sewage,⁷ the dilutions involved would seem to be too great for sewage farms and rivers to be important centres of virus pick-up. Earth closets are obvious sources, but they are mainly restricted to rural areas, and most of the cases are reported from towns.

There is, however, one persistent source of fresh human stools, open to visitation by flies, embracing every town. I refer to our vast network of railway lines. Because of the primitive sanitation on our trains and the large number of apparently healthy people who may be poliomyelitis carriers, railway tracks may be an important source of the virus. From it flies may contaminate food in near-by warehouses, restaurants, and homes. This might account for the widely scattered outbreaks of the disease and the speed with which it travels both here and in America.

The fact that few cases are reported from country districts, where there are earth closets as well as railway lines, does not oppose this theory. In those countries like China and the Philippine Islands,⁸ where sanitation is primitive, the native populations do not suffer from epidemics of poliomyelitis. Yet the virus is there, for British and American troops quickly acquire it and go down badly with the disease. It is also a fact that poliomyelitis is most widespread in those countries with the most efficient sanitation and that the disease has increased there progressively during the last fifty years.

All this suggests that under conditions of bad sanitation the bulk of a population somehow acquires immunity to poliomyelitis. The disease is rare in children under one year of age and it may be that they tolerate the virus. Sabin⁹ has in fact suggested that, with a widespread source of the virus and many flies, children may normally suffer a symptomless attack during their first year, acquiring immunity in the process. This would explain the comparative rarity of outbreaks in rural areas where there are still earth closets. It would explain why poliomyelitis increases in countries where improvements in sanitation reduce the chances of acquiring natural immunity. It would support my contention that raw stools on railway tracks running through towns are a menace.

It is difficult to see, since so many factors are involved, how this theory could be tested adequately. I would suggest that the possibility that it may be right should be sufficient incentive for the Government to order the fitting of properly serviced chemical toilets on trains as early as the present situation permits. Now that we have had one epidemic of poliomyelitis, American experience suggests we can expect more.—I am, etc.,

London, E.C.4.

CHAPMAN PINCHER.

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SIR,—I have read with much interest recent remarks appearing in the *B.M.J.* anent precautionary measures against the spread of poliomyelitis. The present extensive outbreak, the greatest yet experienced in this country, is naturally causing grave concern, and there is reason to believe from a study of statistics of past years that the height and extension of the infection have not yet been reached; in fact, any marked subsidence is not likely to occur until October. The widespread nature of the present epidemic calls for every effort to limit extension and to bring about its reduction as quickly and as far as possible.

While there is no doubt that the virus of the disease is largely communicated from one person to another by secretions of the oropharynx, either by direct personal contact with actively infected individuals or with healthy carriers, there is also definite evidence that the virus commonly appears for some days and even weeks in the faeces of typical and of abortive cases. The virus, which withstands drying for considerable periods, has further been demonstrated on flies and on exposed food in the homes of poliomyelitis cases. This is strongly suggestive that the infection can be disseminated in much the same manner as the enteric infections, such as paratyphoid, epidemic diarrhoea, dysentery, and typhoid. Unfortunately, owing to the nature of the virus of poliomyelitis, it is not possible as yet readily to detect contamination of food, water, fomites, etc.,

as is the case with these other infections caused by easily demonstrable micro-organisms.

Statistical evidence, however, shows so close a correspondence between the seasonal incidence of poliomyelitis and that of the enteric infections as very strongly to suggest that analogous factors operate in dissemination. For example, allowing for slight lag between time of infection and death (actual morbidity figures not being available), the incidence of deaths from enteritis presents a very remarkable correspondence with that of poliomyelitis. Taking the five years between the two wars 1924 to 1928, a period covering the mid-high epidemic poliomyelitis year 1926, and one which was comparatively little disturbed by fluctuations or geographical migrations of population, almost perfect correspondence existed in the incidence of poliomyelitis and deaths from enteritis; in fact, for the whole period I have found the coefficient of correlation to be no less than 0.95. During these years, moreover, the annual relative magnitude of the two infections also closely corresponds. In several other years an almost equally close correlation appears, the incidence commencing to rise in the same week and reaching maximum and minimum in a not very dissimilar manner. Somewhat similar though less well sustained correlations also obtain in respect of typhoid and paratyphoid fevers.

The notable fact that the initial rise of poliomyelitis and of the enteric infections almost invariably occurs at identically the same period of the year and that the gradients in the respective curves of incidence closely resemble one another throughout the remainder of the year is, I suggest, strongly indicative that, apart from climatic conditions, common disseminating factors are in operation. Moreover, the fact that the incidence of poliomyelitis has in general predominated more in rural than in urban areas is a point in itself somewhat significant.

