DR. THOMSON, replying to the discussion, said that in a district remote from a laboratory the question of contacts was a difficult one. Time was spent in waiting for the necessary appliances for taking swabs. Probably the best plan was to send a special messenger by train. He could not say what proportion of cases entirely recovered their mental condition, but he thought a good many showed some weakness as the result of their illness.

In his experience, about 35 per cent. of the cases showed Kernig's sign, but one observer had put the figure as high as 90 per cent. Tenderness at the angle of the jaw was perhaps common to a few diseases but he thought it useful in diagnosis.

He had not used vaccines. He agreed with Dr. Dickinson that cerebro-spinal fever was of low infectivity, but he put it higher than lobar pneumonia. The disease was so dangerous and severe for the patient, however, that every precaution should be taken against it.

NEW POSTAL REGULATIONS.

ARTICLES SENT FOR MEDICAL EXAMINATION OR ANALYSIS.—Deleterious liquids or substances, though otherwise prohibited from transmission by post, may be sent for medical examination or analysis to a recognised Medical Laboratory or Institute, whether or not belonging to a public health authority, or to a qualified Medical practitioner or veterinary surgeon within the United Kingdom, by *Letter Post*, and on no account by *Parcel Post*, under the following conditions:—

Any such liquid or substance must be enclosed in a receptacle hermetically sealed or otherwise securely closed, which receptacle must itself be placed in a strong wooden, leather, or metal case in such a way that it cannot shift about, and, with a sufficient quantity of some absorbent material (such as saw-dust or cotton wool), so packed about the receptacle as absolutely to prevent any possible leakage from the package in the event of damage to the receptacle. The packet so made up must be conspicuously marked "Fragile with care" and bear the words, "Pathological Specimen."

Any packet of the kind found in the parcel post, or found in the letter post not packed and marked as directed, will be at once stopped and destroyed with all its wrappings and enclosures. Further, any person who sends by post a deleterious liquid or substance for medical examination or analysis otherwise than as provided by these regulations is liable to prosecution.

If receptacles are supplied by a Laboratory or Institute, they should be submitted to the Secretary, General Post Office, in order to ascertain whether they are regarded as complying with the regulations.

MEAT INSPECTION,

BY

WILLIAM J. HOWARTH, M.D., D.P.H.,
Medical Officer of Health of the City of London.

INCREASING interest is being devoted to this branch of preventive medicine, but it is doubtful whether, if in any but a few educational centres, instruction in meat inspection is dealt with as fully as it deserves to be. The power of the meat inspector for good or evil is very considerable, and it is essential, therefore, that the officer in charge of this work shall be fully equipped. Lack of knowledge is chiefly observed in respect of veterinary pathology and anatomy, both of which are essential, if accurate deductions as to the importance of recognised lesions are to be assured, or if inspection in the most difficult circumstances, *e.g.*, of beef cut into joints, is to be satisfactory.

In recent years the recognised scope of meat inspection has been much increased, and among the contributory causes may be included (1) the more general recognition that outbreaks of food poisoning may be due not only to products of decomposition, but to ante-mortem conditions of the flesh used and to post-mortem bacterial contaminations; (2) the fact that a large amount of meat is imported into this country in the carcase form, and that special problems attach to this class of meat; (3) the increasing trade in both home-prepared and imported canned meat; and (4) the increase of knowledge as to the channels of infection in the case of tuberculosis of bovines and porcines.

Existing legislation requires that articles of food to be consumed by human beings shall not be diseased, unsound, unwholesome, or unfit for the food of man, and possibly the following classification of conditions will include most of those which would come within the scope of meat inspection work.

1.—Carcases of animals which before slaughter were suffering from some disease transmissible to man—*e.g.*, acute infections and parasitic diseases.

