thick necrotic tissue from the edges of which pus constantly oozed. There was an odour of gangrene, and the nails were extremely painful to touch. Circular scars covered the ends of the fingers. The body skin was slightly pigmented, the abdomen flabby and prominent; axillary hair was absent, and pubic hair scanty. Mitral stenosis with regurgitation was present.

Discussion

Others (Harbinson, 1904; Johnson and Hedges, 1935) have reported cases in which rheumatoid arthritis preceded the onset of acrosclerosis, but few cases in the literature are described fully enough to show whether or not arthritis is a frequent forerunner of the disease. As the arthritis has involved many joints other than the hands it is unlikely that the pains and stiffness are actually the onset of acrosclerosis.

Hunt (1936) described a "rheumatic" arteritis in which sore throats, arthritis, carditis, or chorea may rapidly be followed by a typical Raynaud's phenomenon, and in severe cases "nutritional changes such as superficial sores at the finger-tips and whitlows may appear," but such cases usually improve rapidly. Hunt also thought that "the vascular symptoms and the rheumatic manifestations suggest a common aetiological factor."

Littler and Canter (1951) are of the opinion that dysfunction of the suprarenal glands is the chief aetiological factor in the pathogenesis of acrosclerosis. They quote Winfield (1904) as obtaining much improvement in a case given suprarenal extract and Schwartz (1917) as improving six cases with pituitary extract.

Two of my cases have had rheumatoid arthritis and two had rheumatic endocarditis. It is suggested that acrosclerosis is a disease of adaptation and would probably respond to cortisone treatment.

Summary

The clinical picture of acrosclerosis is reviewed and three cases are described in detail. It is suggested that it is a disease of adaptation and would respond to cortisone therapy.

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The prefect of Paris issued a decree on June 8 introducing a compulsory medical examination of all taxi-drivers in the capital. Men up to the age of 45 are to be examined every 10 years, and every five years thereafter. The first summons to examination called upon 80 men on September 19, and about half this number attended (*Le Figaro*, September 20). The examination included visual and hearing tests, and the investigation of any propensities to black-outs or nervous troubles. Following these examinations almost all Parisian drivers went on strike for 24 hours in protest, and they have threatened to take further action if the ruling is not modified. Most of the objections are understood to come from the older drivers.

ABACTERIAL CYSTITIS

REPORT OF THREE CASES AND ISOLATION OF A SPIROCHAETE FROM ONE

BY

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Abacterial cystitis is the name given to the syndrome in which there are symptoms and signs of cystitis but no organisms can be demonstrated in the urine by ordinary methods of examination. Characteristically, there is no constitutional upset, but the local symptoms are severe, with dysuria, frequency, and urgency of micturition, and sometimes terminal haematuria; there may or may not be a preceding or coincidental urethritis; cystoscopy reveals an intense cystitis and marked reduction of bladder capacity; and pyelography may show slight dilatation of the ureters and renal pelves. The urine is loaded with pus and sometimes red blood cells, but no organisms can be seen in the stained centrifuged deposit, and no growth is obtained on the usual culture media, either aerobically or anaerobically. Tuberculosis is often suspected, but tubercle bacilli are never found even after guinea-pig inoculation.

Local treatment of the bladder, and the use of urinary antiseptics, sulphonamides, and penicillin have little or no effect. The attack may clear up spontaneously, but in many cases the cystitis persists for months and even for years. After the administration of neoarsphenamine there is always a dramatic response and rapid cure, irrespective of the duration of symptoms. The pyuria disappears, and the bladder capacity, the bladder mucous membrane, the ureters, and the renal pelves all return to normal. Recent reports indicate that arsenoxide ("mapharside") and quinquivalent arsenicals are as effective and that streptomycin and "aureomycin" may also be of value.

It has been suggested by several observers that the causative organism may be a spirochaete. Coutts and Vargas-Zalazar (1946) stated that they found "spirilla of diverse morphology" on dark-ground examination of the urine in five cases and Fieldsend (1947) found "numerous spirillum-like bodies" in one case. These observers did not identify the organism further. It is known that spirochaetes are not uncommonly present even in the healthy genito-urinary tract, and that "spirillum-like bodies" may be seen in degenerating pus. It is difficult, therefore, to determine the significance of such findings in the urines of cases of abacterial cystitis unless the spirochaetes are more exactly defined.

