the left lateral sinus thrombosed? If so, had the thrombus spread from the right side, or was it a primary condition? On February 14th and 16th there was a slight rigor, which strongly suggested sinus thrombosis. Antipneumococcus serum was injected on the 17th, and polyvalent staphylococcus serum on the 18th and 19th. The general symptoms of toxæmia were so slight that it was thought that the infection was most probably staphylococcal. As a matter of fact, an examination of the pus obtained from the lateral sinus showed that the causal micro-organisms were the *Staphylococcus pyogenes albus* and Hoffmann's bacillus or a similar micro-organism. These injections had no obvious effect. On the 19th there was slight twitching of the left side of the mouth and tenderness along the left jugular. An examination of the left ear showed no signs of any recent disease; no optic neuritis. It was decided to expose the right lateral sinus.

Second Operation.

Under chloroform no thickening of either jugular could be detected. Before the lateral sinus was exposed over 3-in. of sclerosed bone had to be cut away, and two more gouges were sacrificed. With the greatest difficulty (owing to the intense hardness of the bone) the sinus was exposed along about an inch of its course. It was full of fluid stinking pus. As there had been some twitching of the left side of the body, and the exposed dura was bulging, it was incised, but nothing escaped. This proceeding was, I think, an error, but no harm resulted. The pus was collected and a vaccine prepared by the Clinical Research Association. At the end of the operation the patient's condition was too precarious to allow ligature of the jugular to be carried out. The result was eminently satisfactory; the patient's condition rapidly improved, although his temperature did not fall much and his pulse remained rapid. The pulse became stronger and regular and he felt much better. His tongue rapidly became clean.

Five days later the vaccine arrived, and was at once used. An increasing dose was given daily, and each was followed by an evening rise of temperature. The following doses were injected: 25 millions, 50 millions, 75 millions, 100 millions, and 125 millions. After the fifth dose symptoms like those of serum disease appeared, skin rashes and joint pain, so the treatment was discontinued. On March 7th the temperature sank to normal. The mastoid wound was healing rapidly. It had been irrigated daily with boracic lotion and hydrogen peroxide and packed with iodoform gauze.

March 10th. The patient's temperature began to rise again, and he received an injection of 175 millions of vaccine.

March 16th. A swelling appeared over the inner aspect of the right tibia, which was red and tender. This did not go on to suppuration, but rapidly got well.

March 20th. The temperature is gradually falling to normal. There was a little diarrhoea with bloody stools. The wound has almost healed.

The patient now appeared likely to make a good recovery, but further complications soon appeared. The temperature became normal, the patient seemed perfectly well, but a swelling appeared over the left squamous part of the temporal bone. This eventually fluctuated, and the patient was anaesthetized and the scalp incised. Nearly the whole of the squamous portion was found loose as a sequestrum and was removed. The skull bones were necrosed all round and a probe could be passed down to the dura in every direction. The dura was exposed over an area of about one square inch and was bathed in pus. The patient, however, declared that he was perfectly well, and his temperature was normal. There were no signs of meningitis. No sooner had this wound healed than a fresh swelling appeared. It was incised, and again bare bone, riddled with holes and widely necrotic, was exposed. The process was repeated until hardly a square inch of his skull escaped. In all, he had twenty operations, and often had six or seven tubes in his head, draining pus. All the time he remained perfectly well. After a full year's treatment in hospital he was discharged hale and hearty, and returned to his work as a fitter at Worcester. Before doing so he was two months at a convalescent home, and the last time I saw him he looked the picture of health.

The question may be asked, Is this case an example of the triumph of vaccine therapy? It is at least extraordinary that a man with such extensive osteomyelitis of his skull should remain in perfect health, with no temperature, and no sign of any cerebral irritation. Mr. Leedham-Green, who saw the case, said he had never seen one like it, and I have never heard of one. In Tilley's book, *Diseases of the Nose and Throat*, a skull is figured on page 188 which gives some idea of the condition of my case, although fortunately his skull was not quite so bad.

