

Surgeon Royal

~~*Robt. A. ...*~~

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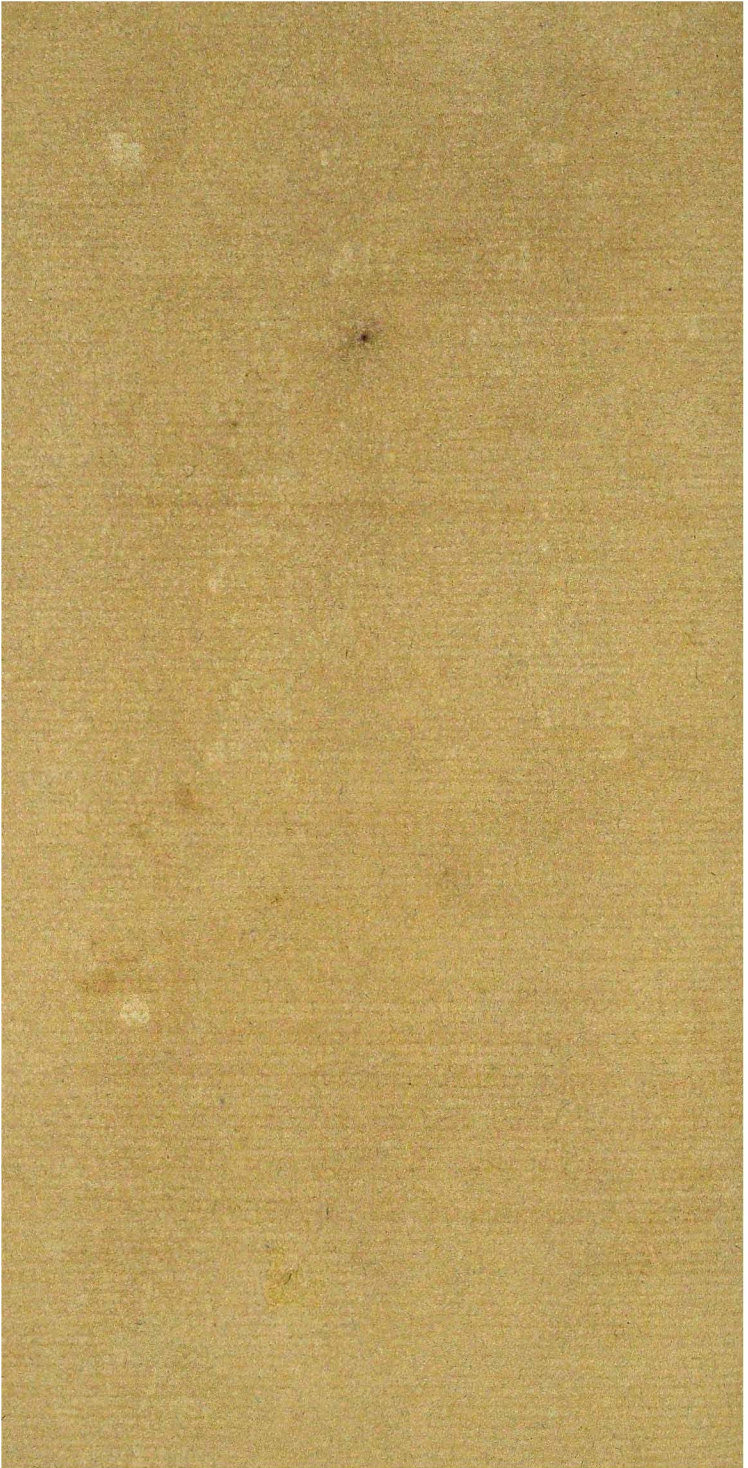
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CHAPTER III.

Of WOUNDS.

SECTION IX.

Of Wounds in the Face.

IN Chapter XXX. I shall enter upon the consideration of wounds of the head which either primarily or eventually may affect the brain: And in Chapters XXXI. and XXXII. we shall treat fully of diseases of the Eyes, Nose, and
VOL. II. B Mouth;

Mouth; referring therefore to what is there to be said upon these parts of our subject, I shall at present offer a few observations upon external wounds of the face.

In the treatment of wounds in every part of the face, one important object is to prevent deformity. This is indeed an object in every part of the body; but in the face it is so essential, that the slightest injuries done to it require attention.

As every cicatrix is apt to leave some degree of deformity, we should endeavour, in all wounds of the face, to have the divided parts laid as exactly and neatly together as possible, and to retain them by those means which will be productive of the least mark. In all superficial wounds of the face, as well as in those which run deep, when of a longitudinal direction with respect to the fibres of the injured part, we should trust to adhesive plasters alone for retaining them. But wherever the edges of a wound retract
much

much from each other, as we will not be able in any other manner to retain them, futures ought without hesitation to be employed: And of these the twisted future, to be described in Chapter IV. Section V. ought in general to be preferred; for it prevents retraction with more certainty than the others, at the same time that it does not produce more pain or uneasiness. In this manner it is more especially necessary to treat all wounds of the lips, which cannot indeed in any other way be prevented from leaving much deformity: We shall refer, however, to Chapter XXXIII. for some farther observations upon this point, when treating of the operation for the Hair Lip.

Wounds in the cheeks are apt to penetrate the salivary ducts leading from the parotid glands; and as this is frequently productive of much inconvenience, by the divided duct continuing to pour out the saliva long after the rest of the wound is healed, it becomes often an important object to accomplish a cure. But as we shall enter into a particular

consideration of this point in Chapter XXXIV. Sect. XIV. I must now refer to what will then be said upon it.

In the forehead, wounds are sometimes attended with hemorrhagies, which prove troublesome from our not being able in the usual manner to apply ligatures upon the divided arteries, owing to their running in a groove of bone; as is the case with a small branch of the internal carotid which passes out on each side immediately above the eye-brows. In all such cases, we should, in the first place, employ sponge, agaric, or any mild astringent, along with gentle compression; and when this fails, we may endeavour to pull out the bleeding vessel with a tenaculum, and in this manner may tie it with a ligature. I once succeeded in this way with perfect ease, when every other method had been tried in vain.

It may sometimes however happen, that even this will fail. In such cases, when the hemorrhagy continues so profuse as to endanger the patient, it may be proper even to remove that portion of
the

the skull in which the vessel is incased ; or, in the hands of a nice operator, the intention may be answered by taking away the outer table of the skull only : For, in some cases, these arteries run for a considerable space between the two lamina of the bone ; and in such instances our object may be accomplished by the removal of one of them ; and thus the risk of exposing the brain will be avoided.

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SECTION X.

Of Wounds in the Trachea and Oesophagus.

IT is necessary in some cases to make openings into the trachea and oesophagus, for allowing food and air to pass to the stomach and lungs when these passages are obstructed. We must refer, however, for the method of effecting this, to Chapters XXVII. and XXVIII. where these operations will be particularly described: At present we are only to consider the method of treating wounds in the trachea and oesophagus, inflicted in some cases by accident, but more frequently by design; as often happens where suicide is attempted.

The trachea is seldom divided longitudinally. Transverse wounds running between two of the cartilages of which

it

it is composed, are more frequent. In some cases these wounds are superficial, and only penetrate the anterior part of the tube; in others, they run so deep as to divide it entirely.

In all longitudinal wounds of the trachea, a cure may be obtained by the use of adhesive plasters alone: The lips of the wound are easily brought together; and as the retraction is never considerable, a proper application of adhesive plaster proves sufficient for retaining them. In such cases, therefore, this should be preferred to futures; and bandages are here inadmissible, as they cannot be applied with such tightness as to have any effect upon the wound, without compressing the trachea so much as to impede respiration.

Even in slight transverse wounds of this part, a cure may often be effected with adhesive plasters; and this especially, if they are assisted by a proper posture of the head, which in all wounds of this kind should be kept as much as possible

bent down upon the breast. Indeed, if this does not meet with proper attention, it will often be impossible to make the divided parts reunite, either with plasters or any other means : It ought not therefore to be left in the power of the patient. The head should be fixed with a bandage ; and the most simple, as well as the most effectual, method of doing it, is by putting a common night-cap upon the head, and a piece of broad tape or ribbon being sewed on each side of it above the ear, it may now be pulled down and fixed as low as is necessary, by tying the tapes to a circular roller put round the chest. In this situation the head should be kept for several days, till there is reason to think that the parts are firmly united.

But in transverse wounds of the trachea, which penetrate deep, we should not trust to adhesive plasters ; the interrupted suture made with broad ligatures will answer better. I am doubtful, however, if the ligatures should ever be passed into the

the trachea, as some have advised ; for the irritation and cough which they excite is very apt to do mischief, by tearing asunder the very parts they are meant to unite ; at least this has been the case in different instances where I have known this method practised. A troublesome cough was induced in all of them ; the stitches were torn out ; and much perplexity was thus given both to the patient and surgeon.

Instead of passing the ligatures round any of the cartilages of the trachea, and thus carrying them into the cavity of the tube, I have in different instances succeeded merely by external stitches done in the following manner : The surgeon being provided with a number of needles and ligatures in proportion to the extent of the wound, and the patient being properly placed, one of the needles should be inserted at one side of the wound, and being passed slowly up for the space of an inch between the trachea and skin, so as
to

to include all the cellular substance and muscular fibres which lie between them; it is now to be pushed out along with one end of the ligature; and the other extremity of the thread being likewise armed with a needle, must in like manner be passed through the teguments of the opposite side. None of the ligatures should be tied till they are all introduced; when this is done, and the divided edges of the cut properly supported by an assistant, the ligatures should be secured with running knots, so as to admit of their being easily untied, 'if this should be found necessary; adhesive plasters should be applied over the whole; and the head should be firmly secured in the manner mentioned above.

In passing the ligatures, care should be taken to run the needles as close to the cartilages of the trachea as possible, so as to include whatever may afford them any support: For which purpose flat needles should be employed with a slight degree
of

of curvature, as is represented in Plate V. fig. 5.

Whether or not this method will succeed where the trachea is completely divided, I cannot as yet determine, having had no opportunity in such a case of putting it in practice: But as it has succeeded where all the anterior part of the tube was divided, there is reason to imagine that it would not often fail. At any rate, it should always be proposed in the first place; for even when it does not succeed, we are not prevented from employing other means of relief. In such instances we are reduced to the necessity of passing the ligatures round one or more of the cartilages of the trachea, which, with a curved needle, may be easily done: Care should be taken, however, to enter both ends of the ligature from the inside of the trachea, when by pushing the point of the needle outward, all risk of doing mischief will be avoided.

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To give the practice as much chance as possible of succeeding, there should be as many ligatures introduced as may seem fully necessary for retaining the divided ends of the trachea in contact: In general, three stitches will be sufficient; one in the middle of the prominent part of the trachea, and another on each side towards the ends of the cartilaginous rings.

Wounds of the œsophagus are to be managed nearly in the same manner with wounds of the trachea: But they are more dangerous, on account of the difficulty of reaching the œsophagus from its deep situation; from the under part of it, when entirely separated from the rest, being apt to fall altogether within the sternum; and from the difficulty of supporting the patient with nourishment.

These wounds are likewise to be considered as dangerous, from their vicinity to large arteries and nerves. If the recurrent nerves are divided, the voice may
be

be nearly destroyed; and if any of the large branches of the carotid arteries are wounded, the patient may die from loss of blood, before assistance is procured.

In wounds of the trachea and œsophagus, our first object should be to put a stop to the hemorrhagy, not only in order to prevent the loss of blood, but to obviate the cough and sickness, which greatly aggravate the injury, and which are often the consequence of blood finding access to the stomach and lungs. Every vessel therefore that pours out blood, whether artery or vein, should be immediately tied with a ligature. When the wound is not extensive, but confined nearly to the boundaries of the trachea and œsophagus, the artery which goes to the thyroid gland will probably be the largest that is cut; for it is commonly in this situation, immediately below the thyroid cartilage, that attempts are made upon the throat. But in wounds of greater extent, the jugular veins, and even the carotid arteries, are sometimes divided.

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In almost every instance, wounds of these arteries prove quickly fatal; but when one of the carotids is only partially hurt, it may be possible to save the patient by securing the bleeding vessel with a ligature both above and below the cut: At least it should always be attempted; and I think it probable, when one artery only is cut, that the attempt would succeed. There is no reason to doubt of its proving successful in wounds of the jugular veins: But where these veins are only wounded, without being cut entirely across, we may with propriety endeavour to effect a cure by compression. When slight compression only is necessary, it may be accomplished by a circular roller put round the neck; but when much pressure is required, as this cannot be employed without impeding respiration, we are under the necessity of using a machine for protecting the trachea. In Plate III. fig. 1. an instrument is delineated, which answers this purpose very effectually.

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As soon as the hemorrhagy is stopped, we should proceed to unite those parts of the œsophagus which have been divided ; and in doing it, if the wound is not very extensive, it will be of much importance, both to the operator and patient, to have it enlarged in every direction that may be necessary for bringing the injured parts easily and completely into view, by which the ligatures will be introduced with much more exactness than can otherwise be done. In passing the threads, the needles should be entered from within, and pushed outwards, in the manner directed above for wounds of the trachea: And in both cases, the ends of the ligatures should be left of a sufficient length to admit of their hanging out of the external wound in the teguments. The interrupted suture appears to be best adapted for this operation.

