

III.

Observations on the Pathology and Cure of Rheumatism. By
WILLIAM BALFOUR, M. D. Edinburgh.

Tantum, quantum quisque potest, nitatur.—CIC.

SYDENHAM was the first who favoured mankind with a distinct and accurate history of rheumatism. Before his time it seems to have been confounded with gout; since that period it has maintained its ground as an idiopathic disease, and has for long been as well understood as any other, the proximate cause of which can be matter of conjecture only.

Concerning the proximate cause of rheumatism various opinions have been entertained. Dr Macbride and others imagine it to consist in a peculiar acrimony; others in a lensor of the fluids; and Dr Cullen supposes it to be, in the *acute* species, a phlogistic diathesis of the blood, with a peculiar affection of the muscular fibre; but, in the *chronic*, “an atony both of the blood-vessels and of the muscular fibres of the part affected, together with a degree of rigidity and contraction in the latter, such as frequently attends them in a state of atony.”

That in *acute* rheumatism a phlogistic diathesis of the system prevails, admits not of doubt, and that there is an affection of either the muscular fibre, or of the cellular membrane, or of both, is equally certain. An atony, in the *chronic* species, of the muscular fibres, or of the cellular membrane, must also be admitted. But which of these it is, the muscular fibre, or cellular membrane, that, in either species of the disease, is primarily affected, is a matter not quite so manifest. To ascertain this point with any degree of clearness, a review is necessary of the structure and functions of these organs themselves; and I am not without hopes of being able to adduce facts, in the history of cases hereafter to be detailed, which render it highly probable that there is in rheumatism, *chronic* as well as *acute*, an affection of the *aponeurosis* of the muscles, and perhaps of the whole cellular substance connected with them, which forms a principal part of the proximate cause of the disease.

The cellular membrane abounds everywhere in the human body. It covers the whole, and connects every part. The celebrated Haller, indeed, considers it as constituting the greater part of the whole mass. All the blood-vessels receive a coat
from

from it, from the *aorta*, where it emerges from the heart, to the minutest capillary that enters a tendon.

The nerves are composed of fasciculi, and these again of filaments or fibrillæ. The cellular membrane furnishes a sheath to every nerve, a covering to every fasciculus, and every filament is a tube of the same substance, filled with medullary matter; and on the parieties of this tube are ramified, and are supposed to secrete the medullary substance it contains, those capillaries, of exquisite minuteness, which are continuations of the arteries seen to penetrate the fasciculi. A muscle, whatever be its length, breadth, or thickness, is not a mass of homogeneous substance, but, like the nerves, is formed of many fasciculi. These fasciculi are themselves composed of fibres so delicate and numerous, as to be divisible *ad infinitum*. At all events, their minuteness is such as to have hitherto set at defiance the patient investigations of the most accurate physiologists to discover their ultimate division. But, incalculably minute as are these fibrillæ, they are supplied with vessels and nerves, and inclosed in a cellular sheath, upon which perhaps the vessels and nerves terminate. They are also connected to each other by means of cellular membrane, to form the fasciculi, which in their turn, are enveloped in a common sheath of the same substance, similar to that which covers the muscle, and separates it from all other parts.

The structure of the cellular tissue is extremely vascular. Mascagni considered its laminæ as consisting entirely of lymphatics; Ruysch, by his injections, reduced the membranes and cellular substance into a net-work purely arterial, the texture of which was so close as to leave no observable space for any other vessels. Hence he concluded, that capillary arteries formed the basis of membranous and cellular tissues. The truth, however, lies between the opinions of these two celebrated physiologists. For, if one set of vessels only are injected, they become distended, compress and conceal the neighbouring parts; and we know, that lymphatic absorption and arterial exhalation take place from all the internal surfaces, by which is proved the existence of both arteries and absorbents in membranes and cellular tissue.

From these data it may justly be inferred, that the functions of the cellular membrane are not merely mechanical; that it does not merely cover, connect, divide, suspend,—but that it serves a purpose in the animal economy, essential to the healthy functions of the parts on which it is so liberally bestowed. It is not consistent with common sense and reason to suppose, that a substance formed as is the cellular tissue of vessels, which carry on,

if I may so express myself, the business of life in every part of the body, can remain sound, when the muscular fibre is affected with disease. It is infinitely more rational to conclude, that the affection of the muscular fibre is a consequence of the affection of the cellular substance, whose functions seem, from its universal diffusion, subservient to those of every other organ. For if, as we have seen, the cellular membrane is formed of capillary arteries and absorbents, the balance between their functions being in any degree overset, must produce corresponding phenomena. Thus, if the absorbents of a muscle carry off more than the arteries deposit, permanent contraction, in every direction of that muscle, must be the consequence.

It is well known, that diseased appearances are often confined to the cellular membrane, and that, when this is the case, the organs or vessels which it surrounds exhibit a morbid action. It is likewise ascertained, from ample observation and experience, and it goes far in countenancing our theory, that, however insensible the tendons and aponeuroses of muscles are in their sound state, injuries and morbid affections of these parts are accompanied with pains unusually severe. Thus, inflammation of the integuments, the subjacent cellular substance and *fascia* of the fore-arm, sometimes the consequence of blood-letting, occasion not only the most inexpressible sufferings, but not unfrequently render the arm contracted and rigid for life.

