Report on the work of inspectors of foods for the year 1911-12 / being a report by A.W.J. MacFadden.

FOR OFFICIAL USE.

EXTRACT

FROM THE ANNUAL REPORT OF THE

MEDICAL OFFICER

OF

THE LOCAL GOVERNMENT BOARD

For 1911-12.

REPORT ON THE

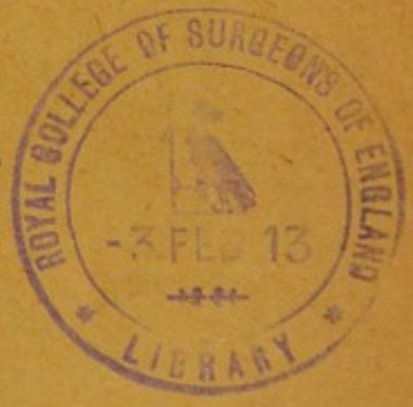
WORK OF INSPECTORS OF FOODS

For the Year 1911-12.

BEING

A REPORT BY

A. W. J. MACFADDEN, M.B.



LONDON:
PUBLISHED BY HIS MAJESTY'S STATIONERY OFFICE.
To be purchased, either directly or through any Bookseller, from
WYMAN AND SONS, LIMITED, FETTER LANE, E.C., and
54, ST. MARY STREET, CARDIFF; or
H.M. STATIONERY OFFICE (SCOTTISH BRANCH),
23, FORTH STREET, EDINBURGH; or
E. PONSONBY, LIMITED, 116, GRAFTON STREET, DUBLIN;
or from the Agencies in the British Colonies and Dependencies,
the United States of America, the Continent of Europe and Abroad of
T. FISHER UNWIN, LONDON, W.C.

PRINTED BY
DARLING AND SON, LTD., BACON STREET, E.
1913.

Price Twopence.

With Dr. MacFadden's compliments.

LOCAL GOVERNMENT BOARD,
WHITEHALL,
LONDON, S.W.

EXTRACT FROM THE REPORT OF THE MEDICAL OFFICER.

TO THE RIGHT HONOURABLE JOHN BURNS, M.P., PRESIDENT OF THE LOCAL GOVERNMENT BOARD.

SIR,

I HAVE the honour to submit a record of the work carried out in the Board's Medical Department in 1911-12.

* * * * * * *

Work of Inspectors of Foods.

The work which has been carried out during the year in the food inspection branch of the medical department is reported on by Dr. MacFadden, on p. 161. The inspectors of foods have visited the principal food-importing ports and made local inquiries respecting the examination and control of imported foods under the Board's food regulations. They have found that, speaking generally, the work of administering the regulations is proceeding smoothly and satisfactorily. The improvement previously noted in the condition of food arriving at the ports continues to be maintained, and, although it is still found necessary to direct special attention to the examination of Australian beef with a view to ascertaining its condition as regards onchocerciasis, the work of inspection for this purpose has been lessened owing to the greater attention given to the examination of the meat in Australia. The condition as regards disease of offal imported from Argentina, has not been satisfactory, and the Board have made representations through the Foreign Office to the Argentine Government on the subject.

Dr. Farrar while in China in connection with the Chinese Plague Commission was instructed to make inquiries regarding the methods of production of Chinese pork exported to this country. His report on the inquiry has been published.

In some comments on the investigation of cases of bacterial food poisoning Dr. MacFadden lays stress on the necessity for prompt inquiry into the circumstances of these occurrences and on the importance of preserving for bacteriological examination samples of what remains over of the suspected food. It often happens that materials which would be of prime importance in throwing light on the cause of an outbreak are promptly destroyed as soon as they have come under suspicion of being the cause of illness.

In connection with local inquiries into arrangements for meat and food inspection Dr. MacFadden again refers to the drawbacks met with in some districts where good administrative measures for controlling the wholesomeness of the food supply are sometimes discounted largely by conditions prevailing in surrounding districts,

(27106r—21.) Wt. 27288—354. 875. 12/12. D & S.

and he refers also to the difficulties encountered in dealing with the trade in meat, derived from "wasters" and other diseased animals.

Several reports by inspectors of foods were issued during the year, relating to matters affecting administration of the Sale of Food and Drugs Acts, and involving also considerations of public health. In his report on flour Dr. Hamill points out that the chemical and other treatment to which much of the flour sold in this country is subjected must be regarded with considerable apprehension. Legislation would appear to be necessary to enable these practices to be dealt with effectively, and the Board have the question under their consideration. The desirability of making regulations under the Public Health (Regulations as to Food) Act, 1907, dealing with the matters to which Dr. Coutts called attention in his report on condensed milk is also under consideration. Inquiries into other forms of prepared foods for infants are now in progress. Regulations under the 1907 Act, prohibiting the addition of preservatives to milk and controlling their employment in cream, have already been issued.

* * * * * * *

I have the honour to be,

Sir,

Your obedient Servant,

ARTHUR NEWSHOLME.

Appendix A, No. 7.

Report by Dr. A. W. J. MacFadden on the Work of Inspectors of Foods during the Year 1911–12.

The report now submitted on the work of the Inspectors of Foods is arranged under the following headings :—

1. Work in special relation to the Public Health (Regulations as to Food) Act, 1907.
2. Local arrangements for food inspection.
3. Bacterial food poisoning.
4. Work in relation to the Sale of Food and Drugs Acts.

Addenda : Circular and Memorandum, 1911.

1. Work in Special Relation to the Public Health (Regulations as to Food) Act, 1907.

Inspections have been made during the year at the majority of the principal food importing ports in England and Wales in connection with the administration of the Public Health (Foreign Meat) and the Public Health (Unsound Food) Regulations, 1908.

As has been pointed out in previous reports it is important in the interests of public health and also of trade that the administration of the regulations should be carried out uniformly so far as possible at the various ports, and at their visits inspectors have continued to direct attention to this need. The work under the regulations has been found to be proceeding satisfactorily. The staffs of assistant officers at the various ports have been maintained and in certain instances additional assistant officers have been appointed when this has been found to be necessary.

During the period of the transport strike in August and for some time afterwards considerable strain was thrown on the staffs of the larger ports in connection with the supervision of the great quantity of perishable food materials involved. The arrangements made to cope with the situation appear to have been adequate.

Foreign Meat Regulations.

Improvement continues to be maintained in the character as regards soundness and freedom from disease of meat imported from abroad. The difficulties with regard to inspection on importation of Australian beef affected with onchocerciasis, referred to in the annual report for last year, have been lessened considerably in consequence of the greater attention which has been given to examination of the meat in Australia. It has been found, however, still to be necessary to maintain a somewhat close examination of hind quarters, and where inspection in this country has revealed the presence of nodules the facts have been communicated to the High Commissioner for the Commonwealth. It may be mentioned that the Commonwealth Government have now appointed a veterinary surgeon, Mr. C. Cummins Cherry, B.V.Sc. (Melbourne), to be attached to the High Commissioner's Office. This appointment

should provide an additional means of control in regard to Australian meat imported into the United Kingdom.