THE department of public health in Queensland has commenced this year a campaign in Brisbane against mosquitos, the main object in view being the abolition of dengue fever and filarial disease. The co-operation of all householders is being sought by circulars and visits from officials from the public health department instructing them how to abolish breeding places on their premises and exclude adult mosquitos from their houses.

NASAL OBSTRUCTION DUE TO OSTEOMATA OF THE POSTERIOR NARES.

By F. P. STURM, M.Ch.,

LEIGH, LANCs.

OSTEOMATA of the nasal cavities are so infrequently met with that they constitute the rarest of all the varied causes of nasal obstruction. Cases have been reported by Stein, Ballenger, and Boenhaupt, but nothing definite is known as to the etiology of the condition. Iodides are stated to be of value in cases with a specific history (Ballenger). The following is the single instance of the condition with which I am personally acquainted.

A boy aged 11 was sent to me by Dr. M. J. Halton for operation on account of deafness and complete nasal obstruction. The septum and turbinates as viewed by anterior rhinoscopy were apparently normal. Both drumheads were retracted and immobile; tuning-fork tests revealed typical conductive deafness. The tonsils were enlarged; the naso-pharynx was packed with suppurating adenoid masses which occluded the Eustachian tubes and rendered it impossible to obtain a view of the posterior nares by means of the rhinoscopic mirror. A former operation by another surgeon, four years previously, had lacerated the soft palate, and torn the right half of the uvula completely away. There was no history of syphilis or tubercle.

Under a general anaesthetic the ragged edge of the palate was trimmed, the remains of the uvula removed, the tonsils enucleated, and the adenoids curetted away. Digital examination

Posterior rhinoscopic image.

then revealed a dense bony enlargement of the posterior end of each inferior turbinate. These growths completely occluded the upper respiratory passages, and all but met in the middle line behind the vomerine plate. Each was of the size of a cherry, and of such ivory denseness that neither spokeshave nor saw was able to make the slightest impression, though repeated attempts were made with both these instruments and with posterior nasal forceps. The result of the operation has been that the deafness has completely disappeared and the general health greatly improved, as would naturally follow the removal of suppurating adenoids and diseased tonsils, but the nasal obstruction remains, and will almost inevitably result in the recurrence of the adenoids.

If this case comes up for operation again, or in any similar case, one would be inclined to attempt the removal of the bony tumours by means of a long-bladed gouge or chisel introduced by way of the anterior nares. The accompanying illustration is a sketch of the posterior rhinoscopic image made two months after the operation.

NOTES ON ARTHRITIS.

BY

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THAT there is a very real difficulty in making a satisfactory classification of the various forms of arthritis is recognized by most writers on the subject, and in practice there is sometimes still greater difficulty in placing a particular case so as to conform to the academic connotation of any particular type. The difficulty suggests that the customary classification is an artificial one and does not correctly represent this form of disease. There is nothing strange in different micro-organisms causing very similar symptoms, and, in fact, *a priori*, it is more remarkable that these primitive vegetable organisms when planted in the body should evoke such dissimilar and characteristic symptoms in the host as many of them do. It is, then, not difficult to see that any classification based on symptoms or morbid anatomy must be a confused one. When the bacteriology of arthritis is more complete, it will be an easy matter to picture clearly the arthritic changes produced by infection in general, together with the peculiar phenomena associated with infection by certain bacteria in

particular. My own view is that the vast majority of all cases of arthritis are due to the action of a micro-organism, that different micro-organisms are capable of producing lesions which are clinically identical, and that, regarding the body as a tube, the infection is caused by an entry being effected through some part of the surface of the tube by a micro-organism not necessarily dissimilar to the ordinary bacterial flora of that region of the body.

Diathesis I do not ignore, but I interpret that term, prolific in fact, as meaning the constitutional proneness of an individual for a particular infection—in other words, his suitability as a culture medium for any particular micro-organism, and the importance of even slight differences in the constitution of culture media is fully appreciated by workers in bacteriology. It is impossible to do the smallest work in bacteriology without appreciating that the soil as well as the seed has to be reckoned with. An abnormal deficiency in bacteriotropic substances would also as a constitutional peculiarity be included under diathesis.

