that care in these matters is as important—is even more important—than the choice of a food; and that a practitioner who neglects them is doing only half his duty, and is, moreover, setting up obstacles in his own path, and unwittingly creating difficulties which more prudent conduct would avoid.

I have ventured elsewhere¹ to formulate three simple rules for the hand-feeding of infants. These if carefully observed would, I am sure, make the rearing of bottle-fed infants a far easier matter than it often proves to be. I have no desire to claim any novelty for these rules, unless, indeed, it be new to bring simple reason and common sense to bear upon our task, taking account only of plain facts and leaving theoretical considerations on one side.

The first rule is directed to the maintaining of the warmth of the surface and the avoidance of chills from exposure:

1. Take care that the infant is bathed as quickly as possible in hot water, and that his feet and legs are never allowed to get cold.

The second rule aims at encouraging the digestive processes by variety of flavour in the food. This is a matter of great importance to hand-fed babies, especially to those whose digestive deficiencies have already been a cause of anxiety. An infant, it is true, will digest his mother's milk morning, noon, and night, and want no change. He is taking his natural food which his healthy organs are specially constructed to digest, and he draws it straight from the gland, fresh, pure, and uncontaminated by noxious germs. A hand-fed baby, on the contrary, whose food is only something like that provided by Nature, and is often far from pure, is apt to resent the monotony of his artificial diet. In any case, his stomach should have every advantage we can give it, and we learn from ourselves that variety in diet is an active aid to normal digestion. Therefore:

2. See that a sufficient variety of flavour is contained in the several meals.

It will usually be sufficient to give two differently tasting foods alternately in the day and a third for the night. In exceptional cases, however, a greater variety than this is required.

The third rule relates to cleanliness, etc.:

3. See that the feeding apparatus is absolutely clean, the food fresh, and the sanitary arrangements generally in good order.

Milk should be kept outside the living room; cream is only to be used when quite fresh; foods are not to be allowed to stand for hours after being mixed; and highly perishable articles, such as whey, barley water, etc., must be made fresh and fresh as required. At any rate, whey is not to be depended upon after four hours nor barley water after six.

These rules, as I have said, are nothing more than reasonable precautions, and any thoughtful person might frame them for himself. I believe the neglect of them—and that the first two are continually neglected no practical physician would venture to deny—is due to the attention of the family medical adviser being too entirely engrossed with the conflicting claims of the legion of foods, digestives, and modified milks which are pressed upon his notice; and also, and perhaps chiefly, to his feeling that the nursery arrangements are none of his business, and must be left to the attention of the person who is responsible for them. Experience has, however, shown me that this is leaning upon a very feeble support, too apt to fail us at our need. In any case, it does not absolve the medical attendant from the duty of himself keeping an eye on these matters, for I think I am quite within the mark when I say that more than half of the cases where difficulties arise in the course of hand-feeding—cases in which the infant digests with difficulty, frequently vomits, and suffers continually from flatulence and discomfort—are due solely to breaches of the above rules. Owing to neglect of these precautions many young children contract a catarrh during the first few weeks or even the first few days of their lives. This mishap may so heighten their susceptibility as to be a cause, not only of serious trouble during the first twelve months, but of much anxiety for years afterwards. In every case of

difficulty in the bottle feeding of an infant the practitioner should personally look into the conditions in which the child is being brought up, and do his best to remedy without delay any carelessness or neglect in the nursery. By this means he will be far more likely to bring about the result he desires than by any ingenuity he may show in devising a food, or care in prescribing the exact proportions of casein, sugar, and cream to be allotted to the several meals.

REFERENCE.

¹ See a paper by the author on "Infant Feeding" in the *Index of Treatment*. Bristol: J. Wright and Son.

ORAL SEPSIS IN GENERAL PRACTICE.

By ARTHUR MILLS, M.D.,

KINGSKETTLE, FIFE.

