normally as saprophytes (so-called) in various parts of the body. It is difficult, on the supposition of a specific bacterial cause of rheumatism, to correlate this conflicting work, and indeed it seems reasonable to suppose that the soil is more important than the seed, and that any streptococcus present in a given patient may, in suitable circumstances, become the infecting agent. What these circumstances are has not yet been determined, but the sensitization by small doses of streptococcal toxin over long periods is a point of importance. Swift, Wilson, and Todd²⁶ suggest that patients may be made more sensitive to toxins by repeated skin test doses, and also that hypersensitivity seems to increase with age. They also think that type specificity does not exist. Swift, Derick, and Hitchcock²⁷ have gone a step further in this direction. They produced a hypersensitive state in rabbits, when a comparatively small dose of streptococci would produce a disproportionately severe result. Their conclusions represent an interesting hypothesis for the etiology of rheumatic fever.

"The theory is advanced that the pathogenesis of rheumatic fever can be explained by the existence in certain individuals of a condition of hypersensitiveness (allergy or hyperergy) to streptococci, resulting from repeated low-grade infections or from the persistence of foci of infection in the body. When under suitable circumstances streptococci or their products are disseminated to the tissues, these tissues over-react and the characteristic picture of the disease results. When, on the other hand, a state of immunity exists" (which they say may be developed by different dosage among other things) "the dissemination of streptococci results in a minimum of injury to the tissues, and the characteristic phenomena of the disease fail to appear."

To return to the tonsils, they may well be one of the foci in which these "repeated low-grade infections" occur, which would account for the undoubted advantages to be obtained from tonsillectomy in rheumatism. If, as has been suggested, the type of streptococcus is unimportant, then the fact of there being little difference between the rheumatic and non-rheumatic tonsils as regards their streptococcal flora is not of much importance, and cannot be used as an argument against tonsillectomy, as *prima facie* it might seem to be.

Conclusions.

1. Streptococci isolated from rheumatic tonsils do not differ materially from those isolated from non-rheumatic tonsils.

2. This absence of difference fits in with the theory that there is no specific streptococcus which is the cause of rheumatism, but that the condition is due to a hypersensitiveness resulting from repeated small doses of toxin.

3. The tonsil is probably one of the foci from which these toxins may be absorbed.

4. For this reason, in spite of the lack of difference mentioned above, tonsillectomy in rheumatic cases is probably a valuable prophylactic and therapeutic measure.

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AN UNUSUAL INFECTIVE CONDITION OF THE BLADDER.

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THE case of cystitis here recorded, in which an atypical bacillus was apparently the infecting organism, is of considerable bacteriological interest. The clinical details were as follows.

The patient, a man aged 65, had an acute attack of cystitis about ten years ago; since then he had been troubled with a mild degree of frequency of micturition at various times; he continued to pass a very turbid urine, and a diagnosis of prostatic abscess had been made. He reported that his urine had been examined bacteriologically on several occasions during the past ten years, and it had always contained much pus and, as he stated, *B. coli*. He was referred to me for the possibility of vaccine treatment.

Examination of the urine showed numerous pus cells and non-motile bacilli, which in stained films proved to be Gram-negative. Cultures on all the usual media were sterile. These results were repeatedly obtained, whether attempts were made to grow the organism aerobically or anaerobically. Finally, after numerous attempts, a small growth was obtained on agar to which human oxalated blood had been added. After several subcultures on this medium it became possible to grow it fairly readily on ordinary agar, and its cultural characteristics were further investigated, with the following results: gelatin was not liquefied; indol was produced in broth in overnight cultures; litmus milk was turned acid but was not clotted. When the organism was grown in sugar media—dextrose, maltose, dulcitol, mannite, lactose, and cane sugar—they became acid, but no gas was produced.

At the time the organism was thought to be *B. coli anaerogenes*. Later on my attention was called to a paper by Bamforth,¹ in which an organism with very similar cultural characteristics, which was associated with a small outbreak of dysentery, is described, and related to the bacilli described by Sonne. Later still Nabarro's observations² on the relation between *B. coli anaerogenes* and Sonne's bacillus were noted; accordingly, further observations were made on my cultures. On plating the agar culture it was found that the colonies could be divided into rough and smooth forms. On litmus lactose agar plates both red and blue colonies were noted. On further forty-eight to fifty-two hours' incubation the colourless colonies showed central red papillae. The red colonies were thus coloured in twenty-four hours, and, as Nabarro points out, are not to be distinguished on plates from *B. coli*.

Both Dr. Bamforth and Dr. Nabarro very kindly sent me some of their antiserum, which they had prepared from their bacilli. Considerable difficulty was experienced in making stable emulsions, since, as White³ points out, spontaneous agglutination is very apt to occur in rough forms of this group, and therefore emulsions in distilled water were used. In each case agglutination took place up to the end point of the two serums employed. Both were pooled serums, and were used on agar subcultures of mixed types of colonies.

The interesting features of this case are the unusual infecting organism and the curious fact that many times no growth could be obtained, although the urine was swarming with bacilli. No lysis of the cultures subsequently obtained was ever noted.

I might mention that recently I saw a similar case. The patient had cystitis, and microscopical examination showed very numerous pus cells and masses of Gram-negative bacilli, but no growth could be obtained; I was informed that a previous examination had given a similar result. Unfortunately I had no opportunity of examining this second case again.

At the present time the first patient's symptoms remain the same in spite of all treatment. The urine still contains numerous pus cells and masses of Gram-negative non-motile bacilli. The curious fact that has arisen now is that the bacilli described previously can be isolated without difficulty, so that one is uncertain whether the organism now isolated with ease is the same bacillus noted in every examination, but which could not be obtained by culture in many of the previous examinations. Morphologically it appears to be exactly similar. The patient's serum does not agglutinate this organism obtained from his urine.

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