The methods of packing offal (livers, kidneys, lungs, &c.) exported to the United Kingdom from the great meat producing countries have much improved since the regulations came into force. Improvement in the condition of these materials as regards disease is not however so satisfactory and inspectors at the various ports have found it necessary to condemn a somewhat high percentage of ox livers especially of those imported from South America. The Board made representations in regard to this matter through the Foreign Office to the Argentine Government who have now appointed a veterinary surgeon, Dr. E. E. Castillo, to reside in this country, with a view to enabling a stricter supervision to be exercised over Argentine meat products exported to the United Kingdom.

Reference is made in the last annual report to the unsatisfactory character of some of the meat imported from the Continent *via* German ports. Port sanitary authorities continue to pay special attention to the matter, and the authorities at the port of Grimsby had occasion during the year to condemn a number of tuberculous sides and quarters of beef and also beef offal which arrived at that port from Hamburg and Cuxhaven. The strict attention which is being paid to imports of this class will no doubt have the effect of discouraging this trade.

Treatment of refrigerated meat by formaldehyde.—Inspectors of foods still continue to take samples of refrigerated meat treated by the formaldehyde process. The use of this process has been discontinued in the case of meat coming from Australia, and at present appears to be confined to meat arriving from Argentina. During the year samples were taken on five occasions. In all but one of the samples the results of analyses showed that the importers had maintained the improvement previously noted in regard to the amount of formaldehyde taken up by the meat. In one case the amounts found indicated that a considerable excess of formalin had been employed in the process. Further inquiries were made in regard to this case, and it was ascertained that the engineer responsible for the application of the process on board ship had misread his instructions in the matter. The importing firm have taken measures to prevent a recurrence of the mistake which had been made.

Official certification of imported pork.—Reference has been made in previous reports to the arrangements which have been made with certain foreign and colonial governments in regard to the official certification of pork in accordance with the requirements of the Foreign Meat Regulations (Art. 1 (*h*)). As the Government of the Commonwealth of Australia has taken over from the States control of the inspection of all meat for export, the Board have now recognised an official certificate provided by the Commonwealth Government which supersedes those which were previously in force for the separate States.*

Chinese pork.—The opportunity was taken of Dr. Farrar being in China in connection with the Chinese Plague Commission, to have some enquiries made on behalf of the Board into the export of Chinese pork to this country. Dr. Farrar's report on the subject was issued in October, 1911.† He found that pork was being exported

---

* See Addendum A., p. 176.

† Food Reports, No. 16. On Inquiries in China and Siberia respecting Pork and Bacon Exported to England (Dr. Reginald Farrar). Wyman & Sons, Ltd., Price 4*d*.

to England from two distinct localities in China, viz., Hankow on the Yang-tze River and Harbin in Manchuria. Arrangements were in progress for exporting pork also from Shanghai. Dr. Farrar visited each of these places and made inquiries as to the feeding and rearing of the pigs and the methods of slaughter and inspection followed in each district. He also discussed the question of the production of Chinese pork and its export, with the managers and officials, European and Chinese, of the firms concerned in this trade, with the British Consuls and Commissioners of Customs in the districts visited, and with medical practitioners and other European residents in China. A prejudice was entertained amongst some of the latter and had been transmitted to this country, against the use of Chinese pork on the ground that the Chinese pig was said to be a scavenger pig, fed on garbage and was therefore likely to become the vehicle of parasitic disease. Dr. Farrar reports however, after personal inspection and inquiry that the pigs which are exported to England, and those also which are generally sold in the native markets for consumption by the Chinese, are grain-fed pigs reared on farms under conditions which compare favourably with those which obtain in England, and that he found no evidence to justify the belief that parasitic diseases occur more commonly in Chinese than in English pigs. The testimony of medical men practising among the Chinese was to the effect that trichinosis is extremely rare in China and practically unknown in the Yang-tze Valley, and that *Cysticercus cellulosæ* and other parasites are uncommon.

The larger proportion of the pork which had been shipped to England up to the time of Dr. Farrar's inquiry had been exported from Hankow and was derived from a particular breed of pigs in the province of Hunan. Dr. Farrar directed special attention to the manner in which pigs in this province were fed and reared. He found that their food consisted principally of rice refuse and that the conditions under which they were kept at the farms visited seemed satisfactory. Included in one of the earlier shipments of Chinese pigs to England was a small experimental consignment of the native black pig known as the Honanese pig, which is the variety commonly sold in the native markets in Hankow. It is sometimes described as the "razor-back" on account of its sharp prominent spine. It appears that this pig has various characteristics which clearly differentiate it from the Hunanese pig, but that although commercially it is an inferior pig to the latter, inquiries from independent sources indicated that the Honanese pigs are reared in farms and properly fed on vegetable food. Dr. Farrar states that the pigs exported from Harbin are, generally speaking, of the same type as the Honanese pig. They are mostly kept on farms in large open pens. Their food consists principally of crushed soya-bean cake mixed sometimes with other vegetable material. Although no pigs had been exported to England from Shanghai at the time of Dr. Farrar's visit he paid special attention to the pigs which are available for export from that place. These appear to be of three varieties, the most common of which was of the Honanese type, and all were pen-fed and reared in stys which do not differ materially from those to be observed on ordinary English farms. They were well fed on rice or on "swill" containing a large proportion of rice.

Dr. Farrar found that arrangements were in existence at the various centres from which pigs were exported to this country for examination of the animals at the time of slaughter. At Hankow

the exporting firm had voluntarily made arrangements locally for this work. At Shanghai and Harbin the pigs are killed in municipal abattoirs and are subjected to the routine inspection in force in these establishments.

During the year under review 19,754 frozen carcases of Chinese pigs arrived at Liverpool, all of which were imported from Hankow. On arrival these carcases were placed in cold store and were inspected by the port sanitary authority's officers as the carcases were taken out for use. Of these, 12,972 were examined in this way; 12 carcases were condemned on account of tuberculosis; nine carcases and 78 pieces on account of other diseased conditions; and 179 carcases and 234 pieces for decomposition or other unsound conditions. Two small consignments arrived during the same period at the port of London. The first, which came from Harbin *via* Vladivostock consisted of 13 carcases. These had all become unsound on the journey and were condemned on arrival. In one case examination was made for disease and the carcase was found to be affected with tuberculosis. The other consignment consisted of 22 carcases from Shanghai. On examination the carcases were found to be satisfactory.

Unsound Food Regulations.

Reference was made in Dr. Buchanan's annual report for 1909* to objections which had been raised at Swansea to affording officers of the port sanitary authority facilities for examining goods as required by Article IV (3) of the Unsound Food Regulations, 1908. The owners of coasting vessels using the port contended that it was unnecessary to apply the regulations to vessels arriving coastwise and that any inspection of goods while in transit must be futile and serve no good purpose. The port sanitary authority found it necessary to serve formal notices requiring facilities for inspection to be afforded and since then they have met with no difficulties in this respect. Shortly after these facilities had been provided one firm surrendered to the authority two hundred tons of unsound potatoes.