SOON after starting practice in this country district in Fifeshire I became impressed with the number of patients who sought my advice and who were suffering from what at first sight appeared to be a marked degree of anaemia. These patients were most frequently women, but, as a rule, considerably over the age that one associates with chlorosis. Their complaints were various in character, but usually referred to a disordered state of the digestive organs, want of appetite, flatulence, pain, and sometimes vomiting. Occasionally they volunteered the information that they had frequent "bilious attacks," or that they "suffered from their liver." On the other hand, the symptoms complained of were not infrequently those which could be more easily attributed to their apparently anaemic condition, namely, breathlessness on exertion, weakness, giddiness, and palpitation. Constipation was the rule in these cases, but rarely a very urgent symptom, and once or twice an attack of diarrhoea was the immediate cause of my being consulted. The one feature which led me to group these patients together as being of one type was the very evident pallor of the face and mucous membranes. The face had a pasty-white appearance quite unlike chlorosis, and the mucous membranes were decidedly pale.

At first my efforts in the way of treatment of these patients were directed to relieving the stomach symptoms with suitable drugs and diet, regulating the bowels, and then administering iron, the idea, of course, being to improve the blood condition, which I believed then to be the true cause of their trouble. The stomach symptoms were frequently relieved for the time being, but the blood condition appeared to be affected very little, and sooner or later the patient returned to repeat the story. All this was in marked contrast to the behaviour of a typical case of chlorosis which I treated about this time in the usual manner. The foul odour of the breath in one of these cases led me to make a more careful examination of the mouth than usual. I found that the patient had a large number of decayed stumps, that the gums were swollen and red, that they bled easily on pressure, and that pus could easily be expressed from between tooth and gum, in many places. I persuaded this patient to have her decayed stumps removed, ordered her a mouth wash of hydrogen peroxide, recommended the frequent use of a toothbrush, and afterwards prescribed iron in the usual manner. She made a rapid and complete recovery. Similar cases, and others where the condition of the mouth was by no means so evidently bad, responded equally well to this treatment.

According to Dr. William Hunter, the credit of having recognized the fact that indigestion may be caused by a foul condition of the mouth belongs to Professor Miller; but Dr. Hunter himself appears to have been the first to emphasize the importance of septic conditions in the mouth as a cause of disease.¹ He originated the name "oral sepsis," intending it to cover not only pyorrhoea alveolaris, which is only one (and a comparatively rare one) of a large number of possible pathological conditions in the mouth, but "every other form of trouble, dental and oral, producible by septic infection for which an appropriate adjective can be found," the essential feature of all being that they are produced by pus organisms.² It is in this sense that the term "oral sepsis" is now used, and it covers, amongst others, all such common conditions as dental caries, stomatitis (numerous forms), gingivitis, alveolar abscess, and pyorrhoea alveolaris.

Although there has been a tendency to attach more and more importance to this subject within recent years, yet modern textbooks of medicine devote little or no space to it, and it is probable that the general practitioner does not yet value oral sepsis at its true worth as a direct and indirect cause of many disorders and ailments which he is called upon to treat.

I have kept a record for the past four years of all those patients who have come under my care and in whom this condition appeared to have a direct bearing upon the case. They number 80—61 females and 19 males—and are of all ages between 7 and 70. Many of the commonest forms of oral sepsis appear to be quite frequently unaccompanied by any degree of pain, and it is of interest to note that of these 80 patients only 8 came to me with the condition of the mouth as their complaint.

The cases can be conveniently arranged into groups.

GROUP I.—*Oral Sepsis associated with "Indigestion" and Symptoms suggesting Anaemia.*

This group comprises 36 cases—27 females and 9 males. Want of appetite, pain in the stomach, flatulence, irregular attacks of vomiting—known in this district as "bilious attacks"—lassitude, breathlessness, giddiness, palpitation, were the most frequent complaints of these patients. All without exception were sallow and anaemic in appearance; 12 were young women between the ages of 19 and 25, and in each of these 12 cases a rapid and complete recovery took place after due attention had been paid to the septic condition of the mouth. Iron was administered in the majority of instances, but in 4 cases at least recovery followed without its use, and to all appearances as quickly and as completely. The remaining 24 of this group ranged in age between 25 and 70. Recovery in these cases, though not so rapid, was also the rule. It appears to be more difficult to persuade these older patients to submit to the necessary treatment. Many become reconciled to a low level of health, and accept weakness and lassitude, "indigestion," and a frequent "bilious attack" as part of their destined lot; 10 of these 24 are of this description and remain untreated.