But the knowledge we possess of the functions of the cellular membrane, goes a great way in explanation of the phenomena of rheumatism. We know that it officiates at once as a *fascia*, a ligament, a mucous gland; and that by it is secreted all the fat and oily substance that is deposited about the joints, upon, between, and in the interstices of the muscles.

In the first place, then, the *fasciæ* of the muscles confine them to their situation parallel with the bones. Were that not the case, a muscle could not contract at all. Destined to act in a certain sphere, if that sphere is lessened, a muscle will either not contract, or its contraction will be of no use. Suppose, for instance, the *biceps flexor cubiti*, the *Sartorius*, any rectilineal muscle, was deprived of its natural bandages that confine it to its situation, what appearance would it exhibit in a state of contraction, were it possible to contract at all in such circumstances? A muscle in contracting, becomes shorter, thicker, harder, rough, and vibrates like a cord when put upon the stretch. It is evident, therefore, that unless a muscle were bound by its *fasciæ* or *aponeuroses*, its contractions would either be very limited, or, in contracting, it would start from its place like the string of a bow. It follows, that a perfectly sound state of the

fasciæ of muscles is necessary to their vigorous action ; and on the supposition of there being in rheumatism a morbid affection of the *aponeuroses* of the muscles, are explained the pain and difficulty of motion, in the first stages of the disease at least, of a limb affected with that disorder.

In the second place, the doctrine of a morbid affection of the *aponeuroses* of, and cellular substance connected with, the muscles, accounts satisfactorily for the debility of the latter,—their permanent contraction,—their rigidity in *chronic* rheumatism. Were it not for the cellular membrane lubricating the surface of the muscles, it is impossible they could move upon each other ; they behaved to contract simultaneously, and to the same degree, otherwise inflammation and adhesion could not fail to be the consequence of their friction upon each other. If, therefore, there should be, from a morbid state of the cellular membrane, a deficiency of that lubricating substance which facilitates the motion of the muscles, rigidity and pain upon motion must in proportion be the consequence. Not only so, if there is a deficiency of the fatty substance, which, in a state of health, is found in greater or less quantity, deposited between, and in the interstices of the muscles, they must become shorter in proportion,—their fibres must approximate nearer to each other in every direction,—for the muscular fibre is not a line of continuous substance extending from origin to insertion ; it is made up of many pieces whose ends are connected with each other, laterally, by means of vessels, nerves, and cellular substance. What, therefore, has hitherto been deemed a wasting of the muscular fibre, may, with greater propriety, be considered a deficiency of those cushions which give plumpness to every muscle, and symmetry to the whole. Not but that there is a wasting and contraction, or absorption of the molecules of the muscular fibre itself to a certain degree, and also an affection of the nerves of a part affected with rheumatism. For if we reflect, that the fasciculi and fibrillæ of both the nerves and muscles are enveloped in cellular membrane, we must infer, that the apposition of muscular, and the secretion of nervous substance, are performed by the capillary vessels of that membrane. If, therefore, the functions of these vessels are impaired, the parts they supply must suffer in their turn. But mere disuse will produce emaciation of a limb. There is no fact in physiology better established, than that action is necessary to circulation, and circulation to nutrition. These are, indeed, matters of daily experience. Emaciation of the muscles must therefore be considered more as a consequence than a cause of rheumatism.

In the third place, the effusions that sometimes take place into

the sheaths of the tendons, is a proof that the cellular membrane is principally affected in rheumatism. I have seen effusions of this kind occur as the first symptom of the disease; and I have an instance of it in a gentleman who is presently under my care. In this case, a circumscribed tumour, without the least previous pain, appeared in the course of the tendon of the ring finger of the left hand. Unable to explain the cause, the gentleman took little or no notice of it for some days, when it became the centre of pains which shot alternately to his wrist and to the points of his fingers, with frequent and most painful catchings of the tendon on which the tumour was situated. These pains and spasms occurred chiefly in the morning when warm in bed; and in a short time, the patient became unable to grasp any thing with his hand, with any degree of firmness. When he applied to me, I desired him to grasp his left hand firmly with his right, pressing the thumb of the latter upon the *aponeurosis palmaris* of the former, and, in that situation, to try what command he had over his fingers. He could instantly use them with the utmost ease and with the greatest vigour. I next directed him to lay firm hold of the wrist of the affected hand with the other, and in this way to try the effect a bandage would produce. This gave him a more complete command still of the whole hand, and enabled him to do with it what he pleased. A clearer proof that the *annular ligament* was deficient in power, cannot be adduced. I endeavoured to persuade this gentleman to wear a bandage about his wrist, till a radical cure was obtained; but, highly amused with the success of the above experiments, and believing that he has the means of relief at command, he satisfies himself with the use of the flesh-brush, and, as occasion requires, with the repetition of these experiments, which never fail of the desired effect. Now, if we reflect that parts of similar structure, though far distant, are often observed to sympathize, we cannot wonder that the tendinous aponeurosis of the muscles, and all its processes, which are of the same nature and structure with the sheathes of the tendons, and indeed but a continuation of the same substance, should be simultaneously affected with them.