Imported fruit pulp.—In course of a visit of inspection to the port of Sunderland, Mr. Hancock was informed that considerable quantities of fruit pulp packed in cans arrived at the port consigned to a local jam manufacturer and that many of the cans had been condemned on account of being blown. Mr. Hancock suggested the desirability of having samples of future consignments analysed with a view to detecting metallic or other undesirable contamination of the pulp. This procedure was followed with the next consignment, consisting of 100 cans, arriving at the port. Examination of two samples by the public analyst showed that each contained a rather large amount of tin, while in addition one sample contained 30·8 grains and the other 21 grains of salicylic acid per pound of pulp. Each sample also contained traces of boric acid. The whole consignment was seized by the medical officer of health and taken before a magistrate who condemned it and ordered it to be destroyed.

Examination of Imported Milk, Cream, and Butter for Tubercle Bacillus.

Consignments of dairy produce from abroad are sampled on importation by Officers of Customs under Section 1 of the Sale of Foods and Drugs Act, 1899. The results of the chemical examination

* Annual Report of the Medical Officer of the Board for 1909–10; Appendix A No. 10, p. 205.

of these samples are published in the annual report of the Government Chemist. In ordinary circumstances the imports of fresh milk are comparatively trifling in amount, but at times when the demand exceeds the supply of home-produced milk it is found profitable to import milk from the Continent. This trade has been kept under observation by the inspectors of foods, who have from time to time taken samples of imported milk for examination for the presence of tubercle bacilli. During the past year sampling for this purpose has also been extended to imported cream and butter. The samples were examined in the Board's pathological laboratory by Dr. Eastwood.

Milk.—Forty-three samples were taken between the middle of September and the middle of December. In no case was *Bacillus tuberculosis* discovered.* The milk was imported from two sources, viz., Normandy *viâ* Cherbourg, and Holland *viâ* Harlingen and the Hook of Holland. Nearly all the milk imported during the period under investigation was derived from Cherbourg. Importation of milk practically ceased about the middle of December. During the autumn, when importation was at its maximum, 80 to 100 churns of milk were imported several times a week.

All except one of the above samples of milk were also examined by Dr. Monier-Williams at the Board's laboratory in regard to evidence of pasteurisation and the presence of dirt. It was found that in each case the milk had been pasteurised, and that all the samples examined reached a good standard of cleanliness as judged by the small amount of sediment remaining after centrifugalisation.

Cream.—Thirty-two samples were taken between July and December, 1911. Three sources were sampled, two from Normandy imported *viâ* Cherbourg and Southampton, and one from Holland imported *viâ* Harlingen and the port of London. A number of samples were taken from each source. In the case of some samples a declaration was attached to the churn that the cream had been treated with preservatives. All the cream from Normandy was labelled "pasteurised." Bacteriological examination of the cream samples for the *Bacillus tuberculosis* yielded negative results except in the case of one sample imported from Harlingen and labelled "preserved." Attempts were made to secure further samples, but it was found that cream from this source was no longer being imported.

Butter.—Forty-eight samples were taken between the end of July and the end of September from the original packages, on the premises of six large importers of butter. The countries of origin were:—New South Wales, Queensland, Victoria, New Zealand, Canada, France, Siberia, Russia, Holland, Denmark, and Sweden. In no case was the *Bacillus tuberculosis* discovered. In the case of the Commonwealth, New Zealand, Holland, and Denmark the packets bore labels indicating official inspection in the country of origin. The samples included salted and unsalted butter; in some cases a declaration was made on the package that the butter contained boric acid in amount not exceeding 35 grains per lb. Many of the samples were taken from butter imported and stored in the frozen state.

II.—Local Arrangements for Food Inspection.

In a number of districts inquiries have been made during the year as to the arrangements provided locally for the inspection of meat

* As to the significance of these negative results, see App. A., No. 9.

and other food materials. Improvement continues to be maintained in this respect especially in the larger cities and towns, but the circumstances in many districts, particularly rural districts, cannot be considered satisfactory.

Inquiries made by Dr. Spencer Low at Hartlepool and West Hartlepool further illustrate the difficulties, referred to in previous reports, which are experienced in some districts where good administrative measures to protect the public meat supply may be greatly reduced in value by circumstances existing in some neighbouring district. At West Hartlepool there is a public abattoir and but one small private slaughter-house. The sanitary officials are thus in a position to maintain an efficient control over the meat of animals slaughtered in West Hartlepool. In the neighbouring borough of Hartlepool, however, there are about 24 private slaughter-houses and premises licensed or registered for slaughtering. In some instances slaughtering takes place in the butcher's shop with the shutters up, and pigs and sheep are slaughtered in yards at the rear of butchers' shops. In circumstances such as these it is difficult for local officers to maintain adequate supervision over meat slaughtered in the district, and there is good ground for suspecting that diseased animals are brought from West Hartlepool to Hartlepool to be slaughtered and the meat taken back to the former place for sale.

In course of inquiries in certain districts of the county of Somerset, Mr. Hancock noted that little if any systematic inspection of meat was made, and this was especially the case in the rural districts visited. The difficulties which militate against adequate inspection in these districts appear, in some measure, to be due to local circumstances, *e.g.*, the wide area which many of the districts cover, the large number of slaughter-houses which they contain, and the multifarious duties of the local officers. Thus the Taunton rural district covers an area of 68,094 acres with a population of 17,834 inhabitants. There are 32 private slaughter-houses in the 40 parishes comprising the district. There is but one district inspector who, active as he may be in the discharge of his other duties, is unable consistently with these to give adequate attention to slaughter-houses and to the inspection of meat. The Langport rural district is a similar case. This district covers an area of 59,410 acres with a population of 13,347 inhabitants. Apart, however, from difficulties presented by local circumstances, the district inspectors in many cases are not specially qualified either by training or experience as meat inspectors. In the districts mentioned, as in other districts in the county of Somerset, *e.g.*, the rural district of Yeovil, the Shepton Mallet rural district, and the neighbourhood of Bridgwater and Highbridge, a considerable traffic in diseased meat or meat of questionable character is known to have been carried on for some years, specific instances of such traffic having come to the knowledge of the local officers on several occasions. This circumstance in particular emphasises the need for a more thorough system of inspection and control in these districts.

Metallic Contamination of Oysters.—The medical officer of health for Liverpool drew attention to the condition of certain oysters consigned to the fish market in that city which on chemical examination were found to contain considerable amounts of copper and zinc. In some of the samples the zinc was found in considerably larger amounts than the copper. Samples of oysters were obtained by the Board from layings which were the source of some of the Liverpool

samples. These were submitted for examination to the Government Chemist whose reports showed results similar to those obtained in Liverpool. Owing to the colour which copper imparts to the shellfish the occasional presence in them of this metal has been recognised for a long time, and in the report made to the Board in 1896 by their inspector, the late Dr. H. T. Bulstrode,* reference is made to the metallic taste which is noticeable in such oysters, rendering them in some cases uneatable and in this way limiting them as a source of danger to public health. It does not, however, appear to have been realised before that zinc may bulk so largely in the metallic content of some oysters. The results of the recent examinations made at Liverpool and at the Government Laboratory showed that zinc was present on an average in an amount more than double that of the copper found, and if this ratio should prove to be of common occurrence in oysters contaminated by metals of this group it is by no means certain that the protection afforded by abnormal colour and taste would suffice to safeguard consumers against serious risk of metallic poisoning from zinc, the presence of which would not be so obvious.