GROUP II.—*Oral Sepsis and Disorders of Menstruation.*

The following are notes on 6 cases in this group:

(a) Did not menstruate till the age of 16. She had been systematically dosed with iron from the age of 14½ onwards. Menstruation started six weeks after the mouth condition had been treated.

(b) Menstruation started at the age of 17, three months after the treatment of her oral sepsis. She had also been treated with iron for long periods previously.

(c) First menstruated at 20, over a year after some attempt had been made to deal with the mouth. The menstrual periods are still very irregular and a recent examination of the mouth disclosed three or four decayed stumps, surrounded by soft red gum discharging pus, and an extremely dirty tooth plate.

(d) Age now 23, menstruated at 14, and for a few years was quite regular and had little discomfort. About three years ago began to suffer from pain, sickness, and vomiting for one or two days at each period. She also lost her appetite and suffered from an occasional "bilious attack." The periods have now become very irregular, and she frequently misses five, six, or seven weeks. There is a perfectly clear history in this case of marked oral sepsis from the age of 16 onwards. Her pallor is very striking. She has taken iron on different occasions for three months at a time with no appreciable effect.

(e) Menstruated first at 15½. Her periods were then very irregular and she had frequent attacks of sickness and vomiting and the appetite was poor. She had five months' amenorrhoea at the end of 1911 and beginning of 1912, at which time she had a chronic alveolar abscess. The whole of the upper teeth, which were extremely bad, were removed; her periods immediately returned and the dyspepsia ceased. She came to me again on November 1st, 1912, complaining that she had again missed five and seven weeks and that a fortnight before she had had an attack of sickness and vomiting. She had numerous decayed stumps in the lower jaw. These were removed on November 3rd. She menstruated on November 14th (nine weeks after her previous period) and subsequently on December 16th, and then middle of January, and there is now no complaint of "indigestion." This patient also suffered from interesting symptoms of *arthritis*, described in the appropriate group.

(f) Well-marked oral sepsis. She did not menstruate till she reached the age of 19. In this case the mouth was not treated. Dosing with iron, however, had no effect whatever, as she had had no iron for six months previous to the onset of menstruation.

GROUP III.—*Oral Sepsis and Vomiting in Pregnancy.*

The notes of the 3 cases in this group are as follows:

(a) Mouth untreated; suffered for five months from incessant sickness and vomiting, and was confined to bed for two months previous to her labour.

(b) I was called repeatedly to see this patient in the early months of pregnancy, as she was suffering from persistent vomiting. Most of the usual remedies were tried with no effect. Removal of septic stumps, and the frequent use of a mouth wash was followed in a week by almost complete relief. At the end of another week she was perfectly well. She had then completed the fourth month, however, when some amelioration in her condition might naturally have been expected.

(c) Consulted me when she had been seven weeks pregnant. She complained of constant vomiting for the previous four weeks, growing worse every day, and said that she could not retain even a mouthful of water. She was extremely anxious not to take to bed. Her mouth was in a filthy condition. I immediately removed twelve teeth and several stumps. The roots of one or two molars were fringed with foul smelling granulations. She was also ordered the frequent use of a mouth wash. At the end of one week there was well-marked improvement, and thereafter she suffered only from a little sickness in the mornings. The morning sickness ceased at the end of the third month.

GROUP IV.—*Oral Sepsis and the Climacteric.*

The 9 women in this group suffered greatly from the usual disagreeable symptoms associated with the menopause as well as from disorders of digestion. Three of them complained also of recurring attacks of an eczematous rash over the face and neck and wrists. In 5 the oral sepsis was treated, and they were soon rid of the greater part of their symptoms. The number treated included 2 of those who suffered from skin trouble, and in these 2 cases the rash did not reappear.

GROUP V.—*Oral Sepsis associated with other Localized Suppurations.*

From the following record of 9 cases it would appear that oral sepsis tends to lower the resisting powers of the individual to pyogenic infection in other parts of the body. In each of the following cases oral sepsis was a very marked condition:

(a) Had an anal abscess.

(b) A carbuncle.

