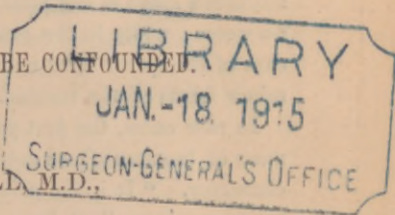


[Extracted from the American Journal of the Medical Sciences for July, 1878.]

ON A RARE VASO-MOTOR NEUROSIS OF THE EXTREMITIES,¹

AND ON THE

MALADIES WITH WHICH IT MAY BE CONFOUNDED.



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A FEW years ago I published in the *Philadelphia Med. Times* (1872, pp. 81 and 113) a brief paper upon certain painful affections of the feet, and drew attention to a form of foot-disorder which I was unable to find fully described elsewhere. This paper attracted little attention; and I now find myself called upon, by a larger and more fertile knowledge, to review the subject, and again to call to the notice of physicians a somewhat rare, and yet most interesting, form of disease.

I have called it a rare disease, because, in a large experience, I have seen but few cases; yet it is likely that, when once recognized, it may be found to be more common than I now conceive it to be.

In dealing with this subject, I shall first draw a picture of the malady as I have seen it in its various degrees of severity; I shall then relate cases from the mildest to the most severe; and end by discussing them from such points of view as they may suggest.

The patient, nearly always a man, after some constitutional disease, like a low fever, or after prolonged physical exertion afoot, begins to suffer with pain in the foot or feet; usually it comes in the ball of the foot, or of the great toe, or in the heel; and from these parts it extends so as to involve a large portion or all of the sole, and to reach the dorsum, and even the leg. More often it is felt finally in a limited region of one or both soles, and does not extend beyond these areas. At first it is felt only to-

¹ The foot and hand disorder I am about to describe may be conveniently labelled Erythromelalgia; ἔρυθρος, red; μέλος, a member; άλγος, pain.

wards night, and is eased by the night's rest ; but, soon or late, it comes nearer and nearer to the hour of rising from bed. In like manner, while at first it is made to increase only by excessive exertion afoot, by and by it comes on, whenever the upright posture is assumed, or even when the foot is allowed to hang down. Since, however, the disease is not necessarily progressive, there are instances in which the pain never passes a definite limit. One case may for years have the trouble only in the evening ; a second may reach and remain at the point where only a long walk in summer causes it ; a third may stand still, as it were, in a far more advanced stage of the malady, and, though suffering horrible pain, become no worse ; while in the gravest cases, more familiar signs of organic disease of the spinal cord may arise to shed light upon the pathology of the minor forms of the trouble.

In rare cases, the first pain is said to be an ache of the foot ; but in the mass of instances, and soon or late in nearly all, the pain is of a burning character. " It is the pain of a burn ;" " the pain of mustard ;" " of intense sun-burn ;" at least these are the phrases used to describe it, and certainly the character of the suffering is often so well marked as to be clinically distinctive. In the milder cases it may come and go, or be present daily at some time, as upon exertion, and yet be but trifling in its intensity ; while in severer cases the burning reaches the extreme of torture. The sufferer, when placed on his feet, rocks as if unsteady ; and if his eyes be closed, may deceive the observer into the belief that he has before him a case of locomotor ataxia. Yet a vigorous effort of will is fully competent to preserve the balance ; and this unstable equilibrium is not seen until, owing to the upright posture having been preserved for some minutes, the pain has risen to a maximum of anguish.

In the later stages of the disease the pain is throbbing, aching, and burning, owing, I suppose, to the vasa disorders, which are seen in some cases throughout, and always in the graver examples.

In every case, and at all stages, the pain is relieved or arrested by the horizontal position, and by cold. It is brought on and made worse by standing or walking ; and, in bad cases, by allowing the feet to hang down ; while warmth, and, of course, heavy foot-covers, act in like manner. Summer is usually, not always, the season of greatest annoyance ; winter a time of comparative ease. The sufferer sleeps with uncovered feet, and goes about without stockings in his house ; and finds, even in winter, a light slipper or a low shoe comfortable.

The next striking peculiarity of this disorder is the flushing of the part upon exertion. This symptom, which is usually absent in the very early stages, is a notable feature of the worst of the prolonged cases, and in some mild instances can always be brought on by great exertion afoot. In the graver examples, the area of greatest pain in the soles or hands is distinctly and permanently marked by a dull, dusky, mottled redness, as if

the smaller vessels were always over-distended. In these and in some of the less severe cases, the region of pain is in places tender, and firm pressure by the finger or hand will bring on increased pain, and even cause the whole foot or hand, or a part of it, to become red, just as it does when the man stands up.

The pain in these cases is also entirely inhibitory of walking, and if this action be persisted in, gives rise to intense redness, swelling from dilatation of vessels, and finally to blistering of the soles.

Where flushing is a part of the phenomena of this interesting malady, it comes on during the erect position slowly in milder cases, and almost at once in others, and involves both veins and arteries. The foot gets redder and redder, the veins stand out in a few moments as if a ligature had been tied around the limb, and the arteries throb violently for a time, until at length the extremity becomes of a dark-purplish tint.

In the worst cases, when the patient is at rest, the limbs are cold, and even pale. The flushing, which, at first, seems to be an active condition, accompanied with rise of temperature, in a few minutes becomes passive; that is, the arteries cease to throb, the heat lessens, and there is evidence of lessened oxidation.

The less severe examples manage to get along by rest at intervals, but the worst cases are unable to stand for more than a moment, and the sufferer crawls on his hands and knees, keeping his feet off the floor, or is obliged to be carried about.

I have seen lately two examples in which the disease seemed to have been progressive, and to have been associated in the later stages with distinctive evidences of spinal disease, such as atrophic states, the pain-belt (*douleur en ceinture*), partial losses of power, and other phenomena, which vary in the two cases alluded to. Also in one of them all the singular features which in the early stages were seen in the feet, were at a later stage exhibited in equal fulness in the hands, or rather in the hand, since one had been lost by amputation.

One other peculiarity is common to all of them. They are rarely amenable to treatment. They are aided for a time by cold and by rest; but either they remain unchanged for years, or else in rare instances become gradually worse.

As to diagnosis, I am aware of no other malady with which the bad cases of this trouble can be confounded; but there are certain other more or less painful affections of the feet, with which the lighter forms might be confused; and I shall, therefore, make some brief allusions, at the close of these pages, to the maladies of the feet, from which it is needful to distinguish the disease I am describing.

