THE TREATMENT OF

RHEUMATIC AFFECTIONS IN GENERAL PRACTICE

based on 81 cases: with special reference to the value of "Thyroid and Potassium Permanganate" Therapy: with a review of the Literature and Discussion on the Pathogenesis.

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INTRODUCTION.

"It is only rheumatism"? How often does one hear such a remark made by a patient in the Consulting Room, as if making an excuse for his presence there? And how often do we doctors use the same phrase meaning to set the patient's mind at rest, and to infer that there is nothing seriously wrong? An ointment or liniment may be prescribed, but nothing more may be done, and so the seeds of chronic invalidism may be allowed to grow. Yet, we learn from the report of the Ministry of Health, "The Incidence of Rheumatic Diseases" (1924), based on an analysis of sickness rates occurring among 91,000 insured persons (58,000 males and 33,000 females) during the year 1922, that we are spending £2,000,000. annually on sick benefit amongst an insured population of 14,000,000 people, and the time sacrificed by loss of work is 3,141,000 weeks annually. It should also be remembered that these figures refer only to the insured population of 14,000,000 people: there is no mention of those individuals who can afford to drift from Spa to Spa in an attempt to obtain relief, or of those uninsured patients who are treated by their private medical attendants or at hospitals.

Such a state of affairs is a serious menace to the welfare of the country and should act as a challenge to the Medical Profession. The numerous examinations carried out during the War brought this fact into prominence - that we were approaching the category of a C_3 nation.

Tuberculosis, rickets, syphilis, and alcoholism, all had their victims, but no small number of the rejected were sufferers from the ravages of rheumatism in some form or other.

You may tell a patient that he is suffering from rheumatism and he will be only slightly, if at all, perturbed: but if you say that he is suffering from arthritis, this is a different matter entirely. The word conjures up in the public mind the picture of a helpless cripple, confined to bed or to a chair, and racked with agony. Arthritis is looked on by the layman as an incurable and progressive disease, and I am afraid that many of the Medical Profession take a similar view.

In his daily routine the general practitioner finds that rheumatic conditions form the great bulk of his practice, yet the accurate diagnosis of such conditions is rendered extremely difficult by the fact that the classification of chronic rheumatism is still a bone of contention -- the morphologist and clinician arranging their cases in totally different series. A review of the literature makes this fact apparent -- "quot homines tot sententiae". This chaotic state is slowly being restored to order, and soon we may read an article by an investigator in some other country and know that when he talks of "Arthritis deformans" he means exactly what we do.

In the Preface to the Ministry of Health Report on Chronic Arthritis (No.52), the Chief Medical Officer, in dealing with the investigation into rheumatic

conditions says "If all the elaborate diagnostic investigation, and the treatment and removal of foci found, is to be undertaken under the most favourable conditions, an "arthritis unit" is almost indispensable." Concerning this statement there is no doubt, and as well as arthritic units, physical treatment centres and Spa hospitals are also necessary, for doubtless at some stage in the disease physical treatment is necessary. In this country only about 0.3% of the patients in the large General Hospitals are admitted for the treatment of the various forms of chronic arthritis, and only about 0.5% of all deaths are attributed to them[1].

After reading the foregoing quotation one feels that the problem is too great for a general practitioner; the sense of helplessness is appalling, and yet until the development of arthritic units something must be done for the vast number of rheumatic patients. This sense of inferiority is slightly relieved by these words from the same Report (No.52 p.74) : " If the general practitioner is not content merely to relieve immediate symptoms, if he recognises the necessity of searching for the cause, and if he exercises the tact, patience and energy necessary to persuade the patient to submit to the necessary treatment,whether given by the Practitioner himself or by others, invaluable time may be saved."

With this object in view, I have during the past three or four years made clinical notes on 81 cases,

and these notes, together with a discussion on the various treatments employed, form the main theme of my thesis. I have also embodied a review of the literature on the subject of Chronic Rheumatism and have stated the various views on the great problem of the aetiology.
Some suggestions of my own are made: they may not be new, but so far I have not met them in the writings on the subject. In investigating the cases one cannot very often do all that one would wish, as the question of expense has to be considered; bacteriological examinations of urine, and faeces, cost money and, as the result may be somewhat problematical, patients do not see why good money should be spent in obtaining facts which may only be of academic interest and may not help them to get better.

A full review of the pathogenesis of the subject is necessary in order to understand the rationale of some of the treatments employed. I make no claim to originality in any of the treatments, but my only wish is to show what can be done in General Practice, while we await the Utopia for the rheumatic patient in the shape of the "Arthritis Unit".

RHEUMATIC AFFECTIONS IN GENERAL PRACTICE.

CLASSIFICATION:

At the onset, in dealing with this subject, one must have some kind of classification and here, as already mentioned in the "Introduction", the various nomenclatures and different classifications adopted by investigators have been a stumbling block to the advance of our knowledge of chronic rheumatism. Acute rheumatism very seldom develops into chronic joint disease, and people have been in the habit of describing chronic joint disease of obscure aetiology as "rheumatoid", because, although not rheumatism, it was like it. Even today many use the term to embrace all forms of chronic arthritis of obscure origin. The whole question has been investigated by the Committee appointed by the Ministry of Health to study the incidence of rheumatic disease. In this thesis I have adopted its classification. I have, however, included a few cases of gonorrhoeal arthritis, and also one of arthritis occurring in a syphilitic patient because of the presence of other causes besides the specific one: these cases may be true specific ones, but on the other hand they have probably a mixed origin.

In the classification adopted by the Investigating Committee, rheumatic diseases fall into three main categories, viz: A B and C.

A. (1) Rheumatic Fever (Acute Rheumatism).

(2) Subacute Rheumatism. A mild attack of acute rheumatism; pyrexia not exceeding 101°, responding to salicylate treatment; often accompanied by endocarditis without chronic joint deformities.

B. Non-Articular Rheumatism.

(1) Muscular Rheumatism (Myalgia) including Fibrositis, Pleurodynia and Torticollis.

(2) Lumbago (myalgia of the erector spinae muscles) given a separate classification on account of its occupational interest.

(3) Sciatica, Brachial and other Neuritis: sub-divided according as to whether there is evidence of real neuritis or not.

(4) Para-rheumatic diseases, viz: erythema nodosum, iritis and panniculitis.

C. Chronic Arthritis.

(1) Rheumatoid Arthritis (Infective periarthritis) Characterised usually with acute initial attack of pyrexia; many smaller joints usually affected, especially first and second phalangeal joints; spindle-shaped joints; temporo maxillary joints often affected; frequently bi-lateral, mostly peri-articular, and often accompanied by much fibrositis. Nutrition bad and patients usually females.

(2) Osteoarthritis. Onset usually afebrile; usually at first confined to one large joint, e.g. knees, hips; grating, lipping: eburnation; osteophytes; lesions often asymmetrical and patient usually well nourished.

In rheumatoid arthritis therefore, many of the smaller joints are affected and there is no early bony change; osteoarthritis, on the other hand, only attacks a few joints and those the larger joints; bony outgrowths, synovial changes, loss of cartilage may be present and the general health is usually unaffected. These are the clear cut cases, but unfortunately most cases are not so clear cut. Warren Crowe[2a] points out that we may have a patient who has suffered from grating and stiffness of one knee for years, but is now developing spindle swellings of fingers, weakness of muscles of forearm and hand, and general malaise: this looks at first like a case of osteo-arthritis, but later one of rheumatoid arthritis. Again, a typical case of rheumatoid arthritis comes to operation in order to have a flexed knee straightened: when the joint is opened there are found thickened synovial membrane, cartilage replaced by granulation tissue and bony outgrowths on the condyles of femur. There must therefore, according to this writer (Warren Crowe), be a third sub-division of the arthritic cases:-

(3) Mixed Arthritis.[4a]

Some authorities also are of the opinion that there is still another group due to the imbalance of the

endocrine glands --- this type is well illustrated in:

(4) Climacteric Arthritis.

The Chronic Arthritis group may therefore be sub-divided as follows:-

(1) Rheumatoid Arthritis (Infective periarthritis or focal arthritis.)

(2) Osteoarthritis.

(3) Mixed Arthritis.

(4) Climacteric Arthritis.

In my series of cases there are none of acute rheumatism and this thesis deals with Groups -

A 2. B 1, 2, 3, 4. C 1, 2, 3, 4.

AETIOLOGY.

The aetiology of chronic rheumatism is an extremely complex problem, owing to the large number of apparently causal factors. After reading through the literature on the subject, it would seem better in the first place to take a broad view of the subject and to review the various theories as to the possible aetiological influences of many alleged factors. It should be remembered that chronic arthritis is not a local disease, but a local manifestation of a general pathological disease.

Underlying Factors:-

In all forms of rheumatic affections there would seem to be certain common underlying factors. It is

so very common to find that various relatives do or did suffer from rheumatism, that the idea that there is a diathesis at work is forced on us; it may be acquired or inherited, but it undoubtedly plays no small part in determining attacks of articular or muscular rheumatism. Allowing for the frequency of chronic rheumatic affections in all classes of the community, and for the confusion of the different types, one cannot help thinking that there must be a rheumatic diathesis. Regarding this diathesis, Professor Stockman[3a] is very careful in defining what he means, and points out that, while certain writers use the term to denote a supposed constitutional or inherited tendency to contract rheumatism, others employ it to describe individuals who suffer frequent or repeated attacks; the two are quite different. Certain families may be more liable to rheumatic infections than others, but the same can be said for many germ diseases, e.g. Tuberculosis. It may be a matter of infection from intimate association, or a mixture of this and unusual vulnerability. Individuals who suffer from repeated attacks, say of acute rheumatism, cannot be looked upon as having merely a rheumatic diathesis, they must be considered as being infected and already harbouring the causal organism. Professor Stockman concludes by saying that he does not think that our present knowledge admits of a definite conclusion being come to. On the other hand, it is now accepted that chronic rheumatism is due at least partly to a focal infection, and as such

infections are so very common and the percentage of those who suffer from rheumatism so relatively low, unless the disease is due to a specific organism there would certainly seem to be some special personal factor at work. In discussing this point, F. G. Thomson and R. G. Gordon[4a] state that "while all the available evidence appears to point to some personal idiosyncrasy determining the incidence of chronic arthritis and chronic fibrositis, the nature of this idiosyncrasy is largely a matter of speculation. Presumably there is some lowered resistance to the infective organisms which, being of low toxicity, are only able to obtain a footing and excite inflammatory reaction in the lowly organised fibrous tissue which constitutes the tendons and sheaths of the muscles and forms the chief component of the capsule and other parts of the joint. This lowered resistance, while it may be due to purely extrinsic and fortuitous causes, such as want of nourishment, unhealthy environment, or debility from some other disorder, the tendency of chronic rheumatism to run in families suggests that there may be some more permanent inherited factor, some alteration in chemical or vital processes, some familial perversion of metabolism to account for it." This special liability to rheumatism has been attributed to want of endocrine balance.

Harrower[40] points out that some writers regard rheumatism as a manifestation of digestive trouble purely and simply: if the digestion is corrected the rheumatism automatically passes. Others maintain that it

is the result of imperfect mineral metabolism, and that the giving of certain inorganic neutralising agents will quickly cure the condition: others insist that not only in the obviously infective forms of rheumatism, but in all forms, there is a bacterial origin. Harrower also mentions that opinions are veering round from the view of the relationship of uric acid to the rheumatic diathesis, and that it is not uric acid but disturbances of the intermediary purin metabolism that are at the root of the evil. In rheumatism one of the most constant manifestations is a disturbance of metabolism, and also there is evidence in a considerable number of cases that the original basis of trouble is an obscure infective process; his opinion is that excessive amounts of protein and lack of mineral elements are responsible for the metabolic chaos. As in his view all forms of rheumatism are "evidences of essential changes in the chemistry of the body", he pleads that the regulators of metabolism (the endocrine glands) should be considered both in the aetiology, as well as in the treatment of these conditions. Presuming that the various manifestations of rheumatism are toxic in origin, he asks "Is not detoxication controlled by certain of the endocrine glands?" He also mentions that a close relationship may be discovered between certain of the ductless glands and the symptoms which are now considered as being pathognomonic of rheumatism.

The theory that rheumatism is due to a

vitamin insufficiency is championed by many writers; this shall be dealt with in more detail later.

It will thus be seen that the problem is very complicated, but viewing it in its broadest aspect it is probable that there is an element of truth in each theory. I hope to show that in reality the various hypotheses are in close relationship and are linked up together.

If the existence of a rheumatic diathesis is granted, or at least considered to be highly probable, there are in addition certain factors which undoubtedly act as predisposing causes.

Predisposing Factors:-

(1) Cold and Damp. It is common knowledge that rheumatic patients are susceptible to cold and damp, or perhaps it might be more exact to say to sudden changes in temperature or in the degree of humidity in the atmosphere. Most patients show some sign of vasomotor irritability in the form of cold extremities, chilblains, and spasmodic ischaemia of fingers and toes. Chronic fibrositis pains are especially liable to vary with the change in weather, and some observers consider that the variations in the barometric pressure, by causing changes in the pressure on the superficial capillaries, are responsible as much as the changes in the temperature. One of my cases (No.75) showed this peculiarity - that while her pains were fairly uniformly severe all the year round, she frequently suffered exacerbations in the summer

and frosty weather. In seeking for an explanation why rheumatic symptoms vary with climatic conditions, one turns naturally to that organ - the skin - which acts as a "buffer" between the body and its immediate environment. Sir William H. Willcox[5] has pointed out that, while in this country skin conditions, in relation to rheumatism, have received little or no research, on the Continent, by means of special skin thermometers, the reaction of the skin of rheumatic patients to varying conditions of atmospheric moisture and temperature is markedly deficient: the skin temperature was found to be 3° or 4° below that of an ordinary individual. Pemberton[6] has shown that at least part of the pathological changes in the rheumatic syndrome consists of interference with, or obstruction to the blood flow in the finer capillary beds. Ray[7] points out that Schulhof, in the Archives of Medical Hydrology, January 1927, confirms this finding, and states that the essential cause of rheumatic symptoms is a trouble of capillary circulation in the organs of locomotion, and suggests that cold or climatic irritation sets up a capillary spasm, followed by stasis in the capillaries and lymph spaces; in this way he explains the beneficial effect of hyperaemic treatment.

Professor Wild[8], in seeking for an explanation why an increase in the moisture of the atmosphere should cause "changes of a sensitive nature to take place in joints that were continually bathed in fluid," refers to experiments carried out on the estimation of the amount of carbonic acid in the expired air in the case of mice kept in chambers in

which the humidity of the air was varied; it was found that, when the humidity of the air reached a certain point the elimination of carbonic acid from the body was much diminished, and he (Professor Wild) considered that the accumulation of carbonic acid in the body might be an explanation of the obscure pains.

(2) Fatigue. Some authorities[4b] are of the opinion that undue fatigue, by causing an accumulation of lactic acid in the tissue and especially when followed by exposure to cold and damp, is a most common cause of an acute attack of lumbago or sciatica, and other forms of fibrositis.

(3) Strain. Prolonged strain, they also mention, may be an important cause of fibrositis in certain occupations, e.g. coal miners are especially prone to attacks of lumbago and sciatica; and it is also a causal factor in osteoarthritis, where frequent minimal injuries, acting on a joint the nutrition of which is affected by arterio-sclerosis, eventually produce arthritic changes. Certain static deformities, e.g. flat-foot or pes cavus, set up a state of chronic strain, and in the case of the examples cited, by throwing the leg out of alignment cause strain, not only on the knee-joint and hip, but also on the muscles and fasciae of the leg, thigh, and back; this may eventually lead

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to an arthritis or chronic pain in the calf or fascia lata. These static deformities are important, as their existence is frequently overlooked, and unless they are rectified, no treatment for the joint or muscular condition is of any avail.

J. Browning Alexander[9] cites some interesting examples of how strain may determine the certain joint which is to be affected by the rheumatic disease. In my series I have three cases (Nos. 56, 74 and 77) which prove the effect of chronic strain produced by static deformities.

(4) Trauma. Apparently acts as a determining factor; gross injury to a joint may be followed by the occurrence of an arthritis years later.

(5) Arterio-sclerosis: Thomson and Gordon[4c] have pointed out that atheromatous changes in the articular arteries have been frequently demonstrated in osteoarthritic joints and are of the opinion that the consequent impairment of nutrition is doubtless causal in the onset of senile arthritis. Strain and malnutrition are now regarded as the primary factors in the onset of osteoarthritis. Such joints may become secondarily infected by the organisms of low virulence, but this condition is not due to infective agencies as in "focal" or "infective" arthritis. Arterio-sclerosis must therefore be considered as a predisposing factor in arthritis.

(6) Want of Sunlight and Fresh Air, along with an inherited diathesis may, by causing a lowering of the body immunity, determine the onset of chronic rheumatism. It is remarkable the benefit some rheumatic patients receive from a course of Ultra-Violet radiation.

(7) Diet . There can be no doubt that a diet which is rich in vitamins must raise the body immunity and enable it to fight against the toxaemic factors which play an important part in the causation of chronic rheumatism. The experiments of M.J.Rowlands [11] on this matter are most interesting and throw a great deal of light on the problem.

In the meantime I have mentioned "diet" or rather vitamin deficiencies as a possible predisposing factor, but I hope later to show that it may play a much higher role, and in fact may be looked on as one of the actual causes.

THE THEORIES OF CAUSATION.

Having mentioned some factors which probably act as predisposing agents in the development of chronic rheumatism, it is now necessary to discuss the various hypotheses held by writers on this much debated subject of the aetiology of chronic rheumatism. These theories may be classified into those which state that the causal factor is:-

(a) Disordered metabolism , and under this heading may be considered also the endocrine disorders.

(b) Infective, due to microbes or their toxins, and

(c) Derangement of the vegetative nervous system.

I propose to discuss these together, and, if possible, to show how they are in reality inter-dependent the one on the other.

At the Annual Meeting of the British Medical Association held at Bath in 1925, Sir Humphrey Rolleston[12] mentioned that in 1907 Sir Archibald Garrod, while admitting that the treatment of focal infection was sometimes followed by an amelioration or even cure in the affected joints, doubted if these were examples of the specific disease "rheumatoid arthritis" as described by his father Sir Alfred Garrod in 1858.[13] In 1923 he seemed to be of the same opinion and in this he was supported by M. Cassidy[13]. At this meeting of the British Medical Association, the concensus of opinion was that the primary origin of the disease (rheumatoid arthritis) was infective. Sir Wm. H. Willcox[14] gives the following reasons why the claim for the infective origin should be admitted.

(1) Many well known pathological organisms give rise to arthritis and fibrositis, indistinguishable from chronic rheumatism. Gonococcal infection forms the best example, but those of bacillary dysentery, pneumococcal infection, and typhoid and paratyphoid fever, may also be cited: streptococcal septicaemia not infrequently is accompanied by multiple arthritis and fibrositis.

(2) The frequency of rheumatoid arthritis

following parturition is suggestive of an infective origin.

(3) The great majority of the early cases of chronic rheumatism show evidence of an infective cause. Pemberton[6], however, who has done a great amount of research work on the subject gives this warning:- "There has been temptation to regard phenomena of arthritis as due solely to local depredations so to speak of micro-organisms, especially streptococci in situ, but it can easily be shown that proof to this end is far from complete, and that other kinds of influences must be considered in both development and subsidence of the disease."

Somewhere in the body there exists an infective focus from which toxins are elaborated, absorbed into the blood-stream and thus carried to the tissues. Such foci may be present in the teeth, tonsils, nasal sinuses, ears, alimentary tract, and uro-genital tract: some observers have reported cases where apparently the source of the poison was a surface suppurating wound.

In considering the modus operandi of the toxin, it is interesting to review the researches of Pemberton[6]. He states, "that arthritis is only the expression in the joints of the underlying rheumatoid state operative in many tissues of the body", and later points out that in arthritis there is frequently a delay in the removal of sugar from the blood, so that hyperglycaemia results. He maintains, however, that

the inability of the arthritis patient to remove ingested sugar as rapidly as normal from the blood, is by no means specific for this disease, as it can follow certain thyroid and a few other disturbances[6]. This lowered sugar tolerance was found to grow less or disappear as convalescence proceeded, whatever method of therapy was employed, but it returned to normal most rapidly after the removal of the causative foci[15]. The lowered sugar tolerance was not to be regarded as specific for arthritis and"should be interpreted only as reflecting part of the underlying pathology of this disease, which apparently consists in an interference with the respiratory function of the circulating blood"[15].

The frequent association of glycosuria with carbuncles and other septic conditions, suggests that in such toxic conditions the carbohydrate metabolism is impaired and the capacity of the body for removing sugar from the blood and storing it in the liver is interfered with, and in this way glycosuria may develop. This is probably due to the infection which, by inducing pancreatic disorder, leads to a more or less permanent lowering of sugar tolerance[12]. On the other hand, lowered sugar tolerance alone could not cause arthritis, for it is not a feature of diabetes mellitus[16]. Further examination of arthritis cases has revealed that there was a slight delay in elimination of salt and water, basal metabolism was lowered in 20 per cent of cases, while the data for blood fats and cholesterol, blood calcium, blood urea and

non-protein hygiene were found to be normal[15]: so that the metabolic defect seems to be chiefly marked by the lowered sugar tolerance which may be regarded as being due to infection. An inherent disorder of metabolism may, however, by diminishing resistance favour the development of an infective or toxic arthritis; but with the knowledge that infection can produce disorder of the pancreas and that rheumatoid arthritis is not a feature of diabetes mellitus, it seems that the argument, that a disordered carbohydrate metabolism is the primary factor in the development of rheumatoid arthritis, is most inconclusive. The infection may, however, affect the endocrine glands and so modify metabolism and produce joint changes, but this is different from maintaining that an error of metabolism is primarily responsible, independent of infection.[12.]

It will be seen then, that the two theories - metabolic and infective - have a definite relationship the one to the other.

Pemberton[6] has shown that blood which contains a large amount of inadequately removed sugar, contains a higher percentage saturation of oxygen than it did immediately before the test; the blood is therefore holding up too much oxygen and the tissues are not getting it, or, in other words, they are in a state of "suboxidation". The failure seems to be on the part of the tissues which are unable to utilise the oxygen presented to them. The muscular disabilities of chronic rheumatism are explicable by this [illegible]

that this suboxidation causes accumulations of by-products due to deficient oxidation of lactic acid, which is normally produced by muscular action, and these set up irritation which eventually causes the formation of the characteristic nodules[7]. Llewellyn[17] considers a state of suboxidation to be one of the chief characteristics of the rheumatic diathesis.

With reference to arthritis, Pemberton has also shown that as the central area of the articular cartilage is without blood supply and obtains its nourishment directly from the synovial fluid, it is thus easily understood how toxins can be readily conveyed from foci to the articular cartilage. This nutritive function of the synovial fluid is also noted by Strangeways[10b], resulting from his observations on the growth of loose fragments in joints. Also, it is known that glucose taken by the mouth quickly reaches a concentration in the synovial fluid higher than in the blood; this shows that substances from the intestinal tract have a very ready access to the joint cavities[18].

Alexander[9] maintains that, as all the infections described as causal have been noted in persons without arthritis, a second factor has to be considered; he suggests that this is due to failure of the liver to act as a filter and so toxins are allowed to enter the circulation. Sir Wm.H.Willcox[14], on the other hand, fails to see why the liver, kidney, or any other organ should fail in its

function without some extraneous cause which is, in his mind, the toxaemia of the infection.

The focus may be in any part of the body, but some tissues seem more frequent offenders than others. Willcox[14] thus, in 100 consecutive cases of arthritis and fibrositis reports that the focus was :-

Dental sepsis	in	72
Intestinal	in	13
Tonsillar	in	10
Urethral(gonococcal)		5

Dental sepsis may be present as pyorrhoea, which drains into the mouth (i.e. open sepsis) or as apical infection or closed sepsis. Ackland[19] has pointed out that pyorrhoea never entirely drains, as deep pockets and shut-off foci always exist, whose products may enter into the circulation. Open sepsis is obvious but it is wise to make sure that apical abscesses are not present: this can be decided by a good radiograph and in cases of doubt it should always be done: that this should be done in all doubtful cases is brought out in my series, and also I have found in the treatment of other conditions apart from rheumatism, that although the dentist may pronounce the teeth as healthy even after frequent examinations, an X-Ray may reveal apical infection. A radiograph, however, is not an infallible guide, as apical infection may exist without much appearing in the skiagram[19]. Ackland[19] points out how oral sepsis sooner or later causes sepsis somewhere in the alimentary tract - tonsillitis,pharyngitis,laryngitis, gastric, hepatic, and pancreatic inefficiency. While the

healthy gastric juice may destroy the streptococci, there is no proof that the endotoxin is destroyed; in fact it is more probable that the endotoxin is liberated by the destruction of the streptococci. Again, during the night, while gastric juice is not being produced, the sepsis is poured into the alimentary tract and can produce its effect on the gastric walls and the rest of the tract unhindered. He also believes that intestinal stasis may be caused by the weakening of the muscles of the intestinal wall.
Vaccines as a remedy for pyorrhoea are disappointing, but are useful after extraction. After extraction of a tooth there may be a "flare up" of the arthritis, and the question whether all the teeth should be extracted at one time, or whether only one or two, has to be decided for each individual case. All crowns, bridges, and dead teeth should be condemned whether the skiagrams show mischief or not. - One interesting point in my series of cases is the number of patients who have had a complete upper or lower extraction - usually the lower - some considerable time before seeking advice for rheumatism. This would rather point, especially in the absence of other evidence of focal infection, to oral sepsis being the primary focus in these cases, and illustrates Ackland's remark that "one cannot remove at once the effect of the long years during which immunity has been breaking down.

Tonsillar and Nasal Sinus Infection. The tonsil may be apparently the primary focus of infection, but more

often is secondary to oral sepsis. The hypertrophied tonsil, from which pus may be seen to exude with or without pressure, does not give much trouble in the seeking for a septic focus, as it is easily seen. In my experience the sunken tonsil may appear innocent, and very often the patient assures one that there never has been any sore throats. In such cases frequently there will be noted a peculiar dusky injection over the anterior pillars of the fauces, and judicious probing and pressure will often reveal sepsis in the tonsil. I have found the use of a tonsil suction tube very efficacious in demonstrating the sepsis, and it has also this advantage, that if a patient can actually be shown the pus which has been extracted from his tonsils, he will be much more likely to follow your advice and have them enucleated. The stumps of tonsils which have been previously partially removed, are frequently septic and give the same difficulty in diagnosis as the small sunken tonsil. The existence of enlarged tonsillar glands, with or without a history of attacks of tonsillitis, may be helpful.