(c) A septic hand twice within six months without history of injury.

(d) A septic adenitis (bubo) following a scratch in the region of the vulva.

(e) A septic prepatellar bursitis.

(f) An indolent corneal ulcer of nine months' duration. After the mouth was treated the ulcer gradually healed, though no change whatever was made in the local treatment.

(g) Three attacks of furunculosis in 1908, 1911, and 1912, a whitlow in July, 1912, and in August of the same year a septic finger following a slight bruise with no abrasion of the skin. The mouth was treated in September, 1912. There has been no further trouble.

(h) A septic tonsillitis in March, 1912, a septic hand in October, 1912, following a slight bruise without abrasion of the skin. This patient also suffered in 1911 and 1912 from severe acne vulgaris. Numerous septic stumps were removed in October, 1912, the tartar was removed from his sound teeth, and toothbrush and mouth wash were ordered.

(i) An indolent sore over an interphalangeal joint of many months' duration. This was supposed to be tuberculous, but looked more like a chilblain that had refused to heal. It healed up at once after treating the oral sepsis.

GROUP VI.—*Oral Sepsis and Arthritis (10 Cases).*

This forms an interesting group, and in it the direct relationship between the two conditions appeared most evident.

(a), (b), (c), (d), and (e) were 5 cases of true rheumatoid arthritis,³ and in each the onset of the disease was preceded by a well marked septic condition of the mouth. Treatment of the mouth was carried out thoroughly in 2 cases, and was quickly followed by very great improvement. Both have since been entirely free from "active" pains, their troubles now being associated with the already deformed and partially ankylosed joints.

(f) Had an attack of rheumatic fever on September 16th, 1912. He was treated with sodium salicylate, and on the fifth day pulse and temperature were normal and there was no pain or swelling in the joints, though there was some stiffness. I was called again to see him on October 9th, as he was suffering from pain and stiffness in several joints, and he was unable to walk. The temperature was normal and there was no swelling or redness of the joints. He had no appetite, felt languid and weak, and showed marked pallor. The sodium salicylate had been

stopped on September 30th. A large number of decayed stumps were removed, and a mouth wash was prescribed and sulphur as an aperient. In a week he was walking about, and in another week had returned to work.

This case is in accordance with Rolleston's statement in his Hunterian Lectures on acute arthritis of doubtful origin, that a patient who has oral sepsis may recover from the rheumatic attack and subsequently suffer from arthritis due to infection derived from the mouth.

(g) A case very similar to the above, where the mouth was untreated. She was confined to bed for five months, and has made anything but a complete recovery.

(h) A woman of 60; complained of pain and stiffness in one knee of seven months' duration, growing gradually worse. On attempting to walk there was a decided limp, and she evidently suffered great pain. She also complained of some pain in the left shoulder, and one metacarpo-phalangeal joint was thickened and tender. She had a poor appetite, felt very weak, and looked "anaemic." Her mouth was thoroughly treated and she was ordered an iron and quinine mixture. In ten days she walked without a limp, and in three weeks was practically well.

(i) This patient's menstrual and digestive symptoms are recorded in Group II. She consulted me on November 1st, when she had had pain and swelling in two interphalangeal joints, and in one wrist, of three or four days' duration. Pulse and temperature were normal. The mouth was treated (numerous stumps removed) on November 3rd. On November 8th she complained of pain and swelling in another small joint, stiffness of both wrists in the morning, and pain in the left shoulder, and on November 14th, when the joints were almost well, she had an extremely tender, red, inflamed spot over one internal malleolus, with great swelling of the foot. Complete rest and hot fomentations for two days was followed by recovery. This patient has had no further trouble.

(j) This was a boy of 6½ who had had his tonsils removed on September 10th. I was called on October 7th, to find him suffering from rheumatic fever, and a few days later he had an attack of pericarditis. Dental caries had been very extensive from the age of 3 onwards. One decayed tooth had been broken when having his tonsils removed, and at the site of this broken tooth there was a mass of pulpy granulation tissue discharging pus.