CASE I. The patient, a sailor, aged about forty, while in the United States naval service on the coast of Africa, suffered from sunstroke. This was followed after a few months by a grave attack of coast-fever, and from

this seemed to date an enfeebled condition of the heart, with an apex murmur heard during the systole. He reached the Norfolk Hospital eight months after his fever, and was there during the whole winter. Some time early in the next year he began to have dull, heavy pains, at first in the left, and soon after in the right foot; the pain was a dull ache, and seemed to be in the interior of the foot, between the sole and the instep. At first, and indeed for three months, the pain was unaccompanied by swelling, but in April this new symptom was observed, after much exercise, and then only.

The disease progressed rapidly, and when I saw the man, in June, his condition was no less strange than pitiable. He was a well-made, vigorous person, of rather ruddy complexion. His appetite and digestion were good, his bowels regular, and his urine, save some slight though constant deposit of urates, in all respects normal. He told me that he had pain in the feet whenever he attempted to walk, but that while at rest in bed he was perfectly comfortable. The case, as he spoke of it, was to me so novel that I somewhat mistrusted his statement, and, therefore, directed him to walk up and down the ward and about the grounds until I sent for him, which I did when at the close of an hour my visit was over. He made his appearance in the ward, walking with the step of a man whose feet were tender. On examining his extremities I found them both swollen. They scarcely pitted on pressure, but were purple with congestion; the veins were everywhere singularly enlarged, and the arteries were throbbing visibly. The whole foot was said to be aching and burning, but above the ankles there was neither swelling, pain, nor flushing. On other occasions I examined him in bed, and then caused him to stand for a time. Almost at once, without previous pallor, the feet began to fill with blood, and after a quarter of an hour or less, if he walked, the pain appeared, and with it the swelling so increased as after a time to force him to lie down. He was very sure that he had suffered pain long before either swelling or redness was observed, and I am disposed to think this statement correct. As the autumn came on and the weather grew cold, I was able to verify another of his statements, to the effect that cold relieved him and that heat increased his sufferings. In fact, he preferred to wear slippers without stockings, and while on cool days he could walk for an hour before his pain became great, in warm weather a few minutes of exertion were enough to bring about this result. A hot foot-bath had a like effect, and cold bathing was almost the sole means of speedy relief. A long series of therapeutic experiments failed to afford him any permanent ease. The local use of cold, and of alternate heat and cold, bandages, sedative washes, lead-water and laudanum, leeching and blisters, digitalis, arsenic, and tonics, all alike failed to help him, so that at last, having gained something from the cold of early winter, he left us, and I have never heard of the issue of his most singular history.

CASE II.—G. K., æt. 35, single, clerk, American. The patient lost his right arm during the war, in the year 1862, and since that time he has been gradually losing strength. He was not subjected to hard marching when a soldier, and he denies all venereal taint.

The indirect cause of his indisposition, he thinks, was "army life," and the direct cause "prolonged continence."

In 1864 he had an attack of "typhoid fever," which left him with some impairment of vision, so that continued reading would bring on headache.

In 1872 he was examined ophthalmoscopically by Liebreich, who detected hypermetropia, and gave him glasses for its relief. Some time before this latter date the patient began to experience burning pain in the soles of his feet upon walking; if he persisted in the attempt after this, the feet grew red and swollen, and finally became blistered.

Walking also caused pain in the back. During cold weather he was moderately comfortable, provided he did not walk; but in warm weather his feet ached him nearly all the time, and for relief he was obliged to apply cold to the feet. In this condition he continued, without much change, until August, 1875, at which time he made a misstep, and his right ankle gave way under him, and before he recovered from the sprain a like accident befel the left ankle.

A few days later, while leaning on his hand, his wrist also gave way, and soon after this he began to experience a burning pain in the hand, particularly when pressure was made upon the palm.

Using his hand also caused violent pain, after which it became relaxed and feeble; the whole hand would then swell and the fingers in particular become red.

The pain, before mentioned, in the soles of his feet was at first limited to the part immediately below the metatarso-phalangeal articulations, but by 1876 it began to extend toward the outside of the feet, and finally appeared upon the dorsum of the right foot. Pressure over this region never caused pain, except when the patient was suffering from a more than usually severe attack. At such times the pain would shoot upwards on the outside of the right leg. The heels were never the seat of pain.

In November, 1876, when the foregoing notes were taken, the man's condition was as follows:—

The patient was well nourished, his appetite and digestion were good, and his bowels regular. Walking caused so much pain in the feet that he rarely attempted it, but sat all the time with his feet elevated, and so managed to keep moderately comfortable. When in bed he frequently left his feet outside of the bedclothes, in order to keep them cool. After a night's rest he suffered little, but the pain reappeared soon after he arose. More relief was obtained from cold applications than from anything else.

Standing upon his feet in a very few moments caused them to become engorged with blood and swollen. This was particularly marked along the edges of the toes. This posture caused intense burning pain in the part of the sole before mentioned, but gave rise to no pain in the back, as it did a few years before. The right foot was more severely affected than the left. No peculiarities could be observed in the stump of the lost arm, and there was no complaint of pain, either in the stump or in the lost arm or hand. Any pressure on the left palm caused great pain and local flushing, as did any attempt to grasp an object; but no paralysis of the muscles of the arm or hand could be detected. He was able to push with his hand extended without suffering pain. There was also excessive sweating of the hand. The growth of the nails did not seem to be at all affected, and this was true also of the toe-nails. There were no cerebral symptoms other than the headache after reading. There was no tenderness over the spine, and examination of the heart, lungs, and urine gave merely negative results. The patient rarely had seminal emissions, in fact only about three a year. The application of the constant current to the feet where red, caused a whitening of the part, which lasted longer than the

whitening produced by simple pressure. Massage was ordered, and at first this seemed to relieve him, but the improvement was transient.

He was ordered heat to the spine, galvanism to the feet, and digitalis and tincture of iron internally. After this the patient was lost sight of until January 31st, 1878, when the remainder of these notes were taken. He was at that time a patient at the Elmira Water Cure, New York. The following notes, although meagre, were obtained with much difficulty, owing to his condition, and to the fact that his attendants knew but little, if anything, of his history, either before or after his entrance into the institution:—

Patient entered the institution in July, 1877, and appears at that time to have been able to walk a few steps with the aid of a crutch; but this would almost immediately bring on an intense pain in the soles of his feet, in his back, and in his hand. To lessen the latter pain as much as possible, he held the crutch gripped tightly between his arm and side, and used his hand as little as possible.

His right arm having been amputated near the shoulder-joint made progression very difficult, especially as the erect posture also brought on pain in his head, and sudden attacks of vertigo.

