factors in these six power-laundry problems depend in large measure the welfare of the workers, particularly of the women, and the prosperity and prestige of the industry.

EXTENT OF THE POWER-LAUNDRY INDUSTRY.

The army of women leaving the homes to follow in the wake of tasks transferred to machine-equipped factories includes about 80,000 workers in the power laundries. Nearly 32,000 men are likewise employed in these establishments, at work not long since regarded as belonging to the peculiar sphere of women. These 112,000 workers are doing over \$100,000,000¹ worth of washing a year. Reduced to a per capita basis this is not an impressive figure, but it forcibly arrests attention as indicating the evolution of the washtub and ironing board into an organized industry with a capital investment of approximately \$69,000,000 and with an increasing importance as a domestic utility.

"Hand laundries"—Chinese or American—are not included in this survey, for notwithstanding the number of establishments advertised as "hand laundries," most of them employ the power laundries to do at least a part of their work and seem themselves to be in the procession of vanishing things. In Milwaukee—the place chosen for this study—13 of the 15 American hand laundries visited proved to be agencies of outside power laundries. Of the remaining two, one had gone out of business and the other was a private house where the woman "took in washing," her husband acting as "manager." With the power laundries, then, this report is exclusively concerned.

¹ U. S. Census of Manufactures, 1910, Bulletin: Abstract of Statistics for States, Cities, and Industries, p. 73.

TRANSFORMATION IN CONDITIONS OF LAUNDRY WORK.

The transfer of the business of washing from the home to the power laundry has resulted not only in the usual invasion¹ by men of a field of labor traditionally belonging to women, but it has brought about that complete transformation in working conditions which is the corollary of the invention of machinery.

Between the washing and ironing done in the home and the same service performed in the power laundry there is the sharp contrast of an undivided and a highly subdivided labor.

A single pair of hands in the home sorts, soaks, rubs, rinses, and wrings the clothes; then starches, hangs them out to dry, dampens, irons, and lays them away. In a highly organized laundry a dozen or more pairs of hands work upon a single garment in its course from the marking to the routing room. There are women to mark for identification and men to sort for color and quality. Men run the washing machines and other men or women "pack" the washed clothes into the water-ejecting extractor. Girls straighten out the tangled pieces, or load them into the revolving drum that tumbles the tangled articles loose. There are girls to feed the sheets and tablecloths, or small "flat work," into the huge and hot ironing rollers and other girls to fold the finished linen as it comes from the machine. There are drying-room tenders and starchers and girls to run the dampening machines. Cuffs and collars are ironed by one girl, and another does the finishing. One girl irons the neck and wrist band of a shirt, and another presses the yokes. Bosom ironing is the task of one girl, and sleeve ironing is the work of another. The "body ironers" smooth out the unstarched portion of the shirt's body, and even then there are finishers to "do the rest," and when this "rest" is done there are still other workers who assort and check and wrap the finished garments for delivery.

But whatever changes the invention of machinery has wrought in the methods of doing washing and ironing it has not changed the character of the industry's "raw material." On the contrary, to judge fairly of the power laundryman's problems and of the range of conditions surrounding the laundry workers it should be kept well in mind, not only that the raw material of the organized industry is all sorts of dirty clothes from all sorts of people, and that its chief restoring agents are hot and cold water, soaps, chemicals, starches, steam presses, and hot ironing machines, but that the power laundry, unlike the hand laundry or the individual washer-woman, handles this raw material and these restoring agents in large bulk and must cope with situations created by the accumulated difficulties of thousands of individual washings.

¹ According to the census of 1910, one-third of the employees in power laundries are men

Upon the success with which these accumulated difficulties are met depends in large measure the welfare of the workers in any given establishment, and this success in turn depends entirely upon the laundry's equipment, sanitation and general management. In no industry do these factors count for more or tell more quickly than in the power laundry. Under the minute subdivision of labor injected into the task of washing and ironing as performed in a modern establishment, it is easy to understand that not all the occupations, even with the best equipment and most efficient management, are light and pleasant, nor in the worst establishments is all the work equally difficult or unattractive. Throughout the list of occupations there is a certain differential in the labor strain which is inherent in the nature of each task. Heat, humidity, dangerous or heavy running machines, mark out for serious study certain occupations in the power laundries quite apart from the question of general sanitation. For this occupational differential is maintained to a large extent, no matter what the equipment or degree of efficiency. But such occupations as are hard or unattractive at best are made distinctly harder, more hazardous, or more disagreeable under inadequate facilities or unintelligent supervision, and such as are essentially neither difficult, dangerous, nor disagreeable may fall short of their natural advantages under circumstances which lower the whole level of working conditions.

DANGERS INVOLVED IN HANDLING SOILED CLOTHING.

Collection of soiled clothing from even fairly homogeneous city districts involves patronage from people in all states of health. If the manager is careless in the supervision of his drivers, infected garments may find their way into the laundry to the possible detriment of marker, lister, or other worker who handles the clothes before they are subjected to the sterilizing washing processes.¹ When marker or lister with abrasions upon her fingers carelessly handles garments that may be infected with diseases not subject to quarantine, or when such worker neglects to wash the hands carefully before taking lunch or before touching her face she reflects a lax discipline or inadequate facilities which may render the marking room of that laundry a source of real though unrecognized danger.

Dr. Frank Wright, of the health office of New Haven, addressing² the Connecticut Laundrymen's Association on "Inspection of goods taken from houses in which are contagious diseases," said:

There are other diseases that are not placarded to announce to your driver the danger, such as consumption, erysipelas, ringworm and

¹ For the methods of handling soiled clothes in the washing rooms of Milwaukee power laundries, see pp. 38-40.

² Address printed in full in National Laundry Journal, Mar. 15, 1912, p. 33.

itch. Again, there are others, such as are known only to the victims, that endanger other persons and should be guarded against. If by any chance any of your employees have abrasions upon their hands and handle clothing infected by blood poison they may easily contract the malady. Any person handling clothing smeared with infectious discharges may readily carry some of the discharges to his eyes and would surely lose his eyesight, unless the nature of his trouble is known at once and properly and correctly treated.

To Dr. Mazyck P. Ravenel,¹ director of the State Hygienic Laboratory at the University of Wisconsin, there was submitted a description of conditions prevailing in the marking divisions of Milwaukee laundries, with a request for his opinion as to the risk therein involved to the worker and to the public. In answering Dr. Ravenel said:

There is no doubt that certain diseases, such as smallpox, scarlet fever, diphtheria, typhoid fever, and tuberculosis could be transmitted to the worker under the conditions described.² This danger is lessened, of course, by the precautions against receiving work from placarded houses and hospitals, but in most places typhoid fever is not placarded.

The danger to the public is directly very slight. In fact I do not see just where any danger to the public comes at all.

The danger could be entirely avoided by sterilizing by steam heat all bundles of clothes received. This, I imagine, would be a prohibitive expense. It can be greatly lessened by moistening the clothes before sorting, as is done in the Bradford districts of England in sorting wools suspected of having anthrax. The moisture prevents the scales and dry material containing germs from breaking away and rising. However, the danger does not seem to me an excessive one if proper precautions are taken in the collection of material.

The description of methods of handling soiled clothes and the foregoing opinion thereon, written by Dr. Ravenel, were submitted to Drs. O. H. Foerster, C. A. Baer, William Thorndike, and Gilbert Seaman, all of Milwaukee. With the views expressed all the physicians named agreed, a number stressing certain features or discussing others. Dr. Foerster called attention to the fact that because of the short life of the syphilitic germ there is not so much danger from this source as is generally supposed. Therefore even the body flannels, which are most likely to be infected and which in standard laundries are not subjected to sterilizing heat are not a material source of danger from this disease either to the public or to the laundry worker, because in the great majority of cases the garments have not been in contact with the body for many hours before reaching the laundry. In flannels infected with other diseases there would of course be the same danger to the worker as in the handling of other garments worn next to the body. Dr. Seaman laid stress on the risk of getting gonorrheal discharges in the eyes, such a case of infection from the

¹ Dr. Ravenel and the other Wisconsin physicians quoted in this summary were invited by the Industrial Commission of Wisconsin to give expert advice on certain matters involving the health of industrial workers.

² For methods of handling soiled clothes in Milwaukee laundries see pp. 38-40.

handling of underwear in the home having come under his personal observation. Dr. Baer emphasized the danger of contracting tuberculosis from the dust raised by the needless shaking of soiled clothes.

If the soiled clothes came to the laundries sorted as to color and quality and were always free from stains that would be "set" by heat, the problem of sterilization would be comparatively simple. As it is, many of the obvious solutions are not available to the trade because the prestige of a laundry depends principally upon its record for sending clothes home in a spotless condition. Such sterilizing as is done, therefore, before the clothes are sorted must be done with this necessity in view.

But there is a marked indifference among laundrymen and laundry workers to the possibilities of infection from the soiled clothes. The daily contact with materials breeds more or less contempt for possible dangers lurking therein, even when occasional disasters are clearly consequent and definitely so recorded. But there are no records to show just how many persons handling soiled laundry have had infectious or contagious diseases and how many of such cases were directly traceable to the occupation. The marker who falls ill of diphtheria or erysipelas remains away from work and sends for a physician whose business it is to cure her and prevent the disease from spreading to her family or neighbors. Whether the marker herself contracted the disease in the performance of her duties can not well be the subject of inquiry, for it would be difficult to find out the source of all garments handled by the victim during the period of disease germination and impossible to ascertain the condition of such garments at the time of handling, because of the washing processes to which they had subsequently been treated. Neither would it be practicable to discover the health condition of every one of the laundry patrons during a given period. Particularly is this true in the case of laundries taking bundles from agencies whose patrons are often not known to the laundry proprietors. The records, therefore, do not show what danger lurks in soiled clothes because there are no adequate records on the subject, nor are there specifically traceable consequences of such dangers. It is a fact scarcely subject to dispute, however, that among the power laundry's patrons there are sometimes victims of contagious diseases not subject to quarantine, but communicable through clothing, and that there are circumstances under which garments infected with even placardable diseases could, and do occasionally, find their way into the laundry. In view of this fact it would seem that when the clothes are marked or otherwise handled before they are sterilized adequate washing facilities, intelligent supervision, and other reasonable protective measures are essential if the occupations involving contact with soiled clothes are to be free from danger.

Apropos of the Wisconsin physicians' references to the public health, it is noteworthy that one laundryman in Milwaukee compels the markers to wear working dresses, which are left in the establishment at night and are washed before morning. A bath before leaving is also a rule of the marking room, and the workers in this division are not permitted to go from the handling of soiled and possibly infected clothes to any work which will bring them in contact with the clean clothes.

SANITATION IN THE WASH ROOM.

When the clothes are taken from the marking room to the wash room, effective equipment and efficient management are equally needful. For with hundreds of gallons of water spurting every few minutes from the washing machines¹ an improperly constructed floor will create a distinct health hazard for the worker and a destructive waste for the employer. The floor may be scientifically guttered² for carrying off the water, and the washing machines may be properly placed, but if the manager has failed to install exhaust fans or other facilities to draw off the steam emanating from these wash wheels, there results an enervating humidity, costly alike to employer and employee. A laundryman writing of these conditions says:

The ventilation of the wash room is something that should be looked after constantly, as the steam and moisture is steadily collecting and should be disposed of as quickly as possible. A wet, foggy wash room not only ruins the belts, but greatly impairs the working capacity of the washmen and wringermen.³

The chemistry of the wash room in an up-to-standard laundry is an exact science.⁴ The hydrant water is analyzed periodically to determine the degree and character of hardness and to disclose any deposits that may injure the fabrics. On the basis of such analysis the water is treated with neutralizing chemicals or counteracting processes. The effect is to restore to the washing process the soft water of the banished cistern, the drying, freshening ride around the wind-driven clothes reel, and the bleaching influence of the sunshine. All these were chemical actions and needful for successful washing,

¹ For description of washing machines, see p. 48.

² For description of adequate floor construction, see pp. 34 and 35.

³ "Modern laundry methods," by Spurgeon Dewitt, in *National Laundry Journal* of April 15, 1912, p. 38. In the same connection this writer continues: "Exhaust fans should be placed in as many convenient places as can be found in the wall. I have found that an ordinary wash room can be kept free from steam by using two 30-inch fans, placed on the opposite sides of the room. It is well to have two air inlets close to the floor which are so made that they can be opened at any time. Although the windows may answer the same purpose in warm weather, sometimes in cold weather you do not care to have them open on account of the cold draft, whereas these openings can be opened in winter to let in the cold air near the floor, without any annoyance to the men. As soon as the air becomes heated it will at once rise, carrying with it the vapor, and it is then pumped out by the exhaust fans. This system is in use in many laundries and has given the best of results."

⁴ For discussion of wash-room methods prevailing in Milwaukee laundries, see pp. 40 to 49.

but none is any longer easily available in our dust-ridden, smoke-laden, congested cities, and scientific substitutes are imperative.¹ No substitutes, however, can be scientific that are not applied with accurate reference to specific requirements, and herein lies a defect in the methods prevailing in some power laundries that, quite apart from any influence on the welfare of employees, has cost the industry enormously in public confidence and business patronage. This appears to be a needless loss, for in the last analysis such prejudice as exists against modern power laundry methods is not because of the use, but of the abuse of chemical softening, bleaching, and detergent agents. The housewife does not really object to the whitening of her household linen by the use of bleach any more than she objects to the bleached cotton or linen which she asks for in the stores. What she does object to is the destruction of the fabric, which is brought about not by the scientific use but by the indiscriminate and excessive application of chemicals.

This lack of standard in the wash room and its evil influence are reflected in the laundry journals and in the utterances of the officers of the laundrymen's organizations. Since the situation directly affects the conditions under which power-laundry employees work, these utterances are worthy of note here. But more important and more promising is the fact that progressive laundrymen are laboring strenuously to correct the defect, not only in writings and addresses but by encouraging classes for the study of laundry chemistry.²

In the introduction to the American edition of the "Chemistry for Launderers" the editor of the Power Laundry says:

The average washman is much too fond of using a "piece the size of a lump of chalk" instead of an accurately weighed and measured quantity, and this tendency is nearly always in need of restraint. * * * If the launderer learns nothing else from this book but to measure accurately all the materials and temperatures he uses in the wash room and starch room, he will have learned something of the greatest value.

The president of the New York Laundrymen's Association said³ to a convention of New York laundrymen in June, 1912:

When you see a man use a coffee cup full of oxalic acid to a small load of collars and only one warm rinse after it, you feel that the

¹ "When the laundry business began to assume some magnitude it became a question how it would be possible to overcome the lime and other foreign matter found in the ordinary hydrant water, so that it might be used profitably in the laundry work. It was a well-known fact that heat would precipitate lime in water and by a careful filtration this precipitation could be removed. To construct a device to do this it was necessary to have some capital, and a simpler way was sought, whereby it would be possible to precipitate these foreign substances and have soft water without all this trouble. In searching for these facts it was found that alkalies would soften the ordinary water so it could be used for laundry purposes.

"In this way the ordinary alkalies worked into the wash room and became well implanted before the laundrymen in general realized that they might be harmful if improperly used."—"Modern laundry methods," by Spurgeon Dewitt, in *National Laundry Journal*, May 15, 1912, p. 10.

² The Starchroom, August, 1912.

³ James E. Kelso, Address printed in *National Laundry Journal*, June 15, 1912, p. 8.

money spent for advertising the L. N. A. of A. should have been spent to employ a man to educate this class of laundrymen. In one laundry they were using caustic to build their soap, and if the soap in the tank had been tallow there would have been enough caustic to make it soap. They put 3 pounds of soda in the wash wheel and then wondered why their seams seemed to look yellow.

The washman who has no system of measurement for the use of the chemicals is likely to have no time standards for rinsing. Hence even if the manager has enforced a rule for exact measurement of the chemicals, another rule will be needed to insure proper rinsing to remove all traces of acids used to neutralize the bleach. A laundryman of Buffalo, in an address before the New York convention of laundrymen, said:¹

One of the reasons for a great deal of poor work is the lack of system in timing the length of suds, rinse and blue. Every washroom should be provided with a clock and the time of starting a load in a wheel should be marked down so that a man can keep an accurate account of the length of each process. It is impossible for a man running six or eight wheels to remember every change unless he does so.

In the foregoing utterances the laundrymen were emphasizing the injury to the fabrics arising from such inadequate washing chemistry, but it should not be forgotten that the comfort if not the health² of the laundry workers is likewise affected by the conditions described; for if the laundry is a "rule of thumb" establishment with washmen whose formula for the use of chemical solutions is a "pailful, more or less," and whose system of rinsing is "five, ten minutes, or so," there will follow not only a waste of expensive supplies and an

¹ C. T. Champeny, Address printed in National Laundry Journal, June 15, 1912, p. 18.

² As to the effect of chemicals on the health of the workers there is not much unanimity among the physicians consulted, though the drift of opinion strongly indicates the absence of any considerable danger. Following is a symposium on the effect of chemicals used in Milwaukee laundries:

In regard to the injurious effect of the chemicals used upon the workers the only thing to be considered is the chloride of lime. The chlorine produced is not an insidious poison. If enough of the gas were present to do harm the workers would object, as it is such a disagreeable and irritating gas. If they do not complain of it, I do not think it does any harm.—Dr. A. S. Loevenhart, University of Wisconsin.

The only dangers attending the use of the chemicals mentioned would be the maceration of and injury to the skin, with the production of such skin trouble as eczema. I do not believe there is any danger in the so-called fumes from the heated cylinder, provided there is an abundance of ventilation in the workroom.—Dr. Mazzyk P. Ravenel, director of Wisconsin State Hygienic Laboratory, University of Wisconsin.

Theoretically, chloride of lime completely decomposed in alkaline solution according to the formula $2\text{CaClOCl} + \text{H}_2\text{O} = 2\text{CaCl}_2 + \text{Ca(OH)}_2$. Cl_2 would yield about one-half liter of chlorine for every 100 c. c. of a 0.5 per cent solution, which I understand from the statement is the strength of the solution in the washing machine. Or, 15 pounds of chloride of lime should liberate about 74 liters of chlorine gas at 20 C if completely decomposed. Probably the decomposition is complete at the high temperature of the washing machine, but it must be remembered that much of the chlorine will be taken up by the fabric. Whether or not the chlorine liberated would reach a sufficient concentration in the air of the room to be injurious would depend furthermore on the size of the room and the renewal of air. In my opinion the only satisfactory way to answer this question would be to actually determine the amount of chlorine in the air of the room which can be readily done. Free chlorine in 0.04 to 0.06 per thousand taken directly into the lungs is dangerous to life (Blythe) from the formation of free hydrochloric acid in contact with moist mucous membrane.—Dr. J. N. E. Eyster, department of physiology, University of Wisconsin.

In the bleaching processes to which household linen is subjected in the laundry, acid and caustic chemicals are employed, such as chloride of lime, carbonate of soda, etc. If handled in a dry state these cause intense itching and eczematous eruptions of the skin. When vaporized after solution, or in gaseous form, they irritate the eyes and the whole respiratory tract, occasioning conjunctivitis and giving rise to catarrhal inflammation of the throat and bronchial tubes.—Statement of a physician of experience, in the Report on Condition of Woman and Child Wage Earners in the United States, Vol. XII, Employment of Women in Laundries, p. 25.

injury to the fabrics, but a possible health hazard and a probable discomfort to the women handling the clothes in subsequent occupations, or inhaling the vapors given off from the clothes during the ironing processes. In other words, the comfort of the workers happens, in this matter of the use of chemicals, to be bound up in the material interests of the laundry's patrons.

EQUIPMENT AND ACCIDENT HAZARD.

The accident and compensation laws, on the other hand, have bound together the financial interest of the laundry owner and the safety of the laundry machine operator. An unguarded extractor¹—the powerful substitute for the old wringer—may break or jerk from the socket an operator's arm. Failure to put finger guards on the flat-work ironers² may result in burning and crushing the feeder's hands under the hot rollers. The extractor may have been making 1,200 to 2,000 revolutions a minute with perfect precision; the flat-work ironer may have been turning out the smoothest, glossiest sort of table or bed linen, yet the failure to equip them with effective guards has not only made the employer liable for damages and done much to sustain the impression of a hazard inseparable from the operation of all laundry machinery, but it has marred, if it has not cost the life of an operator. This identity of interest has doubtless had much to do with the growing friendliness among laundrymen toward laws regulating and standardizing the equipment of dangerous machinery with guards. The president of the Illinois Laundrymen's Association, commenting on the law which went into effect in that State January 1, 1910, said:³

This law, as you know, provides for protecting and guarding machinery with which employees come in contact * * *. Is there a progressive laundryman listening to me here to-night who will not say that while at one time he considered these things a great hardship, he now looks on them in an entirely different light? If we were able to compute by statistics the amount saved by the guarding of machinery in laundries alone, it would run into many thousands of dollars.

The progressive laundryman complies with these conditions, and while it means expense in complying with the law, it is in the end an investment which more than pays for itself, as it saves many lawsuits, and relief in the thought that he is doing all he possibly can to avoid accidents. If he should unfortunately have an accident, and had complied with these conditions, he will get out of it from a financial standpoint much lighter than if he has not.

¹ For illustration and description of extractors see p. 49.

² For illustration and description of flat-work ironers see p. 50.

³ Address before the convention of Illinois Laundrymen's Association, printed in *National Laundry Journal*, July 1, 1912.

A further means of encouraging adequate safety equipment in laundries is the Employers' Indemnity Exchange established in 1908. Of the work of this exchange the manager said before the New York Laundrymen's Association in June, 1912:¹

The factor of greater importance than the saving of money to the laundry industry is that information concerning accidents in laundries has been compiled at the office of the exchange, and by the office furnished to the manufacturers of laundry machinery in such a way as has enabled the manufacturers to devise means of safeguarding the machines that have caused the more serious accidents, and within the next six months you can expect to see on the market by the leading companies flat work ironing machines that are fool proof. They now have feeding devices that make that part of the machine harmless, but employees still insist on putting their hands under the rolls and at other points than at the feeding place.

Extractors now very largely have covers, whereas four years ago they were the exception.² Within a very short time they will have extractors with covers that must be closed before the extractor can be started and can not be opened until the extractor comes to a standstill. The extractors will also be equipped without any device for stopping with the foot. They will be so constructed that you will set them to run a certain number of minutes, and when that time has elapsed the extractor will stop automatically and ring a bell to call the attention of the employee whose business it is to unload the extractor. To the very present, the worst plant with all sorts of dangerous places, entirely shaft driven and with no safeguards other than the lady inspectors of the State department may have required, can obtain insurance protection at the same cost that the best individual motor-driven plant, with absolutely no dangerous places and no shafting, can obtain this protection.

Beginning January 1, 1913, the exchange will rate the plants of its subscribers according to the hazards, bearing in mind, of course, the conditions brought about by the laws of each separate State.

From such a combination of interests the reduction of accident hazard to a minimum will be a natural consequence.

HEALTH HAZARD FROM OVERSTRAIN IN OPERATION OF MACHINES.

But what of the health hazard involved in the operation of heavy-running machinery? If a laundryman installs an exhausting foot-treadle machine or allows one to become exhausting through lack of repair, the well-being of the operator is hazarded not less certainly than if the employer leaves a dangerous machine unguarded.

During an address before the Sixth International Congress of Hygiene and Demography, 1887, Dr. Fridolin Schuler, Swiss factory inspector, said: "Labor of an exacting kind, involving extreme muscular exertion, must have an injurious secondary effect on every part of the body."³ Certain forms of strain involved in modern

¹ Address printed in *National Laundry Journal*, June 15, 1912, p. 16

² Compare, however, p. 49.

³ Quoted by Josephine Goldmark in "Fatigue and Efficiency," Pt. II, p. 128.

industrial occupations have been singled out by the same expert testimony as especially injurious. Elsewhere in the address mentioned above,¹ Dr. Schuler said:

First of all, as already stated, the kind of work and the way in which it is done must not be overlooked. Preeminently must continuous standing, jarring of machinery, * * * and direct or indirect pressure upon abdominal organs be condemned. By utmost possible avoidance of bad conditions much improvement may be reached even without excluding women from their share of industrial work.

Dr. Schuler at the same time called attention to certain types of machines as presenting problems of fatigue quite as serious though not as well recognized as other causes of overstrain.

Far less conspicuous, he said, is the third set of factors which exert a deleterious influence on health, and so threaten the well-being of the workers, namely, the excessive muscular exertion demanded by modern forms of machinery, the strain on special organs, the one-sided muscular activity resulting from continuous performance of the same motions. These are especially noticeable in women.²

The physical demands of laundry machine occupations were determined in this study of Milwaukee laundries without reference to the physical endurance or individual opinions of the operators, but were secured in terms of weights and measures. For example, the amount of pressure required to operate a given treadle was determined by a tested scale. The height of the treadle from the floor was measured by a rule. The number of operations per minute was recorded and the temperature and humidity in the operator's working zone were taken with tested hygrometers. Thus were the uncertainties of personal estimates reduced to a minimum. The records so taken show that aside from such machines as were difficult to operate because of antiquated manufacture, or lack of repair, there are two types of foot-treadle machines in common use which stand out from all the rest because of the requirements of operation. The prevailing cuff press³ and similar types of machines are operated by foot power and require a pressure frequently ranging to a hundred pounds and over. Maintaining the level of production involves about 16 treads a minute.

The wheels which fix the amount of pressure necessary to operate the foot treadles are adjusted by the operators who showed a marked tendency to screw them overtight, believing that only so could they get a finish on the garments that would pass inspection. This custom not only added a needless pressure requirement of 25 to 30 pounds,

¹ Quoted by Josephine Goldmark in "Fatigue and Efficiency," Pt. II, p. 149.

² *Idem*, Pt. II, p. 151.

³ For detailed description of cuff press and body ironers see pp. 56 et seq.

amounting to a wasted exertion of 270,000 to 288,000 pounds in a 10-hour day, but it distinctly increased the jar which characterizes the operation of this type of machine in some degree even at its best, and which is one of the evils arresting the attention of experts in industrial hygiene. As there are two or more treadles to each machine frequent change of position is necessary and the use of first one foot and then the other is possible, though in Milwaukee laundries the girls were using one foot almost entirely, thus involving a needless strain on one set of muscles. Owing to the fact that the hot press is held down on the "bed" or padded surface by a "clamp," the operator can and does take her foot from the treadles, standing squarely on the floor during the intervals of operation.

The ordinary body ironer¹ is the other type of machine conspicuous for its operating demands. As its name implies, this is a device for ironing the bodies of garments, particularly the unstarched portions of shirt bodies. While the hot ironing cylinder is revolved by steam or electricity, the lower padded roll, over which the body of the shirt is drawn, is brought up into contact and pressed against the upper ironing cylinder by bearing down on a foot treadle. In other words, the operator of the body-ironing machine gets the garment smooth and glossy by a hot-iron pressure as great or greater than that exerted by the handworker, who bears down on her hand iron for the same purpose, only in the case of the machine operation the muscular exertion is transferred from the arms and shoulder to the legs and hips. Unlike the cuff press, the ironing surface and the padded surface of the body ironer are not held in contact by a clamp, but by continued pressure on the foot treadle. The amount of pressure necessary to secure work satisfactory to the operator, foreman, or manager in the Milwaukee laundries, as in the case of the cuff press, ranged to a hundred pounds and over, as shown by the tested scale. But the necessity of constant adjustment of the garment in the course of ironing involves a frequency of operation in some of the machines that amounts to a slow but continuous treading motion, with the strain so largely upon one set of muscles as to result in that one-sided muscular activity condemned in the foregoing quotations. On some machines the use of a second treadle reverses the direction of the cylinder revolutions, permitting a slight change in position and shifting the strain to another set of muscles. In operating one type of the two-treadle machines, however, the girl must stand with one foot on the operating treadle whenever she uses the reverse treadle, thus adding the strain of maintaining the equilibrium to the other demands of operation.

In certain cases where the treadles are over 7 or 8 inches from the floor the use of a platform is practicable and materially reduces the muscular exertion necessary to bring them under the weight of the

¹ For detailed description and illustration of body ironers see pp. 66 et seq.



.PLATE 1.—ONE-WAY SINGLE-TREADLE BODY IRONER.

body. For while the pressure necessary to secure a satisfactory "finish" in Milwaukee laundries was shown by the tested scale as stated to be from twenty to a hundred pounds, the girls were putting their whole weight upon the treadles, as that seemed to be the easiest way to operate. At best, however, all of these machines called for a continued muscular activity, which, measured in pounds pressure exerted in a 10-hour day, mark the work as the hardest machine occupation in the modern power laundry and the machines as the conspicuous trouble makers.¹

OPINIONS OF PHYSICIANS AS TO PROBABLE EFFECTS OF OPERATING CERTAIN MACHINES.

There is not much room for doubt as to whether such machines should be classed among those types condemned by the experts as involving a hazard to the health of the operator. The records for the cuff presses and body ironers were, however, submitted to a number of physicians with requests for opinions as to the probable or possible effects of continued operation upon "young women of average health, 21 years old and unmarried." Dr. M. P. Ravenel, quoted before in this summary, replied:

I would expect such work to be detrimental to the health of a young woman. It would almost certainly produce some distortion of the spine with one-sided development of the body.

The opinions of Dr. Ernest Copeland, Dr. Gilbert Seaman, Dr. O. H. Foerster, Dr. C. A. Baer, Dr. William Thorndike, all of Milwaukee, were practically identical, viz, "if long continued the operation of such machines would have a strong tendency to create pelvic disorders." Dr. Copeland and Dr. Thorndike further emphasized the danger of producing spinal curvature and one-sided developments.

About the time this study was in progress pneumatic devices appeared upon the laundry machinery market as a practicable substitute for all fatiguing foot treadles. Just what change this invention, if it proves to be generally available, will effect in the working conditions of machine operators will be seen by a glance at the accompanying illustrations. Plate 1 shows the prevailing

¹ In an earlier report of the Bureau (Woman and Child Wage Earners in the United States, Vol. XII, Employment of Women in Laundries), of 52 machine operators making definite charges of ill health against their occupations to a medical examiner, 32, or 60 per cent, appeared, from the description of their occupations, to be running either body ironer or the foot-treadle cuff-press machine. This is significant, in view of the fact that the proportion of women operators who run such machines in the average power laundry is between 15 and 20 per cent, depending upon the character of the laundry's patronage. In other words, the proportion of women charging their ill health against the use of the heavy foot-treadle machines was several times as large as the proportion operating these machines. Furthermore, among the total number of 539 laundry workers interviewed—which included hand and machine operators—there were 59 women who ran machines of the body-ironing or cuff-press type. Thirty-two, or over 54 per cent, made definite charges of ill health, as above stated, charges that were sustained at least by symptomatic diagnoses, but 52, or 88 per cent, complained of the fatiguing character of the work.

type of body ironer and illustrates the position of the operator in the act of forcing down the treadle. In sharp contrast to this is the body ironer equipped with pneumatic treadle device, shown in plate 2. Only a slight pressure is required to operate the latter machine, as power for ironing pressure is supplied by compressed air. Furthermore, a girl may stand or sit to operate the new machine, as it is equipped with two sets of treadles to permit of just this change in position.

The comment by laundrymen acquainted with this device is significant of the need of a practicable substitute for the fatiguing foot treadle. As a manager of one establishment put it: "The pneumatic doesn't get tired; it exerts the same pressure late in the afternoon and early in the morning, so the quality of the work is the same all day long."

It should be kept well in mind, however, that it is but a short time since such improvements appeared; that to equip even one machine with pneumatic attachment involves the installation of a compressed-air plant; that this initial expense in itself materially reduces the availability of the device even if there were not a more serious obstacle in the fact that some makes of machines now in use can not be so equipped. In such cases entirely new machines would have to be purchased, entailing an expense beyond the reach of some and against the inclination of many laundrymen, whose machines are as yet mechanically sound and in good repair.

EFFECT OF EQUIPMENT AND SANITATION IN REDUCING FATIGUE.

A study of the records taken in Milwaukee power laundries and a careful reading of the explanatory text ¹ will serve to emphasize the direct bearing of adequate equipment, effective sanitation, and efficient supervision upon the operating demands of all power laundry machines. For while special attention has been called to the prevailing type of cuff press and body ironer as machines which at their best still call for adjustment in the interest of the operator, many other machines which are not necessarily fatiguing become so through lack of repair, faulty adjustment, or inadequate equipment. And even if the worker is running a machine essentially unexacting in its operating demands, as already pointed out, 9 or 10 hours a day in a badly ventilated, poorly lighted, highly humid, or abnormally hot room are in themselves such a drain upon the vitality as to make any work difficult. But these conditions increase the hazard to health when a girl stands for the same length of time and runs a foot treadle requiring such heavy pressure that the easiest way to operate it is to throw her whole weight upon it. To such disadvantages there are sometimes added the handicap of a peculiar jar

¹ See p. 36.



PLATE 2.—BODY IRONER EQUIPPED WITH PNEUMATIC TREADLE.

or vibration due to faulty adjustment and often necessitating greater pressure, and not infrequently increasing the difficulties of turning out satisfactory work. Furthermore, it should be remembered that all ironing machines are hot, and guards against excessive heat are a necessity of the power laundry industry, particularly in hot weather.

The records taken in Milwaukee show the heat in the working zone of operators running some of the big flat-work ironers was as high as 95°, though all these records were taken between March 27 and April 16, during which period the outside temperature did not exceed 75° when temperatures were being taken inside of the establishments. Because of this heat handicap there is urgent need for ample ventilating facilities, such as exhaust fans and pipes, heat deflectors, and electric paddle fans. Commenting on the records showing temperatures ¹ and humidities in Milwaukee power laundries, Dr. Eyster, heretofore quoted, said:

The lowest temperature and humidity given would not seem to represent unfavorable conditions; the conditions would be distinctly unfavorable with the higher temperature and humidity. The result, of course, would vary with the individual case. One person may resist unfavorable conditions for long periods, while others are rapidly affected. There is a certain degree of acclimatization in persons exposed to abnormal temperatures and humidity. The conditions present should approach as closely as possible the lower figures given. Workers should be exposed to—

Temperature (F.)	Humidity.
64°-68°.....	40-60.
77°-86°.....	As dry as possible.
60°.....	70.