Spirochaetes were seen on dark-ground examination of the centrifuged deposit of urine in three cases of abacterial cystitis recently investigated in the department of venereal diseases at Leeds, and from the urine of one of these cases a spirochaete has been cultured and an attempt made to identify it. Abacterial cystitis is shortly to be the subject of a fuller review by one of us (G. O. H.), and further studies of the spirochaete recently isolated are being undertaken, but a prelimi-

nary report is submitted here. Brief histories of the three cases and bacteriological observations are given.

Case 1

An unmarried man aged 24 reported to us on September 30, 1950. Two years previously he had had an attack of cystitis, with dysuria, frequency, and slight terminal haematuria. The haematuria cleared up in a few days, but the other symptoms and pyuria persisted in spite of taking sulphonamides more or less continuously for about five weeks. He was eventually free of symptoms eight weeks after the onset. There had been no constitutional upset, except for slight malaise and shivering at the onset.

He had no further genito-urinary symptoms in the intervening two years until four days before he reported, when slight dysuria and slight terminal haematuria began. There was a mild constitutional upset on the first day only. On examination he appeared well and had no pyrexia. There was heavy pyuria, but a mid-stream specimen of urine was sterile on culture. Rectal examination revealed no abnormality of the prostate gland or seminal vesicles apart from slight tenderness, and no other evidence of disease was found. All treatment was suspended.

Three days later dysuria and urgency were severe; he was passing urine every 10 to 15 minutes, and was very distressed. There was a profuse blood-stained urethral discharge, and the urine was loaded with pus and blood. Cystoscopy revealed a small-capacity bladder—6–7 oz. (170–200 ml.)—and an acutely congested and oedematous mucous membrane. On October 3 he was given 0.45 g. neoarsphenamine intravenously, and within 24 hours he had considerable relief of symptoms, frequency having been reduced to hourly or longer. A day later there was considerable further improvement, and the pyuria and haematuria were much reduced. On October 6 he was given a second injection of 0.45 g. neoarsphenamine, and four days later, when he had his third injection, he was completely symptom-free, and there were only a few pus cells in the centrifuged deposit of the urine.

Cystoscopy was repeated on October 11. The capacity had increased to 18 oz. (510 ml.) and the inflammation of the mucous membrane was very much reduced. On October 16 there were no pus cells in the centrifuged urine. He was kept under observation at intervals as an out-patient, and remained free of symptoms up to his last visit on March 5, 1951.

Case 2

An unmarried man aged 21 reported on November 14, 1950. He had no previous history of genito-urinary disease. Three weeks previously he noticed slight stickiness of the urinary meatus. A definite urethral discharge developed and was followed by increasing dysuria and frequency and urgency of micturition, but he had not observed any haematuria. At the time of reporting he was passing urine every 5 to 10 minutes during the day and every half-hour during the night, and complained of extreme pain during and after micturition. He had had no constitutional upset, and had been working up to the previous day.

On examination he was found to be very distressed on account of the dysuria and frequency. The oral temperature was 98° F. (36.7° C.). There was a slight muco-purulent urethral discharge, which, on staining, showed numerous pus cells but no organisms, and culture gave a scanty growth of *Staphylococcus aureus*, *Staph. albus*, and diphtheroids. The urine was very cloudy in both glasses and contained a large amount of pus. Rectal examination revealed no abnormality of the prostate gland or seminal vesicles apart from slight tenderness, and no other evidence of disease was found. Cystoscopy (after meatotomy) disclosed a small-capacity bladder—3–4 oz. (85–114 ml.)—and an acutely congested mucous membrane. Intravenous pyelography revealed a very contracted bladder with coarsened trabeculation. The ureters and renal pelves were not well visualized.