In walking he was noticed to drag his right leg a little, but no other paralysis was observed. In November his disposition began to change, and, instead of being desirous of company and conversation, he became morose and fond of solitude. His power of conversation also left him, and he would only answer in monosyllables. Since then he has been confined to bed. Since July he has had seven convulsions. In these he became rigid, was but slightly convulsed, and did not foam at the mouth, or bite his tongue. The attacks seemed to be bilateral. For several days after these seizures the patient would be drowsy, and during these periods squinting would be occasionally noticed.

He lies in bed, face downward, and a little upon his right side. This position is retained nearly all the time, as any other causes pain in the dorsal region, and in his thighs in the line of the sciatic nerves. The weight of the bedclothes is so distressing to him that a hoop is needed to keep them from touching his back. He is well nourished, his appetite is fair, and his tongue clean. He is, however, generally slightly constipated.

His skin is dry and cool, and there is a branny desquamation of the cuticle. His conjunctivæ are congested. He, however, states that his vision is unimpaired, although he wears powerful convex glasses; there is no nystagmus; his pupils are large, equal, and react readily to light. He states that his mouth is occasionally drawn to the right side, although at the time of taking these notes it appears a little drawn to the left. His tongue is protruded in a straight line, and without trembling.

His speech is hesitating, whispering, and very slow. All questions are answered with evident reluctance, and in monosyllables. He, however, answers rationally, but the attempt apparently causes great effort and soon exhausts him. He hardly ever sleeps.

There is marked œdema of the body and lower extremities, and these parts pit upon pressure. Any pressure over the dorsal or lumbar region of the spine, on the outer part of the thighs and on the feet, causes great pain. Pain is also caused by pressure over the scalp, back of the neck, on the shoulders, on the hand, and on the forearm up to the elbow, but none is caused by pressure on the upper arm. There is occasional spontaneous pain in the stump of the arm, but nothing peculiar can be detected on inspection.

His hand is extremely cold, and the finger ends are darkly cyanosed. The fingers from the second row of joints to the tips are very shiny, and the nails grow. He is utterly unable to grasp anything in his hand.

There is spontaneous pain in the soles of the feet, particularly when they are at all warm, and pressure causes pain when made on the soles or on dorsum of the feet, but not on the toes. There is slight vesication on the outer side of the left foot and ankle, but this is not the seat of especial pain.

To the hand the feet feel cool, and alike as regards temperature, but a surface thermometer held in contact with the feet for some time fails to register 70° F., the lowest graduation on the scale. Under the tongue the temperature is 99½° F.

From the painful region in the back there is radiating pain around the body, and the patient states that the sensation is that of a "tape tied around" him. Cold applications to the back relieve this pain considerably, and in order that he may remain as comfortable as possible the temperature of the room is kept very low.

Sensation appears to be well preserved in the feet, and impressions are properly located; the difference between heat and cold is also appreciated. The whole body except the head is the seat of a fine tremor, which is much increased by voluntary motion. The muscles can be moved at will, but the effort caused rapid exhaustion. The right leg appears to be a little more feeble than the left.

Electro-muscular contractility to the induced current in the arm is apparently normal; but no reaction is caused in the legs to the same current; a stronger one causes a general spasm of the lower extremities.

The patient never has seminal emissions, or priapism. There is occasional palpitation of heart. Examination reveals feebleness of heart's action, and a slight systolic murmur heard best towards apex. The pulse is 100 per minute. Examination of lungs gives negative result. Ophthalmoscopic examination reveals slight enlargement of veins and irregularity of form of disk, but no choking in left eye. The right disk appears whiter than normal. This examination, being made with great difficulty, is therefore not positive.

The urine is passed freely and in normal amount, it is pale, very slightly acid, and upon standing deposits a light, flocculent sediment, which, however, clears upon boiling.

There is no albumen either upon boiling or upon the application of Heller's test, and no casts could be detected by the microscope.

CASE III.—J. P. S., *et.* 58, born in Philadelphia, formerly a worker in iron. The patient's family history is unexceptionably good, his ancestors living to a good old age, and there is no history of hereditary disease. With the exception of an attack of dysentery twenty-five years ago, the patient has enjoyed good health until the beginning of his present indisposition. He is a temperate man, and denies all venereal taint. Thirty-three years ago he married; he has had eight children, all of whom are alive and healthy; the youngest having been born seventeen years ago. He has been a hard worker, and his business required great muscular exercise, as he had to use the sledge-hammer; as a consequence he was compelled to stand nearly all the time. For many years he has ceased to do manual labour.

In June, 1873, he noticed "a burning sensation" in the extreme end of both great toes; this came on towards the close of a hard day's work,

but soon disappeared after retiring. Upon inspection nothing was to be seen; but the tissues seemed somewhat indurated at the extremity of the toes, and pressure at these points caused pain. Ordinary handling of the foot gave rise to no pain whatever. These conditions lasted without change for six weeks, and then disappeared.

In February, 1876, owing apparently to excessive exertion at the Centennial Exhibition, and after entire freedom from pain since 1873, he again began to experience pain in his great toes; the right one being the most painful. Two weeks later, the pain spread from the right toe across the sole beneath the metatarso-phalangeal articulations to the right side of the foot; any pressure upon this part was very painful, and standing with his shoes on became almost unbearable. The left toe in the mean time caused but little annoyance. Rest in bed, as before, removed all pain. No change worthy of note occurred until the December following, when the pain in the right foot became much more severe, and he then noticed for the first time redness of right foot, swelling of the veins, and slight œdema of toe; this latter symptom was also present, but to a less degree, in the left toe.

By April, 1877, the pain had invaded the right heel, leaving the inner part of the hollow of the foot entirely free. He was now obliged to elevate his foot in order to obtain any comfort. He describes the pain as being of an intense burning character, resembling the pain that would be caused by "holding the foot very near a red hot stove." Shortly after this he began to notice spots of discoloration, each about the size of a pea, particularly towards the anterior part of the right sole, where the pain was most intense; by June these spots were to be found on the right heel, and a little later, they appeared simultaneously with the pain upon the outer part of the dorsum of the foot.

In the early part of the summer he began to complain of vertigo, flushing of the face, injection of the conjunctivæ and tinnitus aurium; the latter symptom being very annoying, and resembling a steam whistle. In addition to these symptoms he began to suffer from amnesia; he had great difficulty in selecting the proper words to express his thoughts, would make many blunders, and would be aware of them as soon as made. There was also some loss of control over the movements of the tongue. The amnesia lasted but one week, while the other symptoms continued for about two months.

Shortly after the amnesia (in the latter part of July) he had paresis of the right arm and leg; this lasted one week, was not accompanied by pain or formication, and the patient does not remember any accompanying facial palsy, nor was there any loss of control over the sphincters.

