PROVINCIAL MEDICAL & SURGICAL JOURNAL.

A COURSE OF LECTURES ON SURGERY, DELIVERED IN THE MEDICAL SCHOOL OF CAMBRIDGE.

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LECTURE IX.

ULCERATION CONTINUED: MORTIFICATION.

Phagedenic Ulcers, their General Characters; are often of Specific Nature; Cause of the Ring or Crescent Shape; Treatment by Caustic; Specific Remedies; Tonics and Opium.—Atonic Ulcers, their General Characters; Circumstances under which they occur; Treatment.—Mortification, its relation to Ulceration; the two often conjoined; Classification of the cases of Mortification into Inflammatory, Phagedenic, and Atonic.—Inflammatory Mortification: Symptoms, Local and General; Resistance of Different Tissues; Treatment.—Sloughing Phagedena; Symptoms and Treatment.

The acute and chronic inflammatory ulcers which I described to you in the last lecture constitute the great proportion of this class of diseases; they are, for the most part, simple in their nature, and the indications for their treatment are generally obvious. Though often very tedious and troublesome, they scarcely deserve to be regarded as difficult cases. I gave the name *inflammatory* to them, because they evince, in the rate of their progress, a greater correspondence with the severity of the accompanying inflammation than do the ulcers we are now about to consider, and the treatment of them consists in the employment of the various means which are used to combat inflammation in its acute and chronic stages.

In the second class of ulcers to which I would now direct your attention, the correspondence between cause and effect,—between the inflammation and the ulceration, is not so manifest. The latter is observed to be out of proportion to the former. The distinguishing character of these ulcers is their tendency to increase without being accompanied by any sufficient apparent cause for so doing. They go on spreading from point to point, as if they possessed an independent power of growth, and as they proceed, they eat away the integuments and subjacent parts, which may look quite healthy, and may present scarce any trace of

inflammation up to the very edge of the ulcer. I do not mean to say that these ulcers really take place without inflammation, or that the destructive process is less directly dependent on inflammation in them than in other ulcers, but merely that the ulceration is so greatly out of proportion to the inflammation, that the latter seems rather a secondary feature than an exciting cause. The term *phagedenic*, which is applied to these ulcers, is expressive of this eating or destructive tendency so strongly marked in them. They are very often the result of some specific disease, as syphilis, the influence of which seems, to a certain extent, to modify the ordinary course of the inflammation, and to impress peculiar characters upon the ulcer.

Phagedenic ulcers are generally of circular or crescentic shape, and they sometimes exhibit a remarkable tendency to spread in one direction, while they are healing in another. Thus the reparative processes of granulation and cicatrization are often observed to be going on from some remaining insular fragments of cutis, which have escaped destruction in the middle of the ulcer, at the same time that the work of destruction is proceeding at the circumference; and when the ulcer is of crescentic shape, cicatrization is generally advancing on the convexity, while the ulceration continues to make way in the concavity of the crescent. The destructive and reparative processes thus going on together, and keeping pace with one another have the effect of gradually enlarging the circle of disease—it may be, without increasing the interval between the ulcerating and the healing lines. Moreover, these ulcers are generally superficial, creeping along the skin without extending through the subcutaneous tissues; and, although they continue to spread at their circumference, the abundant granulations on their surfaces, forming, perhaps, at the same time, show the reproductive forces to be in full vigour at one part, while the work of destruction is going on at another.

This disposition to assume a circular or crescentic shape, and to heal at the centre, while they spread at the circumference, though often strongly marked in syphilitic ulcers, and forming, therefore, a suspicious symptom, is not altogether peculiar to them. The circular is the natural shape assumed by inflammatory affections of all kinds, which commence at a single point, and radiate from it. It is liable to be modified by the unequal resistance of the tissues to the spreading of the inflammation, and by various accidental circumstances, and is generally best marked when the disease

