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ROYAL MEEKER, Commissioner

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M I S C E L L A N E O U S S E R I E S : N O . 1 4

WELFARE WORK IN
BRITISH MUNITION FACTORIES

REPRINTS OF THE MEMORANDA
OF THE BRITISH HEALTH OF
MUNITION WORKERS COMMITTEE



APRIL, 1917

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PREFACE.

This bulletin is the second of a group of bulletins to be published by the Bureau of Labor Statistics of the United States Department of Labor in compliance with the following resolution voted April 7, 1917, by the Council of National Defense:

That the complete reports of the committee appointed by the British Minister of Munitions to investigate conditions affecting the health and welfare of workers be edited so that the salient features thereof may be made applicable to the conditions pertaining in the United States, and printed in condensed form by the Department of Labor.

The matter contained in the memoranda issued by the British Health of Munition Workers Committee is of such interest and importance that the documents relating to welfare supervision and welfare work are reproduced in full in this bulletin.

An earlier bulletin (Bulletin 221) contains documents, official and unofficial, dealing with hours, fatigue, occupational diseases, and the provisions of the Munitions of War Act relating to labor disputes and the restoration of trade-union conditions after the war, while a later bulletin (Bulletin 223) will contain documents, official and unofficial, dealing with the employment of women and juveniles.

It is thought that these bulletins published at the request of the Council of National Defense will be of great service to the country, by giving wider circulation to the experiences of Great Britain, France, Canada, and other countries, in dealing with labor in the production of the largest quantity of munitions in the shortest space of time.

ROYAL MEEKER,

United States Commissioner of Labor Statistics.

BULLETIN OF THE U. S. BUREAU OF LABOR STATISTICS.

WHOLE NO. 222.

WASHINGTON.

APRIL, 1917.

WELFARE WORK IN BRITISH MUNITION FACTORIES.

INTRODUCTION.

The British Health of Munition Workers Committee was appointed in the middle of September, 1915, by the Minister of Munitions, with the concurrence of the Home Secretary, "to consider and advise on questions of industrial fatigue, hours of labor, and other matters affecting the personal health and physical efficiency of workers in munition factories and workshops."

The composition of the committee is as follows:

Sir George Newman, M. D., chairman.

Sir Thomas Barlow, Bart., K. C. V. O., M. D., F. R. S.

G. Bellhouse, Factory Department, Home Office.

Prof. A. E. Boycott, M. D., F. R. S.

J. R. Clynes, M. P.

E. L. Collis, M. B., Factory Department, Home Office.

W. M. Fletcher, M. D., F. R. S., secretary of Medical Research Committee.

Leonard E. Hill, M. B., F. R. S.

Samuel Osborn, J. P., Sheffield.

Miss R. E. Squire, Factory Department, Home Office.

Mrs. H. J. Tennant.

E. H. Pelham, secretary.

The committee took evidence in various industrial centers from employers, representatives of workers, and other interested persons, and made numerous special studies and investigations. In addition, members have visited a large number of factories and workshops, and discussed matters with the management, with foremen, and with individual workers. With this information, and having the advantage of the special knowledge and experience already possessed by members of the committee, it has published up to the present time (April, 1917) 15 memoranda, dealing with one or more of the subjects intrusted to it.

As these memoranda are the work of a committee especially qualified by technical knowledge and special experience, and as they contain many suggestions and recommendations made with the purpose

of securing maximum output over a period of months, or even years, and at the same time safeguarding the health and physical efficiency of the workers, it is believed that their reproduction at this time may be of value in a similar way to industry and labor in this country. The memoranda have been arranged in three groups, the related subjects being brought together, and are reprinted as bulletins of the United States Bureau of Labor Statistics under the following titles:

(The list here given contains only the memoranda of the Health of Mmunition Workers Committee. Each of the bulletins, however, includes also other official and nonofficial material dealing with related subjects. The contents of Bulletins 221 and 223 are given in full at the end of this bulletin.)

BULLETIN NO. 221, HOURS, FATIGUE, AND HEALTH IN BRITISH MUNITION FACTORIES.

Sunday Labor (Memorandum No. 1). November, 1915. 6 pp. [Cd. 8132.]

(Summarized in MONTHLY REVIEW of the U. S. Bureau of Labor Statistics, May, 1916, pp. 66, 67.)

Hours of Work (Memorandum No. 5). January, 1916. 9 pp. [Cd. 8186.]

(Summarized in MONTHLY REVIEW, June, 1916, pp. 77-79.)

Statistical Information Concerning Output in Relation to Hours of Work (Memorandum No. 12). (Report by H. M. Vernon, M. D.) August, 1916. 11 pp. [Cd. 8344.]

(Summarized in MONTHLY REVIEW, December, 1916, pp. 105-119.)

Industrial Fatigue and its Causes (Memorandum No. 7). January, 1916. 11 pp. [Cd. 8213.]

(Summarized in MONTHLY REVIEW, June, 1916, pp. 79-81.)

Sickness and Injury (Memorandum No. 10). January, 1916. 10 pp. [Cd. 8216.]

(Summarized in MONTHLY REVIEW, June, 1916, pp. 88-90.)

Special Industrial Diseases (Memorandum No. 8). February, 1916. 8 pp. [Cd. 8214.]

(Summarized in MONTHLY REVIEW, June, 1916, pp. 83-88.)

Ventilation and Lighting of Mmunition Factories and Workshops (Memorandum No. 9). January, 1916. 9 pp. [Cd. 8215.]

(Summarized in MONTHLY REVIEW, June, 1916, pp. 81-83.)

The Effect of Industrial Conditions Upon Eyesight (Memorandum No. 15). October, 1916. 8 pp. [Cd. 8409.]

(Summarized in MONTHLY REVIEW, April, 1917, pp. 538-540.)

BULLETIN NO. 222, WELFARE WORK IN BRITISH MUNITION FACTORIES.

Welfare Supervision (Memorandum No. 2). December, 1915. 7 pp. [Cd. 8151.]

(Summarized in MONTHLY REVIEW, May, 1916, pp. 68, 69.)

Industrial Canteens (Memorandum No. 3). November, 1915. 7 pp. [Cd. 8133.]

(Summarized in MONTHLY REVIEW, May, 1916, pp. 69, 70.)

Canteen Construction and Equipment (Memorandum No. 6). (Appendix to No. 3.) January, 1916. 7 pp. and plates. [Cd. 8199.]

(Summarized in MONTHLY REVIEW, June, 1916, p. 91.)

Investigation of Workers' Food and Suggestions as to Dietary (Memorandum No. 11). (Report by Leonard E. Hill, F. R. S.) August, 1916. 11 pp. [Cd. 8370.]

(Summarized in MONTHLY REVIEW, January, 1917, pp. 56, 57.)

Washing Facilities and Baths (Memorandum No. 14). August, 1916. 8 pp. [Cd. 8387.]

(Summarized in MONTHLY REVIEW, January, 1917, pp. 150, 151.)

BULLETIN NO. 223, EMPLOYMENT OF WOMEN AND JUVENILES IN GREAT BRITAIN DURING THE WAR.

Employment of Women (Memorandum No. 4). January, 1916. 10 pp. [Cd. 8185.]

(Summarized in MONTHLY REVIEW, June, 1916, pp. 74-76.)

Juvenile Employment (Memorandum No. 13). August, 1916. 8 pp. [Cd. 8362.]

(Summarized in MONTHLY REVIEW, December, 1916, pp. 92-97.)

In the present bulletin there is first presented a summary of the more important suggestions and recommendations of the committee. This is followed by a statement relating to the legal regulation of welfare work in Great Britain and reproducing the text of the provisions for securing the welfare of workers in factories and workshops, as set forth in Part II of the Police, Factories, etc. (Miscellaneous Provisions) Act, 1916. An article on the value of welfare supervision to the employer by B. Seebohm Rowntree, director of the welfare department of the British Ministry of Munitions, is also included. The five memoranda in regard to welfare work are then reproduced in full.

SUMMARY OF THE COMMITTEE'S CONCLUSIONS.

In its study of *Welfare supervision* among munition workers, Memorandum No. 2, the committee found that "almost more important than the immediate or technical environment in which work is carried on and the length of hours during which the workers are employed" are four chief influences which affect industrial efficiency, namely, questions of housing, transit, canteen provision, and individual welfare of the employees. The committee suggests that the influx of workers in certain districts has seriously overtaxed housing accommodations; that many workers, because of inability to obtain housing accommodation near the factory, are compelled to travel to

and from work, occasioning much loss of time; that the provision of facilities for obtaining a hot meal at the factory is often inadequate, especially for night workers; and, finally, that without special arrangement by which the management may deal with the numerous problems of labor efficiency and the personal welfare of the employees, there can not fail to be diminished output, discontent, and unsmooth working.

It is stated that welfare supervision has already been undertaken in a number of munition factories and testimony of managers is given commending the services rendered by welfare supervisors. In one factory, where men only are employed, an educated man devotes all his time to matters concerning welfare, in particular supervising safety appliances, organizing first-aid staffs and canteen accommodation, and in cases of injury and sickness visiting the workers at their homes. Instances of the successful work of women supervisors are mentioned, and employers stated to the committee that the presence of a capable woman of broad sympathies has in itself provided the best and quickest aid to the solution of many of the problems affecting women's labor by which they are assailed. The committee suggests that helpful oversight is especially needed in the case of women and girls if the highest and most enduring efficiency is to be attained, and recommends for this purpose the appointment of a competent woman of experience and sympathy, tactful and sensible in her dealings with others, who should concern herself with the various questions and issues raised in respect of the conduct of forewomen toward women workers, of the character and behavior of fellow women workers, of the maintenance of suitable and sufficient sanitary accommodation, of the worker's own state of health, of her capacity to withstand the physical strain and stress of work, and of her power to endure long hours, overtime, or nightwork. Welfare supervision in factories where not less than 500 men and 100 boys are employed is strongly urged.

The duties of welfare supervision as outlined by the committee include the following:

1. To be in close touch with the engagement of new labor or, when desired, to engage the labor.
2. To keep a register of available houses and lodgings, to inform the management when housing accommodation is inadequate, and to render assistance to workers seeking accommodation.
3. To ascertain the means of transit used and the length of time spent in traveling; to indicate the need of increased train, tram, or motor service; or to suggest modification of factory hours to suit existing means of transit.
4. To advise and assist workers in regard to feeding arrangements; to investigate the need for provision of canteen facilities or any inadequacy in the provision already made; and to supervise the management of such canteens.

5. To investigate records of sickness and broken time arising therefrom; and in cases of sickness to visit, where desired, the homes of workers.

6. To investigate and advise in cases of slow and inefficient work or incapacity arising from conditions of health, fatigue, or physical strain.

7. To consider, particularly for delicate and young workers, all questions of sanitation and hygiene affecting health and physical efficiency, and to supervise the conditions of nightwork, Sunday work, long hours, and overtime.

8. To advise on means of recreation and educational work.

9. To investigate complaints and assist in the maintenance of proper discipline and good order.

10. To keep in touch with responsible organizations having for their object the promotion of the welfare of the worker.

In its memorandum on *Industrial canteens* (Memorandum No. 3) the committee sets forth the proposition that productive output in regard to quality, amount, and speed is largely dependent upon the physical efficiency and health of the workers, which in turn are dependent upon nutrition, and that a dietary containing a sufficient proportion and quantity of nutritive material, suitably mixed, easily digestible, and obtainable at a reasonable cost is essential. The conviction is expressed that "in the highest interest of both employer and worker proper facilities for adequate feeding arrangements should be available in or near, and should form an integral part of, the equipment of all modern factories and workshops." Many employers, it is pointed out, have established industrial canteens, and this practice "has abundantly justified itself from a business and commercial point of view," and in the opinion of the committee "the time has come for a large extension of this method of solving the problem" of supplying suitable food at a low price for large numbers of persons at specified times. Speaking generally, the accommodation provided accords with one or other of the following types:

(1) An available room for the workers to eat their prepared food; (2) a room furnished with a "hot plate" or "warming cupboard" or provided with hot water; (3) a refreshment barrow to perambulate the workshops at appointed hours (particularly useful for light refreshments during long spells of night shifts); (4) a fixed refreshment bar or buffet; (5) a dining room supplying cheap hot and cold dinners; and (6) such dining room associated with an institute or club with facilities for rest and recreation.

In order to insure effective results from the establishment of industrial canteens, certain essential conditions are suggested and outlined, including accessibility and attractiveness, form, construction, and equipment, food and dietaries with suggested prices, prompt service, convenient hours, methods of payment for meals, and management.

The report indicates that substantial advantages, both to employers and workers, have followed the establishment of effective and well-managed canteens. Marked improvement in the health and physical condition of workers, a reduction of sickness, less absence and broken time, less tendency to alcoholism, and increased efficiency and output, a saving of time of the workmen, greater contentment, and better midday ventilation of the workshops are some of the benefits noted.

Memorandum No. 6, dealing with *Canteen construction and equipment*, is issued as an appendix to Memorandum No. 3, *Industrial canteens*. It contains detailed suggestions and specifications for the selection of a site and the erection of these buildings, including methods of ventilation, lighting, and heating, external and internal material to be used, cooking apparatus, and kitchen and catering equipment.

Supplementing Memoranda Nos. 3 and 6, Memorandum No. 11 gives the result of an *Investigation of workers' food and some suggestions as to dietary*, by Leonard E. Hill, one of the members of the committee. Believing that it was desirable in the interest of efficiency to make an examination of the value and character of the food consumed by munition workers and to suggest dietaries that may be expected adequately to restore expended energy, the author of this memorandum conducted an analysis of specimen meals provided for munition workers at the plants, as well as those provided in hotels, and also of meals brought by workers from their homes. An effort was made to determine the percentage of protein, fat, and carbohydrate in the samples and the number of calories¹ furnished by each of these essentials which are required to replace the energy expended and for the repair and growth of the body. Emphasis is laid upon the value of eating fresh fruit, such as apples, oranges, and bananas, and of avoiding the highly stimulating foods and of refraining from eating between meals or at frequent intervals.

Fortunately, the cheaper foods (bread, margarine, porridge, milk, herrings, cheese, beans, onions, cabbages, oranges, and the cheapest cuts of meat) provide all the requisite nourishment and probably better health than is derived from more highly flavored and expensive foods which only artificially stimulate the appetite.

It is stated that about 15 per cent of the energy expended is derived from protein and about 80 per cent from fats and carbohydrates combined; also, that the energy required by a man engaged in fairly light munition work is about 3,500 calories. Where calculations are based, as they are in this memorandum, on food as eaten, the minimum canteen diet may be taken to be about 3,000 calories per

¹ The calorie is the unit of energy value and is the amount of heat required to raise 1 kilogram (4 $\frac{1}{2}$ pints) of water through 1° centigrade (1.8° F.).

day, when balanced among the three classes of foodstuffs in the proportion of 100 grams each of protein and fat and 400 grams of carbohydrates. An average adult woman worker seems to require from 80 to 90 per cent of that required by men workers.

The investigation showed "that the average canteen dinner is a good one, containing, as it should, an energy value of about 1,000 calories well distributed among the amounts of protein, fat, and carbohydrates." The cost of the meals analyzed ranged from 5d. (10.1 cents) to 1s. 5d. (34.5 cents). The analysis of meals brought by workers from their homes showed a range in amount of calories from 683.4 in case of a man on the night shift to 1,719 in the case of a boy 15 years of age on the night shift. As respects meals served in women's restaurants, the memorandum gives an example of a "sensible meal supplied at a small cost" (12.2 cents), consisting of roast mutton, boiled potatoes, cabbage, and sirup roll, and furnishing 687 calories; and also "an example of the unsatisfying meals which pale-faced young women may often be seen consuming in popular cafés," consisting of roll, butter, milk, sugar, stewed prunes, and sirup, and furnishing only 397 calories, at a cost of 14.2 cents.

In order to afford assistance to caterers for munition workers a series of daily dietaries is included.

In Memorandum No. 14, on *Washing facilities and baths*, the committee emphasizes the fact that cleanliness is not only beneficial to the health and personal efficiency of workers engaged on processes in which poisonous materials are manipulated or where heat, dust, or dirt are present to an unusual degree but it also bears an important relation to good health and working efficiency of all workers, and urges the importance of providing opportunities for washing so that workers may be clean and tidy when they leave their places of employment. Evidence before the committee seems to have clearly established the desire of many operatives, especially those engaged in heavy engineering processes, for improved lavatory and washing accommodations. It was found that where washing facilities have been provided sufficient attention is seldom paid to the details of construction, with the result that lavatories quickly fall into disrepair. This can be avoided, it is believed, if the installation is made to conform to the following requirements: Simple in construction and arrangement; strong and durable; sufficient and suitable in accommodation, so that a large number can wash together or in a short time; economical in space; so constructed that it can be easily cleaned; provided with ample supply of cold and hot water; so situated in the factory as to be fairly available for all for whom it is provided.

Nailbrushes secured by chains, so that they can not be removed, should be provided; soap, preferably in liquid or powdered form,

should be placed in small boxes above the washing trough; and clean, dry towels, renewed or washed daily, should be supplied to each worker, though it is suggested that a roller towel may be provided for every three workers but should be renewed or washed daily, or provided for every nine workers if it is renewed or washed after each meal and at the close of the day's work.

