

T H E S I S.

**"Observations on the Treatment of 17 cases of
Rheumatism and allied affections by Superheated
Dry Air".**

Presented by

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GENERAL INTRODUCTION.

For long rheumatism and allied affections have been treated by applications of hot air, but the difficulty was to apply the air sufficiently hot and for any length of time, owing to the fact that it was moist and could not be borne at any very high temperature.

The literature on the subject of treatment by superheated dry air is scanty.

About the year 1890, Tallerman brought out his apparatus, which has received attention at many hands. Dr. Alfred Willett, F.R.C.S. in a lecture delivered at St. Bartholomews in May 1894, gave his observations on a number of cases treated by this method. He stated that there was increased flow of blood to the part with an anodyne effect in the part. He specially referred to its value when employed for contractions in recent affections or subacute inflammatory diseases: in permanent contractions or fibrous ankylosis, he put little value on the treatment except after breaking down the adhesions under chloroform.

Dr. Knowsley Sibley (Lancet. August 29th. 1896) said, "The value of the treatment by superheated dry air is not merely a temporary one but is of a more or less permanent nature. I have never seen results so immediate and satisfactory in cases of rheumatoid arthritis as are obtained by this method. I possess also evidence of its undoubted value in acute and chronic gout".

Dr. Edward Chretien of the Laennec and Salpetriere

Hospitals. Paris, stated ^{2.} (La Presse Medicale, December 26th. 1896) "The results in the treatment of chronic deformatory, rheumatism, sprain, sciatica, gout and certain forms of joint diseases are remarkable. The most evident result is the relief of pain. The following phenomena are noticed:- local reddening and perspiration, more or less marked acceleration of pulse, and temporary elevation of body temperature".

Dr. James Stewart, Professor of Medicine, McGill University, in a paper read before the British Medical Association at Montreal in September 1897 said, "The most valuable of all methods of treatment is that of dry hot air. It has been used in 20 rheumatoid arthritic cases during the last nine months with gratifying results. Pain was quickly relieved. There was generally a considerable increase in the mobility of joints and before much actual destruction had taken place, there was every reason to look for a decided check to the progressive character of the disease".

H. Augustus Wilson, M.D. in an article entitled "Hot Air in Joint Disease" (Annals of Surgery, January 1899) says, "My experience of two years has embraced a wide range of conditions of joints with failure, disappointment, partial successes, signal benefit, and in some cases results that were thoroughly gratifying. The exaggerated statements that are sometimes made would lead one to believe that hot air will absolutely cure every known lesion, but after continual disappointments have accompanied efforts to cure incurable

incurable conditions, one naturally finds that certain conditions appear to be benefited and others undoubtedly relieved while there are a few that are really cured.

"Acute sprains have appeared the most favourable cases."

"In hydrarthrosis, the effusion often rapidly disappears either because of local sweating or by the increased power of absorption. It is apparent that for sweating purposes high degrees of heat are not applicable and are apt to be followed by scalds. 250 - 300 F are better than 360 - 400F.

"Fibrous ankylosis is the field I have found the most susceptible of benefit. Joints more or less firmly ankylosed by acute inflammatory and traumatic synovitis, or from disease following injury, appear to soften under high degrees of temperature. This would allow of increased range of movement with comparatively little pain in doing so. It is not to be expected that a normal joint can always be reproduced, but it is a decided gain over an absolutely stiff joint to have even 5 degrees of motion.

"Inveterate flat-foot has yielded to correction by heat, followed by powerful mechanical manipulation".

Dr. Walsh, M.D. (Lancet, August 18th. 1900) says, "Immediate relief of pain is one of the most marked results. A few cases of sciatica resist this form of treatment, as they do every other. This uncertainty is probably due to the varying origin of pain in a structural neuritis and a functional neuralgia"

"In early osteoarthritis, it is possible to arrest the malady, whereas at an advanced period with eburnation of

articular surfaces and a large amount of periarticular deposit, all that can be hoped for is diminution of pain. Where the mischief is no longer active, the treatment can be applied, irrespective of the origin of the malady. Cardiac complications need not necessarily contraindicate the treatment".

Professor Dr. Augustus Bier of Germany has used the treatment in his practice for years and bears testimony to its great value: he has just published a Book entitled "Hyperaemie als Heilmittel", 1906, in which he gives his observations. Unfortunately, there is no English translation and I am unable to quote from it, beyond the fact that he states "the secretion of sweat is most marked at lower temperatures: with higher temperatures and on prolonged use, the sweat secretory nerves appear to become "tired".

DESCRIPTION of the APPARATUS.

By the kind permission of Dr. Mackintosh, the Superintendent of the Western Infirmary, I have been permitted the use of the Apparatus for Hot Air Treatment, which has been in use for some months now in the Electrical Department of the New Out-Door Dispensary of the Infirmary. The Apparatus consists of a moveable cylinder standing about three feet high with a long flexible tube like a hose-pipe coming from the top: this tube ends with a mouthpiece, having an opening one inch in diameter; close to the latter there is attached a handle made of vulcanite. In the cylinder itself there are a series of fine wires which are heated by an electric current: the instrument is attached in the ordinary way to the supply current by a main switch. Besides heating the wires in the cylinder, the electricity drives a fan at the bottom of the cylinder funnel. When working, the fan causes the ordinary air of the room to be forced up into the cylinder, where it passes over the heated wires. By the time it reaches the top of the cylinder, it has become heated up and the temperature is there regulated by a Centigrade thermometer placed in connection. The air passes on into the flexible tube and is sprayed on to the part of the body to be treated.

The heat can be regulated to the temperature that is desired. In the apparatus, there are three switches: one switch is to work the fan: the cylinder heats much more quickly ~~if~~ the fan is not working. The second switch cuts off the current to the heating wires and if the fan continue working the temperature of the air rapidly falls. The third switch

controls the "resistant" current; when the "resistance" is on, the wires are heated to their greatest: when it is cut off, they are heated to a low extent and the temperature of the air slowly falls. The first two switches are always on, and the heat of the air is entirely controlled by the second. The degree of heat is observed on the thermometer. The temperature can be raised to 200 C.

HOW to use IT. The air passes through the mouth of the flexible tube with a considerable wave. The part to be treated is laid bare: the flexible tube is held by the handle, attached near the mouth, and the air is allowed to play on the part. It is found that it cannot be played on one spot for very long, depending of course on the temperature of the air. A few seconds at a temperature of 90 C will soon cause the patient to let the operator know. So the tube is moved slowly backwards and forwards along the line of a nerve or over a joint. The greater the heat the more **quikly** will it have to be moved. After a little while, however, the patient can stand a greater heat than at first. In my opinion, there is no great advantage in raising the temperature above a certain point: this I have found to be between 140 - 160 C, varying with the patient. If the temperature is raised higher, the spray has to be moved more quickly without advantage and with increase of current and in consequence of expense.

As I had a number of hands under treatment, it occurred to me that by this spraying a good deal of heat was lost which might be utilised with benefit to the patient, so I had a square box of wood made, long enough to enclose the whole hand

and wrist. One end of the box was closed, the other open. Over the open end was attached a piece of "linennette", which, while shutting in the box to a certain extent, permitted the air to pass through it. Round the non-attached end of the "linennette" a piece of elastic was run: the hand was slipped through this into the box and the elastic gripped just above the wrist without constricting or retarding the circulation. In the top side of the box about the middle was a hole which gripped tight the graduated end of the flexible tube: one inch of this projected into the box. The hand could not be kept stationery under the pipe but had to be moved about by the patient. The advantage of this box was that while you still had the tube spraying on the hand, surplus heat was not altogether lost but played on the parts of the hand which were not directly under the mouth of the tube. The patients who were treated in this way all remarked that the hand became much hotter in the box than out of it and that they felt much better after it than without the box.

In cases of neuritis, the air was sprayed along the line of the affected nerve.

THE EFFECTS PRODUCED. These may be classified as local and general. The local effects may be described as superficial and deep, those that are seen and those that are not seen. The superficial manifestations are an increased flow of blood to the part with marked reddening and dilatation of the capillaries and smaller vessels of the skin: the temperature of the part is also raised. Owing to the continuous draught of air at such a temperature, no visible

perspiration occurs but on ceasing to apply the air, the skin is found to have a moist feeling and if the hand be left in the box, the hand quickly becomes covered with drops of perspiration. The deep local manifestations are evidenced by the results of the application rather than by any outward signs. These are the immediate relief of pain in the part, increased mobility of joints with generally greatly diminished pain on movement, which may have been very acute previously and the partial cause of the decrease of movement. These are signs of the dilatation of the capillaries and vessels of the deeper tissues with increased flow of blood to and from the parts with removal of the exciting cause of pain. The immediate and complete removal or at least diminution of the pain is the most marked feature of the treatment. Even these cases which have received no permanent benefit, admit that the pain is always soothed or removed for the time being and usually for some hours.

The general effects are:- (1) the raising of the body temperature from $\frac{1}{2}$ to 3 F: this depends on the length of the application and the heat of the air maintained; (2) increase in the pulse rate: this varies very markedly with the individual and often from day to day in the same patient. In case IV for the first few days the pulse rate went ~~from~~ about 80 before to 120 - 130 after treatment: within 15 minutes of stopping treatment it was observed to have returned to normal again. Besides an increase in the pulse rate, in one or two cases the pulse was fuller and stronger after treatment than before it; (3) in a few cases, depending largely on the

time given, was there general perspiration all over the body. In those cases where the one hand was treated in the box described, it was noted by the patients themselves that the other hand, which was untreated, became hot to the feel and perspired to a certain extent. This, in my opinion, was a reflex phenomenon and may to some extent account for the almost as good recovery of the untreated knee of case XII as compared with the one treated; (4) in the majority of cases, where sleep had been lost as the result of the pain, with resulting bad effects upon the body generally, the pain being less or altogether relieved during the night, the patients were able to get more sleep and to sleep with fewer and shorter intervals of wakefulness. The result of this combined with the improvement of the local condition led to a better state of health with greater cheeriness. The treatment was always given in the mornings and if it had been possible to have it given the last thing before retiring to rest, the results in this respect would have been even better and some of the worst cases, which were so little benefited permanently, might have been much more helped.