increases slowly. The central healing and circumferential spreading of an inflammation upon which the crescent or ring-shape depends, has its analogy in the fairy rings upon grass, and is observed in other inflammatory affections besides syphilis. It is no uncommon occurrence in scrofulous ulcers, and is the cause of that disease being very often confounded with syphilis. Herpes circinatus, or ring-worm, and lepra (common, not syphilitic lepra, for I believe the spots of the latter do not attain sufficient size to assume the ring-shape,) are familiar examples of the same thing. The peculiar shape and mode of increase in these cases probably depend upon the tendency which inflammatory, in common with other diseases, have to run their course, and fade away, on the one hand, and to communicate their noxious influence to neighbouring parts on the other. Thus an inflammation attacking a given point in the skin, runs its course in due time, and subsides at that point; but it has, in the meantime, infected the surrounding integuments, proceeds through the same course in them, and is from them propagated to a greater distance. In this manner a spreading circumference is established around a healing centre. Such mode of increase is most likely to be observed in specific affections, because the disease, depending upon a poison or some extraneous cause, falls upon structures otherwise healthy, and has an opportunity of exhibiting its natural disposition, uninfluenced by the many causes which, under ordinary circumstances, combine to modify it. If this view of the subject be correct, the peculiar shape of phagedenic ulcers is due to the natural unrestrained tendencies of the ulcerative process, rather than to the exercise of a specific influence.

Inflammatory affections are observed to assume the ring or crescent shape chiefly when they depend upon some morbid condition of the circulating fluids, or upon some depraved state of the constitution, doubtless, because they are then least likely to be modified by local influences. Lepra, herpes, some of the forms of roseola, and erythema, and occasionally scrofulous inflammation, are instances of this, and it is probable that the shape of the secondary syphilitic ulcer has a relation to the mode in which the poison of syphilis is propagated through the blood, rather than to the quality of the poison itself. This inference seems to be justified by a comparison of the syphilitic ulcers with the diseases just referred to, for they all agree with one another, and with the secondary ulcers of syphilis, in a disposition to assume the ring or crescent shape, and they all appear to depend upon some morbid condition of the blood, with the exception of scrofulous inflammation, which probably owes its peculiarities to a particular state of the constitution. The primary syphilitic sore, though of specific nature, as shown by its effects, is a local disease dependent on a local cause, and displays nothing remarkable in its shape.

It generally happens in an ordinary ulcer, that the integuments have been quite destroyed in the middle of the sore, so that although granulations may rise up in the centre while ulceration is going on at the margin, cicatrization can proceed only from the circumference; whereas, in the secondary syphilitic ulcer, which com-

mences often with a cluster of minute points, small fragments or islands of incompletely destroyed cutis remain in the middle, and become nuclei, from which the cicatrization may radiate, and this central healing taking place co-temporaneously with the circumferential spreading, gives the peculiar shape we have been discussing.

Phagedenic ulcers are often very painful, the pain being of a sharp gnawing kind. It is severe in proportion to the rapid spreading of the ulcer, and ceases as soon as the process of destruction is brought to an end.

In the first class of ulcers which I described to you, inflammation is the leading feature, and the treatment is regulated accordingly; but in the phagedenic cases, where ulceration is so predominant as in a manner to constitute the disease, we do not proceed by the circuitous course of endeavouring to control the inflammation, but at once attack the disease in some more direct manner. With this view, caustics are applied, and often successfully, to phagedenic ulcers. The disease is by this means literally burnt out. The ulcerating structures are converted into a slough, which separates in the usual manner, and the healing processes succeed. A primary syphilitic sore may be thus exterminated if the treatment be adopted before it has become indurated, and before it has had time to infect the system. The nitrate of silver is not generally sufficient to effect this; it rather increases the spreading than effects the eradication of the sore. Some stronger caustic, such as nitric acid, or potassa fusa, must be employed. The spreading of larger phagedenic ulcers not of primary syphilitic nature, may be sometimes stopped by touching their edges lightly with nitric acid; and you have had repeated opportunities of witnessing the good effects of applying nitrate of silver, in substance or strong solution, to acute ulcers of the cornea, which are not attended by a sufficient amount of conjunctival inflammation to correspond with the severity of the disease.

The exhibition of mercury in sufficient quantity to affect the system, generally succeeds in stopping the primary phagedenic ulcers which have advanced too far for the application of caustic. The same remedy is much less beneficial when the phagedenic ulceration occurs in the subsequent stages of syphilis; indeed, it is then rather injurious. The iodide of potassium is in such cases no less a specific remedy for the syphilitic disease than the mercury is found to be in its primary stages. I believe that both these medicines in course of time lose their influence, and if the disease outlives that period, it is exceedingly difficult to control.

