ing, and giddiness. Less commonly diarrhoea may follow the vomiting, and more rarely a pyrexia may be met with. Another symptom which was encountered here and apparently not noted before was that of frontal headache. Of the twelve cases of diarrhoea eleven occurred in adults.

As the disease is of such short duration it is difficult to decide what particular system is attacked. Earlier papers suggest either the gastro-intestinal or the nervous. So far, in all examinations made no organisms known to cause gastro-enteritis have been found. The greatest argument against a food or water contamination is the type of spread in families. Instead of the whole community going down at once there is a gradual peripheral spread from the first case noted in the institution or family. This can be well seen in our epidemic. In the school cases two children went home, and two days later both parents contracted the disease. In Cases 15 to 20 of the country epidemic the passage from one individual to others in the family is clearly shown. Evidence would suggest that it is a person-to-person infection with at least a two-day incubation period. As Miller and Raven suggest, the probabilities point more to an acute infection of the central nervous system, possibly of a virus type. All the symptoms except the diarrhoea may then be explained. Presumably a droplet infection is the mode of spread. It is difficult to assume that the attacks heretofore reported are isolated incidents; more probably the syndrome is kept alive by sporadic cases occurring about the country and only flaring to epidemic proportions when the environment is ripe.

The importance of this disease does not lie in its manifestations, which are mild, but in the possibility of its being confused with an outbreak of food poisoning or Sonne dysentery when it occurs in institutions. The latter are more serious matters than epidemic nausea and vomiting.

Summary

An outbreak of epidemic nausea and vomiting is reported.

It is suggested that the disease is endemic in this country and capable of assuming epidemic proportions at any time.

The possibility of confusing it with mild dysentery or food poisoning is noted.

I am deeply indebted to Drs. A. J. May and T. G. Anderson for permission to report their cases, and to Dr. W. S. Slater, medical officer of health for the district, for his kind help.

REFERENCE

Miller, R., and Raven, M. (1936). *British Medical Journal*, 1, 1242.

A. Turchetti (*Minerva med.*, 1938, **29**, 570), who records an illustrative case, states that he has found only one other example on record of peritonitis due to meningococci. This was reported in 1917 by Moeltgen in a man, aged 21, who developed this complication in convalescence from cerebro-spinal fever; laparotomy showed a diffuse purulent peritonitis from which a pure culture of meningococci was obtained. Turchetti's own patient was a man, aged 29, who was suddenly seized with severe abdominal pain, which diminished in a few days, leaving a diffuse abdominal discomfort. Three months later the pain became worse again and he developed a circumscribed fluctuating swelling in the left flank; aspiration produced a creamy greenish pus from which one pure culture of meningococci was obtained. Complete recovery took place. The case was of interest owing to the rarity of its causation and its resemblance to pneumococcal peritonitis.

SPORADIC INFECTIONS DUE TO B. TYPHOSUS

BY

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Recent epidemics of typhoid fever have focused attention on a disease hitherto infrequently met with by the majority of younger practitioners. It may be anticipated that one result of these epidemics will be to increase the number of typhoid carriers in this country, and that sporadic cases, or localized outbreaks, may be expected. Isolated cases are more likely to be missed in the early stages of the disease if only for the reason that the practitioner may not give prominence to typhoid fever in his differential diagnosis.

The following account of ten non-epidemic cases of typhoid fever seen during the last four years in two relatively small areas (population approximately 45,000 each) may serve to illustrate the protean nature of the disease in regard to its clinical manifestation, infectivity, and transmission. Unfortunately it is not always possible to prove conclusively the source of typhoid infections, and the investigator's deductions in this respect may be taken as those which appeared most likely from a mass of circumstantial evidence.

Case Histories

Case 1.—A schoolgirl aged 9 was notified as suffering from acute tuberculosis of a few days' duration. She was said to present symptoms similar to those shown by her brother (Case 2), who had died three weeks previously of "miliary tuberculosis." The salient features of the case were pyrexia, furred tongue, and constipation. Blood culture and subsequent Widal reaction confirmed an infection by *B. typhosus*. The patient made a good recovery.

Case 2.—In view of Case 1 the circumstances attending the illness of Case 2 (aged 8) were investigated, and it was found that the patient had eaten raw cockles from the foreshore three to four weeks before his death. The Widal reactions of the immediate contacts of Cases 1 and 2 were negative, and accordingly samples of cockles from the reported gathering-ground were examined. They were found to be heavily contaminated by sewage from an outfall, but no actual typhoid organisms could be demonstrated. No further cases arose as a result of these two cases.

Case 3.—A schoolgirl aged 12 was seen in consultation as a possible case of tuberculosis. Moderate pyrexia, constipation, and malaise were the only obvious findings. The Widal reaction, however, established the diagnosis of typhoid fever. The contacts gave no evidence as to the source, and food and water did not appear to be implicated. It transpired that the father had recently been employed in scraping the woodwork of a pier, which was contaminated by sewage organisms. His working clothes were so offensive that he was wont to remove them in the scullery, where they were hung up beside a sink. It was just possible that infection was conveyed by a towel, drinking-mug, or hands which came in actual contact with the contaminated clothing. The patient recovered and, so far as is known, did not infect others.

In the foregoing three cases a sewage outfall was suspected to be the vehicle of infection. The area served by the sewer was outside the observer's jurisdiction, but the investigations made failed to bring to light any other cases or carriers.

Case 4.—This case was discovered during a visit paid on receipt of information from the Department of Health for Scotland that a refugee from Spain had arrived in the area. The man, who was aged 20, had returned a week previously after service with

the Spanish Government. He stated that he had suffered from diarrhoea since the day he left Spain, but was receiving treatment from his doctor. He looked ill and his spleen was palpable, but there was no elevation of temperature. He was immediately removed to hospital, where he soon presented the textbook description of typhoid fever. Death ensued, and severe ulceration of the large bowel and part of the ileum was demonstrated. *B. typhosus* was isolated from the bowel lesions and the spleen. Despite exposure over the period of one week the man's wife and two children escaped infection, as also did three other families who used a common w.c.