Owing to the fact that most of the cases were treated out-door, it was quite impossible to make investigations on any increased secretion of urine or its constituents, which may have occurred as the result of treatment. Observations were made in Paris with regard to this matter where the Tallerman treatment was being used. Dr. Edward Chretien of the Laennec and Salpetriere Hospitals, Paris, states, (La Presse Medicale. December 26th. 1896):- I have carefully examined

the urine of all the patients, who were treated in the Laennec Hospital and found no change in either the quantity or quality of it. In one case elimination of salts showed slight improvement, particularly chlorides. In another and long standing case of gout the excretion of uric acid rose from 57 centigrammes to 89 centigrammes after the fourth application.

The Tallerman method was one of the first to be adopted in the way of treating rheumatism and allied affections by hot air, which was superheated and yet dry. This permits of the temperature applied to any part to be much higher than where hot moist air was used. With the dry hot air the temperature can be raised far above the boiling point of water. The Tallerman treatment differs from the method I have described in that it necessitated removal of the moisture collected in the cylinders as the result of the perspiration and the admission of fresh air. In the methods, I have described, the constant draught of air over the part prevents the perspiration collecting on the surface and thus gives less chance of scalding.

Personally I have never seen any evil effects as the result of treatment: one or two small blisters were raised as the result of the accidental contact of the end of the tube against the skin but beyond this nothing untoward happened. The patients in no case were made worse as the result of treatment. Precautions of course were always taken that the patients were allowed to cool down before leaving and were well wrapped up on doing so and thus the chance of a chill minimised.

With regard to the question of length of time given, it will be seen to vary a good deal according to the severity of the case. The simpler cases did quite well with 20 minutes to half an hour, but the more chronic cases received from 30 minutes to an hour. The time given varied a little with the number of patients being treated at the time but it was found that unless 20 minutes at least was given, the patient did not benefit so markedly. In case XIV, which was one of rheumatoid arthritis of eight years standing, the time given averaged 40 minutes each day: it was the longest case I had under treatment and improved wonderfully as will be seen from the detailed report.

In quite a number of the cases the treatment was coupled with massage and passive movement of joints and I believe that either treatment alone would not have given as good results as were got when the two were combined. Take for example, case XIV, referred to above: this case had very marked stiffness of the wrist-joints with fibrous thickening: under the combined treatment of hot air, passive movement, and massage, the joints improved markedly, moving much more freely on active and passive movement and the fibrous thickenings around the ends of the bones were found to have softened and in one or two places to have quite disappeared: in this case also there was effusion into the tendon sheath of one of the extensor tendons, extensor digitorum communis going to the fourth finger: this was markedly reduced with the hot air and massage. The hot air, by increasing the circulation in the part, seems to soften the products of inflammation, such as these fibrous thickenings, so that they are more easily

broken down by massage. The massage also helps to remove toxins which may have become deposited in the tissues and the increased heat and flow of blood to the part may help to dissolve such products.

Dr. Knowsley Sibley says (Lancet August 29th. 1896) "The treatment appears to lower the blood pressure of the body and in some way to increase the alkalinity of the blood, which enables it to dissolve the uric acid from the tissues and joints and get rid of this substance from the various excretory organs. This is evidenced by the relief of local pain and the removal of the frequent uric acid nerve depression".

Dr. Chretien says (La Presse Medicale Dec. 26th. 1896) "If we compare all the methods for relieving pains, they have this in common that, all being violent methods, they profoundly disturb the statics and dynamics of the tissues to which they are applied. I believe myself that reaction is caused by molecular changes in the great trunk nerves and their terminations".

Some forms of disease do much better than others and not a few are disappointing. One thing hot air will not do and that is break down old fibrous adhesions which have caused ankylosis and setting of joints in one position. It certainly will soothe pain and help to keep down the swelling, resulting from the forcible breaking down of these adhesions under chloroform. Other cases that seem to be hopeless are those cases of rheumatoid arthritis, which have been going on for years and have gradually come to implicate every

joint in the body with osteophytic and fibrous formations. Such a case was that of case XlIII which in the end showed so little actual improvement.

Mr. Alfred Willett, F.R.C.S. in a lecture at St. Bartholomews in May 1894 said, "For overcoming fibrous articular adhesions it gives the Surgeon no direct help. There is increased power in active movement but no immediate marked increase in the range or extent of motion. In such, however, after an anaesthetic, recovery will be hastened in its subsequent use".

The cases that do best are those that are in the early stage of the disease: subacute rheumatic conditions, or chronic rheumatism or rheumatoid arthritis cases, which implicate only one or two joints and wherein the latter class there is no osteophytic formation or in the last two classes where there is little fibrous adhesions which have contracted and caused immovability of joints.

Of the seventeen cases treated (I add two which were treated shortly before I commenced to take up the subject) seven were cases of neuritis, three of subacute rheumatism, two of rheumatoid arthritis, two of gonorrhoeal rheumatism, one of chronic rheumatism complicated by progressive muscular atrophy, one of chronic rheumatism and one of hallux rigidus. Of these, six were dismissed quite well, three were greatly improved, five were improved, one received no permanent benefit, one seemed to be unaffected this time although cured in two previous attacks and one attended only four days.

I will now proceed to give the cases in detail and have arranged them in groups as far as possible. The following is a short summary, giving duration of disease, duration of treatment and result.

Case 1	7 days		
Case 2	8 days		
Case 3	10 days		
Case 4	14 days	1 month	Good
Case 5	1 month	1 month	Improved
Case 6	2 months	2 days	
Case 7	3 weeks	1 month	Good
Case 8	4 weeks	7 weeks	Marked
Case 9	5 weeks	1 month	Good
Case 10	6 weeks	2 months	Marked
Case 11	7 weeks	3 months	Good
Case 12	8 weeks	4 months	Marked
Case 13	9 weeks	5 months	Good
Case 14	10 weeks	6 months	Marked
Case 15	11 weeks	7 months	Good
Case 16	12 weeks	8 months	Marked
Case 17	13 weeks	9 months	Good
Case 18	14 weeks	10 months	Marked
Case 19	15 weeks	11 months	Good
Case 20	16 weeks	12 months	Marked

Class I. Neuritis.

	DURATION.	TREATMENT.	RESULT.
Case 1. Mr. A. Radial Ulnar etc.	1½ years.	1 month.	No Improvement.
2. Miss A. Ulnar.	14 days.	5 days.	Cured.
3. Mrs. McL. "	8 days.	1 month.	"
4. Barr. Sciatica.	6½ weeks.	1 month.	"
5. Mackie, "	4 months.	7 days.	"
6. Smith. "	3 weeks.	3 days.	Improved.
7. Reilly, Neuritis.	14 days.	10 days.	"

CLASS II. Subacute Rheumatism.

Case 8. Mrs. D. Left hand.	14 days.	1 month.	Cured.
9. Roxburgh. First right metatarsophal. joint.	6 weeks.	1 month.	Improved.
10. Gourlay. Hands & Shoulders.	3 months.	3 days.	?

CLASS III. Chronic Cases.

Case 11. Mr. R. Gonorrhoeal Rheumatism.	3 years.	1 month.	Improved.
12. Macarthur, Gonorrhoeal Rheumatism of knees.	1 year.	1 month.	Much improved
13. Ritchie, Rheumatoid Arthritis.	3 years.	1 month.	Improved.
14. Miss P. ditto.	8 years.	3 months.	Much Improved.
15. Mrs. H. Chronic Rheumatism.	4 years.	2½ months.	ditto.
16. Brown, ditto.	3 years.	1 month.	Not improved.
17. Main. Hallux Rigidus.	?	1 month.	Cured.

CLASS 1. NEURITIS.CASE 1.

Mr. A. age 56, Measurer. Commenced treatment Dec. 24th. 1905. Since May 1904 has suffered in the right arm from neuritis of the radial, musculospiral, median and ulnar nerves at different periods. Patient has one sister who suffers slightly from rheumatism. He is a measurer by trade and is exposed to climatic inclemencies. He takes little alcohol and never to excess.

PREVIOUS HEALTH:- Thirty years ago he had an acute attack of lumbago lasting for six months. Four years ago he had an acute attack of sciatica on left side lasting for ten days but never recurring. He has never had any swelling of his joints but has often had rheumatic pains in muscles and joints, which at times were severe enough to incapacitate him for work and to confine him to bed for a few days. There is no specific history.

PRESENT ILLNESS:- Commenced first in May 1904 with sudden onset of acute pain on the radial side of anterior surface of wrist, this pain was pretty constant and after 14 days spread up the forearm in the situation of radial nerve and then remained at one particular spot midway between elbow and wrist. From this time on till September of that year the pain was situated in upper half of forearm extending to just above the elbow and on the radial side: during this time the pain was not very severe and was accompanied by a feeling of numbness with a certain amount of powerlessness of that arm: he

was unable to write. He was under treatment in Harrogate for six weeks and thereafter remained quite well till April 1905, although during this time he was unable to write more than his signature. In the beginning of May the pain and numbness returned to the radial side of upper forearm and he then came to the Western Infirmary as an Out-Patient. At that time he was treated with hot air and got quite well. It spread however to the ulnar nerve, which was then treated similarly and recovered. He went to the country for six weeks but ^{as} on his return, there was considerable tenderness over the radial and ulnar nerves, he was again put under treatment. In October this was stopped and the arm was put in an elbow splint for ten days. He had then four weeks of fly blistering followed by two weeks of electricity and massage. He remained pretty well after this till Dec. 24th. when the pain again appeared in the ulnar, radial^s musculospiral nerves but most severe in the ulnar. He again commenced the hot air treatment.

PRESENT CONDITION:- I took up his case on Jan. 15th. 1906. He had been under treatment for the present attack since Dec. 24th. 1905 and was improving. He is a healthy strong looking man. On examination of his forearm, no tenderness is elicited along the line of the nerves till one reaches a point two inches from the tips from the epicondyles. Here the nerves are found to be acutely tender, the region embracing the musculospiral, radial and median nerves, the ulnar not being involved.

