Pyretic treatment of rheumatism and allied and disorders / by Percy Wilde.

THE PYRETIC TREATMENT OF RHEUMATISM AND ALLIED DISORDERS

PERCY WILDE
M.D.

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OF RHEUMATISM AND ALLIED DISORDERS

BY

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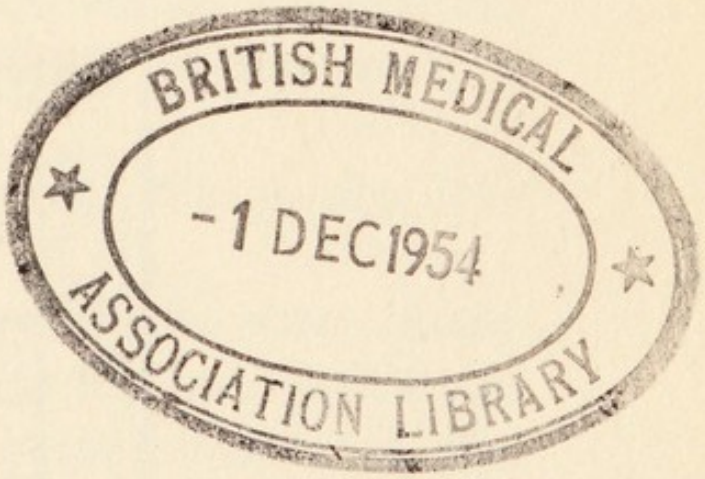

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PREFACE

RHEUMATISM is a symptom indicating an accumulation of acid in the tissues, due to an impairment of the normal excretory functions of the skin.

If we remove the acid and restore the functions of the skin, we not only cure the "rheumatism," but we also improve the health of the patient.

If we fail to do so, no matter what methods we employ, and the acid is allowed to accumulate, the symptoms of chronic "arthritis" may develop with all its disastrous results.

Clinical experience, resulting from over thirty years devoted to the treatment of rheumatism, affords overwhelming evidence of the truth of these statements.

The earlier the treatment, the quicker the results.

To facilitate this, I have devised some simple appliances which will enable the treatment to be carried out either at special clinics, at the patient's own home, or in hospitals. When this is systematically done, chronic rheumatism will have ceased to exist; there will not only be the saving of suffering, but of the millions of money which incapacity to work costs the country.

PERCY WILDE.

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CHAPTER I

THE PYRETIC TREATMENT OF RHEUMATIC DISEASES

SINCE the year 1890 all disorders of the rheumatic class admitted to the Lansdown Hospital, Bath, have received pyretic treatment as the primary means of cure.

This means that the temperature of the patient has been artificially raised each day.

The result of such process is that a large amount of acid is excreted by the skin, and this may continue for an indefinite time, and as the excretion of acid diminishes there is a corresponding improvement in the symptoms of the patient. This result is constant in all cases.

Six observations are made and recorded in respect to each application of pyretic treatment—viz., the temperature of the patient before and after the application, the reaction of the skin in four different parts of the body. At first this was done for purely scientific purposes, but the information afforded by each patient's chart proved so valuable as a guide to treatment that it has always been continued, and may be re-

garded as an essential part of the treatment, which would otherwise become empirical. The observations which led to the adoption of this method were based on the effect of rheumatic fever on patients. One case, in particular, impressed me.

A robust girl of eighteen had an attack of rheumatic fever. The temperature ranged from 103° F. to 104° F. In addition to profuse acid sweats, she had continued acid vomiting and acid diarrhœa. I took the view that this patient's tissues were charged with an acid poison and that Nature was doing its best to relieve the condition and that there was nothing for me to do. I did nothing.

The patient made a complete recovery within three weeks, and expressed herself as feeling better than she had been for months. There was practically no convalescence.

I saw this patient some twenty years later, and she told me she had never had a rheumatic pain since. Her mother and grandmother had valvular disease of the heart as a result of rheumatism.

But few attacks of rheumatic fever are so vigorous or so complete in their results. The patient may not have the vitality to continue the reaction, and the temperature falls before the acid is removed from the tissues. Then we have

prolonged convalescence or relapse. The effort to check the fever by large doses of salicylates produced a vast number of such cases, and 50 to 70 per cent. developed heart disease.

From continued observation I learned that if the temperature of the patient fell before the acid was removed from the system, there would be prolonged convalescence and relapse, but when I continued to raise the temperature artificially until the skin showed a normal reaction they not only made a good recovery, but felt in better health after the attack than before.

We know that in the chronic forms of rheumatism the patient has invariably a subnormal temperature and that such patients usually become chronic and incurable sufferers in spite of all medicinal or bacteriological treatment.

It appeared to me to be a reasonable supposition that if in such cases we could artificially simulate the conditions of rheumatic fever, we could not only cause the acrid poisons to be excreted, but also restore the functions of the skin, the impairment of which had caused this accumulation.

The results were so remarkable in cases, long pronounced incurable, that patients were sent to the Lansdown Hospital from all parts of the United Kingdom. This does not imply that the

medical practitioners sending these patients accepted my views, of which they knew nothing, but because the results of treatment appeared to them so satisfactory.

The result has been that the Lansdown Hospital, which was founded for all classes of patients and diseases, has had to give up all its available space, both on the private and public side, to rheumatic patients.

There were many points in the results obtained which I could not understand or explain, and I was led to a prolonged investigation into the subject of metabolism, which led to a number of important discoveries which I have described in my work on "The Physiology of Gout, Rheumatism, and Arthritis" (Bristol: John Wright and Co.).

It was not until I had made an extensive study of the physics and chemistry of lactic acid that I understood why it was necessary to raise the temperature of the body to remove the acid contents of the tissues.

After the publication of this book, letters reached me from all parts of the world from physicians interested, and I then realised the difficulties of carrying out this treatment in ordinary practice.

The special appliances used at the Lansdown

Hospital were only suited to a place where treatment is carried out on a large scale, and I have since devoted a considerable time to devising some simple and portable appliances which could be used anywhere and under all conditions.

At the present moment pyretic treatment is being carried out, not only in this country, but in the United States and the Colonies, and it appears necessary to speak, not only of its value, but its limitations.

Speaking generally, it may be said that in every case of the rheumatic class there is an accumulation of acid products in the tissues through failure of elimination. There is also an inactivity of the excretory and oxidising functions of the skin.

Pyretic treatment may be relied upon to overcome both these conditions, but if the practitioner starts with the idea that it is only necessary to give a patient a long course of pyretic treatment to cure all the symptoms which are called "rheumatic," he will meet with disappointments.

In all chronic cases of rheumatism there are secondary symptoms, due generally to the functional disuse of joints and muscles, but sometimes to impairment of nutrition, such as the deficiency of lime in the tissues or hæmoglobin in the blood.

Such conditions need their own special treatment. A class of case which frequently comes under our notice is "arthritis" of one or both knee-joints, where all treatment has failed. When we examine the patient we find a passive congestion or inflammation, which is maintained by the patient being allowed to walk about while it exists. It is a curious fact that the ordinary surgical rules in respect to joints are apt to be ignored when the word "arthritis" is used to express the condition.

Or the patient may have no inflammation in the joint, but fluid has been effused and acts as a foreign body, and will continue to cause pain until it is removed. Such cases are very common, because fluid in a knee-joint is seldom detected unless the knee is fully flexed. In many cases pains in the limb may be due to injury of one of the spinal nerves. Rheumatism plays a part in producing the pain, and pyretic treatment is most valuable in such cases; but unless the circulation in the injured nerve is restored there is sure to be recurrence of pain.

An important factor in the treatment of all rheumatic disorders is the patient's power of vital reaction. Anything which diminishes this power will prolong the treatment.

Thus a rheumatic fever patient placed on a

milk diet will take longer to cure and exhibit more gastric catarrh than one who is given a mixed diet of light, nourishing food.

In chronic cases where extensive teeth extraction or other surgical measures have been employed to remove some possible source of sepsis, the shock to the patient's system may seriously imperil his chances of recovery. Many patients date the serious aggravation of their complaint from such operations.

It is true that some forms of sepsis may seriously aggravate a rheumatic arthritis, but sepsis is a secondary condition, and the cure of the sepsis will not cure the primary disorder. Thus, the most pernicious form of sepsis is due to the gonococcus, but it is only one person in a hundred whose tissues are invaded by the gonococcus whose joints are affected by it.

The first and most urgent thing to do is to remove the primary cause, and when pyretic treatment is used it will be found that the joints have become impervious to septic attack.

The term "rheumatic diseases" includes rheumatism, gout, and many of the cases diagnosed as "arthritis." It also includes many forms of skin disease and also most forms of asthma.

The symptoms may vary widely, but when we

come to their cause we find a poison common to all of them, and if we remove this poison we cure the disease.

We recognise that the accumulation of lactic acid in the tissues is the initial cause, but lactic acid is a normal product and does not set up pain or irritation. Lactic acid may be oxidised in the tissues and converted into carbonic acid without producing any symptom; in fact, this is going on all the time without our knowledge. But when lactic acid is partially oxidised it forms a highly acid and irritating substance, and it is this which sets up the irritation in all the disorders we have mentioned.

A very weak solution of lactic acid will not change the colour of blue litmus paper, but if we dip the litmus paper in such solution and then leave it exposed to the air, as the lactic acid oxidises it will change the paper to a brilliant red.

The close connection between gout and certain skin diseases has long been recognised.

A robust person may have an excessively acid skin excretion, but so long as it is freely excreted he is not likely to suffer from gout or rheumatism.

But it requires very little irritation of the skin to produce eczema in such a patient.

We may apply soothing lotions or ointments in such a case and find the disorder very intract-

able because the agents applied from without cannot counteract the acid excretion coming from within.

In very chronic cases of eczema, the first pyretic bath may give a feeling of relief, and this may be continued during a course of treatment, but we shall not cure the eczema until the acidity of the excretion has been considerably reduced, and this may take some time.

In such cases we have to deal with the secondary effects of the inflammation. The tissues of the skin have become infiltrated with inflammatory products, and pyretic baths alone are slow to remove this. Here we have a very valuable resource in the ultra-violet rays and the great stimulation they produce in the superficial tissues.

If we begin with the ultra-violet rays we may cause aggravation, but when used at the proper moment they shorten the treatment very materially.

There are cases in which the skin is dry and harsh and may be covered by scales which may go to ichthyosis, but is more generally a form of xeroderma.

This condition usually occurs in cases of congenital failure of the skin function. It is pronounced incurable by dermatologists, but is

readily cured by restoring the functions of the skin by pyretic baths. In such cases a 5 per cent. solution of lactic acid applied to the skin and left to dry assists the liberation of the epithelial cells.

There is another class of cases which have not the acid excretion which causes eczema, nor the failure of all excretion as in the last class, but where the tissues have a very acid reaction which has continued over a long period. In such cases we may notice a crop of pedunculated warts about the neck and ordinary warts may occur about the body. This acid condition of the tissues may lead to all forms of new formations, including epithelioma, lupus, and cancer. Where such growths exist, pyretic treatment is most valuable, and improvement is visible as the acidity of the tissues diminishes. The local application of the heavy carbonate of magnesia has also a remarkable effect in checking external growths.

I do not think that the acidity of the tissues in relation to cancer has been fully realised, although the remarkable results which sometimes follow the continued use of citrate of potash are well known. Although little is known respecting the pathology of asthma, we know that we have an excessive irritability of the air-passages and that an attack of asthma may be produced by

very slight stimuli. We know also that an attack of gout may cut short a chronic asthmatic condition during its continuance, and that an extensive skin eruption may actually cure a chronic asthma. I mentioned such cases in my work on "The Physiology of Gout."

This seems to afford convincing proof that the cause of asthma is the same poison which causes the symptoms in gout and rheumatism.

It is a routine method at the Lansdown Hospital to give all patients with asthma pyretic baths and also to produce an eruption over the front of the chest and epigastrium, and to maintain this eruption for some weeks. If pustules form, we regard the case as suitable for the skin treatment, but if we fail to produce pustules, the treatment is discontinued so far as the skin is concerned.

I have recorded in my book some remarkable results from this treatment.

CHAPTER II

RHEUMATISM*

We associate the word "rheumatism" with swollen joints and painful limbs.

The ideal of medicine has been to find some remedy which will remove these symptoms and so cure the disease, but it has happened that, when a drug has been discovered which, given in sufficient doses, will cause the pain and inflammation to subside, the after result has proved that the temporary relief was dearly purchased.

This has made the treatment of disorders of the rheumatic class very disappointing, but our failure is less due to the nature of the disease than to the fact that we have followed a false ideal. We have mistaken the symptoms for the disease.

A disease is anything which interferes with the normal functions of the body, while the acute symptom represents the effort of the organism to resist such interference. Rheumatism, as a *disease,* has none of the symptoms which we ordinarily associate with the name. What we call

* A lecture to nurses which appeared in the *Nursing Mirror*, July 16th and 23rd, 1927.

"rheumatism" are the symptoms produced by the effort of the organism to get rid of the real disease; therefore, in our hunt for a specific, we are looking for an agent which, when found, would check those efforts at cure which Nature is making.

The classical stories of the healthy man who wakes up in the early morning with acute gout in the great toe and of the other man who sleeps in a damp bed and develops rheumatic fever are due to the non-recognition of the fact that a man may have gouty concretions in his joints for years without any symptoms which call attention to the fact, and in the same way the tissues may be highly charged with the rheumatic poison for months without any evidence which the patient associates with rheumatism.