Phagedenic ulceration occurs most frequently, and advances with greatest rapidity in persons of feeble or debilitated constitution, the reduced vital powers of whose tissues are unable to resist the destructive progress of the disease. Patients who are suffering under what is called the tertiary stage of syphilis, in which phagedenic ulceration of the skin and fauces constitutes a prominent feature, are often in a very low state of health. I believe that the long continuance of the syphilitic poison in the system exerts a directly enervating influence upon the bodily powers, which has

much influence in reducing the patient to the cachectic condition so often attendant upon the later, and sometimes even accompanying the earlier stages of the disease; and if the specific remedy for the syphilis have not lost its effect, it will be found, in such cases, the very best means of combating the cachexia. I have often known patients loaded and oppressed apparently with the poison of syphilis, improve greatly in health, and resume their lost vigour as the disease faded away under a carefully conducted mercurial course. In this tertiary stage of syphilis, however, when debility is associated with phagedena, a tonic regimen, nutritious diet, sea-side air, and tonic medicines, such as sarsaparilla, nitric acid, and cinchona, are powerful adjuncts to the specific remedy, and, when the latter has lost its influence, we are obliged to rely exclusively upon these measures for invigorating the system, so as to enable it to withstand or throw off the noxious poison.

When the patient is anxious, irritable, and sleepless, and the spreading ulcer is painful, much benefit is likely to attend the administration of opium. It should be given in sufficient quantity to ensure sleep at night, and it is sometimes advisable to give it in repeated doses during the day. It sometimes acts like a charm, and, in combination with tonic medicines, has acquired the reputation of a specific in some of these cases.

In our third class of ulcers,—the *atonic*, ulceration is out of proportion to the accompanying inflammation in consequence of the enfeebled condition of the patient, the vital powers being reduced to so low an ebb that the tissues are unable to maintain their integrity, under circumstances which, in the healthy state, would have failed to produce a destructive impression upon them. One person receives a wound, and it heals up readily and quickly; but in another, and more feeble patient, the surrounding textures being unable to bear the slight disturbing influence of the inflammatory action which accompanies the healing process, give way and ulcerate, and the wound, instead of closing, becomes larger. Hence, the troublesome ulcers caused by wounds in the extremities of old people, in anasarctous limbs, and in persons greatly reduced by illness or starvation. This disposition to ulcerate rather than to heal is no uncommon cause of death after the amputation of diseased joints and limbs, when the patient's strength has been greatly reduced before the operation is performed. It may be that the stump never heals at all, the slight inflammatory disturbance necessary for reparation, producing a destructive effect upon the enfeebled tissues from the very first. Or, supposing the healing process to have commenced, if any slight accident, such as the loss of a small quantity of blood, a diarrhoea, or disordered state of stomach occur, which lowers the patient's strength a little further, the bond of union is very likely to give way, and ulceration takes the place of reparation. A patient in this hospital underwent amputation in the thigh on account of a severe disease in the knee joint, with extensive suppuration, which had reduced his strength very much. The operation was performed with little loss of blood, and abundance of soft parts

were left to cover the bone; but the stump healed only in part; abscesses formed in it, and after a time, the bone projected through the wound. Such tonic medicine and nutritious diet was given as his stomach was able to bear, but he never made a fair start on the road to health; the quick pulse, hectic sweats, and an open stump remained. After he had lingered in this way for a considerable length of time, inflammation occurred in the opposite femoral vein. This was followed by the appearance of an ulcer on the inside of the stump taking place without any apparent local cause. The ulcer spread rapidly, so that in ten days it was as large as a cheese plate. Its surface was grey or ashcoloured, and sloughy, and there was very little inflammation in the skin immediately surrounding it. It was a well-marked specimen of an atonic ulcer, and I need scarcely add that the patient soon died.