He came every morning with acute pain and great tenderness over the above nerves in the region indicated. The

pain was always quite removed after 20 minutes application of the hot air and the tenderness greatly diminished although not altogether removed. He certainly, although slowly continued to show improvement until the 20th. when he was as bad as ever again and the treatment was discontinued on the 22nd.

This was a somewhat peculiar case. If it were an acute neuritis of rheumatic or gouty origin, one would have expected it to yield rapidly to the treatment. The flitting character, going from one nerve to another at first, and the only temporary benefit of treatment rather point to an alcoholic origin. He denies any excess in alcohol: the word of alcoholics, however, cannot be always relied on. He is certainly a well-favoured man although not of alcoholic facies. One curious point about the case was that the attacks always came on on a Sunday during the morning service at church. The last exacerbation was late on Sat. Jan. 20th.

Temperature:- Dec. 25th. - Jan. 20th. 120 - 150 C.

20 minutes.

Jan. 22nd. 140 - 150 C. 20 minutes.

CASE 11.

Miss A. age 50, Housewife. Commenced treatment March 12th. 1906. Acute ulnar neuritis of 14 days duration.

PREVIOUS HEALTH:- Has had attacks of muscular rheumatism for years and several attacks of acute sciatica on both sides, sometimes on the one side, sometimes on the other. The attacks lasted from a few days to a fortnight or three weeks in duration. Two years ago patient had an attack of acute ulnar neuritis of the right arm: the pain was very severe and the attack lasted for three months. She was treated with the usual medicinal remedies but seemed to be unaffected by them: she then had electricity in the form of the high frequency brush and with six weeks of it she very slowly got better.

PRESENT ATTACK:- came on suddenly 14 days ago without anything so far as she knew to bring on the illness. This time it was a neuritis of the ulnar nerve but of the left side, that is the opposite side to the one previously affected. The pain has been severe and continuous ever since and in spite of medicines has been shown no tendency to yield but has become worse. She has had little sleep for a fortnight and none during the last three nights. The pain continues night and day and at times is almost unbearable.

PRESENT CONDITION:- On examination of the affected area, one elicits extreme tenderness from about the middle of the arm along the course of the ulnar nerve right down to the wrist, becoming a little less tender near the wrist. The patient can hardly bare any pressure on the part. The pain at the moment is severe.

Hot air was sprayed along course of the ulnar

nerve commencing with a temperature of 130 C and increasing up to 160 C. Within a few seconds of commencing the patient remarked on the wonderfully soothing effect of the application. The treatment was continued for 30 minutes with the usual local manifestations: by the end of that time the pain had been greatly relieved although not quite away and on pressure along the line of the nerve tenderness was not so marked as before treatment.

March 13th.:- Patient states that she has had one or two attacks of pain since treatment yesterday but that they were ^{not} so severe or so continuous as previously. She slept about four hours during the night. Treatment was again continued for 30 minutes.

March 16th.:- Patient has continued steadily to improve and she only occasionally has pain and that not very severe. She slept almost all night last night and much better than on previous nights. The tenderness also has very much decreased and while it can be easily elicited it is nothing to what it was. She states that the arm feels weak and tired to-day but I think this is probably due to the continued severe pain and consequent want of use for nearly three weeks and not to the effects of the hot air. Treatment was given for 30 minutes. Patient at her own request ceased to be treated, as she was a private patient. The patient is practically well after only five baths.

March 12th. - 15th. 150 - 160 C. 30 minutes.

March 16th. 150 - 160 C. 30 minutes. Pulse before 92 after 96. Temperature before 98, after 98.4 F.

May 20th. There has been no return of the pain and she has been perfectly well since.

CASE 111:

Mrs. Mc.L. age 50, Housewife. Treatment commenced April 18th. 1905. Patient had rheumatism in the right shoulder and was treated with high frequency for a few days. She then developed an acute ulnar neuritis which she blamed on the high frequency. Hot air treatment was commenced and she had 15 minutes application daily for a month. She was dismissed well and the shoulder was also greatly improved. The neuritis was a very acute one but the pain was quickly alleviated by the hot air.

Treatment commenced April 18th. 1905, temperature 120 - 130 C.

Treatment stopped May 20th. 1905.

Time:- 15 minutes daily.

CASE IV.

James Barr, age 20, Labourer. Commenced treatment March 9th. 1906. Sciatica of $6\frac{1}{2}$ weeks duration on left side.

Patient's mother has suffered for 14 months with rheumatism: otherwise there is nothing of importance in the family history.

He is a labourer and exposed to inclement weather.

PREVIOUS HEALTH:- He has always been strong and healthy and has never been troubled with "sore throats" or "growing pains" and has never had rheumatism. There is no history of specific disease.

PRESENT ILLNESS:- Commenced $6\frac{1}{2}$ weeks ago as the result of a chill. He was working on a night shift in a furnace and was exposed to a draught which was chiefly on the left side. The pain came on suddenly extending from the lumbar region along the line of the great sciatic and its continuations to the back of the calf of the leg on the left side. He found that when he stooped he couldn't get back again. I think at first there was a complication of lumbago with the sciatica. He was confined to bed for a fortnight and he could scarcely turn on account of the pain. He had not much pain unless he moved. He is much better now than he was.

PRESENT CONDITION:- He walks cautiously with a stick on account of the pain. He can stoop and come back again without much pain. On lying flat on his back and overflexing the left leg, pain is elicited. There is some tenderness over the great sciatic nerve in the upper third of the thigh.

Treatment was commenced to-day March 9th. and he was under the

spray for 15 minutes at a temperature from 130 - 150 C.

March 12th.:- He states he felt better after last day's treatment and that he was able to walk easier and with less pain.

March 14th.:- He has had pain most of the night in the lumbar region of same side. On examination, tenderness is found surrounding a spot $1\frac{1}{2}$ inches from middle line and 3 inches above the ischial tuberosity and extending over an area round this about 3 inches in diameter. After 30 minutes treatment the pain was alleviated and the tenderness very much less.

March 20th.:- No pain now at night or on walking. There is a little on rising from the stooping position.

March 22nd.:- Massage was given for five minutes to-day over the tender lumbar region in addition to the hot air.

March 23rd.:- States was the better of the massage yesterday.

April 4th.:- Dismissed to-day: well.

March.	Temperature.	Duration.	Pulse before.	Pulse after.	Temperature before.	Temperature after.
9.	130-150 C.	15 minutes.	68.	116.	98.2.	98.2.
12.	130-160 C.	"	80.	120.	97.2.	98.4.
13.	130-168 C.	20 "	88.	84.	97.6.	98.2.
14.	130-160 C.	30 "	96.	132.	98.8.	99.
16.	130-150 C.	20 "	124.	120.	97.8.	98.4.
19.	140-160 C.	15 "	84.	120.	97.8.	98.4.
20.	140-160 C.	25 "	84.	124.	98.	98.4.
21.	140-160 C.	15 "	84.	108.	98.	98.
22.	140-160 C.	20 "	84.	92.	98.	98.4.
23.	140-160 C.	20 "	78.	80.	97.8.	98.
27.	160-170 C.	20 "	76.	84.	98.8.	98.6.
28.	150-170 C.	20 "	78.	80.	98.	98.2.
29.	150-170 C.	20 "	88.	90.	97.8.	98.6.
30.	160-180 C.	20 "	80.	80.	98.8.	98.4.
April						
3.	150-180 C.	20 "	88.	90.	98.	98.
4.	160-180 C.	20 "	92.	90.	98.4.	98.6.

CASE V.

James Mackie. Age 34, Seaman. Commenced treatment March 7th. 1906. Sciatica of four months duration on left side.

There is nothing of note in the patient's family history. He is a sailor and when ashore drinks heavily.

PREVIOUS HEALTH:- Twelve years ago he contracted a chancre but he has no secondary symptoms. He has an occasional sore throat but does not remember having "growing pains". Eighteen months ago he had an attack of malarial fever.

PRESENT ILLNESS:- 8 years ago he first began to suffer from attacks of lumbago on the left side: these attacks usually lasted about 5 or 6 days and at times were severe enough to incapacitate him for work and confine him to bed. Six months ago an acute pain commenced in the lumbar region on the left side and extended down the back of leg into calf, ending in the ankle. This pain was worst at night and in the calf of leg. He has been off work since its commencement. For the first 22 days he was laid up in bed on board ship; four and a half weeks ago he was operated on in Middlesboro' Hospital. He was 13 days in bed. He is able to walk now but after 5 minutes or so complains of pain. He has still pain at nights in thigh and calf of leg. The pain is better in the lumbar region since the operation.

PRESENT CONDITION:- He is unable to straighten himself without a certain amount of pain extending from about gluteal fold down the thigh to calf of leg. On deep pressure tenderness is elicited over the great sciatic nerve and in

the calf of leg. There is none in the lumbar region. He has slight pain on overflexing the leg. Cicatrix of the operation is three inches in length.

March 7th.:- Treatment was commenced to-day, the hot air being sprayed from lumbar region right down the leg on to the calf. After ten minutes there was less tenderness on deep pressure.

March 9th.:- He states that after leaving on the 7th. he was able to walk two miles without discomfort. Pain was also less that night.

March 19th.:- Dismissed well to-day: no pain at nights now and none on walking.

March.	Temperature.	Duration.	Pulse		Temperature	
			before.	after.	before.	after.
7.	130-150 C.	20 minutes.	80.	100.	98.8.	98.8.
9.	130-160 C.	20 "	92.	116.	98.6.	98.8.
12.	130-160 C.	20 "	78.	78.	98.	98.2.
13.	130-160 C.	20 "	112.	120.	98.4.	98.4.
14.	130-160 C.	20 "	120.	124.	98.4.	98.4.
16.	130-160 C.	20 "	100.	120.	98.6.	98.8.
19.	130-160 C.	20 "	80.	100.	98.4.	98.6.

