

Incidence of the Staphyloid Coccus A.

In presenting reliable data on this point it is necessary to exclude all cases examined prior to the complete differentiation of this organism from the other members of the group. I can only therefore employ figures for the last nine months or so.

Table of Organisms Cultured from Urine.

In—	Staphyloid coccus A.	Streptococci.	Bacillus coli.
14 cases of rheumatism	5	8	0
3 cases of neuritis	2	3	0
22 cases of rheumatoid arthritis ...	14	6	5

In regard to rheumatoid arthritis and staphyloid coccus A the proportion 14 to 22 is probably considerably understating the case, because three of the remaining cases gave marked positive agglutination, and two more reacted in such a way to a vaccine of this organism that it was distinctly borne in on one that staphyloid coccus A was pathogenic in those individuals. If these additional figures are added, we find that out of 22 cases 19 were almost certainly infected by staphyloid coccus A.

Treatment.

In the following article Dr. A. Bertram Soltau gives his impressions of the treatment of rheumatoid arthritis by vaccines, both autogenous and stock. The most valuable of the latter turned out to be one prepared from two strains of staphyloid coccus A, each isolated from a case of acute rheumatoid arthritis following parturition, in which I found the organism present in large numbers and in pure culture in the urine. Under this heading, then, I will only urge extreme caution in the use of staphyloid vaccine, if success is to be achieved in arthritis. Even a dose of 500,000 may cause a most unpleasant reaction, and until the urine is free from organisms, more than 5,000,000 can seldom be given. It is for this reason more than any other that it seems to me important for the present to keep a title which will distinguish this germ from the staphylococci.

In conclusion, one must admit that there is a long gap between describing an organism present in a disease and proving a direct pathological connexion; only prolonged experience and careful investigation will lead to the truth. I trust, however, that I have made good this point: that a certain organism, styled temporarily for the purposes of this paper "staphyloid coccus A," occurs with remarkable frequency in rheumatoid arthritis. Is the connexion between them causal, or is it merely casual?

Yelverton, Devon.

A NOTE ON

THE USE OF VACCINES IN THE TREATMENT OF RHEUMATOID ARTHRITIS.

BY A. BERTRAM SOLTAU, M.D. LOND., F.R.C.S. ENG.,
PHYSICIAN, SOUTH DEVON AND EAST CORNWALL HOSPITAL,
PLYMOUTH.

THE treatment of rheumatoid arthritis has presented so many difficulties, and has so frequently been followed by failure or by relapse, inducing a feeling of hopelessness in both patient and practitioner, that any therapeutic measure which gives more hopeful results would be welcome.

Many investigators have been searching for a bacterial cause for the disease, with its possibilities of vaccine therapy, and some encouraging cases have, from time to time, been reported. The variety of organisms which have been isolated suggests that the arthritic lesions are due to many different microbial agencies, and the absence of any constant etiological factor has been the obstacle to any marked advance in treatment.

In the preceding article Dr. H. Warren Crowe describes several "staphyloid" cocci ("staphyloid" on account of their resemblance to staphylococci), one of which, staphyloid coccus A, he has found to recur with remarkable frequency in cases of rheumatoid arthritis. As I have had the opportunity of using the vaccine prepared therefrom in a considerable number of cases a brief account of the results obtained may prove of interest.

A certain proportion of the cases showed a single infection with coccus A, whilst in the others, which formed the

majority, the infection was mixed, the other co-existing organism being frequently a streptococcus, and occasionally bacillus coli communis. In the cases where a mixed infection was present the clinical course followed has been to treat the patient first with a vaccine prepared from what we have regarded as the secondary organism, streptococcus, bacillus coli, &c. It is noteworthy that whilst the joint condition had been thereby ameliorated and the patient has experienced a sense of improved well-being, a complete arrest of the articular lesions has not been obtained by the use alone of the vaccine of the secondary organism, but the diminution of the latter, as proved by cultural tests on the urine, has paved the way for the use of coccus A vaccine. The subsequent employment of the latter has then been followed by a very marked improvement in the arthritis, amounting in some cases to an apparent cure. The word "apparent" is used advisedly, because the lapse of time is yet far too short to allow of any dogmatic statements as to cure.

As regards the type of case treated, no attempt has been made at selection, and the degree of infection has varied considerably, from cases of long standing in which a large number of joints were affected and osseous deformity was present to a considerable degree, to those in which the infection was in an early stage, little more than neuritic pain in the limbs with slight swelling in a few joints being complained of. In two cases the disease was following an acute pyrexial course.

Of the cases being treated by coccus A vaccine nine are so far advanced that it is possible to form some idea as to their progress.

