In cases of human scabies six men suffering from *Sarcoptes scabiei* infection received five to six baths with 20% tetmosol soap on successive days; all were cured. A further series of 110 men received three baths with 20% tetmosol soap over a period of a week. All these cases remained under observation for at least six weeks, at the end of which period 88 (80%) were found to have been cured, and 22 (20%) to have relapsed.

Although it has been shown that the repeated use of tetmosol soap cures a high proportion (80%) of established cases of scabies, the soap is unlikely to supersede any of the standard methods employed which result in more than 90% cures. On the other hand, the simplicity of procedure involved in supplying the patient with a tablet of soap and instructing him to use it when bathing suggests the possible value of the soap if it is used therapeutically in communities which have become disorganized as a result of war, and in which it is not practicable to employ standard methods of treatment.

In the case of clean rats heavily exposed to *Notoedres* infection from their companions, washing the tail once weekly with 5 and 10% tetmosol soap was followed by a marked reduction in the number of mites developing in the skin as compared with controls washed with unmedicated soap. When 20% tetmosol soap was similarly used once weekly the effect was more striking, two rats being completely protected against infection over 22 days, and the remaining rat developing only a very light infection.

In contrast to the partial protection provided by weekly washing with tetmosol soap, the regular use of 5% tetmosol soap twice daily on the tails of clean rats constantly in contact with companions suffering from severe *Notoedres* infection gave complete protection to the treated area during periods of 25 to 36 days (the duration of the experiment). Little or no protective action followed the use of unmedicated soap.

It is considered that the results recorded justify the belief that the generalized use of tetmosol soap in an infected community would reduce the incidence of scabies by sterilizing some existing cases and by destroying the infection in freshly invaded persons. Such generalized use, however, will only be possible if it is found that a high incidence of dermatitis does not follow prolonged use of the soap. We have shown that the incidence of dermatitis following the use of the soap for short periods is low, and that it was low also among a small number of people tested over a prolonged period; but no estimate can be made of the risk of dermatitis until an extensive trial with a large number of individuals has been carried out.

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THE CARRIER STATE IN SONNE DYSENTERY

BY

J. GORDON HAILWOOD, M.D., D.P.H.

Major, R.A.M.C.; Hygiene Specialist

Since the discovery of *B. dysenteriae* Sonne in 1915 accounts have been published of many epidemic outbreaks of Sonne dysentery, but rarely has the original carrier in any single outbreak been traced. In fact, Bloch (1938) states: "It is generally accepted that symptomless chronic carriers of bacillary dysentery are rare"; while Buckle (1938), in the course of an investigation of an outbreak of Sonne dysentery in a mental hospital, says: "Tracing the cause appeared a hopeless task. . . . Proved persistent carriers of this organism are apparently rare, and . . . little investigation has been done to elucidate this point."

The appearance of Sonne dysentery in the Army in many places throughout the country, and particularly the large outbreak in a regiment which I propose to describe in some detail, have led me to search the literature for recorded outbreaks of this disease, especially noting whether or not an original carrier was found in each outbreak. The following table covers most of the recorded outbreaks in this country. It is seen that in only one outbreak—that reported by Thornton and Darmady (1938)—was an original carrier found.

In view of these facts and the suggestions that chronic carriers of Sonne dysentery are rare, the severe outbreak which occurred in an Artillery regiment in July-Aug., 1943, is of

special interest, since a chronic symptomless carrier who worked in the cook-house was traced as the originator.

Author	Place	No. of Cases	No. of Cases Bacteriologically Positive	Cause	Remarks
Weisman (1927)	Glasgow	—	80	Milk	No carrier found
Laws (1936)	Mental hospital	113	75	No cause found	Suggested that mild or symptomless cases were missed and they spread the infection
Parry and Peters (1936)	Mental hospital, Bristol	32	9	" "	Case - to - case spread
Bloch (1938)	Institution, Glasgow	—	78	No evidence of spread by food, milk, or water	Origin not traced
Buckle (1938)	Mental hospital	115	74	No cause found	Six positives among staff, nurses, and porters, but not cooks
Savage (1938)	Somerset	130	?	Ice-cream	No carrier or specific source of infection ascertained
Thornton and Darmady (1938)	Mental colony	—	30	Two symptomless carriers — one a dish-washer	
Cruikshank and Swyer (1940)	—	32	29	No carrier found	Suggested case-to-case spread
Graham (1942)	School	52	Only 5 tested, who were positive	No carrier or infecting agent found	All kitchen staff examined, but negative
Irvine (1942)	Leicester village	73	17	No carrier found	Suggested case-to-case spread
Green and Macleod (1943)	Somerset town	About 400	?	Water	No carrier found. Eight water-works employees examined: all negative