In addition to ordinary washing accommodations the committee suggests the desirability of providing bathing facilities in many industries, especially those in which workers are exposed to great heat and excessive dust or are brought into contact with poisonous material. For men a shower or douche bath is recommended as being simple and inexpensive; for women a horizontal spray at the level of the shoulders is suggested. The number of these baths should be sufficient to enable workers to have a bath at any time without appreciable delay; privacy should be insured; construction should be so carried out as to facilitate the maintenance of absolute cleanliness; pure water at a temperature of about 100° F. should be used; soap in the form of a tablet sufficient for one bath should be provided; where necessary there should be provision for drying the clothes of workers.

The committee emphasizes the importance of care in the maintenance of these baths and lavatories, and suggests that this should be made the definite duty of an appointed officer acting under the welfare supervisor, "who should keep the lavatory clean, control the supply of nailbrushes and soap, and arrange that dry, clean towels are available."

LEGAL REGULATION OF WELFARE WORK IN GREAT BRITAIN.

In the early part of the present year the British Ministry of Munitions established a welfare department, charged with the general responsibility of securing a higher standard of conditions for all woman and girl workers in munition factories through welfare supervision, and Mr. B. Seeböhm Rowntree, a manufacturer well known for his social studies, "Poverty," "Land and Labor," and "Unemployment," was appointed director. More recently, by the Police, Factories, etc. (Miscellaneous Provisions) Act, 1916, bearing date of August 3, 1916, important powers were conferred upon the Home Secretary to secure the welfare of workers in factories and workshops by the issue of orders regulating such matters as arrangements for preparing or heating and taking meals, supply of drinking water and protective clothing, ambulance and first-aid provision, supply and use of seats in workrooms, facilities for washing, accommodation for clothing, and supervision of workers. A notable pro-

vision of the law is the requirement that no contribution shall be exacted from the workers, "except for the purpose of providing additional benefits which, in the opinion of the secretary of state, could not reasonably be required to be provided by the employer alone, and unless two-thirds at least of the workers affected * * * assent."

The abolition of the certifying surgeons' investigations of accidents is in accordance with the recommendations of the British departmental committee on accidents made in 1911. That part of the law relating to welfare work and to investigations of accidents follows:

PART II.—FACTORIES AND WORKSHOPS.

7. *Provisions for securing welfare of workers in factories and workshops.*—

(1) Where it appears to the secretary of state that the conditions and circumstances of employment or the nature of the processes carried on in any factory or workshop are such as to require special provision to be made at the factory or workshop for securing the welfare of the workers or any class of workers employed therein in relation to the matters to which this section applies, he may by order require the occupier to make such reasonable provision therefor as may be specified in the order, and if the occupier fails to comply with the requirements of the order or any of them, the factory or workshop shall be deemed not to be kept in conformity with the Factory and Workshop Act, 1901.

(2) The following shall be the matters to which this section applies:

Arrangements for preparing or heating and taking meals; the supply of drinking water; the supply of protective clothing; ambulance and first-aid arrangements; the supply and use of seats in workrooms; facilities for washing; accommodation for clothing; arrangements for supervision of workers.

(3) Orders may—

(a) Be made for a particular factory or workshop, or for factories or workshops of any class or group or description.

(b) Be made contingent in respect to particular requirements upon application being made by a specified number or proportion of the workers concerned and may prescribe the manner in which the views of the workers are to be ascertained.

(c) Provide for the workers concerned being associated in the management of the arrangements, accommodation, or other facilities for which provision is made, in any case where a portion of the cost is contributed by the workers; but no contribution shall be required from the workers in any factory or workshop, except for the purpose of providing additional or special benefits which, in the opinion of the secretary of state, could not reasonably be required to be provided by the employer alone, and unless two-thirds, at least, of the workers affected in that factory or workshop, on their views being ascertained in the prescribed manner, assent.

(4) If, in the case of any order proposed to be made for a particular factory or workshop, the occupier, or, in the case of an order for factories or workshops of a particular class or group or description, the majority of the occupiers of factories or workshops of that class or group or description, dispute the reasonableness of the requirements in the proposed order or any of them, the objection shall be referred for settlement to a referee selected in accordance with rules made under this section, but the secretary of state may so refer any objection though not made by a majority of the occupiers if he thinks desirable.

(5) Save as otherwise expressly provided in the order, the occupier of a factory or workshop shall not make any deduction from the sum contracted to be paid by him to any workman or receive any payment from any workman in respect of any provision made in pursuance of an order under this section, and, if he makes any such deduction or receives any such payment, he shall be guilty of an offense against the Truck Act, 1831, and shall be liable to the penalties imposed by section 9 of that act as if the offense were an offense mentioned in that section.

(6) The secretary of state may make rules as to the time within which, and the manner in which, notice of objection to any order may be made, and as to the selection of and the procedure before, a referee and the cost of the proceedings before a referee (including the remuneration of the referee).

(7) Any order made under this section may be revoked at any time in whole or in part by the secretary of state, without prejudice to the making of a further order.

(8) This section shall not apply to domestic factories or workshops.

(9) The secretary of state may by a special order made in accordance with the provisions of section 126 of the Factory and Workshop Act, 1901, extend the matters to which this section applies to matters other than those mentioned in this section.

8. *Abolition of investigations of accidents by certifying surgeons.*—(1) After the expiration of one month from the passing of this act it shall cease to be the duty of certifying surgeons to investigate the nature and cause of death or injury caused by accidents in factories and workshops or in premises to which the provisions of the Factory and Workshop Acts, 1901 to 1911, relating to accidents, are applied, or to send to the inspector of the district reports thereof:

Provided, That nothing in this section shall affect subsection (3) of section 73 of the Factory and Workshop Act, 1901, relating to the investigation by certifying surgeons of diseases occurring in factories and workshops:

Provided also, That it shall continue to be the duty of the certifying surgeon to investigate and report upon cases of injury caused by exposure to gas, fumes, or other noxious substances or due to any other special cause specified in instructions of the secretary of state as requiring investigation, and the secretary of state shall issue instructions defining the causes of injury to which this provision is to apply and requiring the inspector of the district to refer to the certifying surgeon all such cases reported to him. It shall also be the duty of the certifying surgeon to investigate and report upon any case of injury which the inspector of the district in pursuance of any general or special instructions of the secretary of state may refer to him for that purpose. The certifying surgeon shall have, for the purpose of the investigation in any such case, the same powers and shall be entitled to receive the same fee as he would if the case had been a case to which section 73 applies.

(2) As from the same date the enactments mentioned in the schedule to this act shall be repealed to the extent mentioned in the schedule to this act.

9. *Construction of Part II.*—This part of this act shall be construed as one with the Factory and Workshop Acts, 1901 to 1911. * * *

13. *Short title.*—This act may be cited as the Police, Factories, etc. (Miscellaneous Provisions) Act, 1916. [Aug. 3, 1916.]

VALUE OF WELFARE SUPERVISION TO THE EMPLOYER.¹

BY B. SEEBOHM ROWNTREE, DIRECTOR OF WELFARE DEPARTMENT, BRITISH MINISTRY OF MUNITIONS.

The editor asked me to write a few notes, based on personal experience during 20 years, on the value to the employer of what has come to be known as "Welfare supervision."

Some employers tell you they do not know what this phrase means. This is only because it is a new name for something which has been carried on to a greater or lesser extent ever since there were factories. Welfare supervision is simply the creation in a factory of those conditions which enable each individual worker to be and do his or her best.

So long as factories were very small there was no need of any special organization to secure this end; the master knew each of his men personally, and if he was wise he saw that each was put to the work best fitted for him and worked under conditions which enabled him to do his utmost both for his employer and himself. But as factories grew larger and larger this personal relation was crowded out. The employer no longer knew his workers even by name. They came to be impersonal "factory hands" to him, who were treated in the mass, without individual consideration. Even when he honestly desired to do well by them it was increasingly difficult for any worker who had some personal grievance to get it remedied, and too little care was taken to suit the work to the worker and surround him with conditions tending to the utmost efficiency.

Gradually it became clear that this state of things was unsatisfactory from every point of view and many employers appointed special officers simply to reestablish the personal relation between themselves and the workers, which still exists in many small factories. The special officers undertaking this work bear different names in different factories; but perhaps the most usual title is that of "welfare supervisor," which was adopted by the Health of Munition Workers' Committee when writing on the subject in relation to munition factories. Both men and women welfare supervisors have been appointed, though the latter greatly outnumber the former, and it is of welfare supervision among women that the editor has more especially asked me to write.

It is a subject which has been brought into some prominence through the recent action of the Minister of Munitions in determining that welfare supervisors shall be appointed in every national munition factory where women or young persons are employed.

¹ Reprinted from an article entitled "Making a success of the woman worker," in *System* (London Edition) for June, 1916, through the courtesy of the publishers, A. W. Shaw Co., Chicago, Ill.

Some employers may think that welfare supervision is merely a fad. This, however, is quite a mistaken view. It is not only good from the worker's standpoint, but it is thoroughly sound business from the standpoint of the employer. As a matter of fact, it is stupid to treat workers in the mass, and only through lack of insight do we fail to realize its stupidity.

For it must be remembered that a manufacturer's equipment is of two kinds—human and mechanical. What should we think of an employer who treated his machinery in the mass? As a matter of fact he watches his mechanical equipment with extraordinary care. It is continually tested to find if there is any overstrain. A man goes round with an oil can all day long to see that there is no unnecessary friction anywhere. Periodical inspections of the plant are made. And finally you have the engineer doing nothing else but seeing after the welfare of the machines. It is recognized, in a word, that each machine must be dealt with separately.

Now, human beings are infinitely more complex and more delicate than machines. Notwithstanding this "hands" are taken on with but scant consideration of the particular work for which they are best suited, and little effort is made to interest them in what they are going to do or to create in them a desire to succeed. A sensitive girl may be engaged by a rough-tempered foreman and put to work without a word of encouragement in a great room full of strangers under the supervision of a nagging overlooker. Although she may never have been in a factory before she is expected from the first day to work a 12-hour shift, sometimes in a very bad atmosphere, and often but scanty provision is made to enable her to get a good meal in the middle of the day amid comfortable and restful surroundings. Need we wonder at it if her work is inefficient? A girl will never do the best for her employer or for herself under such conditions.

If only employers would treat their employees with as much consideration as they do their machines they would have less difficulty in getting satisfactory output.

The editor has put to me some specific questions as to everyday difficulties. I will seek to answer them seriatim, along the lines I have indicated.

First of all, how long can women work efficiently?

It is impossible to lay down any hard and fast rules as to the number of hours girls can work with advantage. It depends upon the severity of the labor, the conditions under which the workers live at home, the transit facilities, the atmospheric conditions in the factory, and the wages paid. But, broadly speaking, I think that the demand of the workers for a 48-hour week is based upon reason. The advantage of going below it is doubtful, and I am pretty sure

that, as a rule, there is little, if any, use in going much above it, except for short periods. Generally speaking, then, I should say the employer is wise who works his women and girls for 8½ hours per day from Monday to Friday, and for 5 hours on Saturday. I question whether it ever pays to keep on working girls for more than 54 hours a week. As for the 60-hour week, it is most unsatisfactory.

A short break of, say, 10 minutes in the middle of the morning is a distinct advantage. There is much evidence to show how great a relief it is to the workers, many of whom come away from home with no breakfast, or an inadequate one, and are thus enabled to get a little lunch. In some munition factories milk is being sold to the workers during this break, which is an excellent plan. In many they are allowed to go to the canteen for tea or other refreshments.

I am asked whether it is desirable for women to work at night. Certainly not; but if for any reason—as, for instance, the exigencies of war time—it is absolutely necessary, then it is far better to work women on 3 shifts of 8 hours than to work two shifts of 12 hours.

Next comes the question of canteens. Are they worth while? The Americans recognize much more fully than we do the advantages of good canteen arrangements in the works. We have all heard that “a man can be neither a statesman, a philosopher, a poet, nor a lover unless he has had something to eat during the last 48 hours.” This is doubtless true, but it is just as true that unless girls in a factory can get a comfortable midday meal they can not be expected to do a good afternoon’s work. I have heard many employers speak of comfortable mess rooms as luxuries and fads, and of a good canteen as involving a capital expenditure which brings in no return.

Nothing is further from the truth. Employers know perfectly well that if they themselves lunch hurriedly on badly cooked and unnutritious food their work suffers, and what is true of them is true of their workers. If we want them to do a good afternoon’s work we should give them a restful dinner hour and see that nutritious food is available. There is some truth in a remark I once heard that “left to herself a woman always tends to live upon cake,” and this is a danger which should be guarded against in the canteens.

Another of the general conditions which a wise employer will carry out in his factory is to see that the ventilation of his workrooms is good, that they are adequately warmed, that the air is fresh, and that they are well lighted. We are quite alive to the importance of these things in our own offices. When the air is stuffy we find that our brains are sluggish, and we open the window. If we are too cold or too hot, and if the sun is shining in our eyes, or the artificial lights are too strong or too weak, we remedy the defect, because it interferes with our work.

Yet we wander through our workrooms, seeing such defects multiplied indefinitely, and wholly fail to realize that the workers are just as sensitive as we are, and that it is extremely bad business to handicap them by irritating conditions. Indeed, we grumble at the Home Office inspectors and call them faddists because they insist upon a certain minimum in the way of ventilation and lighting.

Turning from general conditions, which a wise welfare supervisor will constantly be watching, I should like to say a few words with regard to the more personal side of her work. Employers hardly recognize the importance of a girl's first introduction to our factories. It may make all the difference if, instead of being hurriedly engaged by a foreman, her first interview is with the welfare supervisor. The latter, after ascertaining her qualifications and deciding to employ her, can have a talk with her about her future and try to interest her in it, making her feel both that the firm intends to do "the square thing" by her, and that she must do "the square thing" by the firm. After this, for a time at least, the welfare supervisor should keep closely in touch with the newcomer, visiting her at the end of a day or two to see how she is getting on, and inquiring whether she has any difficulty that can be removed, and after this paying her periodical visits so long as may be necessary.

Great care must, of course, be taken in the selection of the supervisor. She should have a real love for girls, and be methodical and of businesslike habits, and she should in the best sense of the word be a lady. The term is no doubt ambiguous, but it does connote certain qualities of tact, gentleness, and honor, and a dignity seldom asserted and seldom challenged.

For it will be her business to keep in touch with all the girls under her charge. They should feel that she is their friend. One of the great difficulties in even the best organized establishments is to secure perfect justice in the treatment of every worker. Although the general rules may be perfectly fair and reasonable, there must always be a few exceptional cases in which a worker may have a real grievance. Yet it may be impossible for her to put the point to her overlooker. On the other hand, she will not be afraid to explain her particular grievance to a sympathetic welfare supervisor. By this means the management may frequently gain information as to these petty tyrannies and the like which occasionally lower the efficiency of a workroom in apparently mysterious fashion.

There is a rule, I believe, at a certain factory in America that no worker may start in the morning if she has any grievance or cause of irritation against the management. The employee who suffers under a sense of injury will never be able to do herself justice, argue the management. Consequently any such grievances are cleared up first thing in the morning, before the operative starts work.

There are a number of causes which may adversely affect the efficiency of women workers which a welfare supervisor can remove. For instance, a girl may be worried by ill health at home. This worry will prevent her from attaining her normal output. But a chat with the welfare supervisor will often lead to some means being found for relieving the strain upon the girl's mind. This may take the form of a suggestion from the supervisor that the firm might make a small advance to meet the abnormal expenses of the household if the case proves to be genuine. On the other hand, the mere fact that someone at the works has sympathized with the girl about her home trouble will make her feel herself to be a member of the factory family.

It would be difficult to enumerate all the direct and indirect influences which such a worker exercises over a factory. But one thing is certain. Her work not only increases the efficiency of the girls under her charge, but it tends to attract a better type of worker. Many employers can show how they have been able to obtain girls with better education and from better homes through the work of welfare supervisors at the factory. Now rough, unskilled labor is seldom cheap in the long run. And everything that tends to increase the personal responsibility and the efficiency of employees will help to give him a higher rate of output.

A good illustration of the advantage of treating employees individually instead of in the mass is in the means adopted to reduce the amount of broken time—and this is work in which a welfare supervisor may be of great assistance.

The following effective way of keeping a grip on the time broken by individuals has been adopted in a large factory, with excellent results. An attendance chart was arranged on which is entered each day every absentee. In the first column the worker's number is written, in the second her name, and against each name a square is allowed for each day of the week. If a girl is away in the morning without any reason being given, the fact is recorded by a heavy full stop in the extreme top left-hand corner of the square allocated to that day. If she is away in the afternoon a similar dot is placed in the bottom right-hand corner. Should the reason for her absence prove to be unavoidable—e. g., ill health—the dot is transformed into a cross, which represents an unavoidable absence, as distinct from unjustifiable time breaking.

Now, by looking at a chart of this sort, which extends on each page for three months, it is possible to see at a glance—

- (a) Which girls are keeping bad time.
- (b) What departments are keeping bad time.
- (c) Whether time is frequently broken on any particular day, e. g., Saturday or Monday.

In the case of girls this chart should either be prepared in the welfare supervisor's office—the necessary facts being supplied daily by the time office—or if prepared elsewhere should be sent to the welfare supervisor at least once a week. It then becomes her business to take up the matter with any employee who is keeping bad time, and to find out what the real cause is and seek to remedy it.

The cause for keeping bad time usually falls under one of the following headings:

(a) A specific illness, such as scarlet fever, which may keep a girl away for several weeks.

(b) Occasional illness, which may show that the girl's general state of health is poor.

(c) Slackness, which may be caused by either dislike of or distaste for the work.

(d) Possibly demands of parents that the girl shall do housework at certain times.