Why we should be so careful to obtain asepsis in, say, an amputation of a finger and make no effort whatever to obtain the same condition in an amputation of a tonsil I am at a loss to understand. It is generally agreed, too, that the path of infection in rheumatic fever is by the tonsils, and it is also well known that an attack frequently follows at an early date after the removal of the tonsils. It is surely, therefore, not at all unlikely that that attack is either directly caused, or at least predisposed to, by oral sepsis.

OTHER CASES.

Besides the groups of cases mentioned above, some individual cases appear worthy of fuller description.

A. A man, aged about 45, consulted me because he had vomited once or twice during the preceding few days, was "unable to eat anything," and was "growing yellow." When I saw him he was suffering from typical catarrhal jaundice. Inquiry elicited the facts that he had had a very poor appetite for six or eight months and had been feeling anything but fit for his work. His mouth was not one of the worst, but the necessary treatment was undertaken, and he made a rapid and permanent recovery.

B. A woman, aged 32, was operated upon for a ruptured ectopic pregnancy. She was out of bed in three weeks and made a perfect recovery up to a certain point, but remained very anaemic for eight months. During that time she had all the advantages of fresh air and sunshine and good food, and was systematically dosed with iron. Treatment of her septic mouth was then quickly followed by a return to normal condition.

C. A man of 50, who, when I was consulted, was suffering from a severe attack of acute gastritis. He was very feverish and in great distress, the vomiting having been severe for two days. The mouth was one of the worst in my record, and the odour was perceptible immediately on entering the room. His wife informed me that "his breath had been like that since ever she knew him," and that "he had suffered from his stomach for many years." I was also informed that "he had tried everything," and that his daily diet for many months had consisted of a little milk pudding. Two of the lower incisors were easily removed with the aid of a pair of dressing forceps and scissors. Attention was given daily to the mouth, and it was quickly got into better condition. This attack of gastritis occurred eighteen months ago, since when the patient has enjoyed excellent health.

D. This woman had a severe attack of brachial neuritis, probably predisposed to by a long spell of oral sepsis and the consequent malnutrition.

E. A case of chronic phthisis of four years' duration had come to this district for a change of air. The cough was not at all troublesome, but she complained of "want of appetite and indigestion." The condition of her mouth was very bad indeed,

but she informed me that she had been told "she was too weak to have anything done to it." Removal of the offending stumps was not at all difficult, and was quickly followed by improvement in the appetite and digestion. It must be admitted that in such a case as this the treatment of even a slight degree of oral sepsis might be all-important.

F. A woman, aged 46, had suffered from well-marked oral sepsis for at least ten years. A year and a half ago she had an attack of appendicitis, possibly a direct result of the septic mouth.⁴ For some time previous to this, and up to the time when she consulted me, she had felt tired and out of sorts. She complained of intense pain over the eyes coming on a few minutes after attempting sewing or reading. She reported that she had had her glasses "strengthened" three times in three months. She was using 3.50 dioptries, although refraction showed she had barely 1 dioptrie of hypermetropia. This was a case of severe asthenopia, the result of oral sepsis. Optic neuritis was also well marked, and acuteness of vision was subnormal. Three weeks after the mouth was thoroughly treated these symptoms had disappeared.

G. I was called to see this woman, who had been in bed for three or four months. I was told that she had had an attack of cardiac failure, that she had had extensive dropsy, and that the abdomen had been tapped. She had evidently had a very serious illness. About a fortnight previous to my visit she had had intense headaches, but the pain in the head had gone, and she had become gradually more and more "stupid." She was only semi-conscious, was unable to speak, asked for nothing, but swallowed liquid food and water when they were given to her, and suffered from complete incontinence of urine and faeces. Her temperature was subnormal, and her pulse 72 and irregular. She had well-marked cardiac murmurs. The mouth emitted a very foul odour, and she wore an upper artificial plate. Inquiry elicited the fact that the plate had not been out since she took to bed. It was removed with some difficulty, and there was brought away with it a very septic tooth to which it was attached. Her lower incisors were also in a filthy condition. Treatment of the mouth was at once instituted. Improvement set in almost immediately. In a week the patient was quite sensible, and in fourteen days she was feeding herself, and had complete control over urine and faeces. Thereafter she made a perfect recovery.