At 77° to 86° F. 60 to 70 per cent humidity is distinctly unfavorable (Wolpert).

There is a distinct call for intelligence in so distributing machines as to insure to the workers nearest the hottest surfaces full benefit from these cooling devices and to prevent one machine from drawing the heat of another. All such provisions and precautions become vitally important as guards against excessive fatigue.

EFFECT OF SUPERVISION IN REDUCING FATIGUE.

A factor which does not appear in the exact measurement of operating demands but which is none the less important in solving the problem of successful laundry administration, is a discriminating assignment of operators to machines, and instruction as to the proper method of operation to secure satisfactory results with a minimum of exertion. For just as it increases the risk of accident to assign a conspicuously nervous, excitable, careless, or clumsy girl to the operation of a dangerous machine, even though such machines are equipped

¹ For temperatures and humidities in working zones of machine operators, see pp. 55, 59, 65, 71.

with reasonably adequate guards, so is the hazard to health increased by the assignment of an anemic girl or one affected by spinal curvature or lameness to an exacting foot-treadle machine. Furthermore, most of the inexperienced girls applying for work in laundries are not trained in the conservation of physical energy and frequently fall into habits of operation that are unnecessarily injurious to health. As the child in school must be taught the healthful way to sit at his desk and the proper position to assume for writing and study, so should the learning machine operators be instructed by a foreman who is not only acquainted with the dangers of accident lurking in a machine but is likewise aware of its probable and possible hazards to the health of women operators.

While the foregoing discussion has emphasized certain dominant and more or less controllable factors of power laundry equipment, sanitation, and supervision that determine the conditions under which machine operators work, it should be kept clearly in mind that these conditions must be considered in connection with the physical condition of the individual worker before the danger of overstrain and its evil consequences can be measured with reasonable definiteness.

LEGAL PROTECTION AGAINST HAZARDS OF OVERFATIGUE.

The laws have directly recognized the hazards of overfatigue thus far only in restricting hours of labor for women, but such laws set the same working hours for all women in given industries without regard to the character of the work. The girl who sits in a normal temperature and handles paper and pencil to check a bundle of laundry and the girl who operates a hot ironing machine requiring a foot pressure of 100,000 pounds an hour have the same legal working day.

In no State do the laws shorten, or empower labor commissioners to shorten, the working hours¹ for women operating heavy-running machines, even though it could be proved that operation for the legal working hours put an excessive strain on the female organs, incurring a risk of permanent injury as great as any that another machine might inflict by accident. In the case of power laundries, as in the case of many other industries, a discrimination in the working hours of the several occupations would mean either a double shift and consequent readjustment of the wage scale—for garments could not be halted in their progress through the laundry—or such an interchange of occupations as would reduce the period of strain involved in the operation of an exacting machine. Such a shifting

¹ The German industrial code provides that "on the decision of the Federal Council the length of time, the hours of beginning and ending, and the intervals of rest may be stipulated for occupations in which excessive duration of daily working hours endangers the health of the worker."—Industrial Code, Pt. VII, sec. 120 (p. 391 of Dr. E. Hoffmann's compilation).

Since the writing of this report Oregon, California, and Wisconsin have enacted laws conferring power upon their industrial commissions to fix the working hours for women and minors on the basis of working conditions.

of occupations would call for more instruction and closer supervision on the part of foremen and result in less monotony and more versatility for the workers. The adoption of such a method of guarding against overfatigue would often be obstructed doubtless by a curious sense of proprietorship which operators sometimes show in particular machines and which gives rise to a feeling of resentment when such machines are assigned to others. But the opposition would be only temporary, as this feeling of ownership is in itself the consequence of a foreman's custom of making permanent assignments of machines and places. It should not be difficult to make machine operators understand that in the interest of their own well-being girls would not be allowed to run heavy foot-treadle machines all day, but would be assigned for part of the time to machines less exacting, or at least demanding the exercise of a different set of muscles. The factors of skill and wage would enter into this problem to some extent, but a glance at the range of pay for operating the same types of machines in Milwaukee laundries, and the slight variations in the wage of those operating different types of machines, indicate that these factors would not seriously complicate the difficulties. In any case the problem would not be extensive, as there are only a few machines in each laundry that make such demands as to call for more than the usual precautions against overfatigue. In short, this discrimination in the assignment of exacting machines would entail some inconvenience, but it would seem that the gain in efficiency in "getting the same pressure all day long," and more than all, the resulting protection against the dangers of overstrain, would be well worth the inconvenience.

That the existing working-hour laws, which do of course afford some protection against overfatigue, have not inflicted any injury upon the power-laundry industry, but have been, on the contrary, a benefit to the industry, is the testimony of Mr. J. A. Barkey, president of the Illinois Laundrymen's Association, in his address ¹ before the Missouri laundrymen's convention. He said:

What laundrymen, a few years ago, would have dared champion a limited number of hours for women workers in laundries, yet I have no doubt that the majority of laundrymen throughout the country feel that laws of this kind, where not too drastic, are a blessing in disguise. Most of the industrial States of the Union now have laws limiting the number of hours of employment for women. We in Illinois have a "10-hour law," while you here in Missouri, I believe, have a "9-hour law." I know well how you looked upon the passage of this law at the time it was enacted and possibly how some of you look upon it at the present time. It is legislation which it is very hard to get away from and extremely difficult to defeat; but you are still doing business, notwithstanding these laws, and I

¹ Printed in National Laundry Journal, July 1, 1912.

hope making as much money as you ever did, which in itself is evidence that laws are not made to put people out of business, but rather to teach business men to regulate their affairs so that they can meet conditions when imposed, ultimately making better employees out of your workers by showing them that you have something in common with them and that their welfare is as much to you as the accumulation of money.

In some of the States some indirect protection against the hazard of overfatigue is afforded in laws vesting labor commissioners with authority to determine what is safe. Such power involves supervision of ventilation, which enters so largely into the problem of fatigue in power laundries. The power to conserve the industry and yet guard the health of the workers by preventing women in questionable state of health from operating heavy-running machines at all, or limiting the time during which any woman may operate such machines, lies wholly with the employer.

Without doubt the hazard of excessive fatigue from exacting machines has been thus ignored by lawmakers, because its results are not so immediate nor so easily traceable as are those arising from the hazard of accident. Furthermore, unlike the effect of an accident, the injury to health from repeated or continued overstrain is not uniform either in character or extent. An exposed gearing may result in the sudden mangling of an operator's arm but there are no other disasters to be expected from such defect in equipment. The danger is well defined and the remedy in plain view. On the other hand the consequences of failure to reduce the operating demands of an exacting foot-treadle machine make neither a sudden nor a uniform appearance but vary in these particulars, as has been pointed out, according to the special physical predisposition and the general resisting power of the operator. In the words of a physician, "This overstrain * * * does not present a well-defined morbid picture, but it is a slow deviation, often obscured by its very slowness * * *."¹

EFFECT OF OVERSTRAIN OF EMPLOYEES ON EMPLOYERS AND THE INDUSTRY.

The woman injured in health by an excessively fatiguing machine must get through life as best she can, and, if she marries and becomes a mother, will care for her badly-born children as well as she knows how. When the laundryman buys or retains health-hazarding machinery, fails to keep his modern equipment in proper repair, neglects to properly instruct the operators, or falls so far short in matters of general sanitation as to perilously increase the fatigue involved in all occupations, he is paying a high price for his neglect. Aside from his loss through the reduced efficiency of operators, he pays in wasted

¹ Dr. Zaecaria Treves in an address before the Fourteenth International Congress of Hygiene and Demography, 1907, quoted by Josephine Goldmark in *Fatigue and Efficiency*, Part II, p. 165.

padding felt because of needless pressure from ironing cylinders or presses; he pays in excessive wear on machinery, and he pays in claims for goods damaged, sometimes by excessive pressure, frequently because the fabric has been pulled awry through some badly adjusted rollers or has been literally crushed into flimsiness under rollers on which the ironing felt had been allowed to grow hard. But with all that he pays individually, he compels the industry as a whole to pay more dearly in lost prestige and deferred patronage, and finally in its reputation as a desirable employment. For in spite of the marked differences in the demands of the various power-laundry occupations, the impression still remains abroad that all laundry work is alike hard and unattractive. This belief is doubtless something of an inheritance from "Blue Monday"—when the air of the home was tinged by the steam of the recurring weekly wash and at least one set of muscles, and often several sets of nerves, were aching under its exacting demands. The conviction that washing and ironing in the home are characterized by a dead level of hard labor has, not unnaturally, attached itself in more or less modified form to the transplanted task, but the belief takes a new hold upon the public mind each time a poorly equipped or badly managed laundry gets into the limelight, or the fatiguing character of certain types of machines is held up as the measure of the demands made by all the types in use, or as a fair sample of the strain involved in all laundry work. In other words, just as the industry has suffered an injury to its reputation for safety¹ through the failure of some laundrymen to equip the few really dangerous machines with effective guards, so it is still bearing an inherited name for demanding a dead level of hard labor, principally because some short-sighted laundrymen buy or retain antiquated devices, or are negligent in matters of repair, supervision, or instruction; and finally because of the general failure to eliminate entirely the fatiguing foot treadles from laundry equipment. As a whole, this seems an undeserved measure of ill repute, for laundry machinery as a whole is neither necessarily difficult to operate nor excessively fatiguing, and if kept with proper care and run under proper supervision does no injury to the fabric. But the individual and careless laundrymen have not only cost the industry much in lost prestige and patronage, they have made their fellow employers pay out hard-earned money to counteract this influence on the general public. The National Laundry Association of America recently raised a fund for the prosecution of a national publicity campaign, the avowed purpose of which was to acquaint the public with methods and conditions prevailing in standard laundries.

¹ The child-labor law of Wisconsin classes all laundry machinery as dangerous.

Evidences that progressive laundrymen are themselves aware of the penalty the industry is paying for the inefficiency of individuals and that they are making effective efforts to inspire the less progressive with a desire for business efficiency and industrial betterment are clearly reflected in laundry publications and convention addresses. During an address on "Employer's duty to employee," given before the Northwest Canadian Association's convention, a practical laundryman said:¹

Now we arrive at the cause of our not being able to secure girls of a higher average of intelligence * * *. They have heard from other girls who have not been started in right that the work was heavy, the hours long, the place hot, wet, and full of steam. The prejudices against the steam laundry which the associations and individuals throughout Canada and the United States are making such an effort to overcome, get a good start right here. No doubt you have all read, some, at least, of the visionary stuff that was written in a number of the leading magazines of the United States, portraying by print and picture the terrible hardships laundry help had to endure. Now this information was all gathered from dissatisfied or exemployees, like the ones referred to before, who were not started in right and only worked two or three days.

It seems that laundrymen throughout the country are taking a greater interest in the help problem, in order to eliminate as much as possible the antagonistic feeling by having cleaner, better ventilated and lighter workrooms and by adhering to a regular schedule of working hours.

There are laundrymen who believe that their industry has been the object of unfair legislation because of the deficiency of individuals. Before the Michigan Association of Laundrymen, which met in Battle Creek last May, the proprietor of a Kalamazoo laundry addressed the convention on "The duties of the modern power laundry." In the course of his remarks he said:

If we wish to avoid adverse legislation there is no better way to do it than to make the laundry the most popular institution in your particular locality. When you get on the right side of the home you can rest assured that you will be on the right side of the legislative bodies of this land. We can not expect to accomplish this when we start a laundry by renting a hole in the wall, going over to Chicago or some other machinery center and buying a lot of old second-hand, cast-off machinery.

It will bear repeating in this connection that the same laundrymen who are voluntarily working for improvement in conditions surrounding power-laundry employees are in some instances openly favoring restrictive legislation. As already stated, such laws have thus far been confined chiefly to safety guards for dangerous machinery, to

¹ Printed in National Laundry Journal, July 1, 1912.

matters of general sanitation, and to limited working hours for women. The utterance of the president of the Illinois Laundrymen's Association on the recently enacted safety laws and on restricted hours was quoted in connection with the discussion of those subjects. His attitude toward probable laws for reducing fatigue of machine operators is reflected in the following quotation taken from the same address:¹

I look for a number of laws affecting women workers in laundries as well as in other establishments. I believe that the near future will see a law compelling employers to provide seats for women who are now obliged to stand to operate machines.

A summary of the foregoing discussion of factors common to the industry as a whole, which determine working conditions in power laundries, has already been given on pages 8 and 9 and need not therefore be repeated here.

RULES AND RECOMMENDATIONS OF WISCONSIN INDUSTRIAL COMMISSION.

The following tentative rules and recommendations, which were made at the conclusion of the Bureau's study of conditions prevailing in Milwaukee power laundries and with direct reference to the facts developed thereby, were drawn up by Mr. C. W. Price, the safety and sanitation expert of the Wisconsin Industrial Commission, in conference with and by the full approval of the Milwaukee laundrymen serving on the subcommittee appointed by the industrial commission to recommend feasible standards of safety and sanitation in the power laundries of the State:

Safety.

ORDER 225. Extractors.—All extractors must be equipped with metal guards which must entirely cover the opening to the outer shell. The guard must always be in position when the extractor is in motion.

ORDER 226. Flat-work ironers.—All flat-work ironers must be equipped with guards in front of the feed rolls to prevent the hands of operators from being drawn into the rolls. When the so-called doffer roll is used and is propelled by other power than the ribbon or apron feed a guard must be placed in front of this roll.

Note.—It has been found from experience that the most efficient guard on flat-work ironers is the automatic stop guard which disengages the power when the hand of the operator strikes the guard. The ribbon or apron feeds are not adequate safeguards, as there is nothing to prevent a thoughtless or reckless operator from feeding over the apron and getting her hands dangerously close to the rolls.

ORDER 227. Bosom and combination ironers.—All bosom and combination ironers must be equipped with guards placed near enough to the rolls and the ironing board to prevent the hands of the operator from being drawn under the roll.

¹ Printed in National Laundry Journal, July 1, 1912.

ORDER 228. Collar and cuff ironers.—All collar and cuff ironers must be equipped with guards in front of the first rolls to prevent the hands of the operator from being drawn into the rolls.

Note (a).—*Platform for body ironers.*—On all one-way, single treadle, body ironers the operator should be furnished with a platform which should be the height of the foot treadle when at the lowest point.

Note (b).—*Minimum foot pressure.*—The proprietors and foremen of laundries should do everything in their power to educate operators of cuff, neckband, and yoke presses to use the minimum amount of foot pressure necessary to do proper work. It has been found from careful experiments made by competent laundry men that 75 pounds is the maximum amount of pressure necessary to do perfect work on any of the above-mentioned machines. Additional pressure is, therefore, not only a waste of the operator's energy, but a needless wear on the machinery.

Note (c).—*Bulletin No. 1—Orders on safety.*—Laundrymen are referred to Bulletin No. 1 for orders on belts and pulleys, gears, set screws, passageways, platforms, stairways, shafting, sprockets, etc. These orders were issued under date of May 20, 1912, and are now in force and apply to laundries, the same as to all other places of employment.

Sanitation.

ORDER 2300. Heat deflectors.—On all roll body ironers, the hot roll must be equipped with a heat deflector which must be lined with nonconductive material. The deflector must extend far enough down in front to deflect the heat and prevent it from being thrown out toward the operator. On all shoe body ironers, the shoe must be covered with nonconductive material.

Note.—Where practicable, all machines throwing off heat should be so placed that the heat from one machine is not thrown on the operator of another machine.

ORDER 2301. Rooms provided with exhaust fans.—Wherever flat-work ironers are operated, the room must be provided with an exhaust fan of sufficient capacity to draw out the excessive heat or steam which arise.

Note.—All rooms where washing is done and rooms where there is excessive heat or humidity should be equipped with a ventilating system of sufficient capacity to reduce the heat and humidity to a reasonable degree.

ORDER 2302. Floors kept as dry as possible.—The floors of all wash rooms in laundries must be so drained that there is no measurable depth of water where the operators must stand while working. Dry standing room should be provided where possible.

Note.—Instructions on cleanliness.—Below are given eight rules on general sanitation in laundries which the commission wishes to strongly urge that all laundry owners adopt and enforce in their shops. These rules are based on wide experience and are in force in practically all of the first-class laundries.

(a) Ample washing facilities, with hot and cold water, soap and towels, should be provided and placed within easy reach of the markers and others handling soiled clothes.

(b) Markers and others handling soiled clothes should be warned against touching the eyes, mouth, or any part of the body on which the skin has been broken by a scratch or abrasion; and they should be cautioned not to touch or eat food until the hands have been thoroughly washed.

(c) Persons with abrasions on the hands or wrists should not be allowed to handle soiled clothing until such abrasions are adequately protected from infection by bandages or gloves.

(d) Overgarments should be provided for workers while handling soiled clothes, and such garments should be washed frequently.

(e) Markers should be forbidden to shake or carelessly handle soiled clothing so as to raise unnecessary dust. This dust may contain tuberculosis or other germs, which are easily transmitted in the air.

(f) Markers and others handling soiled clothing and who also handle laundered linen should thoroughly wash their hands and faces and change their working garments before leaving the marking room.

(g) Under no circumstances should persons be allowed to sleep in rooms in which laundry work is done.

(h) Wherever possible the washing should be done in a separate room.

WORKING CONDITIONS IN MILWAUKEE POWER LAUNDRIES.

SCOPE OF THE INVESTIGATION.

This study of conditions surrounding women workers in Milwaukee power laundries was conducted with special reference to the varying physical demands of the several occupations, to the working hours and earnings of women engaged in the several occupations, and to the duration of employment afforded women in such power laundries.

The period covered by the investigation is the six months beginning September 1, 1911. The time was so chosen because the 55-hour law went into effect on that date, and it was desirable to avoid the confusion which would arise from dealing with a period which covered two working-hour limits for women. In a highly seasonal industry this limitation of the period covered by the investigation would seriously impair the value of the figures as indications either of the steadiness of employment or the earning opportunities afforded, but in the power laundry business this is not the case. As was pointed out in an earlier report,¹ "the work of a laundry is ordinarily not seasonal, unless an establishment specializes in work that is itself seasonal or depends for patronage on a locality whose residents go away in large numbers for the summer. In laundry work a "rush" period may be precipitated any week by the advent of a large convention, the arrival of a steamer, or an unexpected hotel order. Naturally such emergencies do not affect all the laundries at the same time." It may be added that such emergencies do not occur much more at one time of the year than at another, so that the level of employment for six months is fairly indicative of the level for the whole year. The establishments were visited between the 27th of March, 1912, and the 16th of the following April, a time when the weather conditions would neither exaggerate nor minimize the normal advantages and disadvantages of power-laundry occupations.

To measure the demands of machine occupations, the essentials of operation required by each machine—such as operating position, power, means of control, speed, etc.—were studied in detail. In case of foot-treadle machines, a tested scale was used to determine the exact amount of pressure necessary to secure satisfactory work. The height of the treadle and the distance it was driven in the operation were also measured. Hygrometers were used to measure the heat

¹ Bulletin of the Bureau of Labor, No. 91, p. 882.

and humidity, not only in the working zones of foot press and flat-work machine operators, but in the workroom at large and out of doors, in order to know just how much of the heat and humidity were due to weather conditions, how much to establishment facilities for ventilation, and how much was chargeable against the heat and humidity radiation of the machines themselves. In the effort to determine the physical demands of the occupations, it was the steadfast policy of the investigation to reduce the personal element to a minimum, the opinions of managers, workers, or agents being eliminated wherever possible, and in all cases involving the requirements of machine operating.

All of the 31 power laundries in Milwaukee were included in the investigation, so that the figures for establishments are complete. The reports from employers show that these power laundries employ an average of 852 women and 118 men. As 554 women, or over 65 per cent, furnished individual reports, the data give ample basis from which to draw conclusions as to the hours and earnings of women in the 31 power laundries of Milwaukee.

CHARACTER OF LAUNDRY DISTRICTS IN MILWAUKEE.

Probably the nature of the laundry business keeps the establishments in Milwaukee out of the manufacturing districts, for a smoky, dusty location materially impedes the business of getting clothes clean, even where windows and doors are kept closed so generally as to cause marked discomfort to the workers. Furthermore, as the patrons of the laundry are largely in the residential districts, good business dictates a location necessitating a minimum of travel in the work of collecting and delivering clothes. The higher rental in strictly retail streets, and the same factor as well as other obvious objections in the more expensive residence districts, therefore, leave the semibusiness, the outlying business street, the boarding and lodging house, and the cheaper residence sections as the haunts of the power laundries. This fact has its bearing upon the employees, as it usually reduces the distance to be covered in going to and from work and eliminates some of the disadvantages which characterize approaches to establishments in purely manufacturing districts. Of the 31 power laundries 6 are on strictly business streets; only 2 are in well-defined factory districts.

CHARACTER OF LAUNDRY BUILDINGS.

One-time stores or reconstructed dwelling houses furnish housing for 18 of the 31 power laundries. This is a singularly important factor in determining working conditions in power laundries, because the equipment includes heavy machines usually shaft driven and radiating such heat or humidity, or both, as to make heavy demands even upon

exceptionally good ventilating facilities. Stores and dwellings are not constructed to sustain—particularly in their second or third stories—collections of heavy or vibrating machinery, nor are the ventilating facilities installed with reference to the requirements of a modern steam laundry. Consequently, the distribution of machines in such structures must be made with principal reference to the floor capacity and endurance; and means of supplementing the ordinary door and window ventilation must be improvised if the conditions are not to fall below recognized standards of industrial hygiene. Furthermore the basements of dwellings and stores are not made to shed thousands of gallons of water daily as properly constructed washroom floors are required to do if conditions there are not to be unhealthful. Drainage of some sort is absolutely essential in the washroom and, of course, in abandoned stores and dwellings it must be more or less of an improvisation. The following table summarizes the details of location and structure for the 31 establishments:

LOCATION AND CHARACTER OF POWER LAUNDRY BUILDINGS IN MILWAUKEE.

Type of building.	Total number of laundries.	Number of laundries located in—						Number of stories used by laundry.	
		Manufacturing districts.	Retail business districts.	Outlying business districts.	Cheaper residence districts.	Brick buildings.	Frame buildings.	Range.	Prevailing number.
Built for laundry purposes...	13	.....	4	1	18	13	(²)	§ 1-3	42
Built for stores, business purposes, or residences.....	18	2	2	5	9	13	5	§ 1-2	§ 1
Total.....	31	2	6	6	17	26	5	.....	.....

¹ Including one laundry situated in a well-to-do residence district but close to business section.

² One laundry uses an adjoining frame structure for its office and bundling room.

³ With basement.

⁴ And 2 with basement.

Thirteen, or nearly 42 per cent, of the laundries were housed in buildings constructed or entirely reconstructed for laundry purposes. Three other firms had buildings in process of construction at the time of this investigation. In all of these structures the proper assignment of space for handling soiled clothes, for washing, ironing, starching, etc., the demands of heavy and jarring machinery, the requirements for drainage, ventilation, and general sanitation, were given more effective consideration than could be accorded in the other group of structures. The human value of this situation lies in the fact that while these 13 buildings especially constructed for laundry purposes constitute but 42 per cent of all the laundries, they employ 70 per cent, or more than two-thirds, of all the women workers, and it is estimated on the basis of equipment that they do more than

four-fifths of all the power laundry work done in Milwaukee. This fact should be taken into consideration in the tables and discussions dealing with the details of laundry organization and the conditions surrounding power laundry workers.

DRAINAGE, VENTILATION, AND GENERAL SANITATION.

Because of the large volume of water used in the process of washing, because all flat pieces are at least partly dried as well as ironed on the ironing machines, and because the business requires a collection of hot machines, the questions of drainage, ventilation, and general sanitation assume more than ordinary importance.

The problem of drainage is confined directly, of course, to the wash room, though if such drainage is inadequate the effect is felt all through the building.

The number of washing machines in Milwaukee power laundries ranged from 2 to 18 at the time of this investigation. From these receptacles hot or cold water is constantly being discharged, as the rinses rarely last more than 10 minutes and the "suds" only from 10 to 40 minutes. In such a situation, it is plain that drainage of some sort is absolutely indispensable. Furthermore, it is plain that where there is so much moisture, floors and walls of wood are neither as durable nor do they permit of the same degree of sanitation as floors and walls constructed of cement or similar material.

Twelve, or over 92 per cent, of the 13 buildings constructed especially for laundry purposes had cement floors in the wash rooms. Fifteen, or 83 per cent, of the other group of 18 structures had wash-room floors of the same material. Some of these floors are made with sharp depressions a little wider than the width of the washing machines and running a sufficient distance to contain all the washing machines end to end. In the middle of this depression and directly under the machines an open gutter is constructed and into this the water is discharged directly from the washers. It also collects the water splashed from the machines into the depression constructed for that purpose. In other laundries where the machines do not stand in depressions, the floor has been built with a slight dip from the center to the sides where the washing machines stand over gutters which catch the water shed by the inclined floor as well as that discharged from the machines. In still other cases the machines stood over gutters in the center of the floor which dipped toward the side gutters. A transverse gutter connected the gutters under the machines with the gutters at the side of the room. In one case where there was neither gutter nor pipe connection, a grated manhole was supposed to carry off the water; but this device was not adequate, even though there was a pronounced slope in the floor, because only a concave construction would make the manhole serve as a drain for all parts of the room.

Where the floors were of wood, even though, as in one case, the washing machines stood over gutters and were boxed in by planks to catch the "splash," there was an obvious wet rot. All the 31 laundries had some sort of sewer connections from the washing machines.

The table following shows the prevailing construction of wash-room floors in Milwaukee's 31 power laundries:

LOCATION AND FLOOR CONSTRUCTION OF WASH ROOMS IN MILWAUKEE POWER LAUNDRIES.

Type of building.	Number of laundries.	Laundries having basement wash rooms.		Laundries with specified floor construction.		
		Number.	Per cent.	Cement.	Wood.	Having gutters.
Built for laundry purposes.....	13	4	30.8	12	1	13
Built for stores, business purposes, or residences.....	18	13	72.2	15	3	¹ 14
Total.....	31	17	54.8	27	4	27

¹ The other four had sewer connections, but discharged water into boxed parts of the floor under the washing machines or into a grated manhole.

The foregoing table also shows the tendency to take the wash rooms out of the basement when buildings are especially constructed for power laundry purposes. Less than a third of the latter have located the wash rooms in the basement, while in more than two-thirds of the old buildings washing is done in these frequently poorly lighted cellar rooms.

Naturally the problem of ventilating a room into which steam and water are being constantly discharged assumes an importance corresponding with the problem of drainage. Because of the amount of humidity in the wash room, doors and windows do not afford adequate ventilation, even when the weather permits of their being open. When the windows are shut and there is no exhaust system the atmosphere is heavy with steam.

While the humidity is not so difficult to control in other departments, with the possible exception of a flat-work ironing room containing several large machines, both the heat and humidity generated by the damp clothes, heated machines, and hot starch render ample scientific ventilating facilities indispensable to health and comfort in all the mechanical departments of power laundries, if for no other purpose than to reduce the humidity. It should be remembered in considering the following table, showing atmospheric conditions in the several workrooms, that the records were taken when the outdoor temperature ranged from 31° to 75°, and reached those extremes but once while records were being taken in the laundries, the prevailing outdoor temperatures being between 45° and 65°. The outside humidity for the same period ranged between 30 and 75, the records showing a prevailing humidity of from about 45 to 70.

It is apparent from this table that exhaust systems are playing an important part in keeping down the humidity under a wide range of temperatures. It is significant that the wash rooms in 19 of the 31 power laundries were without exhaust systems. The effect of exhaust systems, as shown by the table, is somewhat obscured by other factors. For example, a wash room in one establishment did not have an exhaust fan, but did have a mechanical drying device which in itself was equipped with an exhaust, and undoubtedly did much to reduce the humidity which in other wash rooms reached 90 when the temperature in each case was 70°.¹ A study of the following table should include careful consideration of the footnotes, which in this case are vitally important in gaining a correct idea of the prevailing atmospheric conditions as affected by equipment.

COMPARISON OF TEMPERATURE AND HUMIDITY RECORDS FOR PLANTS EQUIPPED AND NOT EQUIPPED WITH EXHAUST SYSTEMS.

PLANTS EQUIPPED WITH EXHAUST FAN OR PIPE.

Kind of room.	Number of laundries having work-rooms of specified kind.	Number of work-rooms reported.	Number of work-rooms where records were taken.	Temperature (degrees F.) and humidity records.							
				Taken in laundry workrooms.				Corresponding records taken out of doors.			
				Range of temperature.	Corresponding humidity.	Range of humidity.	Corresponding temperature.	Range of temperature. ²	Corresponding humidity. ³	Range of humidity. ⁴	Corresponding temperature. ⁵
Wash room....	12	13	9	63-78.5	79-47	43-79	74-63	65-75	30-60	68-30	59-65
Flat-work ironing room....	10	12	6	64-78	43-59	43-74	64-76	46-65	72-43	72-69	46-31
Body-linen ironing room.	13	16	12	64-82	52-55	42-72	73-70	48-65	73-30	53-72	45-46

PLANTS NOT EQUIPPED WITH EXHAUST FAN OR PIPE.

Wash room....	19	19	14	1070- 84	11 { ¹²⁶⁸ 72 88 86 90 68 90}	1335	35-91	84-881	11 { ⁵¹ 46 61 37 51 37}	75 72 54 68 75 68}	60-58	75-73	
Flat-work ironing room....	12	12	11	70- 86	11 { ⁶⁸ 90}	42	42-90	86- 70	11 { ⁵¹ 37}	64 68 75 68}	31-37	64-68	
Body-linen ironing room.	17	17	13	70- 86		90- 93	39-91	86-781		37-64	68-31	31-58	64-73

¹ The special bulletin on safety and sanitation in the laundries, issued by the Wisconsin Industrial Commission contains a recommendation, but not an order, that wash rooms be equipped with exhaust systems. See p. 30.

² Corresponding to range of temperatures taken in the workrooms and shown in column 5.

³ Corresponding to outside temperatures shown in preceding column.

⁴ Corresponding to range of humidities taken in the workrooms and shown in column 7.

⁵ Corresponding to outside humidities shown in preceding column.

⁶ One laundry has 2 wash rooms, one with and the other without exhaust equipment.

⁷ Two large flat-work ironers were also in the wash room. The laundry wash room having a higher temperature, of 89°, was not given because, although equipped with an exhaust pipe, its proximity to the neighboring buildings prevented this from operating effectively.

⁸ Two laundries have two flat-work ironing rooms, each having one room with and one room without exhaust equipment.

⁹ One laundry has 3 body-linen ironing rooms; another has 2 such rooms.

¹⁰ The laundry wash room having a lower temperature, 68°, was not taken because, having but 2 washing machines, its temperature and humidity were not comparable with other rooms having 9 or more.

¹¹ The records traced are for different establishments having the minimum workroom temperature shown in column 5.

¹² See physician's statement for unfavorable working temperatures and humidities, p. 23.

¹³ The wash room was situated on second floor, and washers placed but a few feet from dry room, which reduced the humidity.

Adequate toilet facilities are not more essential doubtless in power laundries than in the majority of other industries. The Wisconsin law compels all employers to provide separate toilets for the sexes and to shield the approach to such toilets from undue exposure. The table following shows the equipment of the 31 laundries in this particular:

TOILET FACILITIES IN MILWAUKEE POWER LAUNDRIES.

Toilet equipment. ¹	Number of laundries reported.	Number of women employed.			Laundries in which sanitary condition was—				Laundries not having separate toilets for sexes.	
		Small-est number in any one laundry.	Great-est number in any one laundry.	Total.	Good. ²	Fair. ³	Poor. ⁴		Number.	Women affected.
							Num-ber.	Women af-fected.		
One toilet only.....	21	3	45	304	6	11	4	54	5	38
Two toilets.....	4	10	82	145	4	.....	.....	.....	.....	.....
Three toilets.....	4	40	66	205	4	.....	.....	.....	.....	.....
Four toilets.....	2	80	118	198	2	.....	.....	.....	.....	.....
Total.....	31	.....	.....	852	16	11	4	54	5	38

¹ Referring to women's toilets only, with the exception shown in the last two columns of the table.

² "Good" signifies sanitary in construction and condition.

³ "Fair" signifies unkept but not obviously insanitary.

⁴ "Poor" signifies insanitary in construction, in condition, or in both.

As in the case of other industries, too, other hygienic provisions measurably affect the comfort of the workers. Lunch rooms, apart from the hot and humid workrooms, rest rooms for the noon hour, and, more than all, lockers which will protect the outer garments from the moisture in the workrooms, conserve the health and comfort of workers.

The following table shows the extent of these provisions in the 31 establishments:

PROVISIONS AS TO LOCKERS OR CLOAKROOMS AND REST OR LUNCH ROOMS IN MILWAUKEE POWER LAUNDRIES.

Provisions in laundries as to lockers or cloakrooms and rest or lunch rooms.	Number of establishments.	Number of women employed.
Having lockers or cloakrooms.....	¹ 20	694
Not having place separate from workroom for wraps.....	11	158
Having rest or lunch rooms.....	7	428
Not having rest or lunch rooms.....	24	424
Total laundries.....	31	852

¹ Although a cloakroom was provided in two of these laundries on the lower floor, garments were found hanging on the walls in the upstairs workrooms.

DESCRIPTION OF OCCUPATIONS.

MARKING.

Laundry occupations really begin with the collection of soiled clothes by men known as drivers. When these men deposit their loads in the marking rooms, girls called markers undo the bundles, mark each piece for identification, either by hand or by machine, call the pieces out for the other girls to list or list them themselves, and deposit the marked articles in places specified for the various washing groups of clothes. There may be separate bins or places for collars and cuffs, shirts, shirtwaists, handkerchiefs, bed linen, table linen, woolen and cotton flannels, or whatever subdivisions the extent of the laundry's trade may permit. The girls who mark must have considerable experience and good judgment as to the character of fabrics, else too much sorting falls upon the washman. In laundries doing a large amount of hotel flat work or hospital work the lot is kept together during the washing process and the only marking done, when any is done at all, is on a single piece in the lot.