We know that during a rheumatic fever an enormous amount of lactic acid is excreted by the skin, and the same thing happens during pyretic treatment, and the result of this elimination is that the symptoms subside and the patient's general health improves.

We are justified, therefore, in regarding the retention of lactic acid in the tissues as a cause of rheumatism. But lactic acid is a normal product of muscular contraction and can circulate in the body or tissues without causing pain or

other symptoms. It can also be oxidised in the tissues and converted into carbonic acid without any symptom denoting the process.

It is only when we study the physics and chemistry of this peculiar substance that we can understand its physiological effects under varied conditions.

It is well known that the feeling of general fatigue after a day of extra physical exertion is due to the accumulation of lactic acid in the tissues.

If we examine the history of rheumatic patients we shall find, in most cases, that this feeling of fatigue and indisposition for exertion was experienced for weeks or months before rheumatic symptoms appeared. Sometimes it is attended with mental depression, and in every case of mental depression the retention of lactic acid as a possible cause should be suspected.

In such cases a very few pyretic baths will cause the mental cloud to lift.

It is most important in the cases of children that this pre-rheumatic stage should be recognised, because the valves of the heart are likely to be attacked before any rheumatic symptoms appear. The child is not ill, but listless, and does not want to play games and finds school tiring. It will usually be found that the skin is dry and

has an intense acid reaction when tested with litmus paper. At the Prince of Wales's Hospital, London, special arrangements have been made to give children in this condition pyretic treatment, but the difficulty is that the child may not be thought ill enough to seek medical advice.

We know that every muscular contraction causes the production of carbonic acid gas or the less perfectly oxidised product—lactic acid. We also know that, if we exercise any group of muscles too long, we produce the feeling of fatigue, and some hours later that this may be followed by stiffness in the muscles, which after a time disappears; but, if we have been too vigorous in our exercise, the stiffness gives place to pain on movement, and this may continue until there is pain during rest, and we may find tenderness and swelling over the affected muscle and even slight heat.

You will see, therefore, that we can produce the whole gamut of symptoms which occur in muscular rheumatism by over-exercising the muscles of a healthy person.

We know that the feeling of fatigue when we over-exercise a muscle is produced by the accumulation of lactic acid in the muscles because oxidation cannot take place fast enough to remove it. When lactic acid is oxidised it is converted

into carbonic acid gas and water. The accumulation of lactic acid in the muscle is followed by stiffness because the lactic acid enters into physical cohesion with the cell walls of the tissues and makes them become thicker.

You can easily demonstrate this property of lactic acid by soaking a piece of meat—*i.e.*, muscle—in a 5 per cent. solution of lactic acid, wash it under the tap, and let it dry. It will be found that the muscle has become absolutely rigid, and this will remain until the lactic acid is removed by the methods I will describe. It will then be found that the cells of the tissues have undergone no change whatever, and the natural flexibility returns. In the living body the lactic acid is constantly being oxidised, and this act is not accompanied by any symptoms.

When you exercise a fatigued muscle and carry the exercise to excess, pain quickly follows stiffness, and this may last for some days. By this over-exertion you have not only added to the amount of retained lactic acid, but have also exhausted the oxidising power of the tissues, which is one of the results of strain of all kinds. We have then a condition where rapid oxidation is impossible ; it can only go on very slowly and imperfectly. But as lactic acid absorbs oxygen in insufficient quantity to change it into carbonic

acid gas it gradually increases in acidity and becomes a very acrid poison. It is this transition body which causes the pain and inflammation in rheumatic attacks. These facts will enable you to understand the phenomena you meet with daily in rheumatic patients.

You may have the tissues highly charged with lactic acid with no symptom at all, or only that of slight fatigue; you may have the tissues so stiffened that the joints cannot be moved, pain or swelling being absent; or you may have acute pain and inflammation. All these symptoms may follow one another in the same individual, and they may change from one to the other on slight provocation. Thus, no pain may occur until the patient is warm in bed, and then it is acute.

The heat of the bed brings more blood to the affected tissues, and some imperfect oxidation results.

So far we have only considered lactic acid in relation to the muscles which, owing to their vigorous circulation, are well equipped to oxidise it, but we have seen that this mechanism may temporarily break down under excessive strain.

Rheumatism, however, is essentially a disease of the fibrous tissues, the ligaments, tendons and cartilages, and these tissues differ from those of the rest of the body in the fact that they have no

direct blood supply or capillary circulation. This fact appears to have been forgotten by those who regard the bloodvessels as the channel by which poisons are brought to the tissues.

It is into this lymph bath that the lactic acid excreted by the muscles finds its outlet, and, as it has a great affinity for the fibrous tissues, which have little or no powers of oxidising, it would appear that, instead of wondering why rheumatism is so prevalent, we might ask how any of us escape it. But Nature is remarkably protective in its mechanism. During active exercise there is a large influx of lactic acid into these lymph spaces, but in spite of this the lymph remains alkaline.

The automatic mechanism by which this is secured is described in my work on "The Physiology of Gout, Rheumatism, and Arthritis," and I shall only have time to describe one of the methods which is important to our present study.

What we call the cell wall of the tissues is really the intercellular cement which binds the cells together, and this is largely composed of phosphate of lime. In the fibrous and cartilaginous tissues this cement substance is much thicker than in the other tissues. It is the enormous affinity of lactic acid for phosphate of lime which causes it to combine with all the cell walls of the

tissues without injuring or chemically altering the cell. When we soaked a piece of muscle in lactic acid we saw that it combined with the cell wall, and caused it to become rigid as a result of the swelling it produced.

If we test this lactated muscle with litmus paper we shall find that it has an intensely acid reaction. Now, if we drop this into an alkaline solution, containing phenophthalein, which will indicate the slightest change in the alkalinity of the solution, we should expect, as a matter of course, that the highly acid muscle would remove the alkalinity of the solution.

That this does not happen, however long we may leave it there, will explain how it is that tissues saturated with lactic acid are in no way affected by the alkaline lymph which surrounds them. It also explains why alkalies given by the mouth fail to remove the acidity from the tissues, and also the failure of dietary to affect this object. The combination of lactic acid with the phosphate of lime of the tissues is one of the ways by which the alkalinity of the lymph is maintained. But when this combination has taken place in tissues which have no power to remove the acid by oxidation, you may reasonably ask: "How is it got rid of?"

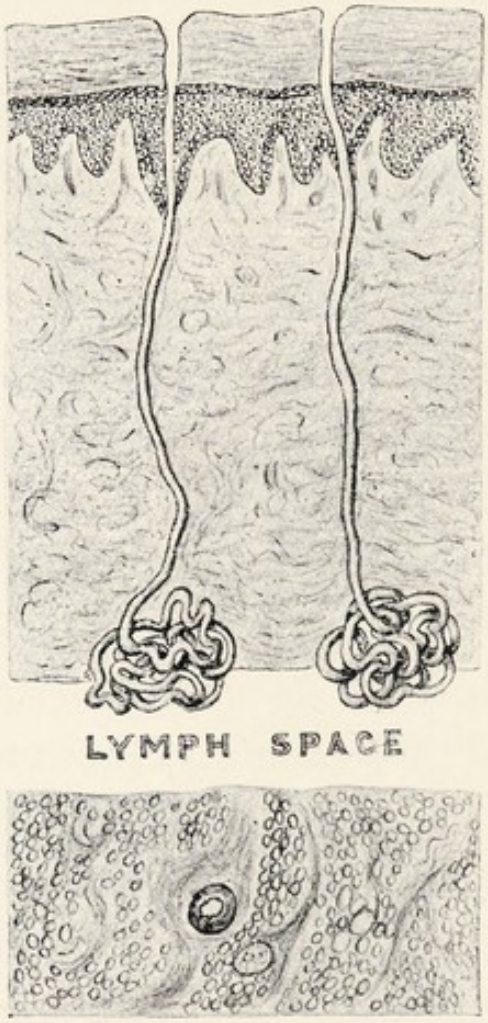
If we commence to heat the fluid in which we

have placed our lactified muscle, we shall find that when the temperature has been raised considerably a chemical change takes place: the solution becomes acid, because the acid is set free from the lactified muscle. The lactic acid is in physical cohesion with the cell walls of the muscle, and heat overcomes this cohesion. You will now understand how a low temperature encourages the combination of lactic acid with the tissues and how a high temperature sets it free. This explains why all conditions which lower the body temperature are conducive to rheumatism and why high body temperature sets free the lactic acid, as we observe in rheumatic fever.

Lactic acid, whether excreted by the muscles or liberated from the tissues, finds its way to the lymph space which lies immediately beneath the skin and between it and the muscles. It is the existence of this lymph space which enables a rabbit to be skinned as easily as a glove can be removed from the hand.

It is a very distensible sac which is filled up with lymph after vigorous exercise and exposure to heat, and is practically emptied when the body is chilled. The fluid in this sac is only separated from the open air by the thin wall of the sweat duct which lies upon its external surface.

This membrane acts as a dialyser, allowing the



SECTION OF SKIN SHOWING LYMPH SPACE DISTENDED

salts and fluid to pass into the duct, but excluding the colloid matter of the lymph. The sweat duct is a tube coiled upon itself so that anything passing through it is delayed. It is still further delayed by muscles which keep the duct in a state of tonic contraction, so that its lumen is rendered very small. Under the influence of heat, exercise or nervous shock, this contraction is removed and the duct relaxes.

The duct is surrounded by the capillary blood-vessels of the skin, the function of which is not to nourish the skin, but to oxidise any matter passing through the sweat duct. The whole mechanism for delaying the passage of fluids and salts through the duct is designed for this purpose. Lactic acid on entering the sweat duct is rapidly oxidised and is excreted as carbonic acid gas and water. This process is going on night and day. When the great lymph space is filled with fluid by heat or active exercise, the contraction of the duct relaxes, and fluid, salts, and lactic acid find their way to the surface, without being oxidised, in the form of sweat.

As oxidation is continuously taking place in the skin with the evolution of carbonic acid gas and water, some amount of heat must be produced.

In rheumatic subjects where the functions of the skin are in abeyance or imperfectly performed,

there is a persistent subnormal temperature. I think the two facts are closely associated.

In this rapid outline I have had to omit many important and interesting facts, but I hope I have made clear to you the important functions of the skin in both oxidising and eliminating the acid products formed by muscular contraction.

The first thing which happens when the body receives a "chill" is that the mechanism of excretion by the skin is arrested. When the chill is accompanied by the reaction of fever, we are very conscious of the fact. The congestion in the great lymph space and in the capillaries makes the relief given by cutaneous excretion a very urgent necessity, and we have remedies we call "diaphoretics," which we use to overcome this arrest. But when the chill is not accompanied by reaction we know nothing about this arrest; more work is thrown on the lymphatics, and acids accumulate in the tissues, but all this is symptomless, and, unless something occurs to overcome the condition, such as very vigorous exercise or exposure to heat, it may go on for months, until the tissues are saturated with acid. It is because the whole process of storing up acid in the tissues is so symptomless that rheumatism, when it begins to show itself by symptoms, appears so mysterious. When the tissues are so charged,

anything which stimulates them may set up that general or local reaction which we call rheumatism. It may be the reaction from a chill or an infection, the effect of vigorous exercise or a local strain of affected tissues which sets up efforts at oxidation which, when they are imperfect, may cause pain.

There has always been a tendency to regard the immediate cause of the rheumatic symptoms as the cause of the disease, but none of these causes can explain the symptoms met with in daily practice or the clinical history of the disease. We naturally associate rheumatism with cold and damp, but rheumatism is very frequent also in tropical countries, and, curiously enough, is more prevalent in dry tropics than in those where there is excessive moisture. This paradox is easily explained by the fact that it is easy to contract a chill in either, but the dry heat of the tropics encourages the radiation of heat from the body and prevents the temperature rising, while the moist heat checks the radiation of heat and so causes the temperature of the body to rise, and by so doing releases the lactic acid from the tissues.

When the rheumatic process has been allowed to continue for months or years without any attempt to relieve the primary cause, we have

very complicated conditions produced, owing to secondary effects resulting from constitutional causes, the environment, and accidents of life, with which we may include infections and injuries. There are many useful agents for dealing with these conditions, but, if you mistake the cause of these secondary symptoms for the cause of the disease, the result will be failure.

In all cases the primary object of treatment must be to remove the acid contents of the tissues and restore the functions of the skin, and while this is being done the secondary symptoms may be dealt with by appropriate measures. Given the time and trouble, cases which have been bed-ridden for years can be restored to useful life. Once you grasp the problem of rheumatism, you will find that no cases are of greater interest, and none will add more to the reputation of the profession when properly treated.

CHAPTER III

GOUT*

GOUT is distinguishable from all other disorders by the presence of calcareous concretions in the tissues. These concretions may remain for years without producing any symptoms to make their presence known. Therefore they do not ordinarily come within the cognisance of the physician.

It is only when one of these concretions begins to undergo resolution that pain is produced and attention is called to the joint or tissue where the concretion is situated. At that moment the concretion has become soft or semi-fluid and so the physical signs of crepitation by which it might have been recognised have disappeared. But if you examine the unaffected joints and find crepitation, the diagnosis of gout is fairly clear.