While unquestionably attention must necessarily largely be concentrated upon the well-recognized dissemination of poliomyelitis through direct personal contact with infected cases and with carriers, I think, at all events until far more is known of the epidemiology of poliomyelitis than is at present the case, it is highly desirable that all those precautions and measures commonly carried out in respect to the prevention of the enteric infections should similarly rigidly be applied to the prevention of poliomyelitis.—I am, etc.,

Christchurch, Hants.

C. CONYERS MORRELL.

Penicillin in the Treatment of Diphtheria

SIR,—We have read with considerable interest Dr. David Long's article on "Penicillin in the Treatment of Diphtheria" (June 21, p. 884). We are glad to find that our article has roused some interest among scientific men abroad. Being a lecturer on bacteriology in a famous school he can certainly comment on our bacteriological findings. Ours was mainly a clinical study, but such bacteriological examinations as were relevant to our study were undertaken to implement our diagnosis and assess the effects of penicillin therapy.

The clinical diagnosis of all our 27 cases was beyond dispute, and the presence or absence of secondary invaders, which are mainly β -haemolytic streptococci and pneumococci in our place, would not alter it. The classification of our cases as early or otherwise was made on the gravity of the general symptoms and the size and extent of the membrane and not by the fever alone. The clinical reports, though brief, contain all the salient features. After all, brevity is essential in writing anything for journals in these days. "Patch" is the common expression for the pseudomembrane in diphtheria, and we wonder why it should not be used in clinical description. If Dr. Long would read the case reports he would find that not only did we see the disappearance of the patch from the throat but daily swab examinations were undertaken, and the dates when the throat swabs became negative were also mentioned. These swabs were cultured and reported only after a full study by the most competent bacteriologist, and we did not depend on morphological study alone as assumed by our friend. The typing could not be undertaken for non-availability of culture media at the time.

Treatment of diphtheria with penicillin alone is no doubt risky and adventurous, but one must be prepared to take some risk if he wants to cover a new field of therapeutics. Dr. Long will find in the case reported by Dr. A. D. Symons in the *Medical Officer*, 75, 224, that a fairly severe case of diphtheria was cured by him with penicillin alone without any antitoxic serum. In fact, he should rightly claim the priority in this new adventure. We are

continuing our work here in Calcutta in greater detail and we hope to acquaint Dr. Long with our results as soon as our data are complete. We assure him that this further work has only confirmed our previous conviction that penicillin is very effective in the treatment of early and even moderately severe cases of diphtheria without the administration of antitoxin, and that the boggy of the toxin killing the patient by involvement of cardiovascular apparatus and the nervous system if antitoxin is not given early should not be entertained.

Dr. Long has also taken an exception to our argument of economy in favour of this method of treatment, but little does he know that 90% of our countrymen hardly get two square meals a day. Only the other day three million people died of starvation in the province of Bengal. Cost may not count in the British Isles, but it is the prime factor in everything that we do here in India, including the treatment of our sick people. Before we conclude, we would request Dr. Long to approach the M.R.C. for a grant with which he may do some practical work in one of the infectious diseases hospitals in London to put the matter to test before hurrying to condemn what may ultimately be accepted as truth all over the world.—We are, etc.,

M. N. DE.
L. K. GANGULI.

Calcutta.

The Lazy Eye

SIR,—Surely Dr. William Moodie (Aug. 23, p. 310) has got hold of the wrong end of the stick psychologically? Should it not be that *because* children have these defects they may be backward educationally? Children wearing glasses and having one eye covered up are presumably squinters. By covering the good eye and making the defective one work, as described in letters by myself in the *B.M.J.* (Aug. 17, 1935, p. 317, and Sept. 28, 1946, p. 475), the worse eye can be materially improved in vision. The younger this is commenced the better, and progress, mentally, takes place with the improvement in vision. This is even possible in adults who lose the sight of a good eye and are left dependent on an eye that had bad vision in spite of any glasses up to the age of forty or so, there being many war and occupational examples of such injuries.

Dr. Moodie mentions equal bilateral vision in connexion, presumably, with covering up an eye. This does occur sometimes in squints, which can look straight ahead with either eye. Such cases of alternating squint are difficult to treat and not very satisfactory even when operated on, as there is some squint left even then, although nothing may be apparent when the patient looks straight ahead.—I am, etc.,

London, W.1.

SYDNEY TIBBLES.

SIR,—Although I quite agree with Dr. William Moodie (Aug. 23, p. 310) that in certain cases in which occlusion of one eye is indicated on ocular grounds it has to be abandoned on account of its ill effect psychologically, Dr. Moodie did not, however, state the generally recognized fact that the main reason for occluding one eye of a child is in the case of a constant squint, where one eye deviates and has in consequence become amblyopic from disuse in spite of appropriate optical treatment.