In the fourth place, from the fact that the same cause affects different parts of similar structure in different individuals, and in the same individual, perhaps, at different times, we might judge *a priori* almost, that it is not the muscular fibre, but the cellular membrane that is peculiarly affected in rheumatism. Thus, exposure to cold produces in one person catarrh, in another pneumonia, in another pleuritis, in another rheumatism, according to idiosyncrasy. Now, the parts affected in catarrh,

pneumonia, pleuritis, however they may differ in density, are of the same nature with the tendinous aponeurosis of the joints and muscles, and the cellular substance interposed between their fibres. It is, therefore, not illogical to conclude, that it is the cellular membrane, not the muscular fibre, that is primarily and peculiarly affected in rheumatism. Not but that there must also be an affection of the muscular fibre; for, as has already been observed, the connection betwixt the two, the cellular substance and muscular fibre, is so intimate, that we cannot well conceive the former to be in a morbid state, and the latter remaining altogether sound. But we must repeat, that this affection of the muscular fibre is secondary, and therefore cannot be considered as constituting a proximate cause.

In the fifth place, Dr Cullen has remarked, that the affection of the muscular fibres attending rheumatism, seems to explain why sprains and spasms produce rheumatic affection. That sprains and spasms frequently terminate in rheumatism, is an acknowledged fact. But this fact is no way explicable on the supposition of a peculiar affection, in that disease, of the muscular fibre. For it is not the muscular fibre that chiefly suffers in these accidents. The muscles are capable of acting with amazing force. They sometimes rupture their natural bandages; lacerate their tendons; and even the bones themselves have been broken by the violence of their action. It is not probable, therefore, that such powerful organs will be the first to yield in such a trial of strength as takes place in sprains, between them, their tendons, and tendinous *aponeurosis*. The fact is, that in cases of sprains, patients uniformly point to the situation of some *aponeurosis*, tendon, annular, capsular, or interosseous ligament, as the seat of debility and of pain. No conclusion, therefore, can be more natural, than that rheumatic affections arising from such accidents, are not affections chiefly of the muscular fibre, but of that substance which is of the same structure with the parts originally affected.

Finally. It would appear from the history of rheumatism, that the proximate cause, of the *acute* species at least, of that disease, is an affection of the aponeurotic expansion of the tendons and membranous covering of the joints. This appears from joints being first affected with pain, and its consequences. In many instances, indeed, the pain is confined entirely to the joints. At other times the muscles come to be affected with pains shooting along their course from one joint to another. But is it by the muscular fibre that these pains are propagated? Is it not more consonant with the other phenomena of the disease, to suppose that these pains are occasioned by the oscillation of the contents

of the extreme vessels? It is ascertained, that when red blood is, in consequence of inflammation, forced into vessels that do not naturally admit it, resolution is affected by that blood taking a retrograde course, till it comes to vessels of sufficient calibre to transmit it; in inflammations of the eye, for example, and of the *pleura*. In the latter, no symptoms of inflammation have appeared, upon dissection, in cases which, previous to death, exhibited every symptom of it; a circumstance that can be explained only on the supposition of the reflux of the blood, after death, from the part affected. From this view, it is more than probable, that vessels so extremely minute, and so very irritable and contractile as are the capillaries of the *aponeurosis* and cellular membrane, are so affected, in rheumatism, as to be incapable of transmitting, as in health, the colourless part of the blood, which therefore, by its oscillations and pressure against the parietes of its vessels, occasions those pains, hitherto believed to be propagated from joint to joint, by the muscular fibre.

Independent of the primary affection of the joints, the very nature of the remote causes themselves renders it probable, that the proximate cause of acute rheumatism is an affection of the membranes connected with the muscles. Sudden changes of weather, the application of cold to the body when warm, cannot but affect those parts soonest, and to the greatest degree, that are most exposed to their operation; and the parts so exposed are, next to the extreme vessels of the skin, the aponeuroses of the joints and muscles. The powerful muscles of the larger joints, the most common seat of rheumatic affections, are necessarily furnished with *fasciæ*, strong and dense, and whose vessels must, of course, be extremely minute. It is, therefore, *a priori*, to be expected, that they must suffer constriction from the application of cold to the body, sooner than vessels of less irritability and contractility, but of larger calibre.

But *chronic* is often the consequence of *acute* rheumatism. Nothing, therefore, can be more evident than that what constitutes the proximate cause of the latter must also form that of the former. For the only difference betwixt the two *species* of the disease consists in this, that the *acute* is accompanied with fever, whereas the *chronic* is free, or nearly free, from it. It necessarily follows, that, if a phlogistic diathesis of the blood, amounting to fever, and an affection of the *aponeurosis* and membranes of the joints and muscles, constitute the proximate cause of *acute* rheumatism, the *chronic* species of the disease must also acknowledge for its proximate cause, an affection, not different

in nature though it may be in degree, of the same membranes and aponeuroses.

I was led into these speculations, near as they may approach, or far as they may be from the truth, by what occurred sometime ago in my own person, and which I have often since practised upon others, with almost uniformly the same good effect. Having been seized with a rheumatic affection of the left shoulder, chiefly in the course of the *deltoid* muscle, the pain at times, but especially towards morning, when warm in bed, was so severe as to make me cry out. Desirous, on one of these occasions, of moving my arm, a task to which its own powers were unequal, I grasped it firmly with my right hand, about the middle of the pained muscle. To my surprise and high gratification I was instantly relieved from pain; and while I thus held my arm, I could do any thing with it I pleased without farther aid from my right hand than mere compression. This, therefore, was the remedy, the only remedy to which, on all future occasions of the kind, I had recourse, and it never was employed without success.