The system employed has been, in the main, as follows. A cultural investigation of the urine is made, and if coccus A be found in single infection a stock vaccine is now employed. This was originally prepared from two strains, each obtained from an advanced case of arthritis following parturition. As remarked before, in mixed infections the allied organisms are first attacked by autogenous vaccines, coccus A being used either concurrently or subsequently. The question of dosage has been a most difficult one to determine, owing to the marked reaction which sometimes follows even minute doses, such as 500,000. In one case the dose had to be reduced to one of 150,000 at first. It has therefore been necessary to proceed with great caution, and my usual practice has been to start with 500,000, raising the subsequent doses by very small increments of 500,000 or even less. Even then it has not always been easy to prevent excessive reactions, and at times a reversion to the earlier minute doses, after reaching a dose of 3,000,000 or 4,000,000, has been necessitated. The reaction has usually been an exacerbation of joint pains and swelling, with slight rise of temperature. The injections are usually made at weekly intervals, but here again each case has required treatment to be modified by its particular reaction, and one obstinate case only began to improve when the period between the injections was reduced to five days. In two cases, where reaction was so marked as to prevent any real advance, a great help was experienced by the injection of ½ c.c. of 4 per cent. solution of eucaine lactate in carbolised saline with each dose of vaccine.

The clinical course which the cases have followed has been on the whole a similar one, though the degree of rapidity of progress has varied within wide limits. The first favourable symptom has been the diminution of nocturnal pain, in itself no small advance, as it has permitted more sleep and an improvement in general health. The neuritic pain so often complained of has usually been relieved more rapidly than the articular pain. This raises an interesting etiological question as to the actual way in which the infection of rheumatoid arthritis acts. The theory so long maintained that rheumatoid arthritis was a disease of nervous origin, as evidenced by the glossy skin, the trophic nails, and the articular changes so similar to those of the neural arthropathies, may be coordinated to the microbial theory by regarding the infection as primarily one of the peripheral nerves, so leading to trophic changes in the joints and other structures. In two cases where the sole complaint was that of pain in the limbs without any joint changes the isolation by Dr. Crowe of coccus A and the employment of the vaccine was followed by rapid improvement. Both cases were pursuing a maintained pyrexial course, one being so severe as to resemble acute febrile polyneuritis. This is suggestive as the possible line of infection which ultimately

develops into the typical rheumatoid arthritis, for an antecedent history of non-articular, and often diffuse, pain is usually obtainable in all cases of the latter disease.

Following the diminution of pain, the most noticeable feature has been the gradual relaxation of the joints. In fact, the complaint was made by several patients that they felt so much weaker. It has then been found that the stiffened joints have gained in flexibility and range of movement, and that the muscles, atrophied by long disuse, have been unable to cope with the increased work thrown upon them by the yielding of thickened periarticular structures. At this stage very gentle massage of muscles, avoiding the joints so as to prevent uncontrolled auto-inoculation, has been found helpful.

The actual joint swellings have been the last to disappear, and, of course, where destruction of bone and osteophytic growth have taken place no alteration can be expected, the diminution of swelling being confined to the thickened ligaments and capsules. Concurrently, the glossiness of the skin has disappeared. In one case, No. 1 in the series, there was a remarkable development of subcutaneous nodules, situated over the pressure points of the large joints and along the tendons, both flexor and extensor, of both forearms. The disappearance of these nodules during treatment was most rapid and complete. Finally, in those cases where a complete arrest of the disease appears to have been attained there is beyond the permanent bony changes, if any, with their mechanical limitation of movement, entire freedom from pain and restoration of articular function. In these cases, however, a regular dose of vaccine at monthly intervals is still being administered.

Details of certain of the cases are as follows:—

CASE 1.—Female, aged 34. The illness commenced over three years ago, about four months after a confinement, her third, which was reported to have been normal. When first seen, two years later, there was involvement of numerous joints. All the small joints of the hands and feet were swollen and tender, as also were the wrists, elbows, knees, hips, and ankles. The fixation of the small joints was extreme, so that the fingers could only be flexed sufficiently to enclose a moderately sized apple. The large joints grated on movement and the knees were distended with fluid, and the general rigidity was so great that it was impossible for the patient to get into or out of a bath or her bed without assistance. Nocturnal pain was very distressing, and the wasting and anæmia were so pronounced as to suggest a general septic infection. *Coccus A* was isolated in pure culture, and vaccine treatment was commenced in June, 1912. Progress was slow, but the pain steadily diminished and the rigidity lessened. Walking a distance of several miles became possible, and by October the fingers could be flexed to touch the palms. At this time, as the patient described it, "there was, following an injection, reaction with increased pain and stiffness in the legs. This was followed by slow relaxing of the joints, which in turn resulted in intense weakness of the legs, which caused great difficulty in going upstairs." On Oct. 8th a further dose was given, resulting in "a certain improvement in above condition, beginning on the evening of 8th inst. After the 10th inst. a marked feeling of relief, and some flexibility everywhere. Occasional short intervals of 'freedom from pain' the first time for two and a half years." Unhappily, towards the end of the month the patient developed an attack of influenza, then prevalent in her household, to which she succumbed.

CASE 2.—Female aged 39. There was a history of pain for over two years, in the shoulders, hands, and thighs. The pain was mainly neuritic, but the interphalangeal joints were swollen and stiff. The urine grew *coccus A* in pure culture, and vaccine treatment was commenced in July, 1912, and was persisted with until the end of the year. At first there were severe reactions, so that minimal doses of 500,000 were necessary. In September the pain began materially to decrease and the stiffness disappeared, so that full movement of the fingers and shoulders was regained. In October the urine was found to be sterile. Progress was steady, and by the end of the year the patient was practically well. She still continues to receive a monthly dose of 10,000,000.