It is obvious that these causes can not be remedied in any wholesale way, nor can bad time keeping be effectively dealt with by severe disciplinary regulations. It is worth the employer's while to treat each case individually, and this can best be done by the welfare supervisor. This is much more effective than to send a clerk or a busy foreman concerned with a multitude of other matters to interview a girl who has broken time. If a tactful woman asks the girl quietly just why it is that she is breaking time she will often get an illuminating answer. If the girl is anemic or otherwise unwell she can encourage her to adopt health rules that will make her stronger. If she is merely wearied by the monotony of the work she can try and interest her in it. In any case she can get a personal approach to the girl, who knows that although the welfare supervisor is an employee of the firm she is not in the usual sense "in league" with the management. By constant care a good welfare supervisor is able materially to reduce the amount of broken time.

In addition to the chart described above, which deals with individual workers, it is worth while to prepare weekly statistics in which the average amount of broken time is shown for each department. In these statistics two sets of figures should be given. The first, a column showing the amount of time broken from all causes, whether satisfactory or otherwise, and whether with permission or otherwise; the second, a column from which are eliminated all absences which have extended over a whole week. These will almost certainly be due either to illness or to absence with leave, and may safely be deducted from the time unsatisfactorily accounted for.

I do not think it is worth while to attempt to distinguish statistically between satisfactory and unsatisfactory causes of broken time

where this only extends to a day or two, as illness is so frequently given as the cause of absence when really it is only the excuse.

These weekly statistics are valuable means of comparing the time keeping in each department. Where this is bad this will probably be found to be due to one or more of these causes:

- (a) A slack foreman;
- (b) Bad working conditions;
- (c) Too much overtime;

any of which are capable of being remedied.

A point that arises in appointing a welfare supervisor is, of course, the cost of such an officer. But this expenditure should be considered not merely as an additional outlay but as a legitimate expense for improving the efficiency of the staff. A small firm can generally secure a suitably trained person for £2 (\$9.73) per week. Larger firms should pay from £3 to £5 (\$14.60 to \$24.33) per week, if they desire a worker conversant with all the subtle difficulties that arise in handling large numbers of women.

If there are 500 girls working in a factory and the management pays £150 (\$729.98) a year for such a supervisor, she is costing the firm less than 1½d. (3 cents) per worker per week. If the average rate of wages is 12s. (\$2.92) per week, the supervisor is costing the firm 1 per cent of the annual wages bill. If they are paying their girls an average of £1 (\$4.87) per week she will only cost 0.6 per cent of the wages bill.

If, as a result of a more contented personnel, one does not get far more than 1½d. (3 cents) of extra output per week from each girl, then something is very much amiss. It is certain that such a worker is an economy in every sense of the word. She saves the manager from worrying over the thousand and one points that can be dealt with by women far better than by the best business man. Consequently she frees the executives for more important work.

It is clear that the whole success of welfare supervision will depend upon two things—firstly, the employer's recognition of its importance, and, secondly, the personality of the welfare supervisor.

After more than 20 years' experience of welfare supervision in my own factory, I am thoroughly convinced of the wisdom of appointing welfare supervisors where large numbers of girls are employed. They not only promote the well-being, the health, and efficiency of the girls, but they save the management an enormous amount of trouble. And it must be remembered that an increase of efficiency is important not only to employers but also to the workers; for there can not be progressive improvement in wages unless there is progressive improvement in methods of production.

WELFARE SUPERVISION.¹

[Memorandum No. 2.]

1. Varied and complex influences are to-day adversely affecting the efficiency of munition workers, and amongst them certain conditions, outside the ordinary undertakings of factory management, appear to be almost more important than the immediate or technical environment in which work is carried on and the length of hours during which the workers are employed. Four of the chief influences thus affecting industrial efficiency concern questions of (*a*) housing, (*b*) transit, (*c*) canteen provision, and (*d*) the individual welfare of the employee.

(*a*) The sudden influx of workers in certain districts has so overtaxed the housing accommodation that houses intended for one family are now occupied by several, and the same bed may be used by day and night. Before satisfactory schemes can be formulated for improving housing accommodation the extent to which present accommodation is inadequate must be ascertained and the whole problem carefully considered by suitable officers.

(*b*) In some districts no local accommodation whatever can be obtained and workers are, therefore, compelled to travel every morning and evening to and from the factory in overcrowded trams and trains of which the times of departure and arrival may involve waiting, delay, and serious loss of time to both employer and workman. Cases have come to the knowledge of the committee where workers have to leave home daily before 5 a. m. and do not return before 10 p. m., thus leaving barely six hours for sleep. Improved facilities for transit may contribute materially to the solution of the housing problem; but until the principal factories in a district can render accurate data of numbers, of distances, and of the practicability of cooperative arrangements the transit companies can not have reliable estimates of the problem before them or properly instructed agents with whom to cooperate.

(*c*) Again, the provision of facilities for obtaining a hot meal at the factory are often inadequate, especially for night workers. Frequently the arrangements made for heating carried food are also wholly insufficient. Again, workers who are poorly lodged may be unable to obtain appetizing and nourishing food to take with them; others living long distances from the factory may have little or no time to spare for meals and thus have to rely on what they carry with them to sustain them during the day. Yet the munition worker, like the soldier, requires good rations to enable him to do good work;

¹ See also "Welfare work in Great Britain." Summary of book on Welfare Work: Employers' Experiments for Improving Welfare Work in Factories, by E. Dorothea Proud (London. G. Bell & Sons (Ltd.), 1916). XVII, 363 pp. In MONTHLY REVIEW, December, 1916, pp. 81-88.

moreover, many of these workers are only boys and girls. Advice and assistance is therefore required in large factories in regard to the betterment of feeding arrangements; where canteen accommodation is provided its management calls for effective supervision.

(d) Lastly, the rapid growth of commercial undertakings, and in particular of munition works, makes it difficult or impracticable for the management to deal, unless by special arrangement, with the numerous problems of labor efficiency and the personal welfare of the employee. Yet, without some such special arrangement, there can not fail to be diminished output, discontent, and unsmooth working. In matters of discipline, output, and long or exceptional exertion, the state of mind of those who are actually at work is all important.

“One inevitable result of the growth of large industrial concerns,” writes a large employer of labor, “has been the loss of the possibility of any real personal relationship between the employer (whether a single individual or a board of directors representing shareholders) and the great mass of the employees. Where the employees number several thousands it is manifestly a physical impossibility for the employers or directors to be in personal touch with them all. Those employers, therefore, who recognize that their responsibility toward their employees involves duties beyond those realized through the medium of the wage office, have to seek to fulfil these obligations by other means. This has led to the establishment in not a few large factories of an organized system of what is called social or welfare work, carried on by specially trained men and women, whose main duty is to humanize industrial conditions of life and to foster and keep alive those right relationships which are the basis of a well-ordered and harmonious community. The best welfare work that can be done is for the employer to see that the conditions of labor are satisfactory as regards wages, health conditions in workrooms, and the considerate treatment of employees by their immediate superiors. These are essentials upon which, as a basis, any system of welfare work must be founded. If the welfare workers have the confidence of the employees, and are always in touch with them, they will naturally be the medium whereby matters occasioning dissatisfaction or misunderstanding can be investigated and put right. By suggesting and advising upon improvements in conditions of work that may be helpful on the business side, by initiating and supervising recreative and other clubs, societies and classes, by visiting the sick, by endeavoring to foster the spirit of good fellowship amongst all grades of employees, and by being ready to give advice and assistance in matters affecting individual employees personally and privately—by these and other methods welfare workers may find means of giving practical effect to the desire of employers to realize their obligations toward their workers.”

On these four grounds, welfare supervision is now receiving the attention of the more enlightened employers.

The success or failure of such work depends upon the spirit in which it is approached and not simply upon the means and organization devised for the purpose. “Successful welfare work in a factory,” writes another large employer, “does not depend upon expensive equipment or vast organization, but the smallest factory and

humblest organization if worked in the right spirit will show good results in the character and well-being of the workers." It must not be regarded as something outside the ordinary factory management or extraneous to it, but as a vital and integral part of the whole discipline and right organization of the business to be shared in by all, directors, foremen, and employees, as well as by the duly authorized welfare supervisor. The same employer adds, "the economic results have justified the trouble and expense."

2. Further, in the course of visits to factories the committee have frequently found various difficulties in existence unknown to or unappreciated by the management. In the past these difficulties have not been so great as they are to-day and hence no one has been given the duty of inquiring into their existence and of devising means to rectify them. Yet without such inquiries, carefully pursued, these adverse conditions can not be brought to light; and without some person specially appointed or designated for the purpose by the management there is no one whose duty it is to discover and apply remedies. It is obvious that neither the employer nor the workman is sufficiently disengaged to undertake such obligations.

3. Welfare workers already exist at a number of factories, 30 of which sent representatives to a conference held at York in 1913, and the number has largely increased since. The duties fulfilled by these workers, who have generally been intrusted with the supervision of females and young persons, have varied in accordance with local requirements and the size and character of the factory. They have included: (*a*) Engaging workers; (*b*) controlling the dining room and kitchen; (*c*) investigating complaints; (*d*) supervising cloak-rooms and lavatory accommodation; (*e*) suggesting improvements in terms and conditions of employment; (*f*) assisting and advising in matters affecting the workers personally and privately; (*g*) visiting the sick; (*h*) organizing gardening, clubs, gymnasiums, and holiday excursions; and (*i*) supervision of first aid. Evidence gathered from places where individuals have been appointed to supervise personally the welfare of the factory worker on the lines here indicated has fully established the value of this kind of supervision. The committee are satisfied that the well-being of the workers is being affected and their output reduced by the absence of that supervision.

4. Welfare supervision is already undertaken in a number of munition factories. The proprietors of one of the largest, after describing the work of a department which has organized housing, transit, and catering for some thousands of workers, write:

As we feel it highly desirable that the workpeople should keep their minds occupied with healthy recreation while they are away from the works, which reflects directly upon their efficiency in the works, we have appointed a chaplain, who, before taking orders, served several years in a large engineering firm and has knowledge of workpeople. This chaplain's duties *inter alia* will be to

settle disputes among the families living in the hostels, to generally look after the children, to organize concerts and healthy recreation, and to generally assist in the welfare of the people. We have, therefore, decided to erect a large theater as a cinema and concert hall, and suitable entertainments will be organized. * * * A qualified doctor and surgeon is being appointed, and we have also taken over a small operating theater and infirmary where cases of illness can be removed from the hostels.

At another factory, where men only are employed, an educated man devotes all his time to matters concerning welfare; in particular, he supervises safety appliances, organizes first-aid stations and canteen accommodation, and in cases of injury or sickness visits the workers at their homes. Yet another munition firm, who carefully attend to the surroundings and physical comforts of their men in such matters as heating and lighting, washing facilities, lockers for personal belongings, and many similar details, have made a shop committee their intermediary for various questions affecting the detailed management of the workshops and the institutions for the benefit or pleasure of the men, such as dining arrangements and the works rifle club.

Many appointments of women supervisors have been made and their success has been unqualified. Employers have stated to the committee that the presence of a capable woman, of broad sympathies, has in itself provided the best and quickest aid to the solution of many of the problems affecting women's labor by which they are assailed. One munition employer writes, after having appointed a lady superintendent:

Generally speaking, we consider it very essential to have a lady superintendent where female workers are employed, and especially where there are men working in the same department. Further, on medical grounds, we think the care and advice of a matron is indispensable. The duties of the lady superintendent here are principally: 1. To maintain discipline in the works, which is exceedingly necessary where mixed classes of labor are engaged. 2. To supervise the catering for and preparation of meals. 3. To give any advice of which she is capable when appealed to by the female workers. A good lady superintendent in work such as we are engaged on is, we consider, advantageous to secure good order and protect the moral welfare of the girls under her charge.

A second, speaking of a similar officer, writes:

Having had previous experience with female labor on a large scale, I felt when I entered on this work that it would be necessary to appoint a matron to look after the girls' general welfare, especially in these strenuous times when the heads and foremen of departments are so fully occupied in endeavoring to obtain the best possible production with the smallest amount of skilled labor, that they are not able to devote very much time to details which, in any case, are better managed by a lady supervisor. In addition to this, there are many matters which arise that can only be dealt with by a lady. The duties of the matron are as follows: 1. To report any condition or irregularity in the factory, which in her opinion is detrimental to the health or welfare of the girls. 2. To take entire charge of the mess room and the lavatories,

and see that the girls wear the uniform and caps provided, and that these are kept neat and in order.

She has no connection with output in any way, as we consider this would defeat the object of her appointment. She is directly responsible to the manager, and is therefore under no restrictions whatever from any official in the works.

Although we had nothing serious to complain of before engaging the matron, we feel that her engagement has been of great assistance to us.

Other testimonies to the services rendered by welfare supervisors could be quoted.

5. The duties of welfare supervision should include the following:

(1) To be in close touch with the engagement of new labor, or, when desired, to engage the labor.

(2) To keep a register of available houses and lodgings; to inform the management when housing accommodation is inadequate; and to render assistance to workers seeking accommodation.

(3) To ascertain the means of transit used, and the length of time spent in traveling; to indicate the need of increased train, tram, or motor service; or to suggest modification of factory hours to suit existing means of transit.

(4) To advise and assist workers in regard to feeding arrangements; to investigate the need for provision of canteen facilities, or any inadequacy in the provision already made; and to supervise the management of such canteens.

(5) To investigate records of sickness and broken time arising therefrom; and in cases of sickness to visit, where desired, the homes of workers.

(6) To investigate and advise in cases of slow and inefficient work or incapacity arising from conditions of health, fatigue, or physical strain.

(7) To consider, particularly for delicate and young workers, all questions of sanitation and hygiene affecting health and physical efficiency, and to supervise the conditions of night work, Sunday work, long hours, and overtime.

(8) To advise on means of recreation and educational work.

(9) To investigate complaints and assist in the maintenance of proper discipline and good order.

(10) To keep in touch with responsible organizations having for their object the promotion of the welfare of the worker.

6. The duties here outlined are chiefly concerned with matters of health and individual welfare which are of immediate urgency today. They are distinct from those usually intrusted to a trained nurse or medical staff engaged to render first-aid or subsequent treatment in cases of accident and sickness, though in exceptional cases some of them might be properly undertaken by the nursing staff, increased and, if necessary, reorganized for this purpose. The ad-

vantage of bringing the work of the nurse into touch with that of welfare supervision is manifest. On the other hand, these duties can hardly be differentiated from a variety of important matters outside the reference to this committee, such as questions of wages, in conditions of contract and discharge, compensation, and notices, rules, and proceedings under the Munitions of War Act.

While, therefore, the duties we have specifically enumerated in paragraph 5 thus fall into a somewhat separate category, the committee recognize that, owing to the disadvantages of having numerous or redundant officers for purposes of oversight, it may prove in many munition works most satisfactory and effective to combine a variety of duties under one supervising staff, professional or particular assistants being appointed as may become necessary.

WELFARE SUPERVISION FOR WOMEN.

7. The committee desire to record their unanimous conviction that a suitable system of welfare supervision (to be administered by an officer specially appointed for the purpose) is essential in munition works where women or girls are employed and, they must add, urgently necessary.¹ In every case the officer should be a competent woman possessing the qualifications set out in paragraph 9. The committee consider that it is important that some scheme of welfare supervision should be adopted, however small the number employed, and they suggest that, when it is impracticable to appoint a whole-time woman supervisor, the duties of welfare supervision should be allotted to a woman on the factory staff specially designated for the purpose. If the employment of women be properly safeguarded and wisely supervised, all may be well; but if not, the ultimate results may be far from desirable or beneficial.

8. In addition to the matters to which reference is made in paragraph 5, and which concern women workers equally with their male comrades, there are certain other matters—particularly of discipline and conduct—in which helpful oversight is specially needed in the case of women and girls, if the highest and most enduring efficiency is to be attained. As examples of such matters, the committee would mention the various questions and issues raised in respect of the conduct of foremen toward women workers; of the character and behavior of fellow women workers; of the maintenance of suitable and sufficient sanitary accommodation; of the worker's own state of health; of her capacity to withstand the

¹ In this connection the committee may draw attention to the fact that it has been the custom of the Home Office, when granting orders for the sanction of night work for women and girls, to insert a condition that a matron or responsible forewoman shall be appointed to supervise the welfare of those so employed at the factory.

physical strain and stress of work; of her power to endure long hours, overtime, or night work. For these and kindred matters the committee are satisfied that the appointment of welfare supervisors is necessary and conducive to the preservation of good health and good behavior in the present novel and difficult environment of industrial employment.

9. The officer appointed should be a woman of good standing and education, of experience and sympathy, tactful and sensible in her dealings with others, and having, if not an actual experience, at least a good understanding of industrial conditions.¹ She should live near the factory, and keep in close touch with all the women and girls employed. In "national" factories she should be appointed and paid by the Ministry of Munitions; in "controlled" establishments she should be appointed and paid by the employer, but her appointment should be reported to the Ministry of Munitions. Her duties would be determined by the authority appointing her.

10. In a few areas there has been a certain amount of discontent and unsettlement owing to the fact that women workers feel that they have been summoned before the Munitions Tribunal on grounds due generally or particularly to conditions of health or physical strain. The welfare supervisor in the course of her duties must have cognizance of facts bearing on these cases; and the committee are satisfied that substantial advantage would be gained if no woman's case were brought by an employer except after consultation with the welfare supervisor; for they believe that the result of such consultation would be that cases for the tribunal would be very substantially reduced in number, and in this way many possible sources of friction and misunderstanding would be avoided. It may be desirable to safeguard the authority of the welfare supervisor in cases of this sort by requiring that her official reports on each case should be in writing, and should be furnished both to the employer and to the Ministry of Munitions.