In August he had a violent attack of dysentery, while at Atlantic City, where he had gone to recuperate. This attack lasted three weeks, and during that time he was entirely free from pain in the feet.

In October the pain became worse at night. He then had the induced current applied, by an electropath, every day for six weeks, for two hours a day; the poles being passed all over the body. At first this gave him relief for about three or four hours each night; but at the end of five weeks' treatment the pain, which previous to this time had been confined to the left toe, began to spread across the sole beneath the metatarso-phalangeal articulation with the little toe, and it then became terribly severe. When he wished to move about his room, he was now compelled to do so on his hands and knees, whereas before he was able to get about with the aid of a crutch and cane.

By the 7th of December an aching pain, like that of a cold, became general over his whole body, and remained for ten days. About this time he began to notice slight loss of control over his bladder.

Cod-liver oil and daily massage were now ordered, and almost immediately the pain began to diminish, and in three days it had entirely left the left foot.

One application of the constant current (fourteen cells descending current) on December 31st caused little if any sensation at the time, but in a few hours the pain became much more severe, and extended up the right leg to the hip; it also returned to the left foot. This exacerbation lasted three days; the pain then entirely left the left foot, and since that time he has been gradually improving. At different times there has been slight jerking of the right leg, particularly when the pain has been severe.

Fig. 1.

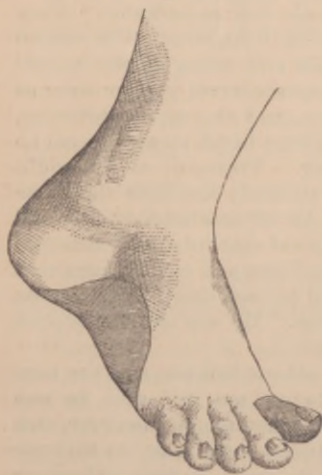


Fig. 2.



Area of pain in right foot, June to December, 1877.

I first saw this man in December, 1877, in consultation with Prof. Wm. H. Pancoast. His condition at the time was as follows: Patient is a spare man, but is fairly nourished, his appetite is fair, and his bowels perfectly regular. Pain exists in the feet over the areas delineated (see diagrams), particularly when the foot is dependent; pressure causes great pain over this region, and standing upon the foot is almost insupportable.

Inspection shows slight redness of the right foot, and a few dark spots, about the fourth of an inch in diameter each, situated mostly towards the anterior part of the sole. There is also dwindling of the right leg.

The left ankle, calf, and thigh at middle third measure respectively 7, 11, and $16\frac{1}{2}$ inches; while at the corresponding points the right leg measures $6\frac{1}{2}$, $9\frac{3}{4}$, and $15\frac{1}{4}$ inches only, and there is distinct appearance of atrophy with remarkable flabbiness of the muscles. Lowering the right foot almost instantly causes very marked distension of the superficial veins, and intense flushing of the skin, and this procedure, as before mentioned, gives rise to acute pain. The temperature of the right foot is decidedly higher than that of the left.

Sensation is normal over the left foot, but there appears to be some hyperaesthesia, even to light touches over the right sole, an "indescribable

sensation" being caused by touching the discoloured spots with a sharp point. The sensation over the rest of the foot and leg appears normal. Appreciation of warmth and cold seems perfect in both feet.

The electro-muscular contractility appears normal in the left leg and foot, while in the right it appears to be distinctly increased despite the wasting. There is no facial palsy, and the tongue is protruded in a straight line. The grip of the right hand is strong, a little more so than the left; there is no apparent wasting, and the sensation is good. There is no pain in any spinal region, and the patient is able to stand perfectly steady with his eyes closed for a short time, but then unsteadiness is caused by the intense pain.

Fig. 3.



Area of pain in left foot, Oct. 1877.

I saw this patient about two weeks later, and found him in bed, with the bed-clothes lifted off his feet by the aid of a cage of half hoops. The congested look of the pain areas in the sole was remarkable. They looked like severe frost-bites. The sudden increase of pain and filling of the vessels on his assuming the erect posture were as notable as ever, and the rapid whitening, when the legs were lifted, seemed to me no less interesting. Pressure on the right sciatic nerve suddenly increases the sense of burning. As he was notably thin and pale, it was agreed that he should continue to take dialyzed iron and cod oil, and that massage should be used daily, as before, on the feet and legs. He was also dry-cupped over the spine.

The amendment under this treatment was almost sudden, and has continued. To-day, Feb. 17, 1878, he came to see me, and said he was better than he had been for a year. It is to be remembered, however, that he has once before improved, and again relapsed. He tells me that the wasted right leg is enlarging, and certainly his gain in flesh and colour was satisfactory.

Dr. Morris J. Lewis, to whose care I am indebted for the notes of this case, endeavoured, on Feb. 16, to study his temperatures; unfortunately for this purpose he was already better. However, I give the result. Dr. Lewis says: "I held the thermometer carefully in position, each time I made an observation, for over fifteen minutes. When the patient was on his back in bed the temperature of the right sole was $96\frac{1}{2}^{\circ}$, the left sole was cold and clammy, and would not register 93° , the lowest degree on the thermometer; it was held in position twenty minutes. When the right foot was on the floor the mercury rose only to $95\frac{1}{2}^{\circ}$, and then began to fall again, and the foot began to lose some of the congestion, which came on immediately after placing it on the floor.

"On the dorsum of the right foot when dependent the mercury stood at $95\frac{1}{2}^{\circ}$. The left foot was still too cold for my thermometer to register."

The group of cases which I have just described seem to me to be closely related, and to differ chiefly in degree, and in the fact that one of them was arrested in its pathological progress; whether or not I am correct in suspecting that they may represent stages of one malady can only be deter-

mined by future research ; but, with this word of caution and reserve, there can be no harm in calling attention to them as members of one genus.

I believe that the group of cases described, together with some of those which I shall now add, represent an unrecognized type of spinal or cerebro-spinal disorder, and that they may be found in the future to be associated with distinct lesions of definite regions. The mere fact of pain, with vaso-motor disturbances, does not, I think, as yet authorize me to attempt to localize the malady, and I prefer to resist the temptation to speculate in this direction without sufficient grounds.

The gravest case of the series has a good deal the aspect of a sclerotic affection ; but, as to the others, this would seem less probable if they stood alone.