No laundries take clothes from houses placarded with contagious diseases,¹ but Milwaukee laundrymen have no way of knowing whether the clothes are infected with either communicable but not placardable diseases, such as tuberculosis and the venereal diseases. Neither laundrymen nor workers handling the soiled clothes are concerned over the situation. The attitude toward any possible dangers² lurking in the soiled clothes is reflected in the following description of the marking occupations in selected laundries, together with the measures of protection taken by the management. The examples cover the whole range of methods prevailing in the 31 power laundries of Milwaukee.

Example No. 1.—The soiled clothing is brought by the driver into the marking and listing room in the basement. The bed linen, towels, and table linen—all known as flat work—are put into one room and the body linen into the other. In these two rooms the girls open the bundles, marking and listing each article and sorting all articles according to washable groups, i. e., white goods, colored clothes, flannels, etc. There are no rules or special precautions in connection with the work.

Example No. 2.—The markers do not handle a garment extensively to find whether a mark is already on it, but usually put one on the first edge or corner picked up in case no mark is on it. Except for the fact that the markers wear aprons, there is no precaution against infection from the clothes. The manager of the laundry explained that the drivers had strict orders to take no laundry from placarded houses nor from the red-light district and that no orders were taken from hospitals. The laundryman taking bundles from agencies on a commission basis, however, usually does not know anything about the house or people from which clothes come.

Example No. 3.—The work is received in bundles at the markers' and listers' tables, where the girls open the bundles one at a time. The markers and listers generally work

¹ One laundryman said that he had taken clothes from a man who lived in a placarded house, but who was allowed to go to his work daily.

² For discussion of dangers from infection, see pp. 11 to 14.

in pairs; one girl opens, counts, and lists the articles, the other marks them. When asked about precautions taken against infection, the manager said he thought the health department should get out lists of places in which there are contagious diseases of any kind, including tuberculosis, and provide the laundries with such lists, so that they might refuse to receive clothing from these places until it had been properly disinfected; that the health department should make it a business to disinfect laundry regularly at places where there is infectious disease, thus protecting the laundry workers and helping a family at a time of great need. The superintendent advocated an ordinance forbidding laundries to have agencies and compelling drivers to call at the homes for all laundry. He believed that such an ordinance would reduce the danger of receiving bundles in which there is contagious disease. "Suspicious looking laundry bundles are not opened, but are returned to the sender."

This laundry does a large amount of steamboat work.

Example No. 4.—The drivers unload the bundles of clothing through the back door on the first floor in the rear end of the washroom. The marking and listing are done here on a long table along the side wall. From 5 to 14 girls are engaged in marking, listing, and distributing the clothes. They also spend part of their days upstairs folding and sorting. A girl standing at the middle of the long table takes the clothing out of the bundles, throwing the white articles and flat work to the two girls at her right and the colored garments, etc., to the two at her left. The markers and listers work in teams, one marking and throwing the articles into the proper pile, and the other listing.

This department is in rather bad condition. The clothing, instead of being put into proper baskets or trucks, is thrown in piles on the floor or into barrels. The clothes are divided into the following piles for washing: Woolen underwear (to be washed by hand); white personal wearing apparel; colored wearing apparel; collars and cuffs; white flat work; flat work with colored borders.

The flat work—i. e., table linen and bedding—is washed together.

There is no protection against infection for the girls doing this work, except that they receive no work from hospitals or hotels, or placarded houses, or from houses where they suspect infection. The manager admitted the danger of infection from non-placarded diseases. If when a bundle is opened the clothing looks suspicious, it is put into a bag which is immersed in a solution of washing soda and cold water and then dried. After this treatment the articles are marked and listed and washed in the same way as all other clothes. If a bundle looks too bad it is returned unwashed to the sender. The girls are not required to change their clothing or to bathe before leaving the building.

Example No. 5.—No precautions taken other than refusing work from hospitals and placarded houses, and no material difference in methods. Manager told of case where a man was taken to the pesthouse the day after a bundle was received from his home. The girls were all vaccinated when the fact was learned and no contagion resulted.

Example No. 6.—No difference in system and no precautions taken other than refusing work from placarded houses. Work is accepted from the red-light district, however.

Example No. 7.—Flat work from hotels and hospitals is not marked but is kept separate throughout the washing process. The markers of other clothes do no other work in the laundry, and the washmen and markers remove their working garments and bathe before leaving the establishment at night. The working garments are washed before being donned again next day.

Example No. 8.—Front part of first-floor room used for marking soiled clothes, checking, and bundling of clean clothes. No precautions against infection except refusal to accept bundles from placarded houses, hospitals, or, knowingly, from the red-light district.

The table which follows shows the protective measures which are taken against possible contagion or infection from soiled clothing.

It will be observed that 4 of the 31 power laundries have no agencies. This is important, as before intimated, because an agency usually takes orders on commission and turns over the bundles to the laundry, whose management is not aware of their source. As the agencies do not handle the soiled clothing, there is a temptation to be optimistic concerning the condition of the garments and to take much on faith.

The impressive feature of the table is that 20, or 64.5 per cent of all the establishments, employing more than half of all the markers scheduled, took no precautions against contagion except to refuse orders from placarded houses. Just how much danger of infection to laundry employees lurks in soiled clothing sent to the laundries is discussed at length on pages 11 to 14.

Protective measures taken in marking rooms of Milwaukee power laundries against possible infection from soiled clothes.¹

Total number of laundries.....	31
Protective measures against contagion or infection—	
For general public: ²	
Number of firms allowing soiled clothes handlers to do no other work.	1
Number of firms compelling soiled clothes handlers to bathe and change garments before leaving laundry.....	1
For markers:	
Total number of markers reported.....	83
Number of firms refusing work from red-light district.....	5
Number of firms having no agencies.....	4
Number of firms taking other precautions.....	³ 3
Number of markers affected.....	36
No precautions taken except against placarded houses:	
Number of laundries.....	20
Number of markers affected.....	47

CHEMICAL PREPARATION OF WASH WATERS.

This is a man's work in the power laundries. The first problem of the washman is the water; for the character and degree of its hardness and the extent to which it is affected by deposits injurious to fabrics determine—or are supposed to determine—the amount of neutralizing chemicals necessary to soften and clear it. As the substances used and the degree of accuracy with which they are used affect not only the fabrics but have some bearing upon the working conditions of women handling the clothes in the succeeding laundry

¹ The figures are not mutually exclusive; one laundry may take one or more of the precautions indicated.

² Statements of physicians, p. 12, indicate that there is no appreciable danger to the public from the commingling of soiled clothes.

³ One laundry subjects all suspicious-looking bundles to a soak in a washing soda solution and dries them before they are marked; the second washes such bundles separately, thus not necessitating marking; the third fumigates the clothes from homes known to have nonplacardable disease.

processes, a brief review of the methods prevailing in the wash rooms of Milwaukee power laundries is pertinent here.

The use of chemicals in the laundry has four distinct purposes, viz: (1) Softening the water; (2) loosening the soil; (3) whitening the clothes; and (4) removing traces of chemicals employed in accomplishing objects 1, 2, and 3. The fourth process is known as souring.

Softening the water.

The quality of water varies not only in different places but at different times of the year in the same place. Therefore if laundry chemical processes are to be scientific, frequent analyses of the water are essential. At the time of this investigation, the city chemist reported Milwaukee hydrant water to contain 9.9 degrees of "permanent" hardness. While permanent hardness can not be reduced by the simple process of boiling as can temporary hardness, both can be reduced by dry soda or washing soda. The following table for softening water is given in a technical work on the power laundry:¹

AMOUNT OF SPECIFIED CHEMICALS REQUIRED TO SOFTEN WATER OF VARYING DEGREES OF HARDNESS.

Degree of hardness.	Required amount of dry soda (58 per cent alkali or 98 per cent carbonate of soda) per 100 gallons, in ounces avoirdupois.	Required amount of washing soda (soda crystals) per 100 gallons of water, in ounces avoirdupois.
5.....	1½	3¾
10.....	2½	7½
15.....	3¾	11½
20.....	5	15
25.....	6½	18¾
30.....	7½	22½

Only one laundryman in Milwaukee analyzed the water often enough to keep posted as to its variations. In this laundry analyses were made at least twice a week and at certain seasons every day. The records of these tests showed the hardness to vary from 4 to 14 degrees at different times of the year. Assuming the foregoing table to be a reasonable standard of measurement, any laundryman who treated the water with either of the sodas all the year round for a given degree of hardness—as, for example, the approximately 10° reported by the city chemist—was at times failing to soften the water and thus impeding the work and increasing the demands upon the workers; or was overloading the water often to the detriment of the

¹ "Chemistry for Launderers," American edition. Appendix A, p. 179.

fabric, and frequently to the discomfort of those charged with the responsibility of the later processes.

Ordinarily the waters treated only with softening agents are such as are used for soaking. Some Milwaukee laundries do not soften these first waters at all, deferring this treatment to the sudsing waters. The following table summarizes the softening processes prevailing in the power laundries of Milwaukee:

AGENTS USED FOR SOFTENING WATER IN MILWAUKEE POWER LAUNDRIES.

[Of the 31 laundries studied 17 used softening agents.]

Softening agent. ¹	Average amount of softening agent used in a 100-shirt machine. ²			Wash waters in which softener is used.	Number of laundries using each specified agent. ³	Number of laundries regularly analyzing water.
	Pounds.	Quarts.	Number of laundries not measuring amount used.			
Boiling.....				Second to fourth, inclusive.	1	
Distilling.....				Third to fifth, inclusive.	1	
Softening plant ⁴				Second to seventh, inclusive.	1	1
Washing soda compounds.....	2.50		1	First.....	11	
Washing soda compound solution..		2.00		do.....	2	
Caustic soda.....	.34			do.....	1	
Borax.....	1.00		1	do.....	2	
Ammonia.....		.38	1	First to fourth, inclusive.	2	

¹ One laundry was reported as relying upon filtering for softening water; this merely removes the iron and suspended matter without reducing the hardness.

² The standard amount of water used in a 100-shirt machine is 50 gallons, except in the suds, for which from 42 to 46 gallons are used. Milwaukee laundrymen, however, with one exception, do not measure the water used accurately.

³ These numbers are not mutually exclusive, some laundries using more than one softening agent.

⁴ A system whereby large quantities of water are mixed with softening chemicals and then filtered.

Loosening dirt and grease.

The second object to be achieved by the use of chemicals is to loosen the dirt and grease. This is usually done by combinations of soda and soaps or soap solutions. The sodas, in addition to softening the water, and thus making the soap more effective, aid in rendering albuminous matter soluble. All of the 31 power laundries in Milwaukee used some form of detergent in addition to soap in the first or second suds and some used them in both suds. The following table reveals the character and quantity of chemicals used chiefly as detergents and the method of their application.

DETERGENTS (DIRT AND GREASE LOOSENERS) USED ON SOILED CLOTHES IN MILWAUKEE POWER LAUNDRIES.

[All of the 31 laundries studied used detergents.]

Detergents.	Average percent of each substance in solution.	Number of laundries not measuring parts in solution.	Usual wash water in which detergent is used.	Average number of quarts solution used in "100-shirt machine."	Number of laundries not measuring amount of solution used.	Number of laundries measuring water in machine.	Number of laundries using specified detergents.
Soap solution.....	9.25	2	{Second and third.	8.40	1	1	4
Solution ¹ of {Soap.....	4.20	4	{Second and fourth.	9.68	6	.....	19
Washing soda compound.....	2.85						
Solution of {Soap.....	4.57	.....	{Second and third.	5.62	1	.....	2
Caustic soda.....	2.75						
Solution of {Soap.....	3.75	.....	{Second and fourth.	12.44	.....	.....	4
Borax compound.....	2.45						
Solution of {Soap.....	3.92	.....	.....do.....	16.25	.....	.....	2
Washing soda compound.....	.93						
Caustic soda.....	.38	.....	.....	.....	.....	.....	.....

¹ One laundryman makes a solution of soap and water, puts it in the wash machine, and then adds "about a tablespoonful of soda."

The most striking thing in connection with the use of chemicals does not appear in the foregoing table nor in any of the tables summarizing the use of chemicals. For, while the number of laundries is given in which there is no system of measurement at all, a large proportion of the others reported the amount used as "about" so much. It is also noteworthy that in one establishment sodas are applied in a solid or dry state rather than in solution, as strongly advised by one authority.¹ Carefully prepared solutions insure a more thorough mixture of the substances with the washing water and guard against lumps of soda deposits which work damage to the clothes, impede the progress of garments through the laundry, and in a dry state are likely to irritate the hands of the workers. It is important to note that these "detergents" are used in the second, third, and fourth waters, as the several waters which follow carry off at least a part of any overload of chemical.

The matter of securing satisfactory soaps is not the least of wash-room problems. The ingredients of soaps used to a large extent in Milwaukee laundries are tallow and caustic soda. Theoretically, 12 parts of caustic soda to 88 parts of stearic acid (the acid in tallow) will produce saponification. In actual practice, however, the tallow which comes to the soap factories contains other acids which must be reckoned with in determining the proportion of caustic to be used. The large soap factories, therefore, analyze the tallow before making combinations, and the laundryman who makes his own soap is under

¹ "Alkali in any form should never be put into the machine in the solid state but always dissolved in water." See Chemistry for Launderers, p. 156.

the same necessity if he is to avoid using too much caustic, which produces a caustic soap, discomforting to the worker and injurious to the fabric; or too little, which leaves a free fatty acid that loosens the dirt but is itself prone to leave grease spots.

The form of soap most generally used in Milwaukee laundries is a "soap chip." When this is dissolved in water there is a noticeable amount of free fatty acid. In all cases except one where this form of soap was used the washmen added an alkali (in the form of soda) to resaponify this free fat. In three laundries the washmen made the soap and in no case was the tallow analyzed, hence there was not adequate means of control over the acids therein.

Bleaching and bluing.

In 30 of the 31 power laundries some substance was used in the first or second suds, and sometimes in both, to whiten the clothes; and in all the establishments the traditional bluing formed a part of the whitening process, though this was applied usually with the last water. The common bleaching agent in Milwaukee laundries was chloride of lime, though oxalic acid and a market compound ¹ purporting to be both a bleach and a detergent were also used. Unless care is taken in regard to the amount of bleach used, not only will the fabric suffer, but irritating fumes ² will be given off from the clothes during the ironing process.

The table below shows the bleaching methods, the substances and amounts used, and the prevailing application of the bluing, which is, after all, but a supplement or finishing touch to the whitening process. The table shows that the bleaches proper are put into the second, third, or fourth waters. Reference to the table on page 47 will reveal the fact that the prevailing number of waters for clothes treated to a bleach is from 7 to 9, hence there are at least three waters to rinse out any ordinary excess of chemicals used for this purpose.

¹ Analyzed, this substance contained: Sodium carbonate, 30.74 per cent; sodium hydrate, 5.60 per cent; fatty acid, 10.8 per cent; combined alkaline, 25.7 per cent; moisture, 27.16 per cent.

² For physicians' opinions as to the effect of chloride of lime upon workers, see footnote to p. 16.

BLEACHES USED IN MILWAUKEE POWER LAUNDRIES.

[Of the 31 laundries studied 30 used a bleach.]

Bleach. ¹	Average per cent of each substance in solution.	Number of laundries not measuring parts in solution.	Usual wash water in which bleach is used.	Average number of quarts substance or solution used in "100 shirt machine."	Number of laundries not measuring amount used.	Number of laundries using specified bleaches. ²
Electrolytic bleach.....	.....	.....	Fourth.....	2.25.....	.....	2
Oxalic acid.....	.....	.....	do.....	.13.....	.....	1
Washing-soda compound ³.....	.....	.....	Third.....	.31.....	.....	4
Liquid chlorine.....	.....	.....	Second.....	.25.....	.....	1
Solution of.....{chloride of lime.....	20.0.....	1	Fourth.....	.88.....	.....	1
.....{ammonia.....	80.0.....		Fourth and fifth.....	1.00.....	1	2
Chloride of lime solution.....	1.0.....		Fourth.....	2.00.....	.....	1
Commercialized hypochloride of soda solution.....	11.1.....	.....	.....	.....	.....	.....
Solution of.....{Chloride of lime.....	2.8.....	1	.....do.....	1.00.....	.....	1
.....{Caustic soda.....	5.8.....		.....do.....	1.67.....	4	20
Solution of.....{Chloride of lime.....	4.1.....		.....do.....	.....	.....	.....
.....{Washing soda compound.....	6.2.....	.....	.....	.....	.....	.....

¹ Bleach is used almost entirely on white linen; but four laundries use it on flannels, and three use it on colored clothes.

² These numbers are not mutually exclusive; one laundry may use more than one bleach.

³ Upon analysis this advertised bleach was found to contain sodium carbonate, 30.74 per cent; sodium hydrate, 5.60 per cent; fatty acid, 10.80 per cent; combined alkaline solution, 25.70 per cent; moisture, 27.16 per cent; or was without bleaching properties.

⁴ Pounds.

Removing traces of chemicals.

Where a softening plant is not in use, and water is softened by the direct application of sodas, an appreciable amount of the carbonates of lime, formed as the lime salts in the water, are thrown out of solution and deposited in crystalline form in the fabrics. Also when these lime salts unite with the soap a pasty material forms on the clothes. Furthermore, the chloride of lime used as a bleach likewise leaves a deposit in the form of sodium hypochlorite. To remove all such deposits, rinsing waters are treated with acids which unite with the lime and leave the other acids free to pass off in the water. They likewise decompose the deposit left by the bleach. This process is known as "souring."

To remove the lime soap, it is of course necessary to use hot water in order to keep the fatty acids melted. As a majority of the laundries use the acetic acid as the souring agent in cold water, this lime soap is not removed. Furthermore, the acetic acid is often put into the bluing water, which is the last water through which the clothes are put. Consequently, the acid is not itself thoroughly rinsed out of the clothes before they are ironed. The other acid used as a "sour" is oxalic. This is more corrosive, but as it is usually put in the sixth water and several waters follow, there is ordinarily ample rinsing to remove all trace of the souring acid.

In three laundries no souring acid is used at all, and in two others practically none, because it is used in small quantity in combination with the bluing solution, which is itself put into the water in very

limited amounts, as the table at the bottom of this page shows. Again, attention may be called to the fact that the bearing of this subject upon the working conditions in power laundries lies wholly in their effect upon workers who handle clothes out of which the chemicals have not been thoroughly rinsed.¹

The following table shows the use of "sour" in Milwaukee laundries:

CHEMICALS USED FOR "SOURING" CLOTHES IN MILWAUKEE POWER LAUNDRIES.

[Of the 31 laundries studied, 26 used a "sour."]

"Sours." ²	Average number of pounds of acid used in a 100-shirt machine.	Number of laundries not measuring amount used.	Number of laundries using specified sour. ³	Usual wash water in which sour is used.	Number of laundries using sour in last water.
Acetic acid.....	$\frac{1}{4}$	4	21	Eighth..	13
Oxalic acid.....	$\frac{1}{8}$	2	10	Sixth...	1

As before intimated the use of "blue" in the laundries is but a supplemental whitening process. Its only bearing upon the working conditions lies in the effect upon the workers of the acetic and oxalic acids often used in combination with the bluing. Since this solution is applied to the last water, it would be of much importance were it not that the prevailing amounts used, as shown in the following table, are so small as to make the effect inconsequential. In a few laundries, however, the acid is used so excessively as to be of considerable importance, because of the irritating fumes that arise from the clothes during the ironing process. But such cases are markedly exceptional, and the following table is presented more to complete the description of the use of chemicals in the Milwaukee power laundries than because of any significant situation which it reveals:

BLUING SOLUTIONS USED IN MILWAUKEE POWER LAUNDRIES.

[All of the 31 laundries studied used bluing.]

Bluing solution.	Average per cent of substances in solution.	Number of laundries not measuring parts in solution.	Usual wash water in which bluing is used.	Average ounces of (liquid) solution used in a 100-shirt machine.	Number of laundries not measuring amount used.	Number of laundries using specified bluing.
Aniline solution.....	7.00	11	Eighth.....	$\frac{1}{8}$	12	17
Solution of { Aniline.....	.77	}	do.....	$\frac{1}{8}$	5	11
Acetic acid.....	5.10					
Solution of { Aniline.....	.92					
Oxalic acid.....	2.40					
Solution of { Aniline.....	.50	}	Seventh and ninth.	$\frac{1}{8}$	1	2
Acetic acid.....	3.00					
Oxalic acid.....	1.50					
			Eighth.....	$\frac{1}{8}$	.....	1

¹ For effect of chemicals used see footnote to p. 16.

² Souring is used on white linen almost entirely; but six laundries sour colored clothes and but two sour flannels.

³ These numbers are not mutually exclusive. One laundry may use both sour.

THE WASHING PROCESS.

Machine washing.

Although all the washing machines in Milwaukee power laundries except one were operated by men, and a detailed description of the occupational demands are therefore not pertinent, the method and efficiency which characterize the several washing processes have a more or less direct bearing upon the demands of succeeding occupations. Consequently an outline sketch of the methods of procedure will not be amiss.

The clothes are taken from the markers to the washmen who, in a large laundry, re-sort them according to the degree of soil. However minutely the general washable groups may be subdivided, the washman usually had one washing formula for each of the four general classifications of clothes: (1) Plain unstarched linen, known as "flat work" and made up of table linen, bed linen, towels, and handkerchiefs; (2) white body linen; (3) colored linen; and (4) flannels. In eight of the laundries woollens are treated as a fifth class. The formula used for each washing group is varied slightly in quantity of chemicals used, and washing and rinsing time in accordance with the degree of soil. In this particular the laundryman doing a small business is at a disadvantage because his "loads" of clothes are not large enough to permit of a fine grading according to degree of soil. Hence the whole load in a machine must be treated both as to quantity of chemicals and length of washing on the basis of the needs of the dirtiest pieces in the lot. Under such circumstances the cleaner clothes get more treatment than they really need.

Reference to the following table will show that all clothes except flannels are subjected to from five to eleven separate waters, beginning with a soapless soak and ending either with a bluing or a clear-water rinse:

WASHING PROCESSES USED IN MILWAUKEE POWER LAUNDRIES FOR SPECIFIED WASHING GROUPS OF CLOTHES.

Principal washing groups.	Laundries using specified number of wash waters for entire washing process.								Number of laundries using soap in—		Average duration (in minutes) of suds.		Number of laundries bringing linen to boil in at least one water.	Number of laundries giving formulas for specified washing group.
	Less than 5.	5	6	7	8	9	10	11	Only one water.	Two waters.	First suds.	Second suds.		
Plain unstarched pieces (flat work).....	None.	2	2	2	9	6	1	2	2	22	23.0	22.1	22	24
White body linen.....	None.	None.	1	4	10	7	6	3	None.	31	21.0	26.2	31	31
Colored body linen.....	None.	None.	3	7	10	5	1	1	None.	27	23.7	25.0	1	27
Flannels.....	8	2	2	3	4	1	None.	None.	4	16	19.4	22.4	1	20

¹ Eight of these laundries gave special formulas for woollens, not included in this table.

All these processes for a given load of clothes are carried on in a cylindrical washing machine, the outer cylinder being stationary and the inner perforated cylinder, into which the clothes are put, being so constructed and controlled as to alternate the direction of its revolutions.

The standard size is known as "a hundred shirt machine" and usually carries besides its load of clothes from 42 to 50 gallons of water, less water being used for suds than for rinses, in standard laundries.

The lack of standards of exact measurement referred to in the comment on the tables summarizing the chemical formulas is further complicated by the fact that there is no standard of exact measurement for the amount of water used for each "run." The measurement is only an estimate made with the unaided eye, sometimes by observing a glass tube at the side of the machine. Obviously if the water is not accurately measured, the value of any standard of measure for mixing chemicals is seriously impaired.

It is important to note that all white flat work in all but 2 cases and all white body linen are subjected to a sterilizing heat during the course of the washing process. Such sterilization as the flannels and colored clothes get in the washing process is mechanical, but it should be remembered that most of these garments are later subjected to the same thermal sterilization during the ironing or steaming processes as is given to other clothes. This of course has a direct bearing upon the question of the possible spread of contagious diseases from an aggregation of soiled clothing.

Only five laundries stated definite temperature for warm-water washing. In four other cases, however, a maximum temperature was given for colored clothes. In the first suds the temperature is generally raised to "hot," which, according to men having a definite standard, varies from 100° to 180° F. After this suds comes a rinse in water of the same temperature, then a second suds, which is heated from the temperature of the last water to 212°, and boiled a few minutes. Two laundries only do not wash unstarched pieces in water heated beyond 190° F. The suds are run from 10 to 40 minutes in different laundries. The average as well as the prevailing time for the first and second suds is 20 minutes for plain linen. The average and prevailing time for the first suds in body linen is 20 minutes, but for the second suds it is 30 minutes. Some laundries run the second suds the same time as the first, some for a longer period, and some for a shorter period. One washman said he did not time the run at all. As a rule 5 minutes is the time reported for the rinses. This is undoubtedly the time aimed at, but it is only an estimate in many cases.

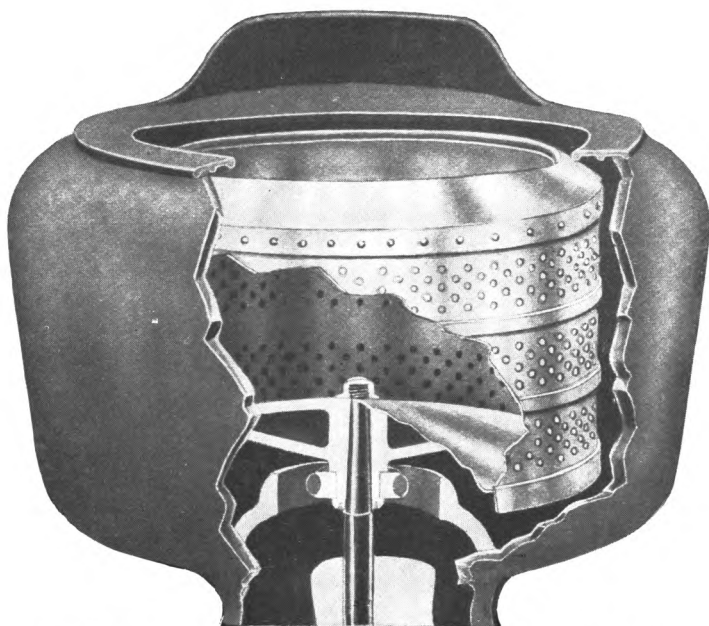


PLATE 3.—EXTRACTOR: SECTIONAL VIEW SHOWING INNER, PERFORATED, ROTARY TUB OR BASKET.

HAND WASHING.

The finer or frail pieces in all laundries and the flannels in six laundries are washed by hand. For this work women are employed, the individual schedules showing but nine of such workers among the 554 reporting and indicating that only an inconsiderable amount of hand work prevails in this department of the laundry. While the chemicals are mixed in the usual way by the washmen, the processes to which the women subject the clothes depend entirely upon the nature and condition of the articles and vary much more than do the machine processes.

WRINGING THE CLOTHES (EXTRACTING).

The washman removes the clothes from the washing machines into trucks in which they are taken to the extractor, a machine which has entirely supplanted the old wringing devices. This machine is shown in the accompanying illustration (pl. 3). It consists of a metal tub on a steel stand; inside of the tub is a perforated copper basket into which the wet clothes are placed. This basket is so adjusted that it can be set to revolving at a speed of from 900 to 2,000 revolutions a minute. The speed at which it is revolving presses the linen tightly against the sides of the basket, the water escaping through the perforations into the outer shell from which it empties into the drain. These machines take 75 per cent of the water from the clothes. Among the most serious accidents that have occurred in the laundries are those chargeable to these extractors. The most common peril lies in the risk of getting the hand caught in a loose end of the clothes and having the arm broken or jerked from the socket. Covers have been devised which can not be lifted until the power is turned off. These have proved inadequate, however, as the momentum created causes the machine to revolve with dangerous speed for some minutes after the power is off. By pressing a foot treadle the whirling basket can be stopped, but to operate this treadle requires a pressure in most cases of more than a hundred pounds, the amount depending upon the size of the load and the speed at which the machine is running. As the treadle is usually under the tub, there is a natural tendency to place the hands upon the edges of the outer shell, thus increasing the danger of getting the hand caught in loose ends of the load. Most of the extractors in Milwaukee laundries were not equipped with other covers than a canvas cloth which was wrapped around the clothes when the load was large to keep pieces from flying out. There is further danger of the extractor being driven at such speed as to cause it to burst. Of the 63 extractors used in Milwaukee laundries, 5 were attended by women. One woman attended two of these

five extractors. Only one of the five was guarded. Aside from the hazard of accidents there are no unusual demands in connection with the operation of the machine. However, the fact that all extractors are in the washrooms subjects the operators to the influences of any defective drainage or ventilation.

"TUMBLING" OR "SHAKING."

When clothes come from the extractor, they are packed, by the centrifugal force, into hard masses and must be disentangled and straightened out before they can be run through the ironing machines. In the case of small flat pieces, this takes much time if done by hand. In some laundries the small flat pieces were shaken apart by a woven wire "tumbler," which on the outside looks like a cylindrical washing machine, but has an interior wire revolving cylinder which "tumbles" the goods about until they are loose.

If the clothes are shaken out by hand, the girls usually stand to do the work, though there is nothing in the nature of the occupation which would interfere with satisfactory work if the girls alternated the standing position with the use of high stools, especially when shaking out the small pieces. The chief demand of the occupation is the constant motion involved in snapping the clothes straight, and calling for the continuous use of the muscles of the arms, back, and chest.

FLAT-WORK IRONING.

The flat work, that is the bed and table linen, towels, and handkerchiefs, is dried and ironed at the same time by being fed into the flat-work ironers. The prevailing type of flat-work ironer is a succession of padded rollers, about 100 inches in length and ten to 12 inches in diameter, running in concave chests heated by steam. Between these revolving rollers and the steam chests the goods are fed, the heat and pressure being sufficient to iron and to dry the fabric. The number of padded rollers on this type of ironer varied in Milwaukee laundries from one to six. Eleven of the 27 flat-work machines of this type were equipped with one roll only.

Four of the 38 flat-work ironers were of the steam cylinder type shown in plate 4. In this machine a conveyor apron carries the goods around the steam-heated drum over which run with considerable pressure six padded rolls about 7 inches in diameter.

Seven of the machines were a combination of the steam-cylinder and steam-chest type. (Pl. 5.)

While 27 of the 38 flat-work ironers in use in Milwaukee at the time of the investigation were of the steam-chest type, plates 4 and 5 are inserted to show the two types of machines which are conspicuous as heat radiators. It should be remembered, however, that less than 30 per cent of the flat-work machines were equipped with the large cylinders, shown in these illustrations.

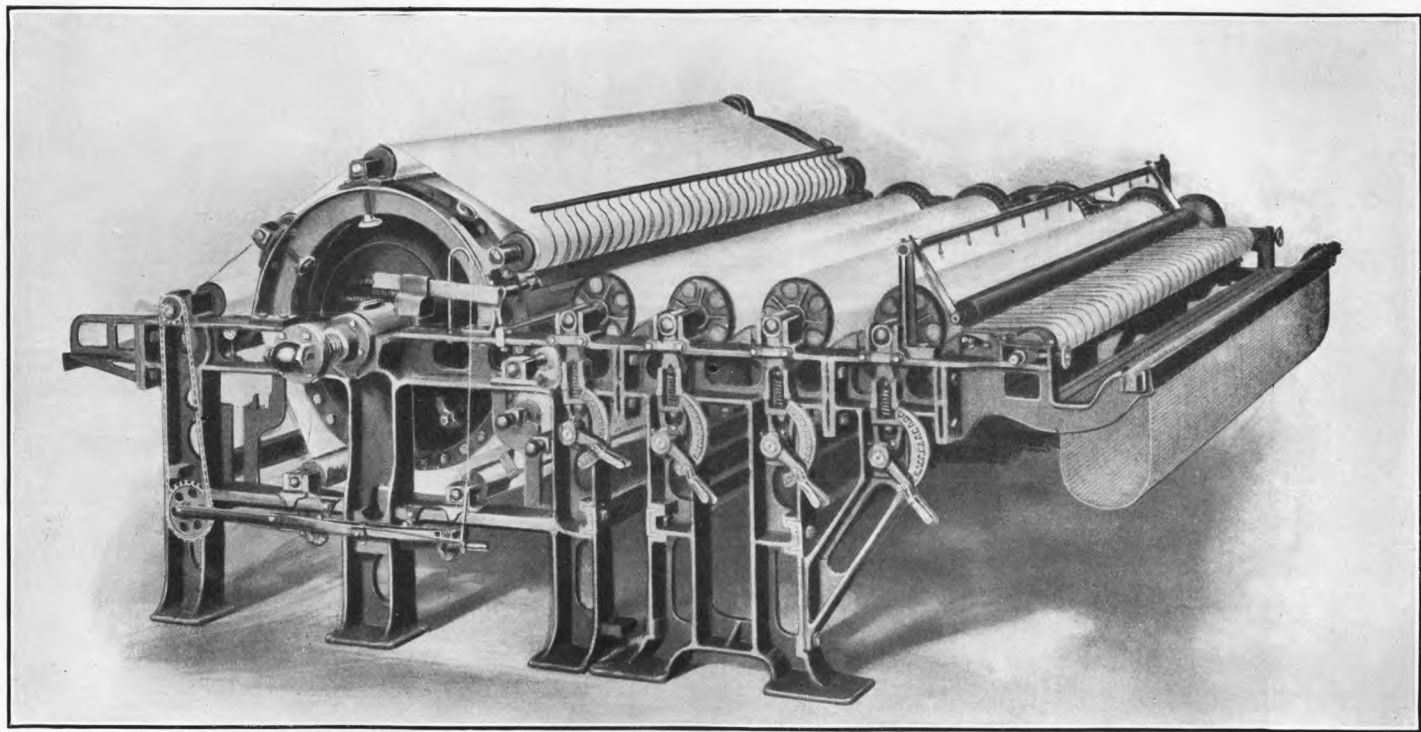


PLATE 5.—COMBINATION OF STEAM CHEST AND STEAM CYLINDER FLAT-WORK IRONER.