Willcox[14] goes so far as to say "that the tonsillar origin of arthritis is often shown by the tendency for the joint symptoms to have a temporary marked improvement and even disappearance, which is then followed by recurrence of the arthritis." He also states that tonsillar sepsis as the primary cause is more often seen in young people. Complete enucleation of the tonsils in most cases can be done by a guillotine(e.g.Ballinger's) but sometimes they have to be dissected out. Sometimes where operation has been

refused, or where it was thought inadvisable owing to other circumstances, I have used the suction tube regularly and have painted the tonsils either with liquid Iodex, or with a paint :-

Tinct. Iodine ... ... drachm ½
Glycerine Acid Carbolic)
Glycerine Acid Tannin) ... of each oz.½

In common with sufferers from dental sepsis, those with tonsil infections frequently are good for nothing in the morning; halitosis is marked; appetite capricious, especially in the morning; insomnia is frequent, and if sleep does come it is frequently accompanied by bad dreams.

Infection of Nasal Sinuses. Attention has been drawn to nasal sinus infection as a cause of chronic rheumatism by P. Watson-Williams[20], W.S.Syme[21], Willcox[14] and others. Most often the maxillary antra are the site of infection, but the frontal, sphenoidal and ethmoidal sinuses may also be infected. The antra may be infected from a molar tooth or the infection may come from the nasal cavity. P. Watson Williams believes that it is the slighter, rather than the profuse purulent forms of sinusitis that cause arthritis, because they are not accompanied by a polymorpho-nuclear leucocytosis which protects against the effects of absorption.[12] Rolleston points out that unless the exit of the discharge, purulent or otherwise, is obstructed, sinusitis is, like pyorrhoea alveolaris, more likely to cause gastro-enteritis and secondary foci in the gall-bladder and vermiform appendix than systemic and arthritic infection. Rhinologists

draw attention to the difficulty of diagnosis of sinus infection. Anterior and posterior rhinoscopy should be employed; it should be remembered that the existence of nasal polypi is frequently due to sinusitis; transilluminati[illegible] and even radiograms of the antra are misleading, and the only certain test is antral puncture and bacteriological examination of the antral washings. It would seem, in doubtful cases, that a thorough examination by a Rhinologist is advisable. Nasal sinusitis is often missed because it is not looked for; it may accompany definite dental or tonsillar sepsis.

Aural Infection, should not be forgotten, and where there has been any history of otorrhoea, with or without mastoiditis, a thorough examination of the ear should be made.

Intestinal Infection. Where there is a focus of infection in the mouth or naso-pharynx, sooner or later the intestinal glands become affected, and can carry on the infective process even when the primary focus has been eradicated. Rolleston[12] points out that on general principles intestinal infection should be prevented from producing secondary changes in the joints by the antitoxic function of the liver, though he admits that it is possible that bacteria or toxins might escape the hepatic filter by gaining entrance into the general circulation via the thoracic duct. Willcox[14 and 22] states that in intestinal infection

the colon is most commonly implicated, the tubular glands (glands of Lieberkühn) being no doubt the site of infection. He points out that Sir Arthur Keith, in his Lecture on "The structural and functional disorders of the large bowel", showed that in health the glands of Lieberkühn were lined in their tubular portions by columnar cells filled with zymogen granules, while the mouths of the glands and the inner surface of the colon between the glands were lined by columnar epithelium, whose function was the secretion of mucus; these latter cells contained no zymogen granules. The reticular tissue between the tubular glands contained lymph spaces and cells for the absorption of minute solid particles, also lymphocytes for fat absorption, and some polynuclear leucocytes; in intestinal stasis the lymph spaces become greatly enlarged.

From this histological review therefore, it would seem that the glands of Lieberkühn have for one of their functions the production of enzymes, which undoubtedly play an important part in body metabolism. Willcox[22] states that if all the glands of Lieberkühn of the small and large intestine, were collected together they would produce an organ comparable in size to the pancreas, so that the part they play in the body metabolism must be important. He thinks that probably the cells in the tubular glands are able to bring about the absorption of glucose and to combine with it, in a similar way to insulin, so that the glucose absorbed in this way is not excreted in the urine. He bases his

belief on the result of his experiments on the part played by the colon in carbohydrate metabolism in diabetes[23]. This is interesting in view of Pemberton's work in determining the hyperglycaemic state in arthritic cases. Severe intestinal infections, which cause atrophy of the glands of Lieberkühn, must therefore play an important part in the metabolic processes of the body generally. Willcox[22], in discussing this question of auto-intoxication from intestinal stasis, mentions that the latter is often associated with enteroptosis, and that no doubt this conditions leads to a thickening of the intestinal walls from lymph stasis: and in this manner the sagging and dropping of the intestines and stomach are produced and thus a vicious circle is set up; he believes that a dropped and a toxic large intestine is a ready victim to bacterial infections, and that in intestinal stasis there is a marked toxaemia due to the prolonged retention of fermenting contents, and also to the toxins of the added infection. Cruickshank[24], on the other hand, after reviewing the experimental findings of various workers on the question of auto-intoxication, says, "The indications are that an intact intestinal mucosa is a sound barrier to the entry of poisonous substances produced by the action of bacteria on food-stuffs, or on the intestinal juices, and that the results of even complete obstruction in the lower levels of the intestinal tract, in so far as they are due to bacterial poisons, are extremely slow to appear." Regarding the impermeability of the intestinal mucosa to bacteria and

their toxins, J. Stavely Dick[39] considers that, if Professor Cruickshank means that this impermeability is absolute, no proof of this has been produced; if, on the other hand, he means that there is comparative impermeability to bacteria and their toxins, everyone, both on theoretical and experimental grounds, will agree. Cruickshank also mentions from the experimental work of others that mucus acts as an important defence against the invasion of organisms and that the activity of the mucus cells is important in maintaining the health of the intestinal wall. Thus a severe intestinal infection which causes an atrophy of the glands of Lieberkühn, can not only effect carbohydrate metabolism by causing the destruction of the enzyme-secreting element of these glands, but can also set up a vicious circle and redouble its action against the mucosa owing to the death of the mucus-secreting element.

Cruickshank also discusses the difficulty bacteriologists have in stating whether an intestinal organism should be considered pathological or not; he shows how various organisms can be grown to the exclusion of others by the use of different media. J. Stavely Dick[39] makes a suggestion from his experience, that as a vaccine prepared from those organisms which grew freely in the patient's own blood used as a medium, had been helpful in a case of infection of the respiratory tract previously treated by vaccines, a similar method of culture might define whether or no an organism was to be considered as pathological.

Willcox[14], who considers that in elderly arthritic patients

the intestine is often the primary focus of infection, recovered a streptococcus of the viridans type from the colonic washings in 90% of his cases.[12] Rolleston mentions that Mutch regarded a long-chained streptococcus as the pathogenic intestinal organism in rheumatoid arthriti , this organism had a great avidity for sugar, and this point is of interest in view of the success which attended Pemberton's treatment of rheumatoid patients by restricting the carbohydrate intake[15]. Willcox[22] mentions that the presence of a colonic infection may be indicated by the bacteriological examination of colon washings after irrigati with sterile warm saline. It has, however, already been shown that bacteriologists have difficulty in saying when an intestinal organism is pathological or not. Willcox[22] also mentions that in such cases there is usually an exces s of indican in the urine, and that this test should always be done.

Genito-Urinary Infection. Whenever there is a history of old infection of this system, a thorough investigation should be undertaken; and also where an exhaustive investigation of the commoner sites of infection has been negative, the focus may ultimately be found in the urethra, bladder, prostate, and seminal vesicles, or in the kidney itself perhaps as a pyelitis. Bacteriological examination of the urine, especially after prostatic massage in males, may reveal an infective focus.[12] Rolleston mentions that prostatic infections which cause arthritis seem to have a predilection for the spinal column. Further

examination may have to be made by cystoscope, urethroscope or X-rays. In females, a catheter specimen of urine should be taken, and where there is leucorrhoea, a vaginal examination is necessary; care should be taken to make sure that there is no chronic inflammation of the adnexa. Willcox[14] mentions that a chronic salpingitis has been found as the cause in a few cases of rheumatoid arthritis. Endocervicitis may be a cause and help can be obtained by taking a swab from the cervix and having it examined by a bacteriologist.

Excluding those of gonococcal origin, infections of the genito-urinary tract do not play a prominent part in the causation of chronic rheumatism.

Infections of the Respiratory System, as a cause of arthritis have not received a great deal of attention in this country, but in France a widely accepted theory is that the commonest form of infective arthritis is due to the toxins of a distant tuberculous focus acting on a joint. Munro[25] does not find any evidence that surgical or pulmonary tuberculosis increases the susceptibility to rheumatoid arthritis, but Rolleston[12] issues a warning that an open mind should be kept as regards the relation of tuberculosis to chronic arthritis of doubtful origin.

Skin Infections in the shape of boils etc., may be a cause and Stockman[26] has reported cases following on general dermatitis and lupus erythematosus; he also believes that, as rheumatoid arthritis is often associated with

psoriasis, there must be a definite relationship between the two.

From the evidence obtained from the foregoing abstract of literature on the subject of the cause of chronic rheumatism and arthritis, it would seem therefore that focal infection, in combination with a disordered metabolism, may be accepted as the cause. Some maintain that where rheumatism and a disordered metabolism are coexistent they are due to a common cause - infection. But surely the literature proves the fact that the two are really inter-dependent the one on the other. It may be argued that if rheumatism results from focal sepsis, why, when the focus is removed, does the morbid condition not always clear up? It can, of course, be quite easily understood that in old-standing cases, where there are definite changes in the cartilage and bone, removal of the causal foci cannot be expected to make these structures return completely to normal. Removal of a focus does not necessarily remove the source of infection, for it has been shown how one source of infection sooner or later leads to others; in this way the focus may only really be part of the source of infection, or it may have ceased to operate and have now no connection with the disease; the disease, on the other hand, may have become a chronic septicaemia.[15] Pemberton believes that an altered physiology has been produced; he says "Following upon a chronic focus of infection, however, there may be more or less permanent dislocation of normal physiology, as

illustrated by the lowered sugar tolerance, such that removal of the focus is not sufficient to restore it, and it is particularly for this reason that disappointing results so frequently follow removal of definite infective foci."

T. C. Clare[38] has shown that red blood cells can be destroyed by sun rays, heat and mechanical means, and that also it is possible for bacteria to exercise this haemolytic effect; his experiments showed that this destructive action was not possessed by the well-known haemolytic organisms only, but that many organisms had this power of destroying the red cells: thus there was set free an endo-cellular toxin into the circulation. Bacterial infection may thus be looked upon as having a dual pathogenic effect - first, the effect of the specific toxin of the organism concerned, and secondly, the effect of the endocellular toxin. He believes that in most cases the natural defensive powers of the body can deal with the original bacterial invasion, but they are handicapped and may even be rendered ineffective by the debilitating effects of the endocellular toxin; and on this belief he has based his method of treatment of bacterial infections. It is quite possible then that this second pathological factor may be of some importance in those cases of chronic rheumatism which fail to improve. The method of treatment devised by Clare might possibly be of use in treating cases of rheumatism after removal of a focus of infection, or where no foci have been found.

So far I have not treated any of my cases in this way.

The Specificity of the Infection. If then the cause of rheumatism is microbic, or due to the absorption of toxins, is there any organism which may be looked upon as specific? A great deal of research work has been done on this subject and Professor Stockman[3b] gives an interesting synopsis. The concensus of opinion seems to be that so far no specific organism has been isolated. Timbrell Fisher[35] mentions that bacteriological examinations of the synovial fluid in arthritic cases have usually been negative, but that this is no argument against the infective nature of such cases, for in definite infective chronic arthritis (e.g. gonorrhoea) the fluid is usually sterile. He recommends that every surgeon in operating on chronic arthritis should make a point of having all tissues removed from the joint systematically examined by a bacteriologist; in this way some evidence of value may be obtained. Warren Crowe[2b] maintains that cases of osteoarthritis are due to streptococci, but staphylococci are responsible for rheumatoid arthritis. His arguments for the former are based on animal experiments and he states that the only universal organism found in the infective foci were non-haemolytic streptococci; rheumatoid arthritis, he believes, is due to a group of white staphylococci, one of which he has called the micrococcus deformans; pieces of bone removed from rheumatoid arthritis cases grew micrococcus deformans in pure culture, and also the serum of such patients agglutinated the micrococcus deformans in greater dilution than the serum of other people. As streptococci and staphylococci are present in everyone and only await a sufficiently lowered resistance to make their

presence felt, he maintains that, from a bacteriological point of view, all cases of arthritis are of the mixed variety; it is on this belief that he bases his vaccine treatment, which I have employed in some of my cases.

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In a preliminary communication four writers report on the routine examination of fifty cases. They state that in a large proportion of cases in which the joints had been opened, an organism was grown which, in its cultural and biochemical features, was identical in every case; the organism did not seem to have been described previously in connection with arthritis so far as they had examined the literature: in only one case was it recovered from the synovial fluid - in all the others it was isolated from the membrane or bone: so far only intravenous inoculation of rabbits had been attempted, but no lesions had been produced.

While the work of such observers is noteworthy, it awaits confirmation: bacteriologists have failed so far to identify an organism which answers the requirements of Koch's postulates. While laboratory workers have long regarded the streptococci group with suspicion as an important factor in the infective arthritides, either as primary agents or as secondary invaders, great difficulty has been experienced in their recognition and separation; this is due to the fact that the streptococci, like the meningococci and pneumococci, constitute a family very closely related. For this reason serological methods, similar in principle to those employed for the more complete identification of meningococci and

and pneumococci, have been employed in arthritis with reference to streptococci. In secondary and tertiary syphilis it is not necessary to isolate the organism to arrive at a definite diagnosis, but by employing such tests as the Wassermann, one is enabled to say that syphilis exists. Burbank and Hadjopoulos[37], working on these lines, have developed a technique for the application of the deviation of the complement, using streptococcus antigen; from over one thousand serological examinations, using various strains of streptococci as antigens, they have made a serological classification of the infective arthritides; by this method it may soon be found whether each type of infective arthritis has a specific organism or not.

The Vitamin Factor. If focal sepsis is the chief cause of chronic rheumatism, what is the cause of the sepsis? Why should teeth become septic; why should pyorrhoea develop? Is it not possible that the foci of infection are the result and not the cause of a lowered general resistance? If this is the case, we are not doing all that is possible for our patients if we remove the septic foci but do not rectify whatever has caused the lowered resistance, which has in turn allowed the development of the foci. Are there any evidences in literature which explain the reason for the development of such focal infections?

Dental sepsis and caries are very prevalent amongst all classes of the community; want of proper dental hygiene accounts, of course, for many cases, but amongst those who pay strict attention to their teeth and who make regular

visits to a dentist, caries and pyorrhoea are by no means uncommon; and again, one sees every day little children suffering from caries in their "milk" teeth; in fact the teeth are sometimes carious even before they appear through the gums. This would tend to point to the existence of some factor which is common to everyone - diet, or rather its deficiencies. There are many references in dental literature to the influence of the accessory food factors or vitamins on the development and structure of the teeth, and dentists now recognise this important fact.[27a] Mrs May Mellanby has shown by her experiments on puppies, that a diet in which the fat soluble A accessory food factor is in abundance (e.g. cod liver oil and butter, etc.) brings about the development of sound teeth. Where the diet was deficient in this factor the following defects were found:-

(a) delayed loss of deciduous teeth,
(b) delayed eruption of the permanent teeth,
(c) irregularity in position and overlapping, especially of the incisors.
(d) very defective enamel and a low calcium content.

She also noted the improvement in the teeth when fat soluble A substances were added to the diet, and says that it was as characteristic as the deleterious effect of the deficient diet. Again, she has shown that a diet rich in fat soluble A vitamin, which allows the formation of good, sound, regular teeth, also seems to confer on the teeth, after eruption, the power to resist bacterial invasion and other destructive influences[27b].

These experiments were conducted on puppies, but there is evidence that a diet, rich in fat soluble A vitamin and not

overburdened with cereals, tends to prevent the onset and spread of dental caries in children more rapidly than one containing less fat soluble vitamin and more oatmeal or other cereal [28].

C. Lee Pattison [29] has shown that by increasing the fat soluble A vitamin in the diet there was a rise in the salivary calcium, and mentions that seemingly there is a definite connection between the quantity of calcium in the saliva and caries, but that more prolonged investigation would have to be made on this point; and that seeing that the calcium content of the saliva is influenced by the same factors of special nutrition as those on which the calcification of teeth and bones depend, if caries of the teeth be influenced by the chemical composition of the saliva, the problem of dental caries is at least partially one of general metabolism. In this connection it is interesting to note the work of Grove and Vines [30] in the treatment of many chronic infective conditions, in which are included the rheumatic group. They found that in these cases, although the total calcium content of the serum was within physiological limits, the amount of the ionic, active, or diffusable calcium was reduced; by treatment with soluble calcium salts and parathyroid extract these cases improved, and they noted that the improvement commenced when the amount of ionic calcium returned to normal. Fraser [31], on the other hand, rather doubts the methods employed by these observers and considers that the therapeutic reports are

far from convincing. In two of my cases, in which the calcium content of the serum was carefully estimated by a bio-chemist, it was found that the ionic and combined calcium were within normal limits.

Mrs. Mellanby and her co-workers have shown the detrimental effect of want of vitamin A in the development and resisting powers of the teeth and this is apparently due to an error in the calcium metabolism. McCollum[32] and his co-workers have, however, shown that it is not the actual presence of vitamin A which controls the calcium absorption, but another fat soluble vitamin - vitamin D - which is contained in it. Calcium metabolism is intimately connected with Ultra-Violet radiation, and it is known that the beneficial effect of the Ultra-Violet rays is due to the fact that it produces vitamin D in the cholestrol of the skin.

Pyorrhoea alveolaris, which is now recognised as a frequent cause of rheumatism, has been investigated mostly by American workers. Kurt H. Thoma[33], in reviewing the findings, shows that pyorrhoea is now recognised as a deficiency disease - due to want of vitamins B and C - although such local causes as improper dental hygiene, improperly fitting fillings and bridges, sticky and gelatinous masses resulting from faulty cooking, etc., all play a part. In this respect one of my cases (No.9) shows how even a bad case of pyorrhoea cleared up with the adoption of a suitable diet and proper dental hygiene; he

still has all his teeth, and it is interesting that his severe brachial neuritis abated without any other treatment than diet. One was greatly helped in this case by the patient, who was very interested in the experiment and gave the diet every chance. A similar case of pyorrhoea clearing up under diet treatment is reported by J. Menzies Campbell in the British Medical Journal of December 24th, 1927, p.1207.

I submit therefore, from the investigations mentioned, that dental caries and sepsis which are recognised as a frequent cause of chronic rheumatism, are really due, at least partially, to deficiencies in the vitamins of the diet. This being the case, can sepsis in the tonsils or nasal sinuses be due to the same cause? Tonsillar sepsis frequently follows on dental sepsis, and antral sepsis may be due to an infected molar tooth, but so far, I have found no direct proof in the literature that such conditions can be due directly to vitamin deficiencies. Ed. Mellanby[34] points out that, in his experiments on dogs, although he had no evidence that enlarged tonsils of the type so commonly seen in children were produced by dietetic defect, this might be because dogs did not develop the condition, or because he did not keep them long enough on bad diets. Grove and Vines[30] report cases of nasal sinusitis and chronically enlarged and septic tonsils in which the ionic calcium content of the serum was below normal; vitamin D controls the calcium metabolism of the body, so that it is very probable that a low calcium

content may be due to want of, or deficiency in, vitamin B in the diet; further investigation, however, would have to be made before this could be recognised as an established fact.

Is there any evidence that intestinal infection might be due primarily to a vitamin deficiency in the diet? It has already been shown how in intestinal infections the tubular glands of the colon- glands of Lieberkühn - are affected: atrophy of both the enzyme and mucus-secreting parts of these glands is produced. Willcox[22] points out that McCarrison showed that in animals fed on a diet devoid of vitamins atrophy of the glands of Lieberkühn resulted, and that Cromer confirmed this observation, and showed that vitamin B influenced the well-being of the cells of these glands. It has already been pointed out that mucus plays a bio-chemical as well as a mechanical part in the protection of the mucous membranes against infection.[24] Cruickshank mentions that, from the findings of many workers, diets deficient in vitamin A bring about a change in the mucous cells, which allows the entry of organisms normally held at bay by the healthy secretion of mucus, and he is of the opinion that "dietary deficiencies may therefore play an important part in determining susceptibility to infection from the intestinal canal." He also mentions that mice from the same stock were fed on two diets -- one the usual laboratory diet on which previous generations of mice had grown and been in good health; the other, a diet very

rich in vitamins -; a culture of B. aertycke was administered to the two sets of animals by the stomach tube; the mortality rate in the animals on the ordinary diet was extremely high, while that of the others was very low. Rowlands[11] is of the opinion that rheumatoid arthritis is a deficiency disease due to partial absence of vitamin B; he bases his opinion on his experiments on mice; he found that intestinal stasis was more marked in the deficiency animal than in the animal on normal diet, and was of the opinion that this was produced by an absence of peristalsis due to the paresis of the nerve supply; this was followed by atrophy and thinning of the bowel wall, thus allowing the passage of bacillus coli and a subsequent bacilluria; he grew the bacillus coli from the urine, dissecting out the bladder with aseptic precautions and incubating it and the contents in bouillon.

From the foregoing observations on the findings of the various investigators, there is ample proof that vitamin deficiencies in diet allow an increase in the risk of invasion by bacteria, and I submit that the same deficiencies can produce the actual septic foci which are now regarded as an all-important factor in the pathogenesis of rheumatism.

Influence of the Vegetative Nervous System.

There seems then no doubt that infective foci play a great part in the causation of chronic rheumatism, but that they are not the sole causal agents seems equally evident from this review of the literature on the pathogenesis of the

disease. Pemberton's words on this matter have already been quoted (vide p.18). Ray[7] says, "The presence of a septic focus either mythical or actual, does not however tell the whole story of the causality. If it did, rheumatism would be more prevalent than it is." He points out that in disease two factors must be considered -- the individual and his environment; the conception of the latter includes everything that interacts with the individual; as nothing in the universe can possibly be conceived as existing independently, all bodies are "conditioned" by their environment; the character of the interaction constitutes a state of health or disease. The joint changes and painful affections of the muscles are simply local manifestations of a rheumatic state operative throughout the body. He goes on to consider the mechanism by which the body maintains its functional unity or health, and points out that this is due to the balanced activity of the two opposing sets of nerves derived from the autonomic or vegetative nervous system, -- the Sympathetic and the Parasympathetic -- and that the respective actions of these two sets of nerves are antagonistic. The imbalance of one or other of these systems produces an effect on metabolism which eventually leads to disease. Hypertonus of the sympathetic produces inhibition of peristalsis of the stomach and bowel; in this way stasis is produced which may eventually be a causal factor in the onset of rheumatism owing to digestive upset and the absorption of toxins. The

endocrine glands are also antagonistic and are under the influence of the two systems of nerves. The thyroid, pituitary and adrenals are in opposition to the pancreas in metabolism; sympathetic stimulation of the thyroid produces a tendency to hyperglycaemia, which Pemberton has pointed out is characteristic of the rheumatic state; this is counteracted by the para-sympathetic stimulation which acts on the pancreas. It has already been shown that climatic conditions, considered as predisposing causes of rheumatism, probably act by causing a spasm of the capillaries. Ray[7], referring to investigations by others, points out that the tone of the capillaries is produced by pituitary hormone, and that adrenalin contracts and ovarian hormone dilates the vessels. This, he thinks, explains why the periods of life accompanied by endocrine transformations seem to be predisposed to rheumatic diseases, e.g., at the climacteric and after ovarian disease. His conclusion is that "considerations of the aetiology of rheumatic diseases must include the conception of a "rheumatic substrate" operative throughout the body, and that this "substrate" is largely explicable by imbalanced states of the autonomic nervous system". This rheumatic substrate, it seems to me, is akin to the rheumatic diathesis which Thomson and Gordon[4a] consider is due to a want of endocrine balance. It would seem therefore, that in considering why a very definite focal infection fails to cause - say joint lesions - the constitution of the individual and his powers of

resistance must be taken into account.

This review of the literature on the pathogenesis of rheumatism, proves that while no single aetiological factor has so far been demonstrated, the various theories have quite definite relationships to each other. I have also been able to show that while the case for focal infection is very strong, there is experimental evidence that septic foci can be produced by vitamin deficiencies in diet.

THE TREATMENT OF

RHEUMATIC AFFECTIONS IN GENERAL PRACTICE.

SUMMARY OF RESULTS AND CONCLUSIONS.

THE TREATMENT OF RHEUMATIC AFFECTIONS IN GENERAL PRACTICE.

It is an established fact that the treatment of any disease whose pathogenesis is fully understood is more accurate and logical than where our knowledge is deficient: in the case of chronic rheumatism there is no doubt that much of the treatment has been empirical, yet in the light of recent investigations, some of the therapeutic measures employed have been proved to be founded on solid facts, of which doubtless the original clinicians were totally unaware.

In the foregoing review of the literature on the pathogenesis, it has been shown that while there are certain points in favour of the infective theory and certain which demonstrate the importance of a disordered metabolism and perhaps of endocrine disorders, all the various hypotheses are in reality in close relationship. The great influence of vitamin deficiency, not only as a contributing cause, but also as a factor which can actually produce the infective foci now recognised as having a connection with rheumatism, has also been emphasised. It would seem, therefore, that while awaiting further enlightenment, much benefit might come to our patients if we treated them by therapeutic means founded on the relationship between the various theories of origin.

In the first place, it is necessary to start with a "clean slate", and this necessitates a thorough search for

infective foci. It must also be remembered that one focus may have been the origin of others and that its removal would then have no influence on the latter or on the rheumatic condition. The state of suboxidation must also receive attention, as must also the lowered sugar tolerance. Finally, the question of diet in such cases is important, for what is the use of removing a septic focus if we do not deal with the factor which allowed it to develop?

On these lines I have treated my cases and the results shall be analysed later. In a disease such as chronic rheumatism, where so many therapeutic measures are adopted, it is extremely difficult to assess the value of each, but is this really necessary? It should be remembered that the patient himself must be considered just as much as his disease, and enquiry made into his mode of life, general physical condition etc., for undoubtedly his trouble is not local, but a "local manifestation of a general disease".

Each of my cases has been fully examined clinically and a thorough search made for septic foci; Blood counts and examination of blood films, urea concentration tests, blood calcium estimations, and Wassermann tests have been done where it seemed necessary.

The detailed reports on the cases are included in the Appendix.

In order to avoid repetition, a short summary of the various therapeutic measures employed will now be given:-

1. Thyroid and Manganese Therapy.

Being impressed by the article by Herbert W. Nott[41] on the above subject, I have employed this therapy in most of my cases and the results shall be determined later in the thesis.