11. The committee suggests that as cases involving matters of health may be brought before the tribunal, a woman worker should be afforded adequate facilities for the proper and full representation of her case by a responsible woman.

¹ A course of social study, which comprises university lectures and practical work, designed for students preparing themselves as members of various local government bodies, as welfare workers in factories, and for others engaged in social administration, has been established at London University (London School of Economics) and at Birmingham University. Similar courses are also given at the universities of Manchester, Leeds, Bristol, Edinburgh, and Glasgow. Experience as foremen, as teachers, and in other positions of responsibility has proved of value in providing welfare workers in several factories.

WELFARE SUPERVISION FOR MEN.

12. The committee consider that a suitable system of welfare supervision (to be administered either by the ordinary factory staff or by an officer specially appointed for the purpose) would be of advantage in munition works where 500 adult males or 100 boys are employed. Welfare supervision is of particular importance in the case of boys, since their employment presents many features of difficulty, to which special attention must be paid, if health and efficiency are to be safeguarded and discipline maintained. Where a number greatly in excess of 500 men or 100 boys are employed, additional welfare supervising staff may become necessary.

13. If a special officer be appointed, he should be a man of good character, of experience and sympathy, tactful and sensible in his dealings with others, and accustomed to the conditions obtaining in the particular industry. He must live near the factory in order to carry out his duties effectively, and he must keep in close touch with the operatives in all that concerns their industrial life. In "national" factories he should be appointed and paid by the Ministry of Munitions; in "controlled" establishments he should be appointed and paid by the employer, but his appointment should be reported to the Ministry of Munitions. His duties would be determined by the authority appointing him.

Signed on behalf of the committee,

GEORGE NEWMAN, M. D.,
Chairman.

E. H. PELHAM, *Secretary.*

DECEMBER, 1915.

INDUSTRIAL CANTEENS.

[Memorandum No. 3.]

INTRODUCTION.

1. There is now an overwhelming body of experience which proves that productive output in regard to quality, amount, and speed is largely dependent upon the physical efficiency and health of the worker. In its turn such physical fitness is dependent upon nutrition. The purpose of nutrition is to secure the proper development and growth, the repair and vital energy, of the human body. Food energy is spent upon keeping up the body heat and in doing work. Nutrition is stimulated by the cooling effect of fresh air and by bodily exercise, and its needs must be met by a food supply suitable in character and sufficient in amount to meet the expenditure on body heat and work.

2. The human body calls for a constant supply of food, first for its growth, for the building up of its tissues and for repair, and secondly as fuel for the production of heat and energy. Both requirements are indispensable, and from the necessity for these there is no escape. Though no hard and fast line of division can be drawn, it may be said that certain kinds of food which are relatively rich in protein and mineral matter (meat, cheese, milk, herrings, dried peas, beans, bread, oatmeal, flour) contribute both to the formation of the body and its repair and supply it with fuel for the production of heat and energy; other kinds such as fat (lard, butter, dripping, margarine), sugar, sago and tapioca, afford an abundant supply of fuel but can not maintain growth and repair. Still other kinds of foods (fresh fruits, green vegetables) contain a small proportion of nutriment but insure the provision of the body with certain important principles conducive to good health.¹ The constituent parts of a dietary are important if the highest value is to be obtained, but, speaking generally, fresh, digestible and appetizing food is more important than chemical composition or proportion. It will be understood that digestibility is dependent partly upon the food itself being of a nature which is easily digestible and partly upon the organs of digestion being healthy and in good working order. Further, it should be noted that a variety of factors affect the relative value of food to the individual consuming it. For instance, there is the nature of the employment, whether sedentary or active, and the amount of energy called for. With increase of work there must be proportionate increase in quantity and in nutritive value of the food eaten. Ill-paid laborers and others whose food amounts only to a bare minimum can not either put forth the same energy or work at the same speed as a well-nourished man. The man who has to work hard, long, or rapidly needs a proportionately ample food supply, composed of highly nutritive ingredients, to withstand the strain. Age, sex, weight, and constitution likewise exert influence. Women require on an average about four-fifths of the food supply of a man, and an adolescent about seven-tenths. Season and climate also affect the question. Lastly, the predisposing influence upon the alcoholic habit of malnutrition, bad feeding, and long periods of work without refreshment should be borne in mind. There can be no doubt that "industrial alcoholism" is, in part, due to the lack of cheap good food.

¹ When work is nervously exhausting, e. g., nightwork, the food of the worker requires to be particularly light and digestible, well cooked and appetizing, for the organs of digestion then lack an adequate supply of nervous energy, and can not deal successfully with heavy indigestible and unappetizing meals. The warmth of the food is of great importance. Hot drinks stimulate the tired worker. The proper adjustment of the food to the expenditure of nerve energy saves a great deal of indigestion and the minor complaints which result from this and lost time.

3. What, then, in general terms, is the necessary dietary for a worker? Broadly, the answer is a dietary containing a sufficient proportion and quantity of nutritive material, suitably mixed, which is easily digestible, appetizing, and obtainable at a reasonable cost.

A STATEMENT OF THE PROBLEM.

4. Though there is little doubt that workers are getting a better type of food than formerly, it must be admitted that large numbers of workers of both sexes are not getting such a dietary day by day. Much evidence is forthcoming that this is being increasingly recognized both by employers and workers. The difficulties in the way of adequate feeding arise mainly where the worker must have his meals away from home. In past years and even now in normal times the worker lived fairly close to his work, and was frequently able to return home for his meal. At present the difficulties of securing adequate food are increased owing to the prevalence of night labor and the large number of men and women who have to travel a considerable distance to their work.

In such cases the simplest alternative is for the worker to bring or receive from his home or lodgings food ready prepared for eating. The objection to this arrangement is the limitation in the kinds of food suitable, and that it is necessarily cold, and liable to be stale. There is a special danger of its being confined to what can be most quickly prepared the night before without much regard to its nourishing character. When the weather is warm, or the food is kept for any length of time in a hot workshop, it readily undergoes degeneration.

A second alternative is for workers to bring food which can be either warmed up or cooked at the factory. This is sometimes done by the worker himself, or facilities for the purpose are provided by the employer. Arrangements on these lines are probably better than those under which the worker brings his food with him ready prepared. On the other hand, it is to be remembered that warmed-up food is generally not so nourishing as freshly cooked food, that if a large amount of food is to be warmed up it is always difficult to deal satisfactorily with widely varying kinds of food, and that valuable time is lost if the worker is compelled to cook his own meal.

Lastly, in some districts workers can obtain a substantial meal at public houses, cookshops, or other proprietary establishments in the neighborhood, but the accommodation in these places is often inadequate and unsuitable.

5. This then is the problem—to supply suitable food at a low price for large numbers of persons at specified times. The modern

progress of factory management reveals a variety of efforts to find a solution. There has been, it is true, considerable development in the provision of proprietary concerns in the form of improved coffee-houses and refreshment rooms. Philanthropic movements have also been initiated with a similar purpose. But by far the most hopeful enterprise has been the establishment by employers of industrial canteens, or workpeople's dining rooms, in or near the factory itself. There is no statutory obligation upon the employer, though action in this direction has received the whole-hearted commendation of the factory department of the Home Office. The earliest and best examples of such restaurants in factories are to be found in the food industry, but makers of soap, paper, cloth, tobacco, and tin boxes have followed suit, and now in all parts of the country accommodation of greater or less degree of suitability and attractiveness has been provided. This pioneer practice has abundantly justified itself from a business and commercial point of view, and in the opinion of the committee the time has come for a large extension of this method of solving the problem. Speaking generally, it may be said that the accommodation provided accords with one or other of the following types: (*a*) An available room for the workers to eat their prepared food; (*b*) a room furnished with a "hot-plate" or "warming cupboard"¹ or provided with hot water; (*c*) a refreshment barrow to perambulate the workshops at appointed hours (particularly useful for light refreshments during long spells or night shifts); (*d*) a fixed refreshment bar or buffet; (*e*) a dining room supplying cheap hot and cold dinners; and (*f*) such a dining room associated with an institute or club, with facilities for rest and recreation (e. g., rest-rooms, recreation or reading rooms, portable gymnasium, baths, roof garden, or educational classes, etc.). Some of these types may be suitably combined, and although arrangements indicated in (*c*) and (*d*) may prove sufficient and satisfactory in certain circumstances, the provision of proper meals seems obtainable only in the types (*e*) and (*f*). The committee recognize that the necessity for, and character of, an industrial canteen are dependent upon the nature of the need and its degree in each factory. They are, however, convinced that in the highest interest of both employer and worker, proper facilities for adequate feeding arrangements should be available in or near, and should form an integral part of, the equipment of all modern factories and workshops.

¹ "Warming cupboards" can be installed in or near the mess room and heated by steam. The cabinet may be constructed of sheet iron (finished off with asbestos and wood covering), with shelves of perforated sheet iron. Employees deposit their food in basins or dishes when they come to work, the cupboard is closed and steam applied under regulation for a specified time. At the dinner hour the employees fetch their food.

ESSENTIAL CHARACTERISTICS OF THE CANTEEN.

6. In order to insure effective results of the establishment of industrial canteens, certain conditions seem to be essential:

(a) *Accessibility and attractiveness.*—It is useless to establish a canteen which is inconvenient or unattractive. It should be situated in or near the works. The effective cleanliness, warming (55–60° F.), lighting, and ventilation should receive careful attention and be properly and continuously maintained.

(b) *Form, construction, and equipment.*¹—The premises should include an ample dining room with a buffet bar attached, with separate accommodation for men and women, and, where necessary, an additional room or partitioned section for the staff, foremen, etc. The kitchen should be properly equipped² and furnished with necessary scullery, pantry, and storerooms. It should be separated from the dining room by a servery and bar. Accommodation should be provided at the canteen or elsewhere for workers desiring to warm or cook their own food.

(c) *Food and dietaries.*—The food supplied should be varied, fresh, and good, suitable in quality and sufficient in quantity, well cooked, appetizing, and obtainable at low prices. For example:

DINNER.

Meat or fish, two vegetables.....	4d. to 8d. (8.1 to 16.2 cents)
Hot-pot, cottage pie, meat puddings....	2d. to 4d. (4.1 to 8.1 cents)
Meat pies and other prepared meat or egg dishes.....	2d. to 4d. (4.1 to 8.1 cents)
Soup, bovril, oxo, etc. (with bread)....	1d. to 2d. (2.0 to 4.1 cents)
Puddings and stewed fruits.....	1d. to 2d. (2.0 to 4.1 cents)

¹ In some works an existing part of the premises may be altered and adapted, in many cases temporary buildings may be erected, and in yet others a more permanent block may seem desirable. Some temporary canteens (100–250 places) recently built on the Mersey Dock Estate consist of timber framing fixed to steel uprights (let into concrete at intervals of 10 to 12 feet) with creosoted weather boarding on outside; lined inside with boards; roof boarded and covered with bituminous felt; floor boards carried on joists supported on concrete piers; inside colored white, with dark green dado; counter and store rooms fitted with shelving. Approximate cost per place £3 to £3 10s. [\$14.60 to \$17.03]. Minimum dining room floor space per head should be 10 square feet. Particular care should be taken to secure means for effective warming, lighting, and ventilation. The larder and kitchen should not ventilate into the mess room. Where necessary, lavatory basins should be provided. The mess room should be furnished with long, relatively narrow tables (with hard, durable smooth tops, or oil cloth, or white tiles), and benches with back rail, or chairs (preferable). Trays or boxes for waste paper.

² The kitchen of an exceptionally well-equipped industrial canteen for 280 persons at Leeds contains the following utensils: One large gas stove (three ovens); one steam-heated hot closet and carving table, for heating plates and dishes and keeping the food hot; one steamer with four compartments for steaming and boiling; one 30-gallon steam-jacketed pan for soups; one 10-gallon copper water-jacketed pan for milk, stewed fruit, porridge, etc.; a knife machine; a potato peeler; a bread cutter; a steam kettle; a whisking machine for batter and Yorkshire pudding; a mincing machine; large bins for storage; enamel bowls, jugs, and stew jars, substantial tinned steel bowls for baking, and ordinary kitchen and dining room "crockery" of white stoneware. This canteen has a staff of matron, cook, and four assistants.

Suet, bread, currant, jam, and fruit pudding	1d. to 2d. (2.0 to 4.1 cents)
Bread and cheese.....	1d. to 2d. (2.0 to 4.1 cents)
Vegetarian and cheese dishes.....	2d. to 3d. (4.1 to 6.1 cents)*
Cakes, buns, jam tarts, bread and butter, sandwiches.....	1d. to 2d. (2.0 to 4.1 cents)
Tea, coffee, cocoa, milk, lemon, barley, aerated and mineral waters, etc., per cup or glass (exceptional quality important)	$\frac{1}{2}$ d. to 1 $\frac{1}{2}$ d. (1.0 to 3.0 cents)

All kinds of fresh fruit in season, oranges, lemons, bananas, prunes, plums, apples, pears, tomatoes, etc.

In certain districts, and in special circumstances, there may be a case for the establishment of "wet" canteens, where alcoholic beverages may be obtainable. The committee recognize that such canteens will require particularly careful supervision, and it may be necessary to impose certain restrictions in regard to the sale of intoxicants.

(d) *Prompt service.*—The quick service of meals is important. Three methods are practicable (method (1) is probably best, as a rule, for large numbers):

(1) Long serving counters (with barriers as at railway booking office) from which workers fetch their food.

(2) Food placed ready on the table before workers admitted. This may be convenient for breakfasts or teas, or where the food provided is cold and the same for all, but it is not always practicable for hot dinners.

(3) Waiters or waitresses, organized in shifts or voluntary (small payment for services rendered).

(e) *Convenient hours.*—The canteen should be open at any hours which meet local needs and circumstances. Midday is clearly the principal occasion of its utility. But in many works it should also be open in the early morning hour for breakfast, and at supper time. Where there are night shifts meals and refreshments should be available as by day. Provision should also be made for the supply of water, milk, tea, or coffee at specified times.

(f) *Payment.*—Different methods of payment are in vogue, but if payment at the time by bill or check be impracticable, probably the most appropriate is for workers to buy books or series of tickets or checks previous to the meal or at the door. Money can not be deducted from wages by the employer for food or drink without a contract under the Truck Act.¹

(g) *Management.*—The success of an industrial canteen depends in considerable degree upon its management. Speaking generally,

¹ The Truck Act, 1831, sec. 23, provides that "no deduction shall be made from the wages of a workman in respect of victuals dressed and prepared under the roof of the employer unless an agreement or contract for such stoppage or deduction shall be made in writing and signed by the artificer." Such an agreement can be readily made or may prove to save time and prevent waste.

three methods, which are not mutually exclusive, are available. The employer may manage, the workers may appoint a management committee, or the entire direction may be contracted out to a professional or voluntary caterer. In not a few of the most successful canteens joint control is exercised by employer and men (an elected shop committee with a chairman representing the management), who may or may not contract out the catering. The method of control is materially affected by the proprietorship.¹ In all cases it should be disinterested and for the benefit of the workers. Exploitation in any form should be avoided, efficiency and economy being steadily kept in view.²

RESULTS.

7. The committee have been impressed with the consensus of opinion which they have received as to the substantial advantages both to employers and workers following the establishment of an effective and well-managed canteen. These benefits have been direct and indirect. Among the former has been a marked improvement in the health and physical condition of the workers, a reduction in sickness, less absence and broken time, less tendency to alcoholism, and an increased efficiency and output; among the latter has been a saving of the time of the workman, a salutary though brief change from the workshop, greater contentment, and a better midday ventilation of the workshop. The committee are satisfied that the evidence of these results is substantial, indisputable, and widespread. In the isolated cases where the canteen has failed it has been evident that its failure has been due to exceptional circumstances, misuse by the workers or mismanagement. In almost all large works the committee find that there is a body of men or women (averaging at least 25 per cent) who in the interest of physical health and vigor need canteen provision at the factory. They are convinced that this group of ill-fed workers accounts in a large degree for such inefficiency as exists, and that its energy and output is reduced in the absence of suitable feeding arrangements. The committee have received a number of statements in favor of industrial canteens from which they select that of an authority of wide experience:

¹ The committee understand that the Central Control Board (Liquor Traffic) appointed under the Defense of the Realm Act, 1915, No. 3, is empowered by the treasury to make grants in aid of capital expenditure for the erection of canteens, approved by the board, in controlled munition works. The policy of the board is first to encourage the employer or owner to make certain provision where necessary; secondly, to facilitate such provision by voluntary agency; or, thirdly, to establish a canteen themselves, either managing directly or handing over the management to a properly constituted committee.

² The tariff can be kept low only by careful management. The food materials can be made to pay, but the incidental expenditure is relatively heavy. Workers are not accustomed to paying for food in canteens, and will not always purchase the most nutritious food. Tact, discretion, and an appropriate menu of popular dishes are necessary. Constant supervision and the careful adaptations of means to ends are needed to prevent loss if good food is to be sold quickly at the low price the worker can afford to pay.

In answer to your inquiry as to the effect which our canteen arrangements have had upon the health and efficiency of our own workpeople, we were so fully alive to the importance of this as to erect a complete installation, separated from the factory proper, for the use of those who live too far away from the works to dine at home. From 1,500 to 2,000 workpeople make use of these rooms daily.