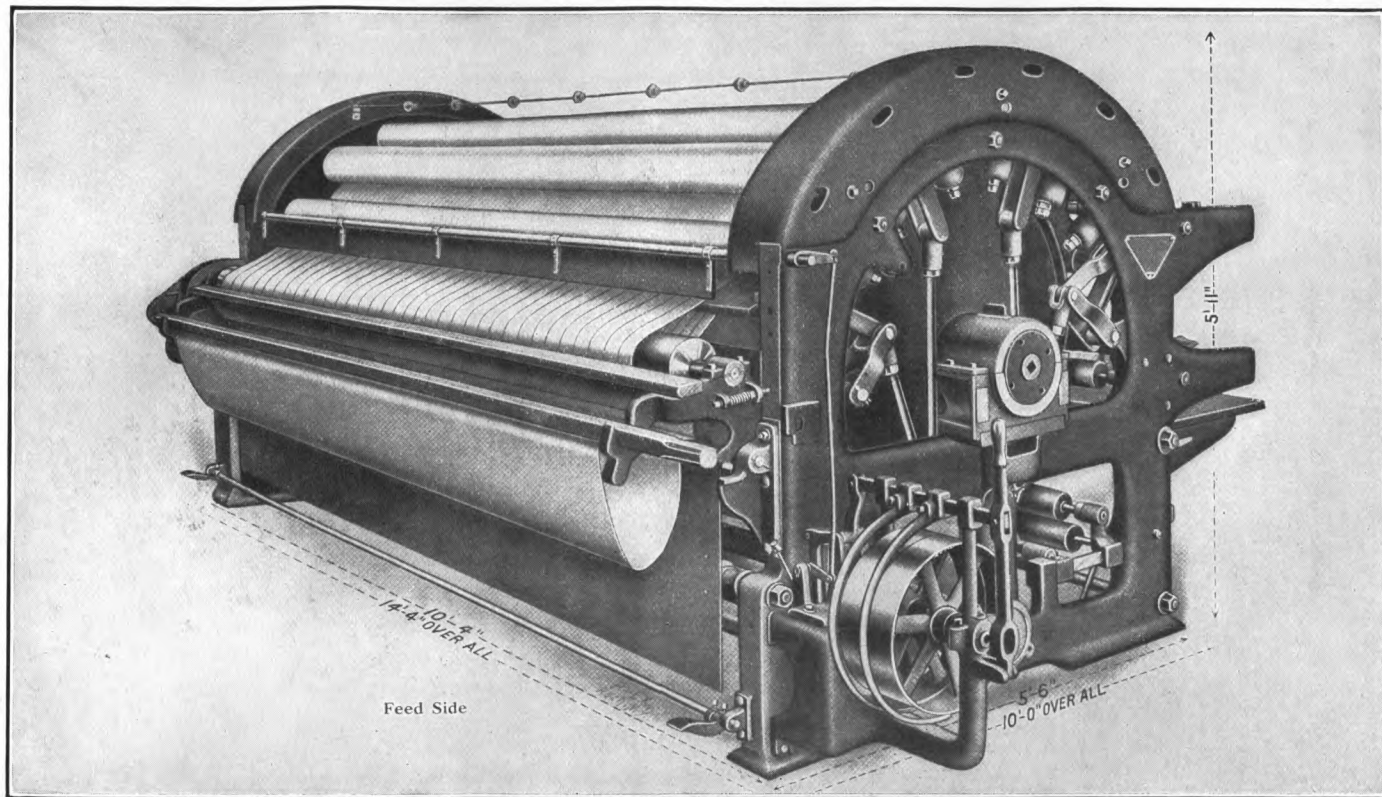


PLATE 4.—STEAM CYLINDER FLAT-WORK IRONER.

The flat-work ironers are not difficult to operate. They run with a continuous motion, the girls using sometimes a hand lever and sometimes a treadle to start or stop the machine, neither requiring a significant amount of pressure. At times as many as four girls feed the flat pieces into the front of the machine when an equal or greater number may be needed to take the finished linen from the machine and fold it for inspection and bundling. The number of feeders and folders—as the number of rolls—depends upon the amount of flat work which the laundry handles. The number of feeders or folders, however, does not affect the physical demands of the work except where the work is so limited that one girl feeds the pieces into a one-roll machine, allowing them to drop into a receptacle on the folding side, and then at intervals changes her occupation from feeding to folding.

The essentials of the occupation of “feeding” are laying the pieces straight upon the feeding apron or along the small feed roll and keeping the pieces smooth and even in their progress into the machine. On this type of machine the majority of feeders in Milwaukee laundries stood at their work, though there was no apparent obstacle in the way of using stools—except the absence of such accommodations.

These as well as the other type of flat-work ironers are distinctly dangerous machines when not adequately equipped with finger guards to keep the hands of the feeders from being drawn under the hot rollers. The girls running four of the big six-roll steam-chest machines and the girls operating one steam-cylinder machine were protected from accident by an automatic screen guard running in front and along the whole length of the first roll. If the fingers of the operator pressed against this guard enough to move it toward the rolls, the machine was stopped automatically. This, of course, guards only the first roll. If a girl is reckless enough to reach over the first, to get or straighten something between the first and second rolls, she puts herself in jeopardy. Because there have been cases of such recklessness, with distressing consequences, a device is now on the market which screens all the rolls and which can not be removed until the machine has been brought to a standstill.

Eight of the two or more roll steam-chest machines and two of the four big cylinder machines were equipped with a small feed roll placed in front of the first ironing roll. While this roll is heavy enough to draw the goods into the machine, it does not endanger the hands of the feeder unless it is revolved by other power than the motion of the traveling feed apron. In such cases the feed roll may itself be dangerous in that its action is powerful enough to draw the hands against the ironing rolls.

Two of the 38 flat-work ironers were equipped with converging bars which permitted the insertion of fabrics but would not admit the fingers.

Seven one-roll chest machines were not equipped with any guards at all. Without in the least belittling the need of guards on these machines, it should be said that the one-roll machines run at a low speed and have a stationary feed plate which render them less dangerous than the other type of machines. This is not true of the big steam-cylinder or steam-chest machines, one of each kind having no guards at all save the feed plate.

Belts and gearing on all these machines, of course, require guarding. The following table summarizes the prevailing conditions in the matter of guards against accidents to flat-work ironing feeders in particular, and against accident from exposed gearing to workers in general.

The table shows some serious deficiencies in accident equipment. There were 17 of the 38 flat-work ironers without finger guards, 18 without gear guards, and of the 32 belt-driven machines, only 12 were properly guarded.¹

ACCIDENT GUARDS ON FLAT-WORK IRONERS IN THE 23 LAUNDRIES USING SUCH MACHINES.

Type of machine.	Number of chests or cylinders.	Number of machines in use.	Guards.				
			Finger.		Gear wheel.	Belt.	
			Number of machines having guards.	Character of guards.	Number of machines having guard.	Number of belt-driven machines.	Number of machines having guard.
Steam chest.....	1	11	3	Roll.....	6	³ 10	5
	2	2	1	Converging bars.....		2	1
	3	1	None.	Roll.....	1	None.	1
	4	1	1	Converging bars.....	1	³ 3	1
	5	5	2	Roll and apron feed.....	3	4	1
	6	7	4	Roll.....		4	1
			4	Automatic safety guard.....	2	4	1
			2	Roll.....			
Total.....		27	17		14	23	9
Steam cylinder.....	1	2	1	Automatic safety guard.....	2	None.	.....
	2	2	1	Roll.....		2	2
			4	do.....	2	2	2
Total.....		4	3		4	2	2
Steam chest and cylinder.....	3	4	None.		1	4	1
	5	3	1	Roll.....	1	3	None.
Total.....		7	1		2	7	1
Grand total.....		38	21		20	32	12

¹ Since this investigation was made the Industrial Commission of Wisconsin has issued orders that gearing and belts on machinery in all industries be guarded, and that finger guards be provided for all flat-work ironers in laundries.

² The 7 machines not included have a steel plate over which linen was fed, which served as a slight guard to the fingers.

³ Two machines were so placed as to make belt guards unnecessary.

⁴ One other machine had a steel plate over which linen was fed which served as a slight guard to the fingers.

That laundrymen of Milwaukee recognized the necessity of equipping all flat-work ironers with adequate finger guards is evidenced by the following rules and recommendations submitted to the Wisconsin Industrial Commission by the subcommittee on safety and sanitation in the laundries. The subcommittee was composed of three members, two of whom were laundrymen of Milwaukee. On the matter of finger guards for flat-work ironers the tentative rules and recommendations read:

All flat-work ironers must be equipped with guards in front of the feed rolls to prevent the hands of operators from being drawn into the rolls. When the so-called doffer roll is used and is propelled by other power than the ribbon or apron feed a guard must be placed in front of this roll.

NOTE.—It has been found from experience that the most efficient guard on flat-work ironers is the automatic stop guard which disengages the power when the hand of the operator strikes the guard. The ribbon or apron feeds are not adequate safeguards, as there is nothing to prevent a thoughtless or reckless operator from feeding over the apron and getting her hands dangerously close to the rolls.¹

The girls who receive the ironed pieces for folding, in the majority of cases, were standing to do their work, though here, too, there is no reason why the work could not be done in a sitting position, if stools or chairs were always provided. As the name "receiver" or "folder" indicates, the essential features of the occupation involve only the receiving and folding of the goods that come from the last roll of the flat-work ironers. As the rolls are running toward the folders, there is no danger of getting the fingers crushed, but in all the types of machines, they get the added heat of the ironed and steaming linen constantly traveling toward them, which results in raising the general average temperature for the folders $2\frac{1}{2}^{\circ}$ above that in the working zone of the feeders, where the clothes are handled in a wet but not a hot state. When sheets and tablecloths, or any other "big" flat-work pieces are "speeded" through the large machines it is often necessary for the receivers and folders to wear gloves to protect the fingers from the hot linen.

As the damp linen passes through any of these machines, but particularly as it passes through the large fiat-work ironers, great clouds of steam rise and are diffused about feeders and folders, and frequently throughout the whole room, unless there is an adequate exhaust system to draw off the steam and excessive heat generated by these combination driers and ironers. Because of the extent of heat-radiating surface involved, the number of machines with two or more rolls shown in the foregoing table becomes important.

¹ In one Milwaukee laundry an operator was observed to be ignoring entirely the fact that such an apron made it unnecessary for her to put her hands into danger, for she was feeding directly into the roll.

That all the flat-work ironers should be equipped with exhaust systems was recognized by the subcommittee heretofore mentioned as recommending to the Wisconsin Industrial Commission rules for safety and sanitation in laundries. In this connection the suggested rules read: "Wherever flat-work ironers are operated, the room must be provided with an exhaust fan of sufficient capacity to draw out the excessive steam or heat which arise."

The proper placing of machines with reference to exhaust fans or other air currents, and especially with reference to other heat-radiating machines, has so much to do with the atmospheric conditions, not only in the working zones of operators but in the room at large, that the following table has been constructed on the basis of advantageous placing and adequately equipping with exhaust systems. A flat-work ironer may be equipped with an exhaust of reasonable capacity for that machine, but the ironer may be so placed that it draws the heat and humidity of a neighboring machine and overtakes what would otherwise be adequate ventilating equipment.

The table shows some remarkable ranges in temperature and humidity, in view of the outdoor atmospheric conditions prevailing at the same time. What the table does not show is the significant fact that in one case there was a range of from 78° to 95° in the working zones of flat-work ironers in the same room at the same time when the outdoor temperature was 75°. This was a striking example of the importance of intelligent placing of machines, for these two machines were not over 8 feet apart. The machine showing the lower temperature was really the greater heat radiator, but it was so placed that the folders got all the benefit of the air current, while the feeders of this machine got none, and worked in a temperature of 94° as compared with 78° on the folders' side. Furthermore, the heat and humidity were carried by the air current directly on the operators of the other machine, whose folders and feeders both worked in a temperature of 95°. To add to the discomfort, the exhaust pipe which was supposed to carry the humidity off from the washing machines to the outer air was so placed that the moisture was drawn upon the operators of the flat-work ironers.

Of course, the floor space and endurance and the shafting possibilities restrict the opportunities for an advantageous distribution of these big machines, but as far as such factors will permit, the recommendations of the Wisconsin subcommittee on laundry safety and sanitation deserve careful consideration. These recommendations read:

Where practicable, all machines throwing off heat should be so placed that the heat of one machine is not thrown on the operator of another machine.

TEMPERATURES AND HUMIDITIES IN THE OPERATING ZONE OF FLAT-WORK IRONERS.

Flat-work ironers well placed and well equipped.¹

Type of machine.	Number of chests or cylinders.	Temperature (degrees F.) and humidity.					
		Number of machines near which records were taken.	Records in operating zone. ²				
			Average temperature.	Temperature range.	Corresponding humidities.	Humidity range.	Corresponding temperatures.
Steam chest.....	1	2	72.5	71-74	56-47	47-56	74-71
	5	1	72.0	70-74	48-47	47-48	74-70
	6	2	72.8	69-75	51-44	44-51	75- ³ 169
Steam chest and steam cylinder.	5	1	75.0	74-76	40-38	33-40	76-74 172

Flat-work ironers not well placed or not well equipped.⁴

Steam chest.....	1	7	78.3	73-86	40-36	34-57	80
	2	2	75.5	72-80	57-54	50-59	73-77
	4	1	88.0	87-89	34-33	33-34	89-87
	5	4	85.1	75-95	55-32	32-55	95-75
	6	5	71.2	74-86	62-37	37-62	86-75
Steam cylinder.....	1	2	76.8	74-82	50-31	31-52	82-76
	2	2	80.3	69-94	68-44	44-68	94-69
Steam chest and steam cylinder.	3	2	78.8	71-86	56-39	35-53	84-74
	5	1	76.5	75-78	48-46	46-48	78-75

Flat-work ironers well placed and well equipped.¹

Type of machine.	Temperature (degrees F.) and humidity.						
	Corresponding records in room at large.					Corresponding outdoor—	
	Average temperature.	Temperature range.	Corresponding humidities.	Humidity range.	Corresponding temperatures.	Temperature range.	Corresponding humidities.
Steam chest.....	70	6-70	6-68	68-6	70-8	51-68	75-47
	70	70	68	68	70	52	30
	74	70-78	68-46	46-68	78-70	65-51	30-75
Steam chest and steam cylinder.	(⁶)					45	55

Flat-work ironers not well placed or not well equipped.⁵

Steam chest.....	74.8	64-85	43-47	46-57	78-80	46-75	72-60
	70.5	64-77	43-63	43-63	64-77	46-66	72-49
	86.0	86	42	42	86	64	31
	80.8	74-85	58-47	47-58	85-74	61-75	61-60
	75.0	74-86	58-39	58-39	74-86	49-64	61-31
Steam cylinder.....	74.0	74	58	58	74	54	35
	78.5	72-85	46-47	47-46	85-72	59-75	68-60
Steam chest and steam cylinder.	72.5	70-78	90-67	67-90	78-70	37-54	63-48
	78.0	78	59	59	78	65	43

¹ The total number of well-placed and well-equipped ironers in all laundries was 6.² The records were taken on the feeders' and on the folders' side of the flat-work ironer.³ Temperatures for different machines having maximum humidity shown in preceding column.⁴ The total number of ironers not well placed and equipped in all laundries was 32.⁵ The temperature near one machine was 92°, with humidity 54.⁶ Not reported.

In the case of the combination steam chest and cylinder flat-work ironers (pl. 5) and in two of the exclusively steam-chest construction the folders work under the additional handicap of the heat radiated by the last steam cylinder or chest, which is above rather than beneath the padded, and hence somewhat protecting surfaces. In only one case were the feeders affected by this transposition of steam chest and padded roll.

Washing, extracting, shaking or tumbling, combined drying and ironing, and folding complete the laundering process for flat work.

BODY LINEN IRONING.

Starching.

The course of body linen through the laundry is much the same as that for flat work up to and including the extracting process. From the extractor such body linen as must be starched is sent to the starching division, where the work is done both by hand and machine in the Milwaukee laundries.

If the essentials of operation are taken as a basis for classifying types of starching machines, there are three distinct groups used in Milwaukee power laundries, viz, (1) those requiring only to be loaded, started, and stopped; (2) those requiring "feeding," and (3) those requiring feeding and foot-treadle operations.

The first group make no constant operating demands other than are involved in loading and unloading the machine. In the table (p. 58) these machines have been described as requiring only "attendance." While there were four styles of such machines aside from the starch extractor, the prevailing devices were the "brass pan" machines. Of 23 starchers requiring attendance only, 15 were of this construction.

These machines are hot, but as the attendant is not confined to the immediate vicinity of the machine while it is in operation, but only when loading and unloading, no temperatures are given in the tables for the "working zones."

The starch extractors—used to eliminate excess starch from garments done by hand or on machines where there is no regulation of amount to requirements—are classed among the machines requiring "attendance" only. For while such machines are equipped with foot treadles, pressure is exerted only to bring the whirling interior basket to a standstill when the process of extracting is completed. The machines are built on the principle of the water extractors (see p. 49), but are not run at such high speed.

The essentials of operation in the second group of machines are feeding the machines and wiping off excess starch. There were 19 machines of this type. Eighteen of them were known as "collar

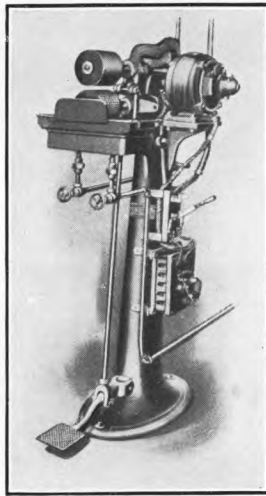


PLATE 6.—BAND STARCHER WITH FOOT
TREADLE.

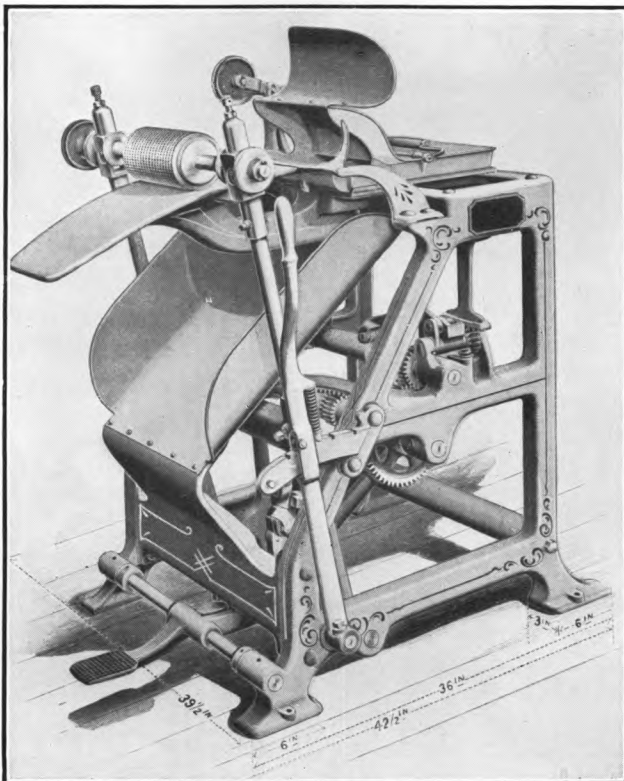


PLATE 7.—BOSOM STARCHER.

rolls." One girl feeds the collars into the machine and another girl at the opposite side of the machine receives them and "wipes off" the excess starch, usually with a bone implement. All of the girls operating these machines stood at their work, though, as in the case of a number of other machines, there was no feature of the work that apparently would be impaired if the operators sat.

The other machine of the second group was a brass pan containing a perforated top, over which the garment was placed and through which the starch was forced by power, the flow being regulated by a hand lever. The essential of operation, however, was placing the article on the machine and then rubbing in and wiping off the starch.

In the third group of machines are all those types which require the use of foot treadles as an operating essential. There were three of such types and 15 machines in all. Of these, 10 were known as band rolls, 4 were bosom rolls, and 1 a brass pan with perforated surface like the one described under the second group, except that the starch was forced through the perforations by the use of a foot treadle instead of by power.

Plate 6 illustrates the prevailing foot-treadle starching machine. The parts of the garment to be starched are fed between two rolls, the lower one of which is constantly supplied with hot starch from the starch pan. Pressure on the foot treadle exerted in a slow treading motion brings the two rolls together with sufficient force to work the starch thoroughly into the fabric. The character of the operation necessitates a standing position. The amount of pressure required on these band starchers ranged from $12\frac{1}{2}$ to 55 pounds. In the case of the bosom starchers (see pl. 7) the pressure ranged from 28 to 65 pounds.

The following table shows the prevailing groups of starching machines, the essentials of operation and, in the case of foot-treadle devices, the number of pounds pressure required, the height of treadles from the floor, and the distance driven in the course of operations.

ESSENTIALS OF OPERATION OF STARCHING MACHINES USED IN MILWAUKEE POWER LAUNDRIES.

[Of the 31 laundries studied, 29 had starching machines.]

Essentials of operation.	Types of machines requiring specified operation.	Number of machines of specified types.	Foot treadles.							
			Height and distance treadle moves (in inches).						Pounds pressure required.	
			Number of treadles reported.	Height.		Distance moved.		Number of treadles reported.	Range.	Average.
				Range.	Average.	Range.	Average.			
Attendance (loading, starting, stopping, and unloading).	Brass pan..... Cylinder..... Barrel..... Dip wheel..... Extractor ²	15 1 2 5 7	(1) (1) (1) (1) 5	..... ..... ..... ..... 6-12	..... ..... ..... ..... 9	..... ..... ..... ..... 2-9	..... ..... ..... ..... 5½	..... ..... ..... ..... 6	..... ..... ..... ..... 25-100+	..... ..... ..... ..... 58.5
Feeding and wiping.	Collar roll..... Perforated surface pan.....	18 1	..........	..........	..........	..........	..........	..........	..........	..........
Feeding and foot treadle pressure.	Bosom (roll)..... Band (roll)..... Perforated surface pan.....	4 10 1	2 6 1	2½-3 1-3 1	2½ 2½	2-2½ ½-3 1	2½ 1½	2 8 1	28-65 12½-55 36	46.5 27.3

¹ No foot treadles.² Foot treadle pressure is used on the extractor only to bring basket to a standstill.³ Exact average not computable because the exact pressure for machines requiring more than 100 pounds was not obtained.

The subjoined table shows the records for temperature and humidity in operators' working zones for such starching machines as require more than mere attendance. For the purpose of comparison there are also given the records for the room at large and for out doors. This table contains further evidence of the effect of careful placing of machines. The starch machines were hot, but there were some so placed that the operators were working in less heat than prevailed in the room at large. The humidities, however, were higher in the working zone of the larger group of machines. The explanation is found in the fact that hot ironing machines, usually present in the starching rooms, do much to dry out the air, while in the immediate vicinity of the starchers the humidity is increased by the vapors from the hot starch.

In a few cases the starching machines were so close to the "driers" as to effectively reduce the humidity in the working zone of the operators.

TEMPERATURES AND HUMIDITIES IN THE WORKING ZONES OF STARCHING MACHINES, REQUIRING MORE THAN MERE ATTENDANCE, IN MILWAUKEE POWER LAUNDRIES.

[Machines requiring attendance only are not included in this table because workers stand near machine only while loading and unloading machine.]

Types of machines.	Number of machines of specified types.	Number of machine temperatures reported.	Temperature (degrees F.) and humidity.				
			Records in operating zone.				
			Average temperature.	Temperature range.	Corresponding humidities.	Humidity range.	Corresponding temperatures.
Collar roll.....	18	15	77.4	68-89	54-43	39-66	73-75
Perforated surface pan.....	2	2	81.0	74-88	43-38	38-43	88-74
Bosom roll.....	4	2	79.5	75-84	48-47	48-47	75-84
Neckband roll.....	10	10	78.3	74-84	37-47	35-57	80-80

Types of machines.	Temperature (degrees F.) and humidity.						
	Corresponding records in room at large.					Corresponding out door.	
	Average temperature.	Temperature range.	Corresponding humidities.	Humidity range.	Corresponding temperatures.	Temperature range.	Corresponding humidities.
Collar roll.....	77.6	73-86	45-39	48-41	70-80	65-75	30-60
Perforated surface pan.....	81	78-84	46-35	35-46	84-78	65-75	30-60
Bosom roll.....	78	76-80	45-57	45-57	76-80	31-66	69-49
Neckband roll.....	78	76-80	45-57	30-57	78-81	31-66	69-49

Drying.

Drying in the modern laundry is done entirely with mechanical devices. The shirts, collars, or other articles of body linen are hung upon racks that are pushed or automatically drawn into sectional hot-air chambers which are kept at a temperature of from 300° to 350°. The device is so constructed that little heat escapes except as the doors are opened and shut. As a rule, the girls doing the starching hang up their pieces on the drier and remove them when dry. Except for this the machine requires no attention from the women.

Dampening.

The clothes were dampened on machines of two types, the operation of neither of which required more physical exertion than was involved in feeding collars and cuffs into the rolls, or passing the garments through the sprays. In Milwaukee laundries, 27 of the 32 machines were of a single type. The attendance upon this machine involves so much moving about that sitting while at work is not practicable. On the collar and cuff dampener, of which there were four, however, the feeders could, and did sometimes, sit at their work. On the shirt

dampener, which is also of the roll variety, the height of the machine was such that girls could not sit while at work except upon a high stool.

Collar and cuff ironing.

Collars and cuffs are ironed on machines of various styles, all of them, however, being built on the general principle of the steam-cylinder flat-work ironers described on pages 50-56. There were 24 collar and cuff ironers in Milwaukee's 31 power laundries. Eighteen of them were of the large padded-roll type with small heated cylinders.

Of the 18 machines of this type there were 11 which were equipped with three heated cylinders, six with one, and one with two hot cylinders. The one-cylinder machines having the heated surface under the padded roll do not especially need heat deflectors. The two and three cylinder machines, however, do need heat deflectors, as the heated surfaces are exposed either on the feeders' or folders' side. In other words, of the 18 machines of this type in use, 12 require heat guards. The table on page 61 shows that only four were so equipped.

The second type of machine has the large steam cylinder beneath small padded rolls, and is to that extent shielded. There were but two of these machines in Milwaukee laundries.

The combined large and small heated cylinders and small padded rolls (illustrated in pl. 8) require heat guards as they have an exposed cylinder on the feeders' side. Two of the four machines of this type found in Milwaukee laundries were without heat deflectors.

The temperatures in the immediate vicinity of nearly all the collar ironers were so obviously affected by their positions in the various laundries as to obscure the records showing effect of heat guards. For example, machines with heat guards were in some instances so badly placed with reference to other hot machines that the temperatures about the operators were higher than about the operators of some other machines not equipped with heat deflectors but so placed that the women got the benefit of the currents of air from fans or other ventilating devices. Of two similarly constructed machines equally well placed, however, it is obvious that the one having the heated cylinders covered with nonconductive material will be more comfortable for the operators.

The essentials of operation in connection with all these collar and cuff ironers consist in feeding and receiving, though in nearly all cases there was but one girl at a machine, as the finished articles were allowed to drop into a receptacle on the receiving side. The operators can, and in some cases do, sit while at work.

Where there are no accident guards there is the same danger of getting the fingers caught between the rolls as in the flat-work ironers, but because of the smaller size of the rolls the accidents resulting are

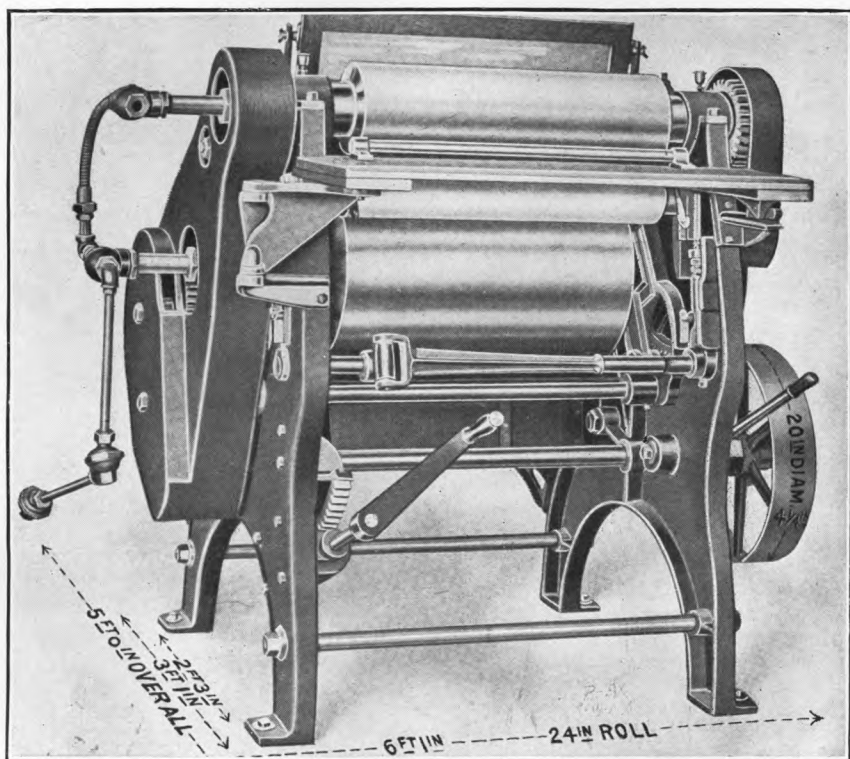


PLATE 8.—COLLAR AND CUFF IRONER WITH COMBINED SMALL AND LARGE HEATED CYL'NDER.

not so likely to be fatal. The tentative rules and regulations of the Wisconsin Industrial Commission provide that—

All collar and cuff ironers must be equipped with guards in front of the first rolls to prevent the hands of the operator from being drawn into the rolls.

The following table shows the number and kind of collar ironers found in Milwaukee power laundries and the number equipped with heat deflectors and accident guards.

ACCIDENT AND HEAT GUARDS ON COLLAR IRONERS USED IN 24 MILWAUKEE POWER LAUNDRIES.

Type of machines.	Number of heated cylinders.	Number of machines in use.	Guards.						
			Finger.		Gear wheel.	Belt.		Heat.	
			Number of machines having guards.	Character of guards.	Number of machines having guards.	Number of belt-driven machines.	Number of machines having guards.	Number of machines requiring guards.	Number of machines having guards.
Small heated cylinder and large padded rolls.	1	6	15	Converging bars.	2	6	1	None.	.....
	2	1	1	Bar	1	1	1	1	1
	3	11	8	Bar, roll, or converging bars.	8	9	3	11	3
Large heated cylinder and small padded rolls.	1	2	1	Converging bars.	2	1	1	None.	.....
Combined large and small heated cylinders and small padded rolls.	2	4	11	.....do.....	3	3	1	4	2
Total.....	.....	24	16		16	20	7	16	6

¹ One machine not included, had a steel plate over which linen is fed, which serves as a slight guard to the fingers.

Collar finishing.

After collars come from the ironers they are shaped and otherwise finished on a variety of finishing machines, none of which except the wing tipper call for more physical exertion than is involved in the occupation of "feeding." None of these machines radiate any considerable amount of heat, nor does the operation of any of them entail risk of serious accident. Most of the operators were standing though not because of the operating requirement. The machine found most often in Milwaukee laundries both dampened the seams (so the starched fabric would not be cracked or broken in process of bending) and shaped the collars.

Machine pressing.

Starched body linen, other than detached collars and cuffs, is sent from the dampeners to the press-machine operators. Shirts or other garments with attached cuffs are first put into the cuff, neckband, and yoke presses. The part of the garment to be pressed is

placed over a shaped and padded press bed. By the operation of a foot treadle a steam-heated brass plate, constructed to fit the press bed exactly, is clamped down on the yoke, cuff, or neck, as the case may be. The accompanying illustration (pl. 9) shows the structure of these machines.

In each case the hot press is "clamped" onto the press bed, released, the cuff turned, the press again clamped. When the treadle is once down, the operator is free to put the yoke or other cuff onto the second bed, by which time the first is ready to be taken out. The height of the "clamping" treadles from the floor ranged from 4 to 12 inches in the machines studied. The first few inches they were driven down with little difficulty. When they struck the "knuckle," over which they must be forced, the scale showed a pressure requirement ranging to more than 100 pounds, with averages of from approximately 66 to 82 pounds. The treadles by means of which the presses are released, or raised from the beds, did not always require so much pressure, as will be seen by the table on page 64. The number of operations per minute is determined by the number of garments done per hour, the condition of the machine, and the efficiency of the operator. Each cuff is turned at least once, which involves clamping the press down twice and releasing it twice, making four foot-treadle operations for each cuff, or eight for each shirt.

There are three other styles of machines constructed and operated upon the same principle as the cuff, yoke, and neckband presses. These are the sleeve and collar presses and the wing collar tipper, which is a device for bending and pressing the points of men's stand-up collars. It should be remembered that all these press machines are not only controlled, but are driven by foot power. The ease or difficulty with which the treadles in all such machines are operated depends upon the extent to which the clamp has been tightened. It was the custom in Milwaukee laundries to permit the operators to adjust these clamps, and as many of the girls believed that only by great pressure could proper finish be secured, there were many cases of a pressure requirement far exceeding the needs of the garment and materially increasing the "jar" incident to the operation.

The other type of press machines was power driven, but was controlled by either treadles or hand levers. It was significant, however, that in some cases the treadle required as much as 60 pounds pressure to operate. In these cases the high pressure was undoubtedly due to the fact that the machines were in bad repair.

The individual machines of this type were the bosom press machines, 9 of the 26 being controlled by treadles and 17 by hand lever, and a skirt press which was operated with foot treadles. The press and press beds are constructed on the same principle as the

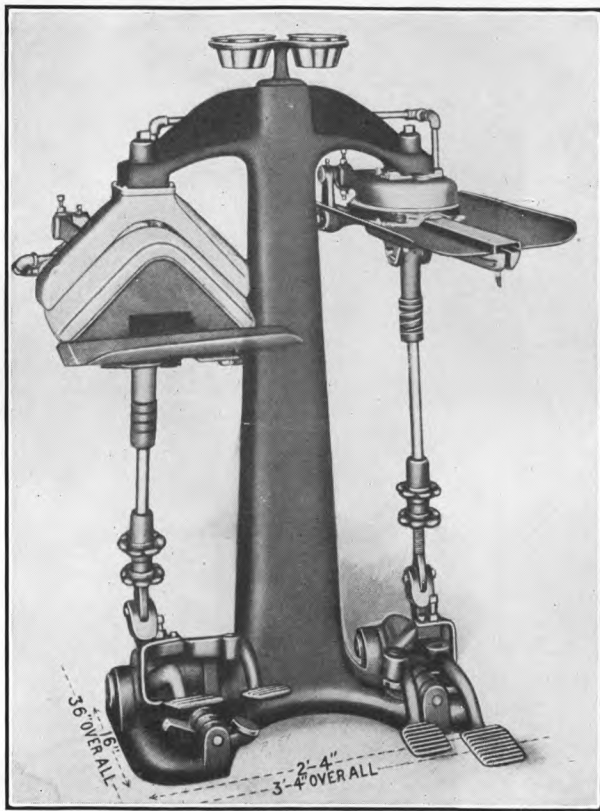


PLATE 9.—NECKBAND AND YOKE PRESS.