As in a large majority of these cases of oral sepsis pallor of the skin and mucous membranes had been well marked, an appearance which Hunter records in 78 cases out of 1,000 out-patients coming under his notice during twelve months,⁴ an effort was made to learn something of the character and degree of the anaemia which this condition produces. Examinations of the blood were made in six cases chosen from amongst those in whom this appearance of pallor was most striking. The results were as follows:

Females:

Case I, aged 55 ...	...	{ Haemoglobin, 84%
		{ Reds, 4,600,000
Case II, aged 23 ...	...	{ Haemoglobin, 89%
		{ Reds, 4,216,000
Case III, aged 25	...	{ Haemoglobin, 90%
		{ Reds, 4,400,000
Case IV, aged 52	...	{ Haemoglobin, 84%
		{ Reds, 4,400,000
Case V, aged 46 ...	...	{ Haemoglobin, 85%
		{ Reds, 4,350,000

Male:

Case VI, aged 28	...	{ Haemoglobin, 93%
		{ Reds, 4,512,000

These figures would show that oral sepsis in the forms in which it is commonly met with does not of itself necessarily produce an appreciable degree of true anaemia, but rather a condition of pseudo-anaemia such as is commonly observed in a person suffering from nausea. The same condition is observed in Bright's disease, and in some forms of heart disease, where we know that a marked pallor may exist with haemoglobin and corpuscles nearly normal.

This finding has of course nothing to do with the possibility of oral sepsis being the cause of certain malignant forms of anaemia as described by Hunter and Dalton.

The general appearance of the patient appears to be no index whatsoever as to the condition of the blood. After making these six examinations I took a specimen of blood from a young perfectly healthy pregnant woman. By no stretch of the imagination could she be described as looking "anaemic" and yet her blood only showed 68 per cent. haemoglobin and 3,900,000 reds.

CONCLUSIONS.

1. That oral sepsis is a very prevalent condition. That its effects are definite and far-reaching, and that it must form a very important factor in the general health of the community.

2. That, as many forms of oral sepsis are not associated with pain, the patient rarely complains of the condition of the mouth, and as his general appearance and symptoms are frequently strongly suggestive of anaemia, the true state of the case may easily be overlooked.

3. That it is a common cause of disorders of the stomach, is directly associated with different forms of arthritis, and that it either predisposes the individual to, or at times directly gives rise to, suppurative processes in other parts of the body.

4. That at critical periods in the life of an individual, as for example at puberty, during pregnancy, at the climacteric or in the course of a chronic disease, it may be the all-important factor in the case.

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AUTOGENOUS VACCINES IN THE TREATMENT OF CHRONIC JOINT AFFECTIONS

(RHEUMATOID ARTHRITIS AND GONORRHOEAL ARTHRITIS).

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RHEUMATOID ARTHRITIS is, I think, a misleading term. I would prefer to call the condition "metastatic arthritis"—that is, metastatic to some infective focus in the body.

The joint is swollen and more painful at times than at others; the muscles around the joint show marked wasting. On palpation the local temperature may be slightly raised, the synovial membrane is thickened and fringing of it may be felt. On movement of the joint a soft crackling is felt, very different to the bony creaking felt in osteo-arthritis, which latter I consider to be quite a different disease, although in more elderly subjects rheumatoid arthritis may pass on to a condition of osteo-arthritis. Further, in some cases of rheumatoid arthritis there is a considerable quantity of free fluid in the joint cavity, and lateral mobility in the joint itself can be obtained.

Pathologically, rheumatoid arthritis presents features of a chronic infection, the synovial membrane is pinker than normal, it is soft and succulent, and often villous processes project from it. The articular ends of the bones beneath the articular cartilages show rarefaction, while microscopically there is present some extent of rounded infiltration in the synovial membrane. Although the synovial membrane is thickened, it does not show a tendency to ulcerate or undergo destructive changes, as in the case of tubercle, and possibly syphilis.

I have repeatedly tried to obtain cultures from the fluid aspirated from these joints, using various culture media, but in no case with success. It has been suggested, and I think feebly, that the organisms present are in such a low state of virulence and numbers that they will not grow; others have said that the organisms lie hidden in the connective tissues of the synovial membrane, but a very careful search in a series of cases failed to reveal any such organisms. Other observers assert that they have been able to grow organisms from these joints, and have produced this villous type of rheumatoid arthritis in rabbits by inoculating the animal with this organism; but such observations have not been confirmed.