In all of the examples the pain seems to have preceded the vaso-motor phenomena, so that we must look upon the latter either as caused by the implication of vaso-motor centres, or as due to a reflex affection caused by the pain or by the disorder of the central organs, disease of which gave rise to pain. It is to be noted that in these cases pain came before flushing was habitual, and that afterwards it always arose whenever the part was so situated as to give rise to flushing ; while in Sir James Paget's case, which I shall presently relate, the pain was coincident with intense pallor of the limbs.

The following case is remarkable, because of being confined to the hands, and because of its irregular intermittent nature :—

CASE IV.—Mr. S., *æt.* 29, merchant. Had syphilis with slight secondary symptoms in 1867 ; was treated with mercury and iodides, and has had no return of the troubles. His father died of tubercular disease. In 1875 he had a slight attack of rheumatic fever, but made a good and rapid recovery. Three months later he noticed that in using a pen the ball of the thumb became sore, and soon after he observed a like soreness of the palm after driving some nails into a wall. Shortly after, without known cause, he was attacked with a sharp burning pain in the cushions of all of the fingers of the left hand ; this lasted but a few days. Then he had a severe attack in the right hand, on the thenar eminence, and from this time the pain was rarely absent for a day.

He consulted me a few months afterwards, when I found him in the following state : He was ruddy and well nourished, had no dyspepsia and no disorder of any viscus. Both hands were suffering from acute burning pain, which affected limited regions, and varied in its place and in severity. When I first saw him the finger ends were darkly congested, and over the thenar and hypothenar eminences of the left hand and on the latter part only in the right hand were distinctly limited patches of dusky redness, sometimes mottled. In the affected parts the pain was burning and aching in character, and was made worse by the least pressure, which was also competent to bring on pain at once or to increase it ; and when I pressed with my thumb on the palm, which was free from pain at the time, a limited well-defined area of congestion appeared, accompanied with intense burning. The nerves of the arms were not unusually sensitive, and the temperature of the burning parts was but a trifle above that of the

rest of the member. The next day he appeared again to show me that he had no pain; but he carried his arms curiously, holding the hands across his breast, and assuring me that to walk with them swinging at his side would renew the pain. When, at my request, he allowed one to hang down, it became flushed all over in a few minutes, and then grew paler until there remained several large islets of dusky redness, which only after a few minutes became painful. Next he rested his body on the other hand placed on a table. The same changes occurred at once, and the pain became intense, the finger ends especially burning and throbbing, and presenting a smooth dusky red appearance. Heat made him worse, and he looked forward to the summer with apprehension, since each return of warm weather had made him suffer, while the cold of winter had always proved grateful. Long immersion in cool, not ice-cold, water greatly eased him, and at times even put an end to his pain.

He had no headache or vertigo, but at the third cervical vertebra there was a dull pain when he made any extreme movements of the head and neck. At times he had numbness of the hands, and this was very common at night, but I could not find that the sense of touch was lessened, although of this I was not secure, because the least pressure with the compass points caused pain and congestion. With the attacks came always great increase of perspiration. Of course, this singular malady made his life one long torment, and, as an example of the annoyances to which he was subject, I may say that he was forced to immerse his hands in cold water when he wished to cut his nails. He thought that there was at times slight burning in the feet, but they showed no signs of congestion, and, as he could walk for miles in all weather, I am inclined to think that he was mistaken. After much local and general treatment, antisyphilitic and other, he was greatly eased by a succession of large blisters on his neck. He went to Europe soon after, and I lost sight of him for a long time. I have since learned that the pain lessened, but that having found that stimulants in large amount eased it, he had become an habitual drinker, and was in utterly broken health. I cannot say whether or not he retained the burning pain.

I may add that, when at his best, movement of the wrist and fingers gave rise to no pain, and that the torment seemed to be in the subcuticular tissues, and not on the surface of the skin.

It is needless to point out the close analogy between this case and those which I have reported, and in which, save in one, the pain was confined to the feet.

CASE V.—I was consulted, three years ago, as to a case somewhat similar to that of Mr. S., but have mislaid the notes of it, so that I shall content myself with stating that it followed, in this instance, a nearly mortal attack of remittent fever, and seemed directly due to the long use of a small hammer, used in breaking rocks for geological study, at least it was to this that the patient referred his disorder. In most other respects, the cases were similar, but in the latter example, the blotches were larger, and the attacks lasted for weeks at a time. There was in this case a certain stiffness of the neck, and at times slight unsteadiness, but no true vertigo, and no ear or eye symptoms. The attacks could be made worse by pressure, and could be brought on by it. The burning pain was intense, and when the attacks went off there was often for some hours a notable pallor and cold of the hands.

While this paper was passing through the press, Professor Alfred Stillé placed at my disposal the following notes of a case reported by his son, Dr. Henry L. Stillé, living at Guerrero, Mexico. It is so interesting, from the combination of livid extremities, burning pain, and trophic changes, that I regret not to have a fuller detail of symptoms.

CASE VI.—The patient is a woman 29 years old. She has a dark complexion, and is well developed and nourished. There is no history of hereditary disease; neither phthisis, scrofula, nor syphilis. There is no disease of the heart or lungs. All the natural functions are well performed, except menstruation, which is at times profuse and at others scanty, and always accompanied by severe pain.

Three years ago, while menstruating, she fell into the river; the day following the menses stopped, and did not reappear for several months. A week after the cessation, she noticed a peculiar tingling or burning on the palmar surface of both hands, from the second phalanx to the tips. This continued until it involved also the dorsal surface of the same portion of the fingers. About the time of the expected return of her menses, she had intermitting flushes of heat over the whole face except the forehead, and the extremities of the fingers were observed to be of a livid color and hyperæsthetic. These symptoms now exist, and, besides, the fingers are clubbed, the nails four or five times their natural thickness, and curving over the tips of the fingers. It seems as if the muscular and fatty portions had shrunken, and also as if the last phalanges had been absorbed. The color of the skin over the affected parts is bluish, and the want of power in the fingers makes it impossible for the woman to sew or work at all, while the tingling and burning are constant, but increased at each menstrual period, when they are also felt in the face. There is no fever nor headache, and the patient eats and sleeps well. A vaginal and uterine examination gives only negative results.

Cases precisely like those I have described must be singularly rare, but I have found a few which present enough likeness to make me willing to quote them as belonging clinically to a group which needs a larger study. In the following case there were burning pain, great congestion, some hardening of the areolar tissues, and swelling.