I now began to think, that surely the muscular fibre was not the seat of pain in rheumatism; not even of those pains occasioned by motion. If it were, how could mere compression enable it to contract with all its pristine vigour? I observed, moreover, that when, during the paroxysms of pain, I endeavoured to move my arm, the moment the belly of the muscle began to press on the *aponeurosis*, I was obliged to stop; but as soon as artificial resistance was opposed to it, the muscle could perform its functions with the utmost ease. A more decisive proof, I think, cannot be adduced, that the pain and difficulty of motion of a limb, afflicted with *chronic* rheumatism, are not referable to the muscular fibre. It may occur to the reader as it did to me, that the sudden relief from pain which I experienced, is to be explained on the principle of ligatures interrupting the progress of pain, or any other sensation, along the course of the nerves, as in some cases of *epilepsy*, *whitlow*, &c. But this by no means accounts for the fact. For I always remained free from pain for a considerable time after compression was removed. I find, upon inquiry, it is no uncommon thing for people afflicted with rheumatism, to grasp and nibble a pained joint or muscle, for the purpose of obtaining even temporary relief, which they never fail to procure in greater or less degree.

A very pertinent instance of the effects of compression occurred to me, on the 14th of November last. A woman, twenty-seven years old, and very much emaciated, complained of a rheu-

matic affection in her left shoulder, which had rendered her arm next to useless for many weeks. The pain was confined to the *scapular* portion of the *deltoid* muscle. She could by no means raise her arm to a right angle with the trunk of her body. She could not put her hand to her mouth, far less touch with the points of her fingers the crown of the head. Placing her before me on a form, I made gentle pressure with the palm of my hand on the pained part, desiring her, at the same time, to raise her hand to the crown of the head. This she could not do. I increased the pressure, and the motion of the arm became in proportion free. This process was continued till she could move her arm in every direction, with little or no uneasiness. What surprised the patient most was, she in a very short time became capable of using her arm, with nearly as much freedom without, as with the pressure.

How are these facts to be explained? Thus, in my opinion. The *aponeurosis*, and perhaps the whole cellular membrane of parts affected with rheumatism, is in a state of morbid sensibility; this state of sensibility arising from a preternatural distension of its vessels. Bandages and pressure, by affording support, take off tension, and facilitate motion, which in its turn promotes circulation. The vessels being in this way unloaded, morbid sensibility is diminished; and if the bandages or pressure be often enough applied, or for a sufficient length of time, the vessels and membrane recover their tone. It is evident, therefore, that in proportion as these effects are produced, the motion of a part formerly rigid, will not only become free, but remain so. On this principle it was, that the motion of this patient's arm remained free after the removal of the pressure; on this principle is explained, the good effects of friction, &c. in rheumatism. If a person could always move a limb affected with this disease, little more would be necessary to the cure of it. But as that is, in many instances, impossible, and in all, attended with difficulty, in a greater or less degree, bandages or pressure, according to circumstances, by facilitating motion, become, if not of themselves a complete cure, at least most powerful auxiliaries, of which, whoever once makes trial, will, when circumstances require, ever after avail themselves.

I did not see this woman again till the 10th of December, (the distance of near a month from the time she called upon me, — a month too of the most horrible weather that can well be conceived,) when I called at her house to ascertain if the cure was permanent. She told me, she allowed the bandage which I applied, to remain till quite dirty, and that when she removed it to have it washed, she found she could do perfectly well without

it, and in my presence performed, with the utmost facility, all the motions of which the arm in its soundest state is capable. In one word, this woman's case is an instance of a severe rheumatic affection, of many weeks standing, being immediately, completely, and permanently cured, by pressure alone.

On the 21st of October last, I was called to a girl of fourteen years of age, whom I found sitting in a warm room, before a large fire. Her skin was hot, face flushed, and pulse at ninety; all which I was disposed to attribute to the warm regimen she had been so carefully observing. I desired her to remove to a distance from the fire. She told me she could not move, on account of rheumatic pains, reaching from her ankles to the middle of her thighs. This account I soon found to be correct, for when, in consequence of my pressing her, she made an attempt to rise, she was forced to cry out most bitterly, so that I saw her limbs were totally immoveable. I told her I would make her walk through the room, without pain, before I left her. So much difficulty was experienced, however, in removing her from the place where she sat, that I began to suspect I had put my credit to too great hazard, and therefore endeavoured to pass off, as a joke, the assurance I had given of instant relief. Having accomplished the removal of the patient to a proper situation, I applied a roller of flannel, with a degree of tightness which she could easily bear, to both limbs, beginning at the middle of the thighs, and continuing it downwards over the feet. I now requested she would make an attempt to walk. To this she consented, on condition of being indulged with another person's arm. I allowed her to touch gently her aunt's shoulder. The girl rose up and walked through the room, stiffly to be sure, but without complaint. I ordered her to be put to bed, and as she seemed to labour somewhat in her breathing, was desirous of taking a little blood from her arm. This was peremptorily resisted by her aunt, the lady of the house, on the score of the patient's youth. It was in vain I represented, that, though bandaging the limbs was a powerful auxiliary, it never could supersede the diligent use of other remedies generally employed in the cure of rheumatism; above all, that it could have no influence whatever on febrile symptoms. Next day the patient's general health was much the same; the pains as bad as ever. I suspected the cause, and soon found the bandages were hanging loose. I immediately replaced them with the same good effect as before. With the exception of some laxatives, this girl got no other remedy, and the pains were, notwithstanding, put to flight in a few days. A sister of this girl, aged eighteen, soon after my patient got better, was seized in like manner, all over the infe-

rior extremities, with rheumatic pains. Without calling any medical aid, she had recourse to the *bandages*, which had the same happy effects with her as with her sister.