Some of you may remember a pale, haggard, emaciated woman, aged 54, with diarrhoea, small quick pulse, parched lips, and glazed apthous tongue, who was admitted into Anne's Ward several months ago, with extensive ulcers, of the atonic kind, on the left lower extremity below the knee. They were covered by soft grey sloughs, and in places where these sloughs had separated, the muscular fibres were exposed, uncovered by granulations. A copious creamy offensive discharge issued from the ulcers. The surrounding integuments were pale, not much inflamed, and when slight inflammation occurred in the course of the femoral absorbent vessels, it was very quickly followed by the formation of abscesses and ulcers, similar to those in the leg. She had long been subject to ulcers in this leg, but the deplorable condition in which she was admitted into the hospital, appeared to have commenced three or four months previously, with loss of appetite, and general failure of strength, after which the ulcers in the legs began to spread rapidly. Stimulants and nutritious diet failed to impart any vigour to her shattered frame, and she died soon after her admission. The internal organs were sound, but bloodless.

These atonic ulcers occasionally present the character which I have mentioned as appertaining to the phagedenic class. There is at this time in Martha's Ward a pale, feeble, emaciated woman, whose lower extremities are the seat of ulcers, of a peculiar kind. In the early stage they were covered by thick yellowish secretion, forming a crust or scale upon them. They were all superficial; several of them had an ulcerating edge in one direction, although they were healing at other parts, and although their surfaces were covered by large flabby granulations. Some were healing at the centre, and spreading at the circumference, and others were of crescentic shape, with cicatrization at the convexity, and ulceration at the concavity of the crescent, simultaneously proceeding. There were also at the time of her admission superficial ulcers of the scalp over the coronal suture, and some symptoms of disease of the frontal bone. Though the appearances of the ulcers were very suspicious, we could not obtain any history of syphilitic disease, indeed the evidence is strongly against it. She is a respectable married woman, with five children, the youngest of which, a

year old, had been weaned three months. She states that at the time of weaning this child her breast became sore, this was followed by an abscess in the axilla, which made her very weak. The ulcers upon the head and lower extremities began soon after, and have been on the increase ever since. At first, under nutritious diet, with small doses of the iodide of potassium in decoction of sarsaparilla, the healing of the ulcers went on very favourably, though the cicatrices were thin and delicate, without contractile power. Lately, however, her health has declined again, the ulcers have, in many places, re-opened, and she is in a worse condition than before. I cannot, of course, be quite certain of the absence of a syphilitic taint in this case, but I think the probabilities are against there having been any disease of that kind; and I have before mentioned to you that the ring or circular shape is not a certain evidence of the specific nature of an ulcer. However, whether the disease in this case be syphilitic or not, it is an instance of the association of phagedenic ulcers, with a cachectic state of the system, which I before mentioned to be of frequent occurrence.

The aphthous sores frequently affecting the mucous membranes of persons who are greatly exhausted by long-continued disease, are also examples of the atonic class of ulcers. So are the ulcers sometimes occurring upon the feet and legs of old people, the ulcers of scurvy, and ulcers affecting limbs weakened by paralysis or other disease.

In the treatment of this class of ulcers our attention is directed to the means best calculated to promote the general health; but, as in the cases which I have related to you, the condition of the patient is generally so miserable and cachectic, that our best efforts are unavailing.

These three classes which I have now described, (the inflammatory, the phagedenic, and the atonic,) will, I think, be found to include all the various ulcers, with the exception of those as depend upon a peculiar cause,—for instance, syphilis, malignant disease, or a scrofulous habit of body.

By the term mortification, we mean the death of a part of the body which is generally preceded and occasioned by some change in the vital actions of the part, wherein it differs from simple death, or death consequent on amputation, or the decease of the entire body. It is indicated by loss of temperature and change of colour. The limb affected becomes cold, and of a mottled, livid, or black colour, the cuticle being at the same time vesicated in places, or detached. When the change is confined to some of the textures only, they more frequently assume a grey or ash colour, and become soft or sodden, as if from the infiltration of fluid into them. The terms sphacelus, gangrene, and sloughing, are applied almost indiscriminately to this condition, at any rate the distinctions between them are not very accurately observed.