2.—Carcases which will not "keep" or resist putrefactive changes during the necessary interval which must elapse between slaughter and consumption. Defective keeping qualities may result from disease, and not necessarily one which is transmissible to human beings; from slaughter of an animal without suitable

preliminary preparation, as immediately after an exhausting journey; and from defective bleeding, the result of slaughter *in extremis* or death without any preliminary bleeding.

3.—Meat already in a state of decomposition.

4.—Meat which is mainly objectionable from the point of view of offending the sentiment of purchasers, as immature or foetal flesh. This condition may possibly be regarded as unsoundness, but the more certain group in which to include it would be "unfit for the food of man."

5.—Carcases of emaciated animals or of aged animals in an extremely poor condition. Although emaciation calls for destruction, lean carcasses on only very rare occasions are regarded as unfit for human consumption. In general, lean meat is fairly satisfactory, and as a nutritive agent the protein content is higher than that from a well-conditioned animal. The toughness and tastelessness after cooking of excessively lean meat from an aged animal, are objections which may be so pronounced that they cannot be counterbalanced by any theoretical physiological advantage.

6.—The flesh of animals not usually used as food animals may occasionally be found substituted for the latter. Dog is rarely, if ever in this country, dressed as veal, and only occasionally is the carcase of a cat found in a consignment of rabbits. Special legislation exists to regulate the sale of the flesh of horses, asses, and mules.

7.—Prepared food products, which are nowadays sold so extensively, require supervision to ascertain that the flesh used is from the carcase of a healthy animal, as well as to ensure that reasonable precautions are taken to avoid the meat being exposed to possible contamination with harmful bacteria after slaughter, and to note whether any harmful substance has been deliberately added as a preservative. Supervision in respect of this latter matter would probably come within the scope of the Food and Drugs Acts, which provide that "no person shall mix, colour, stain, or powder, or order or permit any other person to mix, colour, stain or powder, any article of food with any ingredient or material so as to render the article injurious to health."

8.—Imported meat requires supervision as regards objectionable conditions which it may have acquired during its importation, freedom from disease, and substitution and sale for home-killed meat.

9.—Canned foods require supervision to ensure that the meat is free from decomposition, is from the carcase of sound animals, that the meat complies with the description on the label, and that it is free from added preservatives in objectionable amount.

An absolutely satisfactory examination of meat is only possible at the time of slaughter when all organs are available. In large towns, particularly those bordering on rural areas, much dead meat is brought in, and inspection is limited to the carcase or perhaps to joints. This fact requires an accurate knowledge of the appearances of normal meat and the limits of variations which are compatible with health. Only a practicable experience with carcasses and joints can impart the necessary skill. Descriptions are useful only to the extent that they indicate the points to which attention should be directed.

Carcass examination is easier than that of cut-up meat, since there are more facts available on which to arrive at a judgment. For example: it is easier to decide whether there has been satisfactory setting; the serous surfaces, or when the lining membrane has been removed, the locality, are available for examination; the general characteristics of the fat, particularly, the amount, firmness, colour, and existence or otherwise of increased number of blood vessels containing blood, are more readily ascertained; the colour, feel, and smell of the muscular fibres in each part of the animal may be more searchingly investigated; the lymphatic glands are available, or a more positive decision is rendered possible that wilful removal accounts for their absence if they are not present; a choice of bones is possible, where such require to be sectioned, and characteristics of age and sex are more readily appreciated. Notwithstanding all these facts, organs are missing, and it is in them that often the chief indications of disease are to be found. In some instances animals slaughtered during a state of ill-health are immediately cut up, and are not seen in the carcase form, and if some of the characteristics of the following abnormalities are considered, it will be easily noted how difficult it may be to arrive at a definite decision if the part which should come under observation presents the minimum abnormality or the disease itself has not been fully established. In the case of fevered flesh, there is a more or less of a boiled beef appearance on fresh section which later becomes salmon-tinted, an acid and sometimes a sweet