The treatment consists of rectal injections of pure potassium permanganate of various strengths, given at various intervals according to the severity of the infection and length of time it has existed. The standard solution used is 1 grain of potassium permanganate to 1½ pints sterile warm water, and is prepared in the following way:-

the tablet is crushed to powder in an earthenware basin with a metal crusher (e.g. a teaspoon); cold water is added to dissolve the powder and then warm water is added to the required volume - 1½ pints. The bowels should have moved before the injection is given: I have, as a rule, had the bowels washed out with saline several times after the manner of a Plombières douche, before the injection was given. The patient lies on the left side and the injection is given by means of a funnel and tube, or a Higginson's syringe; at the commencement, only a few ounces may be retained, but this amount can gradually be increased until the patient is retaining 1 pint or even 1½ pints. Usually no ill effects are experienced, but sometimes nausea, or pain in the epigastrium is complained of; these sensations soon pass off. If necessary the strength of the standard solution may be increased, say to 2 grains to 1½ pints. A fresh

solution should be made for each injection. Frequently I have found that, after a few weeks' treatment, colitis has been set up and the injections have had to be stopped; this, as a rule, soon passes off and the treatment can be resumed. At the same time as the rectal injections a half grain tablet of thyroid extract is taken by mouth morning and evening.

For those patients who find the rectal injections irksome or inconvenient, (e.g. during absence from home) the treatment may be given in cachets by the mouth. The cachet contains Tab. Thyroid grain ½ and Potassium Permanganate grain ½, and one is taken morning and evening, preferably on an empty stomach: the cachet is swallowed with a little cold water and four minutes later half a tumbler of warm water is taken. Not more than two dozen cachets should be ordered at one time and they should be kept in a dry place --- this is important.

2. Intramuscular Injections of Guaicol, Iodine and Camphor.

This type of treatment is advocated by S. Watson Smith[42]; the technique described by him I have also followed: it was only used in one case (No.75).

3. Vaccine Therapy.

(1) Autogenous vaccines prepared from various septic foci: injections were commenced with a low dosage and gradually increased, care being taken to avoid violent reactions.

(2) Stock Vaccines. (a) Rheumatic Immunogen(P.D.& Co.)

(b) Staphylococcal and micrococcus deformans vaccines, administered after Warren Crowe's technique[2c], an injection of the one being given one day; after an interval the next injection was given, using the other vaccine: an attempt was made to avoid "reactions" and the dose was gradually increased. Sometimes the combined vaccines were used.

(3) Non-Specific Protein Therapy.

(a) By intravenous injection of T.A.B.vaccine. The vaccine for this purpose is now put up in six graduated doses by Parke Davis & Co.

(b) By intramuscular injections of boiled milk, as introduced by R. Schmidt.[43.]

(c) By intramuscular injections of Yatren casein.

4. Agents administered by mouth:

(a) Acetylsalicylic acid, omnopon, and opoidene for pain.
(b) Sodium salicylate.
(c) Atophan.
(d) Various tonics.
(e) Iodicin capsules.
(f) Ichthyol in 10% solution.
(g) Iodine solution, minims 2 to 10 in milk after meals. (The prescription is:- Iodin gr.40.Alcohol(absolute)dr.3 min.35. Spt.Vini Rect. dr.4 min.25.)
(h) Acid Hydrochlor. Dil. min.20 after meals.

5. External Therapy.

Various anodyne applications:-

(a) Wet dressings of Methyl Salicylate.
(b) Applications of Ungt.Hydrarg Co.
(c) Iodex alone or combined with Methyl Salicylate.
(d) An ointment composed of Ungt.Methyl Salicylic Acid Co. dr.6. and Ungt.Oleo-Resin Capsici Co.dr.2.
(e) Applications of "Kiuma".

6. Physiotherapy.

(a) Radiant heat employed by means of a Thermolite Lamp, either alone or in conjunction with Iodex cum Methyl Salicylate.

Physiotherapy (Continued)

(b) Diathermy.
(c) Massage and manipulations.
(e) Hydrotherapy: employed at a Spa.

7. Ultra-Violet Ray Therapy.

The rays were generated by a Mercury Vapour Lamp (Kelvin Bottomley & Baird's Atmospheric Burner); general body baths were given, commencing with an exposure of 2½ minutes with the Lamp at 36" distant and gradually increasing the exposure until 10 minutes were given; the distance of the Lamp from the patient was then gradually decreased until it was only 20" away. Local applications of the rays were also given to the affected parts.

8. Diet.

For obese patients a reducing diet was employed, while under-nourished patients received a liberal diet rich in animal fats: in all cases an attempt was made to restrict the carbohydrates.

Here is the actual diet which was prescribed for Case No.9 and also Case No.66 :-

On rising: Juice of half a lemon in one tumblerful of warm water.

BREAKFAST: Raw fruit only(neither milk nor sugar); it may consist of any one of the following:-

(a) 2 or 3 large oranges.
(b) 1 large grape-fruit.
(c) 1 or 2 slices of raw fresh pine-apple.
(d) 2 or 3 apples.
(e) 1 large bunch of grapes.
(f) 3 or 4 bananas.
(g) 2 or 3 pears.
(h) 3 or 4 peaches.
(i) any other seasonable raw fresh fruit.

(a) (b) and (c) are the most beneficial.
No tinned or stewed fruits. - No tea,coffee,bread,or anything other than one of the above.

LUNCHEON:

(a) 2 slices of any kind of brown or wheaten bread (crisply toasted) and butter, or

(b) an equivalent amount of rye bread(Ryvita) toasted in the oven,and butter, or

(c) an equivalent amount of wheaten biscuits and butter

AND

Raw celery or a large plate of raw vegetable salad.

1 or 2 glasses of buttermilk, or a little cheese may be added occasionally.

A little honey may be taken with the bread and butter sometimes.

Fruit can with advantage be substituted for the bread and butter at times; at this meal it should be taken either alone or followed by vegetables.

TEA:

Weak China Tea, preferably with nothing to eat, but one biscuit may be allowed.

DINNER:

Any SOUP made from vegetables ONLY with no meat or other stock or

Marmite and

A little MUTTON or BEEF or FISH or CHICKEN or RABBIT or DUCK or CREAM CHEESE or 2 Fresh Eggs, with

2 cooked non-starchy vegetables(see under notes on vegetables) ---- NO POTATOES.

followed by

One large dinner plateful of mixed raw vegetable salad with NO dressing unless a little salad oil or a mixture of salad oil and lemon juice.

NOTE:-

Soup need only be taken if desired.
Mutton includes lamb.
Beef includes veal.
Butcher meat, i.e. mutton, beef, veal or lamb should not be taken more than twice weekly.
Pork, if liked, may be taken occasionally,but must always be accompanied with apple sauce.

While, of course, it was impossible to expect the vast majority of the patients to keep to a diet such as this, an attempt was made to observe the main salient features.

A large proportion of fresh raw fruit and vegetables was contained in the dietary. The less starchy vegetables were used --- turnips, carrots, parsnips, cabbage, cauliflower, sprouts, peas, onions, lettuce, celery, spinach, French beans and leeks. Raw vegetable salads were always advised, and the great benefit of tomatoes as a source of vitamins was explained. Potatoes were forbidden, particularly in the obese subjects, but I am afraid in a great many cases this order was "more honoured in the breech than the observance". It was advised that all vegetables should be steamed, or cooked en casserole, and the addition of bi-carbonate of soda to maintain their colour was discouraged. Vegetable soups were allowed and marmite was used frequently. No tinned vegetables were allowed to be used in the making of soups. Except in the case of stout patients, a liberal supply of butter, milk, cheese and eggs was allowed. The re-heating of cooked meats was discouraged and the use of condiments was reduced to a minimum. Fish and fowl were allowed as a substitute for meat. The greater use of brown or wheaten bread and biscuits, or of rye bread (Ryvita) was advised. In addition, cod liver oil was prescribed frequently for the under-nourished patients.

TABLE I. (OVERLEAF).

TABLE I.

GROUP A.

	AGE GROUPS.							
	5 to 14		15 to 24.		25 to 34		35 to 44.	
	M	F	M	F	M	F	M	F
SUBACUTE RHEUMATISM.								
Males 1 aet 22					1	1	1	
Females 2 aet 9 and 24.								
Average Age = 18.								

Septic foci found:-

Dental: Pyorrhoea 1.

Tonsils: Septic 2.

The pyorrhoea was treated with diet and dental hygiene.

The tonsils were enucleated in one case: the other has still to be dealt with.

In the two female cases endocarditis was present.

SUMMARY OF RESULTS.

In the appendix are clinical notes of 81 cases - 18 males and 63 females: the youngest patient was aged 9 years and the oldest aged 82 years. One patient died from pneumonia.

GROUP A. There are no cases of Acute Rheumatism but three of Subacute Rheumatism - 1 male and 2 females; in each case septic foci were found: in case 40, after having had several attacks which were treated with Sod.Salicylat. and Sod.Bicarb., the removal of septic tonsils caused the case to clear up: in Case 41 pyorrhoea seemed to be the only focus present and this was treated by means of a diet of high vitamin content, along with certain measures of dental hygiene, also a Sod.Salicylat.mixture: by these means there has been no return in a period of over a year; it is also of interest that a V-S murmur, which was very evident at first, is now only heard on exertion. Case 65 is of interest in this, that, while an endocarditis was suspected at a previous attack following on a tonsillitis, it actually developed while under observation in this illness: the Sod. Salicylat. mixture seemed to be having little effect either on the pains or temperature: the substitution of rectal injections of Pot.Permanganate solution brought about an immediate improvement; the pains were at once relieved and the temperature became normal and has remained so: this patient has still to have her tonsils enucleated: she is still having the rectal injections on alternate days: when last examined on 17/12/1928 there was no evidence of a cardiac murmur.

TABLE II. (OVERLEAF).

TABLE II.

GROUP B.

NON-ARTICULAR RHEUMATISM.

FIBROSITIS)
PANNICULITIS) Males 4 - youngest aet 15 - oldest 74.
LUMBAGO) Females 17 - " 28 - " 58.

Total: 21. Average age - Males 48.
Females 45.

Septic foci found:

Dental	Pyorrhoea	2.
	Apical Abscesses ...	1.
Tonsils:	Septic	5.
Bowel	Marked constipation...	6.
	Appendicitis ...	1.
Uterine	Leucorrhoea - due to (a) cervical laceration	2.
	(b) displacements	1.
Bladder.	B. Coli infection ...	1.

The case which had appendicitis also had apical abscesses (Case

One case with septic tonsils refused operation.

AGE GROUPS.

15 to 24.		25 to 34.		35 to 44.		45 to 54.		55 to 64.		Over 65.	
M	F	M	F	M	F	M	F	M	F	M	F
1			2		2	1	10	1	3	1	

GROUP B.

NON-ARTICULAR RHEUMATISM.

TABLE II.

One patient (Case No.31) was treated with an autogenous vaccine before the removal of her tonsils: after the enucleation, cachets of thyroid and potassium permanganate, massage, diathermy, and later hydrotherapy were employed: the result has been excellent.

Case No.54 was under treatment for abscesses with injections of collosol manganese: massage was also employed and strict attention paid to the bowels.

All the other cases were treated with suitable diet, treatment of septic foci, attention to bowels; the thyroid and manganese therapy was employed in each case (except Nos.10, 54 and 57) either in the shape of the cachets or as rectal injections with the oral administration of thyroid. Radiant heat, massage or diathermy was employed at some stage of the treatment.

All the patients were much improved except one (Case No.16) and she refused to have her tonsils out, or to keep to a reducing diet. One patient (Case No.71) showed no improvement with permanganate injections but eventually received benefit from diathermy: her cervical tear was not operated on. Case No.49 showed little or no benefit from vaccine treatment(Warren Crowe), but eventually cleared up with diet, cachets, massage and ultra-violet ray baths: hormotone was also employed in this case. In one case (Case No.15) the cachets had to be stopped as they made her sick: she improved,however, when rectal injections were given.

TABLE II CONTINUED(OVERLEAF)

TABLE II (CONTINUED)

GROUP B.

SCIATICA.

Males 2 : youngest aet 24 - oldest aet 61.
Females 2 : " 44 " 48.

Total 4 : Average age - Males 42 : Females 46.

Septic foci found:

Dental : Pyorrhoea ... 1.
Tonsils : Septic ... 2.
Bowels : Marked constipation 2.

AGE GROUPS.

15 to 24.		25 to 34.		35 to 44.		45 to 54.		55 to 64.		Over 65.	
M	F	M	F	M	F	M	F	M	F	M	F
		1			1		1	1			

BRACHIAL NEURITIS:

Males 4 : youngest aet 30 - oldest 52.
Females 5 " 15 " 62
Total: 9 Average Age - Males 42: Females 35.

Septic foci found:

Dental : Pyorrhoea ... 4.
Tonsils : Septic ... 2.

Bowel (Marked Constipation 1.
(Mucous colitis .. 1.

Uterine: Leucorrhoea due to cervical laceration.1.
Puerperal Fever 1.

The case of mucous colitis had also septic roots of tonsils formerly cut (Case 53).

AGE GROUPS.

15 to 24.		25 to 34.		35 to 44.		45 to 54.		55 to 64.		Over 65.	
M	F	M	F	M	F	M	F	M	F	M	F
	3	1		1		2		2			

TABLE II CONTINUED

Many of the cases of lumbago had also sciatic symptoms but were not true cases of sciatica: some of the cases of brachial neuritis had also fibrositis, fibrous nodules being present in suprascapular regions. Except for one case in which thyroid and manganese therapy was not employed, all the cases improved: attention was paid to diet and to elimination of septic foci. Radiant heat, diathermy and massage were also employed. The effect of diet in clearing up a bad case of pyorrhoea is well seen in Case No.9. Case No.33, in which the neuritis occurred after puerperal fever, improved by means of tonics and diathermy: no other treatment was given.

When neuritis was present in the supra-orbital and great occipital nerves, it was found usually to be due to fibrositis, the nodules pressing on the nerves. Septic foci were found in all these cases and when these were attended to, thyroid and permanganate therapy and diet soon cleared up the condition: counter-irritation and aspirin were employed to relieve the pain at first. One noticeable fact about these patients was that they always felt the pain worse in the morning, and especially if an East wind were blowing.

In the case of iritis (Case No.50) the only septic foci which could be found were two stumps of teeth, which had not been removed, but had been ground down to allow a denture to be worn: when extracted they were found to be very septic. This patient improved with cachets and diet, but has had a relapse and the oculist reports a spread

TABLE II CONTINUED (OVERLEAF)

TABLE II (CONTINUED)

GROUP B.

NEURITIS:

Supra-orbital and Great Occipital (Males 0. Females 4. youngest aet 26. oldest " 60.
Average age - 38 years.

Septic foci found:

Dental :	Pyorrhoea	...	1.
Tonsils :	Septic	...	3[x]
Nasal sinusitis		...	1[x]

x One case had septic tonsils and a nasal sinusitis operated on.

AGE GROUPS.

15 to 24.		25 to 34.		35 to 44.		45 to 54.		55 to 64.		Over 65.	
M	F	M	F	M	F	M	F	M	F	M	F
			2		1				1		

IRITIS: One case - female - aet 49.

Septic foci found:

Dental : stumps of teeth.

ERYTHEMA NODOSUM: One case - female - aet 58.

Septic foci found: none.

TENO-SYNOVITIS: One case - female - aet 46.

Septic foci found - none.

TABLE II (CONTINUED)

of the condition which has now developed into a uveitis. A further search is being made for infective foci. A Throat and Nose specialist reports no infection present in the throat, nose or ears.

Case 32 is interesting in that after receiving some anti-rheumatic treatment her teeth were removed: this was followed by a violent reaction in the shape of a very acute iritis: it was so acute that one does not feel inclined to have the tonsils removed in the meantime at any rate.

Cases 16 and 59 also had intercurrent attacks of iritis during their treatment.

The case of erythema nodosum (Case 62) showed no septic foci, but the attack of pyrexia, in which the kidney-shaped masses of cholesterin were recovered from the bowel, rather makes one come to the conclusion that the focus was in the bowel. Rectal injections of pot. permanganate solution had a beneficial effect.

The case of teno-synovitis (Case 44) was very stubborn but eventually cleared up with diathermy, cachets, diet and exercises: no septic focus was found.

TABLE III (OVERLEAF)

GROUP C. TABLE III.

CHRONIC JOINT CHANGES:

RHEUMATOID ARTHRITIS:

Males	4.	youngest aet 24.	oldest aet 60.
Females	26.	" 32	" 82.

Total : 30 Average age - males 45: females 53.

AGE GROUP.											
15 to 24.		25 to 34.		35 to 44.		45 to 54.		55 to 64.		Over 65.	
M	F	M	F	M	F	M	F	M	F	M	F
1			1		3	2	9	1	7		6

CLIMACTERIC ARTHRITIS: One case - aet 49.

OSTEO-ARTHRITIS:

Males 1. aet 59.) Total: 3. Average age - 63.
Females 2. " 60 and 70.)

AGE GROUP.											
15 to 24.		25 to 34.		35 to 44.		45 to 54.		55 to 64.		Over 65.	
M	F	M	F	M	F	M	F	M	F	M	F
								1	1		1

SPONDYLITIS: One case - male - aet 40.

ARTHRITIS (SPECIFIC)

Males 1. aet 36. due to gonorrhoea.

females 1. aet 48. " "

TABLE III CONTINUED (OVERLEAF)

TABLE III (CONTINUED)

GROUP C.

Septic foci found:		
Dental .	Apical Abscesses.	2.
	Pyorrhoea.	9.
Tonsils:	Septic	7.
Nasal Sinusitis		1.
Bowel:	Marked constipation:	4.
	Appendicitis	1.
	Infection of Gall-bladder	1.
Bronchitis.		1.
Uterine:	Leucorrhoea due to Uterine displacement:	1.
Septic Skin Condition:		1.

One case of apical abscess had had also a septic skin condition. (Case No.76)

In four cases of pyorrhoea, septic tonsils were also present; nasal sinusitis was present along with pyorrhoea in one case. So far in those cases the tonsils and sinusitis have not been attended to.

One case apparently came on after Scarlet fever and another after Erysipelas.

The cholecystitis case has not been operated on.

In the remainder no septic foci could be found: constipation was the rule.

In two cases (Nos. 13 and 48) there was a possibility of a tuberculous basis of origin.

TABLE III.

CHRONIC JOINT CHANGES.

GROUP C.

The arthritic cases have been classified as shown in Table III: this division has been made from the clinical features: doubtless there are some cases of "mixed arthritis" included in the "rheumatoid" group, but an attempt has been made to differentiate the conditions as clearly as can be done clinically. In the rheumatoid group one male and thirteen female cases showed that the swellings around the joints were mostly due to peri-articular thickening: in those cases there were also evidences of fibrositis in other parts: in some cases lumbago was present. These cases have not been included in the classification under Group B but in Group C. Only one case has been included under "Climacteric Arthritis": there are many cases of arthritis occurring at or around the menopause, but as very definite infective foci were found in them, even though they showed evidence of endocrine disturbance, they have been included in the "rheumatoid" group. The case of spondylitis showed also marked fibrositis in the dorsal region.

Of the specific arthritis group, the male case (No.70) was definitely gonorrhoeal in origin: the female case (No.69) from the history and the fact that the condition came on after the operation, looks very like one of gonorrhoea also: no gonococci , however, were found in the discharge.

One case (No. 27) has been included in the rheumatoid group although there was a positive Wassermann reaction, because the clinical features were those of rheumatoid arthritis. In no case in which it was looked for was indican found in the urine: in Case 36 in particular, one would have expected indicanuria on account of the bacteriological report on the intestinal flora. The specific gravities of the urine were, as a rule, low and were thus in agreement with the findings of Dr. H. A. Ellis (Ministry of Health Report No.52,p.27.)

The usual method of treatment was adopted -- eradication of septic foci and appropriate diet. Thyroid and manganese therapy was employed in all cases except Case 17 and the two specific arthritis cases. Protein shock, by means of intravenous injections of T.A.B.vaccine, gave excellent results in the two cases in which it was tried: one of these cases (No.1) had previously had rectal injections of permanganate solution, and, although there was some improvement, especially in the pain, the result was not striking. Case No. 76 - treated with cachets and diet - is now showing very definite improvement with "protein shock" which she had had twice before with very little benefit.

Protein Shock by means of injections of sterile milk, or of Yatren Casein did not seem to have any beneficial effect. One patient (No.75) who had received injections of each felt no benefit: in her case rectal injections of pot.permanganate solution gave her more relief than any other treatment she has had and she

has had many.

It is difficult to assess the value of Warren Crowe's vaccines: employing his technique, the subsequent doses depend largely on whether the previous dose had produced a reaction or not. To determine this, one has to some extent to depend on the patient's word, and as rheumatism "comes and goes" largely with the climatic conditions, which in this country are very changeable, it can be easily understood where the difficulty arises. Warren Crowe's vaccines were used in three arthritic cases, and with the exception of Case 17, as far as I could see,without much benefit.

The best results were obtained from the thyroid and potassium permanganate therapy: in some cases the immediate result was very striking (Cases 3 and 36) and all patients expressed a sense of well-being: the beneficial effect was most marked where the permanganate was given as a rectal injection: it was also most marked when given after removal or treatment of infective foci.

In the Arthritic Groups there are three cases in which there is little or no improvement. InCase No.60 this might be due to the patient's age, or to the fact that she may really be a case of mixed arthritis. She obtains relief from iodex and radiant heat. Case No.75, although she maintains she is no better, is getting reduced and her subcutaneous tissues are much softer. Case No.18 certainly received no benefit from all her treatment: she is now on hydrochloric acid minims 10 t.i.d.: it is somewhat

difficult to make her keep to any treatment and give it a chance.

In the Osteo-Arthritic Group one case (No.58) has been relieved with rectal injections of potassium permanganate solution: the other two cases (Nos. 34 and 72) have had little or no improvement from any treatment, except that relief from pain has been obtained from diathermy.

All the other patients have improved greatly, and in fact most of them may be looked upon as cured. All the kudos cannot be given to the thyroid and manganese therapy, for in most cases other treatments have also been employed -- ichthyol 10% has been used and the employment of radiant heat, massage, diathermy, Ultra-Violet rays, etc. are all important.

I submit then, that in the treatment of rheumatic affections thyroid and potassium permanganate therapy is worthy of being added to our armamentarium. It has this advantage that it is not expensive and is easily administered. At first sight its mode of action would seem to be purely and simply one of producing increased oxidation, but there is probably more in it than that. Nott[45] points out that if the results were entirely due to oxygen, similar good results would be obtained by the use of sodium permanganate: this has not proved to be the case. He makes the suggestion, that there is produced an increase of the oxidative processes in the tissues and fluids of the body by the interaction of manganese, potassium, thyroid gland substance and the liberated oxygen derived from the permanganate on reduction. Life itself depends on oxidation and when it is incomplete

disordered function results. He quotes from W. M. Bayliss ("The Nature of Enzyme Action" 4th Edition 1919, p.158) showing the need for an activator to make use of the molecular oxygen in the body. Bayliss is of the opinion that this activator is of the nature of a colloidal hydroxide of iron or manganese. This shows the importance of the presence of iron and manganese in the tissues, in order that complete oxidation can take place. Nott points out that owing to the increased amount of meat eaten by Western people, it is not probable that the iron content of the food is at fault. Regarding the potassium, he quotes from A. P. Matthews ("General Cytology" Chicago 1924, p.55) to show that the potassium salt is more easily oxidised than the sodium; and that the general richness of all cells in this element has something to do with some fundamental process, possibly respiration. In this way is explained the superiority of the potassium over the sodium salt. Nott also points out, from the works of others, that manganese is essential to oxidative processes and to the growth, not only of the body as a whole, but of the thyroid gland. He mentions that artificial enzymes have been produced with alkaline solutions of manganese in gum arabic (Bertrand's "laccase"), and suggests that perhaps the manganese forms a "laccase" with the mucus of the stomach or bowel, and enters the blood stream as colloids do.

McCarrison[46] by giving rats a diet similar to that of Western nations, has produced serious changes in their thyroid glands. His view, summarised by Nott,

is that -

(1) the thyroid gland is generally considered to be the chief activator of oxidative processes and is given pride of place in the control of the endocrine system.

(2) It is concerned in regulating growth and is profoundly affected by insufficiency in the food of growth promoting factors of all kinds.

(3) It is susceptible to toxic action, more particularly when the diet is wrongly balanced.

(4) When handicapped by toxins and ill-balanced diets, it becomes physiologically subnormal, and is still more susceptible to toxic action.

(5) Accordingly it attempts compensatory hypertrophy which produces diffuse fibrosis and a state of hypo-thyroidism is set up. This state may not produce clinical signs and may only become apparent by the effects noted after thyroid administration.

It would seem therefore, that in the combination of potassium, manganese, and thyroid, we have a formidable array of oxidising agents. Nott maintains that the combined action of these substances produces:

(1) A rapid reduction of infective agents and toxic products in the blood-stream.

(2) A reduction of the load on the thyroid, which consequently returns to its normal action, quickly or slowly, depending on the injury it has received.

(3) He also considered that the administration of thyroid substance provides for any deficiency of thyroxine when the

gland is seriously injured.

(4) A purer blood supply relieves the strain on the other endocrine glands and more normal secretions are prepared.

(5) Organic compounds are probably as selective in their action as atropine, digitalis, or aconite; the increased oxidation probably removes any condition of nerve block and so restores the delicate balance of the autonomic nervous system.

This then is the probable explanation of the beneficial effect of the thyroid and manganese treatment. That it produces a rapid reduction of infective agents and toxic products in the blood is beyond doubt: I have used it regularly in pneumonia with good results, so much so that such cases have now been robbed of a great deal of the anxiety which usually attends their treatment.

The question of diet is also important owing to the prejudicial effect on the thyroid gland of an insufficiency in vitamins. It may be argued that a good mixed diet is all that is required: that may be true, but it should be remembered that some methods of cooking act as vitamin destroyers, and also it is highly probable that many food products do not have the same vitamin content owing to the refining processes or adulterations adopted. Also, Rowlands[11] points out that an ordinary mixed diet might quite well be vitamin deficient owing to the change in the food of the animals on which we depend for our use; cows used to be fed on ground oats, wheat, barley and rye, all of which contain a large proportion of vitamin B; nowadays most farmers feed their cows on cotton seed or linseed

cake which are deficient in vitamin B. Similarly hens are fed on all kind of material and the result is that egg yolk has not the same vitamin value as formerly. This makes it essential to increase the vitamins in our food by increasing the intake of raw fresh fruits and green vegetables, etc. It is an established fact that the latter are very rich in vitamin A, as well as the other vitamins. Manganese also is obtained from vegetables and it has been shown how important is its function as an activator of molecular oxygen and also how essential it is for body growth. Potassium also is obtained from the vegetable kingdom and its importance in cell metabolism has already been mentioned.