The building has a well-equipped kitchen, but the majority of those who dine at the works, although buying tea and light refreshments, bring their own dinner. This habit obtains elsewhere. We make a point, however, of having, in addition to other things, one or two cheap and very nutritious dishes, e. g., a 1d. (2 cents) basin of soup or stew, of which some hundreds are sold daily. In planning the dining block we felt it was not merely a question of supplying food, but of doing so under restful and comfortable conditions, in rooms well lighted and ventilated and properly warmed. A great deal more was done than was required for bare efficiency, and it is not necessary to build on so costly a scale. We have never had a moment's doubt as to the importance of a comfortable dinner hour for our people from the point of view of their efficiency in the afternoon.

The health of our workpeople has unquestionably improved in recent years, and we feel sure that the dining room has helped to bring about this result. At the same time, as there are many factors which have come into play, it is impossible to value with any approach to accuracy the part that each of these has played. The proper ventilation of the workrooms, medical and dental attendance freely given at the works, with facilities for those in poor health getting to a convalescent home, are among the many factors which have each exercised an influence.

This testimony with its qualifications expresses the conviction of the committee as to the benefit arising as a result of a good industrial canteen. The committee have been impressed not only with the improved nutrition manifested by the users of the canteen, but by a lessened tendency to excessive consumption of alcohol, by the prevalence of the spirit of harmony and contentment engendered, and by an increase in efficiency.

Signed on behalf of the committee,

GEORGE NEWMAN, M. D.,
Chairman.

E. H. PELHAM, *Secretary.*
NOVEMBER, 1915.

CANTEEN CONSTRUCTION AND EQUIPMENT.

[Memorandum No. 6. Appendix to Memorandum No. 3 (Industrial Canteens).]

SITE.

1. The first important consideration in the erection of a new canteen is the question of a site for the building. The site should, if possible, have a pleasant open outlook and southern aspect, and should be easy of access for the workers. With high buildings adjoining and mess rooms looking out upon blank walls not many yards distant, the canteen may prove unattractive and its success be to a great extent impaired. The canteen should, if practicable, be placed

where water, gas, and electric mains are adjacent, as well as drainage capable of carrying off the discharge of soil and rain-water pipes and of sinks and lavatory wastes.

BUILDINGS.

2. Plans have been prepared showing canteens suitable for 400 and 280 diners. Instructions are given for reducing the second plan so as to provide only for 150 diners. The question which immediately arises is whether the buildings shall be of (a) temporary or (b) permanent construction. During the war there is much to be said for the erection of a temporary building, mainly on the ground of cost, rapidity of erection, and the smaller demands made upon labor.

3. Permanent buildings naturally take longer to erect, the cost varies from 25 to 40 per cent more than in the case of a temporary building, and the demands made upon labor are greater. On the other hand, a permanent building is, of course, more satisfactory and costs proportionately less than the temporary building for maintenance. In normal times the case for the permanent building is a strong one, but at the present time for canteen purposes the temporary building should be the type adopted.

4. The construction of temporary buildings is dealt with in more detail on the drawings, but it should not be overlooked that the wear and tear of the floors is considerable, whether in the mess rooms or in the kitchens, and in view of this the floors generally should be of concrete, finished with a granolithic face. This type of floor is smooth, hard, durable, and impervious and is easily washed down after meals. Advantage should, wherever possible, be taken of using local material to save railway carriage, cartage, etc.

5. In a large number of canteen proposals it may be found that the dimensions of available sites will not admit of the buildings being erected in accordance with the suggested designs accompanying this memorandum and therefore a few remarks are necessary on the general arrangements which experience proves to be desirable. The canteen or dining hall, being the principal apartment, should be arranged with the most convenient methods of egress and ingress for the workers and with direct approach to the serving counter so that traversing the whole or any great portion of the dining hall to obtain food is avoided. Barriers in front of the counters are advisable to allow of each diner obtaining his or her food in the order of arrival so that there may be no possibility of crowding or pushing, which is sometimes frequent where large numbers are concerned. Adequate gangways or passageways for each diner to proceed to the dining tables without interruption to other diners are essential. The kitchen should be situated as centrally as possible with regard to the

dining room, which it should adjoin. The wash-up or scullery should open out of the kitchen and should abut immediately upon the main dining hall. A counter or shelf with communicating hatch should be provided to admit of dirty crockery being handed direct to the hot-water sinks. In addition to the sinks in the scullery such accommodation is also required in the kitchen for the use of the cook in the preparation of food. The sinks should be supplied with hot water from an independent boiler, which should be placed as near as practicable to the sinks (or otherwise, see par. 14). The sanitary accommodation for the canteen should preferably be situated in an isolated block of buildings adjacent to the canteen, but the requirements in this respect depend upon the sanitary accommodation already existing in adjoining buildings and each case will have to be considered on its merits.

VENTILATION AND LIGHTING.

6. Ample window space (with a large proportion of the windows opening) is desirable for light and ventilation, and in no case should the total glass area of the windows be less than one-tenth of the floor area of the various rooms in which they occur. The fanlights for casement windows should be hinged at the bottom and fall inward. Glazed cheeks or gussets should be provided to admit of continuous ventilation, and at the same time prevent down draft. All casement windows should be made to open for use in warm weather, and to flush the rooms with air after the principal meal. Louver ventilators under the roof or in turrets provide ventilation for the main mess room. A simple cord attachment to wooden flaps should be provided to admit of these ventilators being closed during cold or windy weather. The kitchen should be provided with a continuous louver ventilator, as indicated on the drawings. It is desirable, where electric or other power is available, that an exhaust fan should be placed in the kitchen to extract the heat and steam from the kitchen and scullery, and incidentally assist in the general ventilation of the dining rooms. Larders should face north and have nearly half the glass omitted in the window panes and perforated zinc panels substituted to provide suitable ventilated storage for perishable food.

EXTERNAL AND INTERNAL MATERIALS.

7. The selection of materials, owing to the high prices obtaining, presents some difficulty at the present time. Formerly one of the most favored external coverings for temporary buildings was galvanized corrugated sheet iron. The cost of this material, however, is now almost prohibitive and alternatives are ungalvanized corrugated sheets (painted) or roofing felts. These felts are usually laid on

the boarding with a lapped joint and patent cement supplied by the makers, the sheets being then secured with galvanized clout or large flat-headed nails. Only the stoutest material of the respective makers should be used to insure a water-tight roof. Light asbestos slates also provide a satisfactory, although somewhat heavier, roof covering. All roofing felts need careful laying, otherwise bulging occurs, which, in addition to being unsightly, is a frequent cause of a defective roof.

8. A large variety of materials are available for the external coverings of the walls, among which may be mentioned feather-edged weatherboarding (treated with creosote), ungalvanized painted sheet iron, plaster finished in cement, secured to the wood framing by expanded metal, asbestos slates, or other materials. Internally plaster and cement on expanded metal, asbestos sheets (the joint covered by a small fillet), match boarding or various other materials can be used above the dado. The dado should, however, be somewhat stronger; $\frac{3}{4}$ -inch match boarding is suitable. Thin sheet iron (painted) has also been used; or linoleum on flat-jointed boarding provides a suitable dado and is easily cleaned. The interior of the building should present a clean and cheerful appearance and distempers of a fairly light tint are preferable. Straw color, primrose, duck's-egg green, or French gray are suggested as suitable. An alternative color scheme would be a dark green dado about 5 feet high with 2-inch black line and the remainder of the walls, including the roof, finished white, the roof principals being stained a dark brown.

WARMING AND LIGHTING.

9. Central heating by radiators or hot-water pipes would, no doubt, provide the most satisfactory means of heating the building. The cost, however, of such a heating installation adds so considerably to the initial cost of the whole scheme that it becomes extremely doubtful if the expenditure is warranted, especially in view of the fact that for four or five months of the year no artificial heating is required. Where central heating is not provided, use may be made of an independent stove, standing on the concrete floor, the stovepipe being carried up through the roof. Such stoves may be obtained from any iron founder or ironmonger at varying prices.

10. The steps to be taken for the prevention and extinction of fires should be fully considered. The method of carrying the stovepipe through the roof should be carefully planned, as, owing to the combustible nature of the timber in roofs, defective construction at this point may prove a source of danger to the building from fire. The construction may simply consist of asbestos packing, a sheet-iron sleeve piece, with $1\frac{1}{2}$ -inch space between the sleeve piece and the stovepipe, and a hood to keep the rain out.

11. Where electricity is available it is no doubt the most satisfactory means of artificial illumination, otherwise gas should be used.

COOKING APPARATUS AND KITCHEN EQUIPMENT.

12. The cooking arrangements in an industrial canteen naturally form an important part in the equipment of the building. There are various means of cooking food, but for canteen purposes attention may be confined to: (a) Electricity, (b) gas, (c) coal, (d) steam.

(a) Electricity as a cooking factor has not hitherto been very largely used, but in any case where the power can easily be provided it is worthy of consideration.

(b) Where gas in sufficient quantity is available, gas cooking is usually preferred on account of cleanliness, efficiency, and saving of labor.

(c) Coal is suitable in districts where it is obtainable at cheap prices, or where gas is unobtainable.

(d) As the adoption of steam cooking necessitates the installation of an expensive plant, this method need not be considered unless a special supply of steam is available.

13. The relative position of cooking apparatus naturally varies with the type of apparatus used, but, generally speaking, it has been found better to have the stoves and roasters in the center of the kitchen, with the steamers or boilers behind and the carving table and hot closets adjacent to the serving counter. The serving of tea, etc., should be kept quite separate from the general service table.

14. It is most essential that there should always be a plentiful supply of hot water through the sink taps for washing-up purposes. There are several alternative methods of producing this, among which are the following:

- (1) Circulator boiler connected to a storage system.
- (2) Large hot-water geyser.
- (3) Separate boiler over each sink.

15. The maintenance of cleanliness is one of the most important points in the whole scheme of a canteen, and it is one that the workers are quick to appreciate. In the mess room all floors, tables, seats, and windows should be thoroughly cleansed every day, and in the kitchen all cooking apparatus should be well scoured and kept scrupulously clean. The table equipment should always be well washed and polished. The immediate surroundings of the canteen should be kept free from accumulated rubbish and refuse, as by this means trouble from flies is greatly reduced.

CATERING EQUIPMENT.

16. The following is a list of articles required. The number to be ordered will depend on the size of the canteen and the accommodation for which it is to provide. It is never advisable to purchase inferior table and cooking equipment. As prices vary considerably no estimates are given. Speaking generally, however, it may be said that inclusive equipment will be approximately 32s. (\$7.79) per head for 100 persons, 21s. 6d. (\$5.23) for 500, and 20s. 9d. (\$5.05) for 1,000:

I.—CATERING OFFICE EQUIPMENT.

Account books, etc.
Chairs.
Desk.
Safe for money.

II.—MESS ROOM.

American cloth or linoleum for tables and counter.¹
Chairs or benches.²
Cash till.
Curtains for window (dark).
Scraper mat at door.
Tables (2 feet 3 inches or 2 feet 6 inches wide).³
Waste-paper baskets.⁴

III.—TABLE EQUIPMENT CUTLERY.

Carving knives and forks.
Dessert spoons (7 inches in length).
Forks (7½ inches in length).⁵
Knives (9½ inches in length).⁵
Mustard spoons.
Steels.
Salt spoons.
Tablespoons (8½ inches in length).
Teaspoons (5¼ inches in length).

IV.—GLASS AND CROCKERY.

Cups (liquid capacity 10 ounces) and saucers.
Egg cups.
Jugs for water (liquid capacity 2 pints).
Mustards.
Milk jugs (liquid capacity 1½ pints).
Meat dishes (assorted sizes).
Peppers.
Plates for meats and puddings (10½ inches—one size only).⁶
Salts.⁷
Small plates (7½ inches).
Sugar basins.
Soup bowls (preferable to plates).
Teapots.⁸
Tumblers (liquid capacity 13 ounces).
Vinegars.
*
V.—COOKING AND SERVING APPARATUS.⁹
Boilers or steamers for vegetables and puddings.
Boilers for heating water for making tea, etc.
Carving table.

¹ In some of the best managed canteens the use of tablecloths has been found quite satisfactory.

² Chairs are generally found to be more comfortable and satisfactory than forms, particularly where the workers wait upon themselves.

³ If space permits, frequent passages between the tables should be allowed for.

⁴ Waste paper baskets, preferably wire ones, should be provided about the mess room; the effect these have on the general tidiness of the room is considerable. Trucks can be used for the collection of dirty crockery, etc.

⁵ Large knives and forks only are necessary; the most suitable knives are those with solid metal handles.

⁶ The provision of flat-topped covers for the plates of food is suggested, as these keep the food hot, and render them more easily stored in the hot closets.

⁷ Pourer salts can be used, but it is generally found that an ordinary salt and spoon is best.

⁸ It is not generally advisable to supply a teapot for each individual, and only cups of tea should be served. The tea can be made in one gallon teapots, but can be most economically served from an urn.

⁹ In some districts the local gas companies will hire out stoves, etc., for cooking.

Hot-water apparatus for washing up,
etc.
Oven range.
Roasting oven.
Hot closet for storing cut-up plates of
meat, etc.
Stock pot.
Grilling table.

VI.—LINEN.

Dusters.
Glass cloths.
Kitchen rubbers.
Muslin strainers.
Roller towels and roller.
Swabs.
Small hand towels.

VII.—KITCHEN, SCULLERY, AND LARDER
REQUISITES, ETC.

Baking tins.
Bass broom.
Box of mixed tools and accessories.
Bread knife.
Bread-cutting machine.
Cooks' knives.
Colanders.
Chopping board.
Covered sanitary bins.
Corkscrews.
Dustpan and brushes.
Enameled washing-up bowls.
Enameled cans.
Enameled pie dishes.
Frying pans.
Flour dredger.

Flour bin.
Fish kettle.
Gravy strainer and ladle.
Graters.
Japanned trays.
Knife machine.
Knife boxes.
Kitchen chairs.
Kettles.
Large black oval pots with tin covers.
Large iron spoons.
Lemon squeezers.
Meat safe.
Meat chopper.
Mincing machine.
Potato peeling machine.
Plate rack.
Pudding basins.
Pastry board and rolling pin.
Rigid table.
Scales and weights.¹
Scoop.
Sweeping brushes.
Scrubbing brushes.
Saucepans.
Stepladder.
Sinks (a good size is 3 by 2 by 1 foot).²
Sink brushes.
Sink baskets.
Tin opener.
Towel rack.
Tea canister.
Urns (holding capacity 4-6 gallons).³
Wire dish covers.
Wire sieves.
Wooden spoons.

17. In the preparation of the above memorandum the committee have had the advantage of the expert advice of a number of authorities, including Mr. D. N. Dyke, of His Majesty's Office of Works, Mr. A. F. Agar, the adviser of the catering department of the Young Men's Christian Association, and other persons of practical experience.

¹ When large quantities of food have to be purchased, a platform scales is suggested as well as a small cook's scales. It is most important that everything should be weighed and checked.

² There should always be at least two sinks provided, one for the cook's own use, and the other, or others, for the general washing up.

³ Urns with earthenware linings are recommended, as the ordinary unlined urns show a tendency after a time to impart an unpleasant taste to the tea.

18. Communications respecting canteens and their equipment should be addressed to the Secretary, Canteens Committee, Central Control Board, Canada House, Kingsway, London, W. C.

Signed on behalf of the committee,

GEORGE NEWMAN, M. D.,
Chairman.

E. H. PELHAM, *Secretary.*

JANUARY, 1916.

INVESTIGATIONS OF WORKERS' FOOD AND SUGGESTIONS AS TO DIETARY.

[Memorandum No. 11. A second appendix to Memorandum No. 3 (Industrial Canteens).]

1. Although shortage of food supplies may not possess for ourselves or our allies the same urgent importance as it does at the present moment for the Teutonic nations, still, the high prices of food have rendered of primary importance the provision of a nourishing and economical diet for the civilian population of the country. Some examination, therefore, of the value and character of the food consumed by munition workers seems desirable in the interests of efficiency. Food is necessary to life; for the living body is always losing energy in the form of heat and mechanical work, and this loss is made good by food. The food taken, however, should be regulated by the loss of energy it is required to replace, and not, as it often is, by overindulgence of the appetite. The loss of energy due to cooling of the surface of the body is greater than that due to mechanical work; the latter is variable and may be small. The amount of food required bears a closer relation to the extent of the surface of the body than to its weight; owing to the greater cooling surface of their bodies, tall lean men require more food than short fat men of equal weight, and the latter, in spite of eating less, may continue to grow fat. Growing boys and girls require comparatively more food than adults for two reasons: (a) Their bodies present a greater cooling surface compared with their weight, and (b) they have not only to make good the daily loss of energy, but also to have energy necessary for growth.

2. The amount of physical force expended in daily work and the environment of the work have a great effect on the requirements of the body for food. Hard labor and exposure to open air together call for increased food supply; sedentary work in an artificially heated and confined atmosphere, on the other hand, reduces the output of energy and less food is required. An ordinary laborer may lose one-sixth or more of his total energy output as work, and the remainder as body heat. A sedentary worker may lose little energy as work, and almost all as body heat. The loss due to this latter

cause, as activity increases, grows out of proportion to the actual energy expended as work.