A lady, upwards of forty, who has for many years been a martyr to rheumatism, on hearing "I had found out a cure for it," applied to know what it was. I readily informed her that the application of *bandages*, or *pressure*, according to the situation of the parts affected, with a view to give relief from present pain, and to facilitate motion, was the improvement to which I laid claim, assuring her, that whoever made trial of the remedy, would find their account in it. This piece of information appeared to her so very frivolous, that she never returned an answer. I met her on the street some weeks afterwards, when I inquired if she had made trial of the *bandage*? She said she had tied a bit of flannel above the knee joint, but as she had had no return of the pains since I saw her, she could say nothing about it. I plainly saw "my cure" was too simple, cheap, and of easy application, to gain the least credit with this lady. This conversation took place about the beginning of November last, and I was determined this patient should speak to me before I spoke to her again on the subject. She did so. On the 1st of December I was abruptly stopped by her on the street, when she hastily exclaimed, "It will do, for had it not been for your *bandage*, you had not met me to-day. I was seized yesterday morning with my pains, in a most violent degree, when I was glad to have recourse to the *bandage* as you directed, which gave me instant relief, and I was able to walk abroad with the utmost ease, a thing I could not otherwise possibly have done." This I considered a great triumph over prejudice; and as the patient is a sensible woman, and of unimpeachable veracity, her account may be relied on. This I hold to be an interesting case in every point of view, and quite decisive of the immense utility to be derived from the use of *bandages*, to those afflicted with rheumatism. That a lady for many years afflicted with rheumatism, to such a degree as to render her permanently somewhat lame of one leg, and all the year over more or less subject to pain, which in the winter season became at times so severe as to confine her, if not to her bed, at least to her room, should, from the first trial of the *bandage*, in one of these paroxysms, be not only relieved from pain, but enabled to walk abroad in cold damp weather, with a firmer step than she had done for eight years before, is a thing that speaks for itself.

On the 10th of December I again met this lady on the street, when she accosted me in these words: "I am not near so lame now." This was a piece of information that, I confess, I did not

expect. I would have been quite satisfied with being told that she had experienced considerable benefit from the bandage, in the way of preventing pain. The ten days, it is material to observe, that had elapsed since she first applied the *bandage*, consisted of weather the most inconstant and severe. I therefore now put it seriously to this lady, If she was convinced that the application of the *bandage* had warded off the pains with which she was threatened on the 1st of December? If she believed the strength her leg had recovered was to be ascribed to the *bandage*? If, from what she had experienced, she believed that *bandages* would be found a powerful remedy for rheumatism? All these questions she answered most decidedly in the affirmative.

On the 15th December, William Graham, aged 32, a private in the Cumberland militia, complained of violent *lumbago*, which rendered him unable to mount guard, and he was unwilling to be sent to the hospital. On examining the part affected, found he wore a broad *bandage* round his body. This he had been accustomed to do, but said he experienced from it no benefit to his back. I asked his pocket-handkerchief, which I formed into a compress, and laid it on the part affected, applying the *bandage* over it as tight as he could bear it. On inquiring how he felt, he replied, "Perfectly at ease. I feel a want supplied, and I can turn myself any way I please with perfect freedom." He went to bed quite well, but in the morning found himself much worse. I saw him again on the 16th, about three o'clock afternoon, when I asked him if he had laid aside the *compress* that his pains had returned? He said he still wore the *compress*, and experienced from it so much benefit, that without it he could not walk at all. On the 15th I omitted to examine his pulse, which I now found at 100. I therefore immediately took twenty ounces of blood from his arm. This took off the phlogistic diathesis of the system, and the *compress*, which, as the pain had extended, I ordered to be enlarged, completed the cure.

In the first week of January, Mrs M. a lady about 36 years of age, complained of severe pain in the left lumbar region, for which she had been advised to have blood let. On applying to me, I recommended a trial of a *compress* and *bandage*. Having never heard of such a mode of cure, she appeared at a loss whether to take my advice as a joke or not. On assuring her I was serious, she promised compliance as soon as she got home. I insisted on the trial being made immediately; and as I had been setting a fractured arm just before she came in, there was a piece of flannel lying in the room, of which I made a *compress*,

directing her to lay it on the part affected, and to make use of her handkerchief for a *bandage*. When I returned to the room I purposely introduced another subject of conversation, that what observations she might make on the mode of cure we had adopted should come spontaneously from herself. Accordingly, I soon observed her moving the trunk of her body, without having received any directions from me to that effect, backwards, forwards, and sideways. I asked her what she meant by so doing. She said the pain was gone, which yet she could scarcely believe, and that, to ascertain the fact, she was practising those motions which she dared not attempt before the *compress* and *bandage* were applied, but which she could now do with ease. Next day the pain struck her in the right lumbar region, from which also it immediately removed on application to the part of the *compress* and *bandage*.