In longitudinal wounds of the œsophagus there is reason to imagine, from the result of different cases, that cures might frequently be accomplished without the
assistance

assistance of ligatures. But in tranverse wounds of this part, it is the safest practice to employ one or more stiches, according to the extent of the injury, by which the food will be prevented from escaping during the cure, and by which a reunion of the divided parts will be more readily accomplished.

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SECTION XI.

Of Wounds in the Thorax.§ I. *General Remarks on Wounds in the Thorax.*

TO the consideration of wounds of the Thorax, it will be proper to premise a short account of the boundaries of this cavity, and of the viscera which it contains.

The thorax is an extensive cavity, of an irregular oval figure, bounded anteriorly by the sternum, laterally by the ribs, behind by the vertebræ of the back, above by the clavicles, and below by the diaphragm, a firm muscular expansion, which serves as a partition between it and the cavity of the abdomen.

The diaphragm does not pass in a direct line from one side of the chest to the

other; on the contrary, it falls considerably lower in some parts than in others, by which the extent of this cavity is in different parts very unequal. On cutting the thorax directly across about the middle of the sternum, and looking down upon the diaphragm, we find it round and prominent in the middle, with its edges stretching down to its several attachments. In its highest and most anterior point, it is fixed to the cartilago ensiformis; from whence it descends obliquely, and is attached as it goes along to the seventh, eighth, and all the inferior ribs; while, behind, it is fixed to the upper vertebræ of the loins. From this it is evident that the back part of the thorax is much more deep and capacious than the anterior part of it: A point with which practitioners should be very exactly acquainted, otherwise their ideas of wounds in these parts will often be erroneous. Thus, were we unacquainted with this circumstance, we would be apt to imagine that no injury would be done to the lungs by wounds
running

running directly across the body, after entering any part of the cavity of the abdomen: Whereas it is certain, that no instrument can pass in this direction even at the distance of several inches beneath the upper part of the abdomen, without penetrating the cavity of the thorax; and, for the same reason, all wounds which pass directly across the body from the inferior and back part of the thorax, must necessarily pass through the abdomen.

The whole cavity of the thorax is lined by a firm membrane termed the Pleura, which adheres every where to the sternum, to the ribs, intercostal muscles, and diaphragm. Each side of the chest has a distinct pleura; which uniting together near the middle of the breast, and running transversely from the sternum to the vertebræ, form two cavities which have no communication with each other. This membranous partition is termed the Mediastinum. It adheres firmly, as one membrane, to the sternum through its whole length; but the two pleuræ recede from

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each

each other near to the vertebræ, to admit of a passage for the aorta and œsophagus. The heart, inclosed in the pericardium, occupies a considerable part of the left cavity of the thorax: The rest of this division, with all the right side of the chest, is chiefly filled with the lungs. The only other parts lodged in the thorax are, the aorta, œsophagus, the thoracic duct, thymus, and large blood-vessels about the heart. In a state of health, the lungs do not adhere to the pleura; but it often happens, that very firm and extensive adhesions are produced by inflammation of these parts.

The thorax is exposed to all the variety of wounds; but the distinction chiefly requiring attention arises from their degree of depth. Superficial wounds, not running deeper than the common teguments, when rightly treated, are seldom productive of any important consequences; while even the slightest injury which penetrates the chest will, in some instances, be attended with the most alarming symptoms;
and

and these again are always of a more dangerous nature when any of the viscera lodged in the thorax are wounded.

Wounds of the thorax may therefore be divided into three kinds: Those which affect the common teguments only; such as merely penetrate the cavity, without doing any further injury; and those by which some of the viscera are likewise hurt.

Our first object in these wounds is, to discover whether they have penetrated the chest or not; which in general we may do by attending to the following circumstances: By the patient being put into that situation in which the wound was inflicted, and in this state making a particular examination with the fingers, or probe, of the direction and depth of the wound; by the form of the instrument, and the length to which it seemed to be pushed; by any mild liquid which may be injected returning immediately or lodging in the wound; by air being discharged in considerable quantities during
C 3 respiration;

respiration; by an emphysematous swelling appearing over the contiguous teguments; by the quantity of blood discharged from the wound being considerable or otherwise; by the appearance of the blood; by blood being discharged from the mouth; and by the state of the pulse and respiration.

Each of these circumstances we shall consider in the order they are mentioned.

It is obviously a matter of importance to pay attention to the posture of the patient during the examination of every wound; but in none more than in wounds of the thorax, where, from the variety of muscles which may be injured, and from the mobility of the ribs, wounds may in one posture appear to be superficial, which in others are found to penetrate to a great depth; for if any part of a rib, of a muscle, or even of the cellular substance, is forced by the posture of the patient into the course of a wound, neither the finger, probe, nor injections, will pass with
that

that ease which the free examination of such injuries requires. In all such cases, therefore, before we proceed to examine the direction and depth of the wound, the patient should be placed as nearly as possible in the posture he was in at the time of receiving it.

In some cases, the opening is so large, that we distinguish with the eye whether a wound has penetrated to the depth of the cavity or not; or we introduce one of the fingers, which is better than any probe, when it can be passed forward without lacerating the contiguous parts; but when the opening is too small to admit of this, we are under the necessity of using a probe; and the best substance for this purpose is a common bougie. When we mean by probing a sore to discover whether any extraneous body is lodged or not, or whether the bones beneath are carious or in a sound state, a metallic probe is to be preferred: But for examining the depth and direction of a wound, nothing answers so well as a firm and tolerably thick bougie;

gie ; which neither gives so much pain to the patient, nor is it so apt to be pushed beyond the depth of the wound into the contiguous soft parts, as the common small probe. This indeed will not often happen with practitioners of experience, as they will not only use this instrument in every case with caution, but will be sensible that it is often unnecessarily employed: For even in wounds of the thorax, we should not search for their depth with too much anxiety ; as, by doing so, more harm may be done than could be compensated by any advantage to be derived from the discovery. It is highly proper to examine, in a cautious way, into the direction and depth of such wounds ; but the younger part of the profession should know, that much harm has been done by examinations of this kind being carried too far: And they should likewise know, that it is perhaps of more importance to be acquainted with the direction of an external punctured wound, which does not run deeper than the cellular substance above

bove the ribs, or perhaps to the intercostal muscles, than to know, by means of the probe, whether a wound reaches to the cavity of the chest or not: For even where we find, in the most evident manner, that a wound goes to the depth of this cavity, if no bad symptoms occur, little or no advantage is obtained from the discovery; and where such symptoms take place as are known to proceed from a penetrating wound, and of which we shall afterwards treat, we are thus rendered equally certain of the nature of the case as if a probe had passed easily into the thorax.

Some advantage may be obtained in enquiries of this kind, from our attending to the size and figure of the instrument; the direction it seemed to take; and the depth to which it was pushed: These are points of which we cannot always receive exact information; but it is sometimes otherwise, particularly in duels, where a surgeon is frequently attending, and where the by-standers are often so much interested,

ed, as to be able to give a distinct account of this and every other point of importance.

When we are made certain, by either of these modes of enquiry, of the depth of a wound, it would be unnecessary as well as improper to carry our researches farther: But when the point remains in doubt, it may be sometimes determined by throwing in injections of any mild liquid. If the liquor returns immediately, there will be reason to conclude that the wound is superficial, or at least that it does not pass into the thorax; but when it lodges either altogether, or in considerable part, without raising any outward tumefaction, there will be no cause to doubt of its having reached the cavity. In throwing in liquids for this purpose, it should never be done with much force, as in this manner parts might be torn asunder which were not previously hurt; and the mildest liquor only should be used, as it might prove dangerous to apply any thing possessed of stimulating powers to
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the surface of an irritable part. Honey and water are commonly used for this purpose; but warm water alone is less irritating, and should therefore be preferred.

When air is discharged by the wound during inspiration, there is cause to suspect that the lungs are wounded. But although this is usually considered as one of the most certain proofs of a wound having penetrated the chest, it is proper to remark, that it is far from being decisive. Wherever the lungs adhere to the pleura, a wound may penetrate to a considerable depth; nay, it may pass entirely across the body, without entering what is properly termed the Cavity of the chest; and we know that air is frequently discharged at wounds in the thorax where there is no reason to suspect that the lungs are hurt; for when no adhesions take place between the pleura and lungs, the external air, if it gets access by a penetrating wound, will pass between them, and will necessarily be forced out at every inspiration; a
circumstance

circumstance which invalidates the certainty of this test. In judging, therefore, of the weight which is due to it, we should, in the first place, cause the patient make several full inspirations, in order to discharge any of the external air that may be collected; and at the end of each, the contiguous skin should be so drawn over the wound, as to prevent any more from finding access. In this manner nearly the whole will soon be evacuated; when, if we still find that air rushes forcibly out during inspiration, we may with certainty conclude that the lungs are injured.

Emphysematous swellings sometimes appear as the consequence of wounds of the thorax, by the air from the lungs finding access to the surrounding cellular membrane. This, however, will seldom happen in extensive wounds; as in these the air from the lungs will readily be discharged outwardly: But it is by no means unfrequent in punctured wounds, especially in such as have an oblique direction. It is obvious, however, that although this
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is a certain proof of the lungs being injured, that it may sometimes happen without any communication with the cavity of the chest, for the reason mentioned in the last paragraph.

When the quantity of blood discharged from these wounds is considerable, we may with much certainty conclude, that they have not merely passed into the chest, but that some of the contained viscera are wounded ; for, excepting the intercostal arteries, which run upon the inferior border of each rib, all the other blood-vessels of the external parts are here very small ; and as we can by compression easily put a stop to hemorrhagies from the intercostal vessels, we may in almost every instance discover immediately whether the blood is evacuated from the chest or not.

Even the appearance of blood discharged from these wounds may lead to a knowledge of their depth. It is a known fact, that blood coming directly from a wound in the lungs, has a more red, and particularly

particularly a more frothy appearance, than blood from any other part, owing probably to its being mixed with the air in the bronchiæ; so that when blood assumes this appearance, we have much cause to conclude that the lungs are injured.

When blood is spit up by the mouth, immediately after a wound in the thorax, there will be no reason to doubt of the lungs being hurt. For although we ought not to conclude from the absence of this symptom, that the lungs have not suffered, as they are often wounded without any blood being discharged by the mouth; yet we may be convinced, that some injury is done to them when blood is actually discharged from them.

In our enquiries into the nature of such wounds, the state of the pulse and respiration require particular attention. In wounds which do not penetrate deeper than the common teguments, neither the pulse nor breathing are at first affected, nor do they produce any other consequences

sequences for the first two or three days, than wounds in other parts of the body : But wounds which go to the depth of the thoracic cavity, and more especially such as affect the lungs or other parts contained in it, may often be distinguished by the immediate effect which they produce both upon the pulse and breathing. When the lungs are injured in a part where they adhere to the pleura, the wound may pass to a considerable depth without any extravasation taking place into the cavity of the chest ; in which case no immediate effect may ensue : But when either blood or air finds access to this cavity, the lungs are immediately compressed, by which the breathing becomes difficult, and the pulse feeble, oppressed, and intermitting ; so that when these symptoms take place, we may at once give a decided opinion of the nature of the case.

By due attention to these circumstances, we may, in almost every instance, determine with much certainty whether

a wound has reached the cavity of the thorax or not: And this being fixed, we are next to proceed to the method of treatment. We shall first attend to those wounds which do not go deeper than the common teguments or muscles, and shall afterwards treat of such as penetrate deeper.

§ 2. *Of Wounds in the external Teguments of the Thorax.*

WOUNDS of the thorax not going deeper than the skin and cellular substance, do not give any cause for anxiety, as they heal with the same ease, and are to be treated in the same manner with similar wounds in other parts of the body: But when they reach the muscular substance between the ribs, and especially when they run among these parts for a considerable way like sinuses, there is always reason to fear that at last they may
penetrate

penetrate the cavity of the thorax; for when sores in this situation are not in every respect properly treated, and if any matter that forms in them is not regularly discharged, it is apt to pass deeper and deeper, till at last it penetrates the pleura itself. In all such cases, therefore, it should be our first object to give a free vent to the matter. In open incised wounds, all that is necessary is, by means of easy dressings, to preserve their lips or edges from adhering till they fill with granulations from the bottom: But punctured wounds should either be laid open through their whole extent, or a seton passed from one end of the sinus to the other. When not very extensive, the shortest and easiest method is to lay them freely open with a scalpel and director, and then to heal them from the bottom like incised wounds from any other cause: But when a puncture runs to any considerable length, the method of cure by a seton answers better. By passing a seton along the course of the sinus,

we prevent it from healing outwardly till the whole is equally filled up; and this being accomplished, if the cord is gradually diminished, and at last removed, a moderate degree of pressure continued upon the parts for a few days longer, will seldom fail to effect a cure. Some, indeed, advise us to attempt the cure of all such sores with pressure alone. But although this practice will often prove successful in other parts of the body, particularly in the extremities, where pressure can be applied with exactness along the whole course of a sinus, and continued for a sufficient length of time without risk; yet in wounds of the thorax, the same advantages cannot result from it: For here the constant motion of the ribs prevents us from applying a continued equal pressure without impeding respiration in a very disagreeable manner. When a cure is to be attempted by pressure alone, it must be done with a roller passed firmly round the thorax, supported by what is termed a scapulary, put over the shoulders:

ders: But when a seton has been previously used, any pressure that is necessary may be applied with slips of adhesive plaster laid along the course of the wound, and fixed upon the contiguous skin.