We may have actual swelling of the small joints, or simply pain in the large joints, with often reflex pains passing down the limb; especially is this the case in the shoulder-joint. These cases are commonly diagnosed as "arthritis," "fibrositis," or "neuritis." Fol-

* Reprinted from the *Medical World*, Sept. 2nd, 1927.

lowing on this we are gravely told that gout has become less frequent than formerly. If we take the class who do not earn their living by physical labour and who have passed the middle period of life, gout is more prevalent than rheumatism. This point may be doubted unless we realise that any person with concretions in his tissues is the subject of gout but is not of necessity a patient. On the contrary, he may enjoy the most robust health. But these concretions reveal an impairment of function. Health is retained because other organs take on the work of the non-functioning organs, but if nothing else happens, these organs will fail from undue strain.

Those who have these concretions are usually of a distinct physical type. They may have a sound constitution and good family history. The muscles are firm and resilient, the skin dry and inactive, the hair, sometimes, prematurely grey. The digestion is usually good, but bilious troubles, headaches, and even gall-stones and jaundice may occur.

There is often defective circulation, shown by coldness of the extremities, often unnoticed by the patient, but this does not impair the capacity for vigorous exercise. But the most important symptom of all is a *persistent subnormal temperature.*

As regards diet, I have not found it have the smallest effect upon the formation of the concretions, but of course, during a sub-acute inflammatory attack, stimulating food and drink may aggravate symptoms.

Vegetarians exhibit these concretions equally with those who take a mixed diet.

As regards alcohol, I have been surprised at the number of patients who take no alcohol at all, or only occasionally. In no case that I have seen could I say that an excess of alcohol was a cause of the concretions.

For many years I was puzzled to find the reason why a man in robust health, most careful as to diet, and taking abundant exercise, should have occasional attacks of gout. I found that these patients had one point in common—a *persistent subnormal temperature*—although several of them were great athletes.

This fact suggests that the presence of concretions in the tissues is due to an impairment of function.

We know that in the normal body the acids set free from muscular activity are largely oxidised in the sweat ducts and appear as carbonic acid gas and water in the insensible perspiration. Whenever this function is diminished or in abeyance, there is a subnormal temperature.

We know that when the skin is varnished so as prevent the escape of CO_2, great congestion takes place in the skin, owing to the active oxidation continuing in the sweat ducts, whilst the rest of the body becomes cold from the absorbed CO_2, checking oxidation. The dry, inactive skin of these patients is frequently congenital. They have inherited this from generations who have not earned their living by the sweat of the brow. In one case of this kind, a very healthy lady of twenty-eight, her skin had never sweated and was covered with dry scales; she enjoyed good health and was physically very active, but when, during occasional illness, she had to remain in bed for a few weeks, concretions appeared in all her joints, but these disappeared directly she was able to resume active exercise.

I think that it is not unusual for these concretions soon after they have first formed to disappear spontaneously, but when they have existed for some time they become insoluble for reasons which I will explain.

When the skin is impaired from birth, the secondary route for the waste products, via the lymphatics, veins, and kidney, becomes normal, and the patient enjoys good health until the time comes when the kidneys resent the extra work put upon them and cause trouble. This may

explain why some writers have said that gout commences in the kidney.

When one of these concretions is quite superficial, it seems an easy matter to cut through the skin and remove it. But we find that the concretion forms an integral part of the living tissue, and we can only remove it by cutting away the surrounding living tissue.

This would lead us to question the statement that these concretions are deposits from the blood. To find the cause of these concretions we must go back to the elementary laws of life. Life, in the tissues, consists in the constant formation of new cells, and the death of the old cells. If these dead cells simply dropped off and were carried away by the circulation, the débris would very soon block the smaller bloodvessels and endanger life. It is an absolute law that the dead cell shall not lose contact with the living cell until it is dissolved. Even in the skin, where the falling off of the dead cells could do no harm, they remain in contact with the living cells for weeks, until they are converted into keratin and drop off as an invisible powder.

The cells of the fibrous tissues have a very thick cell wall, which is really the intercellular cement substance which binds the cells together. This is largely composed of phosphate of lime.

When the cell dies, its protoplasm is readily converted into urea, and I have demonstrated that this chemical change takes place *in situ*.*

Owing to the great affinity of lactic acid for phosphate of lime, we always find it in the tissues as a lacto-phosphate of lime, and this in the dead cell undergoes solution by the lymph. In the sweat of rheumatic fever patients we frequently find it in large quantities, and the curious fact is that when we have evaporated a drop of this sweat we always find the lacto-phosphate of lime in the form of concretions, never as a single crystal. I know of no other substance, except lime, which has this peculiarity.

You may make a very interesting experiment by dissolving phosphate of lime in lactic acid and then putting a drop of a weak solution under the microscope. We at first see a number of black-looking bodies of irregular shape ; these are concretions of lacto-phosphate of lime. After a time they begin to sprout like a seed germinating, and after a time these sprouts appear from the whole circumference, and then they grow into long rods, so that we have a large stellate crystal formed. As the oxidation continues, these rods break off and appear like bundles of straw.

Now, if you refer to the textbooks in which

* "Physiology of Gout, Rheumatism and Arthritis."

crystals of urate of soda are illustrated, you will find all these transformations described as "urate of soda." This extraordinary mistake originated in a bad guess made by Sir Alfred Garrod when he "discovered" urate of soda in the blood. He found some crystals, which, when incinerated, produced an ash, alkaline in reaction, and which did not answer to the tests for potash, so he concluded that it was soda.*

He did not recognise it as lime. No salt of soda has the property of producing concretions.

The concretions of gout are always found in those parts of the body and in those tissues where the circulation is most feeble. It is here that through imperfect circulation there may be lack of lymph to dissolve the lacto-phosphate of lime, and so it remains in contact with the living cells and accumulates. In this condition it will give the physical signs of a concretion when the joint is moved with resistance. At the beginning, brisk physical exercise or heat, which will flush the tissues with lymph, may remove the whole accumulation.

But urea exists at the site of these concretions, as a result of the katabolism of protoplasm. By the action of lactic acid this is converted into

* "Gout and Rheumatic Gout" (Alfred Garrod).

ammonia, and this forms an insoluble compound with lacto-phosphate of lime. Under these conditions it is impossible for the lymph to dissolve the concretion and it becomes a permanent fixture.

Lactic acid is the only substance existing in the body which is capable of dissolving these concretions, but in its ordinary state it has no affinity for them. It will combine with the living cell walls round the concretion, but the concretion remains unaffected.

But when a large amount of lactic acid combines with a tissue, it produces some swelling by thickening the cell walls. We are conscious of the stiffness of muscle after undue exertion, due to this cause. As the space round a joint is very circumscribed, the concretion may occupy space required by the swollen tissue and so act as a foreign body and cause irritation. We have here a condition which requires very slight causes to set up an inflammatory attack.

It may be a little extra heat, perhaps even the heat of the bed, a little increase of exercise of the joint, or it may be an acid drink or a fruit of an acid nature, or the excitation produced by stimulating food or drink.

We legislate for this event when we diet patients who have gout, and we may delay or

ward off an attack, but it cannot be supposed that such articles of diet can cause gout or that abstinence from them will cure it.

Local irritation may cause lactic acid to become slowly oxidised, and when this happens a much more acid substance is produced, which acts as an irritant to tissue and accounts for the pain of rheumatism and also the pain in muscles which may develop some hours after very severe exertion.

Sometimes the concretion is so superficial that the whole process of inflammation may be watched with the naked eye. We see the concretion as the centre of an area of inflammation ; the surrounding tissues are swollen by effusion of lymph. Litmus paper applied to the spot gives an intensely acid reaction, although if applied to the skin a few inches away may only show a very slight acid reaction.

As we watch, we see the concretion gradually becoming softer until it becomes of the consistency of milk. We notice that absorption is taking place round the circumference and the concretion is becoming smaller. It looks as if in a little time it would disappear altogether. But then the whole process suddenly ceases, the inflammation subsides, and what is left of the concretion, usually about one-half, passes from the fluid to

the solid state, and there remains. If the acid acting on the concretion came from the blood there is no reason for the sudden arrest of the process, but the acid is obviously drawn from the tissues immediately surrounding the concretion, and the quantity is insufficient to complete the solution. It will be observed that the concretion plays an entirely passive part. Possibly in the case of smaller concretions the solution is complete, but we do not have the opportunity of observing this.

When minute concretions are scattered throughout the tissues and round the joints and the patient develops an attack of sub-acute rheumatism, all these concretions can be attacked at once, or seriatim. We then have a general enlargement of the joints from swelling of the extra-articular tissues. Such cases are constantly mistaken for arthritis. I think they may be very properly described as "rheumatic gout." The constitutional state of these patients is usually good and is helpful in diagnosis.

Acute gout may be defined as the effort of Nature to remove concretions which have formed in the tissues. The direct cause of these concretions is an impairment of the peripheral circulation, causing an absence of the fluid necessary for the solution of the waste products. This

failure of circulation may be induced by long exposure to cold and is often congenital.

It is a matter of common observation that gout is particularly an ailment of the educated classes and is uncommon amongst those who earn their living by physical labour. In this matter we have not only to deal with the habits of the individual, but of the generations before him.

When a family for many generations have not been required to seek their food by physical labour and the sweat of their brows, there is a gradual diminution in the activity of the functions of the skin and in the peripheral circulation. When a man sits writing for hours in a room, not too warm, his feet are likely to become cold from want of circulation, but he may not be aware of the fact. It might be supposed that when he resumes active exercise the circulation would be restored and the mischief repaired.

But it is not always so. I have examined the feet of many robust men, immediately after exercise, on a hot summer's day, and have been surprised at their coldness. It must be remembered that these people, although robust, have an inactive skin, and a subnormal temperature, showing that the oxidation of their waste products is imperfect.

Apart from the acton of cold, a local feeble

circulation in the tissues may result from a severe strain or injury, and this may continue long after all symptoms have ceased. Such tissues are a favourite site both for the accumulation of lactic acid and for the presence of concretions. In all these cases the first line of treatment is to restore the functions of the skin and insure active circulation in the tissues.

All forms of hot baths are useful for this purpose, but not wholly efficient unless they raise the body temperature and so set free the lactic acid. I have explained the reason for this elsewhere.*

For raising the body temperature, dry heat is useless, and steam is not always efficient or desirable. A moist heat not exceeding 105° F. is the best for this purpose. Special appliances for attaining this result are obtainable, which remove all difficulties as regards administration.†

The earlier in life such treatment can be carried out, the less trouble the patient will have in after-life.

When the action of the skin is restored, active exercise and warm clothing to maintain the circu-

* "Physiology of Gout, Rheumatism and Arthritis" (Percy Wilde).

† Cox-Cavendish Electrical Co., Ltd., Great Portland Street, W.

lation is desirable. In respect to this, women are the most difficult patients because they resent warm clothes and sit about in cold rooms in spite of all injunctions to the contrary. For this reason gout is much more prevalent amongst women than men.

Space will not permit me to enter into a discussion on the uric acid theory of gout, but the following facts resulting from my prolonged investigations may be helpful: Normal urine contains both lacto-phosphate of lime and urea. The latter is in combination with chloride of sodium, which enables it to resist the normal acidity of the urine.

But when the urine is abnormally acid, the urea becomes converted into ammonia, and this combines with the lacto-phosphate of lime to form a complex body. This body has the power to lock up the excess of acid by the formation of an insoluble crystal, with the result that the excess of acid does not scald the bladder and urethra.

This crystal has received the name of "uric acid," but as it answers to the tests for lactic acid and also ammonia, I think that lacto-carbonate of ammonia would more correctly express it.

The chemist, in testing for uric acid, uses the same agents as Nature does for its production,

and then tells us that uric acid was present in the substance tested. Thus he adds ammonia to the urine and throws down a gelatinous precipitate which he tells us is "urate of ammonia."

Now, the practitioner can easily test this statement for himself. Instead of urine, let him use a solution of lacto-phosphate of lime and treat it with ammonia in the same manner as the chemist does in producing the so-called urate of ammonia. He will obtain a gelatinous precipitate which to all appearances is identical with "urate of ammonia." Now, if he dissolves each of these precipitates with sulphuric acid, and puts a drop of each on a glass slide, and, when dry, examines it under the microscope, he will find the whole field covered, in each case, by a peculiar hedgehog-like crystal, so that it is impossible to tell one preparation from another. This peculiar crystal has been figured as one of the forms of urate of soda.*

We have seen that the other crystals which have received the same name can all be reproduced from lacto-phosphate of lime.

Urate of soda has no existence in the body, and, if it did, would be incapable of becoming insoluble or of forming concretions.

* "Urinary Deposits" (Golding Bird).

CHAPTER IV

THE TECHNIQUE OF PYRETIC TREATMENT

As the human body is a heat-producing machine and is constantly radiating heat, it is only necessary to check this radiation in order to raise the temperature of the body. If, at the same time, we add to the body heat as we check its radiation, the rise in temperature is considerable.

It would be a very simple matter if the elevation of temperature was all we had to consider.

We have caused active congestion of the capillaries with a large flow of fluid to the great lymph space beneath the skin, containing the acid products, set free by the rise of temperature, and we have to make sure that relief comes to the general congestion by the *natural* relaxation of the sweat ducts with free excretion. I speak of *natural* relaxation of the sweat ducts in contra-distinction to that which comes from exhaustion of the nerves on which the tonic contraction of the sweat ducts depends.

The sweat duct is so constructed as to delay the passage of fluids passing through it, not only by the coils, which lengthen the passage, but by

involuntary muscles, governed by spinal nerves, which maintain it in a state of tonic contraction, so that its lumen is narrowed. The capillary bloodvessels will expand and contract with every momentary stimulus, but the sweat ducts are slow in their reaction to stimuli, and both heat and cold will cause contraction. When intense heat is applied the ducts will dilate, through exhaustion of the nerves, and free sweating will occur, but the final result of this process is to diminish the functional activity of the skin.