CASE VI.

John Smith, Age 35, Labourer. Commenced treatment March 22nd. Peripheral neuritis of three weeks' duration.

There is no history of rheumatism in the family. He takes alcohol to excess at times.

PREVIOUS HEALTH:- He has always been strong and healthy with the exception of a mild attack of enteric fever in South Africa. He never had rheumatism, "growing" pains or sore throats, etc. There is no specific history.

PRESENT ILLNESS:- Commenced about three weeks ago with severe acute pain in hip and extending down to the outer side of the knee on the left side: for several nights he has been unable to sleep and had to stop work. He contracted a chill as the result of working in the double bottom of a battleship where he had got wet.

PRESENT CONDITION:- He has been under medicinal treatment and has not been got much pain now when walking. He complains of pain when he stoops down but not when raising himself. Tenderness is elicited on pressure just behind the head of the great trochanter on left side and again at a spot on the outer side of the knee. The pain, however, extends from one to the other. There is no tenderness on deep pressure over the great sciatic nerve itself. It seems to be a peripheral neuritis affecting the internal cutaneous nerve.

March 25th:- He had three days treatment from 22nd. to 24th. 20 minutes each day at a temperature of from 150-160 C. with relief of the pain at the time. The pain has not been so severe at nights, and the tenderness was less marked.

Patient has not come again.

CASE VII.

Peter Reilly, age 51, Labourer. Commenced treatment March 22nd. 1906. Peripheral neuritis of internal cutaneous on right side of 8 weeks' duration.

There is nothing in his family history: he is a labourer to trade and takes alcohol to excess.

PREVIOUS HEALTH:- 12 years ago he had an attack of "pleurisy" lasting for 2 or 3 weeks. For 10 years he has had a cough and expectoration from a chronic bronchitis. He has never had rheumatism but states he used to be subject to "sor-throats". There is no history of specific disease.

PRESENT ILLNESS:- Commenced 8 weeks ago, coming on as the result of a drinking bout. It started with acute pain commencing at a point about an inch below the top of the great trochanter on the right side travelling down to the inner side of the knee and round below the patella to the outer side. The pain has been very acute and he has slept little during the last fortnight.

PRESENT CONDITION:- Tenderness is very marked at a spot about an inch in diameter about the middle of the thigh in front. The tenderness begins again at a point about 5 inches above the inner condyle and extends right down to inner side of knee and round below patella to outer side. It seems to follow in its course the line and distribution of the internal cutaneous and internal saphenous nerves, and I take it to be a peripheral neuritis implicating these nerves. He

states that there is a feeling of numbness in this region. The sensations of touch seem to be unimpaired but the sensation of heat is most acute over the tender spot in middle of thigh and decreases down the course of the nerve and round below the knee. He complains of a tight feeling about the knee and of stiffness.

March 23rd.:- He was relieved after 20 minutes application yesterday. He complained of pain this morning but it was immediately relieved under treatment. The tight feeling and stiffness are not nearly so marked.

April 9th.:- The treatment has been continued until to-day and the patient is a good deal improved: the pain and tenderness are certainly less than they were.

April 12th.:- Patient has not returned.

March.	Temperature.	Duration.	Pulse before.	after.	Temperature before.	after.
22.	130-150 C.	20 minutes.	104.	112.	98.8.	99.
23.	130-150 C.	15 "	96.	100.	98.	98.2.
27.	170-180 C.	20 "	100.	90.	99.	98.6.
28.	140-160 C.	20 "	72.	100.	98.2.	99.
29.	150-180 C.	20 "	88.	100.	98.8.	99.
30.	160-180 C.	20 "	100.	100.	98.4.	98.6.
April						
3.	160-180 C.	20 "	96.	96.	98.6.	99.
4.	140-150 C.	20 "	84.	88.	99.	99.2.
6.	160-180 C.	20 "	88.	88.	98.	99.
9.	150-170 C.	20 "	92.	96.	98.	98.6.

Thus it will be seen that of these seven cases of neuritis, cases II and III did best: they were both very acute and of a simple rheumatic origin. Case I was disappointing and I cannot account for it, unless it be that alcohol was being taken secretly and so nullifying the good effects of treatment. Cases IV & V were not very severe cases and

yielded to treatment. Cases VI and VII were cases of peripheral neuritis which may have been alcoholic in origin and while being benefited up to a certain point, they were not absolutely cured.

CLASS 11. - Subacute Rheumatism.
-----CASE VIII.

Mrs. D. age 39. Housewife. Commenced treatment Feb. 3rd. 1906. Subacute rheumatism of left hand of 14 days duration.

Father suffered from severe rheumatism, a brother died from heart disease and a sister from dropsy.

PREVIOUS HEALTH:- With the exception of occasional pains in the knees, she had never been troubled with rheumatism till June 1905 when her ankles and feet became swollen and painful and then the left hip-joint. She was feverish for only a day, she says, but was confined to bed for a fortnight. The swelling continued in the ankles and feet for about two months thereafter. She remained quite well till early in December last, when the right knee became swollen and painful, followed in succession by left knee, left hip, right hip. She was confined to bed for a month. The joints gradually recovered but only to be succeeded by pains first down the right arm and then the left. A fortnight ago the left wrist became acutely painful and swollen.

PRESENT CONDITION:- She takes her food well, but she is rather anaemic looking. The back of the left wrist and hand are much swollen. The small joints of the fingers, metacarpophalangeal and phalangeal joints, are also slightly swollen. The wrist and finger joints are painful on movement. She complains of a darting pain every now and then. The other joints which have been affected are still somewhat stiff but

nothing to what they were.

Feb. 8th.:- She has had five applications of 20 minutes each in the "box" and the pain has been relieved each day, although usually returning at times during the day.

Feb. 19th.:- Patient has been unable to attend since the 8th. owing to another attack confining her to bed. It affected her right shoulder. The left hand was much swollen on the 17th. but has gone down very much since. She complains of "stooning" pain to-day in the hand, which was relieved after 20 minutes.

Feb. 20th.:- The hand is less swollen to-day. She feels much better since yesterday's treatment and the shoulder has become less stiff. She very imperfectly flexes fingers on palm and the wrist on forearm.

Feb. 22nd.:- She complains of right hand feeling painful to-day.

March 9th.:- Weather has been very bad for two or three days but she complains only of slight pains in both fore-arms. The swelling of hand is almost nil and she can flex fingers and wrist much better. Treatment stopped.

March 19th.:- Patient came back to-day feeling very well: she has had no pain or swelling since treatment was stopped.

Feb.	Temperature.	Duration.	Pulse before.	Temperature. after.
3.	140-150 C.	10 minutes.	72.	72.
5.	140-150 C.	20 "		
6.	140-150 C.	20 "		

Feb.	Temperature.	Duration.	Pulse		Temperature	
			before.	after.	before.	after.
7.	140-150 C.	20 minutes.				
8.	120-130 C.	20 "				
19.	100-130 C.	20 "	76.	80.	99.4.	100.3.
20.	100-130 C.	20 "	68.	72.	97.	99.4.
21.	100-130 C.	20 "	64.	70.	98.4.	99.4.
22.	100-130 C.	45 "	76.	76.	97.	99.4.
23.	100-130 C.	30 "	72.	72.	97.	99.
26.	100-130 C.	30 "	70.	72.	97.4.	99.4.
27.	100-130 C.	30 "	68.	68.	98.	99.2.
28.	100-130 C.	30 "	72.	68.	97.4.	99.2.
March						
1.	100-140 C.	35 "	72.	80.	96.6.	99.2.
2.	140-150 C.	40 "	72.	72.	97.2.	99.
5.	140-150 C.	35 "	80.	70.	97.6.	99.2.
6.	140-150 C.	30 "	72.	72.	98.7.	99.2.
7.	140-150 C.	35 "	68.	76.	97.	99.
8.	140-150 C.	30 "	72.	80.	97.	99.
9.	140-150 C.	20 "	68.	76.	98.2.	99.

From February 3rd. till 21st. Left hand only was treated.

From February 22nd. to March 9th. both hands were treated.

CASE IX.

Andrew Roxburgh, age 17. Commenced treatment April 17th. 1906. Rheumatism of 1st. Metatarso-phalangeal Joint of Right Foot of 6 weeks' duration.

There is no history of rheumatism in any of the family.

PREVIOUS HEALTH: - He has always been a strong healthy boy and has never had "growing pains" or "sore throats".

PRESENT ILLNESS: - began in Dec. 1905 when he came home from his work at night, he complained of stiffness and pain in the right foot. He had received no injury to it and could give no reason for the illness. The foot became swollen and remained so for a week. He was treated with hot fomentations and the swelling subsided and has not returned. The stiffness and pain have, however, continued and are always present at night on returning from work. He is better again next morning.

PRESENT CONDITION: - There is a slight swelling of the metatarsal-phalangeal joint of the big toe of right foot, with tenderness on pressure and pain on movement.

Hot air treatment was commenced to-day with 20 minutes application.

May 11th.: - Patient has been treated continuously since April 17th. with 20 minutes application each day. There is now no swelling and no tenderness over the joint. There is still some stiffness at nights after moving about but not so bad as it was. Treatment was stopped to-day.

April:	Temperature.	Duration.	Pulse before.	after.	Temperature before.	after.
17.	130-150 C.	20 minutes.	80.	80.	97.6.	98.
18.	140-160 C.	20 "	84.	88.	98.	98.6.
19.	150-160 C.	20 "	100.	100.	98.6.	98.6.
20.	150-170 C.	20 "	88.	88.	98.8.	99.
23.	150-170 C.	20 "	80.	84.	98.	98.6.
25.	150-160 C.	20 "	88.	88.	98.4.	99.
26.	150-170 C.	20 "	88.	88.	98.4.	99.
27.	160-180 C.	20 "	80.	84.	98.6.	98.8.
30.	160-180 C.	20 "	80.	84.	98.4.	99.
May						
1.	160-180 C.	20 "	84.	88.	98.4.	99.
2.	150-170 C.	20 "	80.	80.	98.	98.6.
3.	150-170 C.	20 "	82.	88.	98.4.	98.6.
4.	150-170 C.	20 "	80.	80.	98.	98.4.
7.	150-170 C.	20 "	74.	78.	98.2.	98.6.
8.	160-180 C.	20 "	84.	88.	98.	98.4.
9.	160-180 C.	20 "	80.	84.	98.	98.4.
10.	160-180 C.	20 "	82.	84.	97.8.	98.