This method of cure, by laying the sinuses open, or by the insertion of a seton, to those not much versant in this branch of practice, may appear to be unnecessarily severe; for by many of the older writers we are told, that our object may be accomplished in a more easy manner, namely, by keeping the external openings of the sores pervious by the use of tents till they are firmly healed from the bottom. In wounds which penetrate to the cavity of the thorax, tents, especially those that are hollow, prove often useful; and as they may be used with safety, they should not be so generally condemned as some modern practitioners have affected to do. But in punctured wounds which do not go to this depth, as our great object is to avoid every risk of the matter finding access to the thorax,

whatever can tend to impede the discharge of it, should by all means be avoided. So that in such cases tents should never be used: They would frequently do much mischief in the manner we have mentioned; in many cases they would fail entirely; and if they should ever succeed, the cure would prove much more tedious, and often more painful, than the mode of treatment I have advised.

In every wound of importance, it is proper to pay attention to the regimen of the patient; a point upon which the event of the case very often depends: For we frequently observe injuries of this kind treated in every other respect with propriety; and yet the practitioner fails, from the patient being allowed more freedom in food, drink, and exercise, than is consistent with safety. In wounds of the thorax, attention to these points is still more necessary than in similar affections of other parts: For as the parts contained in the thorax are highly necessary to life, and as they are very liable to inflammation,

tion, even from injuries that do not penetrate deep, every precaution should be employed by which it can be prevented. Hence, for several days at least, or even till there appears to be no farther chance of the parts becoming inflamed, the patient should be kept upon a low, cooling diet; animal food and strong liquors of every kind should be avoided; the bowels should be kept open with mild laxatives; and when the pulse requires it, a due proportion of blood should be evacuated. Rest of body and perfect quietness is of much importance in these wounds; for they are affected by the least degree of motion; even coughing, laughing, or much speaking, is apt to do harm, and should therefore be as much as possible avoided.

§ 3. *Of Wounds which penetrate the Cavity of the Thorax.*

WOUNDS penetrating the thorax, are always to be considered as hazardous,

and therefore merit much attention : Even such as merely penetrate the chest are often attended with important consequences, for the mere contiguity of the lungs and other viscera adds much to the danger. At present, we are to treat of simple penetrating wounds, not connected with any injury done to the contained parts.

It is now known, that in a state of health the lungs fill the spaces allotted for them in the two sides of the thorax so completely, that they are every where in contact with the pleura, both in the state of inspiration and expiration: And it is also known, that great distress in breathing is induced, by air, blood, or any extraneous matter being admitted between them. Now, in penetrating wounds of the thorax, excepting where the lungs morbidly adhere to the pleura, and which we do not here suppose to be the case, it is scarcely possible to prevent both air and blood from being admitted : The external air rushing
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ing in at the wound soon spreads over the whole corresponding cavity ; and when the intercostal artery or any other blood-vessel is divided, if the external opening be not sufficiently large, any blood that is evacuated is apt to fall down between the pleura and lungs to the very bottom of the chest ; by which, difficulty of brèathing immediately takes place, along with all the other symptoms which usually attend a compressed state of the lungs.

In Chapter XXVI. we shall find it necessary to treat fully, not only of the symptoms induced by the collection of fluids in the chest, but of the method of relieving them by the operation of the paracentesis : To avoid repetitions, I shall now refer to what will then be said upon this part of our subject, and at present shall offer a few observations upon the means of preventing such collections as may require the assistance of that operation.

In wounds which do not penetrate to the depth of any of the viscera, but which merely pierce the pleura, almost the only artery which can be cut, that can afford any quantity of blood, is the intercostal; and being of a considerable size, no time should be lost in securing it whenever it is found to be wounded. As it runs in a groove in the inferior edge of the rib, it is difficult to put a ligature round it; but with due attention this may always be accomplished.

In free incised wounds, the bleeding orifice will be brought clearly into view; but in small punctured wounds, as the artery cannot be distinctly seen, there is a necessity for laying the parts sufficiently open with the scalpel. When the artery is thus laid bare, various means have been proposed for securing it. For the reason just mentioned, a crooked needle cannot be passed round it. We are therefore told by some, that the only method of doing it is to pass a firm broad ligature altogether round the rib, and by
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means of it to tie a doffil of lint upon the orifice of the artery ; while others condemn this practice, from the injury which it must necessarily do to the pleura ; for this membrane cannot in this operation be separated from the rib, so as not to be included in the ligature ; so that instruments have therefore been proposed for obviating this inconveniency. The intention of all of these is to compress the intercostal artery, without hurting the pleura ; but as none of them I have met with answer this purpose, I do not think it necessary to delineate them : Those who wish to see them may look into the second volume of Memoirs of the Royal Academy of Surgery of Paris.

It is luckily, however, in our power to secure this artery in a much more simple manner. By dilating the wound sufficiently, we may with a tenaculum, somewhat more bent at the point than usual, draw the bleeding vessel out of its groove, so as to tie it in the ordinary way ; at least in thin people this may be easily

easily done: And where it is found, either from the ribs being deeply covered with fat, or from any other cause, that it cannot be secured in this manner, it may always be done in the manner I have mentioned, by passing a firm broad ligature round the rib, and thus tying a small doffel of lint upon the bleeding artery. In this way a portion of the pleura will no doubt be included in the ligature; but it does not appear from experience, that this proves very detrimental, and with sufficient caution we may always with certainty avoid the lungs. When the lungs do not adhere to the pleura, they collapse in some degree immediately on the external air finding access through the wound to the cavity of the chest. And even when they adhere, we may easily separate as much of them with the point of the finger as will admit of the passage of the ligature.

When a practitioner is called immediately, he may in this manner prevent
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any great quantity of blood from being emptied into the thorax; and as soon as the hemorrhagy is stopped, he should endeavour to expel all the air that has found access by the wound to the surface of the lungs; for till this is accomplished, the breathing will remain oppressed, nor will the patient be able to bear the application of the necessary dressings. In Chapter XXVI. different methods of expelling air from the surface of the lungs will be mentioned; but the simplest and easiest is this: While the wound yet remains open, let the patient in a slow gradual manner, make a full inspiration, by which a considerable part of the collected air will be discharged. This being done, the skin must be instantly drawn over the sore, so as to cover it completely during expiration; and if the wound is moderately opened during inspiration, the whole quantity will in this manner be soon expelled. After which the lips of the wound should be drawn exactly together, and in this situation

situation should be secured with slips of adhesive plaster, care being taken to support the whole by a proper application of the napkin and scapulary bandage.

In this manner, wounds of the thorax will frequently heal, which, if left to themselves, or if treated in the usual way by allowing them to remain open, might be productive of much distress: But in some cases, either from a considerable quantity of blood having been thrown out from the intercostal artery before the ligature was applied; from the oozing of blood from the smaller ramifications of the intercostal arteries; or perhaps from a subsequent formation of pus; oppressed breathing will supervene, notwithstanding all that can be done to prevent it.

When this takes place from the formation of matter as the consequence of a wound in the chest, an opening should be made to discharge it in the manner we shall advise in the chapter on Epyyema; and

and in this case the opening should be made in the most depending part of the thorax. But when it occurs immediately after a wound, and while the blood yet remains fluid, we may often be able to discharge it at the wound itself: And when this can be done, it should always be preferred; for we are not to imagine that the thorax can in any part be laid open but with some risk of harm being done by it. When symptoms, however, of oppressed breathing occur from a wound in the upper part of the thorax, as the effused blood cannot be discharged by it, we are under the necessity of making a perforation in the under part of the chest as soon as the symptoms become severe: It is proper, however, to observe, that this operation should never be advised while the symptoms are moderate: For we have daily instances of small quantities, not only of blood but other fluids, being absorbed; and as the risk attending a perforation in this place is probably greater than would occur from
small

small quantities of blood being allowed to remain, it should not be attempted as long as the breathing continues tolerably free.

§ 4. *Of Wounds of the Lungs.*

WE have already, in the course of this section, enumerated the symptoms which indicate a wound in the thorax to have penetrated the lungs: And although the danger in this case is greater than in wounds which merely penetrate the pleura, yet the method of cure suited to the one is so nearly the same with what we have advised for the other, that it is scarcely necessary to enlarge farther upon it.

It is proper, however, to observe, that as the risk attending wounds in the lungs is considerable, the caution with which they are treated should be proportionally great. Instances indeed have occurred of their healing with ease and safety; but
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these are so rare, that we not hesitate to say, that every injury done to them is to be considered as hazardous.

The danger which attends them, originates, in the first place, from the hemorrhagy being apt to proceed farther than the strength of the patient will bear; and, afterwards, from abscesses forming in the lungs, which frequently terminate in phthisis.

The hemorrhagy is most readily checked by plentiful venesection; by the patient being kept in a cool apartment and at perfect rest; by the use of cooling laxatives; and by a low regimen. Besides rest of body, it is of much importance to keep the lungs as free from action as possible. Hence coughing, laughing, and even much speaking or deep inspirations, should be rigidly guarded against. Attention to this point is necessary in every wound of the thorax, but more particularly in those affecting the lungs; for when the lungs are wounded, they can never be fully distended with air without stretching

stretching every blood-vessel that has been hurt.

Notwithstanding, however, of our utmost attention, the patient will sometimes sink under the loss of blood; in other cases, blood will be collected in considerable quantities between the pleura and lungs, so as to impede respiration; or abscesses will form, as we have observed above, in the substance of the lungs.

We have already considered the method of treatment in collections of blood seated between the pleura and lungs: At present I shall offer a few remarks on the management of abscesses in the lungs.

Matter collected in the substance of the lungs from a wound, may be discharged in three different ways. It may be spit up by the mouth; it may be discharged by the abscess bursting into the wound itself; or it may be emptied into one or other of the cavities of the chest between the lungs and pleura.

When an abscess in this situation opens into the bronchiæ, there may be some risk

at first of immediate suffocation; but when this danger is over, by a considerable quantity of the matter being discharged, if there is no constitutional or hereditary tendency to phthisis, a cure will often be accomplished by the means usually advised in such cases, namely, by a diet that is light and of easy digestion, and at the same time sufficiently nourishing; and by daily moderate exercise, by which any matter collected in the abscess is brought up with more ease than by any other means. A sea-voyage too proves useful in this view, at the same time that it tends to brace and invigorate the system; but when it cannot be obtained, we advise riding on horseback.—When pus collected in the lungs is discharged in this manner, the business of a surgeon becomes nearly unnecessary; but when the abscess either empties itself into the chest, or points outwardly at the wound, we have it often in our power to save the patient by an operation, when otherwise he would inevitably die.

When an abscess bursts into the chest, the matter should be discharged in the manner we shall advise in Chapter XXVII. But when the wound by which the collection is produced remains open, so as to admit of the matter to point towards it, as soon as this is discovered, either by a small oozing of pus taking place, or by the introduction of the finger between two of the ribs, we should at once determine on treating it on the same principles, and in the same manner with abscesses in any other part of the body, namely, by making an opening into it of a sufficient size for discharging the matter. The delicate nature of the part in which the matter is seated may be a means of deterring some from adopting this practice; but it does not require much argument to show, that a patient in such circumstances runs much more risk of suffering by the matter being allowed to remain, than by making an opening into the abscess. By the last measure he avoids the hazard of immediate death, which commonly happens from
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large abscesses bursting into the bronchiæ; at the same time that it prevents the matter from passing into the cavity of the chest, between the pleura and surface of the lungs; and thus obviates the necessity of a second operation. Nay, in cases of this perilous nature, I would even go farther: When from a previous discharge of matter we are certain that an abscess has formed in the lungs as a consequence of a wound; when a stoppage of this discharge takes place, and is succeeded by all the usual symptoms of a fresh collection of matter, such as an increased difficulty in breathing; difficulty in lying on the sound side; frequent shivering fits; and a hectic pulse; as in such a situation there will be no reason to doubt of matter being collected, and as the patient must remain in the utmost hazard till it is discharged, I should think it advisable to enlarge the external wound not only of the common teguments, but of the intercostal muscles, and to extend the opening for the space of two or three inches; by which more

freedom will be given for searching with the finger for the seat of the abscess: And whenever this is discovered, I would not hesitate, at whatever depth it may be, to open it, by running a bistoury along the finger, and pushing it slowly into it. In the course of my own experience, I have had two cases of this kind; in which, by this decisive practice, I had the satisfaction of saving two lives, which otherwise there was much cause to think would have been lost. This was the opinion of other practitioners who attended along with me; and I was so much convinced, in both cases, of matter being collected internally which produced the danger, and of nothing being able to save the patient but the discharge of it, that after warning the patient of his situation, and receiving his approbation, I was resolved to carry the opening into the substance of the lungs to the full length of my finger, rather than leave him to his fate. In both instances I found it necessary to go to nearly the length of my finger; and at this depth I
was

was so fortunate as to reach an abscess containing at least half an English pint of matter. The patients in both cases were instantly relieved; and although they were previously supposed to be in the utmost danger, with scarcely a possibility of recovering, they are now, after several years have elapsed, in perfect health.