It is not necessary, or indeed advisable, to become a "faddist" in the matter of diet; the diet on pages 51 and 52 is only of interest as demonstrating how such a frequent condition as pyorrhoea can be cured by increasing the vitamin content of the food. It is totally unsuitable for everyday use, and even if it were prescribed, few people would adopt it. Apropos of this, it is a noteworthy fact that the average patient is quite pleased and willing to increase his or her vitamin content as long as this can be brought about by buying tablets from the chemist, but shows a natural revulsion to any radical change in diet which would have the same result. All that is required is to prescribe a diet in which the main salient features of the dietary on pages 51 and 52 are preserved.

SUMMARY.

In this review of the literature on the pathogenesis of rheumatic affections, the various theories on the subject have been discussed and it has been shown that there is a definite relationship between them. The importance of the infective theory has been emphasised and the recognised state of suboxidation and also hyperglycaemia in such cases has been mentioned: the role played by vitamin deficiency as the actual producer of infective foci has been explained and it has also been shown how such deficiencies can alter the metabolism of the body generally.

It was thought that treatment founded on the relationship of the various hypotheses should be of benefit to the patients. Accordingly each case has been examined for evidences of septic foci and these eradicated or treated; the state of suboxidation has been combated in most cases by the employment of thyroid and potassium permanganate therapy, the possible mode of action of which has been explained: an attempt has been made to increase the vitamin content of the food; the conserving of the vitamins and mineral salts by proper methods of cooking has been explained: the hyperglycaemic state has been treated by restriction of the carbohydrates. Employment has also been made of various subsidiary measures --- massage, radiant heat, diathermy, hydrotherapy, ultra-violet rays, tonics, etc., and also various anodyne applications.

Eightyone cases of different types of rheumatic affections have been treated and the results have already been reviewed.

CONCLUSIONS:

The conclusions that may be drawn are that:-

(1) Treatment evolved on the foregoing lines is of definite benefit to rheumatic patients.

(2) The search for septic foci and their eradication or treatment is important.

(3) Thyroid and potassium permanganate therapy in such casesis of very great value. It is more potent when employed as rectal injections of the permanganate solution with the oral administration of thyroid substance; employed in this way, or in the form of cachets, the beneficial effect is more marked where a definite septic focus is found and treated; its beneficial effect is not so marked in osteo-arthritis.

(4) A diet rich in vitamins is of great help towards the success of the treatment; certain septic foci can be treated and cured by means of a suitable diet.

(5) Subsidiary measures form an essential part in the treatment of rheumatic affections, both for the relief of pain and the restoration of function: tonic treatment is also sometimes necessary, and ultra-violet ray therapy is helpful.

(6) The true value of vaccine therapy in such cases cannot be determined owing to the small number of cases treated:

the same may be said of non-specific protein therapy: although the two cases treated by intravenous injection of T.A.B.vaccine were successful, "Protein Shock" produced by other means brought no benefit to the patients.

(7) The number of cases treated by administration of Ichthyol 10%, or of the Iodine solution, or injections of Guaicol Iodine and Camphor is too few to arrive at any definite decision as to the value of such substances in the treatment of rheumatic affections.

A P P E N D I X,

CONTAINING CLINICAL NOTES OF

81 CASES.

CASE NO. 1. Mrs. McG. Aet 49; married; two children. First examined 28/9/1926.

Complaint: severe pain and swellings in phalangeal joints of 1st, 2nd and 3rd fingers of each hand; wrist joints enlarged and tender: great pain on movement of shoulders, knees, ankles, and even her toes: duration about 2 years; no family history of rheumatism or arthritis. Menopause in 1924: had dead born child in 1918 and has not felt really well since: had nervous breakdown in 1921 after seeing her nephew drowned.

Her toe joints first became tender and swollen; later the fingers, then shoulders, elbows, wrists, knees and ankles. Marked spindle swellings on fingers: creaking felt on movement of knee and shoulder joints: periarticular thickening round knee joints; great bony deformity of left wrist due to a badly united fracture of lower ends of radius and ulna; ulnar deviation of hand might be partially due to this fracture. No ulnar deviation of right hand.

Examination of heart, lungs and abdomen negative:

Urine - specific gravity 1016; no albumen, blood or sugar; no indican. Teeth - artificial; no evidence of tonsillar sepsis or nasal sinusitis: slight leucorrhoea; cystocoele. Temperature 98·2°. Blood Pressure 142.

Treatment: Early in October 1926, rectal injections of Potassium Permanganate solution were given morning and evening, along with Tab.Thyroid gr.½ by mouth: injections were continued until 30th November,1926; injections were then continued on alternate weeks for another month. Iodex with Methyl Salicylate was rubbed into the joints

daily. At the end of this time the patient felt much better in herself: swellings in and around the joints were much reduced; pain and stiffness on movement, although less, was still felt in shoulders and left wrist. This improved condition lasted for about two months, when the pain became markedly worse. Patient was now given "Protein Shock" using T.A.B.vaccine, starting with a dose of 50 millions; in all, six injections were given; reaction was marked, the temperature rising to 106°; severe headache and vomiting were also present. After this course nothing more was done beyond applying dressings of Iodex & Methyl Salicylate to the joints and attention to the bowels; the old-fashioned sulphur seemed to act well. No improvement was felt for about three months, after which the pains and swellings were much reduced: movement was also better. Improvement is still being maintained (1 year 9 months since treatment was stopped) and this summer she took up bowling as a recreation and apparently played well as she won several prizes. There is now no limitation of movement.

Case No.2. Mrs. T. Aet 54. Widow. First attended in October, 1926.

Complaint: pain and swelling of right knee-joint: duration about one month, but has had attacks "off and on" for a few years (vague on this point). Family history of joint trouble, her father and a sister having been affected: could not give a cause but states she has been worried financially since her husband's death 8 years previously.

Menopause at 50. - Patient very stout; weight 14st.6 lbs; constipated: diffuse fibrositis all over back and marked panniculitis on abdomen: swelling of right knee, mainly periarticular but creaking could be felt. Nothing abnormal made out on examination of heart, lungs, abdomen, and urine. B.P.160.

Treatment: She refused rectal injections and was put on to the cachets of Potassium Permanganate and tab. thyroid gr.½ morning and evening; at the same time a reducing diet was prescribed: carbohydrates were much reduced and fresh fruit was given. Methyl.Salicylate dressings to the knee joint relieved the pain but were expensive: Ungt.Hydrarg Co. dressings were then employed. Massage was employed all over the body, the knee not being dealt with until the acute pain had passed off. In three months' time the patient felt much better in every way and weighed 11st. 8lbs. Fibrous nodules were still palpable, however, but not so tender, and the swelling around the knee was less and movement not so painful. Massage, however, had to be stopped owing to the large number of patients attending for treatment. The improvement has been maintained, although she suffers in cold, damp weather.

An interesting point was that in August, 1927, she developed an acute attack of appendicitis and at the operation a suppurating appendix was removed. One cannot dogmatise on whether this had been a latent focus of infection or not, but the patient has certainly been much better since.

Case No.3. A.K. Farm labourer. Aet 48. Married.
First examined August, 1927.

Complaint: severe pain in and loss of movement of all joints; duration about two years: could not give a cause but states that it came on after a severe wetting which he thought gave him an attack of influenza.

He spent his time sitting in a wheel-chair, with his arms on the rests and his feet on the foot-rests; all the joints were swollen and tender, and movements of the elbows and knees were much reduced and in fact almost completely ankylosed; more movement at the shoulder joints but caused great pain and was accompanied by much creaking: ankle joints and feet swollen: swellings of wrist joints and "spindle" swellings of the phalanges; great muscular atrophy. Pyorrhoea marked: tonsils not enlarged and seemed free of sepsis: tongue clean and no constipation.

Physical examination was difficult owing to the ankylosis of the joints, but nothing abnormal could be made out on examination of heart, lungs, abdomen and urine. His case seemed hopeless for home treatment and I had him admitted to the Infirmary: after a week he was dismissed as "nothing more could be done for him".

Treatment: He was put on to daily rectal injections of Pot. Permanganate and ½ gr. doses of thyroid by mouth morning and evening. At the end of a fortnight's treatment the result was really wonderful: he seemed to have lost the apathetic look, said he felt better, and to my astonishment I found he had quite definite increase of movement at the elbow and shoulder joints: the movement was not increased at

the knees but the swellings were less: the condition of the ankles was much as before. The great decrease in the pain was commented on by the patient. At the end of another month's treatment the movement at the elbows had increased so much that he could almost touch the front of his shoulders with his fingers: the knee joints also could now be extended about half the normal amount; in addition he said he was feeling a new man.

It is interesting that in this case - Thyroid and Pot. Permanganate therapy alone had been employed: no massage, special diet, etc. was prescribed.

Unfortunately the patient left the district shortly after this: I heard from him about a month later and he was still feeling better, although far from well.

I have now lost touch with him.

CASE NO. 4. Mrs. W. Aet 46; married; three children. First seen in May, 1927.

Complaint: severe pain and swellings of knees: duration about one month: getting worse: had a similar attack about 1 year previously, which she thought had been caused by a severe wetting. Had a hysterectomy and oöphorectomy performed 6 years previously on account of metrorrhagia; since operation had been constipated and anaemic. No family history of joint trouble.

Physical examination of heart, lungs, and abdomen negative: urine neg. Periarticular thickening round the knee joints: no other joints affected. Pain felt on pressure over the inner side of the knees. Circulation of hands and feet poor.

No evidence of septic foci: teeth removed 4 years ago and she states they were very much decayed.

Treatment: She was put on to daily rectal injections of Pot.Permanganate, with Thyroid gr.½ by mouth morning and evening: the bowels were washed out with saline before the injection was given: diet consisted largely of fruit and green vegetables: iodex was rubbed in around knee-joints daily.

There was great improvement in a fortnight: the injections were then given each alternate day for another fortnight, the thyroid, however, being taken morning and evening daily: she was then put on to the cachets by mouth for a month, accompanied by an iron and arsenic tonic.

At the end of this time the patient had quite recovered: the knee-joints were no longer swollen, or tender to touch: there was no limitation of movement and she felt very well. The improvement has been maintained; she keeps to the diet and avoids constipation and damp.

CASE NO.5. Mrs. G. Aet 68; widow; no children. Menopause at 51.

First seen in September, 1926.

Complaint: severe pain in right hip joint, aggravated by movement: pain also down back of thigh and on inner side of right knee: duration "off and on" for 4 years.

No family history of joint trouble.

Examination: movement of right hip joint restricted; definite lipping felt; fibrous nodules felt in lumbar region. Physical examination of heart, lungs and abdomen

negative. Attacks of frequency of micturition. Urine - Sp.gr.1018, pale, no albumen, blood or sugar. Urea concentration 1.75%: no pus cells. B.P.180/80.

Treatment: Daily rectal injections of Pot.Permanganate were given, with Thyroid gr.½ by mouth morning and evening. Local inunction with Iodex and Methyl.Salicylate.

At the end of three weeks there was no improvement and this treatment was stopped. Radiant heat was then employed: after a month there was a relief from pain, which, however, comes and goes with climatic conditions. Radiant heat always relieves.

CASE NO.6. Mrs. A.Mc. Aet 61; married; 4 children. First examined 15/8/1927.

Complaint: tired feeling in shoulders: pain and swelling in right knee and ankles: worse in wet weather. Age at onset 55. Menopause at 50. No family history of rheumatism. Of a worrying and anxious temperament: very constipated. In May,1926, she fell and injured her left elbow. In March, 1927, a large ovarian cyst, which was pressing on the bowel, was removed; after operation the constipation was not improved. - Pyorrhoea had been very bad and all her teeth were extracted six years ago. The tonsils are suspiciously septic, although no pus could be pressed out: nasal sinuses appear normal: The patient refused to have her tonsils out. Is much too stout - 12st.7 lbs. B.P.158/80. Physical examination otherwise normal.

Large fibrous nodules, tender to touch, were felt in each suprascapular region: nodules also felt in cervical, dorsal

and lumbar regions in the erector spinae muscles: periarticular fibrosis around the right knee: tender on pressure on inner side: creaking felt.

Treatment: Rectal injections of Pot.Permanganate sol. with thyroid gr.½ morning and evening by mouth: reducing diet with plenty of green vegetables and fruit: local inunction of iodex to the affected parts. At the end of three weeks there was little or no improvement and the patient could not be prevailed upon to continue the injections longer. She was then given Tinct. Iodine(in alcohol) minims 10 t.i.d. in milk, and also local inunctions with Kiuma: no improvement resulted from this treatment. She was then put on to the cachets of Pot. Permanganate and thyroid morning and evening, and radiant heat was employed in conjunction with Iodex & Methyl Salicylate, which was rubbed in. Treatment was given three times weekly for two months: the condition was much improved: the fibrous nodules, though still present, were smaller and the pain had disappeared except in cold and damp. Cachets were continued at home: attention was paid to bowels and diet.

Seen on 31.10.1928, she said she had been feeling very well, and free from pain except for occasional twinges in the knee; this was relieved by inunction of Ungt.Methyl Salicylic Acid Co. drachms 6, and Ungt. Oleo Resin Capsici Co. drachms 2. She is able to do her own housework without exhaustion and sleeps well, being free from pain.

Case No. 7. Mrs. C. Aet 55: married: three children: First seen May, 1927.

Complaint: great pain and swelling of knees: duration

about 5 years: worse in wet weather and also in climatic changes. Menopause at the age of 50 with very little disturbance: had scarlet fever 10 years ago. Is too stout: lassitude and anorexia: says she feels she requires a holiday.

Examination of heart, lungs and abdomen negative. Urine normal. - No leucorrhoea, and examination per vaginam was negative. No constipation. Teeth removed gradually during past six years: artificial teeth. Dusky injection over anterior pillars of tonsils but no septic matter could be obtained from them. Knee joints enlarged: mostly due to periarticular thickening: tender on pressure: soft creaking felt by hand when joints were moved.

Treatment: As the patient did not wish to have rectal injections, she was put on to cachets of Pot.Permanganate and thyroid - of each gr.½; this was continued for two months: Iodex was massaged in around knees; she was put on to a reducing diet and was given plenty of fresh fruit and green vegetables (steamed). At the end of this time she was free of pain, although the periarticular thickening was still marked: after a holiday she felt very well. In three months' time the pains were bad again: the condition of the joints was similar to the previous examination. This time she consented to have daily rectal injections of the Pot. Permanganate solution with thyroid gr.½ morning and evening by mout. In fourteen days her pains had almost disappeared: she was both astonished and delighted: the injections were continued for another fortnight and then

the cachets were taken for a further period of two months: inunctions with Iodex were continued also. She had no return of the symptoms for about a year, and then a further course of cachets along with radiant heat cleared up the condition in a month's time. She still continues Iodex inunction as the periarticular thickening is still present. She has felt very well and free from pain and has great belief in the cachets.

Case No.8. Mrs. M. Aet 56; married: 3 children.
First seen May,1927.
Complaint: Pain, swelling and stiffness of knee joints: duration two years: had been under treatment by various doctors: had had electric treatment and also homeopathic treatment. Menopause at 48: no leucorrhoea; anaemic: lassitude especially in the morning: no history of joint trouble in her family: she thinks the condition came on after nursing a sick relative: has always been a hard worker: the pain and stiffness are worse in wet weather. The knee joints were uniformly enlarged, due to periarticular thickening: creaking was marked, especially in right knee. No evidence of any other joints being involved but occasionally she had a severe shooting pain in right upper arm: no evidence of fibrositis. Is constipated and frequently suffers from flatulence: anorexia.
Examination: Nothing abnormal made out in heart, lungs or abdomen. Urine normal: no albumen, blood or sugar: no indican. Upper teeth artificial: lower teeth sound but many missing. Tonsils sunken but definitely septic.

Treatment: Under chloroform anaesthesia the tonsils were enucleated: on recovery from the operation she was given rectal injections of Pot. Permanganate daily with thyroid gr.½ morning and evening: at the end of a month the improvement was remarkable: she looked and felt better: appetite had returned: the tongue was clean and the knees were no longer painful and swollen. Cachets were continued morning and evening for two months, along with inunctions of Iodex.

When examined six months after her operation and start of treatment, she was very well and suffered no pain in the knees; still slight creaking felt in right knee; constipation troublesome in spite of appropriate diet; states she feels better than she has done for years.

Case No.9. Neil J. Mc. Engineer. Aet 42. Married.

First seen May, 1927.

Complaint: severe pain shooting down left arm from shoulder to fingers: pain most acute down the posterior and outer aspects of arm: duration three days: has not been feeling well for some time: general lassitude, especially in mornings; no appetite; furred tongue and constipated.

Examination of heart, lungs, abdomen and urine - negative. A few fibrous nodules were felt in lumbar region but he complained of no pain. He had a complete set of teeth: two required stopping: some irregularity of incisors and canines: marked pyorrhoea (of open variety) in upper and lower gums; tonsils and nasal sinuses apparently healthy.

Treatment: The arm was rested: anodyne lotions applied and Aspirin with Pulv. Ipecac.Co. given for the pain. The

acute pain passed off in three days. Advised to have teeth extracted but he refused: teeth were cleaned and scaled, and in consultation with the dentist I put him on to the diet as described on pages 51 and 52; this he stuck to faithfully. In three months the effect was remarkable. the teeth were now steady, the gums were healthier, no pus could be pressed out and there was no bleeding. He said he felt a new man and his constipation was apparently cured. Thirteen months later I was called to attend him with an attack of lumbago and sciatica which came on after a severe wetting: he had also been worried in business. He stated that he had not been sticking strictly to the diet and certainly the condition of his gums was not so good as when I last saw him.

Radiant heat, followed by a course of massage and also cachets of Pot.Permanganate with thyroid morning and evening cleared up the condition in about a month, but still nodules could be felt.

Case No. 10. F.C. School boy aet 14.

First seen Feb. 1927.

Complaint: pain in upper dorsal region: worse on movement and in the morning: duration about six weeks "off and on".

At three spots in the dorsal region he was very tender on pressure but no nodules could be felt. X-ray of the vertebrae was negative. He was very tall for his age(6 ft.), athletic but had to give up his games on account of the pain, which was only relieved for a few days by rubbing with an anodyne ointment.

Physical examination was negative.

As the condition was continuing I examined him again in a month: this time I could feel definite fibrous nodules, six in number - two on the left and four on the right side of the spinal column - these were very tender on pressure. The teeth and gums were in good condition: tonsils were found to be of the buried type and very septic (I had missed them on first examination).

Treatment: Tonsils were enucleated under chloroform anaesthesia: massage was continued and the nodules completely disappeared. There has been no return of the pain, i.e. twenty months since operation. He is now 6ft.2 inches, in height and built proportionately.

Case No.11. Arch.McK. Bleachworker; aet 24; married. First seen 25th April, 1924.

Complaint: numbness down left leg stretching from gluteal fold to ankle: most marked in region of calf: occasional twinges of pain, especially on movement, but more frequently he felt as if his leg was asleep: duration six days.

Examination: general condition poor: anaemic: listless: marked anorexia and very constipated: tongue furred: teeth in fair condition and no evidence of pyorrhoea; tonsils enlarged and very septic. Nothing abnormal found on examination of heart, lungs, abdomen and urine: gastric meal revealed a marked diminution of HCl. Reflexes normal.

Treatment: Enucleation of tonsils and when the throat was healed he was put on to an acid tonic. The numbness disappeared from the leg six days after operation and in

another fortnight he was able to return to work: he kept on the tonic for a further fortnight and attention was paid to the bowels. He was advised to take a liberal diet of fruit and green vegetables.

Since then he has been well and has had no return of the symptoms.

Case No.12. J.McW. Analytical chemist; aet 45.

First seen August, 1926.

Complaint: severe pain shooting down left arm; most marked in upper arm: worse on movement and sufficient to waken him from sleep: duration three days.

Examination: Patient much too stout and introspective(he had previously had a nervous breakdown due to overwork during the War); at present unemployed and apt to worry: looks older than his age; he thinks the condition came on after getting wet while working in the garden. Physical examination was negative and no evidence of septic foci could be found. Urine was normal.

Treatment: rest for arm: anodyne liniment applied and arm wrapped in cotton wool: aspirin given for the pain: cachets of Pot.Permanganate and thyroid morning and evening: a reducing diet.

The acute stage passed off in three days, and at the end of a week he was completely free of pain.

The cachets were continued for one month and he was advised to continue with the diet.

He has had no return of the symptoms since; i.e. in a period of 27 months.

Case No.13. Mrs. R. Aet 42. Married: no children.

First seen January, 1927.

Complaint: swelling and pain in hands, wrists and elbows: indefinite pains shooting down arms: swelling around ankles and in knees, and also around the heels: all worse in wet weather and in the morning, when there is also great stiffness: duration about nine months but much worse during the past month. Menstruation normal but attended with pain. She had been subject to headaches all her life: always constipated: had tuberculous keratitis in childhood and there is a corneal opacity of the right eye and also an external strabismus: Operation in 1921 for peritonitis, which apparently was tuberculous; in 1924 was operated on for retroflexed uterus: at operation dense adhesions were found in the pelvis. Pleurisy(right-sided) in January, 1925, but the condition cleared up very quickly; always troubled with constipation and indigestion.

Rheumatism first appeared in September,1926, when she noticed painful swellings around the heels, very tender to touch: she thought the condition was due to chilblains; next the swellings of hands and fingers, wrists, and pains down the arms appeared; all worse in the morning: the knees were next affected and in them the swelling was most marked in front and the patellar outlines were obscured: the swelling of the ankles was most marked posterior to the malleoli, while it was uniformly spread in the wrists and ankles: the dorsum of the hands and fingers were affected.

Slight creaking was felt in the knees. The headaches were frontal in type and she stated she felt "as if the front of

her face was going to fall off". No family history of rheumatism.

Examination of the heart and lungs was negative: there was tenderness in the left iliac region, possibly due to the adhesions: the appendix had been removed at the operation in 1924. Urine - specific gravity 1020; no albumen, blood or sugar. Temperature normal. Examination of throat and nose was negative, and this was confirmed by a specialist who examined her twice: washings after puncture of antra were sterile.

An ophthalmologist examined her and stated that her headaches were not due to her eye condition.

Wassermann reaction negative. Blood pressure 132/60.

Her dentist reported her teeth were normal, but I had radiographs taken and they revealed four apical abscesses: in March, 1927, these teeth and also four crowned teeth were extracted.

Treatment: Daily rectal injections of Pot.Permanganate solution, with thyroid gr.½ morning and evening, were started in March, after the extraction of the teeth, and continued until the end of May. A good mixed diet, rich in green vegetables and fruit, was prescribed. (I am afraid she did not keep to it faithfully). The patient experienced great benefit: the pains and swellings were not so marked: the attacks of acid dyspepsia (relieved by Milk of Magnesia or Bisedia) became less as the bowels were washed out daily. Cachets of Pot. Permanganate and thyroid were continued from end of May until the middle of July. She was then free of pain and went on holiday.

She had no return of the symptoms until October, 1927; she thought this was due to a wetting. A month's course of the cachets again relieved her, and then I gave her a course of twelve "body bath" treatments of ultra-violet rays, and also local treatments to hands, wrists, ankles, and knees; she experienced relief of pain from the fourth treatment and when the course was finished was very well.
Seen on 3rd October, 1928, she stated she had had no return of rheumatism and now does not suffer from headaches except at her menstrual periods.

Case No.14. Mrs. McG. Aet 48. Married. 3 children.
First seen October, 1926.
Complaint: severe pain in dorsal region radiating round chest wall: difficulty in breathing on account of pain: duration 24 hours: came on after a wetting: had had similar attacks before. No family history of rheumatism.
Examination: She appeared healthy but was much too stout. Menstruation normal. Nothing abnormal found on examination of heart, lungs, abdomen and urine. Slight leucorrhoea but vaginal examination was negative. Teeth and tonsils apparently normal and no evidence of any septic foci. No constipation. Temperature normal. Several very tender nodules felt on each side of spinal column in dorsal region: on pressure on these the pain radiated round chest wall.
Treatment: anodyne ointment was rubbed in, and Aspirin with Pulv. Ipecac. Co. given for pain. Pain had disappeared in a week and she was then given cachets of Potassium

Permanganate and Thyroid for six weeks. She was put on a reducing diet but she did not keep to it faithfully. Massage of the nodules was continued.
In a period of two years she has had no return and the nodules have disappeared: she has now left the district.

Case No.15. Mrs. M. Aet 46. Married. 2 children.
First seen in January, 1926.
Complaint: severe pains in back; a feeling of limpness about shoulders when a coat was worn: duration "off and on" for two years: worse during wet weather.
Has never been in very good health: ventro-fixation of uterus performed 12 years ago:had an attack of jaundice in 1922.
No family history of rheumatism.
Examination: Numerous fibrous nodules felt all over the back: very tender nodules in supra-scapular fossae.
Physical examination of heart, lungs - normal: tenderness on palpation over the gall-bladder and one could almost feel it: otherwise examination of abdomen was negative.
Menstruation normal: appetite good, but has a tendency to constipation: tongue clean: examination of teeth, tonsils and nasalsinuses negative. On examination,the urine had been normal, but while arrangements were being made to have an X-ray of the gall-bladder, she developed a typical attack of cystitis. Urine on examination Specific Gravity 1022:albumen, no blood or sugar: on bacteriological examination Bacilli coli were found. She said she frequently had such attacks when she got wet: (perhaps this might be partly due to the ventro-

fixation.)

Treatment: bed, bland diet and Caprokol Drachm I,t.i.d. cleared up the cystitis and the urine was found to be sterile. When she had recovered, massage of the back was started, and cachets of Pot. Permanganate and thyroid prescribed; these had to be stopped as she became very sick. Rectal injections of the Permanganate solution were given and retained, and thyroid grain ½ taken by mouth. Treatment was continued for one month and massage every second day for the same time.

Since then the pain has not troubled her, although a few tender nodules can still be felt.

Case No.16. Mrs. G. Aet 56. Married. 2 children.

First seen in January, 1927.

Complaint: pain and stiffness in lumbar region of indefinite duration, but certainly for 3 years "off and on". Has had no serious illnesses.

Examination: Very much too stout: weight 16 stones. Very definite nodules, tender to pressure, were present all over the lumbar and gluteal regions. Owing to the stoutness the heart sounds were only heard faintly: no murmurs could be heard: nothing abnormal noted in lungs: abdominal examination negative except for some areas of panniculitis. Teeth extracted about six years before and apparently pyorrhoea had been very pronounced. Tonsils very septic: leucorrhoea present: slight prolapsus uteri with cystocoele and rectocoele: cervical tear and endocervicitis. Urine, no albumen, blood or sugar: deposit of urates.

She was advised to have her tonsils enucleated but refused. she also refused to have the vaginal conditions treated by operation.