Case 5.—A boy aged 9 was reported within three days of the onset of symptoms by a medical practitioner who had been circularized regarding Case 4. The patient, although not a near neighbour, resided in the same street as the previous case, and proved by Widal reaction to be suffering from a mild attack of typhoid fever. It may be noted that he had not been included in the list of contacts of Case 4. Investigations disclosed that he had been sailing toy boats in a wash-house tub, which contained soiled linen from Case 4, before the discovery that that case was one of typhoid fever. No further infections arose as a result of Cases 4 and 5.

Case 6.—A typist aged 20 complained of vague malaise and headache. Her medical attendant found that her temperature was slightly elevated, and it was suggested that a specimen of blood be obtained for examination. This showed a titre of 1 in 100 against *B. typhosus*. She was admitted to hospital, where she soon regained her former health. Apart from the positive Widal reaction and constipation, she presented no evidence of typhoid fever—faeces and urine being alike negative. Infection was presumed to have occurred while she was on holiday in the West of Scotland. No case followed this one, but reference will again be made to it in discussing Case 8.

Case 7.—A male factory employee aged 32 was admitted to hospital, as a possible case of typhoid fever, on the request of his doctor. The man had been ill for about seven days, and clinically the case suggested typhoid fever. Shortly after admission he became extremely ill, dying within forty-eight hours. The Widal reaction and a post-mortem examination confirmed the diagnosis of typhoid fever. It was found on investigation that the patient had frequently visited his mother, who had been suffering from "pneumonia" for a period of eight weeks. In view of the rather atypical history of illness the mother's blood was examined, and was found to give a positive agglutination reaction in high titre to *B. typhosus*. The mother is referred to as Case 8. Of the many individuals who came in contact with Case 7 before admission to hospital none contracted the disease, but unfortunately a hospital infection occurred (Case 9).

Case 8.—The mother of Case 7, aged 53, already referred to, was admitted to hospital, where examination of the faeces proved her to be a persistent carrier. Three weeks before the onset of her illness she had taken up duties as caretaker in an office where Case 6 was employed as a typist. The w.c. was common to the office and the caretaker's house. Although Case 6 was again found to be negative for *B. typhosus*, the possibility of a temporary carrier condition and consequent transmission of the disease to the caretaker could not be discounted.

Case 9.—This patient, aged 28, was temporarily a resident medical officer in the fever hospital for two weeks, and performed the post-mortem examination of Case 7. It was learned with regret that after his return to his home county he developed what at first appeared to be tonsillitis. The Widal reaction indicated that he had a *B. typhosus* infection. He recovered after a sharp attack of typhoid fever, and expressed the view that some contaminated material might have splashed his shoes at the post-mortem examination, and that, in adjusting the shoe-laces later, he had conveyed the infection to his mouth by means of a cigarette or food. Certainly the probable date of his infection coincided with the day on which the post-mortem examination was performed. The case was diagnosed and treated outside the Kirkcaldy area, but is included because of the close association with Case 7.

Case 10.—A long-distance bus driver, aged 37, was sent to hospital as a case of typhoid fever (confirmed by Widal reaction) by a doctor who had just taken over a colleague's cases during the latter's absence on holiday. The man had been ill for some time with symptoms suggestive of rheumatism, and had, after a week's illness, been ambulant, only to relapse. In hospital the case pursued the course of a severe typhoid infection with haemorrhage from the bowel, but ultimately the patient recovered. Owing to the nature of his employment—that is, being absent from early morning to late evening—there were no local contacts other than his wife, who escaped infection. The time-table of his working hours showed that during the period when his infection probably occurred he had partaken of meals in two areas of the country where typhoid fever was reported.

Table of Findings at the First Investigation (*B. typhosus* only)

Case	Blood Culture	Widal	•Faeces	Urine
1	negative	1/400	positive	negative
2				
3	"	1/800	negative	"
4	positive	1/200	positive	"
5	negative	1/200	negative	"
6	"	1/100	"	"
7	"	1/1,600	positive	"
8	"	1/1,600	"	"
9	"	1/1,600	"	"
10	"	1/800	"	"

Conclusion

The ten cases recorded were the only *B. typhosus* infections detected during the period in the areas, in which no epidemic had occurred for many years. In only two instances was typhoid fever suspected during the initial stages of the disease.

Such cases of sporadic typhoid illustrate: (a) the difficulty in establishing a correct and early diagnosis on clinical grounds alone; (b) the importance of obtaining a specimen of blood for examination in any obscure case of fever or indefinite illness; (c) the apparent variation in susceptibility of individuals to infection; (d) that transmission of the disease may occur in so many ways that each case presents an individual problem; (e) the value of close co-operation between the medical practitioner and the medical officer of health.

A Dental Emergency Committee which has been set up by the Minister of Health in conjunction with the dental organizations has arranged for the establishment of a Register of Dentists who are willing to volunteer for national service in war-time. This register is being compiled on the basis of replies made by dentists to a questionnaire which has already been circulated to them by the dental organizations. Its object is to secure that the services of the profession will be used to the best advantage in an emergency. All dentists should have already received a copy of the questionnaire, and now that the *National Service Guide* is being distributed some of them may be wondering whether they are expected also to complete the forms of application for enrolment inserted in the *Guide*. Those dentists who have already completed the questionnaire and returned it to their organizations—and these represent about 85 per cent. of the profession—need not take any further action. The information they have already furnished is being collated for the guidance of the Government Departments concerned.