The matter is receiving the Board's attention.

Inspection of Food for Export.

The arrangements with the Swiss Government for certification of meats and meat preparations exported to that country from the United Kingdom, which were referred to in the report for last year, are now in operation. So far two firms only in England and Wales appear to have availed themselves of the arrangements provided.

The systems of certification in respect of meat food products exported from this country to the United States and to Argentina have been kept under supervision. Inspectors during the year have visited firms for which a system of certification had been established and have conferred with the certifying officers as to the sufficiency of the arrangements made under the Board's memoranda relating to the issue of these certificates. By arrangement with the Argentine Government the system of certification for Argentina has been extended so as to include all foods of animal origin, and a memorandum with the necessary revision giving effect to this has been issued.

III.—Bacterial Food Poisoning.

In past years it has frequently happened that information of the occurrence of cases of illness attributed to bacterial food poisoning has reached the Board too late to enable them to afford any effective assistance to local officers either in securing the adoption of preventive measures, or in elucidating factors in the causation of food poisoning of this kind which are still obscure. In view of the importance of the subject the Board issued a memorandum† in September, 1911, in which are indicated the obligation of medical officers of health to report the occurrence of such cases forthwith to the Board and the steps which should be taken in dealing with the investigation and prevention of outbreaks of this nature.†

The two most serious outbreaks reported during the year occurred at Chesterfield and Bacup. In the former, which occurred in June, and was investigated with great care by Dr. Herbert Peck, late medical officer of health for Chesterfield, and by Dr. W. L. Thomson,

* Oyster culture in relation to disease. Wyman & Sons, Ltd., C. 8214, price 8*s.* 6*d.*
† Addendum B, p. 177.

assistant county medical officer of health for Derbyshire, who conducted the bacteriological inquiry, the illness was shown to have been due to the consumption of pork pies. There were 161 persons affected and one death occurred. The organism identified with the outbreak was *Bacillus suipestifer*, which was recovered from the organs of the fatal case and also from the pork pies. It was thought that the organism had been conveyed to the jelly used in preparing the pies in material derived from an infected pig. On the premises where the pies in question were made, the proximity of the slaughter-house and gut-scraping part of the premises to the place of preparation of the pies lent support to this view. Dr. Peck recommends as precautions against the recurrence of such cases, the abandonment of gut-scraping on the premises, the complete shutting off, so far as is compatible with the requirements of the business, of the slaughter-houses from the departments in which food is prepared, the cooling of the jelly where it is not exposed to contamination and the sealing of it with suet or paraffin.

In connection with the Bacup outbreak Dr. Coutts visited the district and conferred with the medical officer of health. In this outbreak which occurred in June, there were 213 cases and five deaths. Owing to the fact that the local officers were not successful in obtaining any of the original material which was suspected of having caused illness, the results of the investigations were inconclusive. An organism of the kind usually associated with food poisoning was isolated by Professor Delépine and Dr. Sellers from the blood and organs of three of the fatal cases. This organism was also agglutinated with specimens of blood taken from some of the survivors, but no organism of the kind in question was found in any of the food materials submitted to Professor Delépine for examination. In these circumstances it was difficult to determine accurately the part played in the outbreak by the various articles—brawn, potted meat, roast pork—which had come under suspicion. The case illustrates the importance in these investigations of obtaining samples of what remains over of the food actually eaten. This is not always possible, but the prospects of success are considerably increased where the investigation of cases is undertaken promptly on the receipt of information of their occurrence.

IV.—Work in Relation to the Sale of Food and Drugs Acts.

Inspectors visiting districts in connexion with the Foreign Meat and Unsound Food Regulations have made detailed inquiries in certain instances in regard to local methods of administration of the Sale of Food and Drugs Acts. Special visits for this purpose have also been made to other districts where inquiry appeared to be specially called for. In the course of these inquiries it was found that in some instances the public analyst had made a report to his local authority on some special investigation which had been undertaken in the district respecting a particular article of food, but that copies of such report had not always reached the Board. During an inquiry in the county of Cheshire Dr. Coutts ascertained that the county analyst had made valuable reports in regard to butter and Cheshire cheese of which the Board were unaware. Reports of this nature are of much interest to this sub-department and it would be of advantage if local authorities would send to the Board copies of all special reports made by the public analyst.

During the year inquiries were completed and reports were issued on several important questions affecting administration under the Sale of Food and Drugs Acts. These are referred to in the following paragraphs.

Bleaching and other Chemical Treatment of Flour.

Reports dealing with these matters were issued in April, 1911. Dr. Hamill's report deals fully with the processes of milling as practised at the present time and describes the grades into which flour is divided and the factors upon which this grading depends. Reference is made to the physical characters which different grades of flour possess and to the effect which bleaching produces upon these characters. He points out that some of the characters of a loaf depend upon the skill and care of the baker, whilst others depend upon the baking qualities of the flour, *e.g.*, strength and water absorbing capacity of the flour. It seems probable that bleaching when carefully carried out produces no appreciable effect upon these baking qualities. The chief effect of bleaching on flour is in the direction of increased whiteness. Bleaching in addition to whitening the higher grades of flour also improves from the trade point of view the colour and therefore the commercial value of lower grades of flour. This has the apparent effect of increasing the proportion of "patents" or high grade flour which can be obtained from the mill and results in a corresponding pecuniary gain to the miller. Millers are also enabled to use cheap wheats yielding a yellow flour since by bleaching it is possible to transform what would otherwise be a yellow cheap flour into a white, higher priced article, the gain due to the enhanced price going to the miller.

Artificial bleaching is brought about by the action on the flour of nitrogen peroxide generated by passing air over sparking electrodes in a special chamber, the resulting gases being intimately mixed with the flour in an agitator. A series of experiments was carried out by Dr. Monier-Williams in the Board's laboratory with the object of ascertaining the effect of varying quantities of nitrogen peroxide on the chemical and physical properties of flour. In order to obtain definite results it was found necessary to employ a substantial quantity of the gas, considerably more than would appear to be employed in British flour mills at the present time. It must not be forgotten, however, that in the past excessive quantities of nitrogen peroxide have in many cases been employed, and that in certain cases local over-bleaching of the flour may occur. Moreover the fact that minute changes in the nature of flour due to treatment with small quantities of nitrogen peroxide are not readily detectable by analysis cannot be held to show that such changes do not take place. It is more probable that the alterations in the flour observed when larger quantities of gas are employed, although more pronounced, are of the same character as those taking place under the conditions of commercial bleaching. For purposes of the investigation a freshly milled high grade patent flour was treated with quantities of nitrogen peroxide varying from 5 c.c. to 300 c.c. per kilogramme, and a series of experiments was carried out which led to the following conclusions:—

I. The golden-yellow tint of the flour is destroyed. Immediately after bleaching no difference in tint due to excess of the bleaching agent could be observed with Lovibond's tintometer, but on keeping for several days the more highly bleached

samples became decidedly yellow, while those treated with 30 to 100 cc. of nitrogen peroxide per kilogramme became still whiter, the maximum of bleaching effect being attained within these limits.