I will now refer to some cases illustrating the above views. Many of the patients have been shown at the clinical demonstrations held at the Cheltenham Hospital during the summer months.

CASE I.

On January 2nd, 1911, I was asked by Dr. Hebblethwaite to see with him a Mr. T., who gave the following history: He had been a robust man up to three and a half years ago, when he had an attack of appendicitis, for which he was operated on. At that operation an abscess had been found and drained, but it had been considered inadvisable to hunt for the appendix, which had accordingly been left behind. One month after the operation he had experienced some abdominal pain, for which he saw his surgeon, who did not consider it of importance, and the pain soon passed off. About six months after the operation he began to have pains in his joints, which became swollen and tender. The knees were first affected, then the fingers, wrists, and shoulders. During the next three years he suffered increasingly from arthritis. He received active medicinal treatment, and was also treated at two spas with waters, baths, and packs to the liver. In spite of this he grew no better, but rather the worse, and in January, 1909, he could with difficulty rise from his chair.

At the time of our examination his wrists and knees were so acutely tender that he dreaded shaking hands, or any jolt to his bed. His fingers showed well marked ulnar flexion. There was present definite tenderness in the right iliac fossa, and the lower part of the right rectus was kept contracted, there was also tenderness on the right side on rectal examination. Dr. Hebblethwaite and I agreed in the opinion that there was present an old appendix abscess, and that the joint affection was a septic arthritis. Two days later Mr. Arthur Cardew operated, and after much trouble in getting through old adhesions, he found a deeply buried abscess in the vicinity of the appendix. The abscess was drained and the appendix was removed. Cultures were made direct from the abscess immediately it was exposed, and growths of *Bacillus coli communis*, and of *Diplococcus pneumoniae* were obtained. A vaccine was made from each organism. After the first inoculation the wound, which had nearly closed up, became painful, and the temperature rose. The wound was reopened on January 21st, and pus was again evacuated. The wound was then kept from closing by gauze plugs until no local reaction was caused by the vaccines. The inoculations were continued by Dr. Hebblethwaite for six months, and the joints steadily improved. In September I had the pleasure of seeing him walking about Cleve Hill, and his joints are now almost normal. He occasionally gets a twinge, however, to remind him of past events. In this case we were fortunate in obtaining an exceptionally trustworthy anamnesis owing to the patient being a very intellectual man, who had, for amusement, studied medicine so far as to be within one examination of obtaining the M.B. degree just before his illness began.

CASE II.

G. G., aged 39, a poultryer, was on December 31st, 1910, dressing turkeys, when he injured the middle finger of his left hand. The finger became septic and an abscess was opened at the Cheltenham Hospital by the house-surgeon. The finger cleared up in a few days, but two days later his left knee began to swell. This was followed on the next day by swelling of the right knee and both ankles. Later his wrists were involved, and as he did not improve under salicylates and looked ill, he was admitted to hospital on February 8th, 1911, under my care. A culture was taken from his blood, 50 c.cm. being run off from his median basilic vein direct into a flask containing 50 c.cm. of sterile broth. The flask was incubated and a growth of a staphylococcus was obtained, from which a vaccine was prepared. An inoculation of 100 million was followed by marked improvement, and after two inoculations the patient was well enough to be transferred as an out-patient. He was inoculated once a week, and by the end of March he felt so well that he ceased to attend, although told to do so for some time longer. He turned up again in the following September with the statement that the joints had kept well up to the previous week. He was again inoculated with the same vaccine and urged to continue attendance if he wished to escape permanent arthritis. As before he improved under inoculations of vaccine, which

were increased to 500 million. On December 1st his joints were almost well, and he again ceased to attend. Since that time I have not seen him. He will very probably have a relapse.

CASE III.