When I relate such instances of the immediate and great good effects of *compression* in *lumbago*, candour and truth demand the acknowledgement, that I have met with several cases in which that mode of treatment completely failed of success. The superficial observer, alone, however, will from hence conclude against the utility of the practice; for the muscles of the loins are not all situated on a plane. Some of them are superficial, others deep-seated. Compression may affect the former; it cannot the latter. To deny, therefore, the utility of bandages in the cure of rheumatism, because cases occur which admit not of compression, would be as unscientific as to say, that, because blood-vessels are sometimes ruptured or wounded, which, from their situation, it is not in the power of man to coerce, Ambrose Parey, in introducing the tying of arteries in amputation, is not the author of the most important improvement ever made in the operative branch of the healing art; or, because we meet with ulcers so vitiated as to admit of being cured by no mode of treatment, that the use of bandages, as introduced by Mr Baynton for the cure of old ulcers, is not the most valuable improvement that medical surgery has received in modern times. *Cinchona* does not always cure intermittent fever, nor mercury syphilis. But would any man be so mad as to reject these remedies as not generally to be depended on, for the cure of these diseases?

On the 16th January, —————, residing at Cramond, came to consult me about a rheumatic affection, of many years' standing, in his left haunch. His knees and thighs had also been affected, and are still feeble, but free from rigidity and pain. Walks with a timorous irresolute step, the one foot often involuntarily kicking the other. I applied a bandage to both

knees, beginning a little below, and carrying it a little above the joints. This gave him a command of his limbs, he said, to which he had been a stranger for many years. His principal complaint, however, was situated immediately under the crest of the left *ilium*. As soon as I ascertained this, I was sure of being able to afford him relief; for the smooth surface of the bone I knew would present an equable resistance to pressure from without. I began, therefore, with desiring the patient to perform the various motions of which the trunk of the body is capable in its sound state. But this was a task to which he was altogether unequal. His body, indeed, had been confined to a prone posture for a great length of time. He could tie the shoe of his right foot with ease, but could not reach farther than the middle of the left leg. I put him, therefore, in this position, desiring him to point, at the same time, to the spot that checked his stooping farther. This done, I pressed my hand against the part affected, and desired him to put his hand down to his foot. This he did at once, and with facility, to his own astonishment, and to that of his son-in-law, who looked on. Having several times practised this, and other motions of which he was formerly incapable, I applied a compress and bandage, formed of such materials as were at hand, and sent him away rejoicing.

On the 9th of January, I was called to Mr B. a gentleman traveller, lodged in the Black-bull inn, who informed me he had been arrested on his journey, for four weeks before, by acute rheumatism, and that he had been attended by ———. His father, who had come from Whitehaven to see and carry home his son, having heard, in the town, of the successful application of bandages in the cure of rheumatism, mentioned, on his return to the inn, the circumstance to the patient, who took no rest till his father brought me to him. I stated the impropriety of my interfering with the patients of another practitioner in his absence. But the young gentleman told me, “he had not seen his doctors for some time; that he conceived they did not intend to visit him any more, he having been out; and, at any rate, he was not to be deprived, on account of any trifling piece of etiquette, of the benefit of the *bandages*, if benefit was to be obtained from them.”

This gentleman I found convalescent, but complaining grievously of pain in his left hand, which was also much swelled; of pain and stiffness of the left elbow; of pain and weakness about the left shoulder; of pain and rigidity of the muscles of the back of the neck; of weakness and pain upon motion, all along the spine; and of pain and stiffness of the left knee, the outside of which he could scarcely suffer to be touched.

I began with desiring the patient to shew me how he could walk. He moved and threw his weight upon the left leg, slowly and timorously, as if afraid to trust himself upon it. But no sooner was a bandage applied, than he planted his foot firmly, and walked with great freedom, declaring that, in respect of his knee, he felt quite a different man. I next proceeded to examine the state of his left arm, and found the range of motion it possessed very circumscribed indeed. He could not even put his hand to his mouth. Upon application, however, of a *bandage* from the points of the fingers to the elbow-joint inclusive, he could do it freely. On account of the patient being very much fatigued, I did nothing at this call to the shoulder, farther than grasping it with one of my hands, in order to shew him what could be done. Upon this, he moved his arm with great facility in every direction.

January 10th.—Passed a good night, having slept from eleven to five without interruption. Pain of the left hand and knee greatly abated; in other respects as before. Removed the *bandages* and ordered the diligent use of the flesh-brush, for a considerable time, to the parts affected, which was extremely grateful to the patient. Applied the *bandages* as before, and also to the left shoulder, making a turn under the right, by which two breadths of the *roller* were made to press upon the back of the neck, a circumstance that also gave much pleasure and satisfaction.

January 11th.—Pain of the left knee, wrist, and elbow almost gone. Muscles of the neck also much relieved. Swelling of the left hand greatly abated. Motion of the left arm entire, and much more vigorous. Omit the *bandages*.

January 12th.—Has slight pain and stiffness to-day, in both ankles. In other respects improving. Swelling of the left hand entirely gone. Applied *bandages* to both ankles.

January 13th.—Was out yesterday; but says the pain and stiffness of his ankles were such, that he could not have walked at all without the *bandages*. Is resolved to have a set of them to carry along with him. This, I think, sufficiently indicates the opinion he entertains of their utility. It is, indeed, in such cases as this, that the pre-eminence of *bandages* in the cure of rheumatism is most conspicuous. Let us suppose that *bandages* had not been applied to this gentleman's ankles,—he must of course have remained at home; let us suppose that I had confided to rubefacients and flannel, for the removal of his pains, when would the desired effect have been produced? in a day? a week? a month? No man can answer these questions. One thing only is certain,—that the longer a patient in such circum-

stances is confined to the house, the longer is his general health of being restored. But no sooner were the *bandages* applied to this gentleman's ankles, than he was enabled to walk abroad. The consequence was, he returned with an appetite greatly improved, and with a universal glow and moisture of the skin, which are most successfully promoted by action in the open air, and of more real benefit to a *rheumatic* patient, than all the sudorifics in the world.