II. The amount of nitrous acid or nitrites present in a freshly bleached flour is approximately proportional to the amount of nitrogen peroxide employed, and corresponds to about 30 per cent. of the total nitrogen absorbed, rising to 40 per cent. in the more highly bleached samples. After the lapse of several days, the proportion of nitrites present decreases considerably in the higher concentrations, but remains very nearly the same in the more slightly bleached samples.

III. Approximately 60 per cent. of the total nitrogen introduced as nitrogen peroxide into the flour during bleaching can be recovered as ammonia a short time after bleaching by reducing the aqueous extract of the flour with a copper-zinc couple, and may be assumed to be present in the flour as nitric and nitrous acids or as nitrates and nitrites. After keeping the bleached flour for some days the amount of nitric acid extracted with cold water decreases. Experiments with pure glutenin and gliadin indicated that in certain circumstances nitric acid may be withdrawn from solution or "adsorbed" by these proteins.

IV. In highly bleached flour a considerable increase in the amounts of soluble proteins and soluble carbohydrates takes place. If one kilogramme of flour is bleached with 300 cc. of nitrogen peroxide, the amount of soluble nitrogen is doubled. This appears to be due almost entirely to the solubility of gliadin in nitric acid of certain concentrations. The simultaneous increase of soluble carbohydrates would seem to point to an intimate relationship between the gliadin and certain carbohydrates in flour.

V. If highly bleached flour is allowed to stand for some time after bleaching, the oil undergoes very considerable alteration and acquires the characteristics of an oxydised oil. About 6 to 7 per cent. of the nitrogen introduced as nitrogen peroxide during bleaching is absorbed by the oil.

VI. The absorption of nitrogen peroxide by flour does not appear to be accompanied by the production of free nitrogen, nor was any evidence obtained of the formation of diazo-compounds.

VII. Sodium nitrite was found to exert no inhibitory action on the digestion of soluble starch by saliva, but the rate of digestion was greatly retarded if the starch had been previously treated with nitrogen peroxide gas. Bleaching was found to exercise an inhibitory effect on the salivary digestion of flour.

Dr. Hamill discusses the effect of bleaching on the digestive enzymes, and draws attention to the possibility that the changes which take place in the oil and protein of flour as a result of bleaching may have a prejudical effect upon the nutritive value of the flour. Some American experiments on rabbits had indicated the existence of danger of acute poisoning from the ingestion of bleached flour, but experiments made on behalf of the Board by Dr. Arthur Harden, F.R.S., at the Lister Institute did not confirm the American results.

Even in the case of flour which is bleached to the small extent which is at present ordinarily practised it would in present knowledge be unwise to conclude that the process is devoid of risk. The

fact that bleached flour has been shown to be something more than natural flour the colour of which has been modified is also of importance in considering whether bleached flour may properly be represented as genuine flour.

Dr. Hamill also deals with the addition to flour of certain chemical substances described by the trade as "improvers," of which acid calcium phosphate and phosphoric acid are examples, with the object of increasing the "strength" and water absorbing capacity of flour. In consequence of the effect which "improvers" are said to have in this direction, it has been represented to millers that by their use a larger proportion of cheap wheats may be employed in the manufacture of flour. Bakers have also been told that as many as 10 to 14 extra 2-lb. loaves can be obtained from a sack of flour so treated. This naturally means a diminution in the actual amount of flour in each loaf and consequently in nutritive value, so that the consumer in this respect loses by the treatment. Apart from this the addition to flour of many of the substances suggested as improvers is highly objectionable. Many millers are unaware of the nature and composition of the "improvers" which they add to flour, and are content with the assurance of chemical manufacturers that the preparations offered to them constitute in all respects desirable additions. If the use of improvers should become general there can be little doubt that preparations, often of a questionable nature, will be offered to millers under attractive and possibly misleading names. It might also fairly be assumed that as competition amongst chemical manufacturers increased millers would be supplied with low grade articles liable to contain objectionable impurities.

Dr. Hamill points out that the increasing activity which is now being displayed in the use of different articles as additions to flour must be regarded with considerable apprehension. Stress is also laid upon the undesirableness of manipulating and treating with foreign substances of questionable utility an indispensable foodstuff the purity and wholesomeness of which is of cardinal importance to the community.

Baking Powder and Self-raising Flour.

In recent years several public analysts have drawn attention in their reports to the fact that certain baking powders and self-raising flours contained excessive quantities of calcium sulphate. Dr. Hamill was instructed to make inquiries into the circumstances in which this material found its way into these articles and to ascertain how far, if at all, its presence might be considered permissible. His report* on the subject was issued in April, 1911. Baking powder consists essentially of sodium bicarbonite and an acidic constituent, and Dr. Hamill shows in his report that two distinct varieties of baking powder are in use in this country, one in which the acidic constituent is tartaric acid, cream of tartar or a mixture of these and the other in which this constituent is acid calcium phosphate. It is in the latter class that notable amounts of calcium sulphate were found, in some cases amounting to as much as 50 per cent. of the whole powder. This was generally accounted for by the substitution, for the sake of cheapness in production, of sulphuric acid for phosphoric acid in the manufacture of acid calcium phosphate, but

* Food Reports No. 12. On the presence of calcium sulphate in Baking Powder and self-raising Flour (Dr. J. M. Hamill) Wyman & Sons, Ltd., Price 1*d*.

in some cases calcium sulphate had actually been added to baking powder as a diluent.

Self-raising flour is flour to which baking powder has been added, and acid calcium phosphate of the lowest commercial quality containing considerable proportions of calcium sulphate as an impurity was found to be largely used in its preparation.

On general grounds it is undesirable that baking powder should contain an appreciable quantity of needless mineral matter such as calcium sulphate which contributes nothing to its value for baking purposes, and may impose an extra and unnecessary burden on the excretory mechanism. Dr. Hamill ascertained that chemical manufacturers would have no difficulty in keeping the calcium sulphate in phosphates used for food purposes below a specified limit, provided this were not too stringent, and after discussing the matter with manufacturers he came to the conclusion that a maximum limit of 10 per cent. of calcium sulphate would allow an ample margin for legitimate exigencies of manufacture. Since the report was issued local authorities have had regard to the limit referred to in dealing with samples of baking powder and self-raising flour taken under Section 6 of the Sale of Food and Drugs Act, 1875, and recent reports made by public analysts indicate that with a few exceptions manufacturers are keeping their materials within the suggested limit.

Bread.