Ulceration and mortification differ from one another in degree rather than in kind. In the one the death of a part takes place slowly, *piecemeal*, or by atoms; the other is more rapid in its progress, does its work of destruction upon larger masses at one time, entire structures, or even a whole limb, dying at once, *en*

masse. Both are also the result of the disturbing agency of inflammation upon the tissues. They are, therefore, alike in their nature, and dependent upon the same cause, and we should expect to find them treading closely upon each other, the one continually advancing into the other; and both proceeding together in the same part; and so it is, for we very seldom see ulceration going on with any great activity without its being accompanied by mortification of the affected tissues, to a greater or less extent. The ulcers in which mortification is thus combined with ulceration, are called "sloughing ulcers." Their only peculiarity consists in the rapidity with which the work of destruction is carried on, and the treatment of them is to be conducted upon the general principles which I described to you in speaking of the treatment of ulcers. If a poultice be placed upon the part, (and it is generally the most desirable, as well as the most comfortable application,) some detergent or cleansing preparation may with advantage be added to it, such as chloride of lime or charcoal, which, by destroying the noisome products of the disease, exerts some influence in arresting the disease itself.

Sloughing is most likely to occur in the ulcers which are attended and occasioned by acute inflammation, and in the atonic ulcers. The latter class of ulcers, indeed, very often seem to spread rather by sloughing than by ulceration. It is also to be remarked that the textures of low vital power are more liable to mortification than to ulceration. This is true of fibrous textures and of bone; so that when an ulcer has penetrated through the skin and subcutaneous tissues down to a fascia or tendon, those structures generally mortify and are separated as soft, sodden, greyish masses. Inflammation of a bone, especially if it be at all acute, is more commonly followed by necrosis than by ulceration, and ulcers in bones are generally attended with more or less of necrosis. Again, ulcers in cicatrices and in textures indurated and otherwise altered or weakened by previous inflammation, advance rather by sloughing than by ulceration. An injury which would occasion a slight ulcer in a young or middle-aged person, may cause severe mortification in the foot of an old man. All this agrees with the statement I have before made to you, that the destructive effects of inflammation are most marked and most rapid in persons and tissues possessed of the lowest vital powers.

Moreover, as on the one hand, mortification is the usual attendant on the more severe stages of ulceration, so, on the other, does ulceration generally accompany the milder forms of mortification; and when the latter has ceased to proceed ulceration continues to finish the work which it had begun. In this manner ulceration exerts a benign influence. By separating the dead parts it clears away the foul products of mortification, and leaves a clean surface on which reparation may proceed.

The several instances in which mortification occurs may be advantageously classed in three divisions, corresponding to those into which we separated the different kinds of ulcers. The first class comprises the cases in which the mortification manifestly depends

upon, and is proportionate to, the attendant inflammation. In the second class we will consider those cases, not of very frequent occurrence, where the mortification is disproportionate to the inflammation, and seems to spread in consequence of some peculiar quality in the disease; and, thirdly, the more numerous instances in which the mortification, in its severity, exceeds the severity of the accompanying inflammation, by reason of the low vital powers of the person or part affected. We have, therefore, simple or inflammatory, phagedenic and atonic mortification.

In the first class of cases the inflammatory process attains to such a degree of violence that it not only renders the nutritive fluids unfit for their purpose and stops the process of nutrition, but it also annihilates the vital properties of the part affected and reduces it to a lifeless mass. Function of every kind, nutrition, and secretion are suspended, and the tissues become subject to the decomposing tendencies of compound structures; or they may be dried and charred to a cinder. The first symptoms which attract our attention when inflammation is about to pass into mortification are a change of colour and a loss of temperature. The bright red colour and burning heat of acute inflammation are succeeded by a dull red, blue, or livid hue, indicating the languor and difficulty of the capillary circulation. At the same time the part begins to feel cold, relaxed and flabby; and it is generally infiltrated with thin reddish fluid. The acute sense of pain, perhaps, begins to subside, so that judging from the pain which may have been a prominent symptom, and to the patient the most important one, the attendants are likely to be misled into the idea that the inflammation is giving way, and that an improvement has commenced. (This is particularly likely to happen when the inflammation attacks an internal organ, the indirect symptoms resulting from it being then the only means by which we can form an estimate of the changes that may be in progress.) As the mortification advances the cuticle becomes detached, vesication perhaps takes place, and the part assumes a mottled colour, then becomes dark, blue, leaden, brownish or even black; it is cold and flaccid, a dirty, thin, bloody fluid exudes from it, and sensation is quite destroyed. Decomposition quickly following, gases are generated, occasioning a crepitating feel and a fœtid odour; the textures become stained of an uniform dull livid hue from the transudation of the colouring matter of the blood, and they are rendered soft and sodden so that they tear like wetted paper.