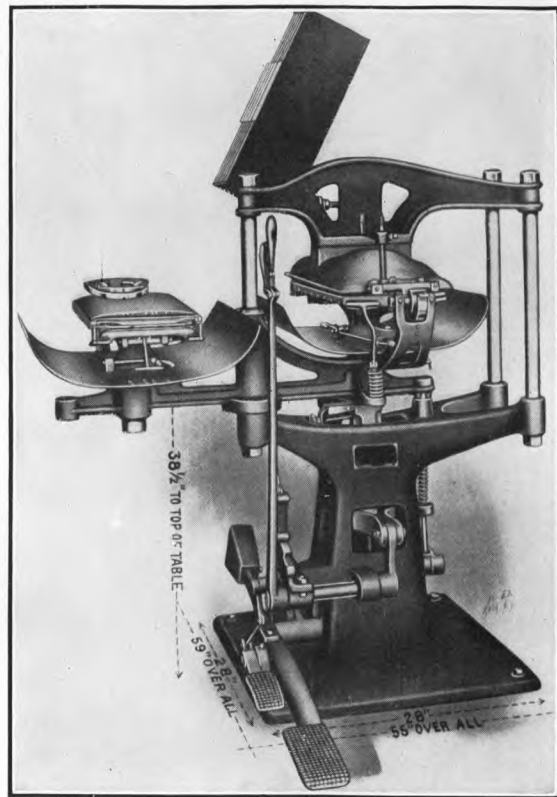


PLATE 10.—BOSOM PRESS WITH FOOT-TREADLE CONTROLLER.

foot-driven machines, but the nature of the garments to be treated calls for a larger heated surface.

Machines of both types (except hand-controlled bosom presses) are equipped with two treadles, which would permit operators to alternate the right and left foot in the course of operations. As a matter of fact, however, the girls in Milwaukee laundries were observed to be using one foot, if not to the exclusion of the other, at least much more than the other. Plate 10 is a fair illustration of the prevailing style of power-driven press.

Only 22 of the 31 power laundries in Milwaukee used press machines at the time of this study. The table following shows the number and character of press machines found in Milwaukee, together with the essential operating requirements for each style. The demands of these machines are such that the workers must stand to perform their duties.

The footnote to the table in reference to the number of cuff, yoke, and neckband presses should not be overlooked. A great many of these presses have double press beds or saddles, but as each press bed is equipped with a set of treadles and involves the same foot operation as if the beds were separate, the basis of the count was the number of presses rather than the number of press frames or supports.

The latter part of the following table showing records for temperature and humidity gets its especial significance from the operating requirements of the foot treadles shown in the first part of the table. It is noteworthy that the humidity in the working zones of these machines is in many cases not as high as in the room at large, though the temperature is frequently so high as to render the attending humidity more discomforting.¹

¹ For relative temperature and humidity conducive to comfortable working conditions see physician's statement, p. 23.

OPERATING DEMANDS OF PRESS MACHINES IN 22 MILWAUKEE POWER LAUNDRIES.

Type and name of machine.	Number of specified machines.	Foot treadles.								
		Function of treadle.	Height of treadle and distance moved.						Pressure required.	
			Number of treadle heights reported.	Height (inches).		Distance moved (inches).		Number of treadle pressures reported.	Range (lbs.).	Average (lbs.).
				Range.	Average.	Range.	Average.			
Power-driven presses:										
Hand-controlled bosom press.	17	None.....								
Foot-controlled bosom press.	9	{ 1. Starting	9	2-6	4.0	1-2½	2.2	9	10-60	33.1
		{ 2. Release.	8	2-6	4.0	1-6	3.0	8	15-55	26.6
Skirt press.....	1	{ 1. Starting	1	2	2.0	2	2.0	1	6	6.0
		{ 2. Release.	1	2	2.0	2	2.0	1	6	6.0
Total.....	27									
Foot-driven presses:										
Cuff press.....	154	{ 1. Clamp..	52	4-10	7.2	2-10	5.7	52	13-100	66.6
		{ 2. Release..	50	1½-8½	4.9	½-7½	3.4	50	5-100	37.7
Neckband press.....	124	{ 1. Clamp..	23	4½-12	7.8	4-10	6.5	23	23-100	83.3
		{ 2. Release..	22	1-10	5.1	1-10	3.9	23	10-100	55.5
Yoke press.....	123	{ 1. Clamp..	22	4½-12	8.0	4-10	6.5	19	27-100	81.7
		{ 2. Release..	21	1-10	5.0	1-9	3.8	18	13-85	44.4
Sleeve press.....	12	{ 1. Clamp..	2	6½-7	6.8	5½-6½	6.0	2	100	100.0
		{ 2. Release..	2	4	4.0	2-3½	2.8	2	90-100	95.0
Wing collar tipper.....	4	{ 1. Clamp..	4	5½-7½	6.8	2½-4½	3.4	4	18-89	60.5
		{ 2. Release..	4	3-7½	4.4	½-5½	2.4	4	24-77	46.3
Collar press.....	1	{ 1. Clamp..	1	5½	5.5	4	4.0	1	85	85.0
		{ 2. Release..	1	4½	4.5	2½	2.5	1	10	10.0
Total.....	108									

¹ The basis of the count is the single press machine; wherever two or more press beds are mounted on one stand they are counted as two or more machines.

² The exact average can not be computed, as the exact pressure of machines requiring more than 100 pounds was not obtained.

OPERATING DEMANDS OF PRESS MACHINES IN 22 MILWAUKEE POWER LAUNDRIES—Concluded.

Type and name of machine.	Foot treadles.			Temperatures (degrees F) and humidity.					
	Treads per minute.			Records in operating zone.					
	Number of operators reported.	Range.	Average.	Number of machine temperatures reported.	Average temperature.	Temperature range.	Corresponding humidities.	Humidity range.	Corresponding temperatures.
Power-driven presses:									
Hand-controlled bosom press.....				17	78.1	71-88	49-35	18-62	72-74
Foot-controlled bosom press.....	9	(1)	(1)	9	79.3	73-86	53-39	27-60	81-78
Skirt press.....		(1)	(1)	1	79.0	79	37	37	79
Foot-driven presses:									
Cuff press.....	19	4-14	8.0	52	76.0	66-90	39-34	34-57	90-81
Neckband press.....	18	4-14	7.1	23	78.0	70-89	48-37	29-59	83-76
		2-10	5.6				38		
		2-10	5.1						
Yoke press.....	2	4	4.0	20	77.3	71-89	56-37	29-59	83-76
		4	4.0				38		
Sleeve press.....	1	4	4.0	2	73.0	73	57	57	73
		4	4.0						
Wing collar tipper.....	4	4	4.0	4	76.5	70-81	48-33	33-66	81-75
		4	4.0						
Collar press.....	1	1	1.0	None.					
		1	1.0						

Type and name of machine.	Temperature (degrees F.) and humidity.						
	Corresponding records in rooms at large.					Corresponding outdoor—	
	Average temperature.	Temperature range.	Corresponding humidities.	Humidity range.	Corresponding temperatures.	Temperature range.	Corresponding humidities.
Power-driven presses:							
Hand-controlled bosom press.....	75.3	70-86	90-39	52-72	64-70	37-64	68-31
Foot-controlled bosom press.....	76.5	70-85	48-38	30-41	78-80	49-75	61-60
Skirt press.....	78.0	78	30	30	78	54	35
Foot-driven presses:							
Cuff press.....	75.3	67-86	46-39	39-91	86-81	46-64	72-31
Neckband press.....	75.7	64-86	52-39	3-30	3-78	48-64	73-31
						75	60
Yoke press.....	75.5	3-86	3-39	3-30	3-78	78-64	47-31
						75	60
Sleeve press.....	70.0	70	48	48	70	49	61
Wing collar tipper.....	75.5	70-78	48-30	30-58	18-74	49-54	61-35

¹ Treadles are operated about three times each every 2 minutes.

² Whenever a neckband and a yoke press were being operated by one person, the count of treads per minute on both machines has been included under the neckband press.

³ Not reported.

There is an obvious chance of getting the fingers caught between the press bed and press, but in the case of the foot-driven machines the pressure is entirely under the operator's control, so there is no danger of crushing. In the case of the power-driven bosom presses

the garment must be adjusted while the bed is swung out of the line of the hot press.

In the nine establishments having no press machines, the neckbands and cuffs were ironed on small hot-roll machines, illustrated in plate 11, and similar in construction to the more universally used body ironer, shown in plate 13. The operating demands of this type of machine are discussed in connection with the "body ironers," on page 60.

Where bosom presses were not used the bosoms were also ironed on hot-roll machines, but of a somewhat different construction, illustrated in plate 12.

The last machines used in the process of ironing a shirt or similar type of body linen are the "sleeve ironer" and the "body ironer." These are devices equipped with an upper power-driven cylinder, or stationary shoe, and a lower padded roll of equal length but of shorter diameter. The upper cylinder or shoe is heated by gas or electricity and is about 12 inches long and 6 inches in diameter on sleeve ironers and about 30 inches long and 7½ inches in diameter on body ironers. The lower padded roll, over which the garment is drawn, is brought in contact with the upper ironing cylinder by pressure on a foot treadle.¹ After the sleeve of the garment has been ironed on the sleeve ironer and the body on the body ironer it is passed to the "finishers," who look for and remedy by hand iron places which the several machines may have skipped. The garment then goes to the inspector, and from her to the delivery department.

The description and illustrations show plainly enough the nature of the body and sleeve ironing processes, but the demands made upon operators by the body ironers and other similarly constructed foot-treadle ironers deserve further attention.

There were 107 machines of the foot-pressure ironer type used in the 31 Milwaukee power laundries at the time of this study. In the case of all of them the amount of ironing pressure put on the garment was determined by the degree of pressure exerted by the operator upon the foot treadle. But while all foot-treadle ironers call upon the operator for ironing pressure, there are three important variations in the operating requirements which mark these devices into three distinct subdivisions. The variations in operating essentials are caused by a variation in treadle equipment. This variation in equipment is shown in the following reproductions of the three styles of sleeve or body ironers, which are the conspicuous examples of foot-treadle ironing machines.

The first group is made up of the single-treadle machines. A one-treadle machine involves the use of the same foot almost uniformly, in order to keep a proper position before the rolls, and the amount of

¹ See plates 13 to 16.

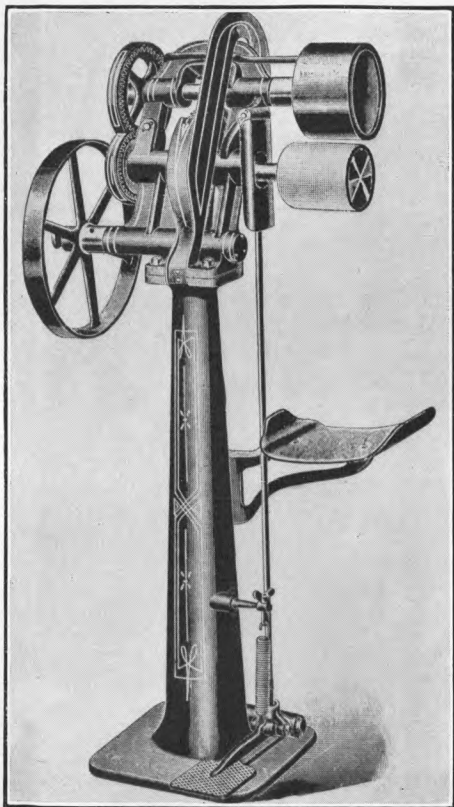


PLATE 11.—BAND IRONER.

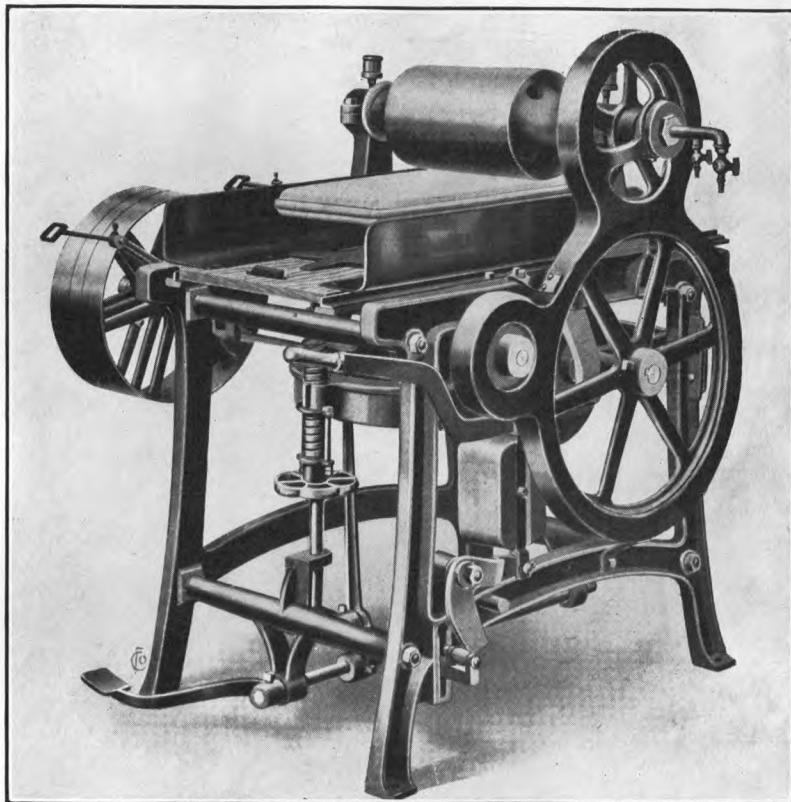


PLATE 12.—BOSOM OR COMBINED IRONER.

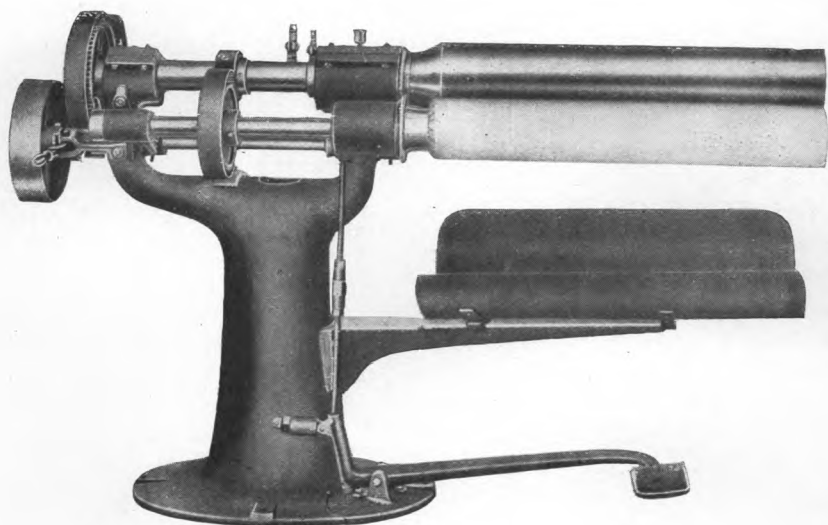


PLATE 13.—SINGLE-TREADLE IRONER.

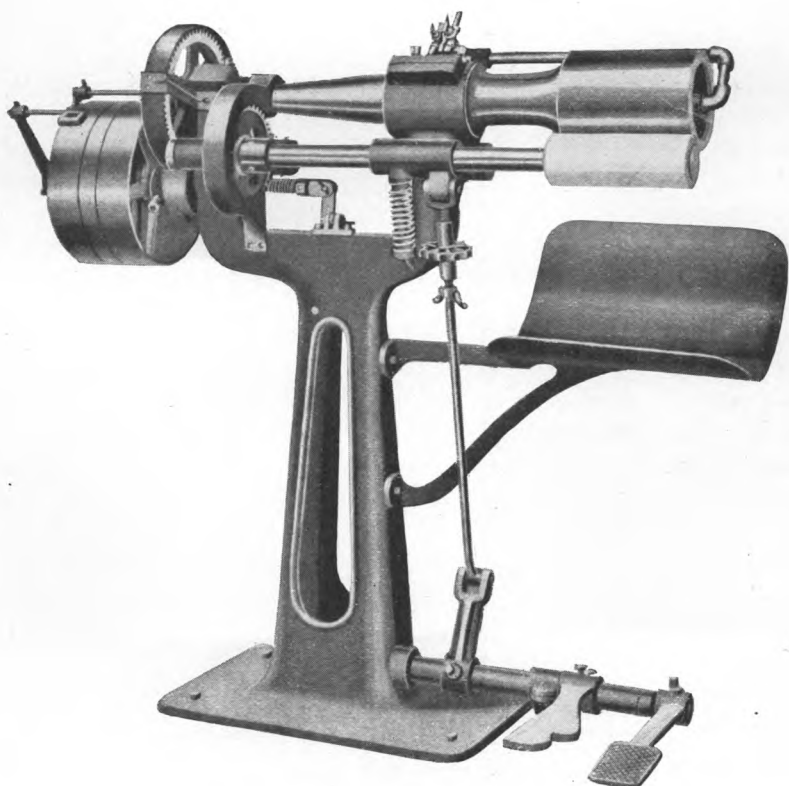


PLATE 14.—TWO-TREADLE SLEEVE IRONER.

pressure required renders standing a necessity. As the heated cylinder revolves in but one direction, the pressure must be relaxed frequently to permit the adjustment of the garment, a fact which involves a slow but constant treading motion and swaying of the body as the operator turns the garment in the process of ironing. Of the 53 body ironers in Milwaukee laundries, 29 were of this single-treadle, one-way cylinder style. In addition to the 29 single-treadle body ironers, there were 33 other foot-treadle ironing machines, not body ironers, but of the same construction, as the table on page 70 will show, making a total of 62 one-treadle machines in the 31 laundries, the operation of which involved a rather uniform treading motion by the same foot. The table below shows that some of the treadles were nearly 12 inches from the floor in the case of the body ironers, but less than 2 inches in case of some of the bosom ironers. In 19 cases platforms were used to bring the treadle within easier reach of the operator. In the tentative laundry rules and regulations issued by the Wisconsin Industrial Commission (see pp. 29-31) there is a recommendation that "on all one-way, single-treadle, body ironers the operator should be furnished with a platform which should be the height of the foot treadle when at the lowest point."

In the second group are the two-treadle machines, illustrated in plate 14, showing the two-treadle sleeve ironer, and plate 15, showing the two-treadle body ironer. All of these two-treadle machines introduce a sharp variation into operating requirements, in that the use of the second treadle breaks the uniform treading motion incident to the operation of single-treadle machines. In all cases the use of the second treadle reverses the direction of the cylinder revolutions. There are, however, two general styles of double-treadle machines. On one style¹ the operator removes the foot from one treadle before using the reverse treadle, thus calling for an entire shifting of the weight of the body. On the other style of machine the operator must stand on the pressure treadle with one foot at the time she is pressing the reverse treadle with the other foot; the result of this arrangement of treadles eliminates much of the treading motion necessary in the other two-treadle machines, but involves another element of exertion to maintain the equilibrium when operating two treadles at the same time. There were in all 35 two-treadle ironing machines used in Milwaukee laundries. Twenty-four, including 10 body ironers, were of the style requiring a complete shift from one foot to the other whenever the reversing treadle was used. The other 11, including 8 body ironers, were so constructed that the second or reverse treadle had to be used in conjunction with the

¹ The sleeve ironer of this style, which is not less exacting than the body ironer, is illustrated in plate 14.

pressure treadle. Eight of the 35 machines of this group were supplied with platforms to reduce the height of the treadle from the operator's standing level.

The third group of foot-treadle ironing machines are those equipped with a sewing-machine style of treadle and involving a heel-and-toe movement. A body ironer thus equipped is illustrated in plate 16. It will be observed that this treadle is so placed that the operator will ordinarily stand on the floor with the left foot and use the right for operating. Pressure with the toe and ball of the foot forces the shaft down and brings the rolls into contact. Pressure with the heel reverses the travel of the rolls. There were 10 machines of this type, including 6 body ironers. In three cases the operators used platforms.

About the time that this investigation closed a fourth type of foot-treadle machine appeared upon the market, but had not yet been installed in any of the Milwaukee laundries, though one firm had ordered a number of the machines and was preparing to install them in place of the older type of machines. These were ironers, and also presses, on which ironing pressure was supplied by compressed air. The device was controlled by foot treadles (pl. 2), which required only a slight pressure and which could be operated in either a standing or sitting position, because there were two sets of treadles on each machine, one set placed with distinct reference to the use of a stool, the other set placed with equally distinct reference to a standing position. As none of these machines were in operation in Milwaukee laundries at the time of this study, no data are included concerning them in the following table, which summarizes the essential operating demands made by the 107 foot-treadle ironing machines actually in use.

There is an important difference between the pressure requirements of the press machines and the body ironers which is not revealed by the tables. The foot-treadle requirements of the press machines could be accurately determined because it was only necessary to force the treadle until the press was clamped upon the press bed. Upon the adjustment of this clamp alone depended the degree of pressure applied to the garment, the operator's foot not being required on the treadle at all when once it was forced down. To determine the pressure requirement, therefore, it was only necessary to impose the scale upon the treadle and take the record when the operation was complete.

Taking the records on the foot-treadle ironing machines was a much more difficult matter, as the amount of pressure varied not only with the character of the garment but with the idiosyncracies of operators. No garment got more pressure than the operator put on the foot treadle, nor for a longer time. The customary way of operating these

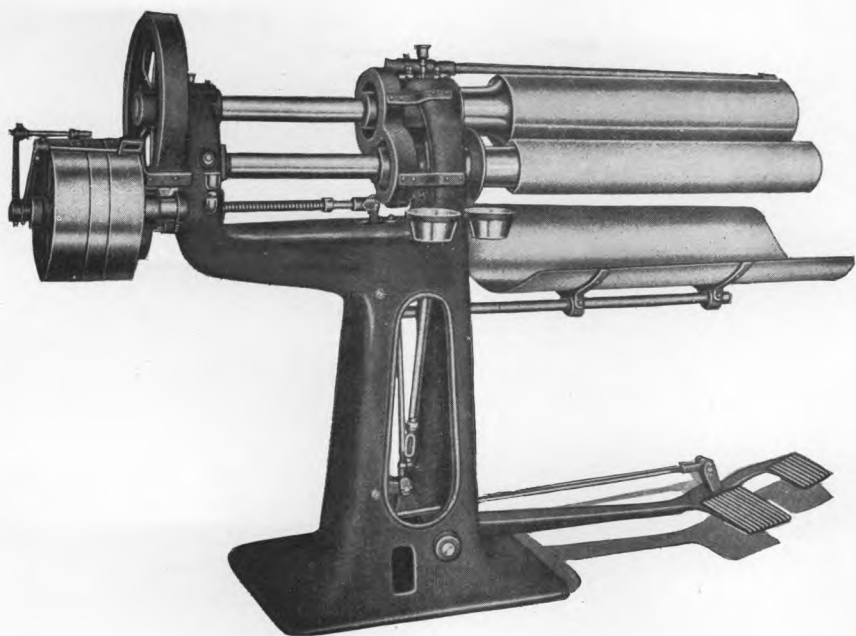


PLATE 15.—TWO-TREADLE BODY IRONER.

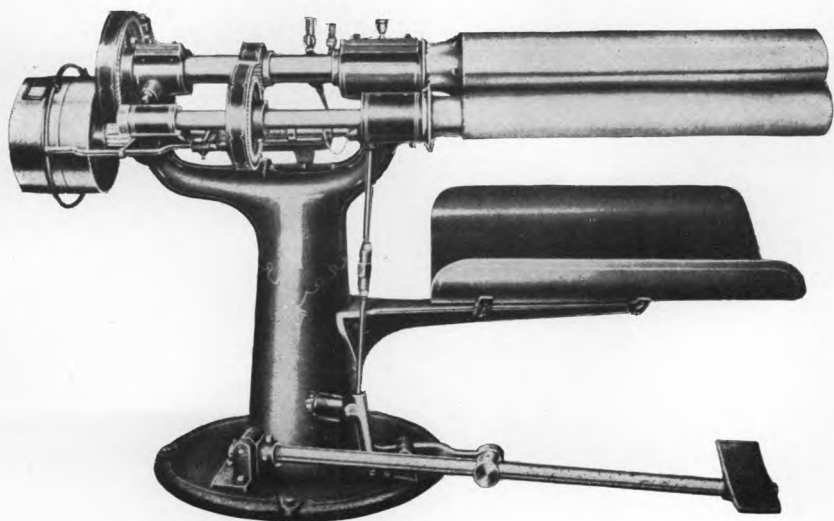


PLATE 16.—SEWING-MACHINE TREADLE BODY IRONER.

machines was to use the whole weight of the body, or nearly so, on the treadle, as that was easier than to force the treadle down by pure muscular exertion. To determine, therefore, how much pressure was really required to do proper work, it was necessary to impose the scale upon the treadles and force them down until the foreman or inspector or operator said the garment being ironed was receiving the proper finish, or until such garment compared favorably with garments which had passed muster. At that point the scale record was taken in each case and the amount of pressure required, as shown in the following table, will readily explain why using the whole weight is the prevailing way of operating these foot-treadle ironing machines.

What was said with reference to the importance of temperatures and humidities in connection with the operation of the foot-treadle press machines is even more applicable in connection with these foot-treadle ironing machines, because there is no time during the process of ironing when the operator of the body ironer is not exerting some pressure. The operator of the press machine gets some respite while adjusting the garment, but the ironing-machine operator must keep her foot on the treadle all the time. The greater the demand for physical exertion the more important becomes the atmospheric conditions. Therefore, the records for heat and humidity should not be overlooked in the table following.

OPERATING DEMANDS OF 107 FOOT-PRESSURE IRONERS

Type of foot-pressure ironers and movement involved, and name of machine.	Number of machines.	Pressure exerted on operating treadle (pounds).		Height of operating treadle and distance moved.				Heated surfaces.		
				Height (inches).		Distance moved (inches).		Kind.	Number of machines with specified heated surface.	Number having heat deflector.
		Range.	Average.	Range.	Average.	Range.	Average.			
Single treadle—uniform tread:										
Body ironer.....	29	20-100	52.6	⁶ 4-11½	7.7	2-9½	5.4	Cylinder..	17	9
Sleeve ironer.....	13	15-100	45.6	3-10	6.8	1½-7½	5.0	Shoe.....	12	
								Cylinder..	9	4
								Shoe.....	4	
Neckband ironer.....	12	19-90	46.4	¹⁰ 3½-10	5.7	2-7	4.8	Cylinder..	6	1
								Shoe.....	6	
Bosom ironer.....	8	¹¹ 25-63	46.9	¹⁰ 1½- 4½	2.8	1-4½	2.3	Cylinder..	8	
Two treadles—irregular tread on operating treadle with shift to reversing treadle:¹²										
Body ironer.....	10	33-100	64.2	¹⁰ 3½-12½	6.8	3½-11	6.0	Cylinder..	10	6
Sleeve ironer.....	12	30-75	52.0	3-12½	6.0	1½- 9½	4.7	Cylinder..	12	4
Neckband ironer.....	2	35-40	37.5	¹⁰ 5½	5.3	2½	2.3	Cylinder..	2	1
Two treadles—prolonged depression of operating treadle with simultaneous use of reversing treadle:										
Body ironer.....	8	40-80	61.0	4½-10½	8.4	3½- 8½	5.8	Cylinder..	8	4
Sleeve ironer.....	3	¹¹ 22-100	¹³ 74.0	¹⁰ 6	6.0	6	6.0	Cylinder..	3	2
Sewing-machine heel-and-toe movement:										
Body ironer.....	6	30-66	47.1	¹⁰ 6-10	7.3	2- 7	4.4	Cylinder..	6	2
Sleeve ironer.....	3	35-68	54.3	¹⁰ 4½- 6	5.4	2½- 4	3.1	Cylinder..	3	
Bosom ironer.....	1	20	20.0	2	2.0	1	1.0	Cylinder..	1	

¹ Corresponding to temperature range recorded in operating zone.² Corresponding to temperatures in room at large shown in preceding column.³ Corresponding to humidity range recorded in operating zone.⁴ Corresponding to humidities in room at large shown in preceding column.⁵ Corresponding to outside temperatures shown in preceding column.⁶ 27 treadle heights reported.⁷ The records braced are for different establishments in which the minimum machine temperature shown in column 13 was recorded.

EMPLOYMENT OF WOMEN IN MILWAUKEE POWER LAUNDRIES. 71

FOUND IN 29 MILWAUKEE POWER LAUNDRIES.

Temperature (degrees) and humidity.													
Records in operating zone.						Corresponding records in room at large.						Corresponding outdoor—	
Number of machine temperatures reported.	Average temperature.	Temperature range.	Corresponding humidities.	Humidity range.	Corresponding temperatures.	Number of rooms.	Average temperature.	Temperature range. ¹	Corresponding humidities. ²	Humidity range. ³	Corresponding temperatures. ⁴	Temperature range. ¹	Corresponding humidities. ⁵
16	78.3	74-90	$\begin{Bmatrix} 40 \\ 47 \\ 51 \\ 54 \end{Bmatrix}$	47	32-60	76-78	13	75.0	$\begin{Bmatrix} 70 \\ 73 \\ 72 \\ 78 \end{Bmatrix}$ (⁸)	$\begin{Bmatrix} 68 \\ 45 \\ 46 \\ 48 \end{Bmatrix}$ (⁸)	48-47	70-74	$\begin{Bmatrix} 62 \\ 43 \\ 59 \\ 68 \end{Bmatrix}$ (⁴) $\begin{Bmatrix} 54 \\ 32 \\ 68 \\ 47 \end{Bmatrix}$ (³)
10	78.6	69-85	48-47	12-49	75-84	9	75.4	64-86	52-39	30-91	78-81	37-73	68-58
7	77.0	74-83	47-29	29-55	83-75	7	75.1	72-80	46-44	44- ⁽⁸⁾	80- ⁽⁸⁾	59-61	68-54
4	77.3	71-86	51-42	27-51	75-71	4	72.5	70-86	42-39	39-90	86-9	37-64	68-31
6	74.5	70-81	$\begin{Bmatrix} 38 \\ 77 \end{Bmatrix}$	45	38-77	70-70	5	71.8	$\begin{Bmatrix} 67 \\ 8 \end{Bmatrix}$ (⁸)	$\begin{Bmatrix} 46 \\ 8 \end{Bmatrix}$ (⁸)	44- ⁽⁸⁾	67- ⁽⁸⁾	$\begin{Bmatrix} 46 \\ 68 \end{Bmatrix}$ (⁴) $\begin{Bmatrix} 72 \\ 47 \end{Bmatrix}$ (³)
3	78.3	75-83	48-43	42-48	77-83	5	77.2	⁽⁸⁾ -85	⁽⁸⁾ -38	38-45	85-73	66-75	49-60
8	76.0	71-84	$\begin{Bmatrix} 33 \\ 56 \end{Bmatrix}$	47	33-56	71-71	5	75.4	$\begin{Bmatrix} 67 \\ 8 \end{Bmatrix}$ (⁴)	$\begin{Bmatrix} 46 \\ 8 \end{Bmatrix}$ (⁴)	91-46	67- ⁽⁸⁾	$\begin{Bmatrix} 46 \\ 68 \end{Bmatrix}$ (⁴) $\begin{Bmatrix} 72 \\ 47 \end{Bmatrix}$ (³)
6	77.3	70-84	46-41	41-63	84-76	5	80.0	⁽⁸⁾ -80	⁽⁸⁾ -57	57-64	80-78	31-66	69-49
12	78.0	66-89	66-41	32-66	77-66	8	76.5	78-85	46-38	30-46	78-78	65-75	30-60
2	73.5	72-75	35-37	35-37	75-72	2	69.5	69-70	55-48	48-55	70-69	48-49	73-61
7	79.5	72-90	45-37	31-50	84-74	7	68.0	78-86	46-39	30-48	78-70	65-64	30-31
3	71.3	70-74	46-50	46-50	70-74	1	72.0	72	57	57	72	31-59	69-68
6	73.6	68-80	46-44	37-54	70-74	5	72.6	78-74	46-47	55-46	69-78	65-54	30-54
3	74.7	72-78	35-46	35-60	72-74	3	73.6	69-74	55-47	55-46	69-78	48-54	73-54
1	73.0	73	57	57	73	1	70.0	70	68	68	70	62	54

⁸ Not reported.

⁹ For physician's statement in regard to unfavorable temperatures and humidities see page 23.

¹⁰ Height of treadle on one machine was not reported.

¹¹ Pressure needed to operate one machine was not reported.

¹² The figures are given for operating treadles only; the reversing treadles were on the whole less exacting in their demands.

¹³ The exact average pressure can not be computed, as the exact pressure on treadles requiring more than 100 pounds was not obtained.

There is little or no danger of fatal accidents on these foot-treadle ironing machines, as the rolls are not large or heavy and the degree of pressure is under the control of the operators. There is, however, some danger of burning and pinching the fingers, but on none of these machines in Milwaukee were there finger guards.

There is a considerable heat-radiating surface, especially on the body ironers, which obviously requires some sort of heat deflector as the operator stands with the face within a short arm's length from the hot cylinder. That there were a number of the machines without these heat guards the foregoing table will show.

Paddle fans placed above the body ironers and other foot-treadle machines tend to reduce the fatigue occasioned by their operation.

