been cooked and served hot for lunch, then left on an open dish in the basement kitchen for eight hours before being served as sandwiches to the Bromyard party. It is presumed that the contamination occurred during this interval. Although the rat-poison used in the restaurant was not the vehicle for the spread of the infection, the risks incurred by using such a poison are obvious; and, in view of the fact that methods of food production and storage in hotels, restaurants, and cafés are seldom satisfactory, the continued use of such poisons in these places is a danger to the public health and should be prohibited.

The patients affected in the outbreak were treated symptomatically for the first week of the infection. Thereafter they were all given a course of sulphaguanidine, the dosage varying from 3 to 4 g. by mouth four-hourly by day for four days. Of the 12 patients thus treated, four complained of symptoms of intolerance, and the dosage was accordingly reduced, and in one case the course was terminated. Specimens of stools were taken from each of the affected persons until three consecutive negative specimens had been obtained, the patient then being considered free from infection. These specimens were taken twice a week for the first four weeks and thereafter once a week.

On account of the irregular intervals between the collection of specimens of stools and the small numbers involved, no relation of statistical significance can be shown between the duration of the infective period and the sex of the person affected. It is of interest, however, to note that the average period of duration of infection (i.e., the time from the onset of clinical symptoms to the date when the first of the three consecutive negative stools was obtained) was 24.4 days for the seven men affected and 47.6 days for the five women. The figures are as follows:

Period of Duration of Infection

Males	Females
23 days	39 days
20 "	44 "
30 "	67 "
23 "	30 "
20 "	58 "
32 "	
23 "	
Mean, 24.4 days	Mean, 47.6 days

If from these figures are subtracted those relating to the persons who did not receive a full course of sulphaguanidine, then the mean periods of duration of infection are: males, 26.2 days; females, 54.7 days. Thus it seems unlikely that the period of infection was influenced by the sulphaguanidine.

The five female patients and one of the male patients prepared food for consumption in their households. These persons were given instruction in personal hygiene and care in the handling of food. It is satisfactory to note that no secondary cases resulted from this outbreak.

Summary

A brief description is given of an outbreak of food-poisoning in Bromyard district due to infection with *Salm. bovis morbificans*.

Investigations revealed that the infection originated from the consumption of beef sandwiches in a Birmingham restaurant, and that the sandwiches were probably contaminated by infected rodents.

The danger of using rat-poisons incorporating salmonella organisms, especially in food premises, is noted.

The duration of infection in the female patients was approximately twice that in the males.

The evidence from this outbreak suggests that infection with *Salm. bovis morbificans* does not respond to sulphaguanidine therapy.

I would like to express my appreciation of the co-operation and help given by the staff of the Public Health Department and the City Laboratory at Birmingham, and the staff of the Public Health Laboratory at Hereford.

Medical Memoranda

A Case of Undulant Fever Treated by Chloramphenicol

The treatment of undulant fever has until recently been unreliable and unsatisfactory. Methods advocated have included the joint use of sulphonamides and blood transfusion (Holmes and Hughes, 1948; further recommended by Romer, 1949), and the use of "aureomycin" (Galpine, 1949); whilst the American Department of Clinical Investigation of Messrs. Parke, Davis, and Co. claim that six patients with active brucella infection responded rapidly within an average of 2-4 days to oral administration of chloramphenicol ("chloromycetin"; Parke, Davis, and Co., Technical Reference No. 1183, p. 2). This claim was so striking that one of us (T.V.C.) decided to attempt treatment of the next case of acute undulant fever met with in this area, where the infection is not uncommon. Compared with the larger towns and cities, the volume of milk consumed in this district not heat-treated is considerable, and contagious abortion in cattle is widespread.

The case of undulant fever described below responded immediately to oral administration of chloramphenicol. The results seem so good that the method deserves a wider trial. No serious complication was encountered.

CASE REPORT

The patient, a man aged 50, was first seen on June 2, 1949; he gave a history of having felt vaguely unwell for the past three to four weeks. Two days previously his afternoon temperature was 103° F. (39.4° C.). The main symptoms were lassitude, sweating, anorexia, constipation, insomnia, pains in bones of back and limbs, and retro-ocular headache. The symptoms were worse in the afternoons. No special physical signs were elicited. (The patient had lived in India for many years, but had been at home and healthy since 1947.) During the next seven days his temperature varied between 100° and 104° F. (37.8° and 40° C.), being usually highest in the afternoon. No localizing symptoms or signs developed.

On June 8 blood was taken for the Widal test, and gave a positive reaction up to 1 in 5,000 against *Brucella abortus* and *Br. melitensis* 1 in 1,250, trace 1 in 2,500. There were also reactions to *Salmonella typhi* H 1 in 125, *S. paratyphi* AH 1 in 50, trace 1 in 125, *S. paratyphi* BH 1 in 125, and N/S Composite Salm. 1 in 125, explained by multiple T.A.B. inoculations in the past. The Vi test was negative. A blood count taken at the same time revealed: haemoglobin, 80% (11.84 g.); red cells, 4,300,000; colour index, 0.93; leucocytes, 5,600 (neutrophil polymorphs 68%, monocytes 7.5%, lymphocytes 24.5%); reticulocytes, 1%.