In the dry, hot-air bath the patient may sweat profusely, but there is no rise of the body temperature, and the acid products are not eliminated.

We observe in patients who have lived in a dry, tropical country, or in those who have spent much time in the hottest rooms of the Turkish bath, a dry, inactive skin incapable of performing its normal functions.

We know that nervous shock will, at the same time, contract the capillary vessels and dilate the sweat ducts so that we have the condition of "cold sweat."

External shock to the sweat ducts caused by the surface of the skin becoming chilled can cause a permanent spasm of the sweat duct, narrowing its lumen to the smallest point, and rendering

the act of sweating difficult or impossible until the condition is relieved.

This is the real cause of most cases of rheumatism, but, as it produces no symptoms at the time, passes unnoticed.

The relaxation of the sweat duct is very much influenced by the moisture of the atmosphere. At first it is difficult to understand that a tube through which moist vapour is constantly passing should relax readily when moist heat at a moderate temperature is applied and offers great resistance to dry heat. But moist heat at a high temperature will not produce normal relaxation of the sweat duct, because the heat stimulates contraction and will continue to do so until the nerve is exhausted ; but moist heat at a moderate temperature favours the relaxation of the sweat duct and the act of sweating.

I have entered into these details because, when I published a book on rheumatism in 1893, I described a simple appliance which I used to surround the patient with a moist heat at a moderate temperature. This was taken up commercially and improved upon with a view to providing a greater heat, and this required the use of dry hot air. One inventor followed another, each claiming to produce a higher temperature. These appliances have been sold all over the

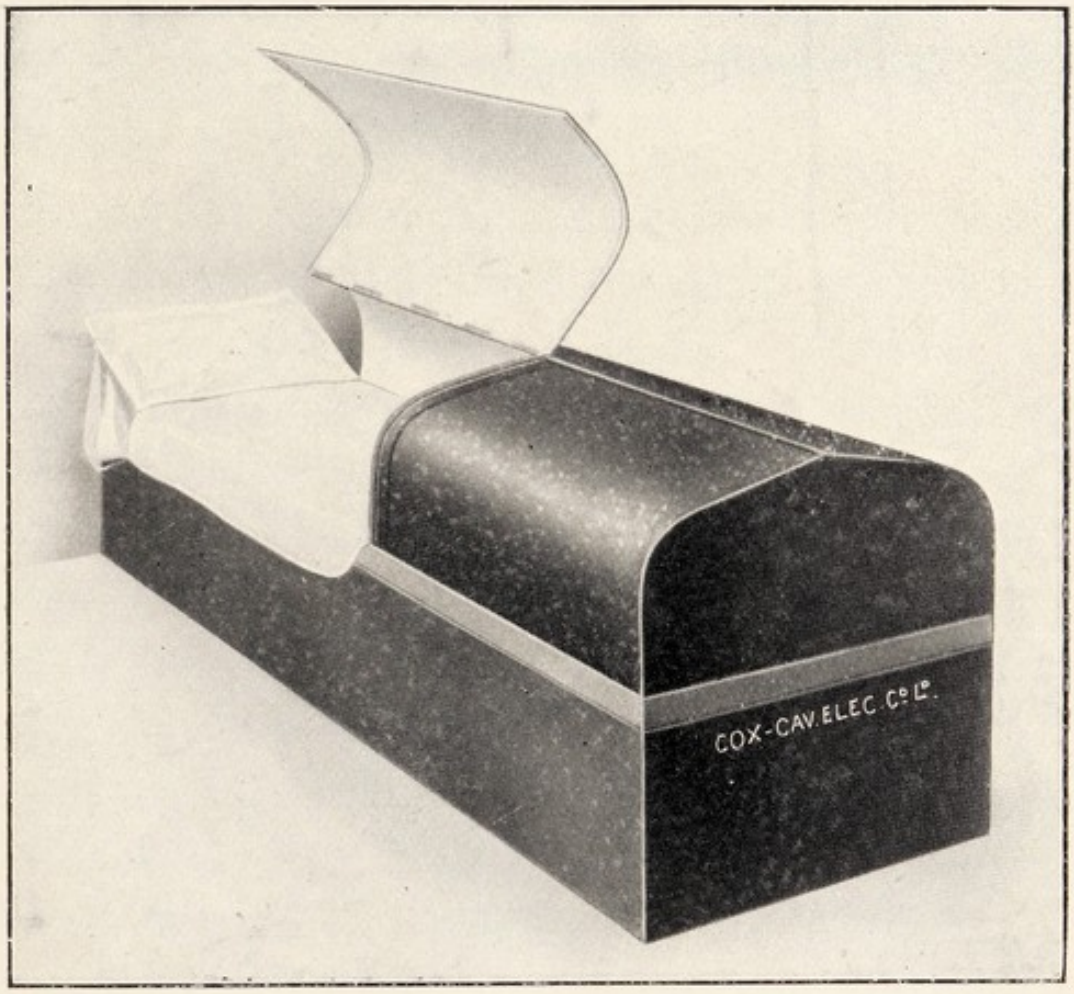
world, and naturally gave rise to the opinion that such treatment was very exhausting. The fact that such appliances were used by the medical profession shows how little the delicate mechanism of the skin is understood and the ease of causing permanent injury by over-stimulation.

All that is necessary to give pyretic treatment is to surround the patient with a moist atmosphere at about 105° F.

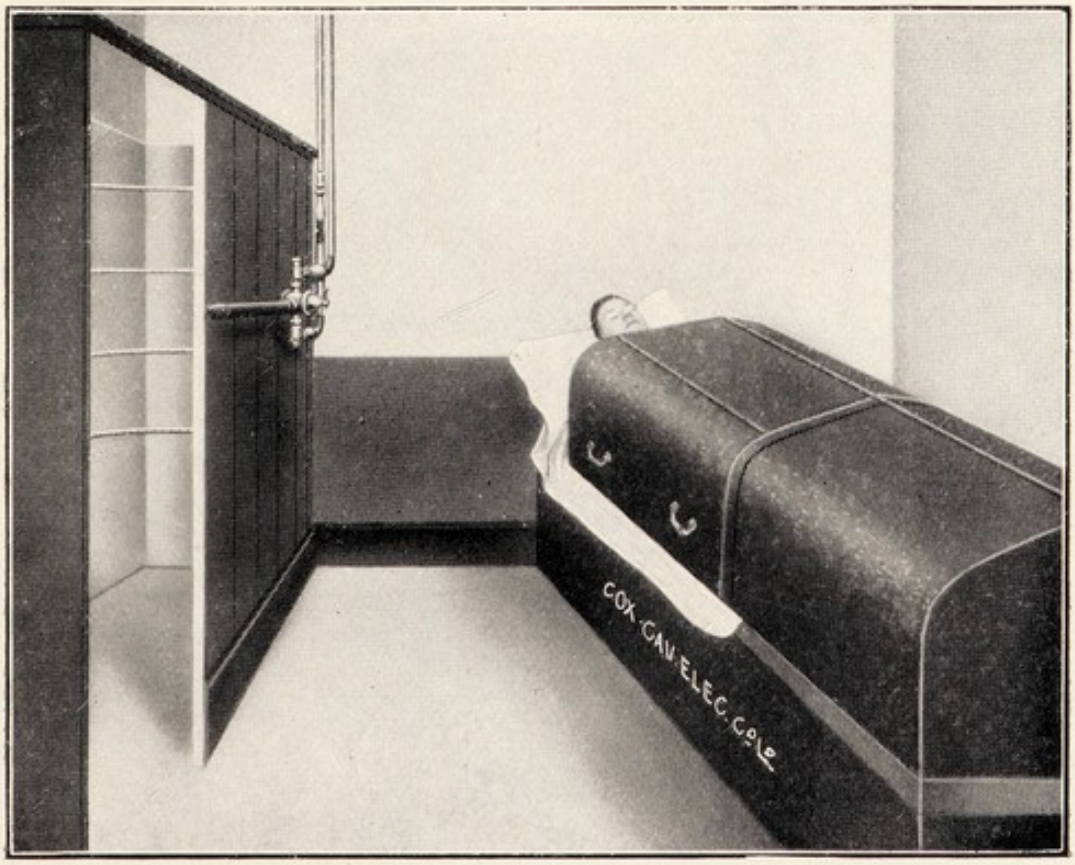
It is only when one comes to the actual administration that mechanical difficulties appear.

Steam is the most convenient agent, but it contains an excess of moisture and coarse particles which condense on the patient's skin. Steam also invades the room where the treatment is given and does serious damage to walls and ceilings when a number of baths are given consecutively. In the thermal couch, used at the Lansdown Hospital, I eliminated the coarse particles of steam by filtering the steam through half a dozen blankets before it reached the patient, and this was quite efficient, although more steam was produced in the room than was desirable. It was only after a long series of experiments that I devised the method of harnessing steam to our exact requirements.

The steam is admitted into a flat condensing chamber about an inch in diameter, where it



THERMAL COUCH FOR PYRETIC TREATMENT (PATENT No. 248190).
Showing cover open ready to receive patient for pyretic treatment.



THERMAL COUCH WITH COVER CLOSED.

condenses and flows back to the boiler. This heats the condenser, and according to the area of its surface we can obtain the exact amount of heat we require.

By placing a certain number of small holes in the condenser we can allow just sufficient vapour from the condensed steam to escape as will give us the exact amount of moisture required. Having regard to the "improvements" made on my previous appliance, I have patented this mechanism. The Cox-Cavendish Electrical Co., Ltd., 105, Great Portland Street, W., have carried out the construction most admirably. Baths constructed on this principle leave nothing to the skill of the bath attendant, for, so long as the water boils, the exact proportion of heat and moisture is automatic.

In the pyretic couch, as used at Lansdown, the condensers are placed beneath the patient's body and on either side of it, so as to avoid too much heat to the spine.

The patient lies on blankets, supported by a wire mattress. A fixed metal cover is placed over the couch, this cover being hinged so as to lift up for the ingress and egress of the patient from the bath.

The boiler is self-filling, so that all danger from the nurse forgetting to turn off the heat is

avoided. It is heated by electricity when available, but gas or even an oil lamp may be used.

The bath is heated for about half an hour before use, and then the patient finds the couch comfortably warm.

The end of the cover is closed by a blanket or quilted wrapper, which is wrapped under the shoulders.

The tendency of the heat is to accumulate, so that it is undesirable to start with it too hot, and as the heat increases it is better to turn down the heat to the boiler. It is sometimes difficult to make nurses understand that too great heat hinders instead of hastens results.

When perspiration appears freely on the forehead, which occurs in fifteen to twenty minutes, the temperature of the patient is taken, the cover of the couch is thrown back and the patient covered with a bath-sheet and blanket while the reactions are taken. We usually take the reaction of the skin over the forehead, the chest, palms of the hands, and soles of the feet with litmus paper, coated on only one side. The patient then has a needle bath or spray, or if this is not possible, a sponge bath.

In very infirm patients they can be sponged down on the couch.

The patient is then wrapped in a bath-sheet

and covered with a blanket while he rests and dries.

When a number of patients are being treated, a second bath may be given whilst the first patient is resting, so that it will be found convenient to have two or even three dressing-rooms to one couch.

The Moist Air Bath.—This is practically a metal cover which can be placed over the patient as he lies in bed.

The cover has a condenser at each side of its interior, and steam is admitted to these condensers by a couple of pipes attached to a boiler at the foot of the bed.

The boiler may be heated by an ordinary oil lamp so that the appliance can be used anywhere and under any conditions.

The escape of vapour is arranged by small holes in the condenser, and this vapour is invisible.

The enormous advantage of this appliance is that it may be given on the bed on which the patient sleeps, because, unlike steam, it will not saturate the bedding, and also no steam escapes into the air of the room, a fact of great importance when the appliance is used in a hospital ward. It is also quite silent in operation. The heat of the bath and the amount of moisture

being automatically regulated, no special skill is necessary.

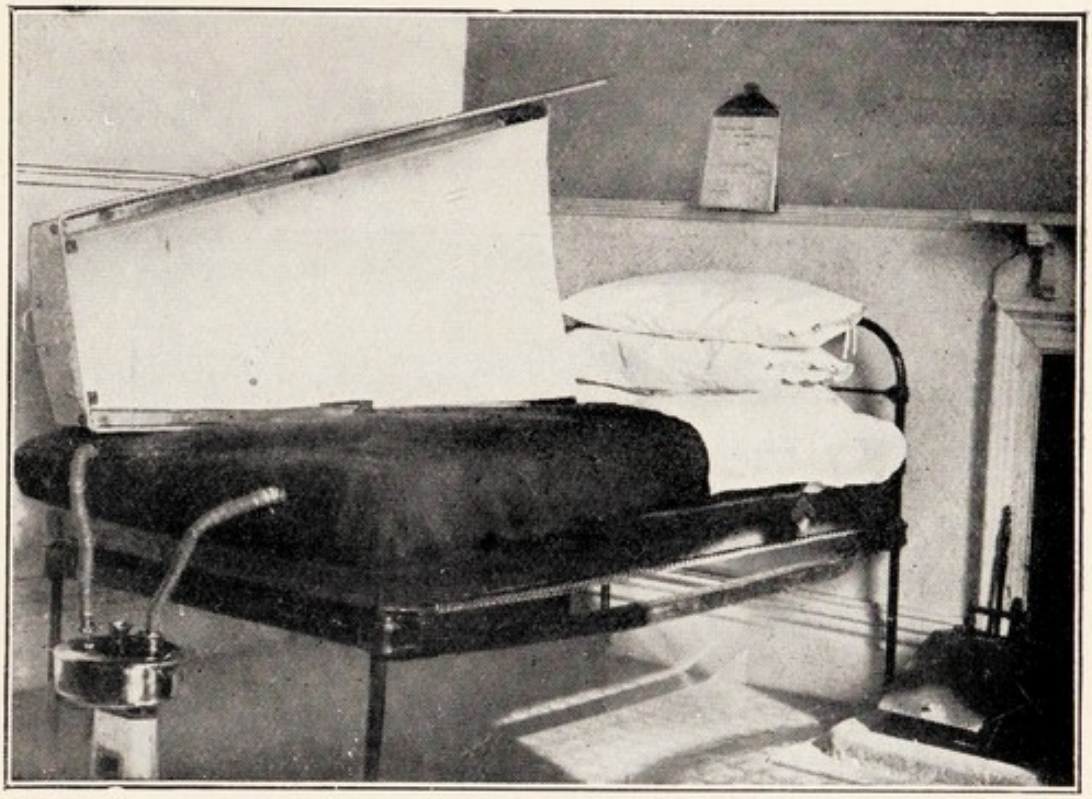
The bed-clothes are taken off the bed, which should be covered by a mackintosh sheet or ground-sheet. The water should be boiling before the cover is applied. The stopper of the boiler should be removed to prevent steam passing through the pipes until they have been attached to the cover.