In making an opening into such a deep-seated abscess, the incision should be carried forward in the most gradual manner, so that no more of the lungs may be injured than is altogether necessary: But when once the matter appears, the abscess should be laid as freely open as may be proper for an entire discharge of it.

In the subsequent treatment of these abscesses, our chief object is to preserve a proper aperture for the discharge of the matter: For if this is neglected before the abscess fills from the bottom, a new collection will take place, and the patient will soon be reduced to the same state of uncertainty and danger as before. In

wounds which do not penetrate deeper than the teguments or muscles of the thorax, I have observed above, that no kind of tents should be employed; and have rather advised them to be laid open through their whole length, or to be treated by means of a seton, as is done with sores of a similar nature in other parts of the body. But as this is impracticable in penetrating wounds, we are in these under the necessity of inserting a tube into the opening, and of continuing it of a sufficient size and length during the whole course of the cure: It ought indeed to be continued as long as any matter is discharged. Tubes of lead being more soft and pliable than those of any other metal, are therefore to be preferred: They should be broad, and of a round oval form, rather than altogether round; and they should always be furnished with a brim considerably broader than the opening of the sore, to obviate every possibility of their falling into the chest. By inattention to this point, a tube of four inches in length,

length, and of a corresponding thickness, passed altogether into the cavity of the breast of a gentleman who had used it for some time; and notwithstanding various attempts to extract it, it still remains lodged. It was fixed in the usual way, by a thread, to a bandage going round the body; but the thread breaking, it immediately slipped in. This happened upwards of eight years ago. It does not indeed excite much uneasiness, but it had an evident effect in increasing the quantity of matter discharged from the wound.

I have met with some cases of wounds in the chest, where solid tents have answered the purpose equally well with tubes; and they may always be used when the parts do not contract so closely round them as to prevent the matter from being freely discharged: But whenever they stop up the passage so much as to produce any collection of matter between one dressing and another, they should undoubtedly be laid aside, and tubes used instead of them.

As tents had been used for a great length of time in almost every wound which penetrated beyond the common teguments, Belloste, and some other surgeons of observation, ventured at last to lay them in a great measure aside. We have already had occasion to observe, that this, to a certain length, was highly proper; but I cannot agree with some modern practitioners who assert, that tents and tubes do mischief in every case, and that they should never be employed. Where the discharge from a wound or abscess continues free and uninterrupted, till a cure is effected by the parts filling up from the bottom, I would never advise either a tent or a tube to be used. But when we find that the external opening of a wound heals up long before the parts beneath are united, and that matter collects and bursts out again, as has happened in different instances with me in penetrating wounds of the chest, it must be from want of experience only, or from a desire of appearing singular, that we refuse to employ the only

ly certain method with which we are acquainted of obviating this inconvenience, and of saving the patient a great deal of pain, trouble and danger.

In extensive wounds of the thorax, where any part of the sternum or ribs have been removed, a portion of the lungs sometimes protrudes, and does not readily recede. When a practitioner is called soon after the accident, the protruded part should be replaced as quickly as possible: But when a portion of the lungs has been long exposed to the air, and especially if much lacerated by the accident, we should, in the first place, see whether or not it is in a state of mortification; and all that is clearly and completely mortified should certainly be cut off before the sound parts are replaced. If the incision is confined to a part that is entirely gangrenous, there will be no risk of inducing either hemorrhage or any other symptom; and by removing parts which are in this state of disease, we prevent all the bad consequences

ces which might ensue from their being returned into the thorax.

§ 5. *Of Wounds of the Heart and large Vessels connected with it, and of Wounds of the Thoracic Duct.*

WOUNDS of the heart and large vessels connected with it, are at all times attended with much danger, nor is the greatest exertion of practitioners able to lessen it. Of such a hazardous nature indeed is injuries done to these parts, that in every instance we may pronounce that they will terminate fatally: For although we are told in books, of the heart itself having been wounded without any fatal consequences ensuing, there is much cause to suspect that these accounts are founded on fallacy or error. We can however conceive that the heart may be slightly injured without proving instantly fatal; but even the slightest wound in it must probably at last end in death: For the weakness in-
duced

duced in this manner upon a particular part, will render it very liable to yield to the strong and constant action of this organ. And when once an aneurism is formed in it, it will not fail to proceed quickly to a fatal termination.

The most probable method of preventing this, or at least of delaying it, is to lessen the action of the heart by copious blood-letting, by low diet, keeping the bowels moderately open, and avoiding bodily exertion: If in such circumstances it is possible to save a patient, these will be the most certain means of doing it; at any rate they will tend to prolong life, which in some cases is of so much moment that a few days or even a few hours may be of great importance.

The same observations are applicable to wounds in the large blood-vessels about the heart. They are to be considered as nearly of equal importance and danger, and to be treated in the same manner with wounds of the heart itself.

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There is still another organ of importance seated in the chest, which it is proper to mention here, viz. the thoracic duct; for although wounds in this canal will in most instances terminate in death, yet some advantage may, in particular circumstances, be derived from an attentive treatment of them. The thoracic duct, after leaving the receptaculum chyli, runs along the spine near to the aorta: And at the fifth or sixth vertebra of the back, it passes behind the aorta; and ascending to the left subclavian vein, it there discharges the chyle.

We judge of the thoracic duct being wounded, from the part at which the wounding instrument entered; from the discharge being either altogether white like chyle, or mixed with a considerable proportion of it; and from the patient becoming daily weaker than he ought to be from a wound of the same size in any other part, owing to the nutritive part of his food being carried off before any advantage is derived from it.

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With a view to prevent the diameter of this canal from being distended, which at the same time will tend to lessen the extent of the wound, the patient should be kept upon a very spare diet: Any food which he takes should not be at regular meals, but in small quantities frequently repeated; nor should he be permitted to take a large draught even of the weakest liquor. The bowels should be kept open; bodily exertion of every kind, and much speaking, or whatever tends to quicken respiration, should be avoided.

§ 6. *Of Wounds of the Diaphragm, Mediastinum, and Pericardium.*

WE judge of the Diaphragm being injured from the situation of the wound, and from the nature of the attending symptoms. As this muscle is in constant action during respiration, any injury done to it is necessarily attended with difficult breathing; with much pain during

during inspiration, not merely in the wound itself, but over all those parts of the chest to which the diaphragm is attached : The patient complains of pain over all the region of the stomach ; sickness, vomiting, and a troublesome degree of hickup take place ; pains in the shoulders sometimes occur, together with cough, delirium, a quick hard pulse, and other symptoms indicating inflammation and fever. Involuntary laughter is mentioned too as a symptom which injuries done to the diaphragm sometimes produce.

It is a common idea among practitioners, that wounds in the tendinous part of the diaphragm will in every case prove mortal, but that injuries done to the muscular parts of it do not so readily end in danger. There is much reason, however, to believe, that few wounds in the diaphragm are cured, whether in the tendinous or muscular parts of it ; nor is it evident from observation, that there is
more

more danger to be dreaded in the one case than in the other.

The symptoms of which we have most reason to be afraid, are those which proceed either from inflammation or irritation. With a view to prevent their accession, or to render them moderate when they have already appeared, blood-letting is to be chiefly depended on; together with gentle laxatives; large doses of opiates conjoined with musk; warm fomentations over the abdomen and thorax; quietness; and low diet.

By these means strictly pursued, a patient, in such circumstances, will have perhaps a better chance of doing well than by any other mode of treatment; but his recovery will by no means be certain. A strict antiphlogistic course, and large doses of opium, may probably obviate all the primary symptoms. But however small a wound in the diaphragm at first may be, the constant action and tension of this muscle will be apt to render it daily wider; and we know from
various

various histories of wounds in this part, that they seldom arrive at any magnitude, without admitting a portion of the stomach, of the colon, or some other part of the bowels, to pass from the abdomen into the thorax; by which the most violent pain is produced, together with some of the other symptoms which usually accompany a strangulated gut in cases of hernia: In such circumstances, a strangulated gut is much more dangerous than a hernia in its more ordinary form; for were we even able to remove the stricture, by making an incision into the cavity of the abdomen, as the passage into the thorax would still remain pervious, a return of the strangulation might very soon be expected.

Wounds in the mediastinum require no peculiarity of treatment. The circumstances which we have most cause to dread are, a lodgement of blood in one or both cavities of the chest, inflammation and suppuration with their usual consequences. But the observations we have already suggested,

gested, respecting the management of penetrating wounds in other parts of the chest, apply with equal propriety to these; so that we need not enter farther upon them at present.

Nor is it necessary to enter minutely on the consideration of wounds in the pericardium. As this bag contains a fluid which we suppose to be necessary for the easy motion of the heart, wounds in it may prove dangerous, from their tendency to prevent this fluid from being collected, as well as from their allowing it to spread through the cavity of the chest. It appears, however, from various observations, that wounds of the pericardium do not prove so hazardous as might at first be expected. They require the same general method of treatment with penetrating wounds of the thorax, which we have already considered.

All penetrating wounds of the chest, where the cure is not effected without the formation of matter, are apt to heal slow-

ly ; and in some cases, especially where abscesses have formed, a discharge of matter will continue for a great length of time, nay, in some cases, for life, notwithstanding all our endeavours to prevent it. As this is an inconveniency which patients are at all times anxious to remove, practitioners become necessarily much interested in the method of treating it : And, with a view to lessen the discharge, and even to heal the sore through its whole extent, astringent, and what are usually termed Vulnerary Injections, have been advised. But although I have known them frequently employed even by surgeons of reputation, and under the best and most cautious management, I have seldom seen them used without mischief accruing from them ; and I do not recollect a single instance of their producing any advantage. They are apt to irritate and inflame the lungs and contiguous parts ; and, instead of healing the sore or abscess, they often extend it farther, by
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tearing open the surrounding cellular substance.

For this reason, in penetrating wounds of the thorax, I do not hesitate to say, that injections should be laid entirely aside: And, however disagreeable a tedious discharge in this situation may prove, we should trust entirely to the means we have already advised for preventing the matter from lodging, by preserving as free and depending an opening as the nature of the case will admit.

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S E C T.

SECTION XII.

Of Wounds in the Abdomen.§ I. *Anatomical Description of the Abdomen and Parts contained in it.*

THE Abdomen, or lower belly, is the largest cavity of the body ; above, it is bounded by the diaphragm, which divides it from the thorax ; behind, it is supported by the vertebræ ; the upper part of both sides is covered by the inferior ribs ; the rest of it is all bounded by the abdominal muscles, excepting the most depending part of it, which terminates in the pelvis, from the contents of which it is only separated by the pæritoneum, a firm extensive membrane, which not only lines all the cavity,

ty, but affords a coat to all the viscera contained within it, being reflected in a very singular manner over them.

Anatomists divide this cavity into different regions. The middle and upper part of it, reaching from the xiphoid cartilage to within a small space of the umbilicus, is termed the Epigastrium; the spaces on each side of this are termed the hypochondria; the umbilical region extends from three inches above the navel, to the same distance beneath it; and all the parts between this and the pubes are termed the Hypogastric Region.

In the treatment of wounds in the abdomen, a minute acquaintance with the parts contained in it, and of their relative situation with respect to each other, and to the divisions or regions which we have just described, is a point of much importance. I shall here give a general description of the different viscera: A more particular knowledge of them is best acquired from dissection.

The parts contained in the abdomen are, the stomach and intestines ; the mesentery, omentum, liver, gall-bladder, and ducts ; pancreas, receptaculum chyli, spleen, kidneys, ureters, and upper part of the urinary bladder ; the aorta, vena-cava, and other large blood-vessels and nerves.

The stomach is a large membranous bag, placed in the upper part of the abdomen, immediately below the diaphragm : It stretches from the left hypochondrium, where the most capacious end of it is seated, obliquely across the epigastrium, and terminates before it reaches the right hypochondrium. The stomach has two openings ; one termed the Superior Orifice or Cardia, where the œsophagus terminates ; and the other the Pylorus, or Inferior Orifice, where the duodenum, the first of the small intestines begins. The cardia lies nearly on a line with the eleventh vertebra of the back, the large extremity of the stomach stretching considerably to the left ; and the pylorus lies somewhat lower, and
nearly

nearly two inches to the right of the vertebræ. It is proper, however, to observe, that the situation of the stomach and of these two openings is considerably affected by the quantity of food contained in it: So that a wound of the stomach, when full, may be directly opposite to an external wound in the teguments, and yet be several inches lower when empty.

The intestines commence, as we have just observed, at the pylorus, and are continued by many turnings or convolutions to the anus. This canal is in different parts of it distinguished by different names: The upper part of the tube is termed the Small Intestines; and the under part of it the Larger, from its diameter being larger in the one than in the other.

