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TRICHINIASIS IN ENGLAND NOW

Following our editorial warning last week (p. 202) that trichiniasis exists in this country, we publish this week at page 237 an account by J. E. S. Lee of the disease as seen at the present time in Wolverhampton. A description by J. H. Sheldon of the same outbreak appears in the current issue of the *Lancet*. Suspicious cases were first seen in the middle of December last, and soon afterwards some of the more severe were admitted to hospital. The nature of what was evidently a distinct and unfamiliar disease entity was finally determined by the demonstration of *Trichinella spiralis* embryos in a piece of excised muscle. Some 500 cases have occurred in this district, and, although some of them have been severe, there have fortunately been no deaths. The clinical picture departs from the usual description in several ways. During the first week after consuming infected meat vomiting, diarrhoea, and upper abdominal pain are said to be characteristic: in these cases they were often completely absent; according to Sheldon only 10% had vomiting and 5% diarrhoea, the majority being constipated, sometimes severely. The absence of prodromal gastro-intestinal disturbance is therefore not a point against the diagnosis, and symptomatic recognition must depend mainly on the features of the stage of invasion. The first of these is usually swelling of the eyelids, accompanied by severe frontal headache; a few days later involvement of the skeletal muscles usually causes pain, tenderness, and stiffness. These effects are very variable, ranging from complete absence in slight cases to a condition said to be worse than labour pains, and causing such stiffness that patients have said they "might have been plaster statues"; the duration of muscular symptoms also varies from a few days to five weeks. A prominent and unusual feature in this epidemic has been evidence of involvement of the nervous system, and this of several kinds. Some cases present the picture of meningitis, with head retraction, semiconsciousness, irritability, photophobia, a meningeal cry, a positive Kernig sign, and extensor plantar responses. Others are deeply lethargic, depressed, and even deluded. Finally, no fewer than thirteen out of seventy-six cases (17%) described by Sheldon have presented signs of focal cerebral lesions, in the form either of monoplegia or of ataxia. Not only may these nervous manifestations complicate a severe and otherwise typical case, but in some giddiness, weakness, and ataxia have been the first manifestations, even preceding the swollen eyes. The general picture is therefore highly complex, and consideration of trichiniasis may be necessary in the differential diagnosis of a large variety of conditions. Fortunately the true nature of the disease seems to be invariably betrayed within the first few days if not at the very onset by oedema of the eyelids—an absolutely constant sign which in the absence of albuminuria calls

for a differential leucocyte count; a marked eosinophilia almost certainly establishes the diagnosis. This blood change may apparently develop late, and was equivocal in degree in some of the cases described by Lee. It would be useful to do repeated counts on a series of cases diagnosed early in order to define more exactly what blood picture is to be expected at each stage. Of the various methods of positive diagnosis by demonstration of the parasite, according to D. L. Augustine,¹ concentration of the blood for embryos and searching the stools for adult worms so often yield no result as to be a waste of time; muscle biopsy may also fail to reveal embryos in a lightly infested case. This author recommends the use of an antigen prepared from embryos both for a skin sensitivity test, which becomes positive during the second week, and a serum precipitin test, first applicable during the fourth week. Since both these reactions persist for a year or more they would serve admirably for ascertaining the full extent of an epidemic during its later stages or even after it is over, as well as for confirming the diagnosis in individual cases. An improved method for preparing the antigen has recently been described by J. Bozicevich.²

We also publish a short account by L. P. Garrod and D. MacLean of further cases of trichiniasis which have been diagnosed in Hertfordshire since the existence of the disease in this country became known. This minor but significant incident perhaps illustrates the consequences which may accrue to the public health if E.M.S. laboratories are looked upon not merely as sources of reports on specimens but as consultative centres for epidemiological problems. The extent of the disease in this area is not yet known, but five comparatively mild cases have so far been diagnosed, each presenting a typical clinical picture and having an eosinophil count of over 2,000 per c.mm.; the embryo has been found in muscle from one case. The importance of these few cases lies of course in the fact that they appear unlikely to be connected in any way with the Wolverhampton outbreak, and the recognition of the disease in another area raises the possibility that it may be widespread. It is incumbent on practitioners throughout the country to be on the look-out for cases having these features, and to call in laboratory aid whenever the disease may be suspected.

Until the extent of the disease is fully known it cannot too strongly be urged that all pork and pork products should everywhere be thoroughly cooked. Sausages are chiefly suspect, and it does not seem to be generally known that the meat they contain has usually not been cooked at all, nor are all physicians perhaps aware that eating raw sausage is a common habit. The piece of social research in this connexion described by Sheldon produced astonishing results. As soon as this habit was recognized as a factor in the Wolverhampton outbreak, all patients were asked about it, and of the next fifty-nine seen thirty-seven confessed to it. It was also found to explain the peculiar sex incidence: sixty-two of Sheldon's patients were females and only fourteen males. Apparently working-class women content themselves with raw sausage either because it is a tasty and portable lunch to take to a

¹ *New Engl. J. Med.*, 1937, 216, 463.² *Pub. Hlth. Rep.*, Wash., 1938, 53, 2130.

factory, or, if they are married, because housework leaves them no time or inclination to prepare a proper meal; their husbands, on the other hand, expect things to be cooked for them. A warning against the dangerous practice of eating raw sausage should be sounded throughout the length and breadth of the land.