CASE VII.—G. P., *æt.* 22, baker,¹ had gonorrhœa in 1854. In 1856, he had a chancre, and in three months cutaneous secondary accidents and rheumatism. He recovered rapidly. In Oct. 1858, after excessive labour, he felt in the toes and fingers acute pains, with swelling, heat, and redness. He had a pulse of 72, and no lesions of any viscus. The heat and swelling and pain were intolerable, and were eased only in very cold water, or by exposure to a temperature a little above zero of C. Somewhat later, rare pustules formed on the hands, and the agony seems to have been excessive. Nothing is said as to pressure, or touch being painful, except that at last the upright posture became unbearable. This disease lasted about two months, when the symptoms lessened in severity, while the loss of muscular power became notable, especially in the extensors of the feet. At the same time, the sensibility of the feet became so much affected, that he could not feel the ground. The patient recovered within three months.

The case I have quoted briefly is a fair example of a few others to be found in French medical literature. They are usually described as cases

¹ *Le Bordeaux Médical*, Sept. 23, 1873. M. Greiner.

of sporadic acrodynia, owing to their marked resemblance to the malady which appeared as an epidemic in France, in 1828, 1829, and 1830 (*αξρρα* extremities—*οδυνη*—pain, acrodynia). It has since been seen so rarely, that the few cases described, and which seem to have lacked many of the symptoms of the original disease, may really have been due to other causes than those which gave birth to it.

The epidemic belonged chiefly to the summer months, and was characterized by vomiting and diarrhœa, œdema of the limbs, redness, or dark splotches like frost-bites on the feet and hands, some thickening of the skin, intense pain, sense of heat, dysæsthesia of palms and soles. The pain existed if the congestion was absent. There were cramps, local spasms, and sometimes loss of power. Relapses were frequent, and death was very rare. The attacks lasted from a few days to two months. I have mentioned this disease merely to distinguish it from the chronic malady I have described, but the analogies are no less striking than the differences.

The cases which follow are members of the group I have already described and illustrated, but differ in being milder. Perhaps, were they more fully reported, the resemblance might be yet more striking.

Vulpian,¹ after discussing the local asphyxia of Raynaud, describes, with exasperating brevity, a case which he saw with Alph. Guérin:—

CASE VIII.—The patient, a nervous woman, 35 to 40 years old, had been tormented for more than a year by attacks of painful burning of all four members, but especially of the legs and feet. This trouble broke out nearly every day, but at no regular hour. When it began, the feet and lower part of the legs became congested, the skin grew dark-red and very warm, while the arteries of the feet, which in the interval were scarcely to be felt, beat with violence, and appeared to be dilated. There seemed to be at the same time a very painful sense of numbness, and to walk so increased the symptoms that exercise afoot became impossible. The only relief was found in cold foot-baths. Many means of relief were used, but bromides, ergot, galvanism, and a number of other remedies all alike failed to be of service. M. Vulpian adds that the congestion came on without precedent anæmia.

M. Sigerson,² whom Vulpian also quotes, has published a somewhat similar observation, in which there was feebleness of the four members, with congestion, heat, and sensitiveness of the hands. Heat made the disorder worse; cold relieved it.

The following case, which I quote somewhat in full, appears to have been a good but irregular example of the disorder, illustrated by my own cases, and is valuable because it comes from the pen of so acute an observer as Dr. Graves.³

CASE IX.—A young lady, aged 16, having had poor health for some time previously, then suppressed catamenia, followed by a severe diarrhœa, which weakened her greatly, was attacked by paroxysms of heat and tingling of the sole of the foot, then of the instep, ankle, and leg to the middle of the calf; subsiding on one side and then beginning on the other, the sensation of heat becoming

¹ L'Appareil Vaso-moteur, t. II. p. 623.

² Progrès Medical, 1874.

³ Clin. Lect., ed. 1864, p. 826.

extreme, and the accompanying pain almost unbearable. As these symptoms increased, the vascular congestion and fulness of the limb augmented, and all the vessels became prominent. The attacks lasted eight or nine hours, leaving her with a sense of uneasiness in the limbs, and some numbness or ill-defined morbid sensations. The daily amount of ease did not exceed three hours.

The congestion of the cutaneous capillaries caused the skin to grow red, then the hue deepened; it became swollen, smooth, and shining—the colour of a black cherry when nearly ripe—and exquisitely sensitive to touch. When the hot fit ceased, these phenomena slowly disappeared, the part gradually becoming pale, deadly cold, and comparatively free from pain. Then the same phenomena appeared in the other foot and leg.

The attacks began daily at seven in the morning, and lasted until four in the following morning; during this time she was unable to sleep. She was obliged to sit or recline during the entire day, since, if she walked, the pain and heat were immediately brought on.

The catamenia had been restored after six months, and her general health seemed good, considering the almost incessant pain and loss of sleep.

All these phenomena increased in severity, so that one year later the limbs were constantly swollen, and, whether cold or hot, equally painful. Both the hot and cold stages were attended with acute pain and extreme discoloration. Applications of cold water alone gave any relief.

Three months later a tendency to palpitation came on without cause, and with it a similar feeling of pulsation in the legs. Also some constipation; easily relieved by magnesia; but the movements of the bowels so induced caused slight faintness. The urine was scanty, reddish, and muddy; the sediment, white or reddish.

Driving caused pain in the left side; headaches became frequent, and the complexion varied. The disease of the feet, however, was not accompanied by the least derangement of the general circulation, or of the state of the rest of the skin.

Three years from the commencement of the affection the "intermissions" lasted from 11 A. M. to 7 P. M., and more rest was secured.

"It is curious that this long-continued derangement in the circulation of her lower extremities, and the extraordinary pain the patient experienced daily for six years, have not produced any paralysis, any diminution of muscular power, thickening of the skin, induration of the subcutaneous areolar tissue, or stiffness of the joints. Considering how hot, red, and swollen a considerable portion of each limb is during many hours every day, it is quite surprising that no evident alteration of structure was the result. This fact is extremely interesting in a physiological and pathological point of view, proving, as it undoubtedly does, that changes in texture are influenced by causes quite independent of the state of the local circulation."

"Although nearly every remedy in the Pharmacopœia was tried, none seemed to have the least effect; and she gradually got well, it might be said, in spite of medicine."

CASE X.—Mrs. ———, aged 82, of a robust and healthy constitution, florid complexion, in February, 1839, had a slight paralytic affection of the left arm and leg, preceded and accompanied by headache, vertigo, flashes of light before the eyes, etc. About one month later she experienced a sensation of cold in the right foot, which, on rubbing the part, gave place to a feeling of heat and itching. On examination, she found that the anterior half of the foot was swollen and red. In about three weeks from the first seizure, the sensation of cold continuing, it became extremely painful, and she then applied for medical advice.

Aug. 1839. Complains of severe pain in anterior part of right foot, which is swollen and red; there is considerable œdema of the ankle and lower part of the leg; the extremities of the toes are dark red, with some lividity. Her general health is good, with the exception of occasional headache with vertigo. Bowels free; appetite good; pulse regular.