Even different parts of these great divisions of the intestines have received different names: The upper part of the small guts, extending about a foot in length from the pylorus, is termed the Duodenum: The next portion of the canal,

nal, from being commonly found empty, is termed the Jejunum. This, in an adult of full growth, is supposed in general to be about four feet and a half long: It is chiefly situated in the umbilical region. All the under part of the smaller intestines is distinguished by the name of Ileum, from its lying almost entirely within the cavity formed by the ossa ilea on opposite sides of the abdomen. After making several convolutions from one side to the other, it at last terminates in the cœcum, the first of the great intestines situated under the right kidney. From the cœcum, which is a round short sac with a small vermiform process, the colon originates: This is the largest of all the intestines; and as it occupies a considerable part of the abdominal cavity, the course of it merits particular attention. After leaving the right kidney, to which it is attached, it rises and passes under the liver, so as to be in contact with the gall-bladder, by which it is tinged of a deep yellow colour:

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From this it is continued in the form of an arch over the duodenum to the under part of the stomach; and passing into the left hypochondrium, it is there attached to the spleen and to the left kidney. This curvature is termed the Great Arch of the Colon. It now runs downward and backward; and again turning up, so as to form the figure of S, it terminates at the top of the os sacrum in the last of the great guts, termed the Rectum, from its running nearly in a straight line, till it terminates in the anus.

The intestines being very pliable, and of a great length, have necessarily much freedom of motion; but as this would render them liable to be entangled in each other, Nature has provided a thin membranous web, termed the Mesentery, which running along the course of the intestinal tube, serves to connect it with sufficient firmness to the vertebræ. The mesentery is evidently a production of the peritonæum: In its duplicature we meet with

a number of small glands, which often become so enlarged by disease as to be felt outwardly through the abdominal muscles ; and it serves as a support to the lacteals, blood-vessels, and nerves of the intestines. The omentum is a fine thin membrane, which comes into view on dividing the muscles of the abdomen and peritonæum. In general, it does not pass beneath the umbilicus : But in corpulent people, when much filled with fat, it sometimes descends to the very bottom of the belly ; and in cases of hernia, we frequently meet with it in the scrotum.

This membrane is evidently intended as a protection to the bowels ; to afford them an additional warmth ; and probably by the fat which it contains to lubricate their external surfaces, so as to admit of their playing with more freedom on each other.

The liver is a large glandular body, situated on the right side, immediately under the diaphragm : It is divided into two lobes ; one termed the Great, and the other

ther the Small Lobe. The great lobe lies in the right hypochondrium, which it fills almost entirely: It rests on the right kidney, and covers a portion of the great arch of the colon: A considerable part of the small lobe lies in the epigastrium; the rest of it passes over the stomach towards the left hypochondrium.

The liver is of a very irregular figure; its outer surface is arched, corresponding to the figure and size of the arch of the diaphragm. On the under side, it is in some parts flat, and in others concave, according to the figure of the parts with which it is in contact. It is of a considerable size and thickness on the right side; but towards the left its thickness decreases, so that at last it terminates in a thin edge.

The liver is kept in its situation by several ligaments attached to the diaphragm and contiguous parts.

The gall-bladder is a pyriform bag, seated in the concave side of the liver. The bile, after being secreted by the liver,

ver, is lodged in this bag, from whence it is conveyed into the intestines through the ductus choledochus, which enters the duodenum by piercing its coats in an oblique direction, about five inches below the pylorus.

The pancreas is a conglomerate gland, lying in a transverse direction between the liver and spleen, immediately under the stomach. The liquor secreted by this gland is carried into the duodenum by a small duct, which in some cases terminates in the gut itself, and in others near to the extremity of the ductus choledochus.

The receptaculum chyli is a small membranous bag, through which the chyle passes from the intestines to the left subclavian vein by means of the thoracic duct. This bag, or sac, lies upon the first vertebra of the loins, a little to the right of the aorta.

The spleen is a large spongy body, seated in the left hypochondrium, between the stomach and false ribs, under the diaphragm,

phragm, and immediately above and contiguous to the left kidney.

In Chap. XV. Sect. II. I shall find it necessary to give a particular description of the kidneys, ureters, and bladder; so that we shall not enter upon it at present. But, besides the several viscera which I have mentioned, the aorta, vena-cava, and the large blood-vessels and nerves which supply the bowels, lie all within the cavity of the abdomen.

The same distinctions may be enumerated of wounds of the abdomen, that I have mentioned of wounds of the thorax. They may either be confined to the common teguments and muscles, or they may penetrate the cavity; or a penetrating wound may be complicated with wounds of one or more of the viscera.

§ 2. *Of Wounds of the Teguments and Muscles of the Abdomen.*

IN one point of view, wounds of the teguments and muscles of the abdomen do not merit more attention than similar injuries in other parts of the body; but they become highly important from the contiguity of the abdominal viscera, and from the danger of these being ultimately injured by the neglect or mismanagement of the external injury.

Our first object is to discover, Whether a wound has penetrated the abdomen or not; and whether any of the viscera are injured. When the wound is extensive, and any portion of the viscera protrudes, the nature of the case becomes evident; but in smaller wounds, where no part of the bowels appear, it is often difficult to judge whether they penetrate the abdomen or not. In general, however, this may be determined by attention to the following circumstances: By a proper examination

amination with the fingers or probe, after putting the patient as nearly as possible into the posture in which he received the wound: By the form and size of the instrument, the depth to which it run, and the direction it appeared to take; by the quantity of blood discharged at the wound being considerable or not; by the state of the pulse and other attending symptoms; and by the discharge of fæces, bile, or any other of the abdominal secretions.

When the wound is of such a size as to admit the finger, we may always determine with certainty whether it reaches the cavity of the abdomen or not; as in this case the finger will come into contact with the viscera: But probes should be used with much caution; and unless the instrument passes easily in, without force, in a direct line, and to such a depth as to convince us that it has reached the cavity, little or no dependence should be placed upon it: For the parts here are so soft, and of such a yielding nature, that a probe with very little force will pass among them

them almost in every direction to a considerable depth. It is scarcely necessary to observe, that it is particularly proper, in every enquiry of this kind, to put the patient as nearly as possible into that posture in which he received the wound. And the loose texture of the parts should prevent us from using injections, as is frequently done with a view to determine this question. In wounds of the thorax, where the parts are firmer and more intimately connected, injections may be used for this purpose more safely; but in the abdomen they are apt to spread among the muscles and cellular substance, by which the test is rendered uncertain, at the same time that mischief is apt to ensue from the pain and inflammation which it excites.

The depth to which the instrument has passed, or the direction in which it run, cannot always be ascertained; but when this information can be obtained, it will assist us in judging of the nature of the wound. By comparing the size of the external

ternal opening with the size of the instrument, we may be led to determine the depth to which it has passed.

When the quantity of blood discharged from a wound in the abdomen is considerable, we may conclude almost with certainty, that some of the large internal vessels have been injured; for excepting the epigastric artery, which runs in the interior part of the abdomen in the course of the rectus muscle, none of the teguments or muscles of these parts have arteries of such a size as to afford much blood. It is proper, however, to observe, that even the largest artery in the abdomen may be wounded without any blood being discharged externally; for if the outward opening is not considerable, and especially if the wound runs in an oblique direction, the blood, instead of being evacuated at the opening, will be extravasated into the cavity of the belly, where large quantities may be collected, even without any remarkable degree of tension taking place.

In such cases, however, we are soon led to suspect what has happened, by the symptoms which ensue. The patient complains of debility and faintness; his pulse becomes low; he is seized with cold sweats; and if the discharge of blood is not stopped, all the other symptoms of approaching death soon make their appearance.

It sometimes happens again that we are at once rendered certain that a wound has penetrated the cavity of the abdomen, by the discharge of fæces; of bile; of the pancreatic juice, or even of chyle: And in some cases, the same certainty is obtained by large quantities of blood being thrown up from the stomach, or discharged by the rectum. Urine may be discharged by a wound which does not penetrate the belly; for the kidneys and ureters as well as a considerable portion of the bladder, may with propriety be said to lie behind the peritonæum; but they are in general to be treated in the same manner with penetrating wounds of the abdomen.

When, again, none of these symptoms take place; when neither the finger nor
probe

probe can be easily introduced; when there is no discharge from the wound that leads to suspect the viscera to be wounded; when the pulse remains natural, and the pain is moderate; there will be much cause to hope that it has not passed to a greater depth than the common teguments or muscles.

In the treatment of these wounds, we are to be entirely directed by the depth to which they penetrate, and by the symptoms which take place.

When a wound in the abdomen does not run deeper than the common teguments or muscles, if none of these parts have been removed, none of the symptoms will be of much importance, at least this is commonly the case, where the habit of body is good, if the patient has not suffered from neglect or mismanagement. Our views here should be nearly the same with what we have advised in wounds of the thorax. The principal object is to prevent inflammation and the lodgement of matter. This we do by blood-letting; a

low diet; the use of laxatives; rest of body; and proper attention to the wound. But for a more particular detail of the proper treatment of such a wound, we shall refer to the last section.

It is proper, however, to remark, that wounds in the boundaries of the abdomen, in one circumstance, differ materially from similar injuries of the thorax. As the muscles and other soft parts of the chest are every where supported by bone, the lungs and other viscera contained in the breast do not readily push out at the wound: But as the coverings of the abdomen are of a soft yielding nature, having anteriorly no bone to support them, and many of the contained parts having no very close attachments, they are apt to push forward and protrude wherever any unusual degree of weakness occurs. In all wounds therefore of the abdomen, even where they do not penetrate, some caution is necessary from this consideration alone; and especially when any portion of the teguments or muscles has been removed.

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The patient should be kept as much as possible in a horizontal posture during the whole cure; and when he attempts to sit or walk, the weakened parts should be supported by a proper compress, and a firm, somewhat elastic bandage of flannel, passed two or three times round the body; a caution which ought to be persisted in for a considerable time after the cure of the fore is completed. Want of attention to this, has been the cause of many distressful cases of hernia, which with ease might have been prevented.

§ 3. *Of Wounds which penetrate the Cavity of the Abdomen, but which do not injure any of the contained parts.*

ALTHOUGH an instrument may have penetrated the abdomen to a considerable depth, we have much reason to hope that none of the viscera are wounded, as long as the parts remain free from much pain and tension, the pulse soft, and the skin

of a natural heat: But even in this state of such a wound, we are not to conclude that there is no hazard; for it often happens, that wounds in these parts, which at first exhibit no appearance of danger, terminate fatally at last.

It is proper, however, to observe, that this may often be traced as an effect of improper management, and that practitioners have it frequently in their power to prevent it: For although some instances will occur of these wounds ending fatally, where no symptoms appeared of the viscera being injured, and where after death this was found to be the case, yet this will not usually happen when the wounds have been properly treated from the first.

The danger here arises chiefly from two causes; from the air finding access to the cavity of the abdomen, by which the different viscera are apt to become inflamed; and from the subsequent formation of matter, which, not finding an opening, will necessarily collect within the peritonæum.

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In every wound therefore of this kind, after securing any blood-vessel of the teguments or muscles that may be divided, our next object should be to prevent, with as much certainty as possible, the air from getting access to the abdomen. In small wounds of these parts, this will be done with most ease and certainty, by the lips of the cut being drawn together, and secured with slips of adhesive plaster: And as a farther security, a compress and flannel roller, such as I have mentioned above, may be put over the whole: The same precautions with respect to blood-letting; a strict antiphlogistic regimen, and rest of body, already pointed out as necessary in more superficial wounds of the abdomen, should be here very carefully observed, where the danger is still more considerable.

Under this management these wounds, when small, will often heal by the first intention; but when they continue open for some time, they should be dressed as seldom as possible, and the dressing renewed

with as much expedition as the nature of the case will admit, so that the unnecessary admission of air may as much as possible be avoided.

It will sometimes happen, however, even that the most exact attention will not prevent bad symptoms from taking place: At first these will be such as proceed from inflammation, and will be removed with most certainty by farther evacuations of blood, and attention to the other circumstances we have enumerated; or they will prove fatal, by ending in mortification; or they may terminate, as I have mentioned above, in the formation of matter. It is this last occurrence which we have now to advert to.

In any other part of the body we would advise an opening to be made immediately for the purpose of discharging the matter: But in these depositions in the abdomen, we can never discover with certainty, whether any collection has taken place or not, till it has continued for a considerable time: For the matter here lies so deep,

deep, that a small quantity cannot be distinguished; nor would it be proper for the discharge of a small quantity of matter to incur that danger which always attends the free admission of air to the abdomen; and in small collections this could not be avoided, as the opening would require to be made in a slow gradual manner with a scalpel, as in such cases the trocar could not be plunged in without much risk of hurting the viscera. Instead of such an attempt, therefore, we should do nothing as long as the quantity of matter continues moderate, and while no bad symptoms have yet taken place. Indeed this is a good general rule in all wounds of the abdomen, never to enquire with much anxiety either for collections of matter, or for such parts as from the nature of the wound there might be cause to suspect should be injured, till the accession of bad symptoms renders it necessary: For much handling often does mischief; while frequently no danger ensues from wounds which at first were attended

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ed with very alarming symptoms. Nay, we know, that in different instances a person has been run through the body with a small sword without any of the viscera being injured, and the patient has done well, without any bad symptom taking place. And we likewise know, that violent inflammation will sometimes terminate favourably, without the formation of matter; and even when matter is formed, that it will sometimes be carried off by absorption, so as to leave no vestige of its having ever existed. It is the actual presence therefore of bad symptoms produced by these collections of matter, or the quantity of matter becoming so considerable as to prove inconvenient to the patient, that should indicate the propriety of making an opening for discharging it: But as soon as we find this to be the case, we should not hesitate; and whenever there is such a quantity collected as to admit of the trocar being employed, we may draw it off with ease and safety: For by inserting the instrument in an oblique direction,

direction, no air will be admitted; by which the only risk which attends this operation will be avoided.