Information obtained by Dr. Hamill in course of his investigations in regard to the matters referred to above indicated the desirability of extending his inquiry to consideration of the relative nutritive values of breads made from different varieties of wheat flour and their bearing on the questions of physical development and public health. In his report* Dr. Hamill summarises the principal scientific and technical information which was available on this subject, and makes reference to so-called "standard" bread, an article which during the progress of the inquiry became the subject of much attention in the public press. It appears that present knowledge as to the physiology and chemistry of nutrition is not sufficient to permit of any conclusive statements being made regarding the exact relative value in nutrition of different varieties of flour. So far, however, as information is available it would appear that the differences in dietetic value of bread made from different varieties of flour are small and not of much importance to the average adult with whom bread is only one out of many varied constituents of his dietary. There are commonly wider differences in protein content and energy value between the same grade of flour derived from different wheats than between different grades of flour derived from the same wheat. Dr. Hamill lays stress upon the importance of variety in diet and points out that a diet consisting mainly of bread from whatever grade of flour it may be made is unsatisfactory. It is more important to secure a greater variety of diet—which does not always mean greater cost—than to rely upon the selection of any particular form of bread however nutritious. These considerations apply with particular force to children for whom an ample and varied diet would seem to be of special importance if satisfactory development is to be ensured. Many children whose food consists largely of bread do not get enough of it and are really underfed in

* Food Reports, No. 14. On the nutritive value of Bread made from different varieties of Wheat Flour (Dr. J. M. Hamill); Wyman & Sons, Ltd., price 3*d*.

respect of such essential substances as proteins and carbo-hydrates. To increase the quantity of bread taken in such cases may be of greater importance than the substitution of one form of bread for another; to supplement the bread by other articles (such as milk) rich in constituents of great value in nutrition will be still more useful. Dr. Hamill points out, however, that some people who are accustomed to a mixed diet may find as a result of sufficient trial that bread of one particular class—from "patent," "entire" wheat, wholemeal or "germ" flour—suits them, individually, better than another. Suitability in this sense may be the result of the greater or less time required for mastication: the presence or absence of laxative properties: the advantage or the reverse of including in the diet an article which leaves a larger undigested residue; the nature of the other ordinary constituents of the dietary; differences in flavour, or other factors. No general rule can be laid down in such cases. The commercial supply of breads of all these classes serves a useful purpose by enabling a choice to be made.

There seems to be no reason for considering that the varieties of bread which the miller and baker have accustomed us to regard as of lower quality—"households," for example—are in any physiological sense inferior to that of the higher priced bread made from high grade and specially white flour. On the contrary, from the point of view of available nutrient material and energy value the advantage is on the side of the "households."

Infants' Foods.

Investigations have been in progress during the year in regard to the composition and suitability of proprietary "patent" foods for infants. A report* by Dr. Coutts on the results of his inquiry with regard to condensed milk was issued in August, 1911. Dr. Coutts dealt fully with the methods of preparation of condensed milks, their chemical composition and the extent of their liability to bacterial contamination. He also discussed their uses, methods of distribution, and the bearing of certain statements on labels and advertisements on the question of infant feeding. Dr. Coutts found that machine-skimmed condensed milk was employed to a considerable extent by the poor in some districts for the feeding of infants, and he pointed out that its chemical composition rendered it entirely unsuitable for such a purpose. He further showed that the absence of adequate declaration of its unsuitability and in some instances the presence on labels and advertisements of inaccurate or misleading statements tended to encourage this undesirable practice. Although not suitable for continued use over prolonged periods, full cream sweetened condensed milk may apparently be used with advantage as a food for infants in certain cases and for short periods, but the excessive amount of sugar it contains renders it an ill-balanced food. The unsweetened full-cream variety of condensed milk is less open to objection from the point of view of nutrition, but it has the disadvantage of not keeping well after the tin is opened. As a result of his inquiries Dr. Coutts made certain recommendations, the most important of which relate to the desirability of:—(1) requiring adequate declaration on the labels of tins of machine-skimmed condensed milk that the contents are unsuitable for infant feeding; (2) requiring declarations as to

* Food Reports No. 15. On an inquiry as to Condensed Milks; with special reference to their use as Infants' Foods (Dr. F. J. H. Coutts). Wyman & Sons, Ltd., price 6*d*.

the amounts of milk fat and of foreign substances ; (3) exercising control over the issue of trade documents containing statements liable to mislead. The question of the issue of regulations on the subject is now under the Board's consideration.

Preservatives in Milk and Cream.

The Board have for some time had under consideration the question of the danger to health which may be entailed by the addition of preservatives and other foreign substances to milk and cream and the importance of controlling such additions ; and they have now published draft regulations which they propose to make under the Public Health (Regulations as to Food) Act, 1907, dealing with these matters. The effect of the proposed regulations is to prohibit the addition of any preservative to milk and to cream containing less than 35 per cent. by weight of milk fat at any stage from the place of production to that of delivery to the consumer. In the case of cream containing over 35 per cent. of milk fat the regulations will secure that only certain preservatives shall be employed and that the use of these shall be subject to suitable declaration of their presence and of the amount employed.

During the latter part of the year the Board were informed that a new preservative for milk and cream was being offered to milk vendors under the name of "Mystin." In the trade circular advertising the preparation it was stated that its presence in milk or cream could not be detected by analysis and that it was, moreover, absolutely non-injurious. A sample was procured and investigated by Dr. Monier-Williams, in the Board's laboratory, and the results of the investigation were embodied in a report* together with notes concerning certain other preservatives sold under proprietary names.

"Mystin" was found to contain formaldehyde and sodium nitrite, the proportion of each being such that milk treated with the preparation failed to respond to the usual test for formaldehyde. It was ascertained, however, that by a suitable modification of the test the detection and estimation of the formaldehyde present was a comparatively simple matter, and a method for the detection of "Mystin" in the routine examination of milk and cream samples is given in the report.

Since the publication of this report it has come to the notice of the Board that a further circular letter has been addressed to milk vendors by the proprietors of "Mystin," from which the following extracts have been taken :—

> "We beg to inform you that after considerable experimenting
> "we have succeeded in perfecting a new preservative, which is
> "a decided improvement on Mystin.
>
> "It has all the advantages that we were able to claim for
> "Mystin last year, and we can guarantee that it is perfectly
> "harmless.
>
> "There will be no literature published on the subject and the
> "preparation will be supplied only to those of our old customers
> "upon whose discretion we can rely.
>
> "The price is the same as before—10*s.* 6*d.* per gallon. Direc-
> "tions for use : three ounces per churn of 17 imperial gallons.

---

* Food Reports, No. 17. On analyses and methods of detection of certain proprietary substances sold as preservatives for milk, cream, &c. (Dr. G. W. Monier-Williams.) Wyman & Sons, Ltd., price 2*d.*

"The preparation will be invoiced simply as 'No. 2.' This "will be inscribed on the backs of plain labels showing no "source of origin."

A sample of the preservative in question has been examined by Dr. Monier-Williams in the Board's laboratory, and has been found to consist of a solution of potassium chlorate (5·93 per cent.) and formaldehyde (0·38 per cent.). The reason for the addition of potassium chlorate is not clear, unless the vendors are under the impression that its presence will interfere with the tests for formaldehyde in the milk. When added to milk in the proportion directed, however, there is no difficulty in detecting the presence of formaldehyde in the resulting sample by the ordinary tests.

The activity which is being shown in the preparation and sale of preservatives of this nature, notwithstanding the issue of the draft regulations above referred to, serves to emphasise the importance of vigilance on the part of local authorities in these matters.

Vinegar.