Liniment and leeches gave some relief.

Two weeks later, as the pain, redness, and swelling exhibited exacerbations, recurring every second day, quinine was tried in various ways without benefit. The pain was now of a most excruciating character. Sometimes one toe, and

sometimes two or more were simultaneously attacked; and in proportion to the intensity of the pain, the affected parts became swollen, red, and then of a shining purple hue.

She was then ordered twenty minims of the wine of colchicum root three times daily, in an ounce of camphor mixture; and a poultice was applied containing one-half ounce of extract of hemlock, and ten grains of watery extract of opium, with one pint of decoction of white poppy. This gave great relief, and in two weeks the foot had almost assumed its natural appearance. The pain became of a different character, and resembled the sensation called "asleep;" and former applications became intolerable—even the hemlock poultices.

Two months and a half later the foot had lost all pain and assumed a natural appearance.

About one month later she had another stroke, and soon died.

"It is obvious that the good effect of the colchicum may excite suspicion that the inflammation was of a gouty nature; still, however, the manner in which it so gradually began, the remarkable violence of the pain, and the change of colour in the skin which accompanied each paroxysm, were of so striking a character, and presented analogies with the case of the young lady before related so obvious, that the histories are placed side by side.

"The absence of dyspepsia, and all constitutional or local symptoms of gout, up to the age of eighty-two; the freedom from gouty deposits, which the urine exhibited throughout the whole course of the old lady's malady; and various circumstances that cannot have escaped your notice, render the hypothesis which ascribed her suffering to gout more than doubtful, and the doubt is still further increased by the very gradual manner in which the disease subsided under the use of colchicum, and its preserving the 'tertian' character to the end."

The pain of the foot and toes was so great, and the discoloration and purple hue of the skin so intense that senile gangrene was apprehended.

Sir James Paget has described a case which somewhat resembles these, and is a remarkable illustration of vaso-motor disturbances. I do not speak of it as precisely like my own or Graves' cases.

CASE XI.—The patient, a young man, desirous of "hardening" himself, stood in cold water up to his knees for eight mornings, and endured at the same time a cold shower-bath. These brought on disturbances in the blood-supply to his feet, so that walking caused them to become cold, white and numb, and aching when he ceased walking; they pretty rapidly flushed, growing ruddy and hot, with over-filling of the veins while the pain subsided.

It is curious that in the cases I have given, or quoted, exercise caused the feet to flush and grow painful, while in this one, exertion afoot produced contraction of the vessels, with pain, and rest after exercise brought about flushing.

Exercise naturally increases the flow of blood to a part, and in the cases I have reported there seems to have been an exaggeration of this natural result, and more rarely, and only in some cases, a contraction of the vessels, as though the controlling centres were sometimes in a paretic, and sometimes in an excitable state. It is, however, unwise to speculate physiologically until we are in possession of a far larger number of these interesting cases.

I shall therefore content myself with calling attention briefly to some other forms of painful feet with which the present disorder may be confounded, and I do this the more readily, because I myself have, I fear, confounded two distinct maladies in my former paper.

The disorder for which this one might most readily be mistaken was briefly mentioned by Prof. Gross in his "Surgery" as podynia, and was described by him as a disease peculiar to tailors. In my own paper (*Phila. Med. Times*) I gave a more detailed account of it. It consists essentially of pain in or about some parts of the sole of the feet. The pain is apt to come even in well-formed feet, and to persist for years. It is an ache or burning pain, and is unaccompanied by marked redness or swelling, nor is it ever complicated with other sensory or motor troubles.

It is made worse by heat and much covering, as well as by exercise, and has been ascribed by Dr. Gross to a subacute inflammation of the periosteum. I have, however, seen at least two cases in which, after some years of pain, there was very distinct evidence of ankylosis, and joint-troubles among the small bones of the foot, so that I am disposed to regard it as due originally to a low grade of inflammation of the complicated joint surfaces of this member.

I give five cases as illustrations of this annoying malady.

CASE XII.—The patient, a man of 20 years, consulted me on account of a pain and burning in the feet. He was tall, in fair general condition, but subject to occasional attacks of palpitation of the heart, which were at times severe and prolonged, and for which neither in his habits nor in the heart itself could I find a competent cause. He was, however, easily wearied; and, as he worked in an iron-foundry, was apt to be very tired by nightfall. After some two years of such labour, he began to have every evening pain and ache, with burning. By and by it came earlier in the day, and at last attacked him whenever he was an hour or two on his feet. Occasionally, after great exertion, the feet flushed a little, but did not swell. Summer was the time of the greatest torment, and a cool day gave more or less relief. After a time the pain became so severe that he was forced to seek a sedentary occupation, after which the pain, on the whole, became less, although ready to appear anew whenever he took too much exercise on foot. I should add that, although some years have now gone by, this tendency still continues, while in no other way does the patient show any manner of disease.

I have lately asked anew concerning this case, and find that the trouble still persists, some fifteen years having gone by since it began.

The feet were well formed, and there was no taint in the ancestry, and no history of gout, rheumatism, or syphilis. It was a mild case of pedal pain.

CASE XIII.—In June, 1871, I saw the next instance of this obstinate disorder. Mr. C., æt. thirty-seven; married. A healthy, well-built man, free from any constitutional taint, and never having had gout or rheumatism. When nineteen years of age, Mr. C. lived on a farm and worked as a field-hand to learn the business. After a few months, and in mid-summer, he began to feel in the feet a sense of weariness—a fatigue and sore feeling, as if he had walked too long. As this grew worse it came to last over night, and was then eased by walking in the morning. At last the soles became so sore that he would sometimes crawl down stairs in the

morning on his knees, and after cooling his feet with pump-water would pull on his boots. There was neither redness nor swelling, and the soles were the chief seat of pain, which was a dull, heavy ache, always much under the control of temperature, heat increasing and cold relieving it. The autumn and winter brought entire ease.

He quitted the business of farming, and became a clerk. During nine years he walked a good deal, and felt each summer some slight return of annoyance, but the winter brought absolute relief. When twenty-nine years old, a change of business brought with it heavier responsibilities and a great increase of exercise on foot.

The first warm weather in May caused a return of the foot-trouble, from which, up to this time, nine years, he has not been altogether without discomfort at any time.

The pain and suffering in his first attack were unlike those of the other cases, but when they returned they differed little from these. The heat of summer and too much foot-covering increased the pain and the readiness with which exercise caused it, while cold had exactly a reverse influence.