CASE X.

Mrs. Gourlay, Age 56, Housewife. Commenced treatment March 9th. Subacute rheumatism of hands of three months' duration.

There is no history of rheumatism in patient's family but a daughter had rheumatic fever when 28 years old, a son died at 21 from Heart Disease, and another son complains of severe "growing pains".

PREVIOUS HEALTH:- When 27 years of age she had rheumatic fever of a typical character and she was confined to bed for three months. She remained quite well for eighteen years when she had another attack, lasting about three months. She had a similar attack three years ago and again was confined to bed for about three months.

PRESENT ATTACK:- She remained quite well till Christmas day of last year, when the right wrist became swollen and painful: then right shoulder followed by knees and ankles. She was confined to bed for 9 weeks. She has been going about for 4 weeks now and is better than she was.

PRESENT CONDITION:- Her knees and legs occasionally became swollen and congested as the result of varicose veins. She has occasionally pain in knees and back. The wrists and metacarpophalangeal joints and some of the **phalangeal** joints are swollen. They are painful on movement and grating can be made out in the wrists. She has a "gouping" pain in them, worst in the morning and sleeps badly at night. Each hand has been treated in the box for 10 minutes. The pain was immediately relieved. The fingers are much more supple and

there is very little pain on movement.

March 12th.:- She has felt considerably better since being treated and has also been sleeping better. The pain was present again this morning but was immediately relieved after 20 minutes application.

March 20th.:- Patient has not returned. I include this to show the relief of pain in what was a fairly bad case. I think she would probably have improved markedly if she had continued.

March.	Temperature.	Duration.	Pulse		Temperature	
			before.	after.	before.	after.
9.	120-140 C.	20 minutes.	88.	96.	98.2.	98.8.
12.	120-160 C.	20 "	96.	100.	98.	99.
14.	120-160 C.	20 "	96.	96.	98.	99.2.

I have classed these cases together under subacute rheumatism. Cases VIII and X certainly were, case VIII did well and she has not returned to the Dispensary since. I take it that she has remained well. In case X there was immediate relief of the pain at the time but owing to the short time under treatment no permanent benefit could accrue. The third case, case IX, seemed to be of rheumatic origin as there was no question of injury having caused it. He had tried several remedies for it and none had succeeded. The hot air has benefited him.

CLASS III. CHRONIC ARTICULAR CASES.CASE XI.

Mr. R. age 26, Clerk. Commenced treatment on Dec. 20th. 1905. Gonorrhoeal rheumatism.

There is no history of rheumatism.

PREVIOUS HEALTH:— has always been good. He went to South Africa in 1900 and was there for 18 months.

PRESENT ILLNESS:— started in January 1903. Four weeks previously he contracted gonorrhoea for which he was treated in the ordinary way and it ran the usual course. Four weeks later, severe pain commenced in the 1st. metatarsal joints. These rendered walking difficult: it then spread to knees and before going on to the ankles, settled in the left knee. Sometime after he felt painful spots in the heels which prevented him walking. In April 1903 he went to Harrogate and was there six weeks, after which he started work again, but soon had to stop and was admitted to Ward XVI of the Western Infirmary in Dec. 1903, where he remained for 5 months. After leaving he went to the country and in November 1904 went to Saltcoats for treatment. He next tried Peebles for 4 weeks, Turkish and Electric Baths with Massage. He was back at business till the end of January 1905 when he went to Droitwich for 2 weeks: there he had brine baths etc. 6 months ago he felt pain in the finger joints. It then went to the wrists followed by shoulder joints and lastly the elbows. He had little or no pain in joints of back and chest. One year ago he had pain for some days in the left temporomaxillary joint. He was admitted to Ward XII of the Western Infirmary on

November 11th. 1905 complaining of pains more or less all over the body but especially in soles of feet and in shoulders.

PRESENT CONDITION:- He is pale and easily tired. The joints are not much enlarged but are all more or less tender. The pressure of the bed clothes is sufficient to cause pain. His attitude is that of lassitude, weakness and as if he were always in pain.

LEFT FOOT:- 1st. metatarsal joint is somewhat enlarged and 2nd. toe is stiff. Painful spots are felt over the metatarsal joints, in sole and also over os calcis where small hard "rheumatic nodules" can be felt. Movement at ankles is fairly free. Right is much the same as left only the toes are stiffer. Knees are very painful especially on pressure over patella. There is also slight effusion.

LEFT ARM:- the hand is mobile: elbow scarcely affected but shoulder is very stiff.

RIGHT ARM:- unaffected: wrist slightly: shoulder is much the same as on the other side, but there is no impairment of movement at elbow.

This was the condition of affairs as reported in the Journal at the time of admission. His temperature has been normal since admission. He has occasionally vomited his food. There is no discharge from the urethra. His weight has gradually increased: on admission it was 8 st. 12½ lbs: on Dec. 11th. 9 st. 1¼ lbs: Jan. 3rd. 9 st. 6¾ lbs.

The treatment has been as follows:- at first he had the faradic current with massage. He has been massaged for half an hour each day with in addition graduated exercises.

He has had three injections of Meiyer's serum (1) 20/12/05: 3
CCS: (2) 27/12/05, 10 CCS: (3) 11/1/06, 10 CCS.

Hot air treatment was commenced on Dec. 20th. 1905
with 7 minutes to each shoulder at a temperature of about
120 C. I saw him for the first time on January 15th. 1906.
For two days he had 7 minutes to each shoulder at a tempera-
ture of 130-140. He informed me that the massage was the
thing that had benefited him most but that the hot air seemed
to relieve the pain and to make them less stiff and more pli-
able for the masseur afterwards. Personally, I don't think
he had a proper chance with the hot air. He had only been
having 7 minutes to each shoulder and that at a temperature
of 120, which to my mind and after experience was not suffi-
cient. For 4 days, thereafter, he had 15 minutes to the
left shoulder only and the temperature varied from 120-130.
He afterwards left for Dunblane for a month's rest and has
not returned for hot air treatment.

I include this case because he had been treated for
a month and certainly, according to his own statement, he
benefited by it, although not so markedly as I think he ought
to have.

CASE XII.

Macarthur, age 42, Seaman. Commenced treatment Jan. 15th. 1906. Gonorrhoeal rheumatism affecting the knees.

There is no history of rheumatism in any members of the family.

He has been a seaman engineer and, consequently exposed to great variations of temperature but when younger took alcohol to excess.

PREVIOUS HEALTH:- Up till 1899 he had perfect health. In December 1898 he contracted gonorrhoea: the discharge was slight and under treatment soon disappeared.

PRESENT ILLNESS:- In January 1899 the present trouble commenced with swelling and pain in joints at wrists and elbows. He had pains all over the body and was in bed for two months. He gradually recovered. In January 1905 he took ill again: the left knee commenced to swell, following 5 months later by swelling of the right knee. On November 22nd. 1905 he was admitted to Ward VI of the Western Infirmary. The swelling of the joints have varied from time to time but since the end of October they have become more swollen and although varying a little in size have been constantly so. They cause him great pain in walking and incapacitate him for work. He has lost 1 st. 10 lbs. in the last 10 months.

PRESENT CONDITION:- On admission, November 22nd. Knees: both are greatly swollen, the left slightly more than the right: the swelling in both cases is chiefly confined to the suprapatellar pouches. Fluctuation is very marked and

grating of joints felt on movement. The left leg is flexed at the knee and complete extension is impossible. On both legs are deeply pigmented scars, all of which he ascribes to trauma. Glands of groin are much enlarged

JAN. 15th.:- Since admission there has been no temperature. Weight, Nov. 22nd. 10 st.2 lbs. Jan. 13th. 11 st.6 lbs. He has been treated with gradually increasing doses of Potassium Iodide till he is now taking full doses, that is to say two drachms three times a day. Flannel bandages have been applied to the knees and the limbs elevated. There is tenderness on firm pressure over the heads of the tibia and fibula. Left knee is slightly flexed and cannot be straightened. On each side of the patella numerous small fairly hard bodies may be felt slipping between the fingers and the bone in both knees: on more careful examination these are not free but are attached and situated mostly about the level of the joint. I take them to be thickened synovial fringes. He complains of having pain in knees which occasionally keeps him from sleeping. Hot air treatment was commenced to-day but only to the left knee.

MEASUREMENTS.

	<u>Above Patella.</u>	<u>Middle of Patella.</u>	<u>Below Patella.</u>
Jan.15.Right,	14 $\frac{1}{2}$ ins.	14 $\frac{1}{2}$ ins.	12 $\frac{1}{2}$ inches.
Left,	15 "	15 "	15 "
25.Right,	14 $\frac{1}{2}$ "	14 $\frac{1}{2}$ "	12 "
Left,	14 $\frac{1}{2}$ "	15 "	12 "
30.Right,	14 "	14 "	11 $\frac{1}{2}$ "
Left,	13 $\frac{3}{4}$ "	13 $\frac{3}{4}$ "	11 $\frac{1}{2}$ "

He has now no pain in the knee. There is less

tenderness of the heads of tibia and fibula. The left leg, however, is just as stiff as before.

Feb. 6th.:- Patient is to get up and move about. Potassium Iodide is to be stopped and the knees are to be massaged.

Feb. 12th.:- The left knee is the smaller of the two. The swelling in both has gone down very markedly since the commencement of treatment. He has no pain now and practically no tenderness. He feels quite well as he moves about.

Feb. 14th.:- The patient consented to be put under chloroform and have the knee straightened but at the last moment would not permit it. He was keen to get to work and left Hospital to-day, the treatment being discontinued.