Reducing diet was prescribed but without much success and the patient lost heart: (I do not think she was really faithful to the diet.) an anodyne ointment well rubbed in relieved the pain for the time being. A month's course of cachets of Pot.Permanganate and thyroid failed to have any effect.

An interesting point was that several months later she developed an attack of iritis, which cleared up eventually with atropine drops and the cachets and darkness.

In this case one felt that a great deal could have been done if the patient had been willing to follow advice.

Case No. 17. Miss S. Aet 36. Housekeeper. Unmarried. First seen in February 1927.

Complaint: swelling and pains in knees: worse in damp weather: four weeks' duration but had it a year before.

No serious illnesses: has always been troubled with dysmenorrhoea.

Examination: Pale and anaemic, but rather stout. Nothing abnormal made out on examination of heart, lungs, abdomen and urine: tongue clean: no constipation: teeth, tonsils and nose apparently healthy. Temperature normal.

The swelling of the knees was uniformly distributed and due to synovial thickening: creaking felt: spindle swellings of inter-phalangeal joints: fibrous tender nodules felt over

trapezius on each side and in the lumbar region. Profuse leucorrhoea: uterus retroflexed.

Treatment: Uterus curetted and retroflexion corrected: on recovery from the operation the rheumatic condition was treated. Iodex or Ungt.Hydrarg Co. was applied to the knees and an anodyne ointment rubbed into fibrous nodules. Injections of streptococcal and micrococcus deformans vaccine were given alternately (the dosage depending on the reaction) after the method of Warren Crowe. In all, nine injections were given at intervals of 4 to 5 days; four of these injections were with the mixed vaccine. Twice during the treatment the patient had a violent reaction and a week's interval had to elapse before the next dose was administered. Unfortunately she had to leave the district and treatment had to be stopped. When she left, the pains and stiffness of the knees were much less: sleep was not disturbed and she could move about more freely: the swellings, however, were much the same; the fibrositis was not troubling her although the nodules were still present.

Case No.18. Mrs. M. Aet 67. Married. 4 children.
First seen in June, 1925.

Complaint: severe pain shooting down arms, in wrists, fingers, elbows, knees and ankles: unable to sleep for the pain: duration six years. No history of an acute attack: condition started first in wrists and fingers. No history of rheumatism in family: can give no probable cause, but has had a hard and worrying life.

Examination: Appears in poor health: thin and anaemic: constipated, furred tongue: exhausted from want of sleep.

Heart slightly enlarged and V-S murmur heard: lungs show signs of chronic bronchitis: nothing abnormal made out on abdominal examination. Urine: specific gravity 1016; no albumen, blood or sugar; no indican. Temperature normal. Marked spindle swellings of interphalangeal joints: wrist joints enlarged and distorted: swelling of knee joints due to synovial pouching and also periarticular thickening: creaking both felt and heard: movement restricted: elbows not enlarged but almost ankylosed: great muscular atrophy: ankle joints enlarged and feet swollen and oedematous.

Treatment: A liberal diet was prescribed with plenty of fruit and green vegetables. Daily rectal injections of Pot. Permanganate solution, with thyroid gr.½ morning and evening by mouth. At the end of 14 days there was no change and she would not continue. Pain was so bad that frequently an opiate had to be given. Capsules of Iodolysin had no effect but made her sick. Tincture of Iodine, minims 10 t.i.d. in milk was continued for six weeks with no effect.

The patient developed a right basal pneumonia but recovered. No treatment was given for two months and she was then given a course of Warren Crowe's vaccines; there was no improvement and it was very difficult to say whether she had a reaction or not.

Ichthyol minims 10, t.i.d., was continued for six weeks and had no effect; the pain was still as bad as ever. She was left without any treatment except Aspirin or Opoidene for two months.

Immunogen (P. D. & Co.) ½ c.c. was injected hypodermically

and she felt sick after it: in three days another ½ c.c. was injected and this time she had a violent reaction: a third injection six days later had a similar effect and she would have no more.

Seen a fortnight later she was comparatively free of pain but still would not allow any more injections of this kind to be given. Her pains soon returned and she was as bad as ever. As I did not wish to employ protein shock by intravenous injections of T.A.B.vaccine, she was given intramuscular injections of sterile milk: the dosage was started at ½ c.c. and gradually worked up until she was getting 5 c.c. Any reaction was slight and the temperature never rose above 100°; she obtained no benefit.

On 15th October, 1928, she was put on to Hydrochloric Acid 10% t.i.d. p.c. and is still continuing: when seen on 13th November,1928, there had been no benefit.

Case No.19. Miss J. R. Aet 46. Single.

First seen 18th October, 1926.

Complaint: severe pain shooting down right leg along the course of the sciatic nerve: also severe lumbar pain and restriction of movement: confined to bed: duration 3 days: has had previous attacks since the age of 28: always came on after exposure to cold and wet. There is a family history of rheumatism - father, three brothers and one sister all affected.

Examination: She is of a nervous, worrying disposition: makes the most of her complaints: very constipated and suffers

from acid dyspepsia: tongue very furred.

Numerous tender fibrous nodules can be felt in the lumbar and dorsal regions: very numerous over supra-scapular fossae and also in cervical region: painful on pressure over exits of great occipital nerves: pain on pressure over right sciatic nerve: pain increased on flexing the hip with the leg extended: she also complained of pain in the 1st interphalangeal joint of the left fore-finger but examination was negative. Looks well nourished. Nothing abnormal found on examination of heart, lungs and abdomen. Vaginal examination negative: Urine specific gravity 1022; no albumen, blood or sugar. - She always felt as if the rectum was not emptied and feared a cancerous growth: rectal examination proved negative: later, X-ray of the bowel revealed no abnormality. Temperature 98.4° ; pulse 68; Blood Pressure 124/84. Teeth well attended to; no signs of sepsis. Tonsils and nose healthy.

Report on bacteriological examination of :-

(1) Urine: Films show B.coli and diphtheroid B. Cultures show a scanty growth of B. coli.

(2) Faeces: large number of B.coli, some gram-positive sporing bacilli and a few enterococci: on culture a profuse growth of B. coli and a few colonies of enterococci.

Treatment: The acute pain passed off in two days with heat and aspirin. She was then put on to rectal injections of Pot.Permanganate solution twice daily, with thyroid grain ½ morning and evening by mouth: In three weeks she felt very well. Dieting was difficult as she always maintained that fruit caused indigestion, but by persistence I managed to get

her to take more fruit. In another three weeks she was given massage and diathermy, which soon cleared up the nodules. She now takes Rubinat water daily and has remained very well, except for a slight similar attack in April, 1928.

Case No.20. Miss ..H. Aet 14. Schoolgirl.
First seen in February, 1927.
Complaint: pain shooting down arms but more particularly the right arm: worse at night: came on after a soaking: duration off and on for ten days. Also complains of stiffness on moving her neck, and of a huskiness o f the voice which has been present for three weeks.

Examination: Fairly well nourished but pale and anaemic; anorexia and general lassitude; menstruation normal; no constipation but tongue furred; teeth sound: tonsils enlarged and very septic. Examination of larynx negative. Complained of nasty taste in the mornings and had frequent colds in the head. Nasal examination negative.

Treatment: Tonsils enucleated: a small pad of friable adenoid tissue was also removed: the huskiness disappeared in ten days from operation. Iodex & Methyl Salicylate was massaged into the back of the neck and shoulders; pain had all disappeared in three weeks. An iron tonic was given.
She is now quite fit, looks much better and has had no return of pain etc. since.

Case No. 21. Miss B.D. Aet 26. Single. Shop Assistant.
First seen in April, 1925.
Complaint: Severe frontal headache, pain of a shooting nature: worse in the morning: lasting for about 7 days at a time. Duration of several years; worse when east wind was blowing. Complained also of stiffness of the neck.
Is of a worrying nature.
Examination: Is well nourished but anaemic. Physical examination of heart, lungs and abdomen negative. Urine specific gravity 1020: no albumen, blood or sugar. Menstrual periods regular, lasting six days: flow excessive: no dysmenorrhoea. Constipated. Teeth sound: tonsils seem healthy but dusky injection seen on the anterior pillars: excessively painful on pressure over supra-orbital nerves; also pain on pressure over the exits of the great occipital nerves: numerous fibrous nodules in cervical and dorsal regions.
Treatment: Cachets of Pot.Permanganate with thyroid prescribed, morning and evening. Camphor and menthol painted over the supra-orbital nerves: tinct.iodine painted over the great occipital nerves. Cachets were continued for a fortnight, after which she was much better. She has had attacks since but the cachets(without the anodyne paint) always clear it up in a few days. An iron and arsenic tonic was also given.
Re-examined in September, 1928, on account of the return of headaches. The tonsils were proved to be definitely septic. Tonsillectomy performed on 5th October,1928. Cachets and

an Iron and Arsenic tonic prescribed after recovery from operation; cachets stopped after a fortnight.
Seen again on 15th November, 1928. She states that she has been entirely free from headaches since: she has no stiffness of the neck now.

Case No.22. Miss J. Aet 44. Single. Housekeeper.
First seen in February, 1926.
Complaint: Pain and swelling of back of hands and fingers: excessive pain in elbow joints: duration about two years: came on gradually: no history of acute onset.
Examination: Of robust appearance but too stout. Swelling mostly confined to the first metacarpo-phalangeal joints on each hand: slight spindle swellings of the interphalangeal joints: generalised puffiness of dorsum of each hand: slight periarticular thickness round wrist joints: elbows stiff: no creaking felt: no thickening.
The patient was only on a visit and I did not get a complete examination made. The teeth were carious but were being attended to by a dentist: tonsils apparently normal: tongue furred; constipation troublesome; urine normal. Nothing abnormal made out on examination of heart, lungs and abdomen. Blood pressure 156.
Treatment: Had been under treatment since onset and found that Iodicin, one capsule t.i.d. had done her most good. She continued on that treatment: also a reducing diet was prescribed with plenty of fruit and green vegetables: a salin each morning: radiant heat with Iodex medication relieved the pain after the first few treatments. She was better when

she left the district but a great deal more requires to be done.

Case No. 23. Mrs. B. Aet 48. Married. 4 children. Charwoman. - First seen on 2nd July, 1926.
Complaint: severe pain and stiffness in lumbar region shooting down legs, also pains and a tired feeling in shoulders, frequent headaches: duration off and on for fully two months. Had not been feeling well for some days and felt she had a chill of the stomach or influenza as she was sick. Had been confined to bed for three days when I saw her; tenderness over the stomach, heartburn and flatulence; the whole abdomenwas distended with wind. Temperature 102°. Pulse 100. Generalised stiffness found in the lumbar region; also several very tender spots and nodules here and in the dorsal region, especially over the trapezii. Heart and lungs apparently normal. Urine normal. Menstruation regular.
Treatment: The Influenza was treated in the usual way:- Calomel, followed by a saline and sweating powders. When it had passed off the fibrositis was attended to. Movement caused great pain; she had also panniculitis. Massage with Ungt.Methyl Salicylic Acid Co. and Ungt. Oleo-Resin Capsici Co. relieved the pain: she was put on to cachets of Potassium Permanganate and Thyroid - one morning and evening. She felt better in about a fortnight. Proper massage was then started and also a reducing diet was prescribed. The diet, massage and cachets were continued for ten weeks in all. At the end of that time the patient was completely free of pain and the nodules had disappeared. During her treatment she found that

if she did not take her cachets regularly, her pains were definitely worse.

Case No. 24. Mr. C. Aet 61. Married. Foreman joiner. First seen in January, 1927.

Complaint: pain shooting down right leg along the course of the sciatic nerve: worse on movement: duration 10 days: had had twinges of pain before but this was first attack: came on after working in the garden: had not been feeling well for some little time: loss of appetitie, acidity and flatulence. Bowels regular. Has had no serious illnesses.

Examination: pain on pressure over sciatic nerve - especially at the sciatic notch. Apparently healthy for his years. Heart and lungs normal: slight tenderness on pressure over right iliac region: has right inguinal hernia but wears a truss. Tongue furred: halitosis most marked: pronounced pyorrhoea in lower jaw: open sepsis: upper teeth had been removed years before for same trouble. Tonsils and nasal sinuses normal. Urine: specific gravity 1018: no albumen, blood or sugar. Blood pressure 165.

Treatment: Teeth were removed under a general anaesthetic. This was followed by great increase of sciatic pain. Aspirin grains 10 t.i.d. prescribed and when the acute pain had subsided an anodyne ointment was well rubbed in. Cachets of Pot. Permanganate and thyroid: diet rich in fruit and green vegetables. The cachets were continued for one month: at the end of that time he had no pain or gastric disturbance.

Case No.25. J.C. Aet 60. Gardener.

First seen 28th February 1927.

Complaint: pain in lumbar region: has been troubled off and on with this for 15 years; he thinks he strained his back when lifting a tree trunk.

Examination: Well-nourished and of fresh appearance. Nothing abnormal found on examination of heart, lungs and abdomen: no indigestion or constipation; has to rise twice during the night to pass urine: slight enlargement of prostate: states that he has sometimes to wait before the flow of urine starts and he dribbles after he thinks he is finished: no history of venereal disease.

Urine: specific gravity 1020: haze of albumen; no sugar, blood, pus, or indican.

Numerous fibrous nodules found in lumbar muscle and in glutei: tender to pressure.

No evidence of sepsis in tonsils or nasal sinuses. Has a complete set of artificial teeth: his teeth were extracted 16 years ago and he states they were very bad.

He had been treating himself by rubbing in an embrocation for the past two months.

Treatment: He was put on to cachets of Pot.Permanganate and Thyroid, morning and evening; his back was rubbed with Ungt. Methyl Salicylic Acid Co. and Ungt.Oleo-Resin Capsici Co. daily. Diet consisted of plenty of fruit, raw vegetable salads, wheaten bread, etc.

In four days he was entirely free of pain: the nodules could still be felt but were not tender. He was advised

to go on with the rubbing and to continue with the cachets for one month.

Case No. 26. Mrs. D. Aet 46. Married. One child. First seen in February 1927.

Complaint: severe pain and stiffness in lumbar region: pains shooting down legs and aggravated by movement: came on suddenly after working in the garden when she got wet.

Examination: Well nourished and not anaemic: tendency to get stout. Physical examination of heart, lungs and abdomen normal. Urine: specific gravity 1020; no albumen, blood or sugar. Menstruation becoming irregular and also other signs of the climacteric - flushings and irritability, etc. No evidence of sepsis in mouth or nose. Has always had great trouble in obtaining a movement of the bowels: frequent attacks of acid dyspepsia and flatulence. Numerous tender fibrous nodules in lumbar region: no arthritis.

Treatment: An injection of Morphine Sulph. gr.$\frac{1}{4}$ was given at first: later Calomel gr.$\frac{1}{2}$ in hourly doses until six tablets had been taken, followed by a saline. Cachets of Pot.Permanganate and thyroid were given morning and evening, and an anodyne ointment was rubbed into the lumbar region. The acute pain disappeared within three days: the stiffness gradually got less. Rubbing with the anodyne ointment continued for a week: cachets continued for two months: reducing diet with plenty of fruit and green vegetables, which she still keeps to.

She has had no return of pain and constipation no longer troubles her.

Case No.27. Mrs. B. Aet 70. Widow. No children.

First seen in October, 1926.

Complaint: Pains in knee joints and ankles when going down stairs: swollen and tender after walking: duration about 12 years: getting worse: first started in fingers and hands; rheumatic history in family: thought condition came after a wetting which she said caused influenza: also had a worrying time nursing her husband.

Examination: There were spindle swellings of inter-phalangeal joints of 1st and 2nd fingers on each hand: enlargement of 1st metacarpal-phalangealjoints: ulnar deviation of hands: enlargement of wrist joints: great enlargement of knees: movement restricted and in position of semiflexion but could be straightened: generalised swelling round ankle joints, especially swollen posterior to external malleoli: several fibrous nodules in supra-scapular area: slight creaking of shoulder joints: great muscular atrophy. Rather emaciated: abdomen distended: lungs normal: heart enlarged slightly - apex beat two fingers breadth outside nipple line - V-S murmur. Edentulous: tongue fairly clean: pupil fixed and contracted: knee jerks diminished. Wassermann reaction positive. (Her husband died of locomotor ataxia). Tonsils healthy.

Treatment: Rectal injections of Pot. Permanganate solution and thyroid by mouth continued for 14 days: had to be stopped owing to the diarrhoea and colitis which were set up and the abdominal pains which were caused. The rheumatic condition was no better and the pains were sufficiently severe to keep her awake. Ungt. Hydrarg. Co. applied as a dressing to

the knees: pain not relieved: wet dressings of Methyl Salicylate were tried: pain slightly relieved.
Subcutaneous injections of Galyl 30 c.grm. bi-weekly had to be stopped after the third, as the patient complained of great pain at seat of injection.
Iodine solution minims 10 t.i.d. continued for two months: rheumatism no better.
Patient developed pneumonia and died.

Case No.28. J.R. Male. Aet 52. Manufacturers' Agent.
First seen in November 1926.
Complaint: severe pain shooting down right arm from shoulder: aggravated by movement, so severe as to make him cry out: duration 24 hours.
Examination: An injection of Morphine Sulph. gr.¼ deadened the pain sufficiently to allow an examination to be made. Several tender nodules were felt in the right supra-scapular fossa and pain was acute when the front of the upper arm was pressed on: pain shot down into fingers. Physical examination of heart, lungs - negative. No abdominal symptoms. There is an operation scar: gastro-enterostomy performed after perforation of duodenal ulcer two years previously: now no stomach trouble and bowels more regular. Upper set of teeth artificial: marked pyorrhoea in lower jaw: pus exuding. Tonsils normal. Urine normal.
Treatment: As hot applications (fomentations, anti-phlogistin and thermogene) along with aspirin, failed to

relieve pain, at the patient's suggestion the limb was wrapped in Dol's flannel. This brought immediate relief. The limb was rested. Some weeks later, under chloroform the teeth were extracted: for business reasons he wished them all removed at once. There was no reaction and he has had no return of the neuritis since.

Case No. 29. Mrs. L. Aet 56. Widow. No children. First seen in January, 1926.

Complaint: pains and creaking of knees: also pain and stiffness in lumbar region: worse on movement. Has headache and giddiness: lassitude; duration three months but has suffered more or less for years. Family history of rheumatism. Had an attack of erythema nodosum in September 1921.

Examination: Of stoutish build: weight - 13 st. 3 lbs: florid complexion; troubled with flushings; menopause six years previously; constipation very troublesome; tongue furred: teeth all removed some years ago: tonsils apparently healthy although there was a history of frequent attacks of tonsillitis: no enlargement of tonsillar glands. Examination of heart, lungs, and abdomen - negative. Urine, specific gr. 1008: no albumen, blood or sugar: pale in colour; urea concentration 1.5%: Blood Pressure 200/100. Numerous tender nodules were found in lumbar region: pouchy swellings of knee-joints and marked creaking on movement: no other joints affected.

Treatment: was started by a calomel purge and she has received no food for two days:water was given freely. A reducing diet

with fruit and green vegetables was prescribed. Ungt. Iodex was massaged into the knees daily. Cachets of Pot.Permanganate and thyroid were taken morning and evening; rest in bed for 14 days. At the end of that time she felt much better. Blood pressure 184. Cachets were continued for one month, omitted for a fortnight, then continued for a month, and so on. Massage was given to the back. Hormotone (without post-pituitary) one tablet t.i.d. a.c. was also given. Once a week Calomel in ½ gr. doses every hour until four had been given, followed by a saline in the morning. After six months treatment she was free of giddiness and flushings. She had no rheumatic pains and the knees were free of swelling and creaking. Blood pressure 165. The diet and weekly doses of calomel were continued. She reports once a month. The improvement is maintained and the Blood Pressure varies between 160-165.

Case No.30. Miss K.B. Aet 56. Single.

First seen October, 1927.

Complaint: pain in left ankle: duration about one month: pain aggravated by movement or touch: condition came on after an attack of tonsillitis. Rheumatic history in family. Has had no serious illnesses.

Examination: Pain was felt in front and behind the external malleolus: also severe in front of ankle joint: whole joint swollen, but swelling most marked posterior to external malleolus. Heart, lungs, and abdominal examination negative. Urine normal. Teeth and gums not in a healthy state:

pyorrhoea marked round the lower incisors and bicuspids: lower molars crowned with gold. Tongue furred. Tonsils sunken, full of crypts, and very septic. Constipated. **Treatment:** She refused to have her tonsils enucleated. Eleven teeth, including the "crowns" extracted: apical abscesses were found in four. Massage and diathermy were employed. Cachets of Pot. Permanganate and thyroid, morning and evening. Strict diet and attention to bowels. The tonsils were painted with Tinct.Iodine Drachm ½: Glyc.Acid Tannic and Glyc.Acid Carbolic - of each ½ oz. daily. There was great improvement in a fortnight and the condition had completely cleared up in six weeks. There has been no return so far: if she does have another attack she may have the tonsils enucleated.

Case No.31. Mrs. F. Aet 56. Married. 2 children. First examined in November 1927.

Complaint: Severe pain in the right wrist joint in the region of the anatomical "snuff-box". Also pains in the supra-scapular fossae. Pains down the arms and in the back: frequent headaches: Duration three months: condition getting worse. Has suffered from rheumatism off and on for 15 years: has been treated by massage, electricity, etc. and also Spa treatment: has received no benefit. Pains have been getting worse during the past two years.

Examination: A tall and well nourished woman; apparently in good health; Left elbow ankylosed due to old tuberculous arthritis in childhood. A few scars in the neck resulting from old T.B.glands. Nothing abnormal made out on

examination of heart, lungs, and abdomen. Urine: specific gravity 1018: no albumen, blood or sugar. Menopause six years ago. Numerous fibrous nodules were present all over the back and were tender on pressure. Teeth and gums in good condition. Tonsils showed injection over anterior pillars but seemed healthy: no pus could be pressed out of them: slight deviation of nasal septum to the right: no complaint.

Treatment: The patient was put on to cachets of Pot. Permanganate and Thyroid, morning and evening. Radiant heat was applied to the right wrist, along with Iodex & Methyl Salicyl. and she was advised to keep strictly to the diet. She improved wonderfully in three weeks' time and went to Droitwitch for a course of the baths. While there, her doctor took her to a throat and nose specialist, who said that her tonsils were definitely septic: a swab was taken of the secretion and a culture of streptococcus haemolytica was grown. She came back under my care and was given a series of injections of vaccine prepared from the streptococcus, (one injection every three days or so depending on the reaction produced); in six weeks' time she had her tonsils enucleated, and later the deviation of the septum was rectified. 10 days after the operation she was completely free of pain. She then went to Droitwitch again and had a course of baths(douches, needle spray baths - hot and cold) and radiant heat and massage. She was completely free of pain six months later. A few nodules, however, were still present.

Case No.32. Miss W. Aet 58. Single.

First seen 18th March, 1927.

Complaint: Severe pain in the arms, wrists and fingers: knees and ankles; hands swollen in the morning: pain severe and sufficient to prevent sleep. Duration about one month, though she has had attacks before. The pain and the swellings started 7 years ago. Apparently there is no history of pyrexia but she had several attacks of "Influenza" which is in itself suspicious. Pains are much worse in wet weather. The original attack came on after the death of her father, whom she had nursed for many years.

Examination: She is thin and anaemic. Lives alone and earns her living by dressmaking. Does not take enough food. Is of a nervous temperament and inclined to worry. There are typical spindle swellings in inter-phalangeal joints;metacarpal-phalangeal joints of first finger of each hand very swollen; wrist joints swollen with slight ulnar deviation of hands: elbow and shoulder joints creak on movement but are not swollen: numerous tender nodules felt in the dorsal region: knee-joints are enlarged with periarticular thickening and are tender on pressure over the internal condyles: there is evidence of pyorrhoea in the few remaining teeth: lower gums are spongy. Tonsils sunken and definitely septic. Tongue furred; constipated. Examination of the circulatory system was negative: evidence of old-standing healed phthisis in lungs, which she states attacked her about the age of 28. Nothing abnormal was found on examination of the abdomen or urine.

Treatment: As she seemed too frail, I hesitated to have her teeth or tonsils dealt with at first. She was put on to daily rectal injections of Pot. Permanganate solution and thyroid by the mouth. A building-up diet was prescribed, rich in all vitamins. Iodex was applied as a dressing to the joints. At the end of 14 days' treatment there was not much improvement; she felt better in herself, however. She then had a course of injections of streptococcal and micrococcus deformans vaccines (Warren Crowe). The course lasted 10 weeks and she had in all 16 injections; no great improvement was felt for about a month after the treatment, when she said her pains were not so severe. She kept strictly to the diet and was now given radiant heat with Iodex medication. Ichthyol minims 10 t.i.d. was continued by mouth for two months. She had a fairly good winter in 1927; the pain was less although the deformities were just as marked. In February 1928 she was still feeling much better and had several teeth extracted. This was followed by a severe reaction in the shape of an attack of double iritis and also an increase in the pains in the knees. The iritis took six weeks to pass off. An ulcer formed in the left eye and had to be cauterised.

Since then she has been fairly free of pain, and can sleep comparatively well: she feels better of herself. In view of the reaction following the extraction of the teeth, one feels reluctant to recommend the enucleation of the tonsils in the meantime at least.

Case No.33. Mrs. W. Aet 24. Married. One child.

First seen in October, 1922.

Complaint: Severe pain in left forearm and wrist, unaccompanied by swelling.

Condition came on after a severe confinement, which was followed by puerperal fever in which the pyrexia lasted for fully six weeks. The pain in the arm commenced after this. She was apparently healthy in every way. Examination of heart, lungs and abdomen revealed nothing abnormal. Had an appendectomy performed when she was four months pregnant.

Treatment: Aspirin was given for the pain, and as soon as she was able to be out of bed she was given radiant heat, and later, diathermy and massage. Iron tonics were prescribed.

The condition passed off in about a month, without leaving any evidence.

Case No.34. Miss McM. Aet 60. Single. Papermaker.

First examined 18th April, 1925.

Complaint: great pain and swelling of left knee joint: always worse in the evening after day's work. Condition started six years ago. No evidence of involvement of any other joints. Her work is heavy and she refused to give it up. She fell and "twisted" her left knee about 10 years ago.

Examination: She has a very marked knock-kneed condition: the joint is very swollen and there is fluid in the joint: pain on pressure over internal condyle. Great creaking on movement but no lipping. Physical examination of heart, lungs and abdomen normal. No evidence of septic foci. Teeth all artificial. No constipation. Menopause 12 years ago. Reflexes normal. Urine, specific gravity 1008, no albumen, blood or sugar. Blood Pressure 175. Arteries sclerosed.

Treatment: While still at work she was given radiant heat along with Iodex c̄ Methyl Salicylate, and cachets of Pot. Permanganate and thyroid. After a month's treatment there was no improvement.

Ungt. Hydrarg Co. lessened the pain and swelling but they always came back at the end of day's work.