After walking for a time, he felt as if there was a cushion under the toes and the ball of the foot. Then the foot burned and pricked, and these latter feelings, which were so sharp at times as to amount to stinging, became worse for a little while when resting after a walk. His mode of relief was to bare his feet and place them on a higher level than the remainder of his body. At no time was there redness or swelling, and only once or twice could I find spots of tenderness on the sides of the feet, which, I should add, were well formed.

This case, like the last one, persisted under every mode of treatment I could devise, and is, I believe, rather worse to-day than better.

CASE XIV.—My next case came to me from Dr. James King, of Pittsburg. The patient, aged twenty-one, managed, at the time I saw him, a large printing-office. He was healthy up to 1864, when, after an extended army service, he had ague, which clung to him a long time. Returning home, much weakened in health, he began for the first time in his life to have, after long walks or after standing for a time, vague pains in both feet. Disregarding these, he continued to be much on his feet, and engaged in a business which taxed severely all his powers; and soon his annoyance increased so much as to cause him to seek for aid.

When I saw him in 1868, he was suffering most gravely. Usually he arose in the morning free from pain, but it came on in one or two hours, and increased in severity as long as he remained active and on foot. It thus happened that by nightfall both feet were aching, and so painful as to make further exertion impossible. The seat of pain was not distinctly fixed, being rather, as he said, throughout the feet. There was never at any time swelling, but once or twice a month some great excess of movement would cause the feet to be slightly flushed. At times also, as in the evening or whenever unusual or sudden exercise had been taken, the pain was of a burning character, and the feet throbbed. At such times they became tender, and were so sore that pressure or the effort to pull on a boot caused extreme pain.

The patient was free from heart-disease or other troubles, functional or organic, and, like the previous case, had not had gout or rheumatism.

As in the other cases, the summer brought more intense pain, and it

was in hot weather easily induced by the slightest exertion; while winter brought not only a general relief, but also enabled him to walk much longer without producing pain. Having learned these facts very early, he saved himself suffering as much as possible by wearing the lightest of foot-coverings. Later in his case the pain was chiefly on the sides of the feet, and at all times he could obtain perfect relief or insure freedom from annoyance by rest in the recumbent position. In October, 1868, Dr. C. B. King, of Pittsburg, writes to me that he has carefully watched the patient while applying electricity, and that he has never seen the feet either red or swollen. He adds that the right foot is the worse of the two, and that the severest pain is in the centre of the sole. He could find no tender points when the patient had been for a while without exercise, as in the mornings; and when the feet were worst the tenderness varied in position, and was usually general and not acute or in limited localities; neither was it seated in the muscular tissues of the feet, an observation which I myself confirmed on several occasions.

In 1875 I saw this patient, and prescribed various treatments, none of which helped him for more than a few days. At one time iodides seemed to be of use, at another blisters and cups, hot and cold douches. Rest, galvanism, all manner of liniments, and a variety of baths were tried in vain. During his disease he was in the hands of the ablest and most ingenious of our profession in and out of Philadelphia, but with one and all the result was the same.

Dr. James King writes me recently, Feb. 1878, that the pain still continues under certain circumstances. In spring and autumn especially, the approach of a storm always causes pain, which remains until the weather becomes clear. In summer and winter storms affect him less, and this form of evil influence is intensified by any depression of health. Walking or standing increases the pain, and when seated he turns his feet inwards so that the soles face one another, while more ease is obtained by elevating the feet. He has tried, since I saw him, various changes of climate and locality, and thinks he was made worse by the use of electricity and acupuncture. Attention to his general health, free use of quinia and of cold water, have aided him most. At present his feet are habitually cold. I may add that he inherits on the maternal side a very nervous temperament, and that his father suffers from hereditary gout.

CASE XV.—In November, 1874, Dr. Stone brought to me a salesman, C. H. A., *æt* 21, in a state of great suffering. In November, 1873, without hurt or excessive exertion, this young man began to have, when walking or standing, pain-ache and burning in the ball of the left foot. It covered the whole ball, and thence affected the heel, but never the intervening arch of the foot. The right foot was attacked in like fashion two months later, but it began in the heel and passed to the ball of the foot. The pain was intense, was made worse by excessive covering of the feet, was better on awakening in the morning, but became more sore during the morning, and, as he rested in the afternoons, it grew then less annoying. There has been all along a literally drenching sweat of the feet. When seen by me, both soles, and indeed the whole of the feet, were a little puffy and swollen. The calves were remarkably flabby, but there were no spinal symptoms. So great was the pain, that the patient was forced to crawl about. No constitutional or other cause could be assigned for this trouble. The feet were tender at times, but until the disease had lasted a year, mere movement of the toes, without pressure, caused no annoy-

ance. I exhausted my ingenuity in efforts to relieve this case, which, however, left the hospital unaided. To-day, February 20th, 1878, I saw the patient again, and learned that very slowly he has become better. I observe, however, that while the sweats have ceased, and the pain grown very much less, three of the smaller toes of the left foot seem to have partially lost power to extend themselves, and that the metacarpo-phalangeal joint of the third toe is sore on motion, and that there is considerable limitation of motion in the metacarpo-phalangeal articulations, and an unusual want of freedom of passive motion in the small bones of the carpus.

CASE XVI.—One of the worst cases I have seen came to me from Dr. Corson, of Norristown. After every other means had failed in my hands, and those of several able physicians, Dr. T. G. Morton twice operated on the feet in the manner which he describes in the following note:—

The first operation: a narrow, long, straight bistoury was carried in at the most prominent part of the heel posteriorly, and all the tissues were freely divided from side to side; the edge of the knife was then turned towards the os calcis, and the tissues directly on the bone were freely incised, several longitudinal cuts being made.

The second operation was similar to the first, save that the division of the tissues from side to side was more complete; after this, a portion of linen soaked in carbolized oil (1 pt. to 15) was carried through the puncture, and the wound fully stuffed with it; at the end of three days this was withdrawn, and the part poulticed.

The parts healed rapidly in each instance.

The first operation gave great ease for three months, so that he could walk with the aid of a cane. Then he relapsed, and since the second operation has been worse than before.

Gout and rheumatism at times afford instances of painful soles, but these get well readily, and the still rarer form of tender feet which follows typhoid fever, though more mysterious in origin, also ends in recovery after one or two months.

Almost as rare are the cases of tender feet from syphilis. I have seen but two cases—one of them within a month. In both, a very careful examination after prolonged soaking in hot water, so as to soften the soles, revealed nodes on the bones of the feet. In both instances these were on the heel, and caused the patient to walk in an odd fashion on the ball of the feet, so as to save the diseased parts from pressure.