This case was an interesting one: he was taking internally most of the time large doses of potassium iodide. Only one knee was treated and the swelling in both went down. Was it due to the Potassium Iodide or the Hot Air? Certainly the swelling had gone down to some extent as the result of rest, elevation and the medicine but it went down much more quickly after the hot air treatment was commenced. The worst knee was treated: it had been longer affected and was the more swollen of the two: in addition, there was pain and tenderness. When treatment was stopped, the treated knee was certainly the smaller of the two, the pain and tenderness were quite gone and he was able to walk without any pain. The stiffness which was never very marked was obviously due to adhesions which didn't yield to hot air and

might have been broken down under chloroform. In conclusion, therefore, I think this case was markedly benefited by the hot air. The rest, elevation and potassium iodide probably all helped towards the beneficial result. As I have already pointed out on page 6, heat and sweating occurred reflexly in the opposite limb to that treated and I think it is quite likely in this case that the untreated knee came in reflexly to a certain extent for the benefit of the treatment of the other.

He had 27 applications, lasting usually 20 minutes: the temperature of the air was from 140-150 C. On only the last two days were his pulse and temperature noted.

Feb.	Pulse		Temperature	
	before.	after.	before.	after.
13.	84.	88.	97.	98.5.
14.	92.	92.	97.	98.

CASE XIII.

Isabella Ritchie, age 30, Housewife. Commenced treatment February 1st. 1906. Rheumatoid arthritis of 3 years duration.

In no members of the family is there any history of rheumatism or rheumatic tendency.

For 4 years she has served in a draughty shop at Forres.

PREVIOUS HEALTH:- When 16 years of age she had an attack of typhoid fever. When 19 and 21 she had attacks of Influenza. In all she made a good recovery. She has otherwise been strong, healthy and able for work and never had sore-throats or "growing" pains.

PRESENT ILLNESS:- Began three years ago, the cause of which she attributes to draughts. Her left shoulder was first affected and became very swollen and painful and the ends of bones enlarged. She has gradually become worse but has never been laid up. In July and August 1904 she went to Strathpeffer and was somewhat improved by baths and waters. For 9 months she has been unable to do any work. The pain has been continually present. Massage, blisters, change of air and medicines have only effected temporary alleviation of the symptoms.

PRESENT CONDITION:- She is pale and anaemic looking and poorly developed. Almost all the joints are affected and complains of pain on movement. She is often conscious of a grating in the affected joints. Left wrist: bones much thickened, rough and irregular in shape. Distinct ulnar

deflexion of wrists and fingers. Metacarpal joint of 1st. finger is much swollen, as are also the proximal phalangeal joints. Fingers are kept semi-flexed and cannot be straightened. Exostoses are present on all the bones of the hand and fingers: creaking on movement. Heberden's nodes are present on the fingers. Right wrist: and finger joints are very similar but all the changes and especially the bony growths are more marked. Both elbows are slightly flexed and complete extension is impossible. Exostoses and thickening of the ends of the bones are marked. The shoulders show a similar condition. In the lower limbs the ends of the bones are enormously increased in size and exostoses are present. Extension is very incomplete at knees and creaking and grating can be felt on movement of them. More or less pain is felt on moving any joint but excepting the left knee and elbow, which are much the most swollen, it is not very acute. There is a certain amount of tenderness on pressure over the spine and on any rotatory movement of the body, pain is caused there and there is also some rigidity. Temporomaxillary joints are painful and movement is limited. Grating is felt. Condyles are markedly enlarged. Other organs are normal.

Such was her condition on admission to Ward 1 on October 14th. 1905.

Treatment has been rest in bed, regulation of bowels, generous diet and a tonic. Hot bathing and applications of turpentine linament with fixation of joints.

Nov. 10th.:- Massage and passive movement. Jan. 17th Sodium salicylate, 20 grains at bedtime. Weight 1902, 10st. 7 lbs. On admission, Oct. 14th. 7 st. 3 lbs. Jan 27th.

7 st.5 lbs.

Feb. 1st.:- Patient came from the wards to-day for hot air treatment. Her condition now is practically the same as described above but the pain in ankles has been very severe and keeps her from sleeping at night: the right slightly the worse of the two. Owing to the pain in these, I determined to treat them only. On trying to move these ankle joints I found them very stiff and painful and they grated markedly. Treatment was commenced to-day the Sodium Salicylate was stopped at night.

Feb. 2nd.:- She felt easier yesterday after treatment and has slept better.

Feb. 7th.:- The right ankle is stiffer than the left. She has not so much pain in them and she is sleeping better at nights.

Feb. 8th.:- The right ankle moving more freely. 1st metatarsal joint is tender and very painful to-day: five minutes application over toe relieved it.

Feb. 15th.:- Left ankle is quite well: she has no pain in it now and none on passive movement: stopped treatment in left.

Feb. 16th.:- Right ankle was treated for 45 minutes to-day: the pain was eased and movements were quite free after it.

Feb. 19th.:- Ankles are very well. Treatment was commenced on the knees. They are both very much swollen, the right being the worst. There is tenderness over the femoral condyles and heads of tibiae and fibulae.

Feb. 23rd.:- Treatment was stopped to-day. The pain has returned again slightly to the right ankle. She has got disheartened over her slow progress and wants to try some other baths.

I think the hot air undoubtedly helped her. The first few nights after the applications she slept better. The pain in the ankles was always relieved and the movements were easier for a time: she stated that towards evening they again stiffened up. The progress was undoubtedly slow but when treatment was stopped the ankles had been improved. The case was one so extensive, however, that probably permanent benefit could hardly be expected. The disease had got such a hold of her and implicated the joints so extensively that permanent deformity was assured. It should be noted that she was one of those neurotic despondent women.

Feb.	Temperature.	Duration.	Pulse before.	after.	Temperature before.	after.	Situation.
1.	130 C.	10 minutes.					Right ankle.
2.	130-140 C.	20 "					Both ankles.
3.	130-140 C.	20 "					" "
5.	130-140 C.	20 "					Right ankle with passive movement.
6.	120-130 C.	25 "					Left ankle with passive movement.
7.	120-130 C.	30 "					Right ankle & 1st. right metatarsal joint.
8.	120-130 C.	30 "					Left ankle ditto.
9.	120-130 C.	30 "					Right ankle ditto.
10.	130-140 C.	20 "					Right ankle ditto.
12.	130-140 C.	30 "					Right ankle ditto.
13.	130-140 C.	15 "	84.	96.	96.	98.	Left ditto.
14.	130-140 C.	30 "	96.	104.	98.	98.2.	Right ankle & toes ditto.
15.	130-140 C.	20 "	108.	108.	97.4.	98.5.	Left ditto.
16.	130-140 C.	45 "	106.	108.	98.2.	98.6.	Right ditto.
17.	130-140 C.	30 "	108.	100.	98.6.	99.	Right ditto.
19.	130-150 C.	30 "	92.	100.	98.5.	98.8.	Right ditto.
20.	130-160 C.	30 "	106.	108.	97.	98.	Both knees.
21.	130-150 C.	30 "	106.	96.	98.8.	98.6.	" "
22.	130-150 C.	30 "	104.	100.	97.2.	98.8.	" "
23.	130-150 C.	30 "	104.	106.	98.4.	98.8.	" "

CASE XIV.

Miss P. age 38, Teacher of Cookery. Commenced treatment February 5th: 1906. Rheumatoid arthritis of 8 years duration.

There is no **rheumatic** history in her family.

PREVIOUS HEALTH:- She has never had "growing" pains or "sore-throats". She was always very strong and healthy and went in for a great deal of tennis when young; she thinks this must have something to do with her illness. For the last 9 years she has had to undertake the work of cookery, which means, of course, extremes of temperature.

PRESENT ILLNESS:- dates back about 8 years. It commenced as a strain in the right wrist which was swollen and painful for months. Two years ago ~~the left~~ the left then became affected. The right was always the most painful although it never swells much now. Both hands gradually stiffened up. Two years ago her right elbow became affected and gradually became stiff till now it is absolutely fixed at a right angle. In September 1904 she had a left-sided facial paralysis: previous to the paralysis she had severe pain for weeks just behind the ear: the night before it came on she remembers distinctly she was working in a draught from a window which came on the left side. During the next 3 months she gradually recovered: there is still a slight twist in the mouth to one side, which becomes more marked on speaking or laughing. Every fortnight her right eyelid becomes oedematous and swollen: it lasts for two days and then subsides. This has been going on for 8 years and occurs about every fortnight. She always feels unwell the day before and has a bad headache

towards evening.

Treatment:- She has been treated since the disease commenced with every form of treatment: she has had baths and electricity at home and abroad. For about a month, she has been treated in the Dispensary in the radiant heat bath, from which she has received benefit, the hands becoming a little less stiff than they were.

Present Condition:- Feb. 5th. 1906. The right elbow is quite fixed at a right angle: it gives just the slightest thing on strong movement: there is slight tenderness on pressure over the inner side of the humerus and ulna. The ends of the radius and ulna on this side are thickened: the wrist is stiff, although it gives to a certain extent, but is painful on movement. The right thumb is slightly painful but the other fingers seem unaffected. The radius is found to be quite fixed and thus quite limits pronation and supination. There is fibrous thickening with pain on pressure extending from a point on the dorsum of the lower end of the ulna to the dorsum of head of 5th. metacarpal. There is also fibrous thickening in the wrist joints, which prevents extension, flexion and rotatory movements of hand or wrist. The left elbow is normal. On the left side there is marked thickening of the ends of the ulna and radius with tenderness on pressure. The stiffness at the wrist is very marked and there is hardly any flexion and extension or rotatory movements, of hand and wrist, and these are very painful. There is marked fibrous thickening in the joints of the wrist preventing these movements. There is thickening and some swelling

in the tendon sheath of the tendon going to 4th. finger of the extensor digitorum: there is tenderness on pressure. There is slight ulnar deflexion in both. Patient states that her wrists are often very painful and she says she is a weather-glass not for rain but for wind. There is slight grating in both wrists and very marked grating in the metacarpal joint of thumb which is very painful on movement. All other joints are healthy.