Where the cylinders of ironing machines are heated by gas there is an obvious necessity of keeping the jets in good repair as a guard against hurtful fumes. On the subject of foot-treadle press and ironing machines the tentative rules of the Wisconsin Industrial Commission read:

On all roll body ironers, the hot roll must be equipped with a heat deflector which must be lined with nonconductive material. The deflector must extend far enough down in front to deflect the heat and prevent it from being thrown out toward the operator. On all shoe body ironers, the shoe must be covered with nonconductive material.

The proprietors and foremen of laundries should do everything in their power to educate operators of cuff, neckband, and yoke presses to use the minimum amount of foot pressure necessary to do proper work. It has been found from careful experiments made by competent laundrymen that 75 pounds is the maximum amount of pressure necessary to do perfect work on any of the above-mentioned machines. Additional pressure is, therefore, not only a waste of the operator's energy, but a needless wear on the machinery.

Hand ironing.

As heretofore indicated, the hand ironers are still a factor in power laundries, as they "finish" what the machines have left undone, and frequently do pieces which can not be done at all by machines. Those who do the fine handwork are naturally older and more experienced women. The "finishing work" does not require great skill. Aside from the difference in skill and the difference in the degree of equipment, the demands of all hand ironing are much the same in the power laundry as they are in the home, and call for no special description.

After the inspector has passed the laundered linen it is assorted into the proper lots, checked with the original lists, and wrapped for delivery.

RECAPITULATION OF OCCUPATIONS.

The successive occupations in Milwaukee power laundries were: Marking (involving a sorting of soiled clothes), washing, extracting, shaking, flat-work ironing and folding (involving drying), starching, drying, dampening, body linen ironing and "finishing," inspecting, assorting, and wrapping.

In this succession women were found almost exclusively as markers, shakers, flat-work ironers and folders, starchers, dampeners, body-linen ironers (or pressers), finishers, inspectors, assorters, and wrappers. Men operated the washing machines and extractors and usually controlled mechanical drying rooms (though the starchers usually loaded the frames).

It will be observed from the descriptions, illustrations, and tables in the foregoing pages that these machine occupations as performed in the power laundries of Milwaukee varied greatly in the demands made upon the operators. These differences were in all cases measured mechanically and are not the result of personal judgment. It will not be disputed that on this basis the machines making the largest demands are the foot-treadle press and ironing machines, and chief among these are the body ironers.

HOURS OF LABOR AND EARNINGS.

In view of these differences in occupational demands a study of the hours and earnings by occupations becomes more than ordinarily significant.

HOURS OF LABOR.

During the time covered by this investigation the Wisconsin laws limiting the working hours for adult women to 10 a day and 55 a week, and to 8 a day and 48 a week for all minors under 16 had gone into effect. Under the present law no minors are permitted to do night work, and adult women are limited to 48 hours a week if they work at night.

For reasons explained in the summary of this report, the working hours do not fluctuate greatly with the seasons, though a holiday may cause an increase in the daily hours for the rest of that week. The average hours for the 26 weeks covered by the study did not amount to 52 per week for all the establishments, nor did the average maximum week for the 31 establishments exceed 55 hours. There were individual laundries, however, in which some workers reported weeks of 60 working hours, and 9 of the 554 women reporting individual details gave maximum hours per day as in excess of 10, as the table at the end of this report will show. It may be said that on the whole the working hours for women employed in the 31 power laundries of Milwaukee fell slightly below the limit allowed by law.

The following table summarizing the industrial data concerning women workers contains much matter for consideration:

SUMMARY OF HOURS AND EARNINGS OF WOMEN EMPLOYED IN MILWAUKEE POWER LAUNDRIES.

Occupations.	Number of women in specified occupations.	Average age.	Average laundry experience in years.	Average duration of employment in weeks within period covered by investigation.	Working hours.			Average earnings per week	
					Average hours per usual day.	Workers having 2 or more short days.			Average hours per week.
						Number.	Per cent.		
Hand occupations:									
Markers and sorters.....	1 83	21.5	4.4	24.7	9.7	62	74.7	\$7.18	
Hand washers.....	2 9	40.0	2.9	24.7	9.9	6	66.7	7.15	
Shakers.....	9	28.0	1.5	19.3	10.0	7	77.8	5.02	
Hand starchers.....	3 14	26.6	4.4	23.1	10.0	12	85.7	6.01	
Hand finishers.....	4 61	28.9	4.9	25.1	9.9	56	91.8	7.15	
Fancy clothes ironers.....	5 65	30.5	7.3	23.8	9.9	50	76.9	8.02	
Miscellaneous hand workers.....	6 8	28.6	2.5	25.4	9.6	7	87.5	6.20	
Machine occupations (power-driven machinery):									
Water-extractor operator.....	7 1	25.0	5.5	26.0	10.0	1	100.0	8.25	
Starchers.....	8 38	22.2	4.1	24.1	9.9	33	86.8	6.30	
Dampeners.....	3	18.0	2.1	21.3	10.0	3	100.0	5.50	
Flat work and collar ironer feeders.....	9 55	19.7	2.5	24.4	9.9	54	98.2	5.54	
Flat work and collar ironer receivers.....	10 45	18.9	1.7	20.6	9.7	37	82.2	5.03	
Collar-shaper operators.....	12	20.7	4.4	24.7	9.8	12	100.0	6.29	
Bosom and shirt press operators.....	11 22	22.9	5.0	23.8	10.0	22	100.0	6.92	
Machine occupations (foot-pressure machinery):									
Starchers.....	12 16	20.8	3.5	23.9	9.4	15	93.8	6.10	
Cuff, yoke, and neckband press operators.....	13 21	18.4	1.8	24.6	9.9	20	95.2	5.45	
Body and sleeve ironer operators.....	14 66	20.8	2.9	23.7	9.9	63	95.5	6.04	
Neckband and bosom ironer operators.....	15 12	20.2	3.4	25.9	9.7	11	91.7	6.42	
Menders (machine).....	4	36.3	5.0	26.0	9.8	4	100.0	6.31	
Supervisory occupations:									
Department heads.....	10	32.4	11.8	26.0	9.7	6	60.0	11.47	
Totals and aggregate averages	554	23.8	4.1	24.0	9.8	481	86.8	6.58	

¹ Six of these workers are employed at power-driven machines part of the time.

² Five of these workers are employed at power-driven machines or shaking part of the time.

³ All of these workers tend the dry room; 4 do other kinds of starching part of the time.

⁴ Three of these workers do other work, as cuff-press operating, mending, or starching, part of the time.

⁵ Ten do dampening, 2 do mending, when necessary; 1 starches and feeds flat-work ironer part of the time.

⁶ Includes flannel steamers, stocking stretchers, helpers, and cleaners, all of whom do several kinds of work.

⁷ This was the principal occupation of the women shown. Three other women operated water extractors, but not as their principal occupation.

⁸ All of these workers do some other work in the starch room, such as dampening, dry-room tending, or operating other starch machines, part of the time.

⁹ Twenty-three are employed at receiving or other machine work, usually light in character, part of the time.

¹⁰ Seventeen are employed at shaking, collar finishing, marking, and sorting or dampening part of the time.

¹¹ Thirteen do some dampening; 5 of these also operate foot-pressure machines.

¹² Thirteen do hand starching or ironing or operate other starch-room machines part of the time.

¹³ Seven do some dampening.

¹⁴ Twenty-three are employed at other work part of the time, 7 do heavy machine or hand work, 3 tend dry room, 7 dampen, and 2 operate moderate and light machines.

¹⁵ Seven do starching, dampening, hand ironing, or operate other heavy machines part of the time.

It will be observed that the occupations have been grouped according to the character of work done and, in case of machine operators, on the principle underlying the classification of laundry machinery. For example, all operators of foot-treadle machines, such as cuff presses and body ironers, are grouped under one general head. The operators of machines making less demands for physical exertion, such as the flat-work ironers, finishing machine operators, etc., are likewise segregated, as are also the light and heavy hand occupations.

The significance of the foregoing table develops upon comparing it with the tables which show the demands of the several machine occupations.¹ The foregoing table shows that the hours for all machine occupations (the water-extractor operator excepted) vary less than three hours per week, while the occupational demands for machine work vary from requirements of only such physical exertion as is involved in attending or feeding a power-driven, unheated machine, to the exactions of the foot-treadle, steam-press, and gas-heated ironing machines, which involve continual standing and the exertion of a foot pressure ranging to over 100 pounds for each operation, and frequently aggregating 100,000 pounds an hour.

Attention should sharply be called to the fact, however, that this grouping shows a comparatively small proportion of laundry women engaged on what the foot-pressure records mark out as fatiguing machines. Out of 554 women workers scheduled there was a total of 123, or scarcely 23 per cent, operating exacting foot-treadle machines. The other women, constituting three-fourths of the whole number employed, were operating machines which the records show to be making no unusual demands, or were engaged in hand occupations. It is fair to say here, too, that when the one establishment in which pneumatic treadles had been ordered on all foot-pressure machines gets these devices in operation there will be a smaller proportion of exacting foot-pressure occupations than the figures here show. At the time of this study, however, there were 123 women reporting the running of a foot-treadle machine as their principal occupation. The question naturally arises as to whether the women are kept at the same machine work all day, week in and week out, particularly when such a machine makes a double demand upon the operator because of foot-pressure requirement and the radiation of heat and humidity. Careful questioning as to the interchange of occupations brought out instructive reports.

¹ See pp. 58, 64, 65, and 70.

Of the 123 operating foot-treadle machines 51, or approximately 41 per cent, reported an interchange of occupations during the course of an ordinary day's work. The other 72 foot-treadle machine operators kept steadily at their work all day long. The shift of occupations is given in detail in the following table:

INTERCHANGE OF OCCUPATIONS OF INDIVIDUAL FOOT-TREADLE MACHINE OPERATORS DURING AN ORDINARY DAY'S WORK.

Type of machine.	Principal occupation.	Total number scheduled.	Number having other occupations.	Other occupation.			
				Number of individual operators.	Character of occupation.		
					Heavy.	Moderate.	Light.
Foot-pressure ironers.	Body ironer....	42	13	3			Dampener.
				1			Handkerchief folder.
				1		Dry room tender	
				1		Collar ironer feeder.	
				1	Hand starcher..		
				1	do.	Dry room tender	Dampener.
				2	Hand ironer.....		
				1	Hand ironer and hand starcher.	Dry room tender	Do.
				1	Sleeve ironer...		Do.
				1	Sleeve and neckband ironer and cuff, neckband, and yoke press operator.		
				2			
				1		Flat work ironer, feeder, and folder.	Do.
	Sleeve ironer...	24	9	1	Bosom press operator.		
				2	Hand ironer.....		
				1	Neckband ironer and cuff press operator.		
				2	Cuff, neckband, and yoke press operator.		
	Neckband ironer.	4	1	1	Hand ironer.....		
				1			
	Bosom ironer..	8	6	1	Hand starcher ..		Do.
				1	do.	Starch machine attendant.	Do.
				1	Band roll starcher.	Collar roll starcher, and starch machine attendant.	Do.
Presses (foot-driven).	{Cuff, neckband, and yoke press operators. ¹ }	21	7	1	Hand ironer.....		Do.
				1	Cuff press operator and neckband ironer.		Do.
				6			Do.
				1			Dampener and collar shaper.

¹ As one operator uses two or more similar or different press beds in immediate succession, their operation is classed as one occupation.

INTERCHANGE OF OCCUPATIONS OF INDIVIDUAL FOOT-TREADLE MACHINE OPERATORS DURING AN ORDINARY DAY'S WORK—Concluded.

Type of machine.	Principal occupation.	Total number scheduled.	Number having other occupations.	Other occupation.		
				Character of occupation.		
				Heavy.	Moderate.	Light.
Presses (power-driven with foot control).	Bosom press operator.	8	12	1		Dampener.
	Bosom roll starcher operator.	6	6	1	Dry room tender	Do.
				1	Collar roll starcher feeder.	
				1	Collar roll starcher, feeder and wiper.	
	Band roll starcher operator.	9	6	1	Band starcher operator.	
				1	Hand ironer....	
				1	Hand ironer and hand starcher.	
				1	Dry room tender	
				1	do.	
	Perforated surface pan starcher operator.	1	1	1	Dry room tender and collar wiper.	
				1	Hand starcher and starch extractor operator.	
				1	do.	
				1	Hand ironer....	
				1	Dry room tender	
Total.....		123	51			

¹ The second person also operated a foot-pressure ironer, but the kind of machine was not reported.

To the physicians invited by the Wisconsin Industrial Commission to pass upon matters affecting the health of industrial workers, the records of operating requirements on these machines were shown. On the whole their opinions, which will be found on page 21 of this report, furnish a strong argument in favor of a careful and discriminating assignment and interchange of occupations, pending the elimination of foot-pressure requirements, as a guard against the health hazard involved in the operation of the foot-treadle machines now in use. The ages of the operators of such machines are particularly to be noted in connection with the statements of physicians.

A material obstacle in the way of this interchange is the sense of proprietorship which girls sometimes feel in a certain machine and a sense of resentment, as if a reflection had been cast upon them, when "their" machines are assigned to others. That this is not an insuperable difficulty, however, is shown by the fact that the girls do interchange occupations, as the foregoing table has shown.

While the difference in the aggregate weekly hours for women in the several occupations is insignificant, there is quite a variation in

the "busy days." For example, good management can ordinarily arrange so that a "load" of soiled clothes is ready for the washmen early Monday morning, but this is not true of work for ironers, as clothes that were started in the washing process the previous week must be "run through" and delivered by Saturday night. Hence the ironers and starchers come late on Monday. On the other hand, there may be an accumulation of soiled clothes to be marked, and there is sure to be a heavy inflow of bundles from the drivers to keep the markers busy for the full period during the early days of the week. In many establishments they spend the late hours of the afternoon assorting clean clothes. During the latter part of the week, when the soiled clothes have been pretty well "marked in" for the week, the markers spend more time assembling the clean clothes in the proper lots for delivery. In one establishment only are the markers confined exclusively to the business of marking. The ironers and starchers, who come late Monday, are rushed Wednesday, Thursday, and Friday in order to get the work out in time for delivery Saturday. Nearly all the overtime reported during the time of this investigation was reported by the ironers for Thursday and Friday. Naturally the starchers come a few hours ahead of starched-clothes ironers in the beginning of the week, and leave a little earlier at the end.

WEEKLY EARNINGS.

The average earnings for all of the 554 women individually scheduled in Milwaukee power laundries was \$6.58 a week, as will be observed from the table on page 74. The average for no occupation fell below \$5, and for none except for the heads of departments did it rise above \$8.25. For machine operators, with the exception of the single operator of two water extractors, the average weekly earnings ranged from \$5.03 in the case of girls receiving ironed pieces from the power-driven flat-work and collar machines to \$6.92 in the case of women running the bosom ironers or presses, which are also power-driven machines. It is significant that the operators of the cuff, yoke, and neckband presses and of the body and sleeve ironers, which are the foot-treadle machines shown by the records to make excessive occupational demands, average \$5.45 and \$6.04 a week, respectively. The significance lies in the fact that the earnings of women operating such machines differ but slightly from those running much lighter machines, in one instance the difference being in favor of the lighter-running machines. If, therefore, earnings are in any sense based upon degree of skill required, it would seem that there was no good reason why there should not be such an interchange of the machine occupations as would distribute the strain involved in running the foot-treadle machines until such time as these trouble makers can be entirely eliminated.

The average age and average years of experience of women operating the foot-treadle machines and of those running such light machines as the collar shapers would likewise indicate approximately the same degree of operating skill.

DURATION OF EMPLOYMENT.

The table on page 74, showing also the number of weeks of employment, indicate that while the earnings in Milwaukee power laundries are not high, they are at least fairly steady, as the 554 women show an average of approximately 24 weeks out of the 26 covered by this investigation. As the six months are fairly representative of the year's work in the industry for reasons explained heretofore, it is apparent that the fluctuations of trade do not cause an average loss of more than one month in twelve.

RACE AND CONJUGAL CONDITION.

Nearly three-fourths of the women scheduled in Milwaukee power laundries were either Polish or German, the Germans having only five more representatives than the Polish. Only 90 of the 554 were of American parentage. This is not surprising in view of the large German and Polish population in Milwaukee.

The table below which summarizes the data as to race also shows the number and per cent of each group that were single, married, or divorced. It will be observed that the largest proportion of single women were Polish. The largest proportion of married and divorced in the three groups named were American; the Irish exceeded the Americans in this particular, but their number was too small to make the percentage significant.

RACE AND CONJUGAL CONDITION OF WOMEN EMPLOYED IN MILWAUKEE POWER LAUNDRIES.

Race.	Single.		Married.		Widowed, divorced, or deserted.		Total.	
	Num-ber.	Per cent.	Num-ber.	Per cent.	Num-ber.	Per cent.	Num-ber.	Per cent.
German.....	174	84.1	17	8.2	16	7.7	207	37.4
Polish.....	196	97.7	3	1.5	3	1.5	202	36.5
American.....	74	82.2	11	12.2	5	5.6	90	16.2
Irish.....	17	81.0	.....	.....	4	19.0	21	3.8
Other nationalities ¹	27	79.4	6	17.7	1	2.9	34	6.1
Total.....	488	88.1	37	6.7	29	5.2	554	100.0

¹ In this group are represented French, English, Scotch, Bohemians, Roumanians, Slavonians, Syrians, Austro-Hungarians, Greeks, Italians, Hebrews, Norwegians, Swedes, Welsh, and Dutch.

HOURS OF LABOR AND DURATION OF EMPLOYMENT AS REPORTED BY EMPLOYERS.

The information from employers as to the industry's activity, the number of people employed in various seasons, etc., is summed up in the following table and shows a substantial correspondence with the returns from individual workers in matters of common report:

HOURS OF LABOR OF WOMEN EMPLOYED IN MILWAUKEE POWER LAUNDRIES
SEPT. 1, 1911, TO MAR. 1, 1912, AS REPORTED BY EMPLOYERS.

Estab- lish- ment num- ber.	Num- ber of men em- ployed.	Normal season.												Busy sea- son.		Dull season.	
		Number of women employed.			Duration in weeks.	Hours of usual day.		Average hours of short day.		Average hours per week.		Maximum hours per week.		Duration in weeks.	Hrs. per week.	Duration in weeks.	Hrs. per week.
		16 yrs. and over.	Un- der 16 yrs.	To- tal.		16 yrs. and over.	Un- der 16 yrs.	16 yrs. and over.	Un- der 16 yrs.	16 yrs. and over.	Un- der 16 yrs.	16 yrs. and over.	Un- der 16 yrs.				
1	1	4	.....	4	26	10	.....	51	.....	50½	.....	50½	.....			
2	2	15	.....	15	13	9½	.....	7½	.....	53½	.....	53½	.....	13	53½		
3	2	9	1	10	26	10	8	3½	3½	52	.....	52	.....	13	52		
4	1	10	.....	10	21½	10	.....	5½	.....	51½	.....	51	.....	4½	51		
5	28	115	3	118	21½	10	8	5½	8	46	48	46	48	4½	46		
6	3	5	.....	5	26	9½	.....	6	.....	51	.....	51	.....	4½	51		
7	3	54	1	55	26	10	.....	6½	.....	52½	.....	52½	.....	.....	.....
8	2	7	.....	7	26	10	.....	6	.....	52	.....	52	.....	.....	.....
9	3	12	.....	12	26	10	.....	6½	.....	52½	.....	52½	.....	.....	.....
10	4	9	.....	9	26	10	.....	6½	.....	53½	.....	53½	.....	.....	.....
11	2	22	1	23	21½	9½	8	7	5	52	45	52	45	4½	45		
12	4	38	2	40	13	10	.....	5½	.....	51	.....	51	.....	.....	.....	13	53
13	6	66	.....	66	26	10	.....	7½	.....	54½	.....	54½	.....	.....	.....	13	51
14	6	82	.....	82	26	9½	.....	5½	.....	49½	.....	49½	.....	.....	.....	8½	54½
15	2	10	.....	10	26	10	.....	5½	.....	51½	.....	51½	.....	.....	.....	8½	51
16	5	80	.....	80	26	10	.....	6½	.....	49½	.....	49½	.....	.....	.....	.....	.....
17	2	28	2	30	26	10	.....	7½	.....	54½	.....	54½	.....	.....	.....	.....	.....

1 4 additional in busy season.

2 Working schedule varies according to occupation.

3 1 month within period (10 per cent increase in force).

4 No short day, 1 long day of 10 hours.

5 Frequently work overtime one-half hour or more, particularly on Fridays; 1 sorter sometimes 1 to 2 hours overtime on Saturday.

6 Occasionally, after a holiday.

HOURS OF LABOR OF WOMEN EMPLOYED IN MILWAUKEE POWER LAUNDRIES
SEPT. 1, 1911, TO MAR. 1, 1912, AS REPORTED BY EMPLOYERS—Concluded.

Es- tab- lish- ment num- ber.	Number of men em- ployed.	Normal season.												Busy season.		Dull season.	
		Number of women employed.			Dura- tion in weeks.	Hours of usual day.		Average hours of short day.		Average hours per week.		Maximum hours per week.		Dura- tion in weeks.	Hrs. per week.	Dura- tion in weeks.	Hrs. per week.
		16 yrs. and over.	Un- der 16 yrs.	To- tal.		16 yrs. and over.	Un- der 16 yrs.	16 yrs. and over.	Un- der 16 yrs.	16 yrs. and over.	Un- der 16 yrs.	16 yrs. and over.	Un- der 16 yrs.				
18	3	18	.....	18	26	10	.....	6	.....	52	.....	52	.....	.....	.....	.....	.....
19	4	13	.....	13	26	10	.....	5½	.....	51	.....	51	.....	.....	.....	.....	.....
					26	10	.....	5	.....	50	.....	50	.....	.....	.....	.....	.....
20	2	22	1	23	26	10	.....	7½	.....	55	.....	55	.....	4+	55	.....	.....
					26	10	.....	6½	.....	52½	.....	52½	.....	4+	52½	.....	.....
					26	10	8	.....	6	.....	46	.....	46	4+	46	.....	.....
21	8	43	1	44	26	10	.....	7½	.....	55	.....	55	.....	(2)	.....	8½	55
					26	10	.....	7	.....	54	.....	54	.....	(2)	.....	8½	54
					26	10	8	.....	5	.....	45	.....	45	(2)	.....	8½	45
22	3	27	1	28	26	9½	.....	5½	.....	49½	.....	49½	.....	9	49½	.....	.....
					26	9½	.....	7½	.....	55	.....	55	.....	9	55	.....	.....
					26	10	8	.....	3	.....	43	.....	43	9	43	.....	.....
23	4	25	.....	25	26	10	.....	6	.....	52	.....	52	.....	.....	.....	.....	.....
					26	10	.....	6½	.....	53	.....	53	.....	.....	.....	.....	.....
24	1	7	.....	7	26	10	.....	5	.....	50	.....	50	.....	(4)	.....	.....	.....
					26	10	.....	6½	.....	50½	.....	50½	.....	(4)	.....	.....	.....
					26	10	.....	6½	.....	53½	.....	53½	.....	.....	.....	.....	.....
25	1	12	.....	12	26	10	.....	6	.....	52	.....	52	.....	.....	.....	.....	.....
					26	10	.....	5½	.....	51	.....	51	.....	.....	.....	.....	.....
					26	10	.....	5	.....	50	.....	50	.....	.....	.....	.....	.....
26	1	13	.....	13	26	10	.....	5	.....	55	.....	55	.....	.....	.....	.....	.....
					26	10	.....	6½	.....	53	.....	53	.....	.....	.....	.....	.....
					26	9	.....	8	.....	53	.....	53	.....	.....	.....	.....	.....
27	4	42	3	45	26	10	.....	5	.....	54	.....	54	.....	.....	.....	.....	.....
					26	10	.....	5	.....	55	.....	55	.....	.....	.....	.....	.....
					26	10	8	.....	.....	43	.....	48	.....	.....	.....	.....	.....
28	7	3	.....	3	26	10	.....	.....	.....	40	.....	40	.....	.....	.....	.....	.....
					26	10	.....	5	.....	50	.....	50	.....	.....	.....	.....	.....
29	1	9	.....	9	26	10	.....	7	.....	54	.....	54	.....	.....	.....	.....	.....
					26	10	.....	5½	.....	51	.....	51	.....	6 4½	51	.....	.....
					26	10	.....	5	.....	50	.....	50	.....	6 4½	50	.....	.....
30	2	22	3	25	26	10	.....	7½	.....	51½	.....	51½	.....	6 4½	51½	.....	.....
					26	10	.....	6	.....	52	.....	52	.....	6 4½	52	.....	.....
					26	10	8	.....	5	.....	45	.....	45	6 4½	45	.....	.....
31	1	11	.....	11	26	9½	.....	5	.....	48	.....	48	.....	(6)	.....	.....	.....

1 Working schedule varies according to occupation.

2 Summer busier, but only moderately so, increase 16 per cent in force.

3 About 18 per cent increase in force during summer months or "white clothes season."

4 Holiday weeks, but no increase in force or lengthening of hours.

5 Increase force about 12½ per cent.

6 One or two operatives added around holiday season on account of increased business.

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STATISTICAL DATA IN REGARD TO INDIVIDUAL LAUNDRY WORKERS.

The tabulation of the individual data relating to 554 women laundry workers which follows has been arranged in occupational groups because of the differences in the physical demands of the various occupations pointed out in the summary and in the body of the report:

AGE, RACE, CONJUGAL CONDITION, LAUNDRY EXPERIENCE, AND HOURS OF WORK AND EARNINGS OF WOMEN EMPLOYED IN MILWAUKEE POWER LAUNDRIES.

MARKERS, LISTERS, SORTERS, AND CHECKERS.

No.	Age.	Race.	Con- jugal con- di- tion.	Laun- dry expe- rience (yrs.).	Hours.					Earnings.			Number of weeks em- ploy- ed, Sept. 1, 1911, to Mar. 1, 1912.	Other em- ployment between Sept. 1, 1911, and Mar. 1, 1912.	
					Usual.			Maximum.		Sys- tem of pay- ment.	Week- ly rate of pay.	Aver- age week- ly earn- ings.		Number of wks.	Total earn- ings for such other em- ploy- ment.
					Work- ing hours per day.	Num- ber of short days.	Aver- age hrs. per wk.	Hrs. per day.	Hrs. per week.						
1	20	American	M.	1	10	2	1 20	10	20	Time	\$3.00	\$3.00	8	None	.....
2	16½	Polish....	S.	1½	10	1	59½	11	59½	do.	4.00	4.00	26	None	.....
3	17	German....	S.	1½	10	2	51	19	51	do.	4.00	4.00	26	None	.....
4	17	American	S.	2	10	2	54	10	54	do.	4.50	4.40	26	None	.....
5	21	French....	S.	1	9½	1	55	9½	55	do.	4.50	4.40	18	3	\$9.00
6	18	Polish....	S.	2	10	2	54	10	54	do.	5.00	4.95	26	None	.....
7	17	German....	S.	1½	9½	2	54	9½	54	do.	5.00	5.00	25	None	.....
8	17	Polish....	S.	1½	10	2	52	10	52	do.	5.00	5.00	26	None	.....
9	17	German....	S.	2	9	2	48	10	50	do.	5.00	5.00	25	None	.....
10	22	Irish....	S.	2½	10	2	50	10	50	do.	5.00	5.00	6	20	150.00
11	18	German....	S.	2	10	2	52	10	52	do.	5.00	5.00	11	None	.....
12	16	do.	S.	1½	9½	2	49½	9½	49½	do.	5.00	5.00	26	None	.....
13	16	American	S.	2	10	2	50	10	50	do.	5.00	5.00	26	None	.....
14	19	Polish....	S.	3	10	2	48	10	48	do.	5.04	5.05	26	None	.....
15	17	do.	S.	2	10	2	51	10	51	do.	5.10	5.10	26	None	.....
16	27	American	W.	2	10	2	40	10	40	do.	5.25	5.25	26	None	.....
17	21	do.	S.	1½	10	2	52	10	52	do.	5.46	5.45	24	None	.....
18	20	German....	S.	3½	9½	2	54½	9½	54½	do.	5.50	5.50	26	None	.....
19	18	Polish....	S.	3	10	1	50	10	50	do.	5.50	5.50	26	None	.....
20	18	German....	S.	4	10	2	46½	13	63	do.	5.70	5.70	24	None	.....
21	21	American	S.	8	10	2	50	10	50	do.	5.75	5.75	26	None	.....
22	23	German....	S.	1½	9½	1	55	9½	55	do.	5.85	5.85	26	None	.....
23	18	American	S.	3	10	2	55	10	55	do.	6.00	6.00	26	None	.....
24	28	German....	M.	15	10	None	40	10	2 40	do.	6.00	6.00	26	None	.....
25	19	American	S.	3	10	2	53½	10	53½	do.	6.00	6.00	26	None	.....
26	16	Polish....	S.	2	10	2	56	10	56	do.	6.09	6.09	26	None	.....
27	24	German....	S.	3	9½	1	55	9½	55	do.	6.00	6.00	26	None	.....
28	20	French....	S.	4	9½	1	54½	9½	54½	do.	6.00	6.00	24	None	.....
29	18	German....	S.	4	9½	2	50½	10	53½	do.	6.50	6.15	26	None	.....
30	19	do.	S.	3	10	2	54	10	54	do.	6.21	6.25	26	None	.....
31	17	American	S.	3	10	1	49	10	49	do.	6.37	6.35	25	None	.....
32	21	German....	S.	1½	8½	2	50	8½	50	do.	6.50	6.50	26	None	.....
33	22	Irish....	S.	5	10	2	54	10	54	do.	6.50	6.50	26	None	.....
34	18	German....	S.	2	8½	2	50	8½	50	do.	6.50	6.50	26	None	.....
35	19	American	S.	1½	10	2	55	10	55	do.	6.60	6.50	26	None	.....
36	20	German....	S.	6	9½	1	55	9½	55	do.	6.55	6.55	26	None	.....
37	21	American	S.	1½	10	2	55	10	55	do.	6.60	6.55	26	None	.....
38	19	German....	S.	5½	9½	2	53	9½	53	do.	7.00	7.00	26	None	.....
39	20	American	S.	3	9	2	48	9	48	do.	7.00	7.00	26	None	.....
40	18	German....	S.	3	9	2	48	9	48	do.	7.00	7.00	26	None	.....
41	23	Polish....	S.	3	9½	1	55	9½	55	do.	7.00	7.00	26	None	.....
42	19	American	S.	3	10	2	53	10	53	do.	7.00	7.00	26	None	.....
43	20	Polish....	S.	6	10	2	55	10	55	do.	7.15	7.00	26	None	.....
44	25	German....	S.	3	9½	1	54½	9½	54½	do.	7.00	7.00	22	None	.....
45	20	do.	S.	5	10	2	53½	10	53½	do.	7.00	7.00	25	None	.....
46	23	do.	S.	9	10	2	53	10	53	do.	7.50	7.20	26	None	.....
47	20	American	S.	3	10	2	50	10	50	do.	7.25	7.25	24	None	.....

1 Works only 1 full day and 2 half days per week.

2 Works only 4 days per week.

3 Works only 5 days per week.

AGE, RACE, CONJUGAL CONDITION, LAUNDRY EXPERIENCE, AND HOURS OF WORK
AND EARNINGS OF WOMEN EMPLOYED IN MILWAUKEE POWER LAUNDRIES—
Continued.

MARKERS, LISTERS, SORTERS, AND CHECKERS—Concluded.