She was then marked "unfit" and given a course of diathermy. After six weeks' treatment the swelling and pain were much reduced. She has not gone back to work and has refused to have an operation.

Case No.35. Mrs. B. Aet 50. Married. One child.

First examined in February, 1927.

Complaint: severe pain in the shoulders, shooting down the arms, more marked in the right arm: duration one week; came on after a severe wetting. No rheumatic history in family. Has had a few twinges of pain previously, but nothing very severe.

Examination: Of healthy appearance. Physical examination of heart, lungs, and abdomen normal. Slightly constipated. Urine, specific gravity 1022; no albumen, blood or sugar. At present passing through the menopause. Bowels irregular, and flushings marked; very irritable. Numerous tender fibrous nodules were felt in the dorsal region and were most marked in the supra-scapular fossae. No evidence of joint involvement.

TREATMENT: cachets of Pot. Permanganate and Thyroid, morning and evening: Iodex with Methyl. Salicylate well rubbed into supra-scapular fossae daily.

There was great improvement in a week and she was advised to continue for another 14 days. Massage was then started and the cachets were continued for a month. She kept on a diet rich in fruit and green vegetables and was not worried with constipation.

She has remained free of attacks since. She was then put on to Hormotone - one tablet t.i.d. a.c.

Case No.36. Mrs. B. Aet 53. Married. 5 children.

First examined 12th October, 1926.

Complaint: severe pains shooting down arms from shoulders, pain and swelling of wrist joints,hands and fingers, knee and ankle-joints: swelling of feet. Family history of joint trouble. Patient has had no serious illnesses. The pain began in shoulders 18 years ago, following on a wetting. No history of pyrexia. She suffered off and on until four years ago, when the pain and swelling of knees became marked; she rubbed them with"Golden Compound."and Chili paste. The condition gradually became worse, until when I saw her she had been confined to bed and crippled for five months. Pain was severe and worse at night. The only treatment she was getting was to have Iodex rubbed into the swellings.

Examination: She was very stout: slight enlargement of thyroid: heart sounds faint: no murmurs could be made out; the apex beat could not be palpated, nor could the left border of heart be percussed owing to the excessive stoutness. Examination of lungs and abdomen was negative. Urine, specific gravity 1010; no albumen, blood or sugar; no indican. Bacteriological examination of urine -- no organisms on direct films: on culture - B.coli present but scanty. Bacteriological examination of faeces - direct films showed a large number of organisms of gram-negative coliform type: also large gram-positive sporing bacilli and a few enterococci. The bacteriologist remarked:- "The predominant intestinal flora is therefore of the putrefactive

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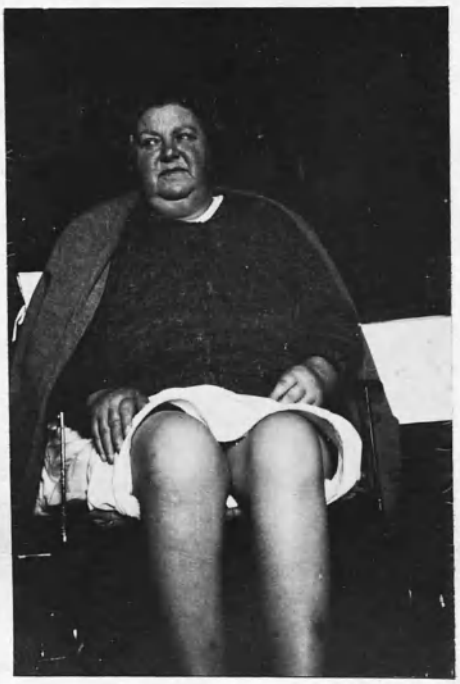
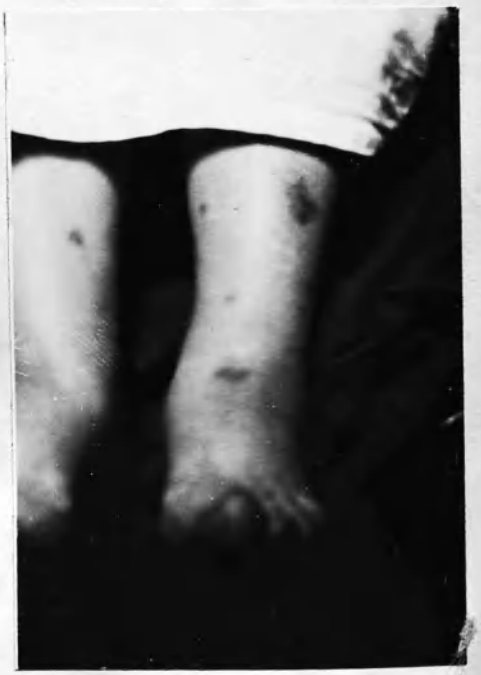
PHOTOGRAPHS ILLUSTRATING CASE

NO. 36.





type." - There is slight leucorrhoea arising from cervical laceration. Temperature 98°; pulse 82. Blood pressure 118/80. Haemoglobin 66%. Red blood corpuscles 2,650,000: White blood corpuscles 5,000.
Wassermann reaction negative. Blood calcium as determined by Clark's method was normal. Teeth had been bad when she was young and all but four had either fallen out or been extracted about 30 years ago: pyorrhoea round these teeth: no artifical teeth. Tonsils and nasal sinuses apparently healthy. Severe pain on movement of shoulder joints: creaking: elbows not swollen but almost ankylosed at a right angle: wrist joints very swollen: ulnar deviation of hands: hands puffy and spindle swellings on fingers: 1st meta-carpal phalangeal joint very enlarged and painful on each hand: arms cannot be raised owing to the pain. Knee-joints swollen due to periarticular thickening: movement much restricted and knees almost fixed at a right angle: ankle joints swollen: most marked by soft swellings posterior to the mallecli and in front of joint: feet oedematous. Muscular atrophy was very marked and she lay in bed with knees flexed and arms across her body - a cripple.
Treatment: Rectal injections of Pot.Permanganate solution twice daily: thyroid gr.½ morning and evening. Iodex massaged well into the swollen joints: a diet rich in fruit and green vegetables, with the carbohydrates reduced.
In three weeks the improvement was really remarkable: she looked and felt better: she could raise her arms from the bed and could almost touch her head with her right arm:

pains were much easier: thickenings much the same. Injections were continued twice daily for other three weeks and then once daily until the end of February, 192". The improvement was maintained but there was little or no progress during the last two months of treatment; she had several times a rise of temperature (99° - 99.4°) which lasted for several days. The injections had to be discontinued several times, owing to the colitis which was set up. At the end of treatment she had very little pain and the swellings were slightly reduced: she could sleep usually without pain except in cold, wet weather. She was given no treatment except inunction with Iodex until 27th March, 1927, when a course of Warren Crowe's vaccines was started. In all 18 injections were given between that and 8th June, 1927. Only once did she have any reaction. Little or no benefit was gained. - The remaining teeth were extracted, without causing any reaction. An attempt was made to straighten the knees by means of extension, which was kept on for two weeks: range of movement was increased. - In August, 1927, she was put on to Ichthyol: the commencing dose was minims 10 t.i.d. but this was gradually increased until minims 40 t.i.d. were being given: she is still taking it. She has continued to improve and when examined on 6th October, 1928 (i.e. two years from first examination) she was entirely free of pain, could sleep comfortably and had a good appetite: the swellings had almost completely disappeared and the range of movement at the knees was almost normal: slight creaking

still felt and still slight oedema of feet: she could raise her arms above her head: there was still some limitation of movement in elbow joints: she could get out of bed herself and had taken four steps by pushing a chair in front of her.

Haemoglobin 78%. Red blood corpuscles 4,630,000; white blood corpuscles 7,500.

Massage to tone up the muscles was started.

Seen on 11th November, 1928, the improvement was maintained but she will not walk much better until the muscular tone is improved and she gains more confidence. She still takes Ichthyol.

Case No.37. Mrs. G. Aet 47. Married. No family.

First examined in August, 1927.

Complaint: general tiredness: feeling of fatigue about the shoulders and occasional pains about the supra-scapular regions: also complains of want of appetite and a nasty taste in her mouth in the morning.

Examination of heart, lungs, abdomen - normal. Urine, specific gravity 1022: no albumen, blood or sugar. Teeth in good condition: a few artificial worn on a plate. Tonsils enlarged and very septic: said she was not subject to sore throats: tongue very dirty: no constipation: anaemic: menstruation normal. Numerous tender nodules in dorsal and suprascapular regions.

Treatment: Tonsillectomy performed: the tonsils proved to be very septic. In ten days she was put on to cachets of Pot. Permanganate and thyroid, morning and evening, and

continued for six weeks: at the same time attention was paid to diet(plenty of fruit and green vegetables).
At the end of this time she felt like a new woman but was put on to an iron and arsenic tonic for a fortnight.
Except for a slight return of pain in the dorsal region in September, 1928, she has had no return of her symptoms and feels very well.
She has been advised to carry on with massage until the nodules are eliminated.

Case No. 38. D.G. Male. Aet 24. Single. Gardener.
First examined 8th October, 1927.
Complaint: pain and swelling of left knee: duration one week. He thought his knee condition was due to strain produced by working the lawn mower on a slope. Rheumatic history in family - his mother Case No.16.
Examination: well-nourished but says he has not been feeling fit for some time, being troubled with loss of appetite, indigestion and constipation. Examination of heart, lungs and abdomen negative. Urine, specific gravity 1020: no albumen, blood or sugar. Artifical upper set of teeth: lower teeth and gums healthy. Tonsils enlarged and very septic: frequent attacks of tonsillitis. Left knee joint swollen and tender, especially on inner side: walked with a limp.
Treatment: As he was averse to having his tonsils out, he was put on to cachets of Pot.Permanganate and thyroid, morning and evening, and Ungt.Hydrarg.Co.dressings to the

knee. At the end of 10 days there was no improvement and he consented to having his tonsils enucleated. This was done under chloroform: they were very septic and adherent. As soon as he could swallow, he was put on to the cachets again and dressings of Ungt.Iodin Denigrescens Co. were applied to the knee.

He was back at his work in four weeks from his operation: has had no return since and feels very well.

Case No.39. Mr. J. C. Aet 60. Dustman.

First examined February 1927.

Complaint: severe pain and stiffness in the shoulders. Duration about three weeks: came on after frequent wettings at his work. Could not lift an ashbin up to the dust cart on account of the pain. No family history of joint trouble. Erysipelas of face a year previously.

Examination: No enlargement of joints: very marked creaking in the shoulder joints: pains felt on pressure in the upper arms: numerous tender fibrous nodules in cervical, supra-scapular and dorsal areas. Physical examination of chest and abdomen negative. Urine, specific gravity 1020, no albumen, blood or sugar. All his remaining teeth were very carious: pyorrhoea was marked : tongue foul: had been suffering frequent attacks of indigestion and flatulence. Tonsils and nasal sinuses apparently normal.

Treatment: The teeth were all removed - 4 or 5 at a time; reaction was slight, if any. He was put on to cachets of Pot.Permanganate and Thyroid. Diathermy was applied to the

affected parts and later massage was employed.
He began to improve after a fortnight's treatment and was able to return to his work in six weeks. The cachets were continued for another month.
Since then he has had no return of symptoms.

Case No.40. J.W. Male. Aet 22. Analytical chemist. Single.
First examined in February 1926.
Complaint: pain and swelling in knees, ankles, wrists and elbow joints: duration 36 hours: Temperature 101°. Pulse 80. Had had a similar attack six weeks previously after a severe wetting. Family history of rheumatism. - He had growing pains as a child and also several attacks of tonsillitis.

Physical examination of heart, lungs and abdomen - negative: Urine - specific gravity 1026, no albumen, blood or sugar; teeth sound and gums healthy; tonsils not very enlarged but very septic: tonsillar glands enlarged. Tongue furred.

Treatment: Rest in bed: Sod.Salicylat. gr.10. and Sod. Bicarb. gr. 20 t.i.d.: wet dressings of Methyl Salicylate to the affected joints; temperature and pulse normal in three days: salicylate mixture continued for ten days; kept in bed for three weeks. As soon as he had recovered tonsillectomy performed.
He is now fit and well and has had no return of symptoms in the past two years; he has become a vegetarian.

Case No. 41. Miss C. S. Aet 24. Shop Assistant.

First examined November, 1927.

Complaint: pains and swelling of knee, ankle and wrist joints: duration two weeks but has had frequent attacks about one every eight weeks during the past year; has had rheumatic fever twice in childhood. Temperature 101°: pulse 96. Pale; anaemic; thin and very tall.

Examination of lungs, abdomen and urine showed nothing abnormal: Heart - apex beat three fingers' breadth outside nipple line in fifth interspace; palpable thrill; on auscultation V-S mitral murmur conducted into axilla. Constipated. Tonsils not enlarged and no sign of sepsis: no enlargement of tonsillar glands: no evidence of nasal sinusitis. Teeth complete but evidence of commencing pyorrhoea; gingivitis; gums bleed on pressure: lower incisors and canines slack.

Treatment: Rest in bed: Methyl. salicylate dressings applied to swollen joints: Sod. Salicylate gr.10 with Sod. Bi-Carb. gr. 20 t.i.d. Daily massage of gums with Forhan's tooth paste and strict adherence to a diet of fruit and vegetables. Temperature normal in five days and swellings and pains of joints had disappeared. She was kept on her back for three weeks; condition of gums much improved: Sod.Salicyl.and Sod.Bi-carb.mixture continued t.i.d. for two months, during which time she was kept in bed; mixture continued for another month after getting up; diet continued and Forhan's tooth paste now used with tooth brush. Now no bleeding of gums and no slackness of teeth. V-S

murmur can still be heard but only after exertion: no enlargement of heart: no signs of cardiac embarrassment. She returned to work and reports once a month.
So far, in over a year, there has been no return of the subacute rheumatism and the patient is feeling much stronger.

Case No. 42. Mrs. S. Aet. 40. Married. No children. First seen November, 1927.
Complaint: gnawing pain down right leg; feeling of heaviness about the shoulders; general lassitude; duration about a month; came on after nursing her sister who had rheumatoid arthritis and died. Her mother suffers from rheumatoid arthritis (Case No.43) and her father had rheumatic fever twice between the ages of 30 and 35. He has apparently got sntirely over it and does not suffer now. He is 70 years of age; looks much younger and has no cardiac lesion. I learned from the Doctor attending the sister who died, that her rheumatoid arthritis was general: pyrexia was a marked feature and the duration of her illness was a little over a year.
Examination of the patient showed her (Mrs. S.) to be well-nourished. Nothing abnormal was found on examination of the heart, lungs, abdomen and urine. Slight leucorrhoea however. There was displacement of the uterus or cervical laceration. Menstruation slightly irregular; flushings frequent. Blood Pressure 128. Anaemic. Haemoglobin 65%. Numerous tender fibrous nodules were found in the lumbar region; pain on pressure over the right sciatic nerve: pain also caused in the

nerve by flexing the hip with leg extended; no evidence of any enlargement of the joints and no pain complained of in them. No actual nodules felt in the upper part of the trunk, but there was generalised tenderness in the supra-scapular fossae and in the cervical region. Teeth were found to be sound and the tonsils healthy. I wished to have a curettage done but it was not convenient at the time. **Treatment:** She was put on to cachets of Pot. Permanganate and Thyroid, morning and evening, and an anodyne ointment was well rubbed into the lumbar region, over the sciatic nerve, and also in the cervical region and the supra-scapular fossae. She was put on a diet rich in vegetables and fruit. Hormotone - one tablet t.i.d. a.c. - was also given. In 14 days she felt a little easier and in a month she was much better and almost free of pain. The cachets were continued and the rubbing carried on only twice or three times weekly. The Hormotone was discontinued at the end of two months. She looked and felt like a new woman. Cachets were then discontinued and she was put on to Bi-platinoids with arsenic - one tablet t.i.d.for a month. She has had no return of her pain since and feels very well. When seen in October, 1928, she stated she was still free of pain: the generalised tenderness was absent: she was not anaemic and felt very well in every way.

While, of course, it was impossible to expect the vast majority of the patients to keep to a diet such as this, an attempt was made to observe the main salient features.

A large proportion of fresh raw fruit and vegetables was contained in the dietary. The less starchy vegetables were used --- turnips, carrots, parsnips, cabbage, cauliflower, sprouts, peas, onions, lettuce, celery, spinach, French beans and leeks. Raw vegetable salads were always advised, and the great benefit of tomatoes as a source of vitamins was explained. Potatoes were forbidden, particularly in the obese subjects, but I am afraid in a great many cases this order was "more honoured in the breech than the observance". It was advised that all vegetables should be steamed, or cooked en casserole, and the addition of bi-carbonate of soda to maintain their colour was discouraged. Vegetable soups were allowed and marmite was used frequently. No tinned vegetables were allowed to be used in the making of soups. Except in the case of stout patients, a liberal supply of butter, milk, cheese and eggs was allowed. The re-heating of cooked meats was discouraged and the use of condiments was reduced to a minimum. Fish and fowl were allowed as a substitute for meat. The greater use of brown or wheaten bread and biscuits, or of rye bread (Ryvita) was advised. In addition, cod liver oil was prescribed frequently for the under-nourished patients.

salicylate dressings applied to the joints: opoidene or aspirin given for the pain and a saline each morning. At the end of a week she was put on to a daily rectal injection of Pot. Permanganate solution and thyroid gr.½ by mouth, morning and evening. A building up diet, rich in vitamins, was given: At the end of a fortnight's treatment there was very little relief of the pain. By the end of a month she felt decidedly better in herself. The pains were much easier and she was able to get some sleep. The injections had to be stopped for 10 days, owing to the irritability of the bowel; during this time she was put on to the cachets, but these also had to be stopped as they caused sickness. The rectal injections were then again started; the strength of the solution was reduced and not so much liquid was ordered. In this way she was able to carry on the treatment for a further period of a month. She remained comparatively free of pain for a period of three months. The deformities, of course, were still present. The gall-bladder is a possible source of infection in this case. One hesitates to advise operation in a woman of her years, as her general condition is not too good, and even if the infection were removed, owing to the long duration of the complaint, little benefit might be accrued. Seen 16th November, 1928; she had been confined to bed for a few days with an attack of influenza. Her pains had returned but not so bad as before and she is about to start on a course of injections again.

Case No.44. Mrs. G. Aet 46. Married. One child.

First examined October 1927.

Complaint: pain and swelling of left ankle: worse after walking, especially on rough ground: duration two months: came on after she went over on the side of her foot when she stumbled into a rut.

Examination: a very healthy woman; never been ill in her life. Physical examination negative. Urine normal. No evidence of septic foci. A few teeth require stopping but at present attending the dentist: good appetite and does not suffer from indigestion or constipation. The swelling in front of the left ankle seemed to be around the extensor tendons: pain was felt when the toes were moved: condition looked like teno-synovitis.

Treatment: She was given radiant heat with iodex well rubbed in: cachets of Pot. Permanganate and thyroid, morning and evening. At the end of three weeks there was only slight relief of pain. Twelve treatments of diathermy did not produce much improvement although the thickening round the tendons was less: six more treatments banished the pain. She took the cachets for another month. She is now free of pain and the swelling has gone.

Case No. 45. Mrs. S. Aet 60. Married. 3 children.

First examined in October 1927.

Complaint: severe frontal headaches off and on for 15 years: feeling of weariness about the shoulders, especially when a coat is worn: also aching in the lumbar region: all symptoms worse during the past year.

She was of a worrying nature and had many worries during the past two years. - Frequent attacks of tonsillitis: appendicectomy at the age of 28, and had been troubled with "liver" and constipation after the operation: in February 1926 had urticaria, apparently of nervous origin: Had an attack of what looked like gall-stone colic in July, 1926 - X-ray examination inconclusive: At operation in September, 1926, no gall-stones were found but dense adhesions were present binding down the ascending colon and were also attached to the gall-bladder: these adhesions were removed and the bowels moved by daily enemeta.

Examination: much too stout: nothing abnormal found on examination of heart and lungs. Urine, specific gravity 1010, no albumen, blood or sugar. Urea concentration 2%. Blood Pressure 210/90. Slight leucorrhoea due to cervical laceration: no uterine displacement: menopause 12 years ago. No fibrous nodules were felt but there was a generalised tenderness and sense of resistance in cervical, dorsal and lumbar regions: very tender on pressure over exits of great occipital nerves and over supra-orbital notches. No evidence of arthritis. Teeth artificial: gums healthy: tongue clean: tonsils sunken but septic: marked dusky

injection over anterior pillars; no evidence of sinus trouble but she suffers frequent attacks of "colds in the head".

Treatment: Tonsils were enucleated in November, 1927, and found to be very septic. She developed haemorrhage from the right fossa: this was controlled by pressure and an injection of haemoplastin; she took three weeks to recover from the operation and for throat to heal. Was then put on to cachets of Pot. Permanganate and Thyroid (gr.I) morning and evening: a reducing diet with fruit and vegetables: a saline each morning: counter-irritation over great occipital nerves with Lin.Iodine, while camphor and menthol was painted over the supra-orbital nerves. Her headaches had completely vanished in a month and Blood Pressure was 200. The thyroid was now increased to gr.2 in the cachets, which were continued for three months. The patient said herself that she felt like a new woman and remained free of headaches and the other symptoms. Seen in November, 1928, on account of an abscess on brow and styes of left eye, she was apparently run down after nursing a relative and by other worries. She still maintained she had no return of her old headaches and pains in shoulders, etc. Blood Pressure still 200.

Case No. 46. Mrs. H. Aet 48. Married. 2 children.
First examined 15th August, 1927.
Complaint: acute pain in the right hip: came on suddenly after she had removed to a new house. She had been working hard getting the house in order. Had had a similar attack 20 years ago, but had had no trouble since. Family history of rheumatism. Patient had had no serious illnesses previously: had always been healthy and her confinements had been normal. Menopause 4 years ago.
Examination: Nothing abnormal was found on examination of heart, lungs and urine. Tonsils and gums healthy. Artificial teeth, her own teeth having been extracted some years ago. Bowels not constipated: Great tenderness on pressure over the right sciatic nerve, particularly over the sciatic notch. The pain shot down the middle of the calf and was worse when the nerve was put on the stretch. No evidence of any fibrous nodules anywhere. She is of a worrying disposition and very energetic.
Treatment: Morphine grain ¼ was given, also grains 2 of calomel, followed by a dose of salts in the morning. She was well rubbed with an anodyne ointment and was put on to cachets of Pot. Permanganate and Thyroid. A generous diet, rich in fruit and vegetables, was prescribed.
The acute pain passed off in two days. She continued on the cachets for one month and has had no return of symptoms since.

Case No.47. Mrs. S. Aet 50. Married. 2 children. Laundry maid.

First examined on 15th August, 1927.

Complaint: pain and swelling in knees: duration 2½ years. (only came to this district three years ago). Father suffered from sciatica. Menopause at 47. Had no serious illnesses but had difficult births. Pains in the knees worse in the mornings and particularly bad on bending or on going downstairs.

Examination: knees uniformly enlarged, due to periarticular thickening: tender to touch, particularly over the inner side: creaking felt on movement: no evidence of any other jointsaffected. Much too stout. No signs of fibrous nodules but all the tissues gave a sense of resistance to touch. Examination of heart, lungs, and abdomen normal. Urine, specific gravity 1020. No albumen, blood or sugar. Blood Pressure 140. Upper set of artifical teeth; upper gums healthy: marked pyorrhoea in the lower jaw. Tonsils enlarged and flabby; pus found in the left antrum. No constipation and appetite good.

Treatment: The teeth were removed and patient was advised regarding having the tonsils and sinus trouble attended to. She was put on to cachets of Pot.Permanganate and Thyroid, morning and evening, and a strict diet was ordered, low in carbohydrates. Iodex was massaged into the joints daily. At the end of 14 days she stated that the pains and stiffness were much relieved and by the end of a month she could walk about freely. The thickening, however, is still present. The improvement has been maintained and she is awaiting

admission to have her throat and nose attended to.

Case No. 48. Mr. S. Aet 48. Married. Cashier.
First examined December, 1926.

Complaint: Pain and swelling of right knee; confined to bed for one week with a slight temperature; had a similar attack two years ago and stated that he afterwards felt pains shoot through his knee. No family history of joint trouble but his brother suffered from lumbago.

Examination: When first seen temperature 100° and at night this rose to 102°; knee joint much swollen and this was due mainly to the synovitis and to inflammation of the supra-patellar bursa. Patient much too stout. Heart sounds normal but the left border could not be made out by percussion, nor could the apex beat be felt owing to the amount of fat. Examination of the lungs showed slight rales all over, also slight degree of emphysema; the examination of the abdomen was negative. Urine, specific gravity 1020, no albumen, blood or sugar. The left thumb was amputated in childhood for Tuberculosis and there was evidence of scarring in the neck due to T.B.glands in childhood. The upper teeth were artificial; he had six teeth in the lower jaw and pyorrhoea was profuse. Tonsils healthy and no constipation.

Treatment: Aspirin gr.10 t.i.d. and Methyl Salicyl.dressings to the knee relieved the pain but the temperature continued to rise at night. The teeth were extracted and this was followed by an increase in the symptoms. As the temperature

persisted at night investigation was still further pursued. A blood count showed slight leucocytosis but no anaemia. The Wassermann reaction was negative on two occasions. X-Ray revealed evidence of old T.B. at the hila. The inflammation of the knee cleared up in 21 days and he was put on to cachets of Pot.Permanganate and Thyroid morning and evening; the pyrexia continued for six weeks, the temperature being normal during the day but rising at night to 99·2°; after this time it became normal.
Two months later the patient gradually found himself becoming deaf. Examination by an Aurist showed that this was due to "nerve deafness". The Thyroid and Manganese treatment was continued but there has been no improvement in the deafness. He is now completely deaf and wears an electrical apparatus. He is, however, learning lip reading.
There has been no return of the knee infection.

Case No. 49. Miss M. H. Aet 44. Single. Housekeeper.
First seen in February, 1927.
Complaint: Pain and a"drawn"feeling in the cervical region, and also aching in the lumbar area; a feeling of lassitude. Duration: "off and on" for four years.
Examination: Of a very nervous temperament and somewhat neurotic; much too stout and florid in appearance.
Menstruation still regular but flow increased and she suffers severe headaches and also all her pains are worse at the period times; flushings very marked. Nothing abnormal found on examination of heart, lungs and abdomen. Urine,

specific gravity 1018; no albumen, blood or sugar. Has a tendency to constipation; tongue clean; teeth and gums healthy; tonsils not enlarged and look healthy; appetite is capricious and she suffers greatly from gastric acidity. Blood Pressure 180. Numerous tender, fibrous nodules were found in the cervical, supra-scapular, dorsal and lumbar regions.