3. Natural foods yield the essentials required to replace the energy expended and for the repair and growth of the body. They contain these essentials in the form of protein, fat, and carbohydrates, and also supply salts and certain substances of unknown nature, called vitamins, which exist in minute quantities in fresh foods and are necessary for the growth and health of the body. Protein is the chief solid constituent of lean meat; it is also present in milk, cheese, and eggs; and occurs in all vegetables, particularly in flour (bread), peas, and beans; it is not only a source of energy, but it is also a body builder, and no dietary can be complete without it. Fat is chiefly derived from animals; nuts also are rich in fat (from which margarine is made), but other vegetables only contain fat in a much smaller degree. Carbohydrates are mainly derived from vegetables in the form of flour, potatoes, or sugar.

Fat and carbohydrate can replace one another in a diet, but the body digests and deals best with a certain proportion of each. Fat, however, yields weight for weight more than twice as much energy as carbohydrate, and so in cold climates and cold weather more fat is naturally eaten. Experience shows that the diet should include raw food, fruit, or salads. The consumption of fresh fruit, such as apples, oranges, or bananas, is highly to be commended, and should be actively encouraged by the provision of good fruit at the lowest possible prices.

Fortunately, the cheaper foods (bread, margarine, porridge, milk, herrings, cheese, beans, onions, cabbages, oranges, and the cheapest cuts of meat) provide all the requisite nourishment, and probably better health, than is derived from more highly flavored and expensive foods which only artificially stimulate the appetite. The drinking of strong tea many times in the day is physiologically unsound, as also is the consumption of sweetmeats between meals, especially by boys and girls.

4. Fatigue prevents the proper digestion of food, and one of the earliest symptoms of overwork is some form of digestive derangement; further, since nervous energy is required to control the work of the digestive organs, nervous fatigue, as well as physical fatigue, is followed by digestive disturbances. A tired man accordingly benefits by a brief rest before a meal. Food should be taken regularly and not hurriedly, and the energy so taken should be distributed fairly evenly over the day; thus strength is maintained and the digestion at no time overloaded. Food should not be taken between meals or at

frequent intervals, because a good digestion depends upon a keen appetite.

5. *Calculation of energy value of foodstuffs.*—The energy value of a foodstuff can be determined by burning a weighed quantity of it in a suitable apparatus called a calorimeter, and ascertaining how much heat it gives off. The large calorie, which is used as the unit of energy value, is the amount of heat required to raise 1 kilogram (1½ pints) of water through 1° Centigrade (1.8° Fahrenheit). Calculation has shown that, when dried, foodstuffs contain the following energy value:

One gram¹ of—

Protein.....	Contains 4.1 calories.
Carbohydrate.....	Contains 4.1 calories.
Fat.....	Contains 9.3 calories.

6. The energy expended in mechanical work can also be expressed in calories, for 1 calorie has been found to be equivalent to the energy expended in lifting 1 kilogram through 425.5 meters, which is about the energy expended by a man 70 kilograms (11 stone) in weight in walking up a staircase 6 meters (about 20 feet) in height. Such a man would require 1 extra calorie in the energy value of his food to make good this expenditure of energy. Even in walking on the level the body is raised at each step, and the calculation has been made that to walk 2.7 miles in an hour on a level road calls for the expenditure of 160 calories in a man of 11 stone.

7. Investigations made by a number of authorities indicate that about 15 per cent of the energy expended is derived from protein, and about 80 per cent from fats and carbohydrates combined; that is to say, that normally protein supplies only one-fifth of the total energy expended. Numerous investigations have shown that the energy required by a man engaged in fairly light munition work is about 3,500 calories of food as purchased. Where calculations are based (as they are in this report) on food as eaten the minimum canteen diet may be taken to be about 3,000 calories when balanced among the three classes of foodstuffs in the following proportions of dried weights:

Protein.....	100 grams.
Fat.....	100 grams.
Carbohydrate.....	400 grams.

¹ To express in terms of calories per pound it should be remembered that 1 pound is equal to 453.6 grams; 1 ounce is equal to 28.35 grams.

Example.—Suppose 1 pound of roast beef contained—

Protein.....	26.75 per cent.
Fat.....	12.90 per cent.

In this case there would be $(26.75 \times 4.1) + (12.90 \times 9.3) = 229$ calories per 100 grams. In the pound of meat there would, therefore, be $229 \times 4.536 = 1,040$ calories.

This diet will often be supplemented with fruit or other small addition, according to individual taste. Men engaged in hard physical work, especially in the open air, require a good deal more energy-producing food, and may consume as much as 4,500 calories with advantage. On the other hand, the energy required from food by a man clothed, lying at complete rest, at ordinary room temperature in a still atmosphere, is about 1,600 calories of eaten food, while for a man engaged in a sedentary occupation as little as 2,200 calories may suffice.

An average adult woman worker requires rather less (about 0.8 or 0.9) than a man.

RESULTS OF RECENT INQUIRY.

8. *Canteen meals*.—In order to determine the kinds of dietaries provided for munition workers specimen meals were obtained, by personal visit or otherwise, from a number of canteens attached to munition works, and, to serve as a contrast, from other sources as well. The amount of protein, fat, and carbohydrate in each meal were estimated, the calorie value was calculated, and the costs of the meals and number of calories per penny determined. See Table I.¹

¹ The method of making the estimations was the same in each case. The ingredients were all thoroughly mixed after weighing each separately so that dietaries could afterwards be constructed from the weights. An aliquot part of the intimate mixture was thoroughly dried and weighed. In the dry material protein was determined from a nitrogen estimation, the fat by other extractions in a Soxhlets apparatus, the ash by burning and weighing, and the carbohydrate by difference. In this way the amounts of dry protein, fat, and carbohydrate, respectively, in the meal were obtained, and from these the calorie value was calculated.

TABLE I.

Factory or restaurant.	Style of catering.	Ingredients.	Dry weight, in grams.					Total calories.	Calories per <i>id.</i>	Total cost.
			Protein.	Fat.	Carbohy- drate.	Ash.	Total.			
No. 4.....	Professional.	Potatoes, cabbage, steak, pudding, jam roll.	35.0	42.0	127.0	5.0	209.0	1,053.0	175	<i>s. d. Cts.</i> 0 6 (12.2)
No. 5.....	Amateur....	Roast mutton, boiled potatoes, cabbage, and rice pudding.	48.0	51.0	87.0	7.0	193.0	1,025.0	146	0 7 (14.2)
No. 6.....	.....do.....	Potatoes, cabbage, steak pudding, rice pudding.	36.0	30.0	93.0	4.0	163.0	806.0	101	0 8 (16.2)
A students' club.	Professional.	Roast beef, boiled potatoes, cabbage, sirup roll.	34.0	28.0	101.0	3.0	166.0	814.0	58	1 2 (28.3)
Popular restaurant.	.....do.....	Steak pudding, potatoes and cabbage, sirup pudding.	44.0	42.0	193.0	3.0	282.0	1,344.0	79	1 5 (34.5)
No. 7.....	Amateur....	Steak pudding, peas and potatoes, jam roll, rice pudding.	51.0	42.0	204.0	8.0	305.0	1,433.0	288	0 5 (10.1)
Working class restaurant.	Professional.	Meat pudding, potatoes, cabbage, suet pudding.	29.0	39.0	128.0	4.0	200.0	1,004.0	125	0 8 (16.2)
No. 3 (A)....	Works.....	Roast beef, potatoes and peas, sago pudding.	31.0	31.0	131.0	5.0	198.0	948.0	135	0 7 (14.2)
No. 3 (B)....	.....do.....	Liver and bacon, potatoes and peas, currant pudding.	55.0	30.0	160.0	6.0	251.0	1,155.0	165	0 7 (14.2)
No. 1.....	Professional.	Meat pudding, cabbage, potatoes, and jam roll.	32.0	52.1	178.4	7.5	270.0	1,346.0	192	0 7 (14.2)
No. 2 (A)....	Works.....	Roast mutton, potatoes, peas, currant pudding, bread.	55.5	22.8	180.1	7.1	258.4	1,177.9	131	0 9 (18.3)
No. 2 (B)....	.....do.....	Liver and bacon, potatoes and peas, currant pudding, bread.	58.7	30.1	180.2	7.3	268.9	1,259.0	140	0 9 (18.3)

The results obtained show that the average canteen dinner is a good one, containing, as it should, an energy value of about 1,000 calories, well distributed among the amounts of protein, fat, and carbohydrate. Apart from calorie value, inspection of the dinners showed that meat, vegetables, and puddings were made of good materials and were well cooked. The cost compares favorably with café or restaurant charges, and so the worker gains in pocket and obtains a dinner of good food, well prepared. For the relief of monotony, an important factor in connection with industrial canteens, a change of surroundings during the meal and a short walk before partaking of it are desirable. On this account, and also on account of the importance of ventilating the workshop so that the air may be fresh when the workers return, the custom of eating meals within the workshop should be discontinued, and all food should be taken, whether in a canteen, restaurant, in the open air, or at least away from the ordinary place of work.

9. *Food brought by workers.*—The next subject investigated was the nature and energy value of meals brought by workers from their own homes. Many workers who bring their own food often supplement it by purchasing sweets, cake, or fruit and by taking tea or drinking mineral waters. Even where there is no canteen established, facilities are often provided for heating carried food and for supplying hot water to make tea; and there may be places where sweets, cakes, chocolates, mineral waters, and sometimes fresh fruit can be purchased. The workers from whom meals for analysis were obtained were not asked beforehand to bring a sample meal, but were interrogated at the entrance gate and asked if they would exchange the contents of their dinner basket for a sum ample to buy a meal at the canteen.

The following results were obtained:

(1) Meal brought from home by man on night shift—

Rabbit and vegetables in basin.

Protein.....	28.9 grams	} 683.4 calories.
Fat	7.6 grams	
Carbohydrate.....	120.8 grams	

This meal contained no pudding or other sweet, so probably the owner meant to supplement it by minor purchases at the canteen.

(2) Meal brought from home by man on night shift—

Sausage roll; bread and butter and ham; and cheese.

Protein.....	36.2 grams	} 1,448 calories.
Fat	58.2 grams	
Carbohydrate.....	160.5 grams	

(3) Meal brought from home by boy, aged about 15, on night shift—

Dish of potatoes, tomatoes, and bacon; jam puff; a cake; bread and butter and jam.

Protein.....	31.7 grams	} 1,719 calories.
Fat	61.4 grams	
Carbohydrate.....	248.3 grams	

These meals may be compared with the meal supplied by canteen of the factory (No. 1 in Table I). The boy's meal with its 1,719 calories as contrasted with the 1,346 of the canteen, or with the 1,448 of the man, illustrates the effect of growth and work in producing appetite, but, even after allowance is made for growth, it is probably excessive.

10. *Food of women workers.*—The dietaries of women workers were next examined; and in Table II the energy value of food obtained from women's restaurants, from a works canteen, and from workers is contrasted. The meal from restaurant No. 1 is a sensible meal supplied at small cost, but that from restaurant No. 2 is an example of the unsatisfying meals which pale-faced young women may often be seen consuming in popular cafés. In considering the canteen meals a portion of sweet should be added to each meat dish; the meal then totals up to between 500 and 700 calories of energy value for the sum of 7 to 8 pence. Unless somewhat larger meals are eaten at home, this is too near the minimum required for girls working long hours and traveling considerable distances to and from work. Each of the three normal meals of an average workingman should contain 1,000 calories, as eaten, and of a working woman 0.8 to 0.9 of this amount; that is, from 800 to 900 calories.

11. Girls who bring their own dinner often buy in addition a portion of pudding or cake from the canteen, and the analyses show that this portion adds from 150 to 300 calories to the meal. The food brought from home varies greatly in nutritive value from 295 to 1,143 calories; while the latter is sufficient without anything from the canteen, the former could scarcely be made enough even if a double helping of pudding were added. Whether deficiencies in the meal taken during the working period are made up by more liberal meals at home, or whether these meals also are deficient could not be ascertained; but even if the home meals are more liberal the distribution of the day's eating is on wrong lines; for in a long day's work, say of 12 hours, there should be a good meal in the longest break, if the efficiency of the worker is to be maintained for months and years. Experience, however, indicates that for a large class of workers home meals are hurried, and, especially for women workers, too often consist of white bread and boiled tea. A worker starting the day with a bread-and-tea breakfast and walking or traveling for an hour or more to work can not remain for long an efficient worker, and probably much broken time and illness arise from this cause.

TABLE II.

Source of meal.	Ingredients.	Weight in grams.			Calo-ries.	Total cost.	
		Gross.	Dry.				
			Pro-tein.	Fat.			Carbo-hydrate.
Women's restaurant...	Roast mutton.....	50	29.0	13.0	109.0	687	
	Boned potatoes.....	123					
	Cabbage.....	73					
Women's tea shop.....	Sirup roll.....	157	8.4	8.0	70.0	397	
	Roll.....	50					
	Butter.....	8					
	Milk.....	15					
	Sugar.....	10					
Girls' canteen:	Stewed prunes.....	67	39.0	4.0	56.0	426	
	Sirup.....	20					
	Meat dishes.....	Stewed steak.....					92
	Potatoes.....	200					
	Peas.....	70					
Extra and sweet dishes.	Roast beef.....	69	26.5	3.1	34.9	281	
	Potatoes.....	127					
	Cabbage.....	47					
	Roast mutton.....	66					
	Potatoes.....	117					
Meals brought from home.	Cabbage.....	98	25.7	3.0	36.1	281	
	Stewed fruit and custard.....	276					
	Rice pudding.....	133					
	Seed cake and bun loaf.....	72					
	Roll.....	61					
Meals brought from home.	Butter.....	9	5.3	7.1	34.0	227	
	Meat.....	87					
	Potato.....	100					
	Pastry.....	36	29.5	34.9	93.7	871	
	Rabbit.....	112					
	Pastry.....	215					
	Roast pork.....	70	51.5	54.2	104.4	1,143	
	Yorkshire pudding.....	72					
	Potatoes.....	128					
	Cabbage.....	94	32.8	14.4	77.2	590	
	Roast beef.....	78					
	Potatoes.....	64					
	Cabbage.....	71	30.4	4.7	30.8	295	
	Haricot beans.....	50					

12. *Hostel dietaries.*—The erection of hostels, required on account of the inadequacy of preexisting accommodation for housing the suddenly increased personnel of certain large munition factories, has afforded an opportunity of investigating the whole daily dietary of operatives. The investigation was made at a well-managed hostel where each worker may eat as much as he or she desires. In the dining hall there are separate tables for men and women; and by weighing the food supplied to a definite number at given tables, and by weighing the uneaten residue, the cost of each ingredient being known, the management obtained the cost price of food per week, and found it amounted, in March, 1916, to 15s. 2d. (\$3.69) per man, and 11s. 9½d. (\$2.87) per woman. This gives a consumption for a woman of 0.8 that for a man, a ratio in agreement with that stated

above. The amounts of protein, fat, and carbohydrate present in the food consumed were estimated by two schemes:

(a) The management weighed the amount of each type of food supplied throughout the day to (a) six men and (b) six women, and deducted the amounts unconsumed. The amounts of protein, fat, and carbohydrate present were determined at the laboratory from known data.

(b) The hostel was visited personally and the amounts of all the most important constituents of the menu actually eaten by a large number of persons were weighed; the average daily ration consumed per person was calculated from these data, and then samples of the foodstuffs were analyzed as above.

The results obtained by these two schemes, which closely agree, are set out in the following Tables III and IV:

TABLE III.—HOSTEL DAILY DIETARY PER MAN.

[Calculated from data supplied by management.]

Meal.	Ingredients.		Weight in grams.			
			Gross.	When dried.		
				Protein.	Fat.	Carbo- hydrate.
Breakfast.....	3½ ounces.....	Bacon.....	110	25.3	47.0	.....
	½ ounce.....	Butter.....	14	3.0	11.3	.....
	6 ounces.....	Bread.....	170	12.0	2.0	89.4
	1 ounce.....	Sugar.....	28	.....	.....	28.0
	¼ pint.....	Milk.....	180	2.5	3.0	4.0
	1 ounce.....	Jam.....	28	.....	.....	14.0
Dinner.....	7 ounces.....	Fish.....	200	36.2	1.0	.....
	8 ounces.....	Potatoes.....	228	4.0	.....	55.0
	3 ounces.....	Bread.....	85	6.0	1.0	44.7
	8 ounces.....	Pudding.....	228	7.3	9.3	70.0
Tea.....	1 ounce.....	Sugar.....	28	.....	.....	28.0
	1 ounce.....	Butter.....	28	.6	22.6	.....
	4 ounces.....	Bread.....	114	8.0	1.4	60.0
	¼ pint.....	Milk.....	180	2.5	3.0	4.0
Supper.....	4 ounces.....	Meat.....	114	37.6	3.5	.....
	1 ounce.....	Butter.....	28	.6	22.6	.....
	1½ ounces.....	Pickles.....	43	.....	.....	5.0
	6 ounces.....	Bread.....	170	12.0	2.0	89.4
All meals.....				152.9	129.7	491.3
Caloric value: Total.....			3,847	626.9	1,206.2	2,014.3

¹ Cubic centimeters.

The food consumed by women similarly worked out gives a total of 3,070 calories.

TABLE IV.—HOSTEL AVERAGE DIETARY PER MAN.

[Data obtained by personal visit.]