While the inflammation is thus at one place advancing to the complete destruction of the textures, the surrounding parts may exhibit the several changes above described proceeding at different points. The brownish black colour of the dead and decomposing structures may be shaded off at the circumference into a livid, blueish or mottled appearance, and this again may pass in the same manner by easy transition into the bright red colour, and the burning heat of acute inflammation still raging in the most distant parts. So that there is no abrupt line of demarcation between the inflammation and the mortification; the one is by imperceptible degrees advancing into the other. While

this is the case we know that the mortification is extending and we cannot tell where it may stop. As soon, however, as the destructive process is arrested, either in consequence of a diminution of the intensity of the inflammation, or from the greater vitality of the textures involved in it, then the intermediate livid shades begin to disappear, and a well defined line appears between the living and dead parts. The contrast between the two is very remarkable, because the black slough is surrounded by the inflamed integuments whose bright red colour extending to the very edge of the slough shews that they have not yet begun to lose their vitality.

The mortified part may now be regarded as a foreign body, which by its presence maintains a sufficient degree of inflammation in its circumference to effect the removal by ulceration of the tissues in immediate contact with it. So that in the line of demarcation between the dead and living parts, a narrow groove of ulceration takes place, and extends more and more deeply till it has completely detached the mortified part. This ulceration occurs, of course, in the living textures contiguous to the slough; for the dead structures cannot undergo changes which are the result of a modification of the vital powers. The time required for the complete separation of the slough varies a good deal; in vascular and highly organized textures, as the skin and mucous membranes, it is quickly effected. The slough of a caustic issue comes away in a few days. When the mortification has attacked a limb, and the ulceration has to make its way through all the structures before the slough can be separated, it is a work of some months; for the fasciæ, tendons and bones are, as you know, very resistant to the ulcerative process.

When the slough has separated, the ulcer granulates and heals up like any other sore; and it often does so very quickly, because the inflammation which occasioned the mortification having been active in its progress, has left little induration or other traces of its injurious effects upon the surrounding parts. There is, therefore, nothing to impede the contraction of the ulcer, and the work of reparation generally goes on briskly also.

The effect produced upon the constitution by the transition of inflammation into mortification is very marked, and is proportionate to the extent of the disease, and the importance of the part affected. The change in the constitutional symptoms corresponds closely with that of the local phenomena. A state of great depression follows upon that of much excitement. There is general listlessness and prostration of strength; the countenance becomes sunken, leaden, and cadaverous; the surface of the body cold, flaccid, and clammy with perspiration; the pulse quick, feeble, hesitating, or intermitting; the tongue moist, flabby, and cold; the secretions, with the exception of the perspiration and a few others, stopping, and the intellect wandering. These symptoms of depression are the worst that can occur in the course of an inflammatory affection, for they indicate, either that the local disease has gone on to its most destructive results, or that it has attacked an organ of such importance

that the constitution is unable to bear the sympathetic disturbance excited by it. It does not necessarily follow that mortification has commenced, for we find the symptoms of depression sometimes accompanying even the early stages of inflammation of a vital organ, or of the peritoneum. They are more easily induced by the inflammatory affections of old people than in the young and vigorous; but under any circumstances they are alarming symptoms, for, whether the local disease be severe or not, they shew, at any rate, that the constitution is ill able to bear it. And when the inflammation is seated in an internal organ, and so out of sight, they demand our serious attention, because they may be the only warnings that reach us of the terrible mischief which is going on within.

The mortification consequent on acute inflammation is not often very extensive, unless there be some peculiar circumstances connected with it. It commonly affects tissues rather than limbs, and, as I have before mentioned, it affects most easily those tissues whose vital powers are the least active; thus, in cases of severe inflammation of the fingers, the tendons and the phalanges are the parts whose vitality is first destroyed. The cellular tissue is very prone to mortification, and so is the skin in a less degree. When the mortification is limited in its extent, the sloughing tissues generally present a grey or ash-colour, instead of being livid or black.