The patient, enveloped in a bath-sheet, lies on the bed, and is covered with a blanket folded in four to preserve warmth until the bath heats up. The blanket is then removed.

The bed-clothes and blankets should be placed on the cover to conserve the heat, and a blanket is brought from the top of the cover and placed round the neck and shoulders of the patient so as to cover in the open end of the bath.

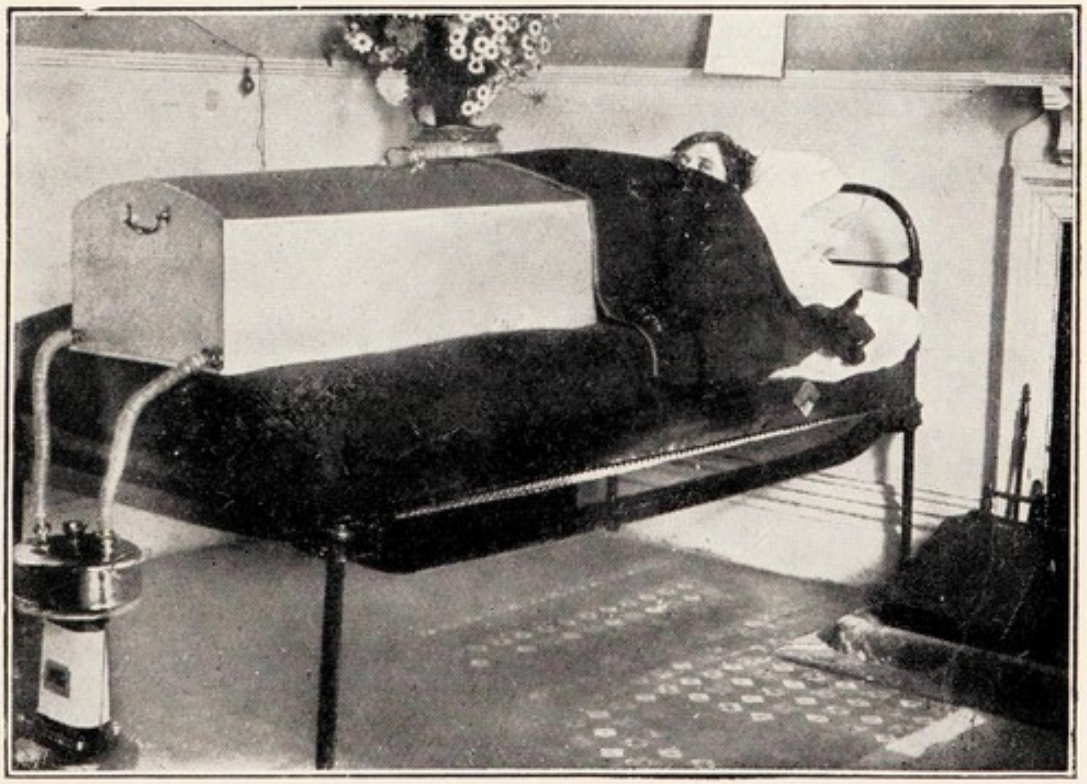
When the bath is finished, the lamp is turned out, the steam pipes unscrewed, and the bath turned on its side, as shown in the illustration.

Another way of giving the bath is to heat it first and then, having removed the stopper from the boiler, unscrew the steam pipes and turn it on its side. The patient then lies down, the cover is replaced over the patient, and the steam pipes attached, the stopper being replaced in the boiler.



THE AUTO-CONDENSING MOIST AIR BATH (PATENT NO. 248190).

Turned on side to show interior. Pipes disconnected. (See pp. 52–53.)

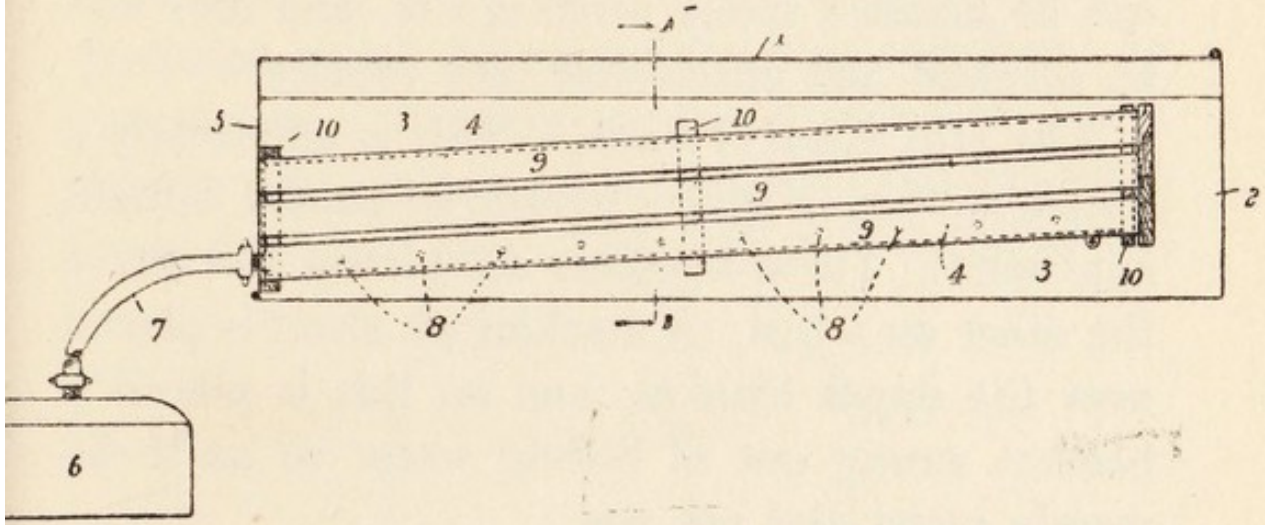


THE AUTO-CONDENSING MOIST AIR BATH (PATENT NO. 248190).

Showing pipes connected from boiler to bath. (See pp. 52–53.)

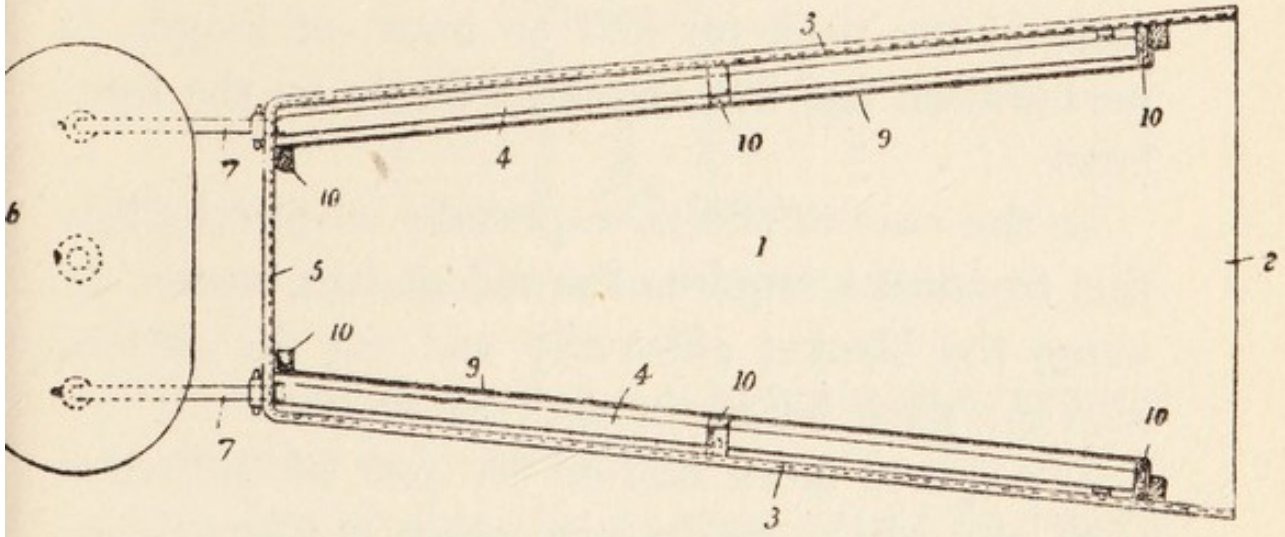
THE COMBINED FOOT AND VAPOUR BATH FOR PYRETIC TREATMENT.

Patient is enveloped in quilted wrapper with the feet in hot water. Moist air rises to the body from the material placed over hot air chamber. (See pp. 55–58.)



SIDE ELEVATION OF AUTO-CONDENSING MOIST AIR BATH.

Showing boiler pipes and condensing tubes.



PLAN SHOWING DESIGN OF AUTO-CONDENSING MOIST AIR BATH.

1, Metal cover; 2, open end; 3, longitudinal sides of bath; 4, condensing tubes; 5, closed end of condensing tubes; 6, boiler; 7, connecting pipes; 8, perforations in condensing tubes for percolation of moist vapour; 9, protective, non-heat conducting strips; 10, battens for securing strips.

The steam pipes are covered with asbestos, and can be handled freely while in use, and they can be screwed and unscrewed very rapidly.

The Hot Blanket Pack.—This is apparently a simple method of giving pyretic treatment without appliances. Three blankets are placed one above the other on a bed. A mackintosh sheet is placed over the upper blanket, and on this is placed a blanket wrung out of boiling water so as to be merely moist and not wet.

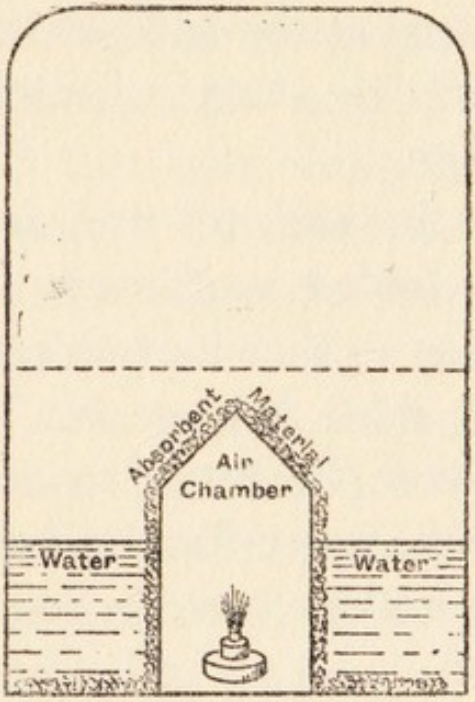
The patient is placed in the centre of the blanket, and each blanket in turn is wrapped round him so as to exclude all air. A hot-water bottle is placed at the feet. He is allowed to remain in the pack for half an hour, or longer, if perspiration has not appeared freely on the forehead.

In the case of adults, especially when crippled, this treatment requires the aid of two nurses, to wring the blanket efficiently and put the patient into the pack before it has time to cool.

It requires more skill on the part of the nurse than any of the treatments where appliances are used, when only one attendant is necessary.

But the hot pack is a most valuable remedy for infants with either rheumatism, convulsions, or concussion, because everything is smaller to handle, including the patient.

Vapour Baths.—The domestic vapour bath is really a steam bath, the steam being admitted, or produced, some fifteen inches from the floor. In consequence, the feet are not exposed to it and remain cold. In all our experiments the feet have more acid than any other part of the body, and



COMBINED FOOT AND VAPOUR BATH.

retain it longer, so that a treatment which leaves out the feet is undesirable.

One can obviate this to some extent by having a foot-bath in conjunction with the vapour bath, but steam is always undesirable because the coarse particles condense on the skin and by their evaporation tend to cool the surface, and they are also cumbersome and not free from

danger. It was consideration of these points which led me to devise the following appliance for domestic use :

The appliance only occupies a floor space of 18 by 21 inches. It will be seen by the diagram on p. 55 that the foot-bath is divided into two parts by a central air-chamber.

A sliding panel at the back of the bath permits of a spirit lamp or electric heater being placed in this chamber.

To prepare the bath for use, an ordinary bed-room towel is folded lengthways and hung over the air-chamber so that its two ends fall into the bath on either side. A large can of hot water is then poured over the towel so as to saturate it and also provide water for the foot-bath. Water should be as hot as can be comfortably borne by the patient.