C. L., aged 28, held an exceptionally fine record as an athlete in boxing, swimming, and football. He had enjoyed robust health until August, 1910, when he began to have a discharge from his left ear, attributed by him to the effects of long diving. In the same month he developed acute arthritis, and was admitted to the hospital in the town where he then resided as suffering from acute rheumatism. He was treated in hospital for seven and a half weeks. On his discharge from hospital he felt very weak and failed to recover his strength. In the following October Dr. Hebblethwaite asked me to see him, he having already diagnosed septic arthritis due to aural infection. The patient was weak and wasted, suffering with pains in his knees, ankles, shoulders, and wrists, with attacks of vomiting, giddiness, and headache, and a small purulent discharge from his left ear.

He was admitted to Cheltenham Hospital under me on October 28th, and I asked my colleague, Mr. Norman Pike, to take charge of the aural treatment. This he kindly did, and on three occasions he removed small polypi from the middle ear through a small perforation in the tympanum. Cultures were made from the aural discharge, and on November 28th he was given 400 million of an autogenous vaccine of *Staphylococcus pyogenes aureus*. This caused oedema in the external auditory meatus, and such acute pain in the ear as to require a hypodermic of morphine. There was also some oedema over the mastoid process. Smaller doses were given in future, and by December 9th the ear was quite free from all discharge, the joints had ceased to be painful, and the patient had increased in weight from 10 st. 7 lb. on admission to 11 st. 5 lb. He was transferred to the out-patient department on December 13th and continued to be inoculated with vaccines until February, 1911, when he was in sound health, weighed nearly 13 st., had no joint trouble, and enjoyed his strenuous labour at an engineering works.

The auditory improvement I am not concerned with, but the crippling produced by this local lesion and the improvement following its treatment was very striking.

CASE IV.

H. E. came to the out-patient department of the Cheltenham Hospital on August 7th, 1911, complaining of joint trouble from which she had suffered for the previous ten years. The fingers of the right hand were the first to be affected. Both wrists were firmly ankylosed, the fingers of the right hand were fixed in a position of flexion at the first interphalangeal joints, the left hand was very weak, but was less deformed; she complained of acute pain in these joints, and also in her right ankle. Both nostrils were noticeably patulous, and the inferior turbinates were atrophied. She admitted having had a nasal discharge for about twenty years. Both anterior nares yielded a pure culture of Friedländer's bacillus. A vaccine of this organism was made, and inoculations were given in doses increasing from 100 to 500 millions weekly, and no other treatment was given. The joint pains became remarkably less and then ceased, so that she was able to resume sufficient house work to earn her living. The deformity and ankylosis remains, and will, I fear, be permanent; but I intend to see if injections of fibrolysin will lessen the fibrous ankylosis which is present.

CASE V.

A man, X., was admitted to Cheltenham Hospital complaining of acute rheumatism. His knees were swollen, and he had pain in several other joints associated with profuse sweating and rise of temperature. On examination a purulent urethral discharge was found. The patient professed his astonishment at this discovery, and stoutly maintained that he was quite unconscious that he had any urethral disorder, and could not explain how such had occurred. The gonococcus was present, and with local treatment the arthritis subsided.

CASE VI.

At the same time there was present in the ward a policeman, W. B., with acute rheumatic fever and endocarditis. He had been treated outside by Dr. Hugh Powell with salicylates and also with quinine. On admission I tried pushing sodium salicylate to 300 grains a day, with twice that amount of sodium bicarbonate, without effecting any improvement. I then obtained from a culture from his blood the *Diplococcus rheumaticus*, and under a vaccine of this he made a good recovery both of his endocarditis and of his joints, and Dr. Hugh Powell tells me that he is in good health, and has not been absent from his duty as a policeman for ill health since his return to duty last summer.

In a case somewhat similar to that of X., I was consulted by a lady who developed a severe arthritis in one knee a few weeks after her marriage. She attributed it to sleeping in a damp bed during her honeymoon. A vaginal examination was refused, but I felt satisfied by the clinical symptoms that the blame might be more justly attributed to the *Micrococcus gonorrhoeae* than to the humidity of the bedclothes.

That gonorrhoeal arthritis may closely simulate rheumatic is well recognized, but it is important to remember

that the secondary infections of the urethra and vagina may also cause arthritis.

The case now to be described was a patient of Dr. Conder, and the only part I had in the case was the preparation of the vaccine employed.