In my experience if occlusion is properly carried out at an early age rapid improvement of the vision of the amblyopic eye takes place, except in rare instances. Such treatment is followed by orthoptic exercises (and operation if necessary), so that the squint is cured before the age at which education becomes of real importance, and before the child is likely to be adversely affected physiologically or psychologically by such treatment.—I am, etc.,

London, W.1.

T. KEITH LYLE.

The Coroner's Court

SIR,—As your Medico-Legal Correspondent points out in the footnote to Dr. B. N. Blood's letter (Aug. 16, p. 272) the Act of 1926 does give the coroner powers as to committing for trial; but surely this is modified by rules as laid down in the same section of the Act?

I have found that the invariable procedure for a person "arrested on a coroner's warrant" is for the accused to appear before the magistrates, who decide whether there is a case for trial. It frequently happens that the inquest is a formal matter

for identity and cause of death to enable the coroner to issue a burial order, and it is then adjourned pending criminal proceedings. A peculiar situation may arise when a person arrested on a coroner's warrant appears before the magistrates and they decide that there is no case against him. In such circumstances it appears that the coroner's warrant still stands, and the accused, already "cleared" by the magistrates, may have to appear at the assizes for trial.

It may be hoped that the committee at present considering the working of the Coroners Acts will suggest useful amendments, and that among them will be found the principle that the coroner's inquest is primarily concerned with establishing identity and with cause of death.—I am, etc.,

Bournemouth.

W. McNAUGHTAN.

Salaries of Specialists in N.H.S.

SIR,—I was interested to read Dr. W. Lindsay Neustatter's letter (Aug. 23, p. 309) and hasten to write to agree with him. I think that the reason of a difference of opinion that has arisen over the payment of psychiatrists as compared with physicians and surgeons has been due to the fact that the standard of the D.P.M. in the past has fluctuated, whereas both the M.R.C.P. and F.R.C.S. standards have remained at a consistently high level. Were there one examining body in the country for the D.P.M. the fluctuations might be overcome. Nevertheless this variation of standard should not be responsible for decreasing the salary.

If it is considered that, before a candidate is thought suitable in experience and training to be appointed as a specialist in psychiatry either to a senior post in a mental or a general hospital, or by a local or Government authority, a D.P.M. is necessary, then in that case the D.P.M. is the criterion of a specialist in psychiatry and the salary should be the same as that for medical or surgical specialists. The view that physicians and surgeons are more concerned with "matters of life and death" than psychiatrists is in my opinion due to gross ignorance of the work of the psychiatrist. Dr. Neustatter points this most admirably, and I would add that a psychiatrist in a general hospital is on occasions asked for an opinion as to diagnosis, treatment, and disposal of cases where neither physicians nor surgeons have come to a definite conclusion.—I am, etc.,

Manchester.

NORTHAGE J. DE V. MATHER.

POINTS FROM LETTERS

Poliomyelitis

Dr. J. N. McINTOSH (Gloucester) writes: There have been occurring in my practice a number of cases (children and adults) of pharyngitis, tonsillitis, and tonsillitis-with-diarrhoea, all having a temperature. The symptoms lasted on an average three days, and the patients completely recovered. Owing to the possibility of these cases being anterior poliomyelitis or polio-encephalitis, all were kept in bed, treated with sulphonamides, and isolated for at least ten days. . . . Now that cases of poliomyelitis are increasing, I am suggesting that all cases of "sore throat" and diarrhoea, even without any fever, be treated on the above lines.

Col. P. F. CHAPMAN, I.M.S. (ret.), writes: Is it not possible that the present prevalence of infantile paralysis may, in part at any rate, be due to some article in our restricted and modified dietary? In the Central Provinces in India there were after famine years widespread outbreaks of a form of spastic paralysis. This was caused by the consumption of the millet, *Lathyrus sativa*. In ordinary times this was only used as an adjunct to other grains, and it was only when used as a staple diet that the paralysis occurred. Is it not possible that in the modification of the austerity diet we may have introduced some article which may be causing this widespread epidemic? Soya-bean flour is largely used, and dried eggs are imported in large quantities. As so far there seems to be no satisfactory method of checking this epidemic, perhaps a long shot such as this may be excusable and excused.

General Knowledge and General Practice

Dr. WARREN MORRIS (Bath) writes: I hope Dr. R. Lawrence (Aug. 9, 230) will not feel injured if one suggests that the injury done to one by an overdose of morphine, or to one's pocket by the present price of tobacco, is in neither case traumatic.