No care is necessary to apportion the water between the two baths, as they are connected by a tube.

When this has been done, the spirit lamp may be lighted, *not before*.

It is advisable to cover the front of the bath with a blanket and leave it for five minutes before use.

It will be understood that as the walls of the air-chamber become heated they will cause the

towel to give off a large amount of vapour at a moderate temperature, which differs materially from the steam derived from boiling water.

The object is now to secure that this vapour shall envelop the patient's body instead of heating the surrounding atmosphere or the chair on which the patient sits.

The patient should be enveloped in an ordinary bath-sheet, and then, preferably, use the quilted wrapper, which has been designed for use with the appliance and is furnished with tapes which enable it to be drawn closely round the neck.

The patient should then sit on a chair of convenient height, about one foot away from the front of the bath. The feet are then introduced into the bath, which is drawn close to the patient.

The lower end of the quilted wrapper is then drawn up to the ledge, in front of the bath, and folded over the top of the bath, and fixed by the tapes provided. When this is done, none of the vapour escapes.

If at any moment the bath should be too hot, the patient, by releasing a ring from a bolt, can shut off the air supply to the lamp and reduce the heat.

In practice this is seldom necessary, but the provision gives confidence to the patient.

An india-rubber hot-water bottle placed at the

patient's back adds to the efficiency of the treatment.

All these appliances are manufactured by the Cox-Cavendish Electrical Co., Ltd., 105, Great Portland Street, London, W.

CHAPTER V

THE JOINT SYMPTOMS IN RHEUMATIC DISEASES

ANY person, regardless of age or sex, may suffer from an accumulation of acid and waste products in the tissues, but the symptoms which result will vary with the condition and constitution of the individual patient.

We try to express these varied results by the use of a number of names, chiefly ending in "itis," which signifies that the joint, or fibrous tissue, is suffering from inflammation.

This is unfortunate, because it is the absence of inflammation which renders these conditions difficult to cure and causes them to become chronic.

An exact nomenclature is difficult because each case represents the result of a number of factors, secondary to the rheumatic condition, which vary in the individual. If we take the case of a robust man, accustomed to hard physical labour, the result of the acidosis of his tissues will show itself in the gradual stiffening of his fibrous tissues, causing an increasing incapacity to use his joints. The secondary effect of this is for the disused

muscles to waste, and the joints may appear to be enlarged as a consequence. But although this condition may continue for years, and because the flexor muscles are so much stronger than the extensor, the limbs become flexed, there is no actual swelling of the joints, neither is there any destruction of the articular surfaces. Also, in spite of the great excesses of acid, there is no involvement of the valves of the heart. Such cases are usually diagnosed as "arthritis" and pronounced incurable.

Chronic rheumatism is a more satisfactory definition, and because there is no destruction of joints, and it is possible by pyretic treatment to remove the acid products from the tissues, they are not incurable.

Both time and labour are required to overcome the contraction of the limbs and restore the functions of the muscles, and success largely depends on the efforts of the patient to assist the remedial measures. This is often rendered difficult by the absence of all belief in recovery, because the patient has been told so many times that cure is impossible.

Another case in which the tissues are invaded by acid may be a young man or woman of a more or less debilitated type. It will be observed that the muscles have no resiliency and tend to

waste before the joints are attacked, that almost directly trouble in the joints develops destructive changes commence. The valves of the heart may be not affected, but there is great cardiac irritability. There is actual swelling of the joints attacked, and this swelling is soft and compressible ; it gives the idea that some lymph had been exuded round the joint, but not to that degree which we find in joints affected by the gonococcus. In the small joints of the hand the swelling is not rounded as in gout, but shades off so as to give a fusiform shape.

In these cases destructive changes take place so rapidly that the removal of the acid from the tissues is a matter of great urgency.

In young children of both sexes, with acidosis of the tissues, it not infrequently happens that before any symptoms occur which are recognised as rheumatic—at the most some fugitive pains, which are described as "growing pains"—the valves of the heart become permanently affected. In cases where there is a reaction against the acidosis and rheumatic fever develops, the heart is frequently attacked at a very early stage.

Here we have a most important problem. The patient suffering from chronic rheumatism or gout may have an intense acidosis lasting for months or years without the heart becoming affected or

any destructive changes taking place in the joints, and yet in a certain class of patients these events follow the condition at a very early stage.

I think the explanation of this problem will be found in my experiments with lactic acid. Even in dead muscle and tissue lactic acid, except in great excess, never produces destructive action upon tissue. Its affinity is for the lacto-phosphate of lime of the cell wall, or inter-cellular substance, which is able to take up and hold a very large amount of lactic acid and in this way prevents its action on the cell. This happens in the case of the most delicate structures; thus the cornea may be invaded by a large excess of lactic acid without in any degree affecting its transparency or injury to its cells.

I think we may say with some certainty that it is the lime in the cell wall of the tissues which prevents lactic acid from causing destructive changes in the joints.

We know that in young children, and also in debilitated persons, there is a great absence of lime in the tissues. Clinically we can recognise this by the lack of resiliency in the muscle. If we compare the firm, resilient muscles of the chronic rheumatic patient, in spite of their having wasted, with these subjects, we recognise this.

It is a matter of urgency in all such cases

to administer lime as a protective, and my theoretical conclusions are amply supported by my clinical experience.

I am confident that if, in the malaise which precedes rheumatism in children, and which may be distinguished as due to this by the acid state of the skin, pyretic baths with the internal administration of lime salts were adopted as a routine, the problem of heart disease in children would be solved.

The condition of the finger-joints is a great aid to the diagnosis of rheumatic complaints. Thus, in chronic rheumatism, there is flexion of the joints without swelling; in rheumatoid arthritis there is a soft, elongated swelling of the joint; in certain types of gout hard nodules appear round the joint, which do not necessarily prevent free movement of the joint. Such patients are usually of a good constitutional type with a good family history and may never suffer from an attack of acute gout. I mention this because I have seen many of these cases diagnosed as "arthritis" and treated with vaccines and extraction of teeth. The septic theory has much to answer for.

In the condition which I think may be properly described as "rheumatic gout," there is a general thickening and swelling of tissues round

the joint. This occurs in cases where minute concretions have existed round the joint and then a sub-acute attack of rheumatism has set up a process of resolution in these concretions, causing swelling and irritation of the tissues.

These cases are usually diagnosed as "arthritis," but can be readily distinguished by the fact that the joint never undergoes destructive changes and that the patient is of a sound constitutional type.

Closely allied with this condition are cases where the swelling and puffiness extends to the whole hand. In such cases thyroid deficiency may be suspected as a factor in the condition. This may often be confirmed by an examination of the ankle-joints, which may exhibit myxœdematous swellings.

But it is not always wise to base a diagnosis on the appearance of the finger-joints alone.

I have seen a number of cases where, during an attack of acute rheumatic gout, one or more of the small joints of the finger have undergone destructive changes, but no other joints have become affected during the lifetime of the patient. Usually they are of good constitutional type, and a diagnosis of arthritis, based on the condition of these particular joints, would be misleading.

Neither would it be correct to say that a patient has no gout because no nodules appear round the finger-joints. In a large number of cases they never appear.

The knee is the largest and most exposed joint in the body, and, further, it has to bear the weight of the body when it is bent at all angles.

It is therefore not surprising that in all chronic rheumatic conditions it occupies much of our attention. It is important to distinguish between those cases where the knee is affected as a part of a general condition of the joints and those where the knee-joint is alone affected.

Most of the chronic cases of knee trouble which come under my notice are diagnosed as "arthritis," but I doubt if a true arthritis ever commences in the knee, and remains the only joint affected.

I have seen many cases of destructive changes in the knee, where the other joints have remained unaffected, but such cases have been due to the neglect of chronic synovitis primarily due to an injury. It is because of the unfortunate results of this neglect that I think the diagnosis of "arthritis" in any case, where the knee is alone affected, should be regarded with suspicion.

Many of the cases I have seen have taken a good deal of surgical advice before coming to me.

The history of most of these cases is that some slight sprain or injury has set up a synovitis of the joint with effusion of fluid. Under ordinary circumstances this fluid is reabsorbed as the inflammation diminishes, but it happens that this does not always take place. The inflammation subsides, but leaves a small amount of fluid in the joint. In the absence of inflammation there is no tendency to its reabsorption ; it remains as a foreign body, causing more or less pain on walking, and especially when going downstairs or down a hill. Physical examination, as ordinarily adopted, does not show a trace of this fluid, because when the patient is lying in the horizontal position quite a large amount of fluid will disappear into the bursa behind the knee. To ascertain the existence of fluid it is necessary to examine the knee with the joint flexed to its fullest extent. Then, if it is present, it will cause distension on either side of the ligamentum patellæ. When the existence of fluid is recognised it is a great waste of time to try and remove it by painting with iodine or ionization, which is most often ineffectual, because immediate results are obtainable by blisters placed over the site of the swelling.

To obtain the best results, it is important to have the blister of proper size in relation to the

amount of the fluid expected, and that it should be placed immediately over the site of the distension when the knee is flexed. In no case should it be less than two inches in diameter, and one will be required on either side of the patella ligament. If the blister is too small, there is the chance of its bursting, and it is of great importance to keep the skin intact. For the same reason it should be covered, when applied, by a thick layer of wool. When the blister is removed, twenty-four hours later, and the fluid evacuated, it is best dressed in the following manner :

A thick pad of cellulose wadding, or lint—the former is preferable—should be made large enough to overlap the blisters by an inch on either side.

This should be laid on a towel and a mixture of glucose and hot water—one in five—poured upon it until saturated ; the towel is then folded over it, and by the pressure of the hands all superfluous moisture is removed. This is laid upon the blisters and covered with a piece of gutta-percha tissue, much larger than the pad, so that when covered with cotton-wool and a bandage all air is excluded. After twenty-four hours the dressing is removed and is found to be saturated with fluid, which has been extracted by endosmosis, and the blister is healed.

In many cases I simply apply dusting powder and cotton-wool at this stage, but where there is a large amount of fluid I repeat the glucose dressing for another twenty-four hours.

It is necessary that the patient should rest in bed for four or five days after the application of the blister.

The detection and treatment of fluid in the elbow and ankle-joints is often a means of clearing up conditions which have proved intractable.

Another and frequent cause of "arthritis" of the knee-joint which has resisted all treatment is that during the treatment the patient had been walking on an inflamed or congested joint and so gradually became worse.

The first step in examining a joint is to place the palm of the hand upon it to make sure of the absence of heat, and, if in doubt, compare it with the opposite knee. If this is done, as a matter of routine, such mistakes are avoided.

There appears to be an impression that when a joint is called "arthritic" the ordinary surgical rule of absolute rest for an inflamed joint may be disregarded. This is not so; but, while the patient is resting the joint in bed, a few passive movements of flexion and extension with care to see that the limb is fully extended is beneficial and necessary.

This brings me to one of the commonest conditions we have to treat in chronic cases of rheumatism—contracted knee-joint.

The tendency of all inflamed knee-joints is to flexion, and because it is more comfortable to the patient, frequently a pillow is placed under the knee. That this leads to a permanently flexed and contracted joint is inevitable. Every nurse should be instructed to gently move the joint at least once daily, fully flexing it and then bringing it to the fully extended position. When difficulty is experienced on account of pain a Macintyre splint should be used and slowly screwed to the extended position for a short time each day.

I see a number of cases who have been treated at first-class hospitals where the patient has walked into the hospital, and after prolonged treatment has been carried out with the limbs flexed and a helpless cripple.

No attention appears to be paid to posture; the patient is allowed to lie in any position which is most comfortable, regardless of consequences.

I use a simple method in the treatment of contracted knee-joints, without splints, which I try to avoid as far as possible.

A bolster, two feet in length and six inches in diameter, is stuffed very tightly. This is placed under the patient's legs just above the ankles.

The effect is that the weight of the limb becomes an extending force and tends to straighten the limb. At first the patient will only be able to bear this for a short time, but after rest and a few flexion and extension movements of the limb he can resume and so repeat the process many times a day. This is possible because all the nurse has to do is to place a bolster or remove it.

In some cases I increase the effect by hanging a sand-bag above the knee and increasing the weight as required. There are cases where it is necessary to stretch the tendons and break down the adhesions, under an anæsthetic. I think that in every case of this kind the bulk of the acid should be removed from the tissues, by pyretic baths, before this is undertaken. Also, that the joint should be prepared for it by continuous moist compresses, to which bicarbonate of soda may be added, for some days prior to the operation. The surgeon should be careful not to abduct the limb at the moment of operation, so as to draw it nearer to himself. I always employ a nurse to grasp the limb above the ankle and keep it in a straight line, and at the moment of operation pull strongly upon it. This leaves the operator with both hands free to gently press the joint into position.

If the joint, when straightened, is put into a

splint, it causes excessive pain. Personally, I use a very bulky hot fomentation, some fifteen inches broad, which acts as a splint, but does not prevent the knee from drawing up again to some extent. As the knee is useless until the muscles have been restored to action, the final straightening can best be obtained by resisted exercises.

In a recent case dismissed from a leading London hospital as incurable, the contracted knee-joints had been broken down and then put into a splint until they had become rigid in the extended position.

This meant that a young man was condemned to lay on his back for the rest of his life. I was able to restore the movement eventually, but it is a condition to be guarded against, as an extended knee-joint is more crippling than a contracted one.

CHAPTER VI

PAIN AS A SYMPTOM IN RHEUMATIC DISEASES

In some of the most painful forms of rheumatism the joints are not affected.