I have been the more particular upon this subject, from having known different instances of these collections ending fatally, where the matter contained in them was discharged, and where there was not previously any appearance of danger.—As it was evident in all of them that matter was collected, an opening was made to discharge it; and as in all of them the matter was supposed to be seated either in a particular cyst, or in the substance of the muscles, and not in the cavity of the abdomen, it was done by making a small opening into it with a scalpel. But in all, the most violent symptoms of inflammation occurred in the course of the first two days; and the patients soon died. And I conclude that it was by the free admission of air to the cavity of the abdomen that these symptoms were induced; for after death the matter was found to be lodged in that cavity;

cavity; and I have since that time, in three similar cases, drawn large quantities of purulent matter off with a trocar, where it was evidently seated in the abdomen, without any bad consequences ensuing.

In drawing off matter from the abdomen, the same precautions are necessary that are now so universally admitted in discharging serum by the usual operation of the paracentesis. But as we shall give a particular account of this in Chap. XXV. I shall now refer to what will then be said upon it.

Penetrating wounds of the abdomen may prove dangerous from another cause. Considerable portions of the bowels are sometimes protruded, without any other injury being done to them; and this of itself may be productive of fatal consequences.

The most certain method of preventing danger in such cases, is to return the protruded parts as quickly as possible into the abdomen. By many we are de-
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fired in the first place to foment the parts with warm emollient decoctions, or to cover them for some time with the web or omentum of some new-killed animal: But these authors do not recollect, that during the time lost in making these preparations, the protruded parts will probably suffer more than can be gained by the application of them; and that the most natural, as well as the most proper fomentation for parts injured in this manner, is the heat and moisture of the patient's belly. In recommending these applications, it is said, that they not only remove the dry parched state of the parts which exposure to the air is apt to induce; but that they enable us to judge with more certainty whether they are in a state that admits of their being with safety returned into the abdomen or not: For it is alleged, even by some writers of reputation, that parts which are apparently in a state of incipient gangrene, and which otherwise we might be afraid of pushing into the abdomen, may, by a proper use of these fomentations,

fomentations, be so far recovered as to render it highly proper to return them.

But although this opinion has been very generally received, and the practice followed which it inculcates, it appears to me to be so fraught with impropriety and danger, that I cannot pass it over without mentioning in the strongest manner the idea I entertain of it.—Much mischief may be produced by it, and I see no advantage that can accrue from it.

By many it is said, that no part of the intestines should be returned into the abdomen that have once acquired any tendency to gangrene, on account of the fæces being likely to burst into the abdomen, which undoubtedly would end in the death of the patient: When we are certain that this would happen by the parts being actually in a state of gangrene, to return them to the abdomen would no doubt be highly improper, as it would be depriving the patient of his only chance of recovering, that of securing

ring the ends of the sound parts of the gut at the mouth of the wound, by which there might be some possibility of their uniting afterwards, as in different instances has happened; and by which he would at least be certain of having at all times a free discharge for the fæces. But although in this situation the practice we allude to is to be considered as the only one to be adopted, yet when gangrene has not actually taken place, as there will still be some cause to hope that the natural heat of the belly may prevent it, the parts should be instantly returned.

When parts protruded from the abdomen are covered with sand, dust, or any other extraneous matter, it will no doubt be proper to remove it before they are replaced; and with this view, bathing them in warm milk, or in milk and water, may answer better than any other method. But this is perhaps the only cause that can render the practice necessary.

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Some address is necessary in returning such parts of the intestines as have been protruded in the easiest manner. The patient should be put into that posture which will most effectually relax the parts in which the wound is seated, with his head and chest somewhat lower than the abdomen and buttocks, so that the weight of the bowels may have some effect in dragging in the protruded parts. When in this situation, the surgeon having his fingers dipped in warm oil, should endeavour to replace the parts by beginning his pressure at one of the ends of the gut, and continuing it along the doubling or curvature to the other. In this manner, when the opening is not very small, any portion of the bowels will be replaced without any farther enlargement of the wound: And when any part of the omentum, or any of the other viscera, are protruded, there will be still less difficulty in returning them. But considerable parts of the intestines are frequently pushed out at such small punctures,

tures, that they cannot be returned but with much more pressure than should ever be applied to them. In this case, our object will be more easily accomplished, and with less hazard to the patient, by enlarging the opening, than by the application of so much force as is generally required in pushing any considerable portion of gut through a small aperture. Some dexterity, however, is necessary in enlarging an opening in this situation. When the aperture is of such a size as to admit the finger of the surgeon, it may be done with ease and safety: But in some cases it is so completely filled with the parts which pass through it, that this is impracticable. In this situation, we are advised by authors to insert a director between the bowels and parts to be divided, and to enlarge the opening by cutting upon it, either with a scalpel or bistoury. This, however, must be attended with much hazard; for we can never distinguish with certainty whether some plies of the bowels are elevated by the director or not,

as this will sometimes happen notwithstanding all our care to prevent it. Instead of following this method, I have in different cases enlarged the opening, by making an incision through the integuments and muscles with a scalpel, in the same gradual manner that we operate in cases of hernia; taking care, as soon as the peritonæum is laid bare, to introduce the end of a prob-pointed bistoury between it and the cut, and dividing it as far as may be necessary, which now may be done with safety. If in this manner the opening is enlarged so as to receive the point of the finger, it may afterwards be increased at pleasure, by inserting the finger so as to act as a conductor for a bistoury or scalpel: But till it can be done in this way, no cutting instrument should ever be passed into the abdomen; for although much ingenuity has been shown in the invention of instruments with wings to protect the bowels in this part of the operation, yet none of
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them answer any other purpose than to render the operation more complex.

In enlarging a wound in this situation, it should be done as much as possible in the direction of the muscular fibres of the parts; and, for an obvious reason, the incision should not commence at the top but at the bottom of the wound, and be carried downwards.

We may thus enlarge the opening to any necessary extent, always taking care not to make it larger than the nature of the case may require. And this being accomplished, the protruded parts should be replaced with as much expedition as possible in the manner we have advised. In returning bowels to the abdomen, it has sometimes happened, through confusion or mistake in the operator, that they have been pushed in between the layers of the abdominal muscles. This should be guarded against with the utmost attention; for when left in this situation, the patient will be nearly in the same danger as at first. Indeed this will be

the case, if they be not placed altogether within the peritonæum.

The accident we allude to may happen in any part of the belly, when a surgeon is not sufficiently accurate and attentive : But it is most likely to occur in wounds that pass through either of the recti muscles, owing to the sheaths of these muscles being particularly loose and flaccid ; and it will more readily happen in corpulent people than in others, owing to the great depth of fat and cellular substance, which, in subjects of this description, lie above and between the different muscles of the abdomen.

Instead of enlarging the opening in the abdomen, it has been proposed to discharge the air contained in the protruded portion of gut, by making holes in it with a needle, by which it may be so much diminished as to admit of its being easily replaced at the same opening. As this has been mentioned by writers of experience, I think it right to speak of it ; but it is chiefly with a view to caution
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the younger part of the profession against it. It may indeed be done with more ease to the operator; but this appears to be the only argument in its favour: For although some may have recovered on whom it has been practised, yet surely the smallest opening made into the gut must be attended with more danger than can probably arise from the external opening in the teguments and muscles being somewhat enlarged. And besides, in reducing protruded bowels, however distended they may be with air, we may often render them perfectly flaccid by pressing the air contained in them into that part which remains in the abdomen. And if done with caution, it may at all times be attempted with safety. Indeed no trial should ever be made for the reduction of a portion of intestine much inflated, till we have endeavoured in this manner to reduce the size of it.

After the bowels are replaced, our next object is to preserve them in their situation till the wound is so firmly con-

solidated as to prevent them from falling out. When the opening is small, this may be done by laying the patient in a proper posture with his head and buttocks elevated; by preventing coſſiveness; and by a firm roller of flannel passed several times round the body, so as to support the injured parts till they are united. But in extensive wounds of the abdomen, it is found, even when they are treated with every possible attention, that it is difficult, and in some cases impossible, by the ordinary dressings and bandages, to prevent the bowels from prolapsing. In such cases, we are under the necessity of drawing the sides of the wound together with futures; an operation commonly termed *Gastroraphy*.

Various methods have been proposed for making this suture; but the common interrupted suture, or the quilled suture, which is merely a variety of the other, answers the purpose better than any of them. Much care and attention, however, is necessary in passing it, particularly

ly in avoiding the bowels, which every where lie contiguous to the parts to be united.

The surgeon being provided with a number of broad flat ligatures, sufficient for the extent of the wound, and of a strength that will retain the parts together, each ligature should be armed with two large curved needles, one towards each end ; and the patient being laid in a posture that relaxes the injured parts most effectually, the surgeon should now insert the fore-finger of his left hand into the wound, and being sure that it is in contact with the peritonæum, without any of the bowels lying between them, he should now pass the point of one of the needles along his finger to the distance of an inch at least from the edge of the wound ; and having secured the other end of it with the thumb and fore-finger of his right hand, he must now push it outward, so as to make it pierce the skin at a similar distance from the external wound in the teguments. One of

the needles being passed, the other must in like manner be pushed through the opposite side of the wound, by carrying it also from within outward. Both needles might indeed be passed by entering them externally and carrying them in upon the finger: But we could not in this manner avoid the bowels with such certainty; a point of the utmost importance, and requiring the nicest attention.

The first needles should be passed within half an inch of the upper part of the opening; and the others should be continued to within an equal distance of the bottom, at the distance of three quarters of an inch from each other; for as the retraction of parts divided in this manner is more to be dreaded than any other occurrence, it ought in a particular manner to be guarded against. The ligatures being all inserted, the parts should now be supported by an assistant; and a proper knot being tied upon each of them, the whole extent of the wound should be covered with a pledgit of lint spread with
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any adhesive ointment, for the purpose of preventing the air from finding access. After this the parts should be supported with a roller: The patient should be put to bed, and treated in the manner we have directed above, with blood-letting, and a low regimen, in proportion to the violence of the symptoms which supervene.

In performing this operation, I have said that the ligatures should be continued to within half an inch of the bottom of the wound; which is contrary to the usual practice. In general an opening is left beneath, with a view to discharge any matter that may form in the course of the cure; but there is no sufficient reason for doing so. Instead of proving useful, it obviously does harm, by giving free access to the air, which in every wound of the abdomen should be particularly guarded against. The opening cannot be preserved without the assistance of a tent, by which much irritation and pain is induced: Nor does it ever answer the purpose of discharging the
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matter, if not accidentally situated near to the under part of the abdomen. I am clear, therefore, that the whole extent of the wound should be treated in the same manner; and if matter should afterwards form, that it will be better to trust to its being absorbed, than to place any dependence on this precarious method of treatment.

Any practitioner who prefers the Quilled Suture, may easily convert the one we have described into it, by introducing each of the ligatures double. After all the ligatures are passed, a small roll of plaster, or a piece of large bougie, should be passed through the different loops, which ought all to be on one side of the wound; and a similar roll being placed on the opposite side between each of the ligatures, they must now be tied upon it with running or bow knots, of a due degree of tightness; care being taken during this part of the operation to have the sides of the wound properly supported by an assistant.

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When the parts are properly and equally drawn together, we seldom find it necessary to remove the ligatures till the parts are united, which they commonly are in six or seven days, if kept in close contact, and if no unusual cause has occurred to prevent it. But when the ligatures give much pain, and the patient complains of much tension over the abdomen, the knots should always be untied and kept perfectly loose, till by blood-letting, fomentations, and gentle laxatives, these symptoms are removed, when the parts may be again drawn together and secured as before.

We have hitherto been supposing that the protruded part consists of a portion of the alimentary canal only, this being the part which in wounds of the abdomen is most frequently pushed out: But it is proper to remark, that the other viscera are also liable to be protruded, particularly the stomach and omentum. This, however, does not vary the method of treatment, which ought to be nearly the same, whichever

whichever of the viscera are pushed out. The parts should in every instance be replaced as quickly as possible, and retained in the manner I have pointed out.

We are now to consider the treatment of wounds in the abdomen accompanied with injuries done to one or other of the viscera. And in the first place, we shall speak of wounds of the alimentary canal, as being both most frequent and most apt to induce important consequences.

§ 4. *Of Wounds of the Alimentary Canal.*

IN a former part of this section we have observed, that wounds of the intestines may be discovered by the discharge of blood from the mouth and by the anus, as well as by the discharge of fæces from the wound in the teguments: We likewise judge of this point by the discharge of fetid air from the wound, and from the depth and direction in which the instrument appeared to run.