CASE 3.—Female aged 47. The first "rheumatic" manifestation was an acute attack of lumbago 18 years ago, which confined the patient to bed for two months. Since then she has had periodic pain, and has never been free for more than a month or two at a time. The pain has been mainly in the hips and thighs, and occasionally also has affected the shoulders and hands. When first seen, nearly two years ago, there was such rigidity of the hip-joints that walking was difficult and the legs could barely be abducted. Nocturnal pain and stiffness were considerable, so that "for hours she lay awake unable to turn over." Spa treatment and other recognised methods did little to relieve her. In January, 1913, the urine was cultured and a mixed infection of *bacillus coli* and *coccus A* was found. A vaccine of the former organism was first employed, and towards the end of February *coccus A* was commenced. Her blood at this time showed a very marked complement deviation to the latter organism. At the time of writing her condition has so far improved that there is no pain in the shoulders, and only "an occasional twinge" in the hands. Walking is easier and she has discarded her sticks. A dosage of 7,000,000 has been reached, but any increase beyond that causes a severe reaction, and she has, like others, done better with persistent small doses which give better results than attempts at increase of dose. The interval between doses, in her case, has been shortened to every sixth day, which gives the best effect.

CASE 4.—Female, aged 38, first seen in September, 1912. The arthritis commenced about 18 months previously. In November, 1911, she underwent a course of treatment at Bath which resulted in temporary

alleviation, lasting for six months, when she relapsed. In September she was seriously crippled, the hands, knees, and hips being so involved that she was practically helpless. There was great œdema over the feet and she was in continual pain. *Coccus A* was present in pure culture, and treatment was commenced forthwith. At present progress has been made so far that practically all the œdema has gone and the swelling in all the joints has diminished. She can walk with comparative freedom, and rests well at night. She is still far from being cured, but the improvement has given her fresh hope.

The above four cases are fair examples of the others which are under treatment. In all cases, when the vaccines are being employed, all so-called specific rheumatic treatment has been abandoned, so that the results should not be confused.

Conclusions.—No claim is made in this report that the sole pathogenic cause of rheumatoid arthritis is the *coccus A*. A vast amount of work awaits the bacteriologists before any definite conclusions can be arrived at, and it is probable that the flora of arthritis will ultimately be found to be widely varied. On the other hand, the remarkable frequency with which this particular organism has been found to occur in the disease, and the confirmation of its presence by the control tests of agglutination and complement deviation which Dr. Crowe has carried out, cannot be ignored. The disappearance of the organism from the urine as improvement was effected by vaccines, and its reappearance in greatly increased numbers when as a result of exercise excessive auto-inoculation leading to increased pain and stiffness occurred, are also facts to note. Lastly, the clinical improvement in cases treated by a vaccine prepared from it is most encouraging and hopeful for further developments.

It is hoped that the publication of this account of the first cases to be so treated, whilst incomplete, may yet be of interest and may lead to wider attention being given to a possible solution of one of the problems of treatment.

Plymouth.

A CASE OF VOLKMANN'S ISCHÆMIC CONTRACTURE OF THE HAND.

BY G. DE SWIETECHOWSKI, M.D. MUNICH,
M.R.C.S. ENG.,

CLINICAL ASSISTANT, ELECTRICAL AND MASSAGE DEPARTMENT, KING'S COLLEGE HOSPITAL.

A GIRL, 12 years old, was brought to Paddington Green Children's Hospital last summer by her mother, who gave the following history of this case. Four years ago the girl had a fall, injuring her left elbow. She was taken to one of the general hospitals in London where a fracture was diagnosed and a splint applied. The next day the left hand was swollen, was very painful, and the girl had lost her power over the fingers. She was taken in, and stayed there for six weeks, but the hand did not improve. She was told that nothing more could be done for her and dismissed. As I was treating her tiny sister, an infant, for pes equinovarus, her mother thought something might be done for the elder girl's hand as well.

Fig. 1 shows the condition of the hand when first seen by me. It represents the position which the hand assumed when entirely unsupported. The wrist flexed ad maximum, the metacarpo-phalangeal joints hyperextended, forming an angle of 120°. Both interphalangeal joints like the wrist flexed to the highest possible degree. The palm was convex instead of being concave. The heads of the metacarpals were distinctly projecting on the palmar surface. The whole hand was much smaller than its fellow, its muscles wasted. The forearm was in a similar condition. The musculature, or, better, what was left of it round the elbow, felt hard. Slight active movements, just sufficient to prove that the muscles were not completely paralysed, were present in the radio-carpal and in all the finger-joints. The elbow was more under the control of the patient, as she could bend and stretch it to about 140°. Passive movements were slightly better; it was possible to bend the hyperextended metacarpo-phalangeal joints so as to form an angle of 180°—that is, to form a straight line, which means the limit of extension with the majority of people. The wrist could not even be stretched so far as to become level with the forearm. Passive movements of the elbow were practically of the same range as the active ones. The knuckles of the left hand were poorly developed as compared