The Outbreak

An Artillery regiment, consisting of three batteries and with a total strength of about 900 men, was at a practice camp in Wales when an outbreak of diarrhoea occurred. This started about July 20, 1943, and appears to have been at its height about Aug. 1, but no examination of faeces was done until Aug. 3. However, from this date every soldier with a history of diarrhoea since the start of the outbreak had specimens of faeces examined. Those with a positive result were admitted to isolation hospital immediately, while negatives had further examinations of faeces until three specimens had been found negative. Altogether there were 292 cases of diarrhoea (32.5% of the total strength), of which 81 were positive for *B. dysenteriae* Sonne. It is probable that the infection had died out in many of the remaining 200-odd cases before the stools were examined, as the attack of diarrhoea in some cases had been two to three weeks previously. Treatment in isolation hospital with sulphaguanidine resulted in the rapid cure of all cases, including the carrier.

This outbreak occurred in what was virtually a closed community, since the camp was isolated and outside amenities were few. The water supply was satisfactory, and was regularly examined bacteriologically. The general lay-out of the camp and the sanitary arrangements were also satisfactory. There was no fly nuisance; food-storage facilities were good; and both larders and cook-houses were clean and well kept. Food for the whole camp was drawn from a single central store. There were four main cook-houses in the camp, one of which served the permanent staff of the camp, while the other three were staffed by and served the visiting regiment.

No cases arose among the permanent staff, and no evidence of diarrhoea was found among the cooks of the staff cook-house. Cases, however, occurred among men served from all the cook-houses used by the visiting regiment. All the cooks and orderlies in each cook-house were paraded and questioned carefully whether they had had diarrhoea during the last 12 months. Twelve gave a history of diarrhoea within the period of the outbreak, and, in addition, one in June, one in May, one in Feb., 1943, and one in Aug., 1942. These men were all excluded from the cook-house immediately and their stools

examined on six occasions before being considered negative and allowed to return to duty. Six positives were obtained among these men. All other cook-house personnel who denied a history of diarrhoea had three specimens of faeces examined, but were allowed to continue their work in the cook-house without interruption.

The exclusion of suspicious cooks from the cook-house was completed on Aug. 11; the last fresh case of enteritis occurred on Aug. 13, and I considered that by Aug. 20 the regiment could be considered free from infection. Owing, however, to the expected activities of this regiment, Higher Authority considered that the risk of another outbreak should be excluded with certainty, and eventually every man in the regiment who had not previously been examined, because he gave no history of diarrhoea, had two specimens of faeces tested. It is of interest that not a single further positive result was obtained.

The Carrier

At least one Sonne-positive case was found among the personnel in each cook-house, but only one man whose history of diarrhoea was outside the limits of the incubation period. This was Gunner P., who gave the following history.

While stationed in Scotland in Aug., 1942, he had been admitted to a camp reception station with acute enteritis, pyrexia, colic, and frequent stools containing blood and mucus. He was in bed for about 7 days, but no investigation was carried out. In Nov., 1942, he was posted to this regiment, and in Feb., 1943, was employed in the sergeants' quarters. His duties included providing the sergeants with cups of tea, bread-and-butter, etc., at various times. At this period there was a mild outbreak of enteritis in the regiment—some 80 cases in all, of which the majority were sergeants. No investigation was carried out, however, and the outbreak apparently died down. For some months he was then employed on the guns, but on July 7 he was detailed for duty as orderly in one of the regimental cook-houses at the practice camp. His job was mainly cutting bread-and-butter. The first cases occurred about July 20, and were among the battery personnel served from this particular cook-house.

It is certain that in the course of his duties Gunner P. visited the other regimental cook-houses to lend or borrow on numerous occasions, and thus infection would be conveyed to food and personnel in them, with consequent spread of the epidemic to the remaining two batteries. It was equally certain, for administrative and other reasons, that he did not so visit the permanent staff cook-house. It has been noted that no cases occurred among the personnel served from there. This man had had no symptoms since his moderately severe attack 12 months previously, but his stool showed a heavy infection of *B. dysenteriae* Sonne.