Meal.	Ingredients.	Dry weight in grams.			Calories.
		Protein.	Fat.	Carbohy- drate.	
Breakfast.....	Sausage.....	6.3	8.2	12.2	1,020.9
	Bacon.....	15.1	30.5	96.7	
Dinner.....	Bread.....	12.1	8.4	96.7	973.8
	Meat.....	42.7	4.0	50.6	
	Potatoes.....	3.7	.....	9.5	
	Cabbage.....	5.3	.....	66.3	
Tea.....	Apple pie.....	13.8	21.2	111.6	603.4
	Bread, butter, and jam.....	44.6	55.8	96.0	1,097.4
Supper.....	Bread, butter, ham, and cheese.....	146.1	137.7	442.9	.....
		Calories.			
All four meals.....	All kinds	Protein.	Fat.	Carbohy- drate.	Total.
		599.0	1,280.6	1,815.9	3,695.5
Sugar and milk used in tea not included in above.....					218.0

13. The calorie values obtained by these two analyses, 3,847 (Table III) and 3,913 (Table IV) approximate closely; they should satisfy the requirements of factory workers, unless very heavy work is being done, and could perhaps be reduced somewhat if facilities for getting extra food are afforded to anyone who wants more. Excess food either passes into useless adipose tissue (fat) or is imperfectly utilized and impairs the digestion and efficiency.

SIMPLE DAILY MEALS DESIGNED TO SECURE A WELL-BALANCED MINIMUM DIETARY.

14. In order to afford assistance to caterers for munition workers, a series of simple but adequate meals is given below. The daily diaries are arranged to show different types, such as a light breakfast and a heavy dinner, or moderate meals all round. The prices quoted are approximate only, and are based on prices ruling in April, 1916. The dinners are selected from specimens analyzed in the laboratory, and the other meals are computed from data obtained from well-managed canteens. The weights given of bacon, meat, etc., are of cooked food. If food as purchased is taken as a basis, the weights stated will need to be somewhat increased; 28 grams are equal approximately to one ounce. Certain articles of diet, not included in these meals, have their values; thus, an apple or orange gives 60 to 70 calories, and two ounces of sweet or chocolates give 200 calories.

TABLE V.—SUGGESTED DAILY DIETARY FOR MUNITION WORKERS.

No. 1.

Meal.	Ingredients.	Cost.	Weight in grams.			Calo-ries.	
			Gross.	Dry.			
				Pro-tein.	Fat.		Car-bohy-urate.
Breakfast.....	2 boiled eggs.....	d. 4.0 (8.1)	100	26.2	19.6	107.8	731.7
	3 slices bread, butter and jam	2.0 (4.1)	175				
Dinner.....	Sugar.....	.1 (.2)	10	32.0	52.1	178.4	1,346.0
	Milk.....	.5 (1.0)	30				
	Meat pudding.....	5.0 (10.1)	120				
	Pudding (jam roll).....	2.0 (4.1)	160				
	Potatoes.....	.75 (1.5)	200				
Tea.....	Cabbage.....	1.0 (2.0)	120	11.9	8.6	93.9	527.0
	2 slices bread, butter and jam	2.5 (5.1)	116				
	Piece of cake.....	.5 (1.0)	35				
	Sugar.....	.1 (.2)	10				
Supper.....	Milk.....	.5 (1.0)	30	41.5	23.1	64.2	648.0
	Cold meat.....	3.5 (7.1)	70				
	Cheese.....	1.0 (2.0)	35				
	2 slices bread and butter....	2.0 (4.1)	116				
All meals.....		25.5 (51.8)		111.6	103.4	444.3	3,252.0

No. 2.

Breakfast.....	Bacon, 3 rashers.....	4.0 (8.1)	75	30.0	44.9	109.7	989.5
	Bread, 3 slices, butter and jam.	2.0 (4.1)	172				
Dinner.....	Tomato.....	.5 (1.0)	50	44.3	32.3	122.2	983.0
	Sugar.....	.1 (.2)	10				
	Milk.....	.5 (1.0)	30				
	Roast beef.....	4.0 (8.1)	78				
	Yorkshire pudding.....	1.5 (3.0)	110				
Tea.....	Potatoes.....	.75 (1.5)	200	11.9	8.6	93.9	527.0
	Cabbage.....	1.0 (2.0)	140				
	Apple pie and custard.....	1.5 (3.0)	171				
	2 slices bread, butter and jam	2.5 (5.1)	116				
Supper.....	Cake.....	.5 (1.0)	35	34.9	21.7	67.2	621.1
	Sugar.....	.1 (.2)	10				
	Milk.....	.5 (1.0)	30				
	2 slices bread.....	2.0 (4.1)	116				
	Cheese.....	1.0 (2.0)	35				
All meals.....	Meat.....	2.0 (4.1)	50	121.1	107.5	393.0	3,120.0
	Pickles.....	.5 (1.0)	25				

No. 3.

Breakfast.....	Fried fish.....	4.0 (8.1)	110	31.2	16.6	114.8	752.9
	3 slices bread, butter and jam	2.0 (4.1)	172				
Dinner.....	Sugar.....	.1 (.2)	10	53.6	25.3	158.4	1,101.7
	Milk.....	.5 (1.0)	30				
	Liver.....	3.0 (6.1)	80				
	Bacon.....	1.0 (2.0)	20				
	Potatoes.....	.75 (1.5)	200				
Tea.....	Peas (preserved).....	1.0 (2.0)	134	11.9	8.6	93.9	527.0
	Sago pudding.....	2.0 (4.1)	250				
	2 slices bread, butter and jam	2.5 (5.1)	116				
	Piece of cake.....	.5 (1.0)	35				
Supper.....	Sugar.....	.1 (.2)	10	30.0	8.0	120.0	895.6
	Milk.....	.5 (1.0)	30				
	Irish stew.....	4.0 (8.1)	600				
All meals.....	2 slices of bread.....	1.5 (3.0)	116	126.7	58.5	437.1	3,077.2

TABLE V.—SUGGESTED DAILY DIETARY FOR MUNITION WORKERS—Concluded.

No. 4.

Meal.	Ingredients.	Cost.	Weight in grams.			Calo-ries.	
			Gross.	Dry.			
				Pro-tein.	Fat.		Car-bohy-urate.
Breakfast.....	2 eggs.....	<i>d.</i> 3.0 <i>Cts.</i> (6.1)	110	33.8	50.3	65.3	876.1
	2 rashers bacon.....	3.0 (6.1)	50				
	2 slices bread, butter and jam.....	1.25 (2.5)	112				
	Sugar.....	.1 (.2)	10				
Dinner.....	Milk.....	.5 (1.0)	30	40.0	30.0	101.0	857.0
	Roast beef.....	5.0 (10.1)	110				
	Potatoes.....	.75 (1.5)	182				
	Cabbage.....	.75 (1.5)	77				
Tea.....	Sirup roll.....	1.5 (3.0)	120	16.8	9.6	132.4	700.1
	3 slices bread, butter and jam.....	2.5 (5.0)	175				
	Lettuce or radishes.....	.5 (1.0)	210				
Supper.....	Sugar.....	.2 (.4)	20	28.0	36.2	64.2	718.3
	Milk.....	.5 (1.0)	30				
	2 slices bread and butter.....	2.0 (4.1)	112				
	Ham.....	3.5 (7.1)	60				
	Cheese.....	1.0 (2.0)	35				
All meals.....		26.25 (53.2)		119.5	126.1	362.8	3,151.0

No. 5.

Breakfast.....	1 sausage.....	1.75 (3.5)	60	21.8	27.4	89.0	708.3
	1 rasher bacon.....	1.5 (3.0)	25				
	2 slices bread.....	1.25 (2.5)	116				
	Sugar.....	.1 (.2)	10				
Dinner.....	Milk.....	.5 (1.0)	30	33.4	25.0	132.8	1,002.6
	Roast beef.....	4.0 (8.1)	80				
	Potatoes.....	.75 (1.5)	200				
	Peas.....	1.0 (2.0)	150				
Tea.....	Curant pudding.....	2.0 (4.1)	136	11.9	8.6	93.9	527.0
	2 slices bread, butter and jam.....	2.5 (5.1)	116				
	Sugar.....	.1 (.2)	10				
Supper.....	Milk.....	.5 (1.0)	30	28.9	36.2	64.2	718.3
	1 piece cake.....	.5 (1.0)	35				
	2 slices bread and butter.....	2.0 (4.1)	116				
	Ham.....	3.5 (7.1)	60				
	Cheese.....	1.0 (2.0)	35				
All meals.....		24.0 (48.7)		96.0	97.2	379.9	2,956.2

15. In conclusion, I desire to acknowledge the assistance received by me from Dr. Benjamin Moore, F. R. S., and from Mr. A. Webster (who has carried out many of the analyses).

LEONARD E. HILL.

JULY, 1916.

WASHING FACILITIES AND BATHS.

[Memorandum No. 14.]

1. In a previous memorandum on "Special industrial diseases (No. 8)" the committee have advocated the provision in factories of suitable washing accommodation and lavatories, more especially for

workers engaged on processes in which poisonous materials are manipulated. Though such provision is most needed where poisonous substances are manipulated or where heat, dust, or dirt are present to an unusual degree there is a general agreement that washing is beneficial to the health and efficiency of all workers and that facilities should be provided wherever possible. In France and Belgium provision of this nature has been frequently instituted. Account must also be taken of the beneficial effect upon the self-respect of the worker who is able to leave his employment clean and tidy. There is the further question of the association with his fellow travelers of a man who returns home straight from work from some dusty or dirty employment. A representative trades-unionist stated in evidence before the committee that—

Material improvements in the arrangements for washing are desirable. It would be a great help if a worker could have the opportunity for really washing up and putting himself in a condition to go out with his family without having to return home first. Anything in the nature of evening recreation is rendered almost impossible if a worker has to travel all the way home, perhaps right through the city, and get cleaned up before returning to the city with his family.

Lastly, there is the relation of cleanliness to good health and personal efficiency, a relation which is sufficiently obvious to make any emphasis unnecessary.

2. Experience has shown that when opportunities for washing are provided they are freely used; there may be a short period of inertia at first, but workers have not only no innate desire to be otherwise than clean, but soon bring influence to bear upon any of their fellows who do not avail themselves of the facilities offered. Evidence laid before the committee and reports received from investigators have clearly established the desire of many operatives, especially those engaged in heavy engineering processes, for improved lavatory and washing accommodation.

Thus a medical investigator appointed by the committee who has carried out a prolonged inquiry at eight large engineering factories, reports that in seven facilities for washing were lacking, but that in the one where provision was made full advantage of it was taken by the workers. As regard the others he reports: "Many complaints were made by the workmen and many expressions of hope were heard that a remedy for the present condition will be found," and almost without exception it was stated by these men how much advantage was to be gained from the freshness resulting after a "good swill." The same investigator adds that on the Continent at a factory belonging to one firm visited every provision for washing is made for operatives engaged at hot and dusty processes. "Individuals who have returned told me that hot and cold shower baths are provided and very freely made use of, and that the workmen leave the premises spick and span, frequently clad in flannels in summer, so giving the impression they are going to a tennis party. They are much envied by the worker at home, and the suggestion was made that the same facilities should be provided

at home as for the continental worker. Questions of washing accommodation in the home may come under discussion, but nevertheless the craftsman expresses himself forcibly and sometimes bitterly upon the indignity of having to leave his work in such a grimy condition. The pleasure of changing into clean and dry clothing after a heavy day's work is considerable."

An employer at another munitions center informed the committee that—

Spray baths are provided for the foundrymen, who number about 100. Tickets can be bought at the rate of 10 for 3d. (6 cents) ; this charge includes the use of towel and soap. Seven minutes out of working hours are allowed each man in the foundry to wash thoroughly before stopping time. Though the foundrymen are not in any way specially selected they use the spray baths greatly, especially in summer.

A representative of the National Federation of Blast Furnacemen has informed the committee that not more than 5 per cent of the members of his union have a house with five or six rooms and a bath. "In Lancashire and South Yorkshire many are living in houses of three small rooms with no scullery. Considering the dirty state into which the men's bodies and clothing get when working, baths should be general."

WASHING FACILITIES.

3. *Lavatories.*—Where washing accommodation has been provided, inspection has shown that sufficient attention is seldom paid to details of construction. Frequently the details seem to have been left to a building contractor with no special knowledge of the hard usage to which fittings are subjected under the conditions of industrial life; as a result lavatories, though adequate when new, may quickly fall into disrepair. Separate basins, originally provided with plugs attached by chains, are found with the chains broken, the plugs lost, and the waste pipes stuffed up with rags. Walls against which basins are fixed, unless protected by an enameled surface, soon become splashed with soap suds, and present an uninviting aspect which can not be easily or quickly improved. Waste pipes are often too narrow for convenient cleansing or contain sharp bends and angles, and consequently become blocked or broken.

Insufficient provision is often made for draining the lavatory floor, which possibly through bad construction becomes uneven and the site of pools of dirty water. The floor should be smooth, hard, impervious, and properly sloped and graded. Nailbrushes and soap, even though frequently renewed, disappear, and thus involve a constant source of annoyance and expense. These troubles may be largely overcome by adhering to certain principles in construction. The installation should be—

- (a) As simple as possible in construction and arrangement;
- (b) Strong and durable, able to withstand considerable wear and tear;
- (c) Sufficient and suitable in accommodation so that a large number can wash together or in a short time;¹
- (d) Economical in space;
- (e) So constructed that it can be easily cleaned and contain a minimum of removable or detachable articles;
- (f) Provided with an ample supply of water (hot and cold); and
- (g) So situated in the factory as to be fairly available to all for whom it is provided.

4. Where difficulties arise in regard to the use of ordinary lavatory basins they may in certain cases be overcome by using a washing trough. There the necessary plumbing is reduced to a minimum; there is no plug; washing is done under a spray of water; the waste pipe opens directly over the drain; and the drain itself is flush with the floor, which is sloped toward it. The trough stands in the center of the room, free from the walls, and the wall space can be used for cloak-room accommodation, whether hooks or lockers. A useful modification of the water supply is to have only two spray taps for occasional use, and a series of flush holes in both sides of the water pipe, the supply to which is controlled by a cock on the far side of the taps. This cock is turned on just before the operatives come to wash at the close of each spell of work. Arrangements can be made for controlling the temperature of the water. Where space is limited, say near the exit of a bit engineering shop, a more compact installation may be used. This may take the form of a large circular basin with spray taps radiating from a central supply pipe coming down from above, and with an open pipe in the center for carrying off the waste water to a drain in the floor. Wherever spray taps are used, advantage is gained by so arranging the height and position of the taps that a douche bath for the head, neck, and arms can be taken if desired.

5. *Nailbrushes*.—The difficulty occasioned by the disappearance of nailbrushes may be overcome by having large brushes made and

¹ The standard adopted under factory regulations is as follows. The washing conveniences should be under cover, and maintained in a cleanly state and in good repair. There should be either—

- (a) A trough with a smooth impervious surface (fitted with a waste pipe without plug), and of such length as to allow at least 2 feet for every five persons, and having a constant supply of water from taps or jets above the trough at intervals of not more than 2 feet; or
- (b) At least one lavatory basin for every five persons, fitted with a waste pipe and plug, or placed in a trough having a waste pipe, and having either a constant supply of hot and cold water or warm water laid on, or (if a constant supply of heated water be not reasonably practicable) a constant supply of cold water laid on, and a supply of hot water always at hand when required for use by persons employed.

fixed in position so that they can drain into the trough. In use the hand is rubbed against such brushes instead of the usual reverse process. In a number of factories stout nailbrushes are provided attached to the washing troughs by chains, and on the whole this plan appears to work satisfactorily.

6. *Soap*.—Soap may be supplied economically in small boxes, about 4 inches square, kept locked and fixed in convenient positions above the trough, say on or near the water pipe; the soap of the consistency of butter or jelly is obtained by inserting a finger into a round hole in the bottom of the box. Each day the attendant fills up the box. Soap for use in this way can be obtained in powder form which sets to a jelly on the addition of water; by buying soap thus in powder form the cost of carriage is diminished. Alternatively, the soap may be served out as a powder placed in a flour dredger chained to the trough. One point, however, should be borne in mind, the natural oil of the skin and hair may be removed by the use of strong alkaline soaps; if such soaps are used, as may be necessary to cleanse hands soiled with oil and grime in engineering works, then some ointment, glycerine, or lanoline should be employed after washing to restore the suppleness of the skin. Without this precaution the skin may become dry and cracked, and so be unable to resist bacterial infection, when dermatitis results.

7. *Towels*.—The supply of clean, dry towels should be adequate; for this purpose it is desirable that—

(a) A towel at least five square feet in area should be provided for each worker, and should be renewed or washed daily; or

(b) One roller towel fastened in position, at least 15 square feet in area, should be provided for every three workers, and should be renewed or washed daily; or should be provided for every nine workers and should be washed or renewed after every mealtime and at the close of the day's work.¹

The provision of separate towels is preferable, partly because the danger of infection is minimized, and partly because each worker thus obtains a dry towel.

BATHING FACILITIES.²

8. *Baths*.—In addition to ordinary washing accommodation, the provision of bathing facilities is desirable for workers in many industries, especially those exposed to great heat and excessive dust, and those brought into contact with poisonous material. Where men are employed under conditions of great heat baths may prove an effective antidote to muscular rheumatism. For men, the simplest

¹ These suggestions are identical with the requirements of the Home Office order for the manufacture and decoration of pottery.