These conditions have been described under the names Muscular Rheumatism, Myalgia, Fibrositis, Lumbago, Sciatica, Neuritis, Pleurodynia, etc.

For purposes of treatment we can classify these disorders as follows :

1. Rheumatism of the fibrous tissues of the muscles or tendons—*e.g.*, muscular rheumatism.

2. Rheumatism of the nerve sheaths—*e.g.*, sciatica.

3. Reflex pains, secondary to inflammation of joints.

The first class of disorders are easily diagnosed by the fact that acute pain is excited by any movement which brings the affected muscle or its tendons into action.

Thus, in lumbago, acute pain can be excited by flexing and extending the body.

This will not happen in many cases called "lumbago," and then we must look to some

other cause of pain in the back, and there are many.

Of late years it is quite common to find cases of muscular rheumatism diagnosed as "neuritis." One medical patient was quite angry with me for diagnosing his "neuritis" as muscular rheumatism. He did not believe that muscular rheumatism could produce the intense pain from which he suffered, and quoted the opinions of four very eminent physicians who had diagnosed his case as "neuritis." But he had to admit that not one of them had made any physical examination. Muscular rheumatism can be a very painful affection, and without pyretic treatment may last for many weeks. Especially is this the case when it affects the intercostal muscles. In a recent case the pain had continued for months and, owing to want of sleep, the patient had lost considerable weight. Almost immediate relief was given because, in addition to pyretic baths, the surface of the affected muscles was covered with a layer of cotton-wool recently warmed; over this was placed a layer of gutta-percha tissue, large enough to overlap the wool, and the whole supported by a domette bandage.

It is remarkable the relief which this gives to all cases of muscular rheumatism when it can be applied. The gutta-percha tissue adheres to the

skin and forms, and prevents the escape of, the insensible perspiration, which accumulates in the wool. The result is much that of a continuous vapour bath. This method is also very useful in the treatment of painful joints.

Rheumatism of the Nerve Sheath.—Sciatica is an example of the severe pain which may occur from rheumatism of the sheath of a nerve. But there are two forms in which nerves are affected in rheumatic subjects. One is where, owing to a chill or the result of a strain, the circulation in the fibrous tissue of the sheath has become defective, with a consequent accumulation of lactic acid. This causes thickening of the tissue and consequent pressure on the nerve.

In this case there is no pain at the site of trouble, but pain at the points of distribution of the nerve. But the nerve exhibits a tenderness on pressure throughout its whole course. Of this the patient is wholly unaware. As the process of lactic acid accumulation may take months before it produces any symptoms, the accident or strain which caused the original mischief may be wholly forgotten.

When the same process takes place in the fibrous tissues of muscles and ligaments, there is a certain amount of functional activity which tends to restore the normal circulation. Thus

stiffness may remain for some time after a sprained ankle, especially if it has been kept at rest too long, but in time the tissues become normal.

But this does not happen in the case of the nerve sheaths, which are little affected by the physical activity of the body. When once invaded by lactic acid they show no natural tendency to recovery. An injured nerve, even if it does not give rise to symptoms, may remain tender for many years, and always be ready to produce pain in its area of distribution, if the patient should be over-fatigued or debilitated.

It is only when oxidation of the lactic acid takes place in the sheath that pain is felt at the site of injury.

If we remember that any spinal nerve may be subject to this condition and may produce pain or irritation at its area of distribution, we shall find an explanation of a great many painful affections which have been difficult to diagnose and more difficult to cure.

In cases described as sciatica, when the sciatic nerve is really affected, we may have three conditions present. The sheath of the nerve may be infiltrated with lactic acid, causing some stiffness behind the thigh, but pain is chiefly felt at the back of the calf and ankle. If rheumatism takes

place in the sheath, there is very acute local pain in the upper part of the thigh as well as the back of the leg. Flexion of the extended limb upon the body will elicit severe pain as the nerve is placed upon the stretch. In both cases there is tenderness on deep pressure at a point midway between the tuberosity of the ischium and the great trochanter.

A third form of sciatica may be found as a result of a severe fall in the sitting posture, causing injury of the sacral nerves. Here pressure on the sacral nerves will reveal the cause of the trouble. As electrical vibration over these nerves is an essential part of treatment in such cases, the importance of exact diagnosis is obvious. A very large number of cases sent me as sciatica have pain down the external cutaneous nerve as a result of injury to the lumbar plexus.

Such injuries occur with very great frequency, and are responsible for a large number of cases which have proved intractable because their nature has not been understood.

Injuries to the Lumbar Plexus.—When only one side is affected, it has been usually caused by a violent twist of the body, either in the act of falling or in the endeavour to save a fall. I have seen it also in gunners who have to rotate the body to receive a heavy shot, swing it quickly

to the opposite side to hand it on, and thus produce a strain on the lumbar nerves.

Not much pain is felt at the moment—anyhow, not sufficient for the majority of patients to remember the accident six months later.

But if the lumbar region is examined at any time subsequent to the accident—it may be years after—a tender point will be found over the affected nerves. Of this the patient is wholly unaware.

Usually the anterior crural nerve is injured, and tenderness will be found over the course of both the external and internal cutaneous nerves in the thigh. The external nerve is conveniently examined by taking a line from the great trochanter to the external condyle of the femur and pressing the finger about the middle of this line; the internal nerve by pressure on the inside of the thigh about six inches above the internal condyle. In these cases acute tenderness will be found over both these points, although the patient is not aware of it.

It may be suggested that as the patient is not aware of the injury, and has no pain, Why trouble?

You will find a reason for it if you have a patient who, whilst walking in the street and feeling perfectly well, finds the knee suddenly give

way, which may have more or less serious consequences. This may occur at intervals. If you find tender points at the places I have indicated the nature of the case becomes clear to you. The integument of the knee-joint is supplied by the internal and external cutaneous nerves, and if they have a permanent diminution of function, which their tenderness indicates, there will be similar loss of function in the knee-joint, although not sufficient to affect ordinary movements under normal conditions.

In only one case I have seen this symptom occurring within twenty-four hours of the accident. Then, the moment the patient stood on the affected limb it collapsed under her. Several surgeons were worried about the case, and were surprised when I pointed out that the lumbar plexus was the site of injury.

Another type of case due to this condition is apt to cause worry.

A patient, with no great tendency to rheumatism or gout and perfectly healthy, suffers frequently from pain and swelling of the knees produced by very slight provocation. The knees yield to treatment, but there is a tendency to recurrence.

When you find tenderness over the cutaneous nerves in such cases, you may be sure you will

find the point of tenderness in the lumbar region. It is only by restoring the normal functions of these nerves that cure will be obtained. This condition may be complicated by gout or rheumatism in the joint, and in such cases there is great danger of defective nutrition leading to destructive changes in the joint. The examination of these nerves should be a matter of routine when diagnosing knee-joint cases. But in some cases these two nerves are the subject of acute pain, especially the external cutaneous, and is usually diagnosed as sciatica.

In chronic cases of injury of nerves, I find electric vibration, followed by deep friction across the nerve trunk, until the part is warm to the touch, the best general remedy. Vibration over the site of pain will be useless. It must be applied to the trunk of the nerve as close to its exit from the spine as possible.

In respect to the class of cases last mentioned, I may point out that pain on the inside of the knee, above the internal condyle, is a frequent symptom of the reflex pain of hip disease, but in these reflex pains there is no tenderness over the surface of the nerve, therefore exact diagnosis is easy.

But in some cases of injury of the lumbar plexus, rheumatism appears in the sheath of the nerve

and causes acute pain in the lumbar region. In most of these cases, the gluteal nerve is apparently involved, either directly or indirectly, and there is swelling and spasm of the gluteal muscles. The hip appears enormously enlarged, and the pelvis may be drawn up so as to cause shortening of the leg.

All the cases I have seen have been diagnosed as arthritis of the hip, but a little reflection will show that in no case of arthritis could we have enormous swelling of the hip, with shortening of the limb, within a few weeks or months. Neither do we see in such cases this spasmodic condition of muscle. In many cases the swelling of the muscles and tilting of the pelvis remains to some extent after the acute symptoms have subsided, causing the limb to be shortened.

In one case, the attack came on suddenly in a young girl. I did not see her until twelve years after. Then she was wearing supports for lateral curvature of the spine, a high boot of four and a half inches, with irons to support the ankles.

She was then a delicate young woman, suffering from neuralgia and worn out by the weight of the machinery she had to drag about with her. My suggestion that the case was probably curable appeared to infuriate her local doctor and the

orthopædic surgeon who had treated her for twelve years. The parents told me that they wished me to treat her for neuralgia and to leave her infirmities to the specialist who was in charge of them.

After lying in bed for six weeks, with treatment to the injured lumbar nerves, the spasm subsided, the spine became straight, and the legs of equal length.

I saw her ten years later, and she was a healthy woman leading an active life.

In many cases the lumbar plexus is injured on both sides simultaneously. This, usually, is the result of lifting a heavy weight with the body in a flexed position.

Nurses doing private work are very liable to it. It does not occur so frequently in hospitals. The reason is that in hospitals the bed is narrow and the nurse does not have to bend forwards in lifting, as is the case where a broad or double bed is used. I mention this because the medical practitioner should never allow a nurse to lift a heavy patient on a broad bed. I have seen so much of the mischief which has resulted.

Bending over to lift a heavy trunk can easily cause strain of both lumbar plexi.

Injuries of the Brachial Plexus.—The brachial plexus is liable to be affected by any exertion

which involves stretching of the nerve sheath. This most often occurs when the arm is extended above the head, such as straining to reach a high ball at tennis, throwing a fly with a heavy salmon rod, or even trying to pull down a high window sash.

As in the case of injuries to the lumbar plexus, pain does not develop at the time of the injury, but some time later.

The pain is not felt at the site of injury, but in the nerves of the arm, and frequently extends to the hand. We find tenderness over the nerves in their whole course. These cases are usually diagnosed as neuritis of the arm, and the same diagnosis is also applied to a wholly different cause of pain in the nerves of the arm, and accurate diagnosis is of importance.

If the fingers are gently pressed into the tissues of the neck immediately above the clavicle, starting at its acromion end, and gentle friction is made, the cords of the brachial plexus will be felt, and as the finger passes over the affected cord or cords, acute pain is elicited. This pain radiates to the lower part of the arm and fingers.

Further examination is made by placing the flexed hand into the axilla so that the cords of the brachial plexus may be distinguished with

the tips of the finger and gently vibrated like the strings of a harp. This will cause tingling down the arm and in the fingers in a healthy person, but acute pain when the nerve is injured.

In coming to the treatment of this condition, and the manipulation necessary, I am reminded of a letter I received from the late Dr. Joseph Bell, the eminent Edinburgh surgeon, many years ago. He sent me a young lady who had suffered from this disorder for over twelve months. Dr. Bell remarked that his medical friends had failed to give her relief, and he hoped that I might help her, but I was on no account to use massage, which had been employed with disastrous results.

The word "massage," as used in this country, means pinching and pounding the muscles by the hour or half-hour, and those employed do not spare themselves in putting much energy into the operation, while the patient keeps her eye on the clock to be sure that she has her full time. The result is that patients suffering from asthenic, which also means an irritable, condition of the nerves, often suffer greatly, and pain may be caused which takes a week to subside. Massage as understood in Sweden is a method of manipulation designed to accomplish a definite physiological purpose, and this may be achieved

sometimes in a certain number of minutes. The treatment of brachial neuralgia illustrates this point.

The palmar surface of the finger-tips are pressed into the neck, just above the clavicle, and moved to and fro until the affected nerves are reached, and then very gentle pressure friction is made by moving the hand rapidly over the surface of the nerve trunk. When this has been continued for a few minutes, the tenderness becomes less, and slightly firmer pressure may be made. After another four or five minutes it will be found that the tenderness of the nerve has practically disappeared, and the tissues feel warm to the touch. This ends the treatment, which is repeated daily. It will easily be understood that if the friction is too vigorous or too long continued, serious irritation may be set up.

In the case sent me by Dr. Joseph Bell the pain had quite cleared up by the eighteenth treatment.

When the symptoms have become less acute, gentle resisted exercises will help to restore the circulation in the arm. Of course, this treatment is accompanied by daily pyretic baths, because unless we take measures to remove the acid from the nerve sheath, the treatment might be indefinite.

In speaking of the necessity of great care in manipulating painful nerves, I am reminded of spasmodic torticollis, or wry neck, which usually comes from a local rheumatic condition of the spinal accessory nerve. This is the most sensitive nerve in the body, and whilst gentle friction over this nerve, with pyretic baths, is the best cure for this affection, very serious injury may be done by general massage of the muscles of the neck, during which this nerve suffers greatly.

I mentioned another cause of "neuritis" of the arm, and this is the more frequent.

The patient has acute pains in the arm, commonly worse near the insertion of the deltoid muscle, but extending down the arm to the elbow. A characteristic of the pain is that it frequently comes on worse just after the patient is comfortably settled in bed, and he wants to walk about to relieve it. This symptom may direct your attention to the possibility of some concretion in the shoulder-joint undergoing resolution. If you examine the shoulder and place your finger just under the coracoid process, you may find a point of acute tenderness, although the patient is not aware of pain at this point. Of course, the concretion may be at any part of the shoulder-joint, but the point I have indicated is most frequent.

The irritation set up by the resolution of the

gouty concretion causes reflex pains in the course of the circumflex nerve. These pains are never accompanied by any tenderness over the nerve conveying the reflex pain. This helps to distinguish them from injury of the brachial plexus.