No.	Age.	Race.	Con- jugal con- dition.	Laun- dry expe- rience (yrs.).	Hours.						Earnings.			Num- ber of weeks em- ploy- ed, Sept. 1, 1911, to Mar. 1, 1912.	Other em- ployment between Sept. 1, 1911, and Mar. 1, 1912.	
					Usual.			Maximum.							Syst- em of pay- ment.	Week- ly rate of pay.	Aver- age week- ly earn- ings.	Num- ber of wks.	Total earn- ings for such other em- ploy- ment.
					Work- ing hours per day.	Num- ber of short days.	Aver- age hrs. per wk.	Hrs. per day.	Hrs. per week.							
48	23	American	S.	2 ¹ / ₂	9 ³ / ₄	2	53 ¹ / ₂	9 ³ / ₄	53 ¹ / ₂	Time	\$7.50	\$7.35	26	None	.....
49	22	Polish....	S.	1 ¹ / ₂	9 ³ / ₄	2	56 ¹ / ₂	9 ³ / ₄	56 ¹ / ₂	..do..	7.50	7.50	26	None	.....
50	22	..do.....	S.	4	9 ³ / ₄	2	54	10	55	..do..	7.70	7.70	23	None	.....
51	26	German..	M.	1	9 ³ / ₄	2	53 ¹ / ₂	9 ³ / ₄	53 ¹ / ₂	..do..	7.70	7.70	26	None	.....
52	19	Polish....	S.	6 ³ / ₄	10	2	55	10	55	..do..	8.00	7.85	26	None	.....
53	23	German..	S.	7	9 ³ / ₄	1	54 ¹ / ₂	9 ³ / ₄	54 ¹ / ₂	..do..	8.00	7.85	26	None	.....
54	19	Scotch....	S.	5 ¹ / ₂	9 ³ / ₄	1	55	9 ³ / ₄	55	..do..	8.00	8.00	21	None	.....
55	21	Polish....	S.	6	9	1	50	9	50	..do..	8.00	8.00	26	None	.....
56	22	..do.....	S.	7	9	1	50	9	50	..do..	8.00	8.00	26	None	.....
57	26	American	S.	10	9	1	50	9	50	..do..	8.00	8.00	26	None	.....
58	21	..do.....	S.	5	9	2	50	9	50	..do..	8.00	8.00	6	20	\$150	
59	26	German..	M.	3 ¹ / ₂	9 ³ / ₄	2	53 ¹ / ₂	9 ³ / ₄	53 ¹ / ₂	..do..	8.00	8.00	26	None	.....
60	20	Polish....	S.	4	9 ³ / ₄	2	53	9 ³ / ₄	53	..do..	8.20	8.20	21	None	.....
61	19	German..	S.	6	9	2	48	9	50	..do..	8.50	8.20	26	None	.....
62	20	Polish....	S.	5 ¹ / ₂	9 ³ / ₄	1	55	9 ³ / ₄	55	..do..	8.50	8.20	26	None	.....
63	24	Irish.....	S.	3 ¹ / ₂	10	2	55	10	55	..do..	8.80	8.50	26	None	.....
64	21	German..	S.	6 ¹ / ₂	9 ³ / ₄	1	55	9 ³ / ₄	55	..do..	8.50	8.50	26	None	.....
65	33	American	S.	15 ¹ / ₂	9 ³ / ₄	1	51 ¹ / ₂	9 ³ / ₄	51 ¹ / ₂	..do..	8.75	8.75	26	None	.....
66	23	German..	S.	4	9 ³ / ₄	1	53 ¹ / ₂	9 ³ / ₄	53 ¹ / ₂	..do..	8.82	8.85	26	None	.....
67	19	American	S.	3	10	2	54 ¹ / ₂	10	54 ¹ / ₂	Piece (1)	8.90	8.90	26	None	.....
68	19	Polish....	S.	4	10	2	57 ¹ / ₂	10	57 ¹ / ₂	Time	9.00	9.00	26	None	.....
69	23	American	S.	5	10	2	54 ¹ / ₂	10	54 ¹ / ₂	..do..	9.00	9.00	26	None	.....
70	20	..do.....	S.	4	10	2	54 ¹ / ₂	10	54 ¹ / ₂	..do..	9.00	9.00	26	None	.....
71	19	..do.....	S.	5	10	2	53 ¹ / ₂	10	58 ¹ / ₂	..do..	9.00	9.00	26	None	.....
72	31	..do.....	S.	9	10	2	54 ¹ / ₂	10	54 ¹ / ₂	Piece (1)	9.25	9.25	26	None	.....
73	21	German..	S.	2	9 ³ / ₄	2	54 ¹ / ₂	9 ³ / ₄	54 ¹ / ₂	Time	9.50	9.50	26	None	.....
74	36	American	S.	20	10	2	53	10	56 ¹ / ₂	..do..	10.00	9.60	26	None	.....
75	25	Polish....	S.	13	9 ³ / ₄	2	51	2 9 ³ / ₄	51	..do..	10.00	10.00	26	None	.....
76	22	German..	S.	1 ¹ / ₂	10	2	55	10	55	..do..	10.45	10.45	26	None	.....
77	18	American	S.	3	10	2	54	10	54	..do..	10.50	10.50	26	None	.....
78	36	..do.....	W.	7	10	2	55	10	55	Piece (3)	11.05	11.05	26	None	.....
79	30	German..	S.	7	10	2	52	10	52	..do.. (3)	11.30	11.30	26	None	.....
80	25	American	S.	9	9 ³ / ₄	2	52 ¹ / ₂	9 ³ / ₄	52 ¹ / ₂	Time	12.00	12.00	26	None	.....
81	31	..do.....	S.	11	10	2	50	10	50	..do..	12.00	12.00	26	None	.....
82	38	German..	W.	15	9 ³ / ₄	1	55	9 ³ / ₄	55	..do..	12.00	12.00	26	None	.....
83	17	American	S.	2	9 ³ / ₄	2	55	9 ³ / ₄	55	(4)	(4)	(4)	25	None	.....

HAND WASHERS.

1	55	German..	W.	1	9 ³ / ₄	2	52	9 ³ / ₄	52	Time	\$6.00	\$5.75	26	None	.....
2	35	Roumanian	M.	2	10	2	52	10	52	..do..	6.50	6.50	26	None	.....
3	38	Polish....	S.	6	10	2	48	10	48	..do..	6.95	6.95	26	None	.....
4	45	..do.....	W.	3	10	2	48	10	48	..do..	6.95	6.95	26	None	.....
5	26	..do.....	S.	4	10	2	48	10	48	..do..	7.20	7.20	26	None	.....
6	35	Irish.....	Des.	1 ¹ / ₂	10	5 1 49 ¹ / ₂	10	49 ¹ / ₂	49 ¹ / ₂	..do..	7.50	7.50	26	None	.....
7	46	German..	W.	1	10	1 50	10	50	50	..do..	7.50	7.50	26	None	.....
8	57	..do.....	W.	5 ¹ / ₂	10	1 55	10	55	55	..do..	7.50	7.50	17	None	.....
9	23	..do.....	S.	3	10	2 49	10	49	49	..do..	8.50	8.50	23	None	.....

¹ 8¹/₂ cents per 100 pieces.

² Average.

³ 7 cents per 100 pieces.

⁴ Not reported.

⁵ Works 5 days a week only.

AGE, RACE, CONJUGAL CONDITION, LAUNDRY EXPERIENCE, AND HOURS OF WORK
AND EARNINGS OF WOMEN EMPLOYED IN MILWAUKEE POWER LAUNDRIES—
Continued.

SHAKERS.

No.	Age.	Race.	Con- jugal con- di- tion.	Laun- dry expe- rience (yrs.)	Hours.					Earnings.			Num- ber of weeks em- ploy- ed, Sept. 1, 1911, to Mar. 1, 1912.	Other em- ployment between Sept 1, 1911, and Mar. 1, 1912.	
					Usual.			Maximum.						Num- ber of wks.	Total earn- ings for such other em- ploy- ment.
					Work- ing hours per day.	Num- ber of short days.	Aver- age hrs. per wk.	Hrs. per day.	Hrs. per week.	Sys- tem of pay- ment.	Week- ly rate of pay.	Aver- age week- ly earn- ings.			
1	20	Polish....	S.	1	10	2	58½	10	58½	Time	\$4.00	\$4.00	26	None	.....
2	16	Ger.-Am.	S.	1½	10	2	51	10	51	..do..	4.00	4.00	12	14	\$100.00
3	40	Dutch....	S.	1½	10	2	52	10	52	..do..	5.00	5.00	21	None	.....
4	49	American	M.	5	10	1	59½	10½	59½	..do..	5.00	5.00	11	15	105.00
5	17	..do....	S.	1½	10	2	55	10	55	..do..	5.25	5.25	26	None	.....
6	24	..do....	S.	1½	10	2	52	10	52	..do..	5.40	5.25	21	4	20.00
7	50	Irish....	S.	1½	10	2	52	10	52	..do..	5.50	5.50	5	None	.....
8	19	..do....	S.	2½	10	1	57½	10½	57½	..do..	5.50	5.50	26	None	.....
9	17	Pol.-Am.	S.	1	10	2	52	10	52	..do..	5.72	5.70	26	None	.....

HAND STARCHERS.

1	16	German..	S.	1½	9½	2	51½	9½	51½	Time	\$2.00	\$2.00	22	None	.....
2	18	Polish....	S.	1½	10	2	58	10	58	..do..	4.00	4.00	6	9	\$31.50
3	18	Pol.-Am.	S.	1	10	2	52	10	52	..do..	5.72	5.70	26	None	.....
4	26	American	M.	5½	10	2	52	10	52	..do..	6.00	6.00	9	None	.....
5	20	..do....	S.	6	10	2	52	10	52	..do..	6.00	6.00	26	None	.....
6	19	Ger.-Am.	S.	5	10	2	53	10	53	..do..	6.00	6.00	26	None	.....
7	17	Polish....	S.	1	10	2	54	10	54	..do..	6.00	6.00	26	None	.....
8	19	Pol.-Am.	S.	2	10	2	52	10	52	..do..	6.24	6.25	26	None	.....
9	55	American	W.	3	10	1	48½	10	48½	..do..	6.50	6.50	26	None	.....
10	39	Italian..	S.	6	10	2	53½	10	53½	..do..	6.50	6.50	26	None	.....
11	25	American	S.	7	10	2	50	2	50	..do..	7.00	7.00	26	None	.....
12	32	Polish....	S.	9	10	1	46	10	46	..do..	7.59	7.35	26	None	.....
13	22	German..	S.	1½	10	2	53	10	53	..do..	7.50	7.40	26	None	.....
14	46	..do....	S.	15	9½	2	51½	9½	51½	..do..	7.50	7.50	26	None	.....

FINISHERS AND PLAIN HAND IRONERS.

1	23	Polish....	S.	2	10	2	48	10	48	Time	\$4.32	\$4.30	24	None	.....
2	19	German..	S.	1	10	2	50	10	50	..do..	4.50	4.50	26	None	.....
3	19	Polish....	S.	2	10	1	46	10	46	..do..	4.60	4.60	24	None	.....
4	22	..do....	S.	3	10	2	48	10	48	..do..	5.28	5.30	26	None	.....
5	18	German..	S.	2	10	2	51	10	51	..do..	5.50	5.50	26	None	.....
6	42	French..	M.	2	10	1	49	10	49	..do..	5.88	5.90	26	None	.....
7	23	German..	S.	1½	9½	2	43½	9½	43½	..do..	6.00	5.90	22	None	.....
8	19	Polish....	S.	5	10	2	54	10	54	..do..	5.94	5.90	26	None	.....
9	46	German..	S.	11	10	2	53½	10	53½	..do..	6.00	5.95	26	None	.....
10	20	..do....	S.	3	10	2	50	10	50	..do..	6.00	6.00	26	None	.....
11	26	Polish....	S.	6	10	2	48	10	48	..do..	6.00	6.00	26	None	.....
12	52	Swedish.	S.	7	9½	2	48½	9½	48½	..do..	6.00	6.00	26	None	.....
13	19	German..	S.	1½	10	2	51	10	51	..do..	6.00	6.00	25	None	.....
14	18	Polish....	S.	3	10	2	50	10	50	..do..	6.00	6.00	26	None	.....
15	28	Irish....	S.	2	10	2	55	10	55	..do..	7.15	6.05	22	None	.....
16	19	Polish....	S.	1	10	2	55	10	55	..do..	6.05	6.05	26	None	.....
17	18	..do....	S.	2	10	2	53	10	53	..do..	6.36	6.10	26	None	.....
18	25	..do....	S.	2	10	1	45	10	45	..do..	6.30	6.30	26	None	.....
19	25	..do....	S.	9	10	2	50	10	50	..do..	7.00	6.45	24	None	.....
20	24	..do....	S.	5	10	2	48	10	48	..do..	6.48	6.50	26	None	.....
21	21	..do....	S.	5	10	2	49	10	49	..do..	6.13	26.50	26	None	.....
22	26	..do....	S.	3	10	3	45	10	45	..do..	6.75	6.65	26	None	.....
23	23	..do....	S.	8	10	2	50	10	50	..do..	7.00	6.73	26	None	.....
24	18	German..	S.	2	10	2	52	10	52	..do..	6.76	6.75	26	None	.....
25	42	..do....	M.	2	9½	2	48½	10	48½	..do..	7.00	6.95	26	None	.....

1 Five-day week.

2 Paid for 3 hours extra for lighting burners under irons.

AGE, RACE, CONJUGAL CONDITION, LAUNDRY EXPERIENCE, AND HOURS OF WORK AND EARNINGS OF WOMEN EMPLOYED IN MILWAUKEE POWER LAUNDRIES—Continued.

FINISHERS AND PLAIN HAND IRONERS—Concluded.

No.	Age.	Race.	Con- jugal con- di- tion.	Laun- dry expe- rience (yrs.).	Hours.					Earnings.			Num- ber of weeks em- ploy- ed, Sept. 1, 1911, to Mar. 1, 1912.	Other em- ployment between Sept. 1, 1911, and Mar. 1, 1912.	
					Usual.			Maximum.		Sys- tem of pay- ment.	Week- ly rate of pay.	Aver- age week- ly earn- ings.		Num- ber of wks.	Total earn- ings for such other em- ploy- ment.
					Work- ing hours per day.	Num- ber of short days.	Aver- age hrs. per wk.	Hrs. per day.	Hrs. per week.						
26	46	German..	M.	$\frac{1}{2}$	11	2	59 $\frac{1}{2}$	11	59 $\frac{1}{2}$	Time	\$7.00	\$7.00	26	None	.....
27	51	do.....	M.	$\frac{3}{4}$	10	2	51	10	51	do..	7.00	7.00	26	None	.....
28	38	American	M.	$\frac{3}{4}$	10	2	50	10	50	do..	7.00	7.00	22	None	.....
29	22	German..	S.	2 $\frac{1}{2}$	10	2	51	10	51	do..	7.00	7.00	26	None	.....
30	37	do.....	S.	4	10	2	53	10	53	do..	7.00	7.00	26	None	.....
31	29	do.....	S.	4	9 $\frac{1}{2}$	2	44	9 $\frac{1}{2}$	44	do..	7.00	7.00	26	None	.....
32	32	Polish...	S.	3	10	2	49	10	49	do..	7.35	7.35	26	None	.....
33	22	German..	S.	4	10	2	51 $\frac{1}{2}$	10	51 $\frac{1}{2}$	do..	7.35	7.35	26	None	.....
34	20	Polish...	S.	6	9 $\frac{1}{2}$	2	45	9 $\frac{1}{2}$	45	do..	7.50	7.50	26	None	.....
35	28	American	S.	4	10	2	51	10	51	do..	7.50	7.50	22	None	.....
36	33	do.....	M.	$\frac{1}{2}$	10	1	55	10	55	do..	7.50	7.50	19	None	.....
37	41	Polish...	S.	5 $\frac{1}{2}$	10	2	50	10	50	do..	7.50	7.50	26	None	.....
38	26	German..	S.	8	10	2	47	10	47	do..	7.52	7.50	26	None	.....
39	26	do.....	S.	4	10	2	50	10	50	do..	7.50	7.50	26	None	.....
40	23	American	S.	5	10	2	53	10	53	do..	7.50	7.50	26	None	.....
41	23	do.....	S.	4	10	2	53	10	53	do..	7.75	7.75	26	None	.....
42	22	German..	S.	$\frac{1}{2}$	10	2	51 $\frac{1}{2}$	10	51 $\frac{1}{2}$	do..	7.66	7.75	26	None	.....
43	21	do.....	S.	$\frac{3}{4}$	10	2	52 $\frac{1}{2}$	10	52 $\frac{1}{2}$	do..	8.00	7.90	26	None	.....
44	44	do.....	S.	8	9 $\frac{1}{2}$	2	52	9 $\frac{1}{2}$	52	do..	8.00	8.00	24 $\frac{1}{2}$	None	.....
45	26	do.....	S.	2	10	2	53	10	53	do..	8.00	8.00	26	None	.....
46	48	Irish....	W.	5	9 $\frac{1}{2}$	2	52	9 $\frac{1}{2}$	52	do..	8.00	8.00	17	None	.....
47	39	German..	S.	10	9 $\frac{1}{2}$	2	52	9 $\frac{1}{2}$	52	do..	8.00	8.00	26	None	.....
48	37	Polish...	M.	2	9 $\frac{1}{2}$	2	48 $\frac{1}{2}$	9 $\frac{1}{2}$	48 $\frac{1}{2}$	do..	8.00	8.00	26	None	.....
49	23	German..	S.	3	10	2	51	10	51	do..	8.00	8.00	26	None	.....
50	25	do.....	S.	9	10	2	51	10	51	do..	8.00	8.00	26	None	.....
51	36	Irish....	S.	4	10	2	51	10	51	do..	8.00	8.00	26	None	.....
52	22	Bavarian.	S.	4	10	2	50	10	50	do..	8.00	8.00	14	None	.....
53	21	Polish...	S.	5	9 $\frac{1}{2}$	2	47 $\frac{1}{2}$	9 $\frac{1}{2}$	47 $\frac{1}{2}$	do..	8.00	8.00	22	None	.....
54	25	Swiss....	S.	2	10	2	51	10	51	do..	8.50	8.35	26	None	.....
55	25	Polish...	S.	6	10	2	52	10	52	do..	8.50	8.50	26	None	.....
56	45	American	S.	20	10	2	51	10	51	do..	8.50	8.50	26	None	.....
57	39	German..	S.	17	10	2	51	10	51	do..	8.50	8.50	26	None	.....
58	21	Bohemian	S.	6 $\frac{1}{2}$	10	1	57	10	57	do..	9.00	9.00	26	None	.....
59	27	American	S.	10	10	2	52	10	52	do..	9.00	9.00	26	None	.....
60	43	German..	W.	16	10	2	53 $\frac{1}{2}$	10	53 $\frac{1}{2}$	do..	11.00	11.00	26	None	.....
61	42	do.....	W.	17	10	2	50	10	50	do..	12.00	12.00	26	None	.....

LADIES' CLOTHES AND OTHER FANCY HAND IRONERS.

No.	Age.	Race.	Con- jugal con- di- tion.	Laun- dry expe- rience (yrs.).	Work- ing hours per day.	Num- ber of short days.	Aver- age hrs. per wk.	Hrs. per day.	Hrs. per week.	Time	Week- ly rate of pay.	Aver- age week- ly earn- ings.	Num- ber of weeks em- ploy- ed, Sept. 1, 1911, to Mar. 1, 1912.	Other em- ployment between Sept. 1, 1911, and Mar. 1, 1912.	Total earn- ings for such other em- ploy- ment.
1	21	German..	S.	$\frac{1}{2}$	10	2	53	10	53	Time	\$4.50	\$4.50	21	None	\$515.00
2	19	American	S.	1	10	2	53	10	53	do..	5.00	4.80	26	None	.....
3	50	German..	M.	7	10	.....	140	10	40	do..	5.80	5.80	26	None	.....
4	20	do.....	S.	3	10	2	50	10	50	do..	6.00	6.00	26	None	.....
5	37	American	M.	13	10	1	55	10	55	do..	6.00	6.00	13	None	.....
6	24	Polish...	S.	$\frac{1}{2}$	10	2	54	10	54	do..	6.00	6.00	21 $\frac{1}{2}$	None	.....
7	30	German..	S.	2 $\frac{1}{2}$	10	1	55 $\frac{1}{2}$	10 $\frac{1}{2}$	55 $\frac{1}{2}$	do..	6.00	6.00	25	None	.....
8	20	do.....	S.	3	10	1	245	10	45	do..	6.30	6.05	13	None	.....
9	35	Polish...	S.	13	10	.....	140	10	40	do..	6.20	6.20	26	None	.....
10	32	German..	M.	9	10	.....	140	10	40	do..	6.40	6.40	26	None	.....
11	19	Polish...	S.	3	10	2	51 $\frac{1}{2}$	10	51 $\frac{1}{2}$	do..	6.43	6.45	25	None	.....
12	33	German..	M.	13	10	1	245	10	45	do..	6.75	6.75	8	None	.....
13	33	Polish...	W.	$\frac{1}{2}$	9 $\frac{1}{2}$	1	54 $\frac{1}{2}$	10 $\frac{1}{2}$	54 $\frac{1}{2}$	do..	7.00	7.00	8	None	.....
14	24	Irish....	S.	$\frac{1}{2}$	10	2	51 $\frac{1}{2}$	10	51 $\frac{1}{2}$	do..	7.00	7.00	2	None	.....
15	38	German..	M.	2 $\frac{1}{2}$	10	2	51	10	51	do..	7.00	7.00	26	None	.....
16	21	Polish...	S.	5	10	2	53	10	53	do..	7.00	7.00	26	None	.....
17	22	American	S.	8 $\frac{1}{2}$	10	2	53	10	53	do..	7.00	7.00	26	None	.....
18	23	do.....	S.	8	10	2	53	10	53	do..	7.00	7.00	26	None	.....

¹ Works only 4 days per week.¹ Works only 5 days per week.

AGE, RACE, CONJUGAL CONDITION, LAUNDRY EXPERIENCE, AND HOURS OF WORK
AND EARNINGS OF WOMEN EMPLOYED IN MILWAUKEE POWER LAUNDRIES—
Continued.

LADIES' CLOTHES AND OTHER FANCY HAND IRONERS—Concluded.

No.	Age.	Race.	Con- jugal con- di- tion.	Laun- dry expe- rience (yrs.).	Hours.						Earnings.			Num- ber of weeks em- ploy- ed, Sept. 1, 1911, to Mar. 1, 1912.	Other em- ployment between Sept. 1, 1911, and Mar. 1, 1912.	
					Usual.			Maximum.			Sys- tem of pay- ment.	Week- ly rate of pay.	Aver- age week- ly earn- ings.		Num- ber of wks.	Total earn- ings for such other em- ploy- ment.
					Work- ing hours per day.	Num- ber of short days.	Aver- age hrs. per wk.	Hrs. per day.	Hrs. per week.							
19	21	German...	S.	1	10	1	54½	10	54½	Time	\$7.00	\$7.00	26	None	.....
20	27	Polish....	S.	5	10	1	1 ¹ 45½	10	45½	..do..	6.97	7.00	22	None	.....
21	26	..do....	S.	11	9½	2	45½	9½	45½	..do..	7.00	7.00	26	None	.....
22	31	..do....	S.	8	10	2	1 ¹ 40	10	42	..do..	6.80	7.15	24	None	.....
23	29	American..	S.	11	10	1	1 ¹ 45	10	45	..do..	7.20	7.20	26	None	.....
24	19	..do....	S.	1 ¹ ½	10	2	52	10	52	Piece	(²)	7.30	26	None	.....
25	28	..do....	S.	6	9½	2	48½	9½	48½	Time	7.50	7.50	26	None	.....
26	26	Dutch....	S.	6 ¹ ½	10	2	51	10	51	..do..	7.50	7.50	17	None	.....
27	23	German..	S.	4	10	1	3 ¹ 44	10	44	..do..	7.04	7.55	26	None	.....
28	29	American..	M.	8	10	2	48	10	48	..do..	7.68	7.70	15	None	.....
29	23	Polish....	S.	4	10	2	53½	10	55	..do..	7.75	7.75	26	None	.....
30	24	American..	S.	8	10	2	52	10	52	..do..	8.00	7.90	26	None	.....
31	24	Polish....	S.	7	10	2	48	10	48	..do..	7.92	7.90	26	None	.....
32	25	..do....	M.	3	10	2	51½	10	51½	..do..	8.24	7.90	26	None	.....
33	23	German..	S.	4½	9½	2	50	9½	50	..do..	8.00	7.95	26	None	.....
34	26	..do....	S.	8	10	1	1 ¹ 46	10	46	..do..	8.00	8.00	26	None	.....
35	28	American..	M.	9	10	2	53	10	53	..do..	8.00	8.00	26	None	.....
36	21	Polish....	S.	7	10	2	49	10	50	..do..	8.00	8.00	17	None	.....
37	33	German..	W.	10	9½	2	53	9½	53	..do..	8.00	8.00	17	None	.....
38	40	Irish....	S.	2½	10	2	51	10	51	..do..	8.00	8.00	25	None	.....
39	45	French....	W.	13	10	2	51	10	51	..do..	8.00	8.00	26	None	.....
40	27	German..	S.	2½	10	2	51	10	51	..do..	8.00	8.00	26	None	.....
41	26	Polish....	S.	12	10	2	48	10	48	..do..	7.68	8.20	26	None	.....
42	48	German..	W.	13	10	2	51	10	51	..do..	8.25	8.25	26	None	.....
43	25	Polish....	S.	5	10	2	51	10	51	Piece	(²)	8.30	26	None	.....
44	38	Irish....	S.	13	10	2	51	10	51	Time	8.50	8.50	26	None	.....
45	38	Dutch....	S.	11½	10	2	53	10	53	..do..	8.50	8.50	26	None	.....
46	27	Polish....	S.	3	10	2	52	10	52	..do..	8.50	8.50	26	None	.....
47	29	Irish....	S.	10	10	2	51	10	51	..do..	8.50	8.50	26	None	.....
48	31	German..	S.	1	10	2	51	10	51	..do..	8.50	8.50	24	None	.....
49	46	Irish....	S.	20	10	2	51	10	51	..do..	8.50	8.50	26	None	.....
50	27	Polish....	S.	5	10	2	50	10	52	..do..	9.00	8.65	26	None	.....
51	36	..do....	S.	11	10	2	55	10	55	..do..	8.80	8.80	26	None	.....
52	29	German..	S.	6	9½	2	49	9½	49	Time	9.00	8.95	26	None	.....
53	33	..do....	S.	14	9½	1	1 ¹ 47½	9½	47½	..do..	9.00	8.95	26	None	.....
54	36	..do....	W.	1	10	2	54	10	54	..do..	9.00	9.00	26	None	.....
55	37	Irish....	W.	20	10	2	51½	10	51½	..do..	9.00	9.00	25	None	.....
56	28	American..	W.	2½	10	2	51	10	51	..do..	9.00	9.00	26	None	.....
57	42	German..	S.	24	10	1	1 ¹ 46	10	46	..do..	9.60	9.50	26	None	.....
58	33	..do....	S.	12	10	2	51	10	51	..do..	10.45	10.45	26	None	.....
59	37	..do....	W.	1	9	2	45	9	45	Piece	(¹)	10.50	26	None	.....
60	39	..do....	S.	3½	9	2	44	9	44	..do..	(¹)	10.75	26	None	.....
61	41	..do....	M.	2	9	2	45	9	45	..do..	(¹)	11.00	26	None	.....
62	26	..do....	S.	12	10	2	53	10	53	Time	12.00	12.00	26	None	.....
63	55	Polish....	S.	20	10	2	50	10	50	..do..	12.25	12.25	26	None	.....
64	28	..do....	S.	15	10	2	51½	10	51½	..do..	10.47	12.55	26	None	.....
65	48	German..	M.	5	9	2	45	9	45	Piece	(¹)	13.00	26	None	.....

¹ Works only 5 days per week.² 25 per cent of charge to customer.³ Works only 4 days per week.⁴ Six to 9 cents per shirt.

EMPLOYMENT OF WOMEN IN MILWAUKEE POWER LAUNDRIES. 87

AGE, RACE, CONJUGAL CONDITION, LAUNDRY EXPERIENCE, AND HOURS OF WORK AND EARNINGS OF WOMEN EMPLOYED IN MILWAUKEE POWER LAUNDRIES—Continued.

MISCELLANEOUS HAND AND MACHINE WORKERS.

No.	Age.	Race.	Con- jugal con- di- tion.	Laun- dry expe- rience (yrs.).	Hours.				Earnings.			Num- ber of weeks em- ploy- ed, Sept. 1, 1911, to Mar. 1, 1912.	Other em- ployment between Sept. 1, 1911 and Mar. 1, 1912.		
					Usual.			Maximum.		Sys- tem of pay- ment.	Week- ly rate of pay.		Aver- age week- ly earn- ings.	Num- ber of wks.	Total earn- ings for such other em- ploy- ment.
					Work- ing hours per day.	Num- ber of days.	Aver- age hrs. per wk.	Hrs. per day.	Hrs. per week.						
1	16	German..	S.	1	10	2	53½	10	53½	Time	\$4.00	\$4.00	26	None	.....
2	16	Ger.-Am.	S.	2½	10	2	51	10	51	..do..	5.00	5.00	26	None	.....
3	22	German..	S.	7	10	2	52½	10	52½	..do..	{ 5.50 6.00 }	5.39	26	None	.....
4	27	Polish....	S.	¾	10	2	51	10	51	..do..	6.12	6.12	22	None	.....
5	54	German..	W.	1½	7	-----	42	7	42	..do..	7.00	7.00	26	None	.....
6	24	..do.....	S.	3	10	2	50½	10	50½	..do..	8.00	7.15	26	None	.....
7	25	American..	S.	2½	9½	2	48½	9½	48½	..do..	7.50	7.50	25	None	.....
8	45	German..	M.	2	10	2	55½	10	55½	..do..	7.50	7.50	26	None	.....
19	25	...do.....	S.	5½	10	2	55	10	55	..do..	8.25	8.25	26	None	.....

STARCH MACHINE ATTENDANTS.

1	17	Bohem'n.	S.	1½	10	2	49	10	49	Time	\$4.00	\$4.00	4	None
2	19	German..	S.	1	10	2	51½	10	51½	..do..	4.00	4.00	24	None
3	17	Polish...	S.	2	10	2	49	10	49	..do..	4.41	4.40	26	None
4	16	American..	S.	1½	10	2	52	10	52	..do..	4.50	4.50	23	None
5	18	Polish...	S.	1	10	2	50	10	50	..do..	5.00	5.00	26	None
6	40	German..	M.	2	16	2	50	10	50	..do..	5.00	5.00	22	None
7	20	..do.....	S.	7	10	2	49	10	49	..do..	5.39	5.30	25	None
8	17	Polish...	S.	1½	10	2	54	10	54	..do..	5.65	5.40	13	12 (?)
9	20	..do.....	S.	6	10	2	49	10	49	..do..	5.39	5.40	26	None
10	18	..do.....	S.	1½	10	2	55	10	55	..do..	5.56	5.50	26	None
11	18	German..	S.	1½	10	2	52½	10	52½	..do..	5.50	5.50	26	None
12	37	English...	M.	5½	10	2	52	10	52	..do..	6.03	6.00	2	None
13	24	German..	S.	5	9½	2	51½	9½	51½	..do..	6.03	6.00	26	None
14	19	..do.....	S.	4½	10	1	48½	10	48½	..do..	6.00	6.00	26	None
15	16	American..	S.	1	10	2	53	10	53	..do..	6.00	6.00	26	None
16	22	Polish...	S.	2	10	2	51½	10	51½	..do..	6.18	6.25	26	None
17	23	..do.....	S.	7	10	2	47½	10	47½	..do..	6.44	6.39	26	None
18	22	..do.....	S.	5½	10	3	50½	10	50½	..do..	6.31	6.30	26	None
19	17	..do.....	S.	2	10	2	54	10	54	..do..	6.50	6.50	26	None
20	19	..do.....	S.	3	10	2	50½	10	50½	..do..	6.50	6.50	26	None
21	18	..do.....	S.	3	10	1	48½	10	48½	..do..	6.50	6.50	26	None
22	20	German..	S.	5	10	2	50½	10	55	..do..	6.83	6.55	26	None
23	37	..do.....	S.	9	9	2	42	9	44	..do..	7.00	6.80	26	None
24	23	Polish...	S.	6½	10	2	50½	10	50½	..do..	7.00	7.00	26	None
25	25	German..	S.	7	10	1	45½	10	48½	..do..	7.00	7.00	26	None
26	26	Polish...	S.	6	9½	2	47½	9½	47½	..do..	7.00	7.00	26	None
27	28	..do.....	S.	5	9	1	39	9	39	..do..	7.00	7.00	23	None
28	19	..do.....	S.	5	10	2	55	10	55	..do..	7.00	7.00	26	None
29	21	German..	S.	5	10	2	49½	10	49½	..do..	7.00	7.00	26	None
30	22	..do.....	S.	1	10	2	50	10	50	..do..	7.00	7.00	24	None
31	21	Polish...	S.	1½	10	2	52½	10	52½	..do..	7.00	7.00	26	None
32	32	American..	S.	15	10	1	48½	10	43½	..do..	7.50	7.20	26	None
33	20	German..	S.	4	10	2	52	10	52½	..do..	7.50	7.25	26	None
34	19	Polish...	S.	3	10	2	52	10	52	..do..	7.28	7.30	23	None
35	24	American..	S.	3½	10	2	50½	10	50½	..do..	7.50	7.50	26	None
36	21	German..	S.	6	10	2	52	10	53	..do..	8.00	8.00	26	None
37	25	Polish...	S.	10	10	2	49½	10	49½	..do..	8.00	8.00	26	None
38	24	German..	Div.	7	10	2	55	10	55	..do..	8.50	8.50	26	None

1 This worker is the only machine operator.

2 Not reported.

3 Worked 5 days a week only.

4 Does not work every other Saturday.

AGE, RACE, CONJUGAL CONDITION, LAUNDRY EXPERIENCE, AND HOURS OF WORK
AND EARNINGS OF WOMEN EMPLOYED IN MILWAUKEE POWER LAUNDRIES—
Continued.

MACHINE DAMPENERS.

No.	Age.	Race.	Con- jugal con- di- tion.	Laun- dry expe- rience (yrs.).	Hours.					Earnings.			Num- ber of weeks em- ploy- ed, Sept. 1, 1911, to Mar. 1, 1912.	Other em- ployment between Sept. 1, 1911, and Mar. 1, 1912.	
					Usual.			Maximum.						Num- ber of wks.	Total earn- ings for such other em- ploy- ment.
					Work- ing hours per day.	Num- ber of short days.	Aver- age hrs. per wk.	Hrs. per day.	Hrs. per week.	Sys- tem of pay- ment.	Week- ly rate of pay.	Aver- age week- ly earn- ings.			
1	17	German..	S.	$\frac{1}{2}$	10	2	50	10	50	Time	\$5.00	\$5.00	12	None	.....
2	17	Polish....	S.	2	10	2	50	10	50	do..	5.00	5.00	26	None	.....
3	20	German..	S.	4	10	2	50	10	50	do..	6.50	6.50	26	None	.....

FLAT-WORK IRONER AND COLLAR-IRONER FEEDERS.