I think we can safely say that the cause is not a form of tubercle. There is no tendency to caseation or to the formation of abscesses and sinuses or to destruction of articular cartilage. Von Pirquet's reaction has invariably been negative; this fact, though proving nothing, at any rate helps in excluding tubercle.

Further, I think we can exclude syphilis. It is true there is a type of syphilitic rheumatoid arthritis, but it is rare, and rheumatoid joints do not resemble syphilitic joints. Out of a large number of cases tested only a very small percentage have given a positive Wassermann reaction. The majority gave a negative history of syphilis, and those who gave a positive Wassermann reaction and in whom there was other evidence of syphilis did not respond to antisyphilitic treatment only, as far as their joints were

concerned. I would, however, suggest that the Wassermann reaction be tried in these cases, for if it be positive it is well to administer antisyphilitic treatment along with treatment appropriate for the joint condition.

I have been interested some five years in this disease, and am becoming more convinced that rheumatoid arthritis is due to metastasis from some infective focus. The disease attacks the young and middle-aged, and in children there is that form called Still's disease, the cause of which is not yet ascertained.

Metastatic arthritis may commence at so early an age as 15 or 16. Commonly we see it in young women at 18 years and upwards. From 35 years onwards to the menopause it is again common. Frequently it is said to follow parturition, and other diseases affecting the female genital organs.

The three main points in the treatment of this disease are:

1. To find the infecting organisms.
2. Having found them, to raise the opsonic index of the individual against these organisms; this is most quickly accomplished by the use of autogenous vaccines.
3. Having rendered the patient artificially immune, to remove where possible the primary focus and apply local treatment to the affected joints.

The commonest foci of infection in my cases have been the following:

The Teeth.

Pyorrhoea alveolaris is frequently associated with rheumatoid arthritis. I have frequently seen cases who have been to American dentists and have been fitted with a dental plate. On removing the plate a series of stumps have been disclosed beneath it, bathed in pus of a most offensive kind containing a very mixed infection. Gold crowns are also bugbears. A dentist friend, by way of experiment, placed a gold crown over a carious molar tooth of his own and awaited results. He developed joint pains, rheumatic pains about the shoulders and back, which subsided immediately the crown was removed. The tonsillar crypts are also another source of infection. I have at present a case of a woman suffering from a very progressive type of rheumatoid arthritis, the primary focus being a pair of caseous, dirty tonsils, causing her, amongst other things, to have a most offensive breath.

In cases of pyorrhoea I have found the following form of treatment give most satisfactory results, and in a number of cases cure.

The mouth should be thoroughly washed and the teeth scrubbed for two or three days with normal saline solution without antiseptics. This gets rid of all extraneous matter from the teeth. At the end of three days a small quantity of pus is squeezed up from the gum, a slide taken, and agar tubes inoculated.

It has been a well-marked phenomenon that in these cases of mouth infection there is marked breaking up of the leucocytes seen on the slide taken, and very few of the organisms are intracellular. In brief, there is a poor attempt at phagocytosis. A vaccine is prepared and an initial dose, varying with the patient, given. After the second injection, if a second slide be taken and stained, it is often remarkable to see the phagocytosis present. It is now evident that the opsonic index is increasing, and this is the time to remove the septic stumps and bad teeth.

I have known cases in which doctors have advised patients to have their teeth removed for this condition. The whole mouth has been cleared at one sitting, and after all this the patient's joint condition has become worse. The teeth should be removed two or three only at a time, and this only after the opsonic index has been raised. Otherwise a large raw surface for absorption is opened up to organisms to which the patient has but poor resistance. If many stumps are removed while the patient's immunity is being artificially increased by means of autogenous vaccines, anaphylactic symptoms appear.

This treatment of joints associated with pyorrhoea has given such gratifying results that I now use it as a routine procedure.

In caseous tonsils a vaccine should be prepared and given, and then enucleation of the tonsils performed.