Treatment: In the absence of any evidence of septic foci she was given massage, which helped her for the time being, but her pain returned in the wet weather. She was then put on to cachets of Pot.Permanganate and Thyroid morning and evening; a strict reducing diet was prescribed and massage was continued. In about three weeks time she felt much better and the nodules were much smaller, but her gastric acidity was troublesome. This was treated by Bismuth Carb. Mag. Carb. pond. and Soda Bi-carb. t.i.d. This relieved the acidity. In about a week she said she felt better but the flushings were troublesome. Accordingly she was put on to Hormotone - one tablet t.i.d. This helped the flushings to some extent. As the lassitude was still markedIgave her 12 body baths of ultra-violet rays. These had the beneficial effect of bracing her up and also relieving the rheumatism.

She remained fairly free, but as she is absolutely neurotic she will almost certainly require more treatment.

Case No. 50. Miss H. Aet 49. Single.

First examined in October, 1927.

Complaint: Severe pain in eye; photophobia; duration "off and on"for two years; History of rheumatism in the family.(See Cases Nos. 49 and 51 - sisters). She thought she had a cold in the eyes but as inflammation continued it was found to be due to Iritis. Menopause three years ago.

She was treated by an Ophthalmologist in the usual way; she was much better but occasionally had a return of the pain and inflammation and at these times she could not read or bear the light on her eyes.

Examination of heart, lungs, and abdomen - normal. Urine normal. Is of a nervous temperament but not neurotic as her sister (Case No.49). No constipation; tongue clean; teeth artificial; gums healthy but two buried stumps were found - one in the lower jaw and one in the upper jaw. No history of leucorrhoea. Blood Pressure 180/80. No evidence of fibrositis; definite Iritis; no synechiae;no glaucoma. Ophthalmoscopic examination showed normal retinae.

Treatment: The stumps were removed and one showed definite sepsis at the root. The cachets of Pot. Permanganate and Thyroid were given morning and evening and a diet, rich in fruit and green vegetables, was prescribed. She wore dark glasses.

In about three weeks pain and redness of the eyes had disappeared. She continued the cachets for six weeks altogether.

Seen on 26/11/1928 the iritis had returned: Oculist reports

that the condition has developed into a uveitis.
A further search is being made for a septic focus.

Case No.51. Mrs. A. Aet 58. Widow. 1 child.
First examined in June, 1925.
Complaint: Dull aching pain and tired feeling in the lumbar region: felt as if she wanted support: duration two months. Had had the symptoms before after nursing her husband, who died 12 years ago. Family history of rheumatism (see Cases Nos. 49 and 50 - sisters). She had had no serious illnesses but has had a hard, worrying life since she was widowed.
Examination: Much too stout (a family failing) and this causes great breathlessness on exertion: the distribution of the fat was uniform all over. The left border of the heart could not be defined by percussion, nor could the apex beat be palpated, owing to the stoutness: heart sounds were faint but no murmurs could be heard. Pulse regular in force and rhythm, 76 per minute. Nothing abnormal found on examination of the lungs; abdominal examination was difficult owing to the stoutness but no tender areas were found and there was no panniculitis. No constipation and tongue clean and moist. On vaginal examination there was a cervical laceration, with slight leucorrhoea: slight sagging of anterior vaginal wall: no uterine displacement. Urine, specific gravity 1026, no albumen, blood or sugar; no frequency or pain on micturition. Teeth artificial; gums healthy; tonsils and nasal sinuses healthy.
Numerous tender, fibrous nodules were found in the lumbar

region: also some tender spots were found in the gluteal regions.

Treatment: The patient did not wish to have any operative interference for the cervical laceration. Rectal injections of Pot. Permanganate solution were given daily and thyroid gr.½ was taken by mouth morning and evening. An anodyne ointment was rubbed into the lumbar and gluteal regions daily. A reducing diet was prescribed.

After 14 days' treatment she felt much better and her pains had almost disappeared: the injections were continued for another fortnight and then she was put on to cachets of Pot.Permanganate and Thyroid for a month.

She was very pleased with the progress: she still felt some aching in her back when tired, and this I feel sure is due to the stoutness: the nodules had disappeared but certain tender areas could still be felt. - If she could reduce her weight by 2½ stones she would be better, but she "comes of a stout stock" and dieting to her is a real hardship.

<u>Case No. 52.</u> Mrs. Wm. H. Aet 46. Married. 4 children. First examined in May, 1928.

Complaint: Occasional severe pains shooting into left ear: worse in the morning: she thought it came on after a motor run: duration 2 weeks: she leads a busy life and has not much time to think about herself.

Examination: Nothing abnormal found in the ear: no tympanitis or tenderness over mastoid: on palpation a definite creaking could be felt over the left temporo-mandibular joint: she

said she was conscious of this creaking in the mornings and it lasted for an hour or so. No other joints involved. Nothing abnormal made out on examination of heart, lungs, abdomen and urine. Evidence of pyorrhoea in lower gum: gum receding from two teeth which were slack: upper teeth and gums healthy. Injection of anterior pillars of tonsils. tonsils sunken and septic: no history of tonsillitis and no enlargement of tonsillar glands.

Treatment: The affected teeth were removed and found to have apical abscesses. The tonsils were painted with a paint(Tinct.Iodine, Glyc.Acid Carbolic and Glyc.Acid Tannin) daily. She was put on to cachets of Pot.Permanganate and Thyroid, morning and evening. Radiant heat with Iodex was applied over the left temporo-mandibular joint.

At the end of a week's treatment she had to return home, but she was then quite free of pain. She continued the cachets for a month and has kept free of pain.

She is coming back later to have the tonsils enucleated.

Case No.53. Miss S.W. Aet 16. School-girl.

First examind in October, 1927.

Complaint: Severe pains shooting down the right upper arm, radiating round the external condyle, then down the volar aspect of the forearm, so severe as to prevent writing. Duration - about one week.

Examination: The patient is of a highly nervous temperament, suffers from mucous-colitis and also from lienteric diarrhoea. Is somewhat simple and likes to play with girls younger than

herself. Backward at school and is consequently in two classes lower than she should be. Previously, while attending her for mucous-colitis, an X-Ray revealed general visceroptosis.

Examination of heart, lungs and urine normal. She has always suffered from cold extremities and chilblains. Teeth and gums healthy. Tonsils supposed to have been enucleated by a specialist in childhood, but the stumps are still present and are very septic.(During her treatment she had an attack of tonsillitis). No nodules could be felt, but she was extremely tender in the right supra-scapular region and also in the middle of the upper arm.

Treatment: At first the arm was rested in a sling and was wrapped up in thermogene wool: later, radiant heat with Iodex was applied and aspirin was given for the pain.

At the end of 14 days there was little or no improvement. Dieting was extremely difficult owing to the colitis. For some time she had been taking Kalzana tablets to help her circulation. These were continued and she was also given Radiomalt. Twelve general ultra-violet ray baths, with local application to the arm, cleared up the condition.

Seen again in November,1928,she was found to have a return of the condition. This time nodules were easily felt in the supra-scapular area and also in the upper arm in the deltoid region. Radiant heat with Iodex was employed, and cachets of Pot.Permanganate and Thyroid were given. Pain had vanished in ten days.

Case No. 54. M.R. Act 28. Single. Clerkess.

First examined in May, 1925.

Complaint: Pain and aching in back and left side of chest: duration about three weeks: has had similar attacks before, especially in wet weather. Has had no serious illnesses but has been troubled with boils off and on for 1½ years; these boils occurred anywhere but were very prevalent on the inner aspects of the thighs: she had had two on the vulva. Subject to chilblains.

Examination: There are numerous definite, tender, fibrous nodules on each side of the spine, in the dorsal region, and also along the ribs. Temperature and pulse normal. Nothing abnormal found on examination of heart, lungs, and abdomen. Menstruation regular, but dysmenorrhoea marked: leucorrhoea marked after the period. Urine, specific gravity 1026, no albumen, blood or sugar: the urine had been examined many times before on account of the abscesses and at no time was glycosuria found. Constipation marked: anaemic: teeth and tonsils healthy.

Treatment: She was given general massage, and six injections of Collosol Manganese: interval between injections 4 - 6 days. Abdominal exercises and a suitable diet given to combat the constipation. The diet upset the stomach at first on account of the fruit.

At the end of the treatment, the boils had cleared up: the nodules had disappeared and she was free of pain. She was then put on to an iron and arsenic tonic, but as constipation was troublesome this was replaced by cod liver oil. - She is still free of rheumatism, but the constipation has to be watched.

Case No.55. Miss M.H. Aet 28. Single. Shop Assistant.
First examined on 27th April, 1927.
Complaint: severe pain at back of neck, also neuralgia of left side of face: pain shooting into left ear: duration one week: came on after washing her hair and going out in the cold.
Examination: Patient very tall (6'1"): anaemic but well nourished: tenderness on pressure over great occipital and supra-orbital nerves. No nodules found on examination of body. Aural examination negative. No evidence of creaking on movement of temporo-mandibular joints: no involvement of other joints. A few carious teeth: no pyorrhoea. Tonsils enlarged and very septic: nasal septum deviated to left: very tender on pressure over left frontal sinus, which was dull on transillumination. Nothing abnormal found on examination of heart, lungs, abdomen and urine.
Treatment: Counter-irritation with Tinct.Iodine over great occipital nerves: menthol and camphor painted over supra-orbital nerves. Aspirin alone or with Pulv.Ipecac Co. relieved the acute pain. The carious teeth were removed and she was put on to cachets of Pot.Permanganate and Thyroid morning and evening. She was awaiting admission to have tonsils and sinus trouble attended to: this took 2½ months and during that time her condition did not improve, although the acute pain was not so marked. After tonsillectomy and having the left frontal sinus drained and the septum resected, she was again put on to the cachets and at the same time was given Syrup Easton's

dr.I t.i.d. In about a month she began to improve and her symptoms disappeared.
She is now quite free of pain and in much better health than she has enjoyed for years.

Case No.56. Mrs. T. Aet 65. Married. 4 children. No miscarriages. Menopause at the age of 50.
First examined in March, 1927.
Complaint: Pain in the right knee, especially after being on her feet all day. Duration 1 month, but twinges of pain "off and on" for about two years. No rheumatic history in family.
Examination: Much too stout: chronic bronchitis and asthma: Teeth artificial: Tonsils not enlarged and appear healthy. Examination of the heart negative. On auscultation diffuse rhonchi were heard all over the lung area. Nothing abnormal found on examination of the abdomen, and she was not troubled with constipation. Urine normal. The right knee joint was greatly enlarged and this was mainly due to periarticular thickening. There was no creaking but great pain was experienced on pressure over the inner condyle. No evidence of other joint trouble. When the patient stood on the ground it was noticed that she had flat-foot. The head of the astragalus was pressing on the ground; this threw a strain on the inner side of the knee.
Treatment was started by giving her a week's rest in bed, and Iodex was well rubbed in to the knee daily and left on as a dressing. Cachets of Potassium Permanganate and Thyroid were taken morning and evening. At the end of this

period she felt much better and was given exercises to strengthen the fallen arch.

At the end of three weeks the pain in the knee was much better but she continued with the Iodex, the exercises and the cachets for a month.

Case No.57. Mr. T.R.K. Aet 74. Married. Retired.

First examined in April, 1928.

Complaint: Severe pain and stiffness in the shoulders, especially in the mornings. Condition came on two months previously at Monte Carlo where the weather had been wet and cold; was treated with salicylates and also with atophan. Had a similar attack about 15 years ago.

Examination: The patient is spare and wiry: very energetic: subject to eczema but has had no other illnesses.

Numerous fibrous nodules were found all over the back and in the shoulder areas: no nodules in lumbar region. He seemed somewhat cyanosed and breathless. Temperature normal: pulse 96 and irregular. The heart was not enlarged and there was no murmur present; extra-systoles were noted. Nothing abnormal was found on examination of the lungs, abdomen and urine. No constipation but slight dyspepsia and flatulence. The tongue was furred; there was no evidence of sepsis in the gums or tonsils.

Treatment: consisted of rest in bed. Tinct.Digitalis minim 10 t.i.d. given until pulse rate came down to normal. There were still a few extra-systoles present, however, As soon as he was able to be allowed out of bed he was given diathermy and massage, while he took Iodine solution minim 1

t.i.d. in milk.

In a month's time he was free of pain and the nodules had vanished. The heart was still irregular however, extra-systoles appearing every 15 to 20 beats. The patient considered his cardiac condition was due to the atophan. Since then he has had no return of his symptoms.

Case No.58. Mrs. M. Aet 70. Widow. No children.

First examined in January, 1927.

Complaint: pain and stiffness in back, shoulders: down the legs and in the knees: No definite duration but the condition has become worse during the past nine months. The stiffness came on gradually and was getting worse.

No family history of rheumatism: patient has had no serious illnesses: she was much too stout and complained of frequent attacks of giddiness and headaches.

Examination of heart, lungs and abdomen - negative. Blood pressure 220/100. Urine, specific gravity 1008, pale: trace of albumen, no blood or sugar: Urea concentration 1·2%. Has to rise at night to pass urine. Evidence of areterio-sclerosis on ophthalmoscopic examination of fundi.

Teeth - artificial: no evidence of sepsis in tonsils, gums or nasal sinuses: slight constipation.

Numerous tender nodules found all over back: some very large ones in lumbar region: knees enlarged, partly due to periarticular thickening but "lipping" could also be felt: creaking was marked: also thickening round the ankles.

Treatment: rest in bed: Calomel gr.½ every hour until six had been taken, followed by saline next morning. Afterwards

Calomel gr.I was given every second night. Effervescing citrate of caffein given to relieve headache.
At the end of ten days' treatment the blood pressure was [illegible].
The painful areas were then well massaged with an anodyne ointment. Iodex dressings were applied to the knees, and cachets of Pot.Permanganate and Thyroid were given morning and evening. At the end of a month's treatment there was little or no improvement. Rectal injections of the Permanganate solution were then started while the thyroid was given by mouth: meanwhile the local treatment was continued. In a fortnight she felt much better, and at the end of a month there was a definite improvement in the rheumatic symptoms, while the blood pressure dropped to 19[illegible].
The injections were then stopped and the cachets continued for another two months. A reducing diet was ordered but I am afraid she does not stick to it faithfully.
When last seen in June, 1928, the nodules were still present, but were not paining her unduly: there was still some stiffness in the knees and the blood pressure was 196: she was not troubled with such frequent headaches or giddiness.

Case No.59. Mrs. Y. Aet 61. Married. 5 children: one miscarriage. Menopause at 50.
First seen March, 1926.
Complaint: Severe pain in left shoulders region and radiating down arm: duration one week. Had an attack of lumbago two years before and has been subject to "rheumatic" pains during the past six years. Present attack thought to be due to exposure and worry: always had "bad births".

Examination: Much too stout: anaemic: very nervous and excitable. On examination of heart, lungs, abdomen and urine nothing abnormal was found. Panniculitis was present in the abdominal wall and numerous tender fibrous nodules were present all over back but were especially t ender in the left supra-scapular and acromion areas. Teeth had been removed two years ago after an attack of lumbago: gums healthy tonsils sunken but free of sepsis: nasal sinuses normal. Profuse leucorrhoea due to lacerated cervix: slight prolapsus uteri. Constipation very troublesome. Had appendix removed about 15 years ago.

Treatment: She refused to have operation for the genital condition. A strict reducing diet was prescribed. After a week's treatment with radiant heat and iodex her symptoms were only slightly relieved. Diathermy was then given, and cachets of Permanganate and Thyroid morning and evening. In a week's time the severe pain had abated, but diathermy and massage, and also the cachets were continued for a further three weeks, after which she felt entirely free of pain.

About a year later, when on holiday, she had an attack of iritis: when this passed off there was a return of the neuritis in the arm: diathermy and the cachets quickly relieved the condition.

One feels that a great deal more could be done for this patient but she will not keep at any treatment long enough and in particular refuses to keep to a reducing diet or to have an operation.

Case No. 60. Mrs. A. Aet 82. Widow. 3 children. First examined in May, 1926.

Complaint: Pain and swelling in the knees: duration of this attack three months, but had suffered off and on for 30 years. Pain worse on going downstairs and in wet weather. Had just arrived from U.S.A. No history of acute rheumatism. Menopause at 50.

Examination: Knees very much swollen with periarticular thickening and creaking was marked. There were also swellings of the wrists, ankles and finger joints. Heart not enlarged but slight V-S murmur at apex. Evidence of chronic bronchitis in the lungs. Urine: specific gravity 1008: traces of albumen - no sugar or blood: very pale in colour. Nothing abnormal made out on abdominal examination. Patient very deaf. Her teeth had all been extracted years before and dentures were worn. The tonsils and gums were healthy. She suffered from chronic nasal catarrh which was supposed to have been responsible for her deafness. No evidence of nasal sinusitis could be made out however, on examination. The bowels were very constipated.

Treatment: In view of the age of the patient it was not thought advisable that anything should be done to her nose. Herb tea taken at night greatly helped her constipation. Cachets of Potassium Permanganate and Thyroid were prescribed but at the end of three weeks there was little improvement in her condition. Radiant heat with Iodex relieved the pain greatly and at the end of a fortnight's treatment she felt better and continued rubbing Iodex into

her joints at home.

Case No.61. Miss G. Aet 54. Single.

First seen in October, 1924.

Complaint: I was asked to see this patient not for rheumatism but on account of great palpitation and breathlessness which had been getting much worse during the past month: it began about four months previously.

Examination: The heart was found to be enlarged 2" outside nipple line: there was a marked praecordial thrill: V-S murmur at apex and also a V-S aortic: auricular fibrillation: pulse rate 145 as near as could be counted. Liver enlarged two fingers' breadth below costal margin: had had frequent attacks of sickness: no anasarca but marked oedema of feet. Urine: specific gravity 1022: albumen; no blood or sugar. Great enlargement of thyroid: slight exophthalmos. Teeth artificial: tonsils much enlarged and very septic. Evidence of rheumatoid arthritis in fingers, wrists, shoulders, and knees, but no great pain was complained of although they were stiff in the mornings: cold extremities: thin and emaciated. The rheumatic condition came on about three years previously and she had been in a Nursing Home in Edinburgh for treatment.

Treatment: Rest in bed: Tinct.Digitalis minims 15 q.i.d. until pulse rate was reduced and pulse was steadied: dose then reduced to minims 10 t. i.d. Iodex ointment applied over the thyroid gland daily did not seem to have any effect on the swelling: a paste composed of Ungt.Iodin.,Glyc.

Belladonna, Ungt. Hydrarg. Co., and Ungt. Plumbi Subacetat., was applied as a wet dressing and kept on for three days. Two applications sufficed to materially reduce the size of the thyroid. Rodagen tablets were also administered for three months: improvement was marked. Patient was kept in bed for one year and was then allowed up for a short time each day, and later allowed some exercise: the pulse rate under the influence of digitalis remained about 90 and the fibrillation was not nearly so marked.

In March, 1927, it was decided to have the tonsils enucleated: it was thought advisable on account of the fibrillation to avoid a general anaesthetic: a local anaesthetic was employed, but as the patient became very nervous and excitable during the operation, complete enucleation was not possible: a large portion of each tonsil, however, was removed and found to be very septic. After the operation pains developed in the joints and the temperature ran from 99° to 99.4° but the "reaction" passed off in a few days. The swelling of the thyroid completely disappeared, as did also the swellings of the joints: the pulse rate came down to 86 and there was only an occasional irregularity: Tinct.digitalis minims 5 t.i.d. was continued.

Seen in June, 1928, she was very well and could do her own housework. The deformities were still present in the joints but there was no pain or restriction of movement. Pulse rate 80 with little or no irregularity.

Case No. 62. Mrs. C. Aet 58. Married. 1 child. Menopause about ten years ago.

First examined March, 1925.

Complaint: Severe pain down the front of the legs over the shin bones, redness and swelling: duration one day. Has never had an attack of rheumatic fever but history of rheumatism in her family.

Examination: Her condition proved to be typical erythema nodosum. Nothing abnormal was made out on examination of heart, lungs, abdomen and urine. Temperature varied from 99.2° to 101°. Teeth and tonsils were apparently normal; constipation had always been marked.

Treatment: Salines and rest in bed, aspirin and Pulv.Ipecac. Co. reduced the temperature and relieved the pain only for a time however. She was then put on to Salicin grains 5 t.i.d. and the condition passed off in ten days' time.

An interesting point in this case was that a few months later she had an attack of pyrexia in which the temperature rose to 106° and remained betweem 103° and 106° for six days. No cause could be found. Blood cultures were negative; Blood-count showed a marked leucocytosis; Wassermann reaction negative. The temperature did not become normal for a fortnight. A Widal test done on the tenth day was negative for typhoid and paratyphoid A. and B. Calomel gr.III along with a bowel wash out brought away several kidney-shaped bodies about the size of beans, white and clear. These were examined and reported to be masses of cholestrin. Bowel wash outs and injections of Pot.Permanganate solution

cleared up the condition in a few days and she has had no return of this pyrexial condition or of the erythema nodosum since.

Case No. 63. R.B. aet 40. Married. Laundryman.
First examined 9th September, 1927.

Complaint: Severe pain in mid-dorsal region, shooting through to front and also round sides of chest: duration about one month, but said he had felt pains there off and on for a year, and thought they were due to the frequent wettings he received at his work. No history of rheumatism or venereal disease.

Examination: Thin and ill-nourished: anaemic. Nothing abnormal found on examination of heart: dulness on percussion over the right upper lobe and here the R.M. was reduced: right pulse was found to be slower than left: there was no cough or paralysis of right recurrent laryngeal nerve: abdominal examination was negative and urine was normal. Slight kyphosis: very tender on pressure over 7th and 8th dorsal vertebrae: several fibrous nodules on each side of column. Marked pyorrhoea: tonsils healthy.
The case looked like one of aortic aneurysm: Wassermann tests on blood and cerebro-spinal fluid were negative: cardiograms revealed nothing abnormal: radiographs showed no enlargement of heart and no aneurysm: there was fibrosis at the hila of the lungs and spondylitis of 6th, 7th and 8th dorsal vertebrae.

Treatment: The teeth were extracted: rest from work: diathermy applied over the dorsal region: cachets of Pot.

Permanganate and Thyroid: a liberal diet.

It took quite four weeks' treatment with diathermy before the acute pain passed off: he continued the cachets for another month; he was advised to look for another drier job. In November 1928 he had another attack of pain: rest and a vigorous application of an anodyne ointment and heat relieved him.

Case No. 64. Mrs. McC. Aet 36. Married. One child. First examined in December, 1926.

Complaint: severe headaches: present throughout the day but worse in the mornings: duration one week: came on after nursing her child with pertussis: during this illness she lost a great deal of sleep.

Examination: Very tender to pressure over the great occipital and supra-orbital nerves: numerous fibrous nodules in cervical region and over shoulders. Examination of heart, lungs, abdomen and urine negative. Anaemic. Bottom teeth were carious and pyorrhoea was marked: upper teeth artificial: tonsils not enlarged and apparently healthy: nasal sinuses healthy.

Treatment: Arrangements were made so that she could get sleep. Aspirin relieved the headaches: counter-irritation over great occipital nerves with Lin. Iodin. and camphor and menthol was painted over the supra-orbital nerves. A diet rich in fruit, milk, eggs and vegetables, was prescribed: constipation guarded against. Teeth extracted. Cachets of Pot.Permanganate and thyroid given morning and evening.

Iron and arsenic tonic.

It took four weeks before she was free of pain, but she has had no return since.

Case No. 65. R.L. aet 9. Schoolgirl.

Examined in November, 1928.

Complaint: shooting pains in left groin and leg: also pain in wrists: came on after a wetting: duration one week, but had been complaining for about a month. I saw her originally for a similar attack in March, 1928; this came on after an attack of follicular tonsillitis in February,1928, which developed into a quinsy: at that time (March 1928) she was kept in bed for a month, as I was suspicious of a V-S mitral murmur but could not be quite sure: she then ran a temperature up to 100° for a few days only: she was kept on Sod.Salicyl. and Sod.Bicarb. At the end of a month, as there was no evidence of a murmur, she was sent for a holiday and the parents advised to have her tonsils enucleated - this had not been done.

Examination: When seen in November, 1928, she was complaining of the pain, which was very severe in the wrists and left groin: there was slight swelling of right hand: no swelling of wrists. Temperature 100° : pulse 86. Examination of heart, lungs, and abdomen - normal: Urine normal.

Treatment: She was put on to Sod.Salicylic and Sod.Bicarb. with Methyl.Salicyl.dressings to painful parts.

She continued to run a slight temperature for a week (99° to 100°) but the pains were slightly relieved: a soft blowing V-S mitral murmur developed and heart was slightly dilated.

pulse rate rose to 92: there was no embarrassment of breathing and no cyanosis. The Sod.Salicyl. and Sod. Bic. mixture was stopped and rectal injections of Pot.Permang. solution started on 21st November, 1928. The temperature came down at once and she felt very well: the pains and swelling disappeared.

A fortnight after the injections were started she was very well: there had been no rise of temperature and there were no pains or swellings in joints: V-S murmur still heard. She is still in bed and going on with the injections.

Case No. 66. Miss L. Aet 56. Single.

First examined in January, 1928.

Complaint: stiffness and pains in knee joints: felt most on going down stairs: general feeling of weariness and no appetite: duration six weeks.

Examination: She was too stout: weight 13 st.: had a healthy life and no serious illness. Father suffered from joint trouble. -- Temperature normal: Blood Pressure 156/80. Menopause at age of 49 was uneventful. - Knee joints were slightly swollen, due to periarticular thickening: tender to pressure, especially over inner condyles: movement was free but a fine creaking was felt: no muscular atrophy: a few tender fibrous nodules were found in the lumbar region: no other joints affected.

Examination of heart, lungs, and abdomen negative. Reflexes normal: Urine: specific gravity 1018: no albumen, blood or sugar. Tonsils and nasal sinuses apparently healthy: slightly constipated: tongue furred at back. Teeth were

well attended to: signs of commencing pyorrhoea in lower gum: slight receding of gum round lower incisors: X-Ray plates show no apical abscesses or absorption of bone.
Treatment: Teeth were scaled by a dentist,and she was put on to strict diet (as described p.51 and 52). Cachets of Pot. Permanganate and Thyroid - one, morning and evening. Ungt.Iodex was also massaged into joints daily. Exercise was encouraged.
At the end of a fortnight the condition was unchanged but by the end of a month's treatment she felt decidedly better in her general health and also the pain and stiffness were less: treatment was continued for three months: at the end of that period she had no pain or stiffness in knees: the periarticular thickening was still present but reduced. the dentist reported teeth and gums normal: she felt very well: weight 11st. 3 lbs. She then went for a holiday: she endeavoured to carry out the diet as far as possible, but the cachets were stopped.
Seen in September, 1928, she said she was feeling very well: appetite good and had no trouble with the knees.