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By attending to these circumstances, and to the symptoms which wounds of the intestines commonly produce, such as nausea, sickness, violent gripes, or pains through the abdomen, cold sweats, and faintings, we may in general decide with certainty whether they are injured or not. But unless the wounded part is brought into view, little or no advantage is gained by the discovery: For while it remains undiscovered, our method of treatment must be nearly what we have recommended for wounds which merely penetrate the cavity. Authors indeed direct us to search for the wounded part of the gut: But as the danger arising from thus exposing the contents of the abdomen, would probably be greater than from allowing the wounded part to remain, this attempt ought never to be made; and this especially as we know that wounds of the intestines have healed, without the injured part being discovered.

When we find, however, that a wound is inflicted on a portion of protruded gut,
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it ought not to be replaced till the opening is secured with ligatures.

Different methods are proposed for this. Le Dran thinks that it may be done with most safety by what he terms the Looped Suture; while the generality of practitioners prefer the Glover's Suture. The looped suture is performed in the following manner: One end of the wound is to be held by an assistant, while the surgeon does the same with the other; and the needles, which should be round, straight, and small, carrying each of them a thread a foot long, must be equal to the number of stitches intended to be made. As many of the ligatures are now to be passed through both lips of the wound as appear to be necessary, taking care to keep them nearly a quarter of an inch from each other. The threads being all passed, and the needles removed, all those on one side of the cut must be tied together with a knot at their ends, and those on the opposite side must afterwards be secured in the same manner. They are now to be joined together,

together, and twisted two or three times round, so as to form a kind of a cord: By this means the divided parts of the intestine are puckered together, so that the stitches, which before were distant about a quarter of an inch, are now brought close to each other. The suture being thus finished, an assistant must hold the two ends of the twisted threads, whilst the surgeon replaces the intestine in the manner we have already directed. The threads are to be secured to the bandage employed for covering the dressings; and after remaining till the wound in the gut may be supposed to be healed, they are then to be untwisted; and all the ends of one side being cut off close to the external wound, they must now be drawn slowly and separately away.

The principal objection to this method of stitching these wounds is, that in some degree it must contract the diameter of the gut, by which dangerous obstructions might afterwards be produced. Instead of it, the Glover's Suture, as it is termed,
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is commonly practised. In making this future, a small, fine round needle should be used, armed with a thread of waxed silk. The surgeon laying the lips of the wound exactly together, must perforate both at the same time; and carrying the needle to the same side at which it entered, he must now make a second stitch at a small distance, perhaps at the eighth part of an inch from the first; and in the same manner must continue, by a proper number of stitches, to draw the whole extent of the wound together. This being done, a sufficient length of the thread is to be left out at the external wound, for the purpose of drawing it away when we suppose the wound in the gut may be united.

Even this method of treatment, however, must tend to lessen the diameter of the gut; and I think the operation may be performed with the same degree of security, and in a manner that will obviate this difficulty, by entering the needle always from the inside of the gut, and pushing
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ing it outward. The operation should commence near to one end of the wound: The needle being pushed through one side of the gut, the ligature should be drawn forward and retained by a knot formed on the end remaining in the inside. The needle must now be carried straight across and entered in a similar manner, so as to pierce the opposite side of the wound also from within; but the following and every succeeding stitch will not be opposite to each other. When the operation is rightly performed, the needle will be carried from one side of the wound, in a diagonal line, to the other, and will enter the gut at the distance of two-tenths of an inch from the point which it came from on the opposite side. In this manner the sides of the wound may be drawn closely and exactly together, without lessening the diameter of the gut in any degree; and the end of the ligature may at last be secured and cut off close to the other extremity of the wound, if the gut is to be put freely into the abdomen; or it may be left of a

sufficient length to hang out at the wound in the teguments, if it is the meaning of the operator to retain the wounded part of the intestine in contact with the external opening. This indeed is usually done, that we may have it in our power, as it is said, to draw away the ligature on the wound of the gut being cured. It is probable, however, whatever future may be employed, if more than one or two stitches have been passed, that it will be very difficult, or even impossible, to get the ligature away, without hurting the intestines more than should ever be ventured upon. I would never advise, therefore, with a view to this, that the ligature should be left out at the wound; less danger will arise from cutting it entirely away, and allowing the stitches to remain: A considerable part of it will fall into the cavity of the gut; and in such circumstances the danger of the patient from other causes is so great, that any additional risk than can occur from the remaining part of it, must be so trifling as not to deserve notice. But
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in extensive wounds of the intestines, and whenever there is much cause to fear that the operation will not prove successful, with a view to prevent the fæces from being emptied into the abdomen, it may be proper, by means of the thread used for the ligature, to retain the injured part in contact with the wound in the peritonæum. But of this we shall presently speak more particularly.

This is the method of treatment which I would advise when the gut is not cut entirely across; and, however small a wound of the intestines may be, it ought always to be secured with a ligature: For although it is alleged by some, that we should rather trust to nature for the cure of a small opening in a gut than to insert a ligature; to me it appears that the opinion is by no means well founded; insomuch that I would not leave even the smallest opening that could admit either fæces or chyle to pass without stitching it up. Much danger may ensue from omitting it, and

the hazard of the patient cannot be increased by the practice being adopted.

When again, any part of the alimentary canal is cut completely through, a difference of practice is required. When both ends of the divided gut protrude at the wound, it should be our object to bring them into contact in such a manner as to admit of their uniting; and it may be done in different ways. It has been done by stitching the two ends of the gut to the peritonæum and abdominal muscles, exactly opposite and contiguous to each other; and although the fæces must in this manner be evacuated for some time by the wound, yet different instances have occurred of the two ends of the gut adhering firmly together, and being completely united in the course of a short time: Of this two cases have fallen within my own observation.

In such circumstances, we are commonly advised to plug up the opening in the end of the upper extremity of the gut, not only with a view to keep the patient clean and comfortable,

fortable, by preventing the fæces from being at all times pushed out, but to prevent, as we are told, the gut from contracting, and from being lessened in diameter. I am convinced from experience, however, that this precaution is unnecessary; and I know that it proves hurtful. Instead of introducing tents or dossils of any kind, the outward fore should be dressed as lightly as possible; and if care is taken to keep the patient clean, the rest should be trusted to nature alone.

This is, perhaps, the best method of managing this variety of wound; but the same intention may be answered by inserting the upper extremity of the divided gut into the end of the other, and stitching them together. In this situation it would be difficult to draw the divided parts together with a needle and ligature, without hurting the opposite sides of the gut, in any other way than by keeping it extended by means of some round body inserted into it. For this purpose it has been proposed to make use of a tube of

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thin pasteboard or paper; but as this might be laid hold of, and kept firm by the ligature, a small roll of tallow is preferable, as it will afterwards melt, and pass easily off with the fæces. A piece of it, nearly equal to the diameter of the intestine, should be inserted into the end of the upper portion of the gut; and being afterwards passed into the other, so as to carry the one, to the extent of an inch or thereby, into the other, the two portions should now be stitched together with a small round needle armed with a fine thread. The stitches should be carried completely round the gut: And in order to give them as great a chance as possible of succeeding, they might even go twice round; first at the edge of the under portion of gut, and afterwards about an inch beneath, near to where the upper part of it terminates.

In the insertion of one extremity of the gut into the other, I have desired, for an obvious reason, that the end of the upper portion should be put into the other; but

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it requires some attention to make the distinction. The peristaltic motion is commonly more remarkable in the upper division than in the under: But the most certain method of judging, is to observe at which of the ends the fæces or chyle are evacuated. An inversion of the usual motion of the bowels might indeed produce a deception; but as this is not a common occurrence, we are not to suppose that at this particular time it is likely to happen.

In wounds of these parts, a portion of divided gut sometimes hangs out at the wound, while the other end of it has slipped into the abdomen. In such circumstances, authors in general advise the end of the gut to be stitched to the peritonæum, and other parts contiguous to the wound. If it proves to be the upper part of the gut, the patient, it is said, may live under the inconvenience of an artificial anus, and if not near to the upper part of the smaller intestines, that a sufficient quantity of chyle may be carried into the

blood for his support and nourishment. But in the event of this proving to be the under part of the gut, although death would certainly ensue, were we to rest satisfied with this, it has scarcely been supposed that we ought to proceed farther.

I am clear, however, that this will never prove satisfactory to the feelings of any practitioner possessed of that degree of fortitude which our art requires, and who has that regard for the safety of his patient which every surgeon ought to possess. And although I have advised, in wounds of the intestines, when no part of them protrudes, where we cannot therefore know whether the wound is large, or only a small puncture, and where the injured part may be so situated, that it could not be reached without opening the greatest part of the abdomen, and turning out perhaps the whole alimentary canal, that we had better allow the patient to have the chance of recovering without any attempt to make a discovery, and which he may do if the wound is small, than to propose

pose a measure, which of itself might be attended with more hazard than the injury for which it was meant to be a remedy.—Yet, when we are rendered certain of the gut being completely divided by one end of it hanging out of the wound, as this will give much cause to imagine that the other is at no great distance, I think it ought by all means to be searched for, by enlarging the external wound so as to admit of the fingers of the operator being freely inserted. Even where the upper part of the gut is protruded, it is worth while to submit to this enquiry, merely in order to have at least some chance of avoiding the loathsome inconvenience of an artificial opening for the fæces: And where the upper part of the gut has slipped in, the patient can have no chance for farther existence if it is not discovered. In such a situation, therefore, we should not hesitate upon the measures to be pursued.

In wounds of the abdomen, the intestines, besides being protruded and wounded,

ed, are sometimes mortified; and they are sometimes mortified without being wounded. But whether mortification be combined with a wound or not, the method of treatment should be nearly the same.

Where there is only a tendency to gangrene from the parts being much inflamed, they should be returned immediately into the abdomen, for the reasons we have given already. But whenever they are entirely mortified, the black dead spot will soon fall out, and the remainder being thus reduced nearly to the state of a fore from any other cause, the same method of cure will become applicable.

Authors, in general, have treated of wounds of the small and great intestines separately: But no necessity appears for this; they are nearly of the same nature, and require the same method of treatment. The least injury done to the bowels is always hazardous, and in every instance our prognosis should be doubtful. But it is said, that wounds are more particularly dangerous in the small than
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in the large intestines ; from their being more apt to induce violent degrees of inflammation : I have not observed, however, that this is confirmed by experience.

§ 5. *Of Wounds in the Stomach.*

IN wounds of the abdomen, we conclude that the stomach is injured, from the part at which the instrument entered, and from the depth and direction in which it appeared to run ; from the patient being seized with vomiting of blood ; from his complaining of a great and unusual degree of sickness ; of languor and singultus ; and from the food and drink being evacuated at the wound soon after they are swallowed.

All wounds in the upper part of the left hypochondrium which pass to any considerable depth, as likewise those of the epigastrium, can scarcely avoid the stomach ;

stomach; but wounds of any part of the abdomen may reach it when they run in an oblique direction: And it ought to be noticed, as we have elsewhere observed, that wounds may penetrate this viscus when it is full, which would not touch it when empty.

Wounds of the stomach must always be considered as dangerous, and a doubtful prognosis only should be given; for although many instances are on record of their being cured, yet these are not so frequent as in any case to warrant our expecting it.

The same plan of treatment which we have advised in wounds of the intestines * applies with equal propriety to wounds of the stomach. When the wounded portion protrudes, it should be stitched up, and replaced as quickly as possible. But even where it does not protrude, it ought to be searched for; and when the anterior part of the stomach only has suffered, it will not be difficult to discover.

* Section 4. of this Chapter.

cover. We should not, however, be deterred from the enquiry by the seat of the wound; for we may be able to reach it wherever it may be, excepting in the posterior part of the stomach.

It is to be observed, that wounds of the stomach are more readily discovered than wounds of the intestines; for these last are more concealed by convolutions of themselves, as well as by other viscera.

In all wounds of the stomach and bowels, the patient should be put upon as strict a regimen as his strength will bear: Not only with a view to prevent the accession of inflammation, which, as I have formerly observed, is the most dangerous symptom that can occur, but to prevent the injured parts from being distended, by which they might be materially hurt. Instead of regular meals, a spoonful or two only should be allowed at once; and no more given even in this way than is merely necessary to support life. In wounds of the stomach and
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upper part of the smaller intestines, we might venture in a great measure, and at least for several days together, to trust to nourishing glysters : But this should be carefully avoided in wounds of the great guts ; as the injected liquor might more readily be forced in this way into the cavity of the abdomen than if taken by the mouth.

§ 6. *Of Wounds of the Omentum and Mesentery.*

WE have already mentioned the situation of these parts. But we have no means of judging whether they have suffered in wounds of the abdomen or not, if they are not protruded.

When it is found that a protruded portion of omentum is injured, we ought to see whether any part of it is nearly separated from the rest or not : For whatever part of it is in this state should be
immediately

immediately removed ; or when it has become cold, with much reason to dread that it will mortify, it will likewise be proper to remove it. But when no appearance of this takes place, we should advise it to be immediately returned into the abdomen.

In Chapter IX. when treating of Hernia, it will be necessary again to enter upon the consideration of this : At present, therefore, we shall refer to that part of our subject.