Blood-vessels resist mortification a very long time, and may be sometimes found unchanged when the surrounding tissues are sloughing extensively. When they begin to suffer, the blood usually coagulates in them, and the coagulation may extend for a considerable distance above the mortified part, so as to plug up the tube, and prevent any loss of blood when the slough is separated by the ulcerative process. This coagulation does not always take place in mortifying vessels. Thus, in cases of acute gangrene of a limb, the blood is generally found to be fluid, and the tissues are stained by the transudation of its colouring matter. It seems that the blood and tissues all perish together when the mortification is thus rapid, there being no time for the coagulation of the blood to take place; just as in sudden death from electricity or any other severe shock, which is felt throughout the whole frame, at once annihilating life in every part, in the fluids as well as in the solids, the blood in the heart and great vessels, and indeed, elsewhere, remains in a fluid state.

The most effectual means of preventing the progress of acute inflammation into mortification, are those which serve best to control inflammation under other circumstances. If the fever be high and the pulse hard, general depletion is required, and the antiphlogistic regimen should be enforced, warm soothing applications to the part generally answer better than cold lotions, indeed, the latter sometimes seem to accelerate the mortification. Leeches should not be applied upon or in the immediate neighbourhood of the inflamed part.

Even when the mortification has actually commenced, if it affect only a small part of the body, and the febrile symptoms continue, the loss of blood, and the antiphlogistic regimen, may still be necessary. In

adopting these measures, you must exercise much caution, and not forget the severe constitutional depression which is likely to be induced when mortification has once set in. I need not say that when the depressing influence has begun to extend from the mortifying part to the system, and the symptoms of sinking which I just described have commenced, such treatment is quite out of the question. Our efforts must then be directed to support the drooping frame by stimulants, and to allay the local pain and the nervous irritability by sedatives; brandy and laudanum, or ammonia, with cinchona, beef-tea, &c., must be given, if the stomach do not reject them, and warm fomentations be applied to the part, together, perhaps, with chloride of lime, charcoal, or other purifying agents.

The exhibition of tonics and nutritious diet is not often attended with much benefit till the mortification has ceased to spread, and the ulcerative line of separation has commenced; their good effects is then very apparent, more particularly if the separation of the slough, the granulation, and cicatrization, proceed languidly. The activity of these processes may be also sometimes increased by mild stimulating local applications, such as yeast poultices, weak solutions of sulphate of zinc, or a diluted preparation of nitric acid. It is sometimes desirable to expedite the removal of the dead and stinking mass, by dividing the tendons, bones, or other parts, in which the process of ulceration goes on slowly. This should be done carefully, so as to avoid injuring the adjacent lining structures.

Our second class of cases of mortification consists of the instances in which the progress of the disease corresponds with that of the phagedenic ulcers, the destructive results being disproportionate to the inflammatory symptoms, without there being any peculiarity of constitution sufficient to account for the rapidity and extent of the mortification. We can explain such cases only on the supposition of there being something peculiar in the nature of the disease, which makes it differ in its effects upon the tissues from ordinary inflammatory affections. That peculiarity, as in the phagedenic ulcers, is often due to a specific cause. Thus syphilitic ulcers not unfrequently spread by sloughing. The affection called sloughing phagedena is a better instance of this second class of cases of mortification. It consists in a rapidly-spreading slough, observed most frequently about the pudenda or nates of prostitutes who are suffering under gonorrhœa or some form of syphilis. It commences with an ulcer or abrasion of the skin, which is quickly followed by sloughing; the slough extends without much accompanying inflammation. It invades and destroys the surrounding textures, converting them into a dark or ash-coloured toughish mass. This affection is observed in persons who are out of health, and who have been leading the debauched irregular lives of prostitutes; but the constitutional derangement is not sufficient to account for the rapid progress of the local disease which seems to spread by some force of its own. The most effectual treatment consists in killing as it were the local disease, by applying strong nitric acid freely, so that it may soak through the slough, and exert its

influence upon the surrounding tissues. The eschar made by the nitric acid comes away with the slough, and a healthy granulating ulcer is left, in which the reparative processes go on briskly. The disease is thus fairly burnt out in the same manner that a phagedenic ulcer may be sometimes exterminated by the application of a caustic.