CASE VII.

J. E., a man aged 65, had spent the last forty-five years of his life in India. For the past twenty-five years he had trouble in his right knee in the nature of attacks of acute pain and swelling. These attacks had become more frequent and more severe in the previous six months. He had at times also pains in the left knee, elbow, and wrist, and in the right shoulder, ankle, and great toe, but not recently. On April 29th, 1911, Dr. Conder found the right knee to contain fluid and to be $1\frac{1}{2}$ in. larger in circumference than the other. With a syringe he removed 2 oz. of purulent fluid, the pus cells of which were almost entirely polymorphs. There were also present in the fluid cocci in pairs and short chains. A culture showed a good growth of a Gram-positive diplococcus noncapsulated. On May 4th another ounce of fluid was removed from the same joint and yielded the same organism. On May 2nd the patient's opsonic index to this coccus was 0.89; on the same day he was given 100 million of his autogenous vaccine. After this he felt better, and on May 14th his opsonic index was 1.59; as there had been no visible reaction in the joint he was given the same day 250 million of his vaccine. This proved too large a dose; the day following he felt seedy, his temperature rose to 100° F., and he experienced for the next five days the most acute pain in both shoulders, ankles, wrists, and right great toe. On May 19th his opsonic index was 0.78. On May 26th he was given 150 million of vaccine, and as this dose gave satisfactory results it was adhered to. He had injections about once a week until September. The knee and other joints quite cleared up, and he started touring on the Continent, but took with him some vaccine in order to have an inoculation once a month as a preventive of further attacks, which he has not since had.

Now, in the cases set out above I am quite aware that I am describing no new thing; similar cases of great interest are to be found in Mr. Howard Marsh's book on *Diseases of the Joints and Spine*, but they do not receive the general attention they deserve. I am firmly convinced that every case of "rheumatoid" arthritis is due to a microbic infection; and, though I do not say that at present the infection can always be found, I contend that the more closely early cases of so-called rheumatoid arthritis are investigated the larger will be found the proportion of those in which a definite infection can be traced. If no local site of infection can be detected, the blood ought to be cultured. Mr. Peter Daniel, on page 140 of his instructive book on *Arthritis*, published this year, expresses an opinion in agreement with the above:

Schüller claims that his dumb-bell bacillus is the cause of the affection. The whole of my experience points strongly against a definite cause of this kind, and is in favour of a multiplicity of bacterial processes. Clinical investigation and treatment has led me to attribute most importance to genital infection as a cause of rheumatoid arthritis.

Cases such as described above, if treated with sodium salicylate, guaiacol carbonate, or hydrotherapy in all its branches, degenerate into the forms of joint deformity, which have for years been the subject of treatises on acute rheumatism, chronic rheumatism, rheumatoid arthritis, osteo-arthritis, arthritis deformans, etc. Unfortunately, the complete investigation of these patients demands much time and labour, and on that account the hospital patient is frequently more fortunately circumstanced than his more affluent neighbour. But if fortune is propitious and the labour is successful, the resulting satisfaction to both patient and doctor is by no means small.

DR. ALFRED HOLLIS, of Freshwater, Isle of Wight, was on February 19th presented with a testimonial from the inhabitants of the three neighbouring villages in which his work had lain—Freshwater, Yarmouth, and Totland Bay—accompanied by gifts of a silver coffee and tea set. The testimonial was read by Lord Tennyson, and Lady Tennyson was one of those who presented to Dr. Hollis, on behalf of the bodies they represented, the portions of the service contributed by them. An additional presentation has since been made by a local lodge of the Order of Foresters. Before the presentations were made Lord Tennyson said that no one had been asked to subscribe, the gifts being freewill offerings, and, like the testimonial, the outcome of the true, deep, and genuine affection in which Dr. Hollis was held. Dr. Hollis, who became L.S.A. in 1867, M.R.C.S. in 1868, M.B., C.M. Edin. in 1869, and M.D. Edin. in 1873, was at one time President of the Isle of Wight Branch of the Association.