Blood cultures taken on June 11 failed to yield any positive results, although development of brucella was encouraged by employing liver-infusion media and incubation in a jar containing 5-10% carbon dioxide. Blood-film tests excluded malarial infection.

At this point it was decided that the evidence warranted a trial of chloramphenicol. Treatment was therefore started on June 11. The initial dose was 5 g. (approximately 60 mg. per kg. of body weight), followed up by 0.25 g. every three hours for seven days after the temperature had settled (see Chart)—

total, 27 g. by mouth. Within 24 hours of starting treatment there was definite subjective improvement, which was maintained. The temperature had settled by the fourth day, and has remained normal up to the present time (July 22). On the first two nights the patient showed mild urticarial skin lesions, and for a few hours there was severe pain in the splenic area, but the spleen did not become palpable. The patient is heavily

Sensitivity to Codeine

The following case is recorded because of the rarity of reactions to codeine in spite of its common use and because of the resemblance of the rash to that of scarlet fever.

CASE REPORT

The patient, a woman aged 24 suffering from pulmonary tuberculosis, stated that one night she had been given two "veganin" tablets (containing $\frac{1}{2}$ gr. (22 mg.) of codeine phosphate) for headache. Next morning she developed an irritation of the whole body and later in the day "a red rash" appeared. On the following day the rash had faded and the irritation had subsided. She also stated that a similar reaction had followed a single dose of 1 dr. (4 g.) of syrup of codeine phosphate (codeine content, 16.2 mg.).

In order to demonstrate the specificity of the reaction, and to study the rash, several months later she was given a test dose of $\frac{1}{2}$ gr. (32.5 mg.) of codeine phosphate at midday. At 5 p.m. she developed irritation of the neck and chest, which rapidly involved the whole trunk and limbs. The irritation was followed by a macular rash, which soon coalesced to give a scarlatiniform appearance. The rash was most prominent on the front of the chest, the abdomen, and lower limbs, but the pruritus was not confined to the area involved by the rash. Both the rash and the irritation were less marked the next day, and during the following day both had disappeared; the irritation, however, remained some hours after the rash had gone.

At no time was there any lesion in the mouth, the patient felt well, and there was no febrile disturbance. Slight desquamation occurred over the lower face only. A blood count at the height of the reaction showed 259 eosinophils per c.mm.

COMMENT

In spite of its widespread use very few cases of sensitivity to codeine have been recorded. Indeed, Seidmann (1943) says that his is the tenth case to be reported.

Scheer and Keil (1934) reviewed the literature and added a further case following 1 gr. (65 mg.) of codeine phosphate. They point out that antibodies cannot be demonstrated by the direct Prausnitz-Küstner method, since codeine itself normally produces an erythematous-urticarial reaction with pseudopod formation when injected intradermally. Using a modified P.-K. technique (serum locally and codeine by mouth), they were unable to demonstrate antibodies in the serum. Scheer and Keil describe the original appearance of the rash as follicular, later taking on a generalized erythematous appearance by coalescence of the broad zone of erythema surrounding the individual follicles. They produced a positive skin-patch reaction with codeine phosphate solution (1 gr. to the ounce), while a similar test with a solution of morphine sulphate was negative, indicating a specific hypersensitivity to codeine, which is all the more significant since the latter differs from morphine only in having a methyl group.

The constant feature of the recorded cases is the pruritus, followed by an erythematous rash, the early phase of which may present as macular or follicular. Usually there are no symptoms apart from the irritation. In Seidmann's case, however, weakness, fatigue, headache, nausea, and redness of the mouth and throat occurred a few hours after ingestion of 15 mg. of codeine phosphate. There was an eosinophilia of 1,080 per c.mm.—a finding also recorded by Dittrich (1926). Desquamation has been reported in a few of the cases.

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Temperature chart of the case.

built, and a moderate enlargement of the spleen could easily go undetected. He also had an unpleasant taste in the mouth after taking the drug, particularly if the 0.25-g. dose was exceeded. We had given instructions that if, in error, a dose were missed during the night the succeeding dose should be increased in compensation. At the end of treatment the patient was easily tired, but otherwise he felt well. Convalescence proceeded uneventfully, and he now seems fit.

COMMENT

This case is described because the treatment seems free from risk and can be carried out at the patient's home, whereas any method employing blood transfusion implies admission to hospital and exposure to the hazards of transfusion. We appreciate that our diagnosis is based on a reasonable supposition (agglutination reaction) rather than on the absolute proof which would be given by a positive blood culture. It is known, however, that in only a small proportion of cases of undulant fever due to *Brucella abortus*, estimated at 10–20% (Topley and Wilson, 1945), can a bacteriaemia be demonstrated. Inspection of the temperature chart shows a fall in temperature exactly coincident with the administration of chloramphenicol. At the present time this method of treatment is not cheap, as 27 g. of the substance costs £30 12s., less 33 $\frac{1}{3}$ % discount to institutions, plus £6 16s. 1 $\frac{1}{2}$ d. purchase tax—a net total of £27 4s. 1 $\frac{1}{2}$ d. The makers inform us that negotiations are proceeding to eliminate purchase tax—an imposition which seems illogical, especially if distribution of the amounts available is restricted to definite prescriptions and specific infections.

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