Feb. 5th.:- She rarely has pain now in the wrists and the movements are freer. She can touch the tip of her nose with her right hand a thing she was unable to do before.

March 1st.:- The treatment has gone steadily on: the box was introduced about six days after she commenced and she says she felt much more benefited by it. The wrists are much freer and the pain on movement is not nearly so severe. There is no pain on rotation of the left, but there is still on flexion and extension. In the right the rotation is slightly painful as well as flexion and extension. The rotation of right thumb is still painful. She does not find her wrists affected now by the weather.

March 12th.:- She is sleeping better at night and never has pain now or only very slight and very occasional.

March 14th.:- There has been hard keen black frost for 3 days: the wrists are stiffer to-day but there is no pain. She says that before, she would have had severe pain both before and during frost.

March 16th.:- Stopped treatment for a few days. She is very much better: she has no pain now. The movement of

the right wrist is wonderfully free: there is still pain on rotation but not so much on flexion and extension. Right thumb grates and is painful on severe movement. The left wrist is still somewhat stiff. There is still pain on flexion and extension but not on rotation.

March 21st.:- Professor Stockman, whose patient she is, saw the patient to-day: he has not seen her since she started the hot air treatment and thinks her immensely improved. The movement of the right is very good, the thickening round the wrists being almost nil. In the left, rotation is almost perfect: backward and forward movement is good but it gives and recoils. The fibrous thickening around the end of the ulna has disappeared and movement is perfect there: the fibrous thickening has also disappeared from the heads of the metacarpals but there is still some thickening round the end of the radius. He considers movement of this will become better than the right because rotation is better. The disease, in his opinion, is entirely cured and only its affects are left. Elbow (right) is still in the same condition and he thinks nothing can be done for it unless under chloroform. Hot air was applied for a few days on the elbow but there was no yielding with it and it was stopped. There is no pain in it and it is in very good position.

March 22nd.:- Commenced treatment again.

April 23rd.:- She has been on holiday since the 13th. She feels very well with the exception of right thumb which is very painful to-day.

April 24th.:- She has not gone back at all with the

exception of the thumb which seems to be more painful. It was relieved yesterday with the passive movement and hot air. Otherwise she is very well and has absolutely no pain now in the wrists.

May 18th.:- Patient continues to do well. The pain in the right thumb is only occasional; rotation of it does not cause much pain and the grating which was so marked is very much less.

Feb.	Temperature.	Duration.	Pulse before.	after.	Temperature before.	after.	Situation.
5.	130 C.	30 minutes.					Wrists & Elbow.
6.	130-140 C.	30 "					ditto.
8.	140-150 C.	25 "					ditto.
9.	110-140 C.	50 "					ditto.
12.	110-140 C.	60 "					ditto.
13.	110-140 C.	40 "	84.	80.	97.8.	99.	ditto.
14.	110-140 C.	30 "	92.	90.	97.	99.	ditto.
15.	110-150 C.	35 "	92.	84.	97.	99.4.	Left Wrist & Elbow.
16.	130-150 C.	45 "	80.	80.	97.	99.6.	ditto.
17.	130-150 C.	30 "	86.	88.	97.4.	99.2.	ditto.
19.	130-150 C.	45 "	84.	80.	97.	99.	ditto.
20.	130-160 C.	40 "	82.	88.	97.2.	99.	ditto.
21.	130-160 C.	40 "	86.	84.	98.6.	99.	ditto.
22.	130-160 C.	30 "	100.	96.	97.	98.8.	ditto.
23.	130-160 C.	45 "	84.	96.	96.	99.8.	Both wrists.
26.	130-150 C.	30 "	92.	100.	98.6.	98.6.	ditto.
27.	130-150 C.	30 "	88.	92.	97.6.	99.2.	ditto.
28.	130-150 C.	30 "	96.	100.	96.	99.	ditto.
March							
1.	130-160 C.	45 "	84.	88.	98.	99.	Both wrists.
2.	130-160 C.	30 "	88.	88.	96.	99.3.	ditto.
5.	130-160 C.	40 "	82.	100.	97.	98.8.	ditto.
6.	130-160 C.	40 "	84.	96.	98.8.	99.3.	ditto.
7.	130-160 C.	35 "	84.	92.	97.	99.	ditto.
8.	130-160 C.	40 "	82.	104.	97.8.	99.2.	ditto.
9.	130-160 C.	30 "	84.	88.	97.4.	99.2.	ditto.
12.	130-160 C.	25 "	80.	84.	97.4.	98.8.	ditto.
13.	130-160 C.	30 "	82.	80.	97.	98.8.	ditto.
14.	130-160 C.	30 "	82.	80.	97.	98.8.	ditto.
16.	130-150 C.	20 "	88.	80.	97.4.	98.8.	ditto.
22.	130-150 C.	30 "	92.	88.	97.	98.8.	ditto.
23.	130-160 C.	35 "	72.	92.	98.8.	99.	ditto.
27.	130-180 C.	40 "	98.	1001	97.8.	99.	ditto.

March.	Temperature.	Duration.	Pulse		Temperature		Situation.
			before.	after.	before.	after.	
28.	130-160 C.	40 minutes.	88.	90.	97.4.	99.	Both wrists.
29.	130-160 C.	40 "	80.	88.	98.	99.	ditto.
30.	140-170 C.	40 "	78.	80.	97.6.	98.8.	ditto.
April							
2.	160-180 C.	40 "	96.	96.	97.6.	99.2.	ditto.
3.	160-180 C.	40 "	92.	96.	97.6.	98.8.	ditto.
4.	160-180 C.	40 "	92.	100.	97.6.	98.8.	ditto.
5.	160-180 C.	40 "	100.	100.	97.4.	99.	ditto.
9.	140-160 C.	40 "	88.	92.	97.6.	99.	ditto.
10.	140-150 C.	40 "	88.	92.	97.6.	99.	ditto.
11.	150-160 C.	40 "	72.	76.	97.6.	98.	ditto.
12.	140-160 C.	40 "	88.	100.	97.4.	98.	ditto.
13.	140-160 C.	40 "	76.	90.	98.	99.	ditto.
15.	140-160 C.	40 "	68.	90.	98.6.	99.	ditto.
23.	140-160 C.	40 "	64.	70.	97.2.	98.	ditto.
24.	150-170 C.	40 "	60.	68.	97.	98.	ditto.
25.	160-180 C.	40 "	60.	68.	97.	98.	ditto.
26.	160-180 C.	40 "	60.	68.	97.6.	98.4.	ditto.
27.	160-180 C.	40 "	64.	68.	97.6.	98.4.	ditto.
30.	150-160 C.	40 "	80.	82.	97.	98.	ditto.
May							
1.	160-180 C.	40 "	78.	80.	97.6.	98.	ditto.
2.	160-180 C.	40 "	80.	84.	98.2.	98.4.	ditto.
5.	160-180 C.	40 "	78.	80.	98.	98.4.	ditto.
4.	160-180 C.	40 "	74.	76.	98.	98.	ditto.
7.	160-180 C.	40 "	72.	78.	97.8.	98.	ditto.
8.	160-180 C.	40 "	78.	78.	98.	98.6.	ditto.
9.	160-180 C.	40 "	74.	78.	97.6.	99.2.	ditto.
10.	160-180 C.	40 "	80.	80.	97.2.	98.	ditto.
11.	160-180 C.	40 "	78.	80.	98.	99.	ditto.
14.	160-180 C.	40 "	80.	84.	97.6.	99.2.	ditto.
16.	160-180 C.	40 "	82.	84.	98.	99.	ditto.
17.	160-180 C.	40 "	88.	90.	97.2.	98.	ditto.
18.	160-180 C.	40 "	82.	84.	98.	99.	ditto.
21.	160-180 C.	40 "	80.	80.	97.6.	98.	ditto.
22.	160-180 C.	40 "	80.	84.	98.	98.4.	ditto.
23.	160-180 C.	40 "	84.	88.	97.8.	98.	ditto.

CASE XV.

Mrs. H. age 53, Housewife. Commenced treatment Jan. 18th. 1906. Chronic rheumatism of four years duration.

Patient's mother had several attacks of rheumatic fever and eventually died of Heart Disease with Dropsy. A sister has also had acute rheumatism. The other seven members of the family all suffer more or less from rheumatic pains. Patient has been troubled for years with dyspepsia.

PRESENT ILLNESS:- Commenced four years ago with a feeling of numbness in tips of fingers of left hand, followed by stiffness and pain in the joints: the thumb and the second finger were most affected while the others were quite moveable. She soon got tired when knitting and sowing. Then it went to the wrist, elbow and shoulder on left side. Two years ago the right hand showed signs of numbness with loss of power and without actual pain. The wrist, elbow and shoulder were affected in succession. In September 1904 she was treated at the Dispensary of the Western Infirmary. At that time she could hardly dress herself and could not raise her arms above a certain angle. She had the battery for four months and was pretty well after that. She became worse again in the beginning of September 1905 and was very bad in November when the pains were all over her body. She has been improving of late under medicinal treatment and is able to dress herself now and can move her arms to a certain extent.

PRESENT CONDITION:- Left ^had: 1st metacarpophalangeal joint is swollen and very tender with at times very acute pain: 2nd. metacarpophalangeal joint and 1st. and 2nd phalangeal

joints are also swollen and slightly tender. The 4th. and 5th. are less affected. All the joints are more or less stiff. Right hand: the thumb never swells but she often complains of pain in it. There is stiffness and burning pains at night. The 2nd. to 5th. are not so much affected. The terminal joints of these are slightly swollen: all joints are more or less stiff. Both wrists are affected but the left is much the worst. There is dull aching pain mostly in the left and worst at nights. The left feels very powerless. Both elbows are affected but left is the worst. She is unable to raise arms above a certain height: she has been rather better lately. Sensation of touch is impaired in left hand and forearm as compared with the right. Fingers and region supplied by radial and median nerves are more affected than that of ulnar. The ulnar however is impaired as compared with the right. The grips are very poor, much more so in the left. In fact all the muscles in the left side are less powerful than the right including the shoulder muscles. The biceps and triceps are very powerless and according to the Doctor's report these were unaffected 18 months ago.