BORACIC ACID POISONING.*

BY

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I HAVE ventured to bring these notes before you this evening because boric acid is in such general use with the profession that any case where toxic effects are produced must be of interest to us all. I have looked up the literature on this subject, and cannot find much recorded, hence it will, I think, be of additional interest.

In the *BRITISH MEDICAL JOURNAL* of 1901 I find a reference to 4 cases, 2 of which were fatal.

Rinehart records the two following cases of poisoning by boric acid:

(a) A man aged 38 years had posterior urethritis, and he was treated with a weak solution of AgNO_3 locally, and 5 grains of boric acid was given by the mouth every four hours. Two days later there followed extreme weakness, an erythematous rash with papules and vesicles on the backs of the hands, and a very weak pulse. These symptoms subsided on withdrawing the drug, but reappeared on resuming it. Rinehart says he thinks that it would have ended fatally had it not been detected early.

(b) A man aged 50 years had a suprapubic lithotomy performed, and the bladder was washed out with a saturated solution of boric acid; also 5 grains of boric acid was given by the mouth every four hours. Ten days later an erythematous rash appeared, which later scaled, and crusts formed on the rash. The skin thickened and became infiltrated as in eczema; weakness and albuminuria were prominent symptoms; feeble pulse.

Wood of Philadelphia reports two fatal cases. In these nausea, vomiting, an erythematous skin eruption and fatal collapse occurred. The details of these cases are not given (*vide BRITISH MEDICAL JOURNAL*, 1901, vol. ii, EPTOME, page 91).

These cases suffice to show us that it is very advisable to be on our guard when ordering a drug we have been accustomed to use so freely until we almost think it innocuous.

The following is a report of the case I have observed:

A. G., aged 23 years, was sent to me from Canton on July 5th, 1911. He had been ill with dysentery on and off for ten months past, and the present attack commenced three weeks before admission. He stated that he had been passing a large quantity of blood in his stools, but there was not much at the time he came in. There was much blood-stained mucus; I frequently searched it for amoebae, but I could not find any.

On admission he was put on a mixture of magnesium and sodium sulphate, $\frac{1}{2}$ oz. every four hours. After two days he had a single rectal wash of boric acid and warm water to ease the straining. At this time he was passing 10 to 13 stools daily, consisting of almost pure blood-stained mucus.

On July 8th he was put on tinct. opii m xxx , pulv. ipecac. gr. xxx, diminishing the dose each day. On July 16th (the tenth day) as he had not improved he was put back to the magnesium and sodium sulphate solution, and in addition a rectal wash of boric acid (saturated solution) and water, $\frac{1}{2}$ pint each, was given night and morning. This immediately lessened the number of stools, and the wash was continued as long as I found mucus. I saw the wash each day, and apparently all was returned or each occasion.

This treatment was continued for over three weeks, and the patient was rapidly improving, taking his food well, and up and about; on the day before the onset of the symptoms of poisoning he only passed two stools in addition to the rectal washes.

On August 9th the patient was up and about, was taking his food well, and there was no elevation of temperature.

On the morning of August 10th I found him in bed with a rash covering the whole body, very like a bromide rash, generally scattered, but on the extensor surfaces the papules were gathered more thickly, erythematous in character, disappearing on pressure, not at first hard, although each papule could be distinguished. I at once recognized it as a drug rash, and ordered the rectal injections to be discontinued and only plain water to be used. In the afternoon of the same day he became very restless and inclined to be noisy, so much so that later in the day he was put into a separate ward. On the next day he was more thickly covered, especially on the extensor surfaces and the face, and the spots were more shotty and hard, with a tendency to become purpuric. He was quite delirious, and the pulse very feeble; he could not sleep, and a dose of paraldehyde had no effect. On the morning of August 12th the rash was quite purpuric with hard shotty papules; he was quieter, through weakness. He slept after a dose of chloral, and later took some food. Next day the spots were becoming clearer, but still hard and shotty. His mind was quite clear and he was taking food well. He continued to improve, but on the morning

* Read at the Annual Meeting of the Hong Kong and China Branch of the British Medical Association.