smell, generally a sticky touch and excess of moisture and serum, the fat and lymph glands are usually injected and the serous surfaces may show hæmorrhages and cloudiness. Similar conditions though with darker and perhaps drier flesh, and a different odour, give a clue to the possible slaughter of an animal when in a state of excessive fatigue. Flesh, dark in colour, showing blood vessels gorged with blood, moist to the touch, and badly set, with fat containing an excess of blood vessels, and also lymphatic glands containing an excess of moisture and dark in colour are symptoms indicative in their varying degrees, of defective bleeding to slaughter after death. Meat comprised of flabby greyish-red muscles, gelatinous looking fat and moist connective tissue, with possible softening of the marrow, may be regarded as coming from an animal with pathological emaciation, and in sheep a dropsical condition of flesh is frequently found associated with heavy fluke infection. The colour, touch, and smell combined with the appearances of such fat, lymphatic glands, and serous surfaces as may be present, are the chief points which help in the decisions respecting the above classes, and, as stated, these indications in different joints may vary between wide limits.

The importance of diseased meat as a factor in the production of outbreaks of meat poisoning has been recognised by the United States Government to the extent that in the series of regulations governing meat inspection in that country a list of diseases giving rise to these outbreaks is scheduled, and they include :

- (a) Acute inflammation of the lungs, pleura, pericardium, peritoneum, or meninges.
- (b) Septicæmia or pyæmia, whether puerperal, traumatic, or without any evident cause.
- (c) Gangrenous or severe hæmorrhagic enteritis or gastritis.
- (d) Acute diffuse metritis or mammitis.
- (e) Polyarthrititis.
- (f) Phlebitis of the umbilical veins.
- (g) Traumatic pericarditis.
- (h) Any acute inflammation, abscess, or suppurating sore, if associated with acute nephritis, fatty and degenerated liver, swollen soft spleen, marked pulmonary hyperæmia, general swelling of lymph glands, or diffuse redness of the skin, either singly or in combination.

These regulations further require that any premises or implements used for the slaughter

of animals so diseased shall be thoroughly disinfected, and that any part of a carcass which has been in contact with the carcass of an animal so suffering (except as regards the diseases in paragraph (a)), shall be destroyed, and further, that if contact has existed for a period of time, exceeding two hours, the healthy but contaminated carcass shall be entirely destroyed.

The question as to how far meat used in the prepared form should be compulsorily inspected before being used, even assuming such a system were not applied to meat in general, is one well deserving of more detailed consideration.

The commonest conditions observed during inspection in slaughter houses are the following :

Cattle.—Tuberculosis—observed particularly in old cows, abscesses in different organs, and actinomycosis of the head and tongue. Blood aspiration from defective sticking and also pleurisy are most frequent causes of condemnation of the lungs, as well as tuberculosis. Parasitic diseases of the lungs and liver require the rejection of a large number of these organs, and although not a most frequent cause of destruction, septic infections are amongst the most important.

Calves.—Veal carcasses are chiefly seized on account of such conditions as tuberculosis, asphyxia, immaturity, and hydræmia, and less frequently septicæmic conditions.

Sheep.—Parasitic conditions are most frequent and deposits in the lungs (strongyles) are occasionally mistaken for tuberculosis. Hydræmia often necessitates condemnation. Tuberculosis is practically never seen, but occasionally pseudo-tuberculosis (caseous lymphadenitis) is met with, affecting the glands and certain organs.

Pigs.—Are chiefly affected with tuberculosis and with parasites in the various organs. They also frequently show skin eruptions, either as a distinct ailment as urticaria, or an occasional symptom of some other disease, such as swine fever.

As regards imported meat, it is necessary to be able to distinguish imported frozen or chilled meat from home-killed. The manner of dressing the two types and the changes resulting from the temperature to which imported meat is exposed, and the results of transportation enable this to be done. Home-killed meat appears to be more carefully dressed, the stifle joint is generally opened to let out the synovial fluid, and the spinal column is generally chopped through, though not

always entirely. Imported meat does not appear so well finished, the fat which is of a pinkish hue in chilled meat and dead white in colour in frozen, is more or less ragged, and shows pressure marks; the spinal column is always sawn through, and in frozen meat the flesh, after defrosting, generally exudes moisture; this is less in the case of the chilled variety. Good varieties of chilled beef, when in the joint form, are on occasion most difficult to distinguish from home-killed.