On the 15th of December last, I was called to a young man, Simon Stewart, at the west end of the town, whom I found in a condition that almost begs description. Pale, ghastly, emaciated, he had been a martyr, for three years uninterruptedly, to rheumatism in its most cruel forms. His fore-arms, half bent, felt like two boards, and were so immoveably fixed in the prone position, that he could not see the palms of his hands till they were elevated above his eyes. Had no motion at the wrists; the right *carpus*, especially, was pained, swelled, distorted, and the command he had over his fingers was so small, that for a considerable time he was under the necessity of being fed by others. In the left knee, there was great effusion and pain; it had very little flexion and extension, being almost fixed in the half-bent posture. Both his ankles were pained, swelled, and distorted. He had not been able to stand even, on the soles of his feet, for the last twenty-three months. Sometimes, indeed, within that period, he had walked a little, but he did so by turning his heels outwards, and resting his weight on the outer edges of his feet. In this way he would crawl from his bed, along a range of chairs, to the fireside. Such was this man's situation when I first saw him. At the beginning of his illness he had declined going to the hospital, where he was offered the warm-bath free of expence; but had, notwithstanding, been attended by a host of medical men in succession: one of these, in particular, had done every thing for him that skill could devise, or philanthropy suggest, but, long before I was called in, had also given him over as incurable. Having satisfied myself as to the state of the patient, I applied a roller of flannel to the arms, from the wrists to the elbow-joints inclusive; in like manner to the knee; and, lastly, to both ankles. This done, I desired the patient to come out of his bed and dance! He descended very slowly and timorously, but getting his feet to the ground, and finding he could stand, he at last stepped out, declaring, that if his knee had not been bound so tightly he could have leaped the height of his stick.

December 21st.—Has had great pain in the knee, especially in the night-time, ever since the *bandage* was applied, which has

therefore been laid aside. Some rotatory motion of the fore-arms. Apply a compress of flannel to the *aponeurosis plantaris* of the left foot.

December 25th.—Rotatory motion of the fore-arms increasing; motion of the left wrist very considerable; had none at the beginning. Some pain among the *tarsal* bones of the left foot, but can stand on both soles. The compress to the left foot a great improvement to his walking, to which, he thinks, there is no obstacle but the knee.

December 28th.—Fore-arms more plump in their appearance, and the skin of a more kindly feel. Walked from his bed to the fire-side, without a stick, or any other support. This is the first time he has done so under my care. Feet quite the natural shape, and sets them down without fear or dread. No impediment to his walking abroad but the knee. Can turn his hands half-way to the supine posture.

℞ Muriat. ammoniæ, ℥i.

Acid. acetos. commun. ℥xii. Solve.

To be rubbed with great diligence all over the knee-joint, twice a-day.

December 31st.—Circumference of the knee diminished three-eighths of an inch. Attempted to walk without the bandages about his feet and ankles; could not set down his feet with confidence and firmness. Applied the bandages, when he walked with the utmost ease, knee excepted.

January 5, 1815.—Had pain among the tarsal bones of the right foot night before last;—gone to-day. Thermometer yesterday and to-day at 40; weather hazy and damp. What is the reason that people subject to rheumatism are so much affected upon the change of weather? I firmly believe it is owing to sympathy between the parts affected and the lungs. This is no extravagant idea. According to our theory, the white parts are the chief seat of rheumatic affections. Now, a great proportion of the lungs consists of cellular substance. Besides, we every day observe sympathies much less explicable than this: between the parotid gland, for instance, and the testes; the kidneys and the stomach; and, what is more directly in point, betwixt the urethra and eye, in gonorrhœa. I am aware of a question that may be started here, namely, Can a part distant from the lungs sympathize with them, or be affected through their medium, without their being themselves sensibly affected? I would answer this question in the affirmative. I think it very rational to suppose, that a part already habituated to a particular disease, a disease too that gains ground by repetition, may become severely affected by sympathy with another part that has been but

slightly or imperceptibly affected. In no other way can we explain the fact, that persons subject to rheumatism can, in the morning, before they get out of bed, or even in the night-time, prognosticate with certainty a change of weather. In such cases, the effects produced in the system, by the change that takes place in the atmosphere, must be through the lungs only, for no other part of the body is exposed to its action.

Knee has not been at all troublesome for some nights past. Took off his stockings last night with his own hands, a thing he has not been able to do for twelve months past. Is gaining flesh. The fore-arms, it is remarked by strangers, are more plump than formerly.

January 6th.—Had severe pain last night in both ankles, but especially in the right, and also in a slight degree in the elbow-joints; motion of these parts, however, no way impaired to-day. On inquiry, I found he sat an hour yesterday after my visit, with his clothes hung round him, for want of aid to put them on. Has some catarrhal symptoms, with slight cough. Here I may remark, that I have uniformly observed the return of pain, in this patient, to be accompanied with more or less of catarrhal symptoms,—an observation corroborative of what is advanced in yesterday's report, and indeed of our theory, and the whole reasoning on it, from beginning to end.