Following upon the issue of Dr. Hamill's report on Vinegar in 1908* a number of representations from local authorities and traders concerned were received by the Board urging the desirability of statutory definition in regard to vinegar. The Board indicated that they do not at present possess powers enabling them to make such definitions, but in response to requests that their opinion on the matter might be stated for the guidance of those concerned the Board suggested the following definitions :—

Vinegar is a liquid derived wholly from alcoholic and acetous fermentations ; it shall contain not less than 4 grammes of acetic acid (CH_3 COOH) in 100 cubic centimetres of vinegar, it shall not contain arsenic in amounts exceeding 0·0143 milligrammes per hundred cubic centimetres of vinegar, nor any sulphuric or other mineral acid, lead or copper, nor shall it contain any foreign substance or colouring matter except caramel.

Malt Vinegar is derived wholly from malted barley or wholly from cereals the starch of which has been saccharified by the diastase of malt.

Artificial Vinegar is any vinegar or substitute for vinegar containing, or derived from any preparation containing, any added acetic acid which is not wholly the product of alcoholic and subsequent acetous fermentation. It shall contain not less than 4 grammes of acetic acid (CH_3 COOH) in 100 cubic centimetres of the artificial vinegar. It shall not contain arsenic in amounts exceeding 0·0143 milligrammes per 100 cubic centimetres of artificial vinegar, nor any sulphuric or other mineral acid, lead or copper, nor shall it contain any foreign substance or colouring matter except caramel.

---

* Food Reports No. 5. On the preparation and sale of Vinegar in relation to the administration of the Sale of Food and Drugs Acts (Dr. J. M. Hamill). Wyman & Sons, Ltd., price 3*d*.

ADDENDUM A.—CIRCULAR 1911.

CIRCULAR LETTER (No. 8) TO PORT SANITARY AUTHORITIES AND CERTAIN SANITARY AUTHORITIES.

REGULATIONS UNDER THE PUBLIC HEALTH (REGULATIONS AS TO FOOD) ACT, 1907.

LOCAL GOVERNMENT BOARD,
WHITEHALL, S.W.,
29th September, 1911.

SIR,

I AM directed by the Local Government Board to advert to Article 1. (*h*) of the Public Health (Foreign Meat) Amending Regulations, 1909, and to their circular of the 26th January, 1909; and I am to state that, on consideration of communications received from the Government of the Commonwealth of Australia, who have now assumed entire control of the inspection of all meat for export, the Board have caused to be published in the *London Gazette* of the 1st September, 1911, a notice containing in the schedule a description of a label which is declared to be admissible as an "Official Certificate" in respect of pork and other edible portions of the pig which have been subjected to inspection in the Commonwealth. A copy of this notice, including the schedule thereto, is appended to this circular.

This Official Circular superseded, from the date of the publication of the notice, the Official Certificates which had been recognised by the Board in the case of the States of Queensland, Victoria and New South Wales.

Copies of Circular.

An additional copy of this circular is enclosed for transmission to the medical officer of health. The circular will be placed on sale, so that copies may shortly be obtained, either directly or through any bookseller, from Messrs. Wyman & Sons, Ltd., Fetter Lane London, E.C.

I am, Sir,
Your obedient Servant,
F. J. WILLIS,
Assistant Secretary.

The Clerk to the Port
Sanitary Authority, *or*
The Town Clerk, *or*
The Clerk to the District Council.

APPENDIX.

Notice inserted in the London Gazette *of the 1st September*, 1911.

THE PUBLIC HEALTH (FOREIGN MEAT) AMENDING REGULATIONS, 1909.

WE, THE LOCAL GOVERNMENT BOARD, in pursuance of the Public Health (Foreign Meat) Amending Regulations, 1909, hereby give notice that, for the purposes of those Regulations, the Official Certificate of which the details are set forth in the representation or design in the schedule appended to and forming part of this Notice is, subject to the instructions given therein, hereby declared to be admissible, in the case of the Commonwealth of Australia, from the date of the publication of this Notice, in the manner, to the extent, and subject to the rules and conditions prescribed in this Notice, as evidence that the pig from which any foreign meat is derived has been certified by a competent authority in the place of origin to be free from

disease at the time of slaughter, and that the meat has been certified by the like authority to have been dressed or prepared, and packed with the needful observance of all requirements for preventing danger to public health from using the meat as an article of food:

AND FURTHER, with respect to the manner, to the extent, and to the rules and conditions in, to, and subject to which every Official Certificate is admissible as evidence for any such purpose as is hereinbefore described, We hereby prescribe as follows, that is to say:—

(i) An Official Certificate used in relation to foreign meat, or in relation to a box, case, receptacle or package containing foreign meat shall be admissible as aforesaid only where the meat is derived from a pig.

(ii) An Official Certificate in the form of a label shall be admissible as aforesaid only where the label is securely affixed or attached to any foreign meat, or to any box, case, receptacle or package containing foreign meat; and where the label so affixed or attached has not, in any other circumstances, or on any other occasion, been used as an Official Certificate.

(iii) In this Notice, any word or expression to which a special meaning is assigned by the Public Health (Foreign Meat) Amending Regulations, 1909, has the same meaning as in those Regulations.

AND FURTHER, We hereby declare that the Official Certificates hitherto admitted in the case of the States of Queensland, Victoria and New South Wales, shall, from the date of the publication of this notice, cease to be admissible.

SCHEDULE.

COMMONWEALTH OF AUSTRALIA.

A label, in the form of a combined certificate and stamp, having on it the subjoined representation or design, but subject to the condition that for the words "New South Wales" may be substituted the name of any other State comprised within the Commonwealth of Australia. Above the words "Commonwealth Meat Inspector" will appear the signature of the Inspector.

[*Copy of label here inserted.**]

Given under the Seal of Office of the Local Government Board, this thirtieth day of August, in the year One thousand nine hundred and eleven.

(L.S.) *Thos. Pitts*, Assistant Secretary.

John Burns, President.

* Not here reproduced.

ADDENDUM B.—MEMORANDUM 1911.

MEMORANDUM BY THE LOCAL GOVERNMENT BOARD ON THE INVESTIGATION OF OUTBREAKS OF ILLNESS SUSPECTED TO BE DUE TO FOOD POISONING.

From time to time information of occurrence of cases of illness attributed to food poisoning reaches the Local Government Board from medical officers of health, coroners, medical practitioners and others, or is obtained from newspaper reports. Occasionally the cases in question result from contamination of foods by inorganic poisons (*e.g.*, arsenic and lead), more frequently and especially in the case of meat foods, the poisoning has been of bacterial origin.*

The information obtained in this way as to the occurrence of serious cases or outbreaks of food poisoning in England and Wales is by no means complete, and in many instances the information has reached the Board at a stage too late for any satisfactory investigation to be made by their Inspectors, or any useful assistance given to the

* In the present memorandum, the term "food poisoning" is intended to include both classes of cases, but does not include instances in which foods, such as milk, ice cream or shell fish, have produced any of the notifiable infectious diseases, for example, scarlet fever or enteric fever.

officers of local authorities in dealing with the matter. It is anticipated that if more complete and timely information as to suspected food poisoning were to reach the Board, it might sometimes be possible for them to secure the adoption of effective preventive measures, while a better opportunity would be afforded for elucidating points in the causation of food poisoning which at present are obscure.