On November 15 he was given 0.06 g. arsenoxide intravenously. There was only slight relief of symptoms by the

next day, but a day later the urine was obviously less purulent, and he was able to retain his urine for up to three hours. There was further improvement, and by November 20 he had only slight dysuria (which may have been due to his meatotomy wound), and the urine showed no pus cells on microscopical examination. On this day intravenous pyelography revealed that the bladder was normal.

On the following day he felt unwell, and had pyrexia and some dysuria, and as the urine again contained some pus cells it was suspected that he might have developed a bacterial infection, so sulphonamide treatment was started. A mid-stream specimen of urine taken on that day subsequently grew only a few isolated colonies of *Bact. coli*. All his symptoms subsided within 48 hours, but as the pyuria persisted and red cells reappeared in the urine it was decided to give more arsenic. Culture of a mid-stream specimen of urine at this point showed only a scanty growth of *Staph. albus*.

On November 26 and 28 0.45 g. neoarsphenamine was given. The urine rapidly became free of pus (apart from a few clumps in the first glass, attributed to the healing meatotomy wound) and all symptoms cleared up. On December 8 there were no cells in the centrifuged urinary deposit. He has since been observed at intervals, and remained free of symptoms up till his last visit on February 5, 1951.

Case 3

A married man aged 40 reported on December 4, 1950. While in the Army in 1945 he had an attack of severe dysuria, frequency, and haematuria, associated with a slight urethral discharge. He was admitted to a military hospital and was treated with an alkaline mixture; the symptoms subsided in a few days, although the urine apparently remained cloudy for at least two weeks. He had no further genito-urinary symptoms until three days before reporting, when he began to have dysuria and frequency of micturition (day 20–30 times, night 2–3 times). He had noticed no urethral discharge and no haematuria, and had had no constitutional symptoms.

On examination he was found to have a slight muco-purulent urethral discharge, which, on staining, showed numerous pus cells but no organisms, and no growth was obtained on culture. Dark-ground examination revealed no trichomonads or spirochaetes. The urine was cloudy in the first glass and clear in the second. He was given 600,000 units of procaine penicillin in oil and 5 g. of "sulphatriad" daily for five days as an out-patient. During this time the symptoms and signs gradually subsided, and by December 15 he was symptom-free, the urinary meatus was quite dry, and there were only a few pus cells in the first urine.

On December 18 he stated that he had had severe dysuria and frequency and haematuria for two days, but there had been no constitutional symptoms. He appeared well and the oral temperature was 98.2° F. (36.8° C.). There was a purulent urethral discharge, but no organisms were seen in the stained smear. The urine in both glasses was cloudy and contained a large amount of pus. Cystoscopy was not performed, but intravenous pyelography showed that the bladder, ureters, and renal pelves were normal.

He was given a course of dihydrostreptomycin, 1 g. 8-hourly for seven injections, and 12-hourly for three injections. There was some relief of symptoms within 12 hours of the first injection, and complete relief within 48 hours. The urine rapidly cleared, and after four days there were only scanty pus cells in the centrifuged deposits. He has been observed at intervals since, and was free of symptoms at his last visit on February 26, 1951.

Bacteriological Investigations

Material and Methods

Mid-stream Specimens of Urine.—At the time of admission to hospital in each of the three cases a mid-stream specimen of urine was collected after cleaning the urinary meatus. After centrifugalization the deposit was

examined microscopically (wet film, Gram-stained film, and dark-ground illumination), and inoculated on fresh blood agar and chocolate agar for aerobic and anaerobic culture.

Bladder Specimens of Urine and Biopsy Material.—Cystoscopy was carried out in Cases 1 and 2. In each case, two samples of urine were taken from the bladder (the early flow and the late flow through the cystoscope). Two biopsy specimens were taken from the base of the bladder, near the ureteric orifices, and immediately placed in physiological saline.

Inoculation of Material in Fletcher's Medium.—Specimens, prepared as follows, were inoculated in Fletcher's medium, which is in routine use for culture of leptospira.