As regards the inspection proper of imported meat, the following are the chief points which require to be noted:—

(a) Condition, whether moulds have developed or putrefactive changes have resulted from defective means of transportation.

(b) Diseases, Actinomycosis chiefly in the tongue and glands at the base of the tongue. Occasionally foot and mouth disease is observed in imported tongues. Onchocerciasis affects Australian cattle, and it is this disease which necessitates the removal of the briskets and incisions round the stifle joint of all imported beef carcasses from the Commonwealth. Tuberculous glands are occasionally found on division of a carcass. In pigs, tuberculous lesions are occasionally found, and also minute hæmorrhages in the muscles of otherwise healthy animals are also noted. These appear to be due to rupture of the small blood vessels during death struggles. In imported mutton, "condition" is generally the main object of enquiry.

Other defects are bruises, and the existence of bone-taint, so-called, which is a putrefactive change found in the thick muscular parts of cattle in the region of the buttocks and shoulder joints, and chiefly observed in the best conditioned animals. It is recognised by penetrating these parts by an auger in frozen carcasses and by a skewer in chilled beef, and noting the smell on withdrawal.

In addition to such details as are outlined above, a medical officer should be prepared to consider and express an opinion on many matters of general principle, one of the most pressing of which perhaps is some scheme designed to ensure greater uniformity. The present lack of uniformity gives rise to grievance among the traders, and is a source of irritation to medical officers in those towns in which meat inspection is carried out on rational lines. Greater uniformity would probably result in the establishment of a recognised system of interchange of information; for example, the knowledge that an

animal of doubtful class has been purchased, should, if possible, be communicated to the medical officer of each district to which the animal is transferred; such animals usually make several journeys before they arrive at the place of slaughter.

The subject of the marking of meat after inspection is one which is not accepted generally either by the trade or by officials, as desirable or feasible, though in a few places—viz., Belfast, Exeter, and Hamilton—local schemes are now in operation. It ought to be possible to devise some useful system of marking meat; but this should be under the control of the Local Government Board, otherwise, districts may continue to organise schemes on their own lines, with the danger that present complaints as regards uniformity of action will be as frequent as at present. The present state of affairs results in meat from inspected districts being mixed up with meat from districts in which there is no inspection, and an inspector who visits a shop or a market must pay regard to all, as no distinction is possible.

The provision of public abattoirs is one of which the advantages and disadvantages have been frequently considered, and there seems at present little possibility of general agreement being arrived at between opposite parties. Perhaps this subject would be nearer solution if meat inspection were made compulsory, and more precise regulations were framed to guide inspecting officers. The only guiding principles which are available are those suggested nearly twenty years ago by the Royal Commission on Tuberculosis, which have reference to the method of dealing with the carcasses of animals found on slaughter to be tuberculous. Much work has been done on the subject since that time, and although on the whole the principles laid down are sound, they are rather more dogmatic than scientific. It is recognised at the present time that tuberculosis of an animal does not necessarily require destruction of the whole animal. Consideration is given as to whether the disease exists in a localized or generalized form. These terms, however, are somewhat deceptive, and have not exactly the same application as in general pathology. Tuberculosis is assumed to be localized when the area of infection does not extend beyond the lymphatic glands draining the area showing the primary lesion, whereas generalization is regarded as having happened when the bacilli have reached the different parts of the body

by means of the arterial blood stream. Even this sharp line of demarcation is being blurred, since there are some observers who think that there are cases in which there may have been a slight single generalization, which does not call for complete condemnation of the carcase. Perhaps a generalization limited to the lungs and the liver, without any affection of the systemic lymphatic glands, would be regarded as a case in point by those holding this opinion, but in such an instance secondary lesions would require to be all of the same age, encapsuled and showing no evidence of secondary infection by purulent organisms. This is a difficult subject for discussion, and cannot be referred to further in a paper of this character. Thoroughly to appreciate the import of tuberculous lesions, a knowledge of the position, drainage area, and anastomatic communications of the lymphatic glands is essential.