In these cases, rest of the shoulder-joint is important in the early stages, the application of Lin. Iodi., and the dry wool compress so applied as to prevent the insensible perspiration from escaping. This can best be done by using gutta-percha tissue, to overlap the wool, and firmly fixed by a bandage, which should be carried under the opposite shoulder and across the chest.

At a later stage movements of the joint are essential, as no joint in the body becomes so rapidly stiff under conditions of disuse as the shoulder.

Pyretic baths are essential in the treatment of this condition, which is merely a symptom of the general state of the patient.

CHAPTER VII

ARTHRITIS OF THE HIP-JOINT

IN cases of rheumatoid arthritis, osteo arthritis, chronic rheumatism, and gout, the hip-joint is usually the last to be attacked, but in true arthritis of the hip it may be the first, and only, joint which suffers. This suggests that arthritis of the hip is a local disease due to local causes, although it is often complicated by a general rheumatic or gouty condition. As it is not a symptom of a constitutional condition to which the word "arthritis" is applied, and in no case is there any inflammation, the word "arthritis" is not very fortunate, especially as there is a real arthritis of the hip of a tubercular origin.

The literature on the subject is further complicated by the description of two distinct diseases under the same name. As these differ both as regards cause, pathology, and treatment, I propose to describe them as hypertrophic and atrophic disease of the hip.

Hypertrophic Disease of the Hip.—In most cases there is usually the history of a fall in which the great trochanter receives a violent blow. A

fall from a horse appears to have been the cause in a number of patients I have seen, but some severe strain upon the hip may be a cause, often forgotten, before symptoms appear. The first symptom is usually a feeling of stiffness about the hip on commencing to walk, but which passes off with exercise. Although the patient may have some pains in the thigh, the trouble is referred to the hip at a very early stage. The patient in his effort to avoid pain contracts the muscles of the hip so as to diminish the amount of movement. This favours the deposit of lactic acid in the tissues and also gouty concretions, if the patient is of the rheumatic or gouty type, and this increases the pain on movement.

This accounts for the great benefit that some patients receive from pyretic baths, not because it has checked the disease, but because it has restored the circulation in the affected tissues.

The condition present is one of hypertrophy and proliferation of the bones entering into the structure of the joint with the formation of osteophytes. Probably it commenced with a low grade of congestion as a result of injury, which may also have affected the enervation of the joint, and this, from continued pressure of the weight of the body on the joint has set up a continued irritation, to which the joint has responded

by proliferation of its structures. This condition has a definite object, which is to check pain by causing immobility of the joint. As the disease goes on the movement in the joint steadily diminishes, until at last we have anchylosis and freedom from pain. The patient is left with a stiff hip-joint.

In the early stage of hypertrophy of the hip, the patient can flex and extend the limb freely. It is the movements of abduction and rotation which disclose the impairment of movement. In rheumatism of the structures round the hip, flexion of the thigh upon the abdomen elicits pain behind the joint. In sciatica we have the tender point on deep pressure at a point midway between the great trochanter and tuberosity of the ischium, and also pain elicited when the extended limb is flexed on the abdomen, the pain being felt at the back of the thigh. Limitation of the movement of abduction occurs in spasm of the adductor muscles, but here there is no pain in the hip on walking, but if this condition is associated with some peri-articular rheumatism it may render the diagnosis difficult. But rheumatism of the fibrous tissues or muscles round the hip is usually disclosed by tenderness on deep pressure over the joint, but this is absent in cases of arthritis.

It may occur to the reader that the easiest way to clear up the diagnosis is by an X-ray examination.

I have seen a large number of radiographs of patients suspected of arthritis in which the diagnosis has been confirmed by a radiograph, but the joint was perfectly healthy. I have seen cases where the X-ray plate conveyed the idea of complete anchylosis, although the patient had perfect freedom of movement in all directions.

The hip-joint is deeply seated and surrounded by the capsular ligament, and other fibrous tissues which may be the site of calcareous concretions, which appear in photo as if they were outgrowths or irregularities in the bony surface. I make a rule to never examine the X-ray plates, which patients bring, until I have completed my physical examination.

Of course, in advanced cases no difficulty occurs, but then we hardly need the X-ray to confirm our diagnosis. The patient with hypertrophic disease walks with a stiff hip, not altogether due to the disease, but to a contraction of muscles with a view to avoiding pain. He also walks with a stiff knee-joint, not because the knee is stiff, but to avoid the movement of the hip which lifting the knee causes. He carries his

stick in the hand on the opposite side to the hip affected.

During the progress of the disease there is no object in altering these conditions as they assist anchylosis, but when this is complete it is important to teach the patient to avoid the acquired habit by making him take a long step, the foot being raised several inches from the ground. In this way he recovers his walking power to a considerable extent. There are hundreds of such cases limping through life who with a little instruction could be made to walk with a very slight trace of their infirmity.

Atrophic Arthritis of the Hip.—In hypertrophic arthritis of the hip, anchylosis is the natural result. In atrophic arthritis it never occurs. This makes it of very great importance to distinguish between the two diseases, or very great pain and suffering may be caused.

The disease is particularly slow and insidious in its onset. It has been described as morbus coxae senilis, which conveys the idea that we need not expect it until the patient is of an advanced age.

I think this is because it is seldom recognised until it has existed for many years. I have seen it in many patients between forty and fifty.

At first the patient may be able to walk a con-

siderable distance without pain, but at night, pains radiate down the thigh, and it may be a long while before the patient connects the pain with the act of walking.

In some cases the pain is chiefly felt in the knee.

I saw one man who had been treated in two hospitals for pain in the knee without benefit, who was suffering from atrophic disease of the hip.

I noticed that although the right knee was affected, he used his walking stick with the left hand; this was convincing proof that the right hip was affected before I made my examination.

In the early stages there are no physical signs; it is rather the presence of pain in the absence of them that makes one suspicious. There is no crepitation, no tender points, either around the joint or over the lumbar plexus, and no movement of the joint will elicit pain, and movement is wholly unimpaired.

After a time we may notice, as the patient rises from a chair, there is a slight pause before the first step is taken, but the patient may not be conscious of it. Next, pain may be experienced at the beginning of a walk, which disappears after a very short distance has been covered, and the rest of the walk is free from pain. But the longer the walk, the greater the

pain at night. It is only at later stages that the pain is referred to the hip, and then it is weakness rather than pain that is complained of.

With the advance of the disease the pain and lameness increase, the leg becomes shortened and the foot everted, and there is often severe pain at night. But the movement of the joint is unrestricted. The symptoms are primarily due to atrophy of the head of the femur, which has to bear the whole weight of the body on a limited area of bone.

From the examination of the history of a large number of cases, I think that the disease is caused by a primary pressure on the obturator nerve, a branch of which supplies the head of the femur.

In many cases where the left hip is affected I have found a history of chronic constipation, or, rather, a loaded lower bowel, the whole contents of which were never discharged.

In one case on the right side there was the history of an abscess following appendicitis, which had existed for some time before surgical measures were taken for its removal.

It is only when atrophic disease of the hip is recognised in its early stages that it offers any chance of permanent cure, and then one is faced with a very grave difficulty. The patient is able

to walk about and enjoy life and is only troubled by some nocturnal pains which are apparently rheumatic. We have to insist on a period of absolute rest, to be followed by a life on crutches over a long period. The only chance the patient has is to keep the weight of the body off the hip. For many years I tried appliances which I designed for this purpose, but finally concluded that crutches were more effective.

It is very natural that patients should resent the proposed treatment, but they will learn that it is the only way to avoid freedom from pain, a pain which will steadily increase unless it is carried out. If the patient continues to walk on the diseased hip, the limb will gradually shorten and the foot become everted, but anchylosis will never take place.

The rest required for the hip is not the same as if there was inflammation ; all that is required is rest from the pressure of the body on the head of the femur.

When the patient is in the horizontal position, exercises of the hip should be encouraged. The patient may be taught to describe a circle with the foot, say, six times, and repeat this several times a day. Vibration over the third and fourth lumbar nerves will stimulate the nutrition of the joint. Ultra-violet rays to the lumbar region, and

baths to remove any rheumatic or gouty condition which may follow the enforced rest, are all desirable.

The continued use of small doses of calcium has undoubtedly done good in many cases, and also thyroid extract when indicated.

Even if we fail to cure by the enforced rest of the joint, we are doing the one and only thing which will save the patient pain, and at any rate diminish the advance of the disease.

I was asked to see a patient, by a London consultant, who had some trouble with her hip and who had tried every kind of treatment, both at home and on the Continent, without benefit. I recognised the patient as a lady who had consulted me five years previously. I explained to her, fully, that rest of the hip was the essential treatment either for cure or relief. She promptly sought other advice and continued one treatment after another, during which the pain had steadily increased. On the other hand, I have seen patients of advanced age with a very great amount of atrophy who go about on crutches quite nimbly with practically no pain at all. Those who suffer most are those who try to use a stick, or two of them, in place of crutches. The few patients who I have seen at an early stage, and who have been in a position to carry out treatment fully, have

made recovery. In all such cases, on account of the limited exercise which can be taken, frequent courses of pyretic baths are desirable, and patients should have some appliance in their own homes for doing so.

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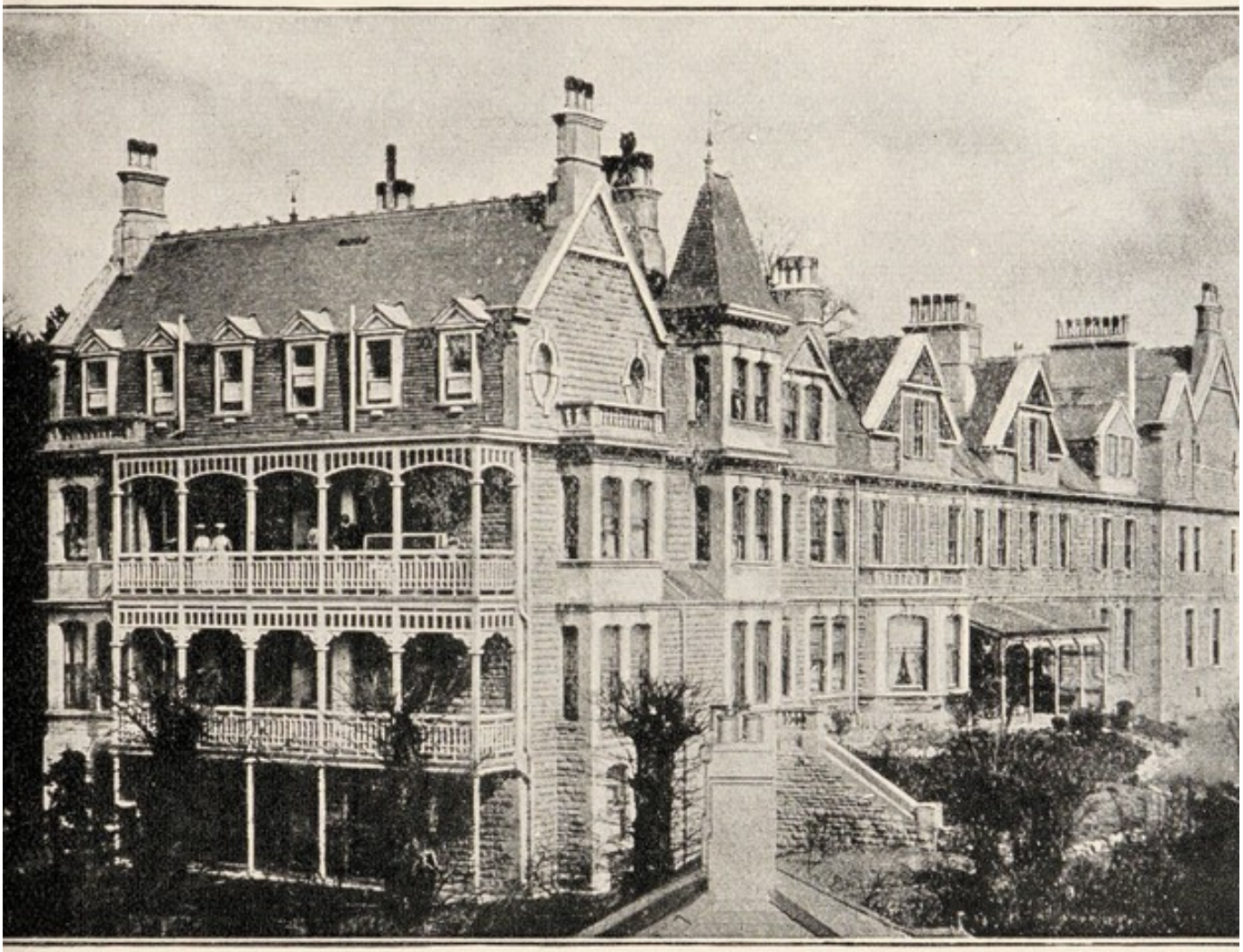

LANSDOWN HOSPITAL AND NURSING HOME

BATH

HOSPITAL WARDS.—Poor persons are admitted to Hospital Wards by payment of 28s. per week (no extras) for periods not exceeding six weeks without special sanction of the Committee.

PRIVATE WARDS from 5½ guineas a week, including Pyretic Baths and Nursing.

BENEVOLENT FUND.—Contributions are urgently needed to this fund, which is devoted to paying the charges, wholly or partly, of poor persons needing treatment, and should appeal to all who have received benefit from Pyretic treatment.

MISS HUMPHREYS (Lady Superintendent).