in enucleating the enlargement, which the pathologist described as a fibroadenoma without any trace of malignancy. I took great care to remove all the shelf between the vesical and prostatic cavities; in fact I took away so much that my assistant was afraid I might open into the rectum.

For a time the patient did very well, and three or four weeks later, when the wound was healed, was passing water without the least trouble. Two months after the operation he began to experience some difficulty, more especially after a tiring day's work. I saw him in August, when he was complaining of great difficulty, the stream being small and intermittent. On passing instruments I encountered some obstruction at the internal meatus, though I managed to get steel bougies through. The dilatation gave him relief for some time, but he returned in February, 1926, when the suprapubic wound had broken down and formed a fistula. He was passing some urine normally with great difficulty, but most of it was coming by the suprapubic route.

I operated again on February 23rd and found a pin-point opening surrounded by dense scar tissue. I removed all the obstructing partition, made a large internal meatus, tied in a big catheter by the urethra and drained the bladder suprapubically. In three weeks the abdominal wound was healed and the patient passing urine without the least difficulty; in fact he does not remember ever micturating so easily and quickly before.

The points of special interest in these cases are:

1. All three patients complained of difficulty as their most prominent symptom before the prostatectomy.
2. The enlargement was in each case of the smaller and more fibrous type, a fact which supports the usually held theory that post-operative obstruction is commoner in this class of case.
3. The rapidity with which the wounds healed and the ease with which the patients subsequently passed water lead me to believe that in dealing with post-operative obstruction it is advisable to tie a catheter into the bladder by the urethra off and on until the suprapubic wound is healed. I have not found that the patient objects to its insertion and retention, if the instrument is changed and the urethra irrigated daily, and a good lubricant used.
4. While there is no doubt that the Thomson-Walker open operation is in the majority of cases greatly to be preferred to the old "blind" method, Case III proves that cicatricial contraction may cause obstruction and difficult micturition even after the more thorough procedure.

STUDY OF AGGLUTINATION OF THE GONOCOCCUS IN MAN.

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MUCH work has been done upon the agglutination of the gonococcus by means of the experimental inoculation of animals, and all workers appear to be unanimous that agglutinins are produced; the titre of such serums is high and there is general agreement that a titre of 1 in 1,600 is relatively easy to obtain.

It is on the subject of differentiation of type that divergence of opinion becomes evident. Some workers have been able to differentiate a number of types and subtypes; the precise number varies. Other workers have concluded that it is not possible to distinguish these types with any certainty by means of the agglutination test. A review of the literature has been given by Tulloch.¹

An attempt to investigate this matter in the human subject presented an initial difficulty in that failure to obtain a positive result might possibly be due to the fact that the patient was infected with a type or strain of gonococcus not present in the polyvalent stock antigen. The only practicable method of overcoming this obstacle was to discard the idea of using a stock antigen and instead to use for each patient his own autogenous strain.

The following technique was therefore employed. Upon a patient presenting himself with a newly contracted urethral discharge a culture was made upon the medium always used in this laboratory and described by me in the *Journal of Pathology and Bacteriology* at various times. Next morning the growth was examined to ascertain that pure culture was possible, and subcultures made. These were incubated for twenty-four hours, examined

for contaminations, and, if satisfactory, made into a suspension of about 2,000 million per cubic centimetre with normal saline. The suspension was then violently shaken for a few minutes to break up any clumps present. The further steps in the preparation varied.

Four methods of treating it were tested. In the first neither antiseptic nor heat was used, the suspension being placed in the ice-chest immediately after shaking. The low temperature is quite sufficient to kill the organism. The second method was to heat at 55° C. for thirty minutes, then place in the chest. The third was to heat as before and afterwards add 0.1 per cent. of formaldehyde before storing in the ice-chest. Lastly, 0.1 per cent. of formaldehyde was added without preliminary heating. Immediately before the actual test was performed a sufficient quantity of antigen was taken from the bulk stock and passed through filter paper or a plug of wool in order to ensure a smooth suspension.

In the case of gonococcal urethritis a period of three or four weeks was allowed to elapse before taking a sample of blood. The purpose of the interval was to allow the patient an opportunity to develop any complications usual to that period—orchitis and so forth. It was thought that a more generalized infection would favour the production of agglutinins.

The test was performed the day after the blood was obtained, which meant that the antigen was then about twenty-four days old. The dilutions ranged from 1 in 10 to 1 in 320. The tubes were incubated at 55° C. for two hours, then put out, on the bench at room temperature for another twenty-four hours. They were inspected at frequent intervals. The antigen and serum were stored and the test repeated at the end of a fortnight and again when the serum was six weeks old. This last procedure was to ascertain if any change in the serum took place with age.

The total number of cases examined was 21; they can be conveniently divided into two groups of 16 and 5 respectively.

The first group comprised the patients in whom the organism had been obtained from the urethra. Most of them had developed posterior urethritis, and four of them testicular lesions also, by the time their serum was collected. The result of the tests showed that the serum of every patient in this group was completely negative in all dilutions. Such a result has been obtained by other workers and has been explained on the assumption that agglutinins are not formed where the infection is localized or semi-localized.

The results obtained in the second group are therefore interesting. This group consisted of five cases of gonococcal arthritis. In each case the organism was obtained in pure culture from the joint fluid. Primary cultures are not difficult to obtain provided the fluid is inoculated as soon as it is withdrawn and not left to lie about the ward for an hour or so. The subcultures were made the next morning when the blood was collected and the serum separated. Immediately the antigen was ready for use the test was performed, and repeated at the same intervals as in the first group. The dilutions used were the same. Four of the serums were negative in all dilutions; the fifth was positive in a dilution of 1 in 10. This particular serum was tested again the next day for confirmation. Fourteen days later it was still positive, but was negative when tested at the age of six weeks.

At the present moment an original method of treating the serum is being tried and appears to offer better results in the second group, but the method is still under observation.

CONCLUSIONS.

1. Agglutinins to the gonococcus are not produced in man when the infection is limited to the genito-urinary system.

2. In a generalized infection such as arthritis the amount of agglutinin produced is so small and uncertain that the agglutination test as ordinarily performed is of no value for diagnostic purposes.

REFERENCE.

¹ Tulloch, W. J.: *Journ. Path. and Bact.*, vol. xxv, p. 353.