The problem of pig tuberculosis is again one of difficulty. The Royal Commission recommends that the carcasses of all pigs suffering from tuberculosis should be condemned. There is an increasing tendency to regard pig tuberculosis somewhat more leniently, and some inspectors consider that when the disease is limited to the glands of the cervical regions, condemnation of the head and neck only is permissible; such a fixed rule is hardly acceptable, as other points require to be considered. It is necessary to recollect that pig tuberculosis is generally of the ingestion type, whilst bovine is more frequently of the inhalation type, and that generalization seems to occur more rapidly, and is more progressive in the pig than in any other food animal; and further, as Eastwood and Griffiths have shown, cases of infection, apparently localized to the neck glands, have caused dispersion of tubercle bacilli in one of the other internal organs without macroscopic evidence.

In the case of tuberculosis of both the pig and bovine, the time appears to have arrived when more complete regulations for the guidance of inspectors are desirable.

A large variety of food products are now put up in the "canned" form, and as regards the meat from the larger food animals, it may safely be stated that the highest quality is not that generally used to prepare corned beef. The term "meat" would appear to include practically any part of the carcase, and sheep's hearts with portions of the diaphragm have been found to constitute corned meat. In another instance, which was first observed by

Dr. Willoughby, of the Port of London, a consignment of American corned beef, "Prepared from meat passed for Sterilization," was held up. This meat was allowed to be re-exported, but not to be sold in this country. Round tins are being increasingly used instead of rectangular. In Australia, brisket meat approved as being free from "worm nests" is used. Having in view the fact that the Foreign Meat Regulations forbid the importation of scrap meat, it would appear reasonable to require that canned meat, which may consist of scrap meat cooked and obscured from view, should only be prepared and packed under conditions of inspection acceptable to the officials of this country.

This paper has been prepared not so much with the object of its proving of practical value as to direct attention to the wide range of matters which are included in meat inspection work and to emphasize the necessity for increased instruction being given in the subject if greater uniformity in practice is to be secured.

PROCEEDINGS OF THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

FOUNDED 1856.

RECONSTRUCTED 1888.

INCORPORATED 1892.

PROVINCIAL MEETING.

Midland Branch.

The Annual Meeting was held at the County Hall, Warwick, on Thursday, July 13th, 1916, at 12.30 p.m.

Present:—Dr. A. Bostock Hill (in the chair), Drs. Henry Malet, T. Ridley Bailey, D. Dryburgh Gold, William Bates, W. M. Clendinnen, Sidney Barwise, C. E. Tangye, Philip Boobbyer, Henry Handford, A. Hamilton Wood, J. W. Miller, J. Orton, and E. H. Snell; and Miss M. S. Lowe, Superintendent Health Visitor for Warwickshire, attended as a visitor.

Letters of regret for non-attendance were received from Drs. Henry May and Killick Millard.

The following officers and council were elected:—President, Dr. T. Ridley Bailey; President-elect, Dr. G. A. Auden; Vice-Presidents, Drs. A. Hill, Henry May, Henry Handford, A. Bostock Hill; Council, Drs. S. Barwise, George Reid, P. Boobbyer, Henry Malet, John Robertson, Petgrave Johnson, W. M. Cowie; Treasurer, Dr. A. Bostock Hill; Secretary, Dr. E. H. Snell; Representatives on Council of Society, Drs. Henry Handford and Sidney Barwise; Auditor, Dr. J. Orton.

It was proposed by the President and seconded by Dr. Ridley Bailey, that a vote of thanks should