² Reference may be usefully made to the report of the Departmental Committee on Washing and Drying Accommodations at Mines. (Cd. 6724, 1913.)

and at the same time the cheapest and most efficacious installation is that of shower or douche baths. The stimulating effect on the skin of the falling water is greater than is obtained by total immersion. Douche baths have been strongly recommended for use by coal miners, and have been installed with success in many factories. For women, ordinary shower baths are less applicable, because of the difficulty of keeping the hair dry or of drying it after bathing; a horizontal spray fixed at the level of the shoulders, or obtained from a movable nozzle or ring on a flexible tube, overcomes this objection. Such arrangement may also be found preferable for men.

The number of baths should be sufficient to enable a worker to have a bath at any time without appreciable delay.

9. *Cubicles*.—The cubicles in which the baths are placed should be arranged to secure privacy. In order to reduce the time which each worker spends in the cubicle it may be possible to arrange for the workers to dress and undress partly outside the cubicle, but at any rate, in the case of women, some provision for dressing, including a seat and pegs, must be provided inside the cubicle. Where this is done the size of the cubicle should not be less than 3 feet wide by 4 feet deep. The walls should ordinarily not be less than 6 feet high. A space should be left between the floor and the walls of the cubicles sufficient to permit of drainage and cleaning.

10. *Cleaning*.—The building and fittings should be so constructed as to facilitate the maintenance of absolute cleanliness. Square corners, ledges, or rough inner surfaces should be avoided. Wood should be used only for seats, and for this purpose hardwood should be employed with spaces between the wood for ventilation. The walls and partitions (and this applies also to lavatories and sanitary conveniences) should always have smooth and curved surfaces which can be readily washed down and can not be used for writing on. Enamel tiles and bricks or enamel metal sheets may be used for this purpose; any initial cost thus incurred is soon recouped by saving in cleaning and lime washing.

11. *Water*.—The water used should be of adequate purity and should not be liable to cause injury to the health of the workers or to yield effluvia. It will generally be found preferable for the temperature of the water to be regulated by an attendant rather than for the temperature of each bath to be regulated separately by the worker. A temperature of about 100° F. is usual. A thermometer should be placed in a convenient position so that the attendant can readily correct variations of temperature.

12. *Soap and towels*.—A simple and economical method of supplying soap is to provide small tablets sufficient for one bath. A convenient size for towels is 25 inches by 60 inches. When the baths

are used by a large number of workers it may be found convenient and economical to provide a small laundry for washing them.

13. *Drying of clothes.*—The conditions of employment which render the provision of baths specially important often also make it desirable that facilities should be available for the drying of clothes. If only cloakroom pegs or lockers are provided for the damp clothes, hot water pipes should be placed immediately beneath them. A preferable plan where a large amount of clothing has to be dried is to suspend the clothes from the roof of the building by a chain or string securely fastened at the lower end. The heat of the building produced by the hot water pipes for the baths causes a good ventilation in the roof which satisfactorily dries the clothes and prevents any disagreeable odor. The interior of the building may with advantage be maintained at a level temperature of about 70° F. This adds to the comfort of the workers and effectively dries the clothes. Ventilation can be obtained by the provision of ventilators in the roof or by the use of fans.

14. The maintenance of any installation provided is almost as important as its construction. This should be made the definite duty of an appointed officer acting under the welfare supervisor, who should keep the lavatory clean, control the supply of nailbrushes and soap, and arrange that dry clean towels are available. Such an officer may also usefully be employed in attending to the sanitary conveniences, and in supervising the cloakroom. While the ultimate responsibility for upkeep must rest with the employer, it may be found, at any rate in the case of baths, that the workers may, with advantage, be encouraged to participate in the management by a special committee or otherwise. The question of the payment to be made for baths will also need careful consideration; in some cases at any rate the workers may prefer to make some small payment. Where periodic baths are of special benefit to health and efficiency, it is found desirable to allow workers time for bathing within working hours.

Signed on behalf of the committee,

GEORGE NEWMAN, M. D., *Chairman.*

E. H. PELHAM, *Secretary.*

AUGUST, 1916.

APPENDIX.

CONTENTS OF OTHER BULLETINS RELATING TO LABOR IN GREAT BRITAIN AS AFFECTED BY THE WAR.

- Bulletin No. 221.** Hours, fatigue, and health in British munition factories.
- Introduction.
 - Summary of the committee's conclusions.
 - Sunday labor (Memorandum No. 1).
 - Hours of work (Memorandum No. 5).
 - Output in relation to hours of work (Memorandum No. 12), report by H. M. Vernon, M. D.
 - Industrial fatigue and its causes (Memorandum No. 7).
 - Sickness and injury (Memorandum No. 10).
 - Special industrial diseases (Memorandum No. 8).
 - Tetrachlorethane poisoning (report of the British medical inspector of factories).
 - Dope poisoning (leaflet issued by the British factory inspector's office).
 - Ventilation and lighting of munition factories and workshops (Memorandum No. 9).
 - Effect of industrial conditions upon eyesight (Memorandum No. 15).
 - British treasury agreement as to trade-union rules affecting restriction of output.
 - Munitions of War Act, 1915, relating to labor disputes and restoration of trade-union conditions after the war.
 - Munitions of War (Amendment) Act, 1916.
 - Munitions tribunals (provisional) rules for constituting and regulating munitions tribunals in England and Wales.
 - Compulsory arbitration in munitions industry in France.
- Bulletin No. 223,** Employment of women and juveniles in Great Britain during the war.
- Introduction.
 - Summary of the committee's conclusions.
 - Replacement of men by women in industry in Great Britain.
 - Extension of employment of women in Great Britain in 1916.
 - Employment of women (Memorandum No. 4) in Great Britain.
 - Migration of women's labor through the employment exchanges in Great Britain.
 - Employment and remuneration of women in Great Britain—munitions orders.
 - Output of munitions in France.
 - Regulations as to wages of workers in munitions factories in France.
 - Juvenile employment (Memorandum No. 13) in Great Britain.
 - Juvenile employment committees in Great Britain.
 - Employment of women and boys in munition work in Italy.

**ADDITIONAL MATERIAL RELATING TO LABOR IN FOREIGN
COUNTRIES AS AFFECTED BY THE WAR.**

WOMEN IN INDUSTRY.

- Woman's war work in Great Britain. Summary of British War Office report on woman's war work. (London, Sept., 1916. 92 pp. 72 illustrations.)
(In MONTHLY REVIEW, Dec., 1916. pp. 88-92.)
- Employment of women on munitions of war. Summary of Ministry of Munitions pamphlet, entitled "Notes on the Employment of Women on Munitions of War, with an Appendix on Training of Munition Workers." (London, 1916. 94 pp., ill.)
(In MONTHLY REVIEW, Sept., 1916. p. 105.)
- Employment of women in retail stores. Summary of reports of the shops committee appointed by the secretary of state for the home department to consider the conditions of retail trade which can best secure that the further enlistment of men or their employment in other national service may not interfere with the operations of that trade. (London, 1915. 10 pp.)
(In MONTHLY REVIEW, July, 1916. pp. 162, 163.)

LABOR CONDITIONS AND LEGISLATION.

- Effect of the war upon railway labor in Great Britain. Article based on report of the general secretary of the National Union of Railwaymen in Great Britain, 1916.
(In MONTHLY REVIEW, Aug., 1916. pp. 81, 82.)
- Proposed Ministry of Labor in Great Britain. Article based on proceedings of British Trades-Union Congress, September 6 to 11, 1915.
(In MONTHLY REVIEW, Aug., 1916. pp. 82, 83.)
- Report of the chief inspector of factories and workshops. Summary of annual report of British factory inspector's office for 1915 (London, 1916. 15 pp.)
(In MONTHLY REVIEW, Dec., 1916. pp. 121-123.)
- Extension of unemployment insurance in Great Britain.
(In MONTHLY REVIEW, Nov., 1916. pp. 65-68.)
- Labor in Great Britain after the war. Resolutions of conference of representatives of capital and labor held in London, January, 1917.
(In MONTHLY REVIEW, Mar., 1917. pp. 479, 480.)
- Industrial unrest in Great Britain. Summary of Chapter II of Labor, Finance, and the War, edited by A. W. Kirkaldy. Published by authority of the Council of the British Association for the Advancement of Science. (London, 1916.)
(In MONTHLY REVIEW, Apr., 1917. pp. 520-525.)
- New Ministries in the British cabinet.
(In MONTHLY REVIEW, May, 1917. pp. 769, 770.)
- Minimum wage law in France. •
(In MONTHLY REVIEW, Dec., 1915. pp. 36-41.)
- Chinese labor in France. Summary of article by "S. G. C., a Chinese correspondent," in the New Statesman, January 13, 1917. p. 343.
(In MONTHLY REVIEW, Mar., 1917. pp. 480, 481.)
- Compulsory arbitration in Norway.
(In MONTHLY REVIEW, Sept., 1916. pp. 78, 79.)

- Great Britain: The Public General Acts, 1914-16, London. Printed for F. Atterbury, King's Printer of Acts of Parliament, by Eyre & Spottiswoode, Ltd., 1916. XII, 459 pp. Price, 3s.
- Great Britain: Manual of Emergency Legislation, comprising all of the acts of Parliament, proclamations, orders, etc., passed and made in consequence of the war to September 30, 1914. Edited by Alexander Pulling, London. Printed for F. Atterbury by Darling & Son, Ltd., September, 1914. XI, 572 pp. Price, 3s. 6d.
- Great Britain: Supplement No. 1, to November 2, 1914, to the Manual of Emergency Legislation. November, 1914. VII, 54 pp.
- Great Britain: Supplement No. 2, to December 15, 1914, incorporating and Great Britain: Supplement No. 4, to August 31, 1915, in continuation of supplement December, 1914. XIII, 217 pp. Price, 1s. 6d.
- Great Britain: Supplement No. 3, to April 30, 1915, in continuation of Supplement No. 2 to the Manual of Emergency Legislation. May, 1915. XVIII, 219 to 697 pp. Price, 2s. 6d.
- Great Britain: Supplement No. 4 to August 31, 1915, in continuation of supplement No. 3 to the Manual of Emergency Legislation. September, 1915. XXVII, 462 pp. Price, 2s. 6d.
- Great Britain: Manual of Emergency Legislation, Defense of the Realm Regulations made to May 23, 1916. Second edition. London. Printed for F. Atterbury by Darling & Son, Ltd., 1916. X, 102 pp., ill.
- Canada: Copies of proclamations, orders in council, and documents relating to the European war; compiled by the department of the secretary of state of Canada. Ottawa, Government Printing Bureau, 1915. XX, 209 pp.; appendixes, 142 pp.
- Canada: First supplement to copies of proclamations, orders in council and documents relating to the European war. Ottawa, 1915. XXXII, 526 pp.; appendixes, 350 pp.
- Canada: Second supplement to copies of proclamations, orders in council, and documents relating to the European war. Ottawa, 1916. LXVI, 527 to 1050 pp.; appendixes, 351 to 537 pp.
- Canada: Order in council of March 23, 1916, for the extension of the provisions of the industrial disputes investigation act, 1907, other than section 63, to include employers and employees engaged in the construction, production, repairing, manufacture, transportation and delivery of ships, vessels, works, buildings, munitions, ordnance, guns, explosives, and materials and supplies for the use of the military or naval forces.
- Canada: Order in council of November 10, 1916, respecting the high cost of living, as amended by order in council of November 29, 1916.
- Canada: Sessional Paper No. 35a. The provision of employment for members of the Canadian expeditionary force on their return to Canada, and the re-education of those who are unable to follow their previous occupations because of disability. A plan submitted by the secretary of Military Hospitals and Convalescent Homes Commission, together with appendices dealing with similar work in England and on the Continent of Europe. Ottawa, 1915. 53 pp.
- Canada: Sessional Paper No. 185. Pensions granted and money allowances made to members of the Canadian expeditionary force since beginning of war, to February 16, 1916. Ottawa, 1916. 83 pp.
- Canada: Ministry of Agriculture. Patriotism and production more than usual. Agricultural war book. Ottawa, January, 1915. 157 pp.

GOVERNMENT REGULATION OF INDUSTRIES AND COMMODITIES.

Restrictions on output of textile establishments in Germany. Article based on material in Reichs-Arbeitsblatt, November, 1915; Soziale Praxis, November 11, 1915.

(In MONTHLY REVIEW, April, 1916. pp. 81, 82.)

Government control of food supplies in Great Britain.

(In MONTHLY REVIEW, March, 1917. pp. 390-407.)

Government control of food supplies in France.

(In MONTHLY REVIEW, April, 1917. pp. 525-533.)

Government control of coal mines in Great Britain.

(In MONTHLY REVIEW, April, 1917. pp. 533, 534.)

Government control of food supplies in Germany.

(In MONTHLY REVIEW, May, 1917. pp. 702-726.)

Government control of food supplies in Italy.

(In MONTHLY REVIEW, May, 1917. pp. 726-743.)

WAGES.

Wages of miners in Germany during the first year of the war. Article based on material in Soziale Praxis, Berlin, 1915, Vol. XXV, No. 4, October 28, 1915, p. 89.

(In MONTHLY REVIEW, April, 1916. pp. 80, 81.)

Minimum wage law in France.

(In MONTHLY REVIEW, December, 1915. pp. 36-41.)

New regulations as to wages of workers in munitions factories in France.

Text of decree issued by minister of munitions on January 17, 1917.

(In MONTHLY REVIEW, March, 1917. pp. 362-365.)

PRICES.

Foreign food prices as affected by the war.

In Bulletin No. 170 of the U. S. Bureau of Labor Statistics.

(May, 1915.) Also, summarized in MONTHLY REVIEW, July, 1915. pp. 42-44.)

Increase in retail prices of coal in Great Britain. Summary of British Board of Trade report of departmental committee to inquire into the causes of the present rise in the retail prices of coal sold for domestic use. (London, 1915.)

(In MONTHLY REVIEW, July, 1915. pp. 45-56.)

Retail prices in foreign countries.

(In MONTHLY REVIEW, September, 1915, pp. 46-57; October, 1915, pp. 44-49; December, 1915, pp. 44-53; March, 1916, pp. 80-85; July, 1916, pp. 80-91; November, 1916, pp. 49-60; February, 1917, pp. 244-251.)

Increase in prices of commodities in Great Britain, 1916. Summary of interim report on meat, milk, and bacon of British Board of Trade Departmental Committee on Prices. (London, 1916. 20 pp.)

(In MONTHLY REVIEW, January, 1917. pp. 51-56.)

Wholesale prices in Great Britain.

(In MONTHLY REVIEW, April, 1917. pp. 586-588.)

EMPLOYMENT.

Employment conditions in foreign countries.

(In MONTHLY REVIEW, July, 1915, pp. 60-80; August, 1915, pp. 16-20; October, 1915, pp. 49-52; December, 1915, pp. 56-71; March, 1916, pp. 86-89; July, 1916, pp. 92-98; January, 1917, pp. 136-149.)

Land settlement and unemployment in England. Summary of introduction and Part I of the final report of the British departmental committee appointed by the president of the Board of Agriculture and Fisheries to consider the settlement or employment on the land in England and Wales of discharged sailors and soldiers. (London, 1916, 30 pp. fold. chart.)

(In MONTHLY REVIEW, April, 1916, pp. 11-13.)

Employment of discharged soldiers and sailors on the land in Great Britain. Summary of Part II of the final report of the British departmental committee appointed by the president of the Board of Agriculture and Fisheries to consider the settlement and employment on the land in England and Wales of discharged sailors and soldiers. (London, 1916, 39 pp.)

(In MONTHLY REVIEW, September, 1916, pp. 87-90.)

INDUSTRIAL DISEASES.

A nonpoisonous dope for airplanes. Parliamentary statement by British War Office and Admiralty.

(In MONTHLY REVIEW, January, 1917. pp. 97-98.)

INDUSTRIAL FATIGUE.

Some new studies of industrial fatigue. Summary of the following reports:

Interim Report on an Investigation of Industrial Fatigue by Physiological Methods, by A. F. Stanley Kent, Professor of Physiology in the University of Bristol. Great Britain, Home Department, London, August 1915, 34 pp. [Cd. 8056.]

Second Interim Report on an Investigation of Industrial Fatigue by Physiological Methods, by A. F. Stanley Kent, Professor of Physiology, University of Bristol. Great Britain, Home Department. London, August, 1916. 76 pp., 18 charts. [Cd. 8335].

The question of Fatigue from the Economic Standpoint. Interim report of the committee, consisting of Prof. J. H. Muirhead (chairman), Miss B. L. Hutchins (secretary), Mr. P. Sargent Florence (organizing Secretary), Miss A. M. Anderson, Prof. Bainbridge, Mr. E. Cadbury, Prof. Chapman, Prof. Stanley Kent, Dr. Maitland, Miss M. C. Matheson, Mrs. Meredith, Dr. C. S. Myers, Mr. C. K. Ogden, Mr. J. W. Ramsbottom, and Dr. J. Jenkins Robb. Report submitted at the Manchester meeting of the British Association for the Advancement of Science in 1915. Manchester, 1915. 67 pp.

The Question of Fatigue from the Economic Standpoint. Second interim report of the committee. Report submitted at the Newcastle meeting of the British Association for the Advancement of Science. Newcastle, 1916. 24 pp.

(In MONTHLY REVIEW, December, 1916. pp. 97-105.)

WELFARE WORK.

Welfare work in Great Britain. Summary of book on Welfare work: Employers' experiments for improving welfare work in factories, by E. Dorothea Proud. (London, G. Bell & Sons (Ltd.), 1916. xvii, 363 pp. 7s. 6d. net.)

(In MONTHLY REVIEW, December, 1916. pp. 81-88.)

COAL MINING INDUSTRY.

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