Comments

It is evident that Gunner P. was the carrier in this outbreak, since he was the only Sonne-positive found who had not had any symptoms within the limits of the epidemic. He had had, in fact, no symptoms whatsoever since his enteritis of 12 months previously, while his history was exceedingly suggestive and his work as a cutter of bread-and-butter was ideal for the spread of the organisms. There can be no doubt that here was an outbreak of Sonne dysentery spread by food—by far the commonest vehicle—infected by a chronic symptomless carrier of a year's duration.

I consider that symptomless carriers are responsible for many of the recently frequent outbreaks of Sonne dysentery in this country. However, I would suggest that they are only symptomless in that they have had no symptoms for, maybe, many months, but that with careful questioning a history of diarrhoea, or perhaps just "looseness of the bowels," at some time in the past will be obtained. This opinion is borne out by the fact that in the outbreak described above not a single positive stool was obtained from the remaining two-thirds of the regiment who were subsequently examined but who had given no history of illness previously. In other words, no positive case was found that did not give a history of diarrhoea at some time.

It is impossible to over-emphasize the importance of careful questioning of all persons connected with food preparation in any outbreak of dysentery: this, followed by the segregation of all those with a history of diarrhoea, however slight, will almost always put an end to the outbreak. Gardener (1929), when discussing asylum dysentery, stated that carriers are the main source of infection; while Hobbs and Allison (1942) have also

recently stressed the importance of carriers and ambulant cases in the spread of the disease. However, although the carrier state is generally admitted, only rarely has a single definite carrier been found in an epidemic of any size. Yet it is essential to isolate such a carrier before one can be satisfied that any such epidemic has been finally brought to an end. Milk, water, food, have all been involved in some or other outbreak, but often the human factor is neglected. The vehicle—and cold uncooked foods should always be primarily suspect—is a link in the chain which will, if carefully followed, bring the investigator to the human focus of the infection.

Summary

An outbreak of Sonne dysentery in a virtually closed community is described.

It was discovered that a chronic symptomless carrier had spread the infection by food during his duties in the cook-house.

The removal of all infected cooks from the cook-house immediately stopped the outbreak.

The opinion is put forward that the so-called symptomless carrier of Sonne dysentery is common, but that a history of diarrhoea at some time in the past can usually be obtained.

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AN ANALYSIS OF COLLES'S FRACTURE

BY

S. C. ROGERS, B.S., M.R.C.S.

Late Casualty House-surgeon, St. Mary's Hospital, Paddington

"No two Colles's fractures are alike."—SPEED (1935).

At first when examining and reducing Colles's fractures this aphorism seemed too true. Later, recurring types were noted, and it was decided to review the radiographs of a series of fractures around the lower end of the radius seen at this hospital between Jan., 1942, and Oct., 1943.

Descriptions of the varieties of comminution of the lower radial fragment in Colles's fracture are absent from surgical textbooks and vague in works on orthopaedics. Comminuted forms are recognized by Platt (1932) and others, and a vertical posterior marginal crack involving the wrist-joint is described by Clayton and Edwards (1929).

Very divergent views on the cause of poor end-results are given. Platt (1935) and Taylor and Parsons (1938) stress the bad prognosis of coincident fractures of the base of the ulnar styloid and injuries to the triangular fibrocartilage, but do not think involvement of the ulnar notch of the radius important. Grasby and Trick (1929) find that imperfect reduction leads to osteo-arthritis of the inferior radio-ulnar joint. Clayton and Edwards (1929) and Bankart (1929) stress the reduction of backward rotation and Mayer (1939) of supination. Finally Lewis (1934) blames lack of co-operation by the patient in active exercises. Thus, given satisfactory reduction and its maintenance and the adequate supervision of active exercises, injuries to the base of the ulnar styloid and the triangular fibrocartilage appear to lead to most trouble. In this analysis Colles's fractures are divided into types with different degrees of damage and mechanisms. A short anatomical account of the radio-ulnar joint will enable the discussion to be followed more readily.

Anatomy

The ulnar collateral ligament of the wrist is attached to the tip of the ulnar styloid process. The apex of the triangular