Case No. 67. Mr. J.H. Aet 46. Married.
First examined in May, 1928.
Complaint: pain and stiffness in small of the back: pain also shooting down right leg: duration 10 days: came on after working in the garden on a wet day: never had it before. Had dysentery in South Africa 20 years ago: no other illnesses.

Examination: Tall and thin: appetite capricious: troubled with constipation: leads a vigorous life.
Several tender fibrous nodules in lumbar region; two larger nodules over the iliac crest on right side were excessively tender: the nodules were not hard like old-standing ones: no tenderness on pressure over the sciatic nerve and there was no pain when the nerve was put on the stretch.
Examination of heart, lungs and abdomen - negative.
Urine - specific gravity 1022. No albumen, blood, or sugar.
Treatment was commenced with a dose of calomel gr.III followed by a saline: he was put on to cachets of Pot. Permanganate and Thyroid morning and evening: an anodyne ointment was well massaged in daily. Diet rich in fruit and vegetables.
In 14 days there was a marked improvement and he was very fit in three weeks: the nodules disappeared: the constipation was less troublesome. A cup of "herb tea" was helpful in obtaining a movement of the bowels.
He has had no return since.

Case No. 68. Mrs. B. Aet 62. Married. 4 children.
First examined in April, 1928.
Complaint: severe pain shooting down right arm from the shoulder to elbow: occasional twinges felt on flexor aspect of forearm and in fingers: duration one week: has also had backache off and on for several months.
Examination: Well nourished and of cheerful disposition: not anaemic. Pain in the arm was increased by movement, and on pressure, especially in middle of upper arm: no nodules

were felt in the dorsal, scapular or lumbar regions. Examination of heart, lungs, and abdomen - negative. Urine, specific gravity 1020: no albumen, blood or sugar: white deposit due to a profuse leucorrhoea. Vaginal examination revealed a torn cervix: slight prolapse of uterus. Constipation: tongue clean however. Teeth all artificial: no stumps and gums healthy: tonsils healthy.

Treatment: A diet rich in fruit and vegetables: cachets of Pot. Permanganate and Thyroid morning and evening. Radiant heat along with Iodex. Pain much relieved after four applications. Cachets continued for 14 days, after which the pain had entirely disappeared. She has had no return since. An anodyne ointment relieved the backache: she refused to have the uterine condition rectified or to wear a pessary.

Case No. 69. Mrs. H. Aet 48. Married. 3 children, 1 miscarriage. - First examined in March, 1927.

Complaint: severe pain and swelling of the left knee accompanied by fever. Patient had a urethral caruncle and leucorrhoea and was admitted to Hospital; immediately after operation she complained of great pain and swelling in the right wrist and right knee, and temperature shot up to 102°; the pyrexia continued for 16 days.

Examination of the vaginal discharge for gonococci gave a negative result. Eventually she was sent home and lay in bed with the knee flexed on a pillow and with the leg everted. She screamed when it was touched and it was extremely painful over the inner condyle. The joint was

swollen and hot to the touch. The temperature varied from 99° to 101° and lasted for about a month. There were frequent exacerbations of pain: physical examination was otherwise negative.

Chloroform was given and a thorough examination of the limb was made. The leg was put up with a half box splint but she complained of so much pain that it had to be removed in a week's time. She then flexed the knee again and kept the foot everted. Dressings of Ungt. Hydrarg Co. were applied to the knee but this caused blistering of the skin and had to be stopped. After the temperature had been normal for about two weeks, slight passive movements were tried. The swelling of the knee was much reduced but still present and she was still very tender on the inner side. Later she was given diathermy and massage and then more vigorous movements.

When seen in August, 1928, the knee condition had improved somewhat; the swelling had disappeared but the joint was partially ankylosed and she walked with her foot everted.

Case No.70. Mr. J.R. Aet 36. Married.

First examined in February 1927.

Complaint: pains in knees and ankles and also severe pain over the sixth dorsal vertebra: duration four days. Frequency of micturition and pain at the point of the penis. An attack of gonorrhoea developed two weeks before and he was receiving treatment at the Venereal Clinic. Temperature varied between 99.2° and 102°.

Examination of heart, lungs and abdomen revealed nothing

abnormal. Urine - albumen; no sugar or blood but pus. Treatment: He was put on to sandalwood oil capsules and continued urethral injections of Pot.Permanganate solution as recommended at the Clinic. In four days' time the knee and ankle joints began to swell. Iodex dressings were applied but these caused blistering of the skin. This was then replaced by Ungt. Hydrarg Co.dressings. As frequency of micturition was still bad and as it was evident that the infection had reached the bladder, he was put on to Tinct. Hyoscyamus and Urotropin, which produced no effect in five days' time. He was then put on to Caprokol Dr.I t.i.d. ex aqua, and the symptoms of the cystitis improved in a week. Caprokol was continued for a further period of two weeks. The temperature came down to normal and the swelling gradually left the joints. When he was able to get up great stiffness was experienced in the knees and ankles. Pain was felt in the quadriceps tendons and also at the insertion of the plantar fascia to the os calcis. He walked as if he was flat-footed. He was then given a course of diathermy, which greatly relieved the stiffness in a month's time. He still had a slight urethral discharge although no gonococci could be found in it. The prostate was enlarged and tender: prostatic massage was employed three times weekly and urethral injections of Acriflavine(1-2000) were given also. In another month the discharge had ceased and the prostate had regained its normal size: the stiffness of the joints had also disappeared. - He has had no return of his symptoms

and has been carrying on his work in all weathers.

Case No. 71. Mrs. P. Aet 46. Married. 5 children. Always had "bad births". Menstruation still regular. First examined in January, 1927.

Complaint: severe pain in the sacral region, shooting down the left leg: duration 7 days: came on suddenly after a day in the washing house.

Examination of heart, lungs, abdomen and urine - normal. Artificial dentures worn. Gums healthy: tonsils healthy: no enlargement of tonsillar glands; nothing abnormal found in nasal sinuses; slightly constipated; reflexes normal; Wassermann reaction negative; very profuse leucorrhoeal discharge due to laceration of the cervix; slight prolapse, no uterine displacement; nothing abnormal found in the adnexa. In the lumbar region there were a few fibrous nodules, tender on pressure. She was very tender on pressure in the sacral region, Temperature and pulse normal: Blood Pressure 140.

Treatment: She was advised to have a curettage and repair of the cervix but did not wish it done meantime. She was then given rectal injections of Pot.Permanganate solution along with oral administration of Thyroid. An anodyne ointment was well rubbed in to the tender parts and aspirin and Pulv.Ipecac. Co. were given for the pain. After a week's treatment there was little or no improvement, and as a colitis had been set up by the injections, they were stopped. She was put on to cachets of Pot.Permanganate and Thyroid. There was little or no improvement at the end of 14 days.

She was then admitted to hospital, where she received diathermy and massage. The condition was greatly relieved at the end of three weeks' treatment and she was discharged in a month.

Since then she has been free of pain. The lacerated cervix and curettage have still to be attended to, but she rather fears an operation.

Case No. 72. Mr. G. Aet 59. Farmer.

First examined in April, 1927.

Complaint: pain and stiffness in the hip joint, knees and ankles, and also in the hands and fingers. Duration about six years. No history of pyrexia. The condition first started in the hip joint and he had great difficulty in walking about. He received some treatment five years ago but it was of no avail. The knees were next attacked, then the fingers. All movements at the hip joints were restricted particularly abduction. "Lipping" was felt. The knee joints were enlarged and bony outgrowths could be felt, and Heberden's nodes were prominent in the fingers. Examination of the heart, lungs and abdomen - negative. Urine - specific gravity 1010: no albumen, blood or sugar. The few remaining teeth were slack and there was profuse pyorrhoea. The tonsils were not enlarged and while injection appeared over the anterior pillars, no sepsis could be demonstrated and there was no enlargement of the tonsillar glands. Dyspepsia and flatulence were frequent. Constipation was marked: the tongue was covered with a thick fur.

Treatment: The remaining teeth were extracted and he was

put on to cachets of Pot. Permanganate and Thyroid, morning and evening; (he lived too far away for the nurse to attend to give rectal injections): As there was no improvement at the end of a fortnight he attended at the Infirmary and received diathermy. Six weeks later his condition was much the same and it was thought advisable to stop the diathermy. Iodine solution, minims 10 t.i.d.was given in milk. This was kept up for six months. At the end of that time his condition was much the same though he said his pains were not quite so acute. He was still very stiff however.

Case No.73. Mrs. D. Aet 48. Married. 3 children. First examined in October, 1926.

Complaint: severe shooting pains in frontal and occipital regions: general lassitude: pains and stiffness in shoulders and in the lumbar region: much worse in the mornings: duration about ten days. - For about 7 years she had been under observation on account of epileptiform seizures, Jacksonian in character, which had developed after a severe attack of Influenza: she had consulted various specialists who all advised continued observation: About 14 years ago, she had a ventro-fixation of her uterus done, but for what I could not find out.

Examination: She was tall and worried looking: anaemic: troubled with indigestion and flatulence: no constipation: tongue furred: halitosis marked. Nothing abnormal found on examination of heart, lungs and urine. Slight tenderness on pressure in right iliac region (she said that this had

been present for a long time and various doctors had put it down to an inflamed ovary). Menstruation slightly irregular and flushings were frequent. Tonsils were healthy but teeth were requiring dental care and there were signs of commencing pyorrhoea. Her dentist considered that scaling and fillings were all that was required, but later X-Ray examination revealed numerous apical abscesses. She was very tender on pressure over the occipital and supra-orbital nerves: numerous fibrous nodules were present in the lumbar region and were also excessively tender in the suprascapular regions. Wassermann reaction negative. B.P.1[illegible]

Treatment: Counter-irritation over the great occipital nerves with Lin. Iodine: camphor and menthol painted over the supra-orbital nerves: aspirin and phenacetin relieved the pain, which was much better in about a week. While arrangements were being made to have the teeth extracted, she developed an acute attack of appendicitis: Operation was performed within 12 hours of the commencement of the attack: the appendix was found to be gangrenous and on the point of bursting: the ovaries when seen at the operation appeared to be normal. After recovering from the operation she felt better than she had done for years. An interesting point was that her epileptiform attacks were greatly diminished; her husband always insisted that these fits were preceded by very foul smelling eructations. After a holiday she had all her teeth extracted and this was followed by a course of twelve body baths of ultra-violet rays, followed by massage.

She is now free of headaches and rheumatism and during the

past year has only had three epileptic attacks: these were slight and came on after indiscretions in diet.

CASE NO. 74. Mrs. S. Aet 49. Married. 6 children. No miscarriages.

First examined in February 1927.

Complaint: stiffness in the right ankle, worse in the morning but wears away during the day and again becomes worse at night: slight stiffness in the knees: Duration six weeks.

Examination: Robust and healthy. Nothing abnormal found in heart, lungs, abdomen and urine. Menstruation slightly irregular and suffers from flushings. No history of leucorrhoea. Tonsils healthy: a few teeth requiring stopping: no pyorrhoea: slight swelling of the thyroid gland, particularly of the left lobe. No tachycardia or dyspnoea; tendency to constipation. A few tender fibrous nodules present all over the back and in the lumbar region. No swellings of the joints; definite creaking felt in the knees but not in the ankles. Slight tendency to flat-foot (right foot).

Treatment: Teeth attended to. Hormotone, one tablet t.i.d. a.c. Iodex dressings to thyroid daily. Radiant heat and iodex applied to the knee joints and ankles: exercises for flat-foot. A reducing diet with plenty of fruit and

vegetables.

In about a month the pain felt much better: the thyroid gland had returned to normal and the pain and stiffness had disappeared from the knees and right ankle.

Case No. 75. Mrs. F. Aet 48. Married. One child.

First examined in December 1924.

Complaint: pain all over the body: aching in the arms, elbows, hands, legs, knees, feet and back: worse in frost and also in summer: duration about 15 years: came on after rheumatic fever. Family history of rheumatism: her father suffered from rheumatic fever, while her brother was subject to severe attacks of brachial neuritis. The patient had an attack of rheumatic fever at 24 and another at 33: also suffers from bronchitis and asthma: she has had all manner of treatments at Spas but says that nothing has ever done her good.

Examination: Very stout, of good colour, and although she says she has been suffering acute pain for 15 years, her face does not denote any sign of suffering. - A few fibrous nodules were felt in the lumbar region: a large, very tender one in the left supra-scapular fossa: all the subcutaneous tissues were thickened and were tender to the touch: no swellings of the joints but therewere periarticular thickenings around the knees and ankles, most marked posterior to the external malleoli: no oedema: very easily bruised: hands puffy and red: a Heberden's node in right mid-finger: any muscular atrophy was masked by the subcutaneous thickening. Cardiac examination was difficult on account of the adipose

tissue: the apex beat could not be felt, nor could the left border be defined. No murmur could be heard (in spite of a history of two attacks of rheumatic fever). Pulse regular in force and rhythm. Blood pressure 140/70. Moist rales heard all over chest, but especially over right upper lobe. Sputum negative for tubercle bacilli but contained micrococci catarrhalis and streptococci. Abdomen - very fat: panniculitis marked: nothing else abnormal found. Menstruation still regular: vaginal examination negative. Urine - specific gravity 1022: no albumen, blood or sugar: no indican. Wassermann reaction negative. Blood calcium within normal limits. Tonsils and nasal sinuses normal: only one tooth left, which was slack and the gum had receded. **Treatment:** When first I saw this patient she was suffering from an acute exacerbation of a chronic bronchitis, accompanied by much coughing and sputum, but with no pyrexia. She was treated in the usual manner and when the acute attack had passed off an autogenous vaccine was prepared: she received the first injection of 10 millions on 16.1.1925: the usual interval was 3 - 4 days, and the last injection of 1000 millions was given on 7.3.1925. The result was very good indeed: all the rales cleared up but she still had attacks of asthma off and on (although I have never witnessed any). The rheumatic symptoms showed no abatement after this: the one remaining tooth was extracted. On 2.4.1925, daily rectal injections of Pot.Permanganate solution were started and thyroid gr.½ was given morning and evening. At the end of a fortnight, the thyroid was increased to gr.I morning

and evening: at the end of a month she felt much better in herself and the pains were slightly relieved. The thyroid was increased to gr.I t.i.d. without any tachycardia or dyspnoea. Hot vapour baths were given nightly and these relieved the pain somewhat and induced sleep. The rectal injections were continued until September, 1925, but there was no further improvement.

Injections of Iodine, Guaicol and Camphor were then tried but made her sick and had to be stopped.

Ichthyol 10%, minims 10, t.i.d., and the dose increased to minims 40 t.i.d.: the thyroid and the vapour baths were continued: at the end of six months she did not feel any improvement, but the tissues were not so tense and thickened and I did not think so tender to touch: the most marked reduction was round the external malleoli.

She was then put on to a very strict reducing diet with plenty of fruit and vegetables: the immediate result was that the asthma disappeared and except for occasional spasms has not worried her since. (I have never yet seen her in an attack).

A course of injections(Warren Crowe) made little or no impression, and the same result followed injections of rheumatic Immunogen (P. D. & Co.) Diet and thyroid were continued. By September, 1927, I did think there was a great improvement in the subcutaneous thickenings but patient would not admit any abatement of pain.

Mild protein shock by injections of boiled milk was tried: once or twice with the larger doses (5 cc) a mild reaction

was produced but no improvement resulted.
In September, 1928, she was put on to parathyroid gr.1/10th morning and evening, and she is still on it. An attempt at protein shock with yatren-casein produced little reaction and certainly no improvement in the rheumatic condition. She is still on the parathyroid and diet, and is certainly getting thinner, and the condition of the tissues is much better, but she still complains of the pain, particularly in the back. Rubbing with Methyl.Salicyl., Iodex, Kiuma, etc. have all been tried: I feel a course of diathermy might help but meantime she cannot go in to town to have it: she will not have massage as she says it always had increased her pain.

Case No.76. Miss B. Aet 36. Single. Schoolteacher.
First examined on 5th March, 1928.
Complaint: pain and swelling of wrist joints. right fore-finger, ankle and knee joints: duration six years. She first of all felt pain in the right hallux, then in the right wrist: the 1st phalangeal joint then became swollen and painful: next the ankle joints, then the left wrist and finally the knees were implicated: the condition was thought to have followed on a septic condition of the right foot caused by a severe burn. Two years ago she had been treated by protein shock (four injections), but she said she derived little benefit, although the condition did not seem to have progressed very much since.

Examination: Nothing abnormal was found on examination of heart, lungs and abdomen. Menstruation was normal. Urine: specific gravity 1012; no albumen, blood or sugar: no indican. No constipation. Tonsils not enlarged and showed no evidence of sepsis: no evidence of sinus trouble: teeth well cared for but there was evidence of the gums receding from the lower incisors. Her dentist reported that her teeth were sound. - Haemoglobin 71.4%. Red blood corpuscles 3, 500, 000 : White blood corpuscles 12,500. The right wrist was much swollen with a soft puffy swelling most marked on the back: the head of the ulna was very prominent but there was no deviation of hand: the swelling around the left wrist was not so marked: marked fusiform swelling of the first phalangeal joint of the right fore-finger and slight pain was complained of in the metacarpo-phalangeal joint but there was no swelling: the swelling around the knees was puffy but there was also some peri-articular thickening: marked creaking in the knees: the swelling around the ankle joints was most marked posterior to the malleoli and was mainly due to periarticular thickening.

Treatment: Protein Shock - four injections (50: 100; 200. 300 millions): good reaction: temperature rose to 102-103° and was accompanied with severe headache and sickness. There was little or no improvement in the arthritic condition. - She was then put on to cachets of Pot. Permanganate and Thyroid, and a liberal diet rich in fruit and green vegetables with a reduction in carbohydrates

was prescribed. Also she was given a graduated course of ultra-violet rays (general baths) and local applications to the joints. In all she had fourteen treatments. When she finished on 25.6.1928 the pain and stiffness had certainly become less but there was little or no reduction in the swellings.

Radiograms of the teeth were then taken and an apical abscess was found at the root of the lower central incisor while there was great rarefication of bone around the 1st upper molars on each side and also the upper left incisor: the teeth were extracted and patient went for a holiday in Spain on 7.7.1928.

Seen on 15.8.1928 she was much improved: all the swellings were reduced: pains in the wrists and ankles were much better still creaking in the knees. Hb.75%. R.B.C.3,650,666. W.B.C. 9,375. - On 3.9.1928 she was put on to Ichthyol (10%) minims 10: t.i.d. The diet was continued.

On 17.10.1928 there was marked improvement in the knees, ankles, and wrists, particularly the right one, but there was slight pain and swelling around the metacarpophalangeal joint of right thumb.

On 7.11.1928 she started on another series of protein shock. T.A.B.vaccine was used and the initial dose was 50 millions: : on 16.11.1928 100 millions were given and on 23.11.1928 200 millions.

Already there is a very marked improvement: there are no swellings around the ankles, knees and left wrist: marked reduction of swelling of right wrist and of 1st phalangeal

joint of forefinger, while the swelling and pain round the metacarpophalangeal joint of the thumb has disappeared: creaking in the knees is much less prominent.
I intend giving her other three injections of 300, 400, and 500 millions at a week's interval between them.

Case No.77. Mrs. McJ. Aet 32. Married 6 years: has four children. - First examined 1st August 1928.
Complaint: great difficulty in walking: swelling and pain in ankles, most marked in left ankle: slight stiffness in knees: duration about one year, but has been much worse during the past three months: came on after last confinement.
Rheumatic history in family: her mother has rheumatoid arthritis.
Examination: Tall and well nourished but anaemic: nothing abnormal was found on examination of heart, lungs and abdomen. Urine: specific gravity 1020: no albumen, blood, or sugar; no indican.
Upper teeth artificial: marked pyorrhoea in lower gum and around the few remaining teeth: tonsils enlarged and septic. Constipation was troublesome. - There was marked swelling round the ankle joints, particularly round the left one; most marked posterior to the malleoli: swelling due to peri-articular thickening: creaking felt in knee-joints but there was only slight periarticular thickening. There was marked flat-foot on the left side and to a slighter degree on the right. No signs of any other joints being affected.
Treatment: The carious teeth were extracted and the gums attended to by a dentist: Forhan's tooth paste was massaged into the gums twice daily. She was put on to a generous

diet in which fruit and green vegetables figured largely: carbohydrates restricted. Rectal injections of Pot. Permanganate solution, along with the oral administration of Thyroid gr.½ morning and evening. Exercises were given to rectify the fallen arches and she was advised to keep off her feet as much as possible.

At the end of a week's treatment she felt much better and the pain was much relieved: in a fortnight she could walk much better and the swellings were now massaged with Iodex daily.

1.9.1928. Marked improvement: gums now healthy: tonsils much more healthy and not so swollen: the thickenings round ankles are much reduced: now no pain and walks much better. The injections were now continued on alternate days and she had the soles of her shoes raised ⅛" on the inner sides: exercises were continued.

2.10.1928. Improvement maintained: can now walk without pain a distance of ½ of a mile: gums in good condition: tonsils now appear healthy and no sepsis visible: no swellings of joints. Injections stopped and cachets of Pot.Permanganate and Thyroid given by the mouth.

14.10.1928. Can now walk one mile without pain: definite improvement in the "flat-foot" condition: no swellings around the knees or ankles: feels in good health and is no longer troubled with constipation: no evidence of pyorrhoea or septic tonsils.

27.12.1928. Improvement has been maintained. Can now walk without pain and can carry out her household duties.

Case No. 78. Miss V. Aet 28. Single. School-teacher.

First examined in May, 1926.

Complaint: pain and stiffness in lumbar and gluteal regions: duration off and on for two years. Has had no serious illnesses: several attacks of tonsillitis: 2 years ago had an attack of haematuria accompanied by great pain in the left loin: no stone was revealed by X-Ray: the condition cleared up in ten days and has not returned since. Rheumatic history in family (Case No.40 - her brother) and her mother also suffers from arthritis.

Examination: Patient well nourished and not anaemic. Examination of heart, lungs, abdomen and urine - negative. Menstruation regular and no dysmenorrhoea. Teeth and gums in good condition: tonsils sunken and septic. Numerous tender fibrous nodules felt in the lumbar and gluteal regions: no evidence of arthritis.

Treatment: Tonsillectomy: massage to back.

She kept free of pain until July, 1928, when it returned after a severe wetting. She was then put on to cachets of Pot.Permanganate and Thyroid: radiant heat was applied to back and Iodex c Salicyl. was well rubbed in.

After a month's treatment she was entirely free of pain but the nodules were still present.

On 22.9.1928 she reported that she had had a slight return of pain: she was then given a course of massage. The nodules are gradually being reduced and she is keeping free of pain.

Case No. 79. Wm. C. Aet 30. Clerk.

First examined 30th April 1928.

Complaint: Pain in upper arms shooting down to the wrists: felt worse on outer aspects of the arms: came on originally two years ago. No family history of rheumatism.

Has had all manner of treatments: the pain is not persistent and comes on at any time of the day: worse in damp weather.

Examination: Well nourished: weight 11st. 2 lbs. Nothing abnormal found on examination of heart, lungs and abdomen: Urine : specific gravity 1026: no albumen, blood or sugar. No constipation. Blood pressure 130/80. Teeth sound: no evidence of sepsis in tonsils or nose: no headaches. Reflexes normal. No tender fibrous nodules could be found and no tenderness on pressure on the arms where the pain was complained of.

Treatment: 12 body baths of ultra-violet rays of graduated doses, with local applications to the arms of radiant heat. The course finished on 11.6.1928 and he was then so very much better that he could play cricket : still had occasional twinges of pain. - He was then put on to cachets of Pot. Permanganate and Thyroid, and sent for a holiday. Felt much better after holiday but still had twinges of pain. Seen on 30.8.1928: the pain was very slight but he complained of lassitude in evenings. Hb. 62.5%: R.B.C. 3,762,500: W.B.C. 6,875: no abnormal cells found in blood films. He was given Glycerine Ext. of Red Bone Marrow Dr.I t.i.d. in addition to the cachets:

He reported on 13.9.1928 and said he was feeling much the same but had now no pains in his arms: he was sent for 14

days' holiday.

Reported on 5.9.1928 and stated he was entirely free of pain and felt completely well. Hb. 85%: R.B.C. 5,175,000. W.B.C.11,250. - All treatment was stopped.

When he reported a month later the improvement was maintained; he looked and felt well and was entirely free of pain.

Case No. 80. Mrs. McA. Aet 36. Married : one child.

First examined on 9th October 1928.

Complaint: pain and stiffness in lumbar region: general lassitude and sleeplessness: duration 14 days. Condition came on after a day in the washing-house when she got wet: never had a similar attack. Family history of rheumatism.

Examination: Healthy and robust but getting stout since the birth of her child in July, 1923. Nothing abnormal found on examination of heart, lungs or abdomen. Urine: specific gravity 1026: no albumen, blood or sugar. Menstruation normal: leucorrhoea due to a torn cervix: no displacement of uterus: adnexa normal. Numerous tender nodules found in the lumbar region and also a few in dorsal region. Constipated tongue furred: teeth requiring attention: no pyorrhoea: tonsils and nasal sinuses apparently healthy.

Treatment: Daily rectal injections of Pot.Permanganate with oral administration of thyroid: anodyne ointment well massaged into the affected parts. A reducing diet of low carbohydrate content and plenty of fruit and green vegetables.

At the end of a fortnight's treatment she was completely free of pain and felt very well: there was no constipation and the tongue was clean: the nodules were still present but not

tender. - She was advised to continue massage and diet.

Case No.81. Mrs. L. Aet 44. First seen in Sept.1928. Married: three children: has had two abortions in past two years. Still menstruating but "flushing" and is very irritable.

Complaint: Pain in back and down legs: duration off and on for 1½ years but has felt it before: came on after a severe wetting: no history of rheumatism in her family. Had puerperal fever 11 years ago and this was followed by erysipelas of face: has not felt in good health since.

Examination: In an extremely hysterical condition: nothing abnormal found on examination of heart, lungs and abdomen: Blood Pressure 132/75: tonsils and nasal sinuses healthy: teeth artificial: own teeth removed six years ago: constipation troublesome; Uterus not enlarged: slight leucorrhoea. Urine: Specific gravity 1020; no albumen, sugar or blood or indican. Numerous tender nodules felt in erector spinae muscles in dorsal and lumbar regions: pain on pressure over right sciatic nerve: increased pain when nerve was stretched by flexing hip on abdomen.

Treatment consisted of washing out bowels with saline and then injecting Pot.Permanganate solution; hormotone, one tablet, t.i.d. a.c.; carbohydrates reduced in diet: fruit and vegetables advocated.

In four weeks she felt much better in herself: pain had disappeared; still hysterical. Hormotone was continued and she was given a rest from the Pot.Permanganate injections for ten days and given an iron and arsenic tonic.

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