ARREST OF DEVELOPMENT OF BOTH BONES OF THE LEG.

TO THE EDITOR OF THE PROVINCIAL MEDICAL AND SURGICAL JOURNAL.

SIR,

Should you consider the following simple narrative of facts referring to a case which occurred in my practice, and which are sent in a true spirit of professional communication, of sufficient interest for insertion in your valuable Journal, they are quite at your service.

I remain, Sir, your obedient servant,

J. N. STEVENS.

11, Princess Square, Plymouth,

May 16, 1849.

Curious and probably unique case of an arrest of development in both bones of the leg, producing the bad effects of a supplemental joint, in which (from a different view of the cause of the unnatural state of the limb, and under the supposition that the bones had been fractured by the rough attempts of the midwife to deliver, in a footling case, and subsequent neglect of proper treatment,) it was determined, on consultation, other means having failed, to perform the operation of excision of the ends of the bones, and thus by treating the case as one of recent compound fracture, give the child the chance of preserving a useful limb, and should this plan fail, amputation was to be performed as a *dernier resort*.

CASE.

Samuel Skewes, aged $2\frac{1}{2}$ years, of healthy appearance, and good muscular development, but the child of delicate-looking parents, became a patient of mine for the first time when a month old, in consequence of an unnatural degree of motion being observable in the right leg, together with a projection of the tibia against the skin on bending the limb, from which it was evident there was a breach of continuity in the bone, and the question naturally arose, how was this state of things to be accounted for? I was immediately struck with the idea of its being a case of an arrest of development in the bone or bones, producing a kind of false joint, but on being informed that the midwife had been very rough in her attempts at delivery, the case being a footling one; and on the parents observing a certain amount of deformity in the limb a few days after the birth of the child, and pointing it out to her, she declared there was nothing of a serious nature to apprehend, and that it would

soon "*right itself again.*" I began to incline to the opinion that she had been the cause of the mischief, and that I had a case of disunited fracture to manage, and acting on this idea, I well bandaged the limb, having previously placed the ends of the bones in proper apposition, and applied suitable splints, enjoining as perfect a state of rest as could be observed, for a considerable time. This request having been complied with, on the part of the parents, I removed the splints, &c., in about six weeks, but found the bones in the same unconnected state as before. I then rubbed the ends of the bones together for some time with considerable force, and reapplied the splints, &c., and at length having discovered the failure of this plan also, I determined on having a consultation on the case with two of the most eminent surgeons in the neighbourhood, who being of the same opinion as to the cause of the mischief, advised the performance of White's operation, with the hope of saving the limb; and should this fail, recommended amputation as a *dernier resort*. This being agreed on, I shortly after proceeded (having brought the child under the full influence of chloroform) to expose and saw off the ends of the bones, by making an incision of about three inches long in front of the spine of the tibia, the centre of which should correspond with the disunited end of the bones; and this having been accomplished without any pain, they were carefully exposed, and a small portion of each removed with the loss of only a small quantity of blood. The edges of the wound were brought together by adhesive straps, and a roller having been applied, the limb was placed in a small open fracture box made for the purpose, in which it was secured, and directed to be kept as quiet as possible, the friends constantly keeping watch by the child for the attainment of this object. All went on well for several days, the febrile disturbance of the system not being at all greater than might have been expected, and the suppuration that ensued continued for some time moderate, and of a healthy character; but having gradually increased in quantity, with a high degree of irritative fever and an excessively irritable state of the nervous system, with rapid emaciation and hectic, I deemed it advisable, after a period of three weeks, and in consequence of severe hæmorrhage having taken place from the wound, to resort to amputation as the only chance of safety for the patient; and having procured the necessary professional assistance, I immediately removed the limb below the knee as quickly as possible, and with scarcely any loss of blood, the popliteal artery being the only one which required a ligature. The child was again placed under the influence of chloroform for the amputation, and all went on well from this time, the boy making a good, though protracted recovery; and considering the very critical state of the child, from the failure of the first operation, with its consequent suppurative fever and hæmorrhage, I considered I had some cause for congratulation as to the issue of the case, and more particularly so, as the examination of the limb satisfactorily proved that no other proceeding could have been of any avail to my little patient, the bones having been found too small, had