In wounds of the mesentery, what we have most to dread is the discharge of blood or chyle into the cavity of the abdomen ; for as the lacteals, together with a great number of arteries and veins, run in the duplicature of this membrane, it can scarcely be injured without some of them suffering. Whenever any portion therefore of the mesentery protrudes, it ought to be examined with accuracy : And when any of its arteries are divided, they should be immediately tied with ligatures ; the ends of which being left out
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at the wound, will admit of their being taken away as soon as they are thoroughly separated.

§ 7. *Of Wounds of the Liver and Gall-bladder.*

FROM the anatomical description we have given of the contents of the abdomen, it appears that the liver will be very apt to be hurt by all wounds that penetrate either the right hypochondrium or epigastrium.

The liver does not appear to be possessed of much sensibility: Many instances have occurred where superficial wounds of the liver have healed with the same ease, and have not induced more alarming symptoms than usually arise from wounds of the same extent in any other part of the body. But wounds of the liver, which pass to any considerable depth, are always to be considered as dangerous,
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from the great quantity of blood which is sent to it, as well as from the interruption which they may give to the formation of bile, one of the most important secretions in the body : And they are apt to prove particularly hazardous, from their allowing the bile, which soon becomes putrid, to be poured into the cavity of the abdomen.

We judge of the liver being injured, from the situation and depth of a wound ; from the quantity of blood that is discharged being more considerable than could probably be afforded by any blood-vessels of the integuments or muscles ; from bile being discharged along with the blood ; from bile tinged with blood being carried into the bowels, and discharged both by the stomach and anus ; from the abdomen being apt to swell and become tense ; and from pain being felt on the top of the shoulder, a frequent symptom in different affections of the liver.

All that we can do in wounds of the liver, is to guard as much as possible against excessive hemorrhagies, and to discharge any collections of blood or bile that may form in the abdomen when they become considerable. We endeavour to prevent or put a stop to the hemorrhagy by blood-letting, gentle laxatives, keeping the patient cool, and at perfect rest both in body and mind. And we discharge collections of blood, bile, or matter, by making an opening in the most depending part of the abdomen, or wherever they may happen to form.

Wounds of the gall-bladder are by experience found to prove more dangerous than wounds of the liver; for they are still more difficult to heal, at the same time that they are more certainly productive of extravasation of bile into the abdomen. Instances indeed have happened of the bile being so completely obstructed in its passage from the gall-bladder to the duodenum, that the bladder
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has swelled so as to produce much external tumefaction: And, in some cases, these swellings, after bursting or being opened, have continued to discharge bile for a considerable time; and at last have been known to heal without producing any extravasation into the abdomen, or any other alarming symptom. This, however, proceeds from the previous distention of the bladder having produced adhesions between it and the neighbouring parts; by which, when an opening is made into it, the bile is prevented from spreading. But few instances have occurred of wounds in this viscus having a favourable termination. To procure as free a vent for the bile as possible, and to discharge it by an opening, such as we have mentioned, when it collects in the abdomen, is perhaps all that art ought to attempt.

§ 8. *Of Wounds of the Spleen, Pancreas, and Receptaculum Chyli.*

WHEN the spleen is laid bare, we easily discover whether it is injured or not: But as it does not afford any particular secretions by the appearance of which we might be determined, and as wounds of it do not excite any remarkable set of symptoms, it is difficult to judge merely from the depth or direction of a wound whether it is hurt or not. It is observed indeed, that blood discharged immediately from the spleen is of a peculiar deep red colour; but this test is not to be depended on: Nor are we to conclude from the quantity of blood being considerable, which a wound in the region of the spleen may discharge, that the spleen itself is certainly injured; for it lies so near to large blood-vessels belonging to other viscera, particularly to
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the emulgent arteries and veins, that no certain judgment can be formed from this circumstance.

The same observations which we have made upon wounds of the liver, will apply with propriety to wounds of the spleen; only we may suppose, that the danger attending the latter will not be so considerable, as no material secretion will be interrupted by them.

As the pancreas lies deeply covered with the other viscera, wounds of it can seldom be discovered: But as a division of the duct of this gland will prevent the secretion which it affords from being carried to the bowels, this may, by interrupting or impeding digestion, do much injury to the constitution; and as the liquor will be effused into the cavity of the abdomen, it may thus be productive of collections, the removal of which may ultimately require the assistance of surgery.

Wounds of the receptaculum chyli will be distinguished from their situation,

and from the discharge being a thin milky kind of liquor. They must necessarily be attended with much danger, as they will deprive the patient of the greatest part, or even of all the nourishment which he ought to derive from his food. They can never in any way become the object of surgery, but by producing collections in the abdomen which may require to be discharged.

§ 9. *Of Wounds of the Kidneys and Ureters.*

IN a subsequent part of this work *, I shall have occasion to mention the situation of the kidneys ; an accurate knowledge of which is an object of much importance in judging whether penetrating wounds in these parts may have injured them or not. But in general we may be determined by the symptoms which take place.

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* *Vide* Chapter XV. Sect. II.

The external coverings of the kidney may be hurt without any symptom of importance being induced ; but neither the pelvis of the kidney, nor the ureters, can be penetrated without some or perhaps all of the following symptoms taking place : The patient complains of violent pain, not merely in the part itself, but over the whole loins ; in the groin, yard, and even in the testicles ; he is liable to severe sickness and vomiting ; the urine is passed with pain and difficulty, and along with it more or less blood is usually discharged ; and although the greatest part of the wound may heal, it commonly happens that a fistulous opening remains during life.

When the kidney is pierced by a wound entering from the belly, the urine is apt to be extravasated into the cavity of the abdomen : But when wounded from the back, or even from the side, the urine will either pass directly out at the opening, or it will spread through the contiguous cellular substance ; for as it is si-

tuated behind the peritonæum, it will not in this case find access to the belly. The risk, therefore, with which wounds of this organ may be attended, will depend in a great measure on this circumstance. When the urine passes into the abdomen, the danger will be very great ; but when this does not happen, if the patient survives the hemorrhagy which at first takes place, he may have a tolerable chance to escape with the inconvenience of a fistulous opening, at which the urine will continue to be discharged. Instances indeed have occurred even of this being at last cured ; but they are so rare that they are scarcely to be looked for. All that art can with propriety attempt, is to prevent the urine from lodging ; and, if the sides of the opening become callous, to render them raw from time to time, either with the scalpel or lunar caustic, by which they may at last be made to unite.

§ 10. *Of Wounds of the Bladder.*

THE bladder, when empty, lies altogether within the bones of the pelvis; but when filled with urine, it rises considerably higher, insomuch that, when the urine is long obstructed, there are instances of its reaching above the umbilicus. In judging, therefore, whether injuries done to these parts have penetrated the bladder or not, we must know whether it was empty or full. But for the most part this point is easily determined; as in general the urine comes away by the wound, and even that which passes by the urethra is at first always tinged with blood.

The danger attending wounds of the bladder is in some degree in proportion to their situation. As the upper part of it lies within the cavity of the abdomen,
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punctures in this part are apt to produce an extravasation of urine into the belly, by which the most dangerous symptoms are commonly induced: While the under part of the bladder, not being covered with the peritonæum, is often wounded, without any symptom of importance taking place, as we daily observe in the operation of lithotomy as it is now practised in the lateral method.

The pain attending wounds in the bladder is often relieved, by fomenting the under part of the abdomen and perinæum, with flannel pressed out of warm water; while by taking blood in proportion to the strength of the patient, advising gentle laxatives, and a low diet, we endeavour to prevent inflammation, the most dangerous symptom attending wounds of this organ. And when inflammation has already taken place, we try to remove it by farther evacuations of blood, by doses of opiates proportioned to the degree of pain, and by the *femicupium*. Indeed warmth applied in this manner seems to have a more certain effect in removing

removing the pain and tension of the abdomen, which these wounds are apt to induce, than almost any other remedy.

When again the upper part of the bladder is injured, together with the risk which occurs from inflammation, we have the additional hazard already taken notice of arising from extravasation of urine.

As the danger with which this is attended is always considerable, especially when the urine passes into the abdomen, it might give the patient some farther chance of recovering, to treat wounds of this kind in the bladder, upon the same principles, and in the same manner, that we have advised for wounds of the intestines; that is, by stitching up the wounded part either with the glover's suture, or in the manner we have advised in a preceding part of this section, as may be seen in § 4. The glover's suture might answer equally well with the other; and here it might be used with more freedom than in the intestines, as the bladder

der can more readily admit of being somewhat diminished in capacity. As yet I have not put this proposal in practice, but I mean to advise it in the first instance that may occur.

To prevent the inconvenience and danger arising from the extravasation of urine into the abdomen, it has been proposed to draw the opening in the bladder forward to the external wound, and to stitch it to the peritonæum and contiguous parts. This may be easily done when the anterior part of the bladder is wounded; but when the opening lies behind, to draw it forward and retain it at the wound would be productive of much pain, and might ultimately be attended with more danger than it was meant to prevent. In such circumstances, I would rather trust to the wound being neatly stitched up, when the parts should be immediately replaced, and the patient treated in the manner I have advised for similar injuries done to the intestines.

§ II. *Of Wounds of the Uterus and its Appendages.*

THE uterus is a strong muscular bag peculiar to the female sex, of a triangular figure, and situated between the bladder and rectum. In an unimpregnated state, it lies altogether within the bones of the pelvis: But during pregnancy, it rises so high in the abdomen as to touch the umbilicus and even the stomach; while at the same time the inferior point of it, termed the Os Tincæ, terminates in the vagina, a smooth membranous sheath which runs contiguous to, and terminates beneath the urethra.

The uterus is firmly attached by different ligaments to the contiguous parts: by the ligamenta lata on each side, which appear to be doublings of the peritonæum; and by the ligamenta rotunda, which arise from the upper corners of the fundus uteri, and passing down through the openings

ings in the external oblique muscle, are lost in the upper part of the thigh. By the tubæ Fallopianæ, which arise near to the ligamenta rotunda, the uterus communicates with the ovaria, two small round bodies placed within an inch and a half of its fundus.

From the uterus stretching, and occupying different parts in the different periods of gestation, it is evident that wounds, which in one state might injure it, in others will pass considerably above it: So that in judging from the situation and direction of a wound in these parts, this circumstance requires particular attention. In extensive wounds we may be determined at once by examination with the fingers, whether the uterus is injured or not: But in others, where this is not admissible, we must be directed entirely by the symptoms which take place.

In an unimpregnated state, a wound of the uterus will not be productive of symptoms very different from those arising from wounds of the contiguous parts. But during

ring pregnancy, wounds of this organ will either induce symptoms of an approaching abortion; or the quantity of blood discharged outwardly by the wound, or extravasated into the cavity of the abdomen, will be considerable. At least this will in all probability happen when the injury done to it is material: For during pregnancy, the quantity of blood sent to the uterus is considerable; and we know from experience, that hemorrhagies which occur from it in this state, seldom stop till delivery is effected; by which the uterus is allowed to contract, so as to compress and support the injured vessels.

In all injuries therefore of this kind, where symptoms of abortion occur, nothing should be done to prevent it; and where they do not take place, and whenever there is reason to suspect that the patient may suffer from loss of blood, if the delivery cannot be accomplished in the usual way, the child should be taken out by the Cæsarian operation. In a subsequent

quent part of this Work we shall have occasion to describe the method of performing this operation; but in cases such as we are now considering, the easiest, and perhaps the best, method of doing it, is to enlarge both the external opening and the wound in the uterus to a size that will admit of the extraction of the child. In other circumstances, wounds of the uterus must be managed nearly in the same manner with other penetrating wounds of the abdomen.

Besides the several viscera in the abdomen and pelvis, which we have now mentioned, many large blood-vessels and nerves pass through them, which are also liable to be wounded: But as no remedies with which we are acquainted can afford any relief in divisions of the nerves; and as the large blood-vessels here lie too deep for any surgical assistance, they very universally end fatally. A patient may indeed linger long under the paralytic symptoms which succeed to injuries done

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to these nerves ; but a division of the large blood-vessels of the abdomen in every instance proves quickly fatal.

I have thus finished the consideration of wounds of the thorax and abdomen ; and it will be observed, that I have entered minutely into it. To this I was induced, not merely by the importance of the subject, which I consider, however, as one of the most material that practitioners meet with, but with a view to excite the attention of beginners to an intimate acquaintance with the most useful part of anatomy, that of the thoracic and abdominal viscera.

In the preceding sections I have treated separately of all those wounds, which, from the situation, or any other peculiarity of the injured parts, may require any variety in the method of treatment. The extremities indeed are liable to wounds which require a mode of management that has not yet been attended to, namely, those wounds which are complicated with frac-

tures of the contiguous bones: These, however, will more properly fall to be considered when we come to treat of Compound Fractures. The only other varieties of wound which we have now to speak of, are poisoned or envenomed wounds, and gunshot wounds.

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SECTION XIII.

Poisoned Wounds.

WOUNDS may be poisoned in various ways: The bites of several animals, particularly those of the viper, afford examples of poisoned wounds; and the stings of the tarantula, of wasps and bees, are of the same nature. It is evident too, that poison is conveyed to wounds by the bites of mad or enraged animals, particularly by the bites of mad dogs: And they may