℞ Vin. ipecacuan. ℥i.
Tinct. opii, gtt. xl.
Aq. font. ℥vi. M.

the half to be taken an hour before, the other half at bed-time.

January 9th.—Has got cold anew. Coughed a good deal last night; severe pain in the ankles, wrists, elbows, and left-knee. Cannot walk to-day, nor suffer the bandages so tight as usual. Keen frost yesterday; thermometer at 40 to-day; weather boisterous and damp.

12th.—Is able to walk again, but has still some pain among the tarsal bones of the right foot. I do not expect this patient to make any farther progress during the winter months, and shall be very glad if he retains what he has acquired. The bandages, it must be admitted, have done wonders; but they are not a match for an inveterate disease, weather variable in the extreme, an open house, with the patient's bed at the back of the door, a clay floor, and imprudent conduct, combined. I therefore close this case for the present, trusting I shall be able to give a more decisively favourable account of it hereafter.

From the preceding details it will perhaps be inferred, that it is in *chronic* rheumatism chiefly, that decisive effects are to be expected from *bandages*. This may lessen, in the esti-

mation of some, the value of the remedy. But if it is attended to, that *chronic* is as often a cause as a consequence of *acute* rheumatism, that *chronic* rheumatism occurs out of all proportion more frequently than *acute*, *bandages*, as a remedy applicable with the fairest prospect of success in so many instances, cannot, if viewed impartially, be considered in any other light, than as the accomplishment of what has hitherto been a *desideratum* in the cure of rheumatism. To render this evident, we have only to reflect how often every mode of cure of that formidable disease proves abortive. It certainly must be ascribed, as well to the imperfection of the healing art, as to the obstinate nature of the disorder itself, that so many, in every rank, are subjected, during a great part of their lives, to the visitations of this horrible malady. *Bandages* bid fair to supply this deficiency. They are not like medicines exhibited internally, concerning whose operations and effects we are liable to form the most erroneous conclusions. Their effects are immediate and visible. We are not left at a loss to determine, whether the good produced is to be ascribed to the efforts of nature, or to the remedy employed; nor is it a matter of doubt, whether the remedy is of real advantage or not. There can be no uncertainty as to the powers of a remedy, which, the moment it is applied, enables a person to walk, who immediately, and for many weeks before, could not set the sole of his foot to the ground.

But were it even admitted that *bandages* are applicable, with effect, principally in *chronic*, it is evident that they may operate, in many instances, as preventives, at least, of *acute* rheumatism. This is a fair inference from the girl's case above detailed. In her were present, though the symptoms did not run high, all the characteristics of *acute* rheumatism. But, by the timely application of *bandages*, not only were the pains immediately relieved, but the fever soon after subsided. A most useful practical hint this—shewing that, as the derangement of the system was occasioned by local affection, so the melioration of local symptoms had its influence on those of the system. Here naturally arises the question, May not *bandages* supersede the necessity of repeated detractions of blood in *acute* rheumatism, even when local affections are not the primary symptoms? At any rate, *acute* rheumatism is soon subdued by the lancet; and, if *chronic* rheumatism supervenes, the application of *bandages* in this stage, will, we have reason to believe, prevent that lingering illness, general debility, rigidity and coldness of the limbs, pain and stiffness of the joints, so often the *sequelæ* of *acute* rheumatism.

Every practitioner, surely, of even very limited experience,

must have met with cases of *acute* rheumatism, in which the difficulty was, not to subdue fever, but to set the patient on his legs, and, having set him on his legs, to make him walk. In this stage of such cases, more benefit, I hesitate not to pronounce, will be derived from *bandages*, than from all other topical applications that have ever been prescribed by the regular physician, or advertised by the empiric.

But a mechanical remedy that possesses, in any degree, the power of moderating or preventing *acute*, must operate with ten-fold effect in cutting short *chronic* rheumatism. Every body knows that, whoever have once become acquainted with rheumatism, may lay their account with a repetition of its visits; and the oftener it comes, and the longer it stays, it strikes its roots the deeper:—this to such a degree, as, in many instances, to render the patients miserable during its stay, and uncomfortable all the rest of their lives. The early application of bandages, by promoting, in the way formerly stated, circulation in the capillaries of the white parts, prevents their permanent obstruction, and consequently the disease from taking such hold of the system as to render it difficult afterwards to be eradicated. That *bandages*, when early applied, must produce such effects, is proved by what they have done in Stewart's case; for, if they possess such powers in old inveterate instances of the disease, they must, *a fortiori*, be productive of like benefit in recent cases.

Summary of observations made on the effects of *bandages* in rheumatism.

At certain times, in some cases, but especially at the beginning, it is necessary to make the bandages tighter than they can be well borne for any length of time. In such cases, frequent removal of the bandages, and friction in the intervals, are indispensable.

The pains and rigidity of parts do not return immediately on the removal of the bandages; the effects remain for a considerable time after the cause is removed.

Parts that have for a considerable time been treated with bandages come at last to be covered, when the bandages are at any time removed, with a copious, warm, and fluid sweat, which gives a kindliness and pliancy to the skin, which it did not possess before.

Parts that have for a considerable time been treated with bandages acquire plumpness and strength, while parts of the same person, that do not admit of being bandaged, remain emaciated and tremulous as before. This observation is demonstrated in Stewart's case.