Case 1.—In view of the high cellular content of the urine, each of the two specimens of urine obtained at cystoscopy was centrifuged at low speed, and after the sedimentation of the cellular elements the supernatant urine was centrifuged at high speed (about 3,500 r.p.m.) for one and a half hours. The supernatant fluid was siphoned off, and the deposit examined by Gram-stained films and dark-ground illumination and inoculated. The biopsy specimens were triturated with a glass rod and inoculated.

Case 2.—Both specimens of urine obtained at cystoscopy were examined microscopically and inoculated after slow centrifugalization only, and the biopsy material was treated as in Case 1.

Case 3.—Two specimens of mid-stream urine (the early and late flow) were inoculated without preliminary centrifugalization.

Inoculation of Guinea-pigs.—In each case equal parts of the two specimens of urine were mixed and injected into two guinea-pigs, one intraperitoneally and one subcutaneously. In the first two cases centrifuged deposits were injected, and in the third whole urine.

Results

Mid-stream Specimens of Urine.—In each case there was a large quantity of pus with a variable number of red blood cells, the deposit constituting up to about a tenth of the volume of urine. No organisms were seen in the stained films, and all cultures remained sterile. Actively motile spirochaetes were seen on dark-ground illumination in all three cases, but not in the actual specimen used for inoculation in Case 3.

Inoculations in Fletcher's Medium.—Dark-ground examination of the cultures after incubation at 30° C. for three days revealed scanty spirochaetes in those of the late-flow urine and biopsy material in Case 1. The culture of the early-flow urine in this case, and of all the specimens in the other two cases, remained sterile.

Subcultures were made of the growth obtained in Case 1. Preliminary studies showed that the spirochaete morphologically resembled leptospira, and electron microscope photography revealed that it was identical morphologically with *L. canicola* and *L. icterohaemorrhagiae* grown under identical conditions. Attempts are being made to identify it further.

Inoculated Guinea-pigs.—**Case 1:** both guinea-pigs were killed after eight weeks, and no evidence of disease was found. **Case 2:** both guinea-pigs died of inter-current infection (bronchopneumonia) after six weeks. **Case 3:** both guinea-pigs were killed after 17 weeks; no evidence of disease was found.

Discussion

There are several possible explanations of the fact that, although actively motile spirochaetes were seen in

the urine of all three cases, they were from only one case. Spirochaetes are notoriously difficult to grow, especially in primary culture, and the necessary element of luck may have been present in the first case. Spirochaetes were seen on dark-ground illumination in only two of the three specimens used for inoculation. Different batches of media were used for each case. Apart from the biopsy specimens, the preparation of the material for inoculation was different in each case.

Obviously the evidence presented is not adequate to prove that the spirochaete isolated is the causative organism of the syndrome described, and further investigations are required. It is, however, a very unusual finding, which may contribute to the elucidation of the cause of abacterial cystitis and extend the knowledge of the leptospira.

Summary

A brief description of the main features of the syndrome of abacterial cystitis is given, and three case histories are quoted. Actively motile spirochaetes were seen in the urine of each of these three cases. A spirochaete morphologically closely resembling leptospira was grown from the urine of one of them, but not from the other two.

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THE VALUE OF EXTERNAL CEPHALIC VERSION UNDER ANAESTHESIA

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External cephalic version without anaesthesia is an established procedure forming an important part of antenatal care in preventing the foetal loss and dystocia associated with a breech delivery. The same cannot be said for version under anaesthesia, and the published results of this procedure are few. White and Flew (1933), in reporting 92 cases, stressed the dangers of vaginal bleeding which occurred in six of their patients. Wrigley (1934) reported 76 cases with successful version in 45 and assessed the foetal mortality at 13%. This figure seems surprisingly high by modern standards, but it compared favourably with the foetal death rate of 28% for breech delivery given in the same paper. Newell (1941) recorded 48 cases with 18 successes. Peel and Clayton (1948) reported a success rate of 87% in 172 primiparae with four foetal deaths due to version under anaesthesia and a success rate of 89% in 64 multigravidae with no foetal mortality attributable to the version. Their total foetal mortality due to version under anaesthesia was 1.7% in a total of 236 cases (253 attempts), but five infants were subsequently lost during delivery as a breech or a vertex.