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U. S. Department of Labor
Bureau of Labor Statistics.

1. Industrial Health And Efficiency.
(Final Report of The British
Health of Munition Workers'
Conference.) 1919.
X9(MV4;3):943
2. Industrial Efficiency And Fatigue
in British Munition Factories. 1917.
X9(MV4;3):94.3
3. Hours, Fatigue, And Health in
British Munition Factories. "
X9(MV4;3):94-3
4. Welfare Work in British Munition
Factories. "
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PREFACE.

This bulletin is the fourth 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 and other publications issued by the British Health of Munition Workers Committee is of such interest and importance that their publication is continued in this bulletin, which contains an interim report on industrial efficiency and fatigue and two memoranda bearing on the health of munition workers.

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, a second bulletin (Bulletin 222) contains memoranda relating to welfare supervision and welfare work, while a third bulletin (Bulletin 223) contains reprints of official and unofficial documents 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.

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The matter contained in the reports and memoranda issued by the British Health of Munition Workers Committee is of such interest and importance that the documents relating to hours, fatigue, and occupational diseases are reproduced in full in this bulletin.

Later bulletins will contain documents, official and nonofficial, dealing with welfare work and the employment of women and juveniles and such related documents, either official or nonofficial, as are of sufficient interest and importance to warrant reprinting or summarizing in bulletin form.

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.

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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.

U. S. DEPARTMENT OF LABOR
BUREAU OF LABOR STATISTICS

ROYAL MEEKER, Commissioner

BULLETIN OF THE UNITED STATES }
BUREAU OF LABOR STATISTICS } No. 249

LABOR AS AFFECTED BY THE WAR SERIES

INDUSTRIAL HEALTH
AND EFFICIENCY

FINAL REPORT OF THE BRITISH
HEALTH OF MUNITION WORKERS'
COMMITTEE

31



FEBRUARY, 1919

WASHINGTON
GOVERNMENT PRINTING OFFICE
1919

PUBLICATIONS OF THE BUREAU OF LABOR STATISTICS.

The publication of the annual and special reports and of the bimonthly bulletins was discontinued in July, 1912, and since that time a bulletin has been published at irregular intervals. Each number contains matter devoted to one of a series of general subjects. These bulletins are numbered consecutively, beginning with No. 101. Up to No. 236 they also carried consecutive numbers under each series. Beginning with No. 237 the serial numbering has been discontinued. A complete list of the reports and bulletins of the Bureau will be furnished on application.

A list of the series now issued by the Bureau is as follows:

- Wholesale Prices.
- Retail Prices and Cost of Living.
- Wages and Hours of Labor.
- Employment and Unemployment.
- Women in Industry.
- Workmen's Insurance and Compensation (including laws relating thereto).
- Industrial Accidents and Hygiene.
- Cconciliation and Arbitration (including strikes and lockouts).
- Labor Laws of the United States (including decisions of courts relating to labor).
- Foreign Labor Laws.
- Vocational Education.
- Labor as Affected by the War.
- Miscellaneous Series.

LABOR AS AFFECTED BY THE WAR.

The present bulletin is the second in the new series on "Labor as affected by the war." The following bulletins, published since July 1, 1912, contain matter relating to the subject:

- Bul. 170, May, 1915. Foreign food prices as affected by the war.
- Bul. 219, May, 1917. Industrial poisons used or produced in the manufacture of explosives.
- Bul. 221, April, 1917. Hours, fatigue, and health in British munition factories.
- Bul. 222, April, 1917. Welfare work in British munition factories.
- Bul. 223, April, 1917. Employment of women and juveniles in Great Britain during the war.
- Bul. 230, July, 1917. Industrial efficiency and fatigue in British munition factories.
- Bul. 237, October, 1917. Industrial unrest in Great Britain.

PREFACE.

This bulletin reproduces in full the final report of the British Health of Munition Workers Committee, and completes the group of bulletins which the Bureau of Labor Statistics of the United States Department of Labor undertook to publish 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 first bulletin (Bulletin 221) published in compliance with the foregoing resolution 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. The second bulletin (Bulletin 222) contains memoranda relating to welfare supervision and welfare work. The third bulletin (Bulletin 223) contains reprints of official and unofficial documents dealing with the employment of women and juveniles. The fourth bulletin (Bulletin 230) includes the interim report of the Health of Munition Workers Committee on industrial efficiency and fatigue, which sets out the result of a number of investigations which had been made for the committee. The final report of the committee, reprinted in this bulletin, gives a concise survey of the problems set forth in the various memoranda of the committee covered in the above bulletins.

It is believed that these bulletins, published at the request of the Council of National Defense, will be of great service alike to employers and workers in this country because they give the experience of Great Britain in dealing with labor in the production of the largest quantity of munitions in the shortest space of time—an experience which offers many suggestions capable of practical application in the promotion of peace time industry.

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 appendixes dealing with similar work in England and on the Continent of Europe.** Ottawa, 1915. 58 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:
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