OVERHAULING ASEPTIC TECHNIQUE

At a congress of the American College of Surgeons held in October, 1939, the proceedings of which have only recently been reported,¹ post-operative infections and the measures by which they can be prevented were discussed from almost every possible point of view. The mere fact that this subject was chosen for so prolonged a debate acknowledges that perfection in aseptic technique has not been generally reached; what was said on some aspects of it suggests rather there is much room for improvement. This report forms an interesting corollary to the paper by Prof. A. A. Miles and his colleagues which we published a few weeks ago,² for both deal with different aspects of the same subject. The study initiated by the War Wounds Committee of the Medical Research Council has developed on lines which have shown that much preventable infection in wounds is due to imperfections in ward technique; it is suggested that if precautions usually taken in operating theatres were also observed in ward work the transmission of infection could be prevented. The American report, on the other hand, deals almost exclusively with theatre technique itself—that aspect of surgery which should be a model for all other proceedings undertaken in its name. Let us grant at once that theatre infections are far less common than those acquired in septic wards; the problem is not of the same magnitude. But what it does amount to can only be ascertained by accurate record-keeping, and when such a system was introduced in 1925 at the Presbyterian Hospital, New York, it was found that the frequency of post-operative wound infections was no less than 14% of all cases, 4% being serious and 10% trivial. These records have been carefully kept since then; cases have been reported weekly to the staff conference, and changes made in aseptic technique to eliminate the apparent source of infection. The incidence of infections has declined steadily, and amounted in 1939 to only 0.6% classified as serious and 2.6% as trivial.

Among measures for minimizing contamination of the wound the first recommendation made at this congress was the use of an efficient mask, which is now well known to mean one containing an impermeable layer of some such material as cellophane. Current American opinion that the air is the source of staphylococcal wound infection is reflected in several communications on the use of ultra-violet light for air sterilization; but glove perforations are not forgotten, and it is recommended both that small punctures should be more carefully looked for and that a record be kept of the numbers produced by each surgeon, with a view to persuading the chief sinners to take greater care. The patient's own skin is another pos-

sible source of wound infection, and pre-operative skin disinfection comes in for discussion here; but the recommendations made are simple and would lead no uninstructed reader to suppose that methods favoured for this purpose are legion. It is laid down that preliminary cleansing with liquid soap followed by ether and alcohol and the application of a sterile dressing should take place in the ward; for the further swabbing with ether and alcohol carried out in the theatre before the application of a mercurial or dye antiseptic minute directions are given for wiping towards the periphery in order not to transfer bacteria from the unsterile edge of the operative area to the line of incision in its centre. How important such details may be must be left to individual judgment, but it scarcely needs to be said that nothing like this amount of care is always taken over this proceeding.

"Supposedly sterile materials" are the final source of danger dealt with at this congress. Catgut, of course, has always been a problem, but the absolute and invariable sterility of instruments and of fabrics such as towels and dressings is a fundamental condition of successful surgery. It is usually assumed with confidence. Is this confidence always justified? The most detailed report in these proceedings deals with steam disinfection: it condemns the use of metal drums, and condemns the vacuum displacement of air, thereby classing as potentially inefficient probably nine-tenths of steam sterilization in theatre practice in this country. Gravity air clearance, a horizontal path for air escape, and a thermometer at the outlet which must read 250° F. before sterilization is considered to have begun are laid down as essentials. The sterilization of instruments is the subject of a paper which begins by recording the answers to a questionnaire on this subject sent to 207 leading hospitals in all parts of the U.S.A., producing 106 replies. The variety of practice revealed in these replies is astonishing. No fewer than sixteen different methods are used, with variations. Boiling for various periods in either water or a solution of soda and autoclaving at various pressures (temperature not being mentioned) are the most popular. Other methods of applying heat are immersion in oil at 250° F. and a hot-air oven at 170° C., which have ten advocates and one respectively. Alcohol alone in concentrations of from 50 to 95% is used at six institutions, and lysol or carbolic acid in various strengths or combinations with glycerol or alcohol in about twenty others; biniodide of mercury and "70% alcohol and soda soap" have only one advocate each. It should be understood that these are methods used for simple steel instruments: had the inquiry embraced catheters, rubber articles, and suture materials the variety of replies would no doubt have been greater. The author of this paper, E. E. Ecker, goes on to discuss a large variety of other chemical reagents which have been recommended for instrument sterilization, and seems concerned rather to deplore this lack of uniformity in practice than to advocate any particular method, although his statement that boiling in a 2% solution of soda will sterilize a soil suspension in five minutes implies that here is one answer to the problem. There is, of course, no harm in using whatever method one fancies provided that it works, but some of these do not.

¹ *Surg. Gynec. Obstet.*, 1940, 71, 403.
² *British Medical Journal*, 1940, 2, 855.