1	17	German...	S.	2	9 $\frac{1}{2}$	2	53	9 $\frac{1}{2}$	53	Time	\$3.00	\$3.00	26	None	.....
2	17	do.	S.	$\frac{1}{2}$	10	2	50	10	50	do.	3.50	3.50	17	None	.....
3	(1)	do.	S.	2	10	2	50	10	50	do.	4.00	4.00	26	None	.....
4	17	Polish...	S.	1	10	2	51	10	51	do.	4.50	4.50	26	None	.....
5	17	American...	S.	$\frac{1}{2}$	10	2	53	10	53	do.	4.50	4.50	13	None	.....
6	16	Polish...	S.	$\frac{1}{2}$	10	1	52	10	52	do.	4.94	4.75	26	None	.....
7	16	do.	S.	$\frac{1}{2}$	10	2	52	10	52	do.	4.94	4.75	26	None	.....
8	17	do.	S.	$\frac{1}{2}$	10	2	55	10	55	do.	5.25	4.75	26	None	.....
9	19	Norw'g'n	S.	2	10	2	55	10	55	do.	5.00	4.80	26	None	.....
10	16	German...	S.	2	10	2	53	10	53	do.	5.00	5.00	26	None	.....
11	19	do.	S.	$\frac{1}{2}$	10	2	51 $\frac{1}{2}$	10	51 $\frac{1}{2}$	do.	5.00	5.00	8	None	(1)
12	17	Polish...	S.	$\frac{1}{2}$	10	2	51	10	51	do.	5.00	5.00	26	None	.....
13	17	American...	S.	$\frac{1}{2}$	10	2	56	10	56	do.	5.00	5.00	26	None	.....
14	16	German...	S.	$\frac{1}{2}$	10	2	54	10	54	do.	5.00	5.00	26	None	.....
15	30	Slavonian	M.	2	10	2	54 $\frac{1}{2}$	10	54 $\frac{1}{2}$	do.	5.00	5.00	26	None	.....
16	23	German...	M.	4	10	2	50	10	50	do.	5.00	5.00	26	None	.....
17	16	do.	S.	1	10	2	50	10	50	do.	5.00	5.00	26	None	.....
18	19	English...	S.	3	10	2	51	10	51	do.	5.00	5.00	24	None	.....
19	17	Greek...	S.	2	10	2	56	10	56	do.	5.00	5.00	26	None	.....
20	16	English...	S.	1	10	2	56	10	56	do.	5.00	5.00	26	None	.....
21	21	Slavonian	S.	1	10	2	55	10	55	do.	5.00	5.00	26	None	.....
22	17	German...	S.	1	10	2	55	10	55	do.	5.00	5.00	9	13	\$39.00
23	17	do.	S.	$\frac{1}{2}$	10	2	51	10	51	do.	5.05	5.05	26	None	.....
24	16	do.	S.	$\frac{1}{2}$	10	2	52	10	52	do.	5.20	5.20	26	None	.....
25	18	Polish...	S.	2	10	2	52	10	52	do.	5.46	5.25	26	None	.....
26	20	do.	S.	$\frac{1}{2}$	10	2	53	10	53	do.	5.30	5.30	26	None	.....
27	25	German...	S.	7	9 $\frac{1}{2}$	2	51 $\frac{1}{2}$	9 $\frac{1}{2}$	51 $\frac{1}{2}$	do.	5.50	5.50	25	None	.....
28	21	do.	S.	$\frac{1}{2}$	10	2	50	10	50	do.	5.50	5.50	26	None	.....
29	18	Syrian...	S.	2	10	2	50	10	50	do.	5.50	5.50	26	None	.....
30	17	Polish...	S.	$\frac{1}{2}$	9 $\frac{1}{2}$	2	51 $\frac{1}{2}$	9 $\frac{1}{2}$	51 $\frac{1}{2}$	do.	5.50	5.50	26	None	.....
31	19	German...	S.	$\frac{1}{2}$	10	2	51	10	51	do.	5.50	5.50	26	None	.....
32	20	do.	S.	$\frac{3}{4}$	10	2	50	10	50	do.	5.50	5.50	18	None	.....
33	23	Polish...	S.	4	10	2	50	10	50	do.	6.00	5.50	26	None	.....
34	19	German...	S.	4	10	2	48 $\frac{1}{2}$	10	48 $\frac{1}{2}$	do.	6.57	5.55	26	None	.....
35	19	Polish...	S.	5	10	2	53	10	58	do.	5.90	5.65	26	None	.....
36	25	German...	Div.	6	9 $\frac{1}{2}$	2	49 $\frac{1}{2}$	9 $\frac{1}{2}$	49 $\frac{1}{2}$	do.	6.00	5.75	26	None	.....
37	18	do.	S.	2	10	2	53	10	53	do.	5.83	5.80	26	None	.....
38	22	do.	S.	1	10	2	53 $\frac{1}{2}$	10	53 $\frac{1}{2}$	do.	6.14	5.95	26	None	.....
39	22	Swedish...	S.	2	10	2	51 $\frac{1}{2}$	10	51 $\frac{1}{2}$	do.	6.00	6.00	26	None	.....
40	17	German...	S.	3	10	2	50	10	50	do.	6.00	6.00	26	None	.....
41	21	do.	S.	$\frac{1}{2}$	9 $\frac{1}{2}$	2	53	9 $\frac{1}{2}$	53	do.	6.00	6.00	26	None	.....
42	19	do.	S.	$\frac{1}{2}$	10	2	54 $\frac{1}{2}$	10	54 $\frac{1}{2}$	do.	6.00	6.00	26	None	.....
43	19	do.	S.	5	9 $\frac{1}{2}$	2	53	9 $\frac{1}{2}$	53	do.	6.00	6.00	26	None	.....
44	20	Slavonian	S.	1	10	2	55	10	55	do.	6.00	6.00	4	None	.....
45	19	Polish...	S.	5	10	2	53	10	53	do.	6.36	6.20	26	None	.....
46	22	do.	S.	4	10	2	53	10	53	do.	6.36	6.35	26	None	.....
47	28	American...	S.	5	10	2	50	10	50	do.	6.50	6.35	26	None	.....
48	21	Polish...	S.	3	10	2	58	10	58	do.	6.50	6.50	26	None	.....
49	20	German...	S.	2	10	2	55	10	55	do.	6.50	6.50	26	None	.....
50	17	do.	S.	2	10	2	54	9 $\frac{1}{2}$	54	do.	7.00	7.00	26	None	.....
51	19	do.	S.	3	10	2	51 $\frac{1}{2}$	10	51 $\frac{1}{2}$	do.	7.00	7.00	26	None	.....
52	24	do.	S.	7	10	2	50	10	50	do.	7.00	7.00	26	None	.....
53	19	Polish...	S.	5	10	2	53	10	53	do.	8.00	8.00	26	None	.....
54	37	do.	M.	5	10	2	51	10	51	do.	8.00	8.00	26	None	.....
55	25	do.	S.	4	10	2	58 $\frac{1}{2}$	10	58 $\frac{1}{2}$	do.	8.00	8.00	26	None	.....

1 Not reported.

EMPLOYMENT OF WOMEN IN MILWAUKEE POWER LAUNDRIES. 89

AGE, RACE, CONJUGAL CONDITION, LAUNDRY EXPERIENCE, AND HOURS OF WORK AND EARNINGS OF WOMEN EMPLOYED IN MILWAUKEE POWER LAUNDRIES—Continued.

FLAT-WORK AND COLLAR-IRONER RECEIVERS.

No.	Age.	Race.	Con- jugal con- di- tion.	Laun- dry expe- rience (yrs.).	Hours.					Earnings.			Num- ber of weeks em- ploy- ed, Sept. 1, 1911, to Mar. 1, 1912.	Other em- ployment between Sept. 1, 1911, and Mar. 1, 1912.	
					Usual.			Maximum.		Sys- tem of pay- ment.	Week- ly rate of pay.	Aver- age week- ly earn- ings.		Num- ber of wks.	Total earn- ings for such other em- ploy- ment.
					Work- ing hours per day.	Num- ber of short days.	Aver- age hrs. per wk.	Hrs. per day.	Hrs. per week.						
1	15	Polish....	S.	$\frac{1}{2}$	8	.....	48 $\frac{1}{2}$	8 $\frac{1}{2}$	48 $\frac{1}{2}$	Time	\$4.00	\$4.00	11	15	(1)
2	17	Hung'r'n	S.	$\frac{1}{2}$	10	2	50	10	50	do.	4.00	4.00	2	24	\$192.00
3	18	German...	S.	$\frac{1}{2}$	10	2	54	10	54	do.	4.00	4.00	4	18	81.00
4	15	Polish....	S.	$\frac{1}{2}$	8	1	45	8	45	do.	4.00	4.00	6	20	90.00
5	15	do.....	S.	$\frac{1}{2}$	8	.....	48	8	48	do.	4.00	4.00	26	None	.....
6	15	German...	S.	1	10	2	51	10	51	do.	4.23	4.20	25	None	.....
7	16	Polish....	S.	$\frac{1}{2}$	10	2	53 $\frac{1}{2}$	10	53 $\frac{1}{2}$	do.	4.25	4.25	26	None	.....
8	19	Irish.....	S.	2	9 $\frac{1}{2}$	1	55 $\frac{1}{2}$	9 $\frac{1}{2}$	55 $\frac{1}{2}$	do.	4.50	4.40	26	None	.....
9	17	Polish....	S.	$\frac{1}{2}$	10	2	48	10	48	do.	4.42	4.40	26	None	.....
10	17	do.....	S.	$\frac{1}{2}$	10	2	50	10	50	do.	4.50	4.50	8	18	54.00
11	15	do.....	S.	2	8	1	45	8	45	do.	4.50	4.50	25	None	.....
12	16	do.....	S.	$\frac{1}{2}$	10	2	54	10	54	do.	4.50	4.50	8	None	.....
13	15	do.....	S.	1	8	1	46	8	46	do.	4.50	4.50	26	None	.....
14	23	German...	S.	4	10	2	54	10	54	do.	4.75	4.75	26	None	.....
15	18	American	S.	3	10	2	50	10	50	do.	4.75	4.75	24	None	.....
16	17	Polish....	S.	1	10	2	52	10	52	do.	4.94	4.75	26	None	.....
17	16	German...	S.	$\frac{1}{2}$	10	2	51	10	51	do.	4.80	4.80	26	None	.....
18	27	do.....	S.	5	10	2	55	10	55	do.	5.00	4.85	26	None	.....
19	16	American	S.	2	10	2	51	10	51	do.	4.90	4.90	19	None	.....
20	16	German...	S.	2	10	2	52	10	52	do.	4.94	4.95	26	None	.....
21	19	Polish....	S.	3	9 $\frac{1}{2}$	2	52	9 $\frac{1}{2}$	52	do.	5.00	5.00	26	None	.....
22	18	American	S.	3	9 $\frac{1}{2}$	2	53	9 $\frac{1}{2}$	53	do.	5.00	5.00	26	None	.....
23	17	German...	S.	2	10	2	56	10	56	do.	5.00	5.00	26	None	.....
24	16	American	S.	$\frac{1}{2}$	10	2	55	10	55	do.	5.00	5.00	26	None	.....
25	16	Polish....	S.	$\frac{1}{2}$	10	2	55 $\frac{1}{2}$	10	55 $\frac{1}{2}$	do.	5.00	5.00	4	None	.....
26	19	Irish.....	S.	$\frac{1}{2}$	10	2	54	10	54	do.	5.00	5.00	26	None	.....
27	16	German...	S.	2	10	2	54 $\frac{1}{2}$	10	54 $\frac{1}{2}$	do.	5.00	5.00	26	None	.....
28	17	Polish....	S.	$\frac{1}{2}$	10	2	51	10	51	do.	5.00	5.00	26	None	.....
29	21	English...	S.	$\frac{1}{2}$	10	2	55 $\frac{1}{2}$	10	55 $\frac{1}{2}$	do.	5.00	5.00	9	13	\$60.00
30	21	Slavonian	M.	3	10	2	56 $\frac{1}{2}$	10	56 $\frac{1}{2}$	do.	5.00	5.00	26	None	.....
31	39	American	M.]	$\frac{1}{2}$	10	1	59 $\frac{1}{2}$	10 $\frac{1}{2}$	59 $\frac{1}{2}$	do.	5.00	5.00	8	18	90.00
32	16	Polish....	S.	$\frac{1}{2}$	10	2	58 $\frac{1}{2}$	10	58 $\frac{1}{2}$	do.	5.00	5.00	22	None	.....
33	22	do.....	S.	1	10	2	53	10	53	do.	5.30	5.30	26	None	.....
34	17	German...	S.	$\frac{1}{2}$	10	2	51	10	51	do.	5.40	5.40	26	None	.....
35	28	French...	S.	$\frac{1}{2}$	10	2	54	10	54	do.	5.50	5.40	11	15	127.50
36	20	German...	S.	$\frac{1}{2}$	10	2	51 $\frac{1}{2}$	10	51 $\frac{1}{2}$	do.	5.50	5.50	3	None	.....
37	18	Polish....	S.	5	10	2	52	10	52	do.	5.50	5.50	26	None	.....
38	16	do.....	S.	2	10	2	55	10	55	do.	5.50	5.50	26	None	.....
39	24	German...	S.	4	10	2	51	10	52	do.	5.50	5.50	26	None	.....
40	18	Polish....	S.	3	10	1	59	10	59	do.	6.00	5.90	26	None	.....
41	18	do.....	S.	3	10	2	58 $\frac{1}{2}$	10	58 $\frac{1}{2}$	do.	6.00	6.00	26	None	.....
42	20	do.....	S.	5	10	2	51	10	52	do.	6.38	6.35	25	None	.....
43	30	American	S.	$\frac{1}{2}$	10	2	54	10	54	do.	7.00	6.60	17	None	.....
44	19	German...	S.	$\frac{1}{2}$	10	2	52	10	52	do.	7.00	7.00	18	None	.....
45	21	Polish....	S.	4	9 $\frac{1}{2}$	2	50	9 $\frac{1}{2}$	50	do.	7.50	7.50	26	None	.....

COLLAR SHAPERS.

1	16	Polish....	S.	$\frac{1}{2}$	9 $\frac{1}{2}$	2	42	9 $\frac{1}{2}$	42	Time	\$4.00	\$4.00	12	14	\$52.50
2	18	do.....	S.	1	9 $\frac{1}{2}$	2	49 $\frac{1}{2}$	9 $\frac{1}{2}$	49 $\frac{1}{2}$	do.	5.00	5.00	26	None	.....
3	20	do.....	S.	2	10	3	48 $\frac{1}{2}$	10	50	do.	5.09	5.15	26	None	.....
4	19	do.....	S.	3	10	3	49 $\frac{1}{2}$	10	50 $\frac{1}{2}$	do.	5.45	5.35	26	None	.....
5	20	American	S.	4	10	2	51	10	51	do.	6.00	6.00	26	None	.....
6	20	German...	S.	7	10	2	53	10	53	do.	6.50	6.25	26	None	.....
7	20	do.....	S.	5	10	2	51 $\frac{1}{2}$	10	51 $\frac{1}{2}$	do.	6.50	6.50	26	None	.....
8	20	Polish....	S.	5	10	2	50	10	50	do.	6.75	6.75	26	None	.....
9	22	German...	S.	8	9 $\frac{1}{2}$	2	50	9 $\frac{1}{2}$	50	do.	7.00	7.00	26	None	.....
10	24	Polish....	S.	4	10	2	51	10	51	do.	7.50	7.50	26	None	.....
11	21	do.....	S.	5	9 $\frac{1}{2}$	2	49 $\frac{1}{2}$	9 $\frac{1}{2}$	49 $\frac{1}{2}$	do.	7.50	7.50	26	None	.....
12	28	American	S.	7	10	2	52	10	52	do.	8.50	8.50	24	None	.....

¹ Not reported.

² And board.

AGE, RACE, CONJUGAL CONDITION, LAUNDRY EXPERIENCE, AND HOURS OF WORK AND EARNINGS OF WOMEN EMPLOYED IN MILWAUKEE POWER LAUNDRIES—Continued.

BOSOM-PRESS OPERATORS.

No.	Age.	Race.	Con- jugal con- di- tion.	Laun- dry expe- rience (yrs.).	Hours.				Earnings.			Num- ber of weeks em- ploy- ed, Sept. 1, 1911, to Mar. 1, 1912.	Other em- ployment between Sept. 1, 1911, and Mar. 1, 1912.		
					Usual.			Maximum.		Syst- em of pay- ment.	Week- ly rate of pay.		Aver- age week- ly earn- ings.	Num- ber of wks.	Total earn- ings for such other em- ploy- ment.
					Work- ing hours per day.	Num- ber of short days.	Aver- age hrs. per wk.	Hrs. per day.	Hrs. per week.						
1	24	German..	S.	(1)	10	2	49½	10	49½	Time	\$5.00	\$5.00	(1)	None	.....
2	17	Polish....	S.	2½	10	2	54	10	54	..do..	5.94	5.80	26	None	.....
3	20	..do.....	S.	3½	10	2	48½	10	48½	..do..	5.82	5.95	24½	None	.....
4	21	German..	S.	3	10	2	52	10	52	..do..	6.00	6.00	13	None	.....
5	23	..do.....	S.	2½	10	2	50	10	50	..do..	6.00	6.00	26	None	.....
6	17	..do.....	S.	2	9½	2	47½	9½	47½	..do..	6.50	6.35	26	None	.....
7	25	..do.....	S.	5	10	2	52	10	52	..do..	6.76	6.75	26	None	.....
8	23	..do.....	S.	7	10	2	53	10	53	..do..	7.00	6.75	26	None	.....
9	18	Polish....	S.	3	10	2	50	10	50	..do..	7.00	7.00	26	None	.....
10	28	German..	S.	1½	10	2	50	10	50	..do..	7.00	7.00	13	None	.....
11	26	..do.....	W.	6	10	2	50	10	50	..do..	7.00	7.00	21	None	.....
12	22	..do.....	S.	7	10	2	49	10	49	..do..	7.00	7.00	26	None	.....
13	28	Polish....	W.	½	10	2	53	10	53	..do..	7.00	7.00	15	11	\$66.00
14	20	..do.....	S.	4	10	2	50	10	50	..do..	7.00	7.00	24	None	.....
15	21	..do.....	S.	3	10	2	50	10	50	Piece	(2)	7.05	26	None	.....
16	24	..do.....	S.	9	10	2	45	10	45	Time	7.42	7.35	26	None	.....
17	20	German..	S.	5	10	2	50	10	50	..do..	7.50	7.50	26	None	.....
18	19	Polish....	S.	1½	10	2	52	10	52	..do..	7.50	7.50	26	None	.....
19	21	German..	S.	4½	10	2	53½	10	53½	..do..	8.00	7.70	26	None	.....
20	24	Irish.....	S.	8	10	2	52½	10	52½	..do..	8.00	8.00	26	None	.....
21	31	Polish....	S.	14	10	3	49½	10	49½	..do..	8.00	8.00	26	None	.....
22	32	German..	S.	15	10	2	51	10	51	..do..	8.50	8.50	26	None	.....

FOOT-POWER STARCHER OPERATORS (NECKBAND ROLL, BOSOM ROLL, AND PERFORATED SURFACE PAN STARCHERS).

1	16	German..	S.	1½	10	2	51	10	51	Time	\$4.00	\$4.00	24	None	.....
2	21	..do.....	S.	3	10	2	53	10	53	..do..	4.00	4.00	26	None	.....
3	17	Polish....	S.	1	10	2	48	10	48	..do..	4.80	4.80	26	None	.....
4	17	..do.....	S.	1½	10	2	49½	10	49½	..do..	5.00	5.00	4	18	(1)
5	21	American	S.	3	10	3	49½	10	49½	..do..	5.45	5.30	26	None	.....
6	19	Polish....	S.	1½	10	2	52½	10	52½	..do..	5.51	5.45	26	None	.....
7	26	American	S.	7	10	1	54½	10	48½	..do..	6.00	5.75	26	None	.....
8	17	Polish....	S.	½	10	2	52½	10	52½	..do..	5.75	5.75	26	None	.....
9	18	..do.....	S.	4½	10	2	51	10	52½	..do..	5.87	5.85	26	None	.....
10	27	German..	Div.	5	9½	2	46½	9½	48½	..do..	6.00	6.00	22	None	.....
11	18	Polish....	S.	4	10	2	47½	10	47½	..do..	6.50	6.50	22	None	.....
12	16	..do.....	S.	1	10	2	49½	10	49½	..do..	7.00	7.00	26	None	.....
13	19	..do.....	S.	5	10	2	53	10	53	..do..	7.16	7.00	26	None	.....
14	24	..do.....	S.	8	10	2	48	10	48	..do..	6.48	7.50	25	None	.....
15	33	German..	M.	4	10	2	55	10	55	..do..	8.00	8.00	26	None	.....
16	23	..do.....	S.	6	10	2	53½	10	53½	Piece	(7)	9.50	26	None	.....

¹ Not reported.

² 25 cents per 100.

³ Worked but 5 days a week.

⁴ Does not work every third Saturday.

⁵ A 5-day week.

⁶ Does not work every other Saturday.

⁷ 5 to 9 cents per 100 pieces.

EMPLOYMENT OF WOMEN IN MILWAUKEE POWER LAUNDRIES. 91

AGE, RACE, CONJUGAL CONDITION, LAUNDRY EXPERIENCE, AND HOURS OF WORK AND EARNINGS OF WOMEN EMPLOYED IN MILWAUKEE POWER LAUNDRIES—Continued.

FOOT-POWER MACHINE OPERATORS (CUFF, YOKE, AND NECKBAND PRESS AND COLLAR TIPPER OPERATORS).

No.	Age.	Race.	Con- jugal con- di- tion.	Laun- dry expe- rience (yrs.).	Hours.				Earnings.			Num- ber of weeks em- ploy- ed, Sept. 1, 1911, to Mar. 1, 1912.	Other em- ployment between Sept. 1, 1911, and Mar. 1, 1912.		
					Usual.			Maximum.		Syst- em of pay- ment.	Week- ly rate of pay.		Aver- age week- ly earn- ings.	Num- ber of wks.	Total earn- ings for such other em- ploy- ment.
					Work- ing hours per day.	Num- ber of short days.	Aver- age hrs. per wk.	Hrs. per day.	Hrs. per week.						
1	17	Polish.....	S.	1 ¹ / ₂	10	2	51	10	51	Time	\$4.08	\$4.10	26	None	
2	16	do.....	S.	1	9 ¹ / ₂	2	46 ¹ / ₂	9 ¹ / ₂	46 ¹ / ₂	do..	4.50	4.50	25	None	
3	18	German..	S.	3	10	2	50	10	50	do..	4.50	4.50	26	None	
4	16	Polish....	S.	1 ¹ / ₂	10	2	50	10	50	do..	4.50	4.50	7	None	
5	17	German..	S.	1	9 ¹ / ₂	2	46	9 ¹ / ₂	46	do..	4.50	4.50	22	None	
6	17	Polish....	S.	2	9	2	46 ¹ / ₂	9	46 ¹ / ₂	do..	4.65	4.65	26	None	
7	18	American	S.	1 ¹ / ₂	9	2	49	9	49	do..	4.90	4.90	26	None	
8	16	Polish....	S.	1	10		60	10	60	do..	5.00	5.00	26	None	
9	16	do.....	S.	2 ¹ / ₂	10	2	53 ¹ / ₂	10	53 ¹ / ₂	do..	5.00	5.00	26	None	
10	19	do.....	S.	2	10	2	50	10	50	do..	5.00	5.00	26	None	
11	19	German..	S.	1 ¹ / ₂	10	2	52	10	52	do..	5.20	5.20	26	None	
12	18	Polish....	S.	1	10	2	53	10	53	do..	5.30	5.30	26	None	
13	16	do.....	S.	2	10	2	52	10	52	do..	5.50	5.40	26	None	
14	18	do.....	S.	1 ¹ / ₂	10	2	50 ¹ / ₂	10	50 ¹ / ₂	do..	5.50	5.50	26	None	
15	19	do.....	S.	3	10	2	49	10	49	do..	5.88	5.90	24 ¹ / ₂	None	
16	16	German..	S.	1 ¹ / ₂	10	2	50 ¹ / ₂	10	50 ¹ / ₂	do..	6.00	5.98	26	None	
17	18	do.....	S.	2 ¹ / ₂	10	2	49 ¹ / ₂	10	49 ¹ / ₂	do..	6.00	6.00	26	None	
18	19	American	S.	2	10	2	50	10	50	Piece	(1)	7.00	26	None	
19	29	Polish....	S.	5 ¹ / ₂	10	2	51	10	51	Time	7.00	7.00	22	4	\$24.00
20	24	German..	W.	1 ¹ / ₂	10	2	50	10	50	do..	7.00	7.00	26	None	
21	20	American	S.	4	10	2	50	10	50	do..	7.50	7.50	26	None	

BODY AND SLEEVE IRONER OPERATORS.

1	30	Polish....	S.	10	8 ¹ / ₂	1	26	8 ¹ / ₂	26	Time	\$4.16	\$4.16	26	None
2	19	Irish.....	S.	1 ¹ / ₂	10	2	53	10	53	do..	4.50	4.50	26	None
3	17	American	S.	1 ¹ / ₂	10	2	52	10	52	do..	4.50	4.50	17	None
4	17	Polish....	S.	10	10	2	53	10	53	do..	4.50	4.50	8	None
5	19	American	S.	1 ¹ / ₂	10	2	54	10	54	do..	4.50	4.50	5	21 \$52.50
6	17	Polish....	S.	1	10	2	53	10	53	do..	4.77	4.75	26	None
7	20	German..	S.	1 ¹ / ₂	10	2	50	10	50	do..	5.00	4.90	8	18 54.00
8	37	American	M.	1 ¹ / ₂	10	2	53	10	53	do..	5.00	5.00	9	17 85.00
9	28	German..	M.	4	10	2	50	10	50	do..	5.00	5.00	26	None
10	18	American	S.	2	10	2	52	10	52	do..	5.00	5.00	26	None
11	21	German..	S.	3	10	2	50	10	50	do..	5.00	5.00	24 ¹ / ₂	None
12	16	do.....	S.	1 ¹ / ₂	10	2	50 ¹ / ₂	10	50 ¹ / ₂	do..	5.00	5.00	6	20 83.00
13	17	Polish....	S.	1 ¹ / ₂	10	2	51 ¹ / ₂	10	51 ¹ / ₂	do..	5.00	5.00	26	None
14	19	German..	S.	1 ¹ / ₂	10	2	50	10	50	do..	5.00	5.00	26	None
15	16 ¹ / ₂	Polish....	S.	1 ¹ / ₂	10	2	50 ¹ / ₂	10	50 ¹ / ₂	do..	5.05	5.05	24	None
16	26	do.....	S.	4	10	2	43	10	43	do..	4.98	5.20	26	None
17	20	German..	S.	4	10	2	48	10	48	do..	5.28	5.25	26	None
18	17	do.....	S.	1 ¹ / ₂	10	2	53	10	53	do..	5.30	5.30	26	None
19	18	Polish....	S.	1	10	2	51	10	51	do..	5.35	5.35	26	None
20	18	do.....	S.	2	10	2	52 ¹ / ₂	10	52 ¹ / ₂	do..	5.50	5.50	26	None
21	17	do.....	S.	2	10	2	52 ¹ / ₂	10	52 ¹ / ₂	do..	5.50	5.50	26	None
22	17	German..	S.	3	9 ¹ / ₂	2	52 ¹ / ₂	9 ¹ / ₂	52 ¹ / ₂	do..	5.50	5.50	26	None
23	17	Polish....	S.	1 ¹ / ₂	10	2	52 ¹ / ₂	10	52 ¹ / ₂	do..	5.50	5.50	26	None
24	19	do.....	S.	7	10	2	53 ¹ / ₂	10	53 ¹ / ₂	do..	5.50	5.50	26	None
25	18	do.....	S.	5	10	2	53	10	53	do..	5.50	5.50	26	None
26	19	American	S.	1	10	2	51	10	51	do..	5.50	5.50	4	22 90.00
27	20	Polish....	S.	5	10	2	49	10	49	do..	5.64	5.55	26	None
28	17	do.....	S.	2	10	2	52	10	52	do..	5.72	5.70	26	None
29	17	American	S.	2	10	2	53	10	53	do..	6.00	5.75	26	None
30	16	Slavonian	S.	2	10	2	53 ¹ / ₂	10	53 ¹ / ₂	do..	6.00	5.80	26	None
31	19	do.....	S.	1	10	2	52 ¹ / ₂	10	52 ¹ / ₂	do..	6.00	6.00	17	9 48.00
32	23	German..	S.	3	9 ¹ / ₂	2	52 ¹ / ₂	9 ¹ / ₂	52 ¹ / ₂	do..	6.00	6.00	23	None
33	21	American	M.	2	10	2	52	10	52	do..	6.00	6.00	24 ¹ / ₂	None
34	17	German..	S.	1	10	2	51	10	51	do..	6.00	6.00	26	None
35	20	Polish....	S.	3 ¹ / ₂	9 ¹ / ₂	2	42	9 ¹ / ₂	42	do..	6.00	6.00	26	None
36	26	German..	S.	4	9 ¹ / ₂	2	49 ¹ / ₂	9 ¹ / ₂	49 ¹ / ₂	do..	6.00	6.00	26	None

¹ 14 cents per 100.

² Works 4 days a week.

³ Works 5 days a week.

AGE, RACE, CONJUGAL CONDITION, LAUNDRY EXPERIENCE, AND HOURS OF WORK
AND EARNINGS OF WOMEN EMPLOYED IN MILWAUKEE POWER LAUNDRIES—
Concluded.

BODY AND SLEEVE IRONER OPERATORS—Concluded.

No.	Age.	Race.	Con- jugal con- di- tion.	Laun- dry expe- rience (yrs.).	Hours.				Earnings.				Num- ber of weeks em- ploy- ed, Sept. 1, 1911, to Mar. 1, 1912.	Other em- ployment between Sept. 1, 1911, and Mar. 1, 1912.	
					Usual.			Maximum.		Sys- tem of pay- ment.	Week- ly rate of pay.	Aver- age week- ly earn- ings.		Num- ber of wks.	Total earn- ings for each other em- ploy- ment.
					Work- ing hours per day.	Num- ber of short days.	Aver- age hrs. per wk.	Hrs. per day.	Hrs. per week.						
37	27	German...	S.	3	10½	2	58½	11½	58½	Time	\$6.00	\$6.00	26	None	
38	23	Polish...	S.	7	10	2	51	10	51	do.	6.00	6.00	26	None	
39	21	do.	S.	3	10	2	50	10	50	do.	6.00	6.00	26	None	
40	17	do.	S.	1½	10		60	10	60	do.	6.00	6.00	26	None	
41	16	German...	S.	1	10	1	49½	10	49½	do.	6.00	6.00	26	None	
42	16	do.	S.	2	10	2	53	10	53	do.	6.07	6.10	26	None	
43	18	Irish....	S.	1	9½	2	49½	9½	49½	do.	6.25	6.25	26	None	
44	19	Polish...	S.	5	10	2	52	10	52	do.	6.50	6.25	26	None	
45	22	do.	S.	5	10	2	49	10	49	do.	6.37	6.35	26	None	
46	18	do.	S.	4	10	2	56	10	56	do.	6.44	6.40	26	None	
47	23	German...	S.	2	10	2	51	10	51	do.	6.50	6.50	26	None	
48	22	do.	S.	5	10	2	52	10	52	do.	6.50	6.50	26	None	
49	20	Polish...	S.	4	10	2	50	10	50	do.	6.50	6.50	26	None	
50	19	do.	S.	1½	10	2	54	10	54	do.	6.50	6.50	20	None	
51	29	American	S.	2½	9½	2	51½	9½	51½	do.	6.50	6.50	26	None	
52	37	Saxon...	M.	2½	10	2	52½	10	52½	do.	7.00	7.00	26	None	
53	19	Russian..	S.	1½	10	2	53	10	53	do.	7.00	7.00	26	None	
54	20	Polish...	S.	5	10	2	50	10	50	do.	7.00	7.00	21	None	
55	21	do.	S.	5	9½	2	49½	9½	49½	do.	7.00	7.00	26	None	
56	22	Welsh...	S.	5	10	2	51	10	51	do.	7.00	7.00	26	None	
57	34	German...	S.	5	10	2	50	10	50	do.	7.00	7.00	26	None	
58	17	do.	S.	3	10	2	50	10	50	do.	7.00	7.00	26	None	
59	22	Polish...	S.	1	10	2	50½	10	50½	do.	7.00	7.00	26	None	
60	21	do.	S.	5	10	2	50	10	50	Piece	(2)	7.40	26	None	
61	27	American	S.	13	9½	2	49½	9½	49½	Time	8.00	8.00	26	None	
62	18	Polish...	S.	½	10	2	53	10	53	Piece	(3)	8.00	26	None	
63	20	do.	S.	2	10	2	53	10	53	do.	(3)	8.50	26	None	
64	23	German...	S.	4	10	2	53	10	53	do.	(4)	8.50	26	None	
65	25	Polish...	S.	5	10	2	50	10	50	Time	9.00	8.90	26	None	
66	23	do.	S.	3	10	2	53	10	53	Piece	(4)	9.15	26	None	

NECKBAND, BOSOM, AND COLLAR IRONER OPERATORS.

1	23	American	S.	2	9½	2	42½	9½	42½	Time	\$5.00	\$5.00	26	None
2	18	Polish...	S.	4	10	2	51½	10	51½	do.	5.50	5.50	26	None
3	18	German..	S.	3	9½	2	52½	9½	52½	do.	6.00	6.00	26	None
4	18	Polish...	S.	1	10	1	55	10	55	do.	6.00	6.00	26	None
5	19	do.	S.	4	10	2	50	10	50	do.	6.00	6.00	26	None
6	16	do.	S.	1½	10	2	54	10	54	do.	6.00	6.00	25	None
7	20	do.	S.	½	9½	2	49½	9½	49½	do.	6.00	6.00	26	None
8	23	do.	S.	8	9½	2	49½	9½	49½	do.	7.00	7.00	26	None
9	18	German..	S.	2	9½	2	48½	9½	48½	do.	7.00	7.00	26	None
10	23	American	S.	5	9½	2	42½	9½	42½	do.	7.00	7.00	26	None
11	23	Polish...	S.	5	10	2	50	10	50	do.	7.50	7.50	26	None
12	23	German..	S.	4	10	2	53	10	53	do.	8.00	8.00	26	None

DEPARTMENT SUPERVISORS.

1	21	Polish...	S.	5	10	2	55	10	55	Time	\$8.00	\$8.00	26	None
2	35	American	S.	10	10	2	52	10	52	do.	10.00	9.95	26	None
3	25	do.	S.	10	9½	1	55	9½	55	do.	10.00	10.00	26	None
4	37	German..	S.	15	9	1	51	9	51	do.	11.00	11.00	26	None
5	33	do.	S.	12½	10	1	50	10	50	do.	11.00	11.00	26	None
6	28	Polish...	S.	11	10	2	53	10	53	do.	12.00	11.75	26	None
7	32	do.	S.	15	10	2	50	10	50	do.	12.00	12.00	26	None
8	33	German..	S.	8	10	2	54	10	54	do.	12.00	12.00	26	None
9	42	do.	S.	13	9	1	50	9	50	do.	14.00	14.00	26	None
10	38	do.	S.	18	9½	2	53½	9½	53½	do.	15.00	15.00	26	None
Aver- ages.	32.4	-----	-----	11½	9.7	1.6	52.35	9.7	52.35	-----	11.50	11.47	26	-----

¹ Works 5 days a week.

² 25 per cent of charge to customer.

³ 1½ cents per coat.

⁴ 25 cents per 100 pieces.