Where a medical officer of health becomes aware of the occurrence of a considerable number of cases of food poisoning in his district (for example, resulting from the contamination of particular preparations of meat distributed locally on a large scale), he should report it forthwith to the Board (*see* Article XIX (15) of the Board's General Order of 13th December, 1910, and Article 18 (16) of the Sanitary Officers (London) Order, 1891), and he is, moreover, required by Article XIX (16, of the Order to furnish to the Board a copy of any special report or reports which he makes to his authority on the results of his inquiries into the outbreak.

The case is different where a medical officer of health learns that only a few persons in his district have been attacked by food poisoning—for example, one or two members of a household suffering in consequence of the consumption of canned food from a particular tin. Although this does not constitute a serious outbreak of disease in the district, other canned foods of the same origin may be causing illness elsewhere. Instances have lately come to the Board's knowledge in which the collection of facts as to scattered cases occurring in several sanitary districts has had significant results, and they would accordingly be glad of prompt information whenever such cases come to the notice of the medical officer of health.

In any outbreak where the implicated food has been prepared in the district, it is advisable that as soon as the medical officer of health has established the probability that a particular food is at fault, he should at once proceed to make detailed investigations into the conditions of its preparation and obtain material for chemical or bacteriological examination. The complete history of all the cases attacked can be obtained simultaneously through assistance or by inquiry made subsequently. The determination of the circumstances in which food poisoning has occurred often turns upon the elucidation of apparently trivial points, and after some days' interval it is impossible to rely on accurate recollection of them. Moreover as time goes on inaccurate statements get repeated and believed, and it is difficult to get at the facts. It is neither desirable nor necessary to await the result of chemical or bacteriological examinations before commencing inquiries calculated to throw light on the manner in which the poisonous elements (bacterial or other) gained access to the food. Supplementary inquiries can always be made as a result of laboratory findings.

For convenience of reference, a list of headings for inquiry in the case of outbreaks of poisoning attributed to meat foods is appended to this Memorandum.

Where the food suspected to have caused poisoning has not been prepared in the district it is important to secure the co-operation of the vendor, who should be invited to produce original packages, invoices, and any other facts available to show by what manufacturing or distributing firm the implicated food was supplied to him, and on what date and in what bulk.

The Board would be glad to be informed of the facts obtained in any such cases.

Collection and Examination of Material.

It is important to secure samples of any remaining portions of the actual food which has been consumed by persons attacked, as well as samples of food of similar origin, or food prepared from the same ingredients. Perishable articles should at once be placed in an ice box or cold store pending examination which should be commenced as early as possible. In the case of canned goods, the cans with the labels intact should be preserved. Unopened cans, corresponding in all particulars with those suspected, should also be obtained if possible.

Chemical Examination.—Where the circumstances point to poisoning not of bacterial origin, samples with all the information available should forthwith be sent for chemical examination, and this would in ordinary circumstances be made by the public analyst of the district.

In cases of meat food poisoning samples are sometimes sent to the analyst to be examined for the presence of "ptomaines." Ordinarily little is to be gained by so doing. It is by no means certain that "ptomaines" in the sense of alkaloidal substances produced by bacterial action are present in meat foods which have caused poisoning, and the significance of the reactions which are held to demonstrate the presence of these substances is a matter of considerable doubt. In such cases, however, chemical analyses may be valuable for the determination of special points, such as the presence or absence of preservatives and their nature, the determination of acidity, saltness, and like matters.

Bacteriological Examination.—It is of obvious advantage in the investigation of cases of food poisoning that arrangements for any necessary bacteriological examination should have been considered beforehand and the delay and trouble of making special emergency arrangements avoided.

Where samples are liable to be delayed in transit it is desirable to send them in receptacles which are surrounded by ice or otherwise insulated.

When it appears desirable to procure for bacteriological examination material from persons who have been attacked by food poisoning, the advice of the bacteriologist should be obtained in order that the material may be transmitted with proper precautions and in a condition suitable for examination.

It is important that material should be available for any investigations which the Board may desire to make through their own officers. Where such an investigation is directed an early intimation will be sent to the medical officer of health. In all cases, however, it is desirable that the chemist or bacteriologist consulted should be requested to preserve samples under suitable conditions until it has been ascertained that there is no further use for them.

The Board are aware that neither medical practitioners nor the general public are under statutory obligation to report cases of food poisoning to the medical officer of health. It is believed, however, that if it is generally understood in a district that the local authority, with a view to safeguarding the public health, is prepared to authorise any necessary inquiries and investigations, the arrangements made will receive general approval and tend to secure the co-operation of all concerned.

Local Government Board,
September, 1911.

APPENDIX.

Headings of Inquiry into Outbreaks of Poisoning by Meat Foods.

What cases heard of ; steps taken to secure complete list of cases, *e.g.*, inquiries of medical practitioners, neighbouring medical officers of health and others.

Evidence implicating particular food or foods as cause of outbreak.

Evidence implicating any particular ingredient of the food.

Origin of suspected food or ingredient.

Inquiries in affected households.

Names and ages of persons (*a*) in each household, (*b*) those ill, (*c*) those partaking of suspected food.

Persons affected—(*a*) slightly, (*b*) seriously, (*c*) fatally ; with date and hour of partaking of food in each case and date and hour of first symptoms in each case.

Clinical character of illness.

Particular food implicated. Date of purchase, source ; any form of domestic preparation applied (*e.g.*, cooking) ; if so, how long and to what degree ; if canned meat, when opened, &c.

Inquiries at place of preparation (when food implicated has been prepared in the district).

Address or description of place of preparation ; name and address of owner or occupier ; number of workers employed (male and female) ; nature of employment in each case. Any engaged also in other employments which might have connection with contamination of the suspected food.

Meat concerned ; its nature, where obtained, amount used on days concerned, how and where stored.

Evidence, positive or negative, of unsoundness of the meat.

Evidence, positive or negative, as to disease of animal during life or ascertained post mortem.

Possibilities of infection at slaughter-house or place of storage.

Sanitary condition of bakehouse or food preparing place (including distance from possible sources of contamination, *e.g.*, middenstead, ash-pit, privy, W.C. ; slaughter-house, stable) ; positions of drain openings ; ventilation ; general sanitary condition.

Cleanliness of tables, floors, vessels, utensils, &c.

Preparation of food (exact details of methods employed, including history and condition of various component parts besides the meat, *e.g.*, pastry, stock and jelly for pork pies, skins of sausages, &c.).

Handling of the food (possible contamination by "carrier" of bacteria associated with food poisoning, (*a*) before cooking, (*b*) during cooking, (*c*) after cooking, *e.g.*, transfer into moulds, &c.).

Temperature reached in cooking ; any experimental verification of temperature especially as regards interior of mass ; any reason to suspect under-cooking of whole or part.

Cooling. Where food placed during cooling. Possible opportunities of contamination.

Health of workers previous to outbreak, especially with regard to diarrhœa ; their habits as to cleanliness. What W.C. accommodation for workers (where situated and condition). Arrangements for washing hands and their use.

Collection and examination of Material for bacteriological examination.

Samples collected (dates, description and quantities) of :—

Food materials. (*a*) Portions left over by patients, (*b*) obtained at shops, stores or places of preparation.

Clinical materials. (*a*) Blood from patients or suspected "carriers," (*b*) post-mortem specimens.