DIAGNOSIS:- is one of some difficulty. There appears to be progressive muscular atrophy with slight sensory implication, but, in my opinion, there is also a chronic rheumatic condition. There is a strong family history, there is swelling and pain of joints worst at nights and affected by the weather very markedly. There is no sign of any rheumatoid arthritic condition in which muscular atrophy is well-marked: there is no enlargement of the ends of bone, no osteophytes,

no deformity, no ulnar deflexion of the hands.

JAN. 18th.:- Treatment was commenced to-day on both hands.

FEB. 1st.:- Left thumb is very painful to-day. The left hand swells very little now as compared with what it did: it used to swell every afternoon with pain in addition.

JAN. 22nd.:- The right arm can almost be lifted to back of head, the left not above a right angle.

FEB. 5th.:- Right hand is much improved. The left also but the thumb is still painful at night. Before she could only sleep for half to one hour at a time and remain awake much longer. Lately she has been sleeping two or three hours at a time and gets to sleep much quicker than before. She can sew for half an hour on end now: before it was only five minutes or so. Left thumb is much more supple and less painful: the pain and stiffness are always relieved by the application. There is no numbness in the right hand now. She also feels heat more easily. The right hand can be lifted to top of head. The tips of fingers of left touch the shoulder. She can hold the right arm straight out from the shoulder.

FEB. 8th.:- Commenced treatment of the hand in box.

FEB. 15th.:- Left thumb swollen and painful to-day: 40 minutes treatment.

FEB. 16th.:- Much better after yesterday: swelling very much decreased.

March 1st.:- Improvement continues. She can touch opposite shoulder with left hand.

MAR. 8th.:- She has been sleeping very well up till the last two nights, when thumb has been aching: bad weather. She is feeling stronger and taking her food better and with less pain after it (she is taking medicine for it).

MAR. 9th.:- Both hands slightly sore to-day: the weather is very bad. She states however they are nothing to what they would have been 3 months ago in like weather.

MAR. 20th.:- Weather has begun to improve. She is feeling better again. There is no pain in right: left is still painful.

MAR 22nd.:- Slept better last night: left thumb still very painful.. It is always relieved for a while after treatment.

APRIL 6th.:- She was feeling so well treatment was stopped to-day. Left thumb is still a little painful on movement.

APRIL 23rd.:- Patient has been very well since the treatment was stopped and is much stronger. She sleeps well at night and has very seldom any pain. She also states that the numbness is much improved. There is not much improvement in the muscular power.

In this case I don't think there was any benefit to the "muscular atrophy": it had not increased however since the treatment was commenced. The rheumatic condition, however, which complicated it, was much benefited and the patient's general health and condition were improved.

Jan. 18th. - Feb. 12th. average temperature, 140-150 C.
average time 15 - 30 minutes. Both hands.

	Feb. Temperature.	Duration.	Pulse before.	Pulse after.	Temperature before.	Temperature after.	Situation.
13.	110-115 C.	30 minutes.	72.	80.	97.	99.	Both hands.
14.	140-150 C.	30 "	80.	84.	96.8.	99.4.	L.40: R,20.
15.	140-160 C.	60 "	76.	84.	100.	100.	Left.
16.	140-150 C.	50 "	72.	84.	96.	99.8.	" "
17.	140-160 C.	40 "	72.	72.	97.2.	99.2.	" "
19.	140-160 C.	35 "	72.	80.	98.7.	99.2.	" "
20.	130-160 C.	40 "	76.	84.	97.	99.4.	" "
21.	130-150 C.	30 "	72.	72.	97.4.	99.4.	Both.
22.	130-160 C.	30 "	76.	88.	96.	99.4.	" "
26.	130-160 C.	30 "	84.	92.	97.2.	99.2.	" "
27.	130-160 C.	30 "	72.	76.	97.2.	99.	" "
28.	130-160 C.	30 "	74.	78.	97.	99.4.	" "
March,							
1.	130-160 C.	50 "	84.	88.	97.2.	99.5.	" "
2.	130-160 C.	40 "	88.	88.	97.	99.4.	" "
5.	130-160 C.	40 "	84.	88.	96.5.	99.4.	" "
6.	150-160 C.	30 "	80.	88.	97.6.	99.6.	" "
7.	140-160 C.	30 "	88.	100.	97.6.	99.4.	" "
8.	130-160 C.	30 "	76.	84.	97.	99.4.	" "
9.	130-160 C.	25 "	76.	92.	97.4.	99.2.	Left.
12.	130-160 C.	15 "	76.	88.	97.2.	99.2.	Both.
13.	130-160 C.	25 "	76.	84.	99.	99.4.	" "
14.	130-160 C.	15 "	92.	88.	97.4.	99.2.	" "
16.	130-160 C.	20 "	76.	88.	97.8.	99.2.	Left.
19.	150-160 C.	40 "	76.	92.	97.6.	99.4.	" "
20.	130-160 C.	35 "	88.	100.	98.	99.8.	" "
21.	130-160 C.	20 "	84.	80.	99.2.	99.6.	" "
22.	130-160 C.	30 "	80.	104.	98.4.	99.5.	" "
23.	130-150 C.	20 "	76.	108.	98.	99.6.	" "
27.	160-170 C.	30 "	74.	84.	98.8.	99.8.	Both.
28.	140-170 C.	30 "	76.	78.	98.4.	100.	" "
29.	140-170 C.	30 "	74.	80.	98.	99.8.	" "
30.	140-170 C.	30 "	88.	99.	97.6.	98.8.	" "
31.	160-180 C.	30 "	60.	80.	97.6.	97.8.	" "
Apr. 2.	150-180 C.	30 "	76.	80.	97.6.	98.6.	" "
3	160-180 C.	30 "	88.	100.	98.4.	98.6.	" "
4.	160-180 C.	20 "	80.	90.	97.6.	98.8.	Right.

The temperature it will be seen generally rose over 99 and reached 100 on Feb. 15th. after 60 minutes application and again on March 23rd. after only 30 minutes. The last five times it has failed to rise to 99. The pulse also showed an increase in its rate and in this case, I noted **specially** that the pulse was much stronger after treatment.

CASE XVI.

William Brown, age 56. Commenced treatment, March 6th. 1906. Chronic rheumatism of three years' duration.

There is no history of rheumatism in the family. One of his daughters, however, complains of rheumatic pains.

PREVIOUS HEALTH:- At 21 he had an attack of acute rheumatism which lasted for 6 weeks. Six years ago he had an attack of influenza lasting 5 weeks. As a boy he suffered from severe "growing" pains. He has had a chronic winter cough for years.

PRESENT ILLNESS:- Began three years ago with pains in the feet, followed by legs, hand, shoulders. but always worst in left leg and arm. Every now and again finger, wrist, should, knee and toe joints become swollen and painful, flitting from joint to joint. Left shoulder and right hand usually swell most. Several times he had to take to bed. He has been unable to work since June 1905 on account of the increasing weakness.

PRESENT CONDITION:- Right shoulder, wrist and finger joints stiff and painful on movement: there is no creaking and the heads of the metacarpals are slightly swollen and tender. There is also tenderness over the ends of the radius and ulna and on deep pressure all over the hands. Left shoulder is very stiff, painful and creaks on movement. The wrist is slightly tender on pressure but not much on movement. Biceps muscles have fair strength: the left is painful on pressure. The grasps on both hands are feeble, especially the left.

MARCH 6th.:- The treatment was commenced to-day with 35 minutes to the left shoulder. The pain was much relieved and it was found afterwards his arm could be raised higher, more easily rotated and with much less pain: he could also move it more freely himself.

MARCH 13th.:- Feels it much easier to-day. Right shoulder is quite well and the left is moving easier and with less pain.

APRIL 5th.:- The improvement has not continued: he is better one day and bad the next. The affection seems to be too generalised to benefit from the treatment. Treatment was stopped to-day.

He often had severe pain when he came and the shoulder was usually stiff and painful on movement. After treatment, the pain was always quite relieved, the stiffness very much less and also the pain on movement. He says, however, it usually stiffened up and became painful again in the afternoon. It was disappointing that he seemed to get no permanent benefit.

March.	Temperature.	Duration.	Pulse before after	Temperature before after.	Situation.
6.	130-150 C.	35 minutes.	88.	98.8.	L. Shoulder.
7.	130-150 C.	20 "	88.	99.	R. "
8.	130-160 C.	30 "	80.	98.8.	L. "
9.	130-160 C.	20 "	80.	98.5.	L. "
12.	130-150 C.	20 "	78.	98.2.	L. "
13.	130-150 C.	20 "	88.	98.4.	L. "
14.	130-160 C.	20 "	84.	98.4.	L. "
16.	130-160 C.	15 "	84.	99.	L. "
17.	130-150 C.	20 "	96.	97.6.	L. "
21.	130-150 C.	20 "	100.	98.6.	L. "
22.	130-150 C.	20 "	96.	98.7.	L. "
27.	130-150 C.	20 "	80.	98.6.	L. "
28.	160-170 C.	20 "	80.	98.8.	L. "
30.	140-170 C.	20 "	80.	99.	L. "
31.	150-180 C.	20 "	74.	99.	L. "
Ap1.	160-180 C.	20 "	80.	98.2.	L. "
4.	160-170 C.	20 "	92.	97.6.	L. "
5.	150-180 C.	40 "	60.	98.	Both.

CASE XVII.

Elizabeth Main, age 13. Treatment commenced May 8th.
1905. **Hallux Rigidus.**

The case was a typical one of **Hallux Rigidus.**

Hot air treatment was commenced on 8th. May 1905 and continued till 22nd. June. The temperature averaged 120-130 C and the application was given for 10 minutes daily. She was dismissed perfectly well.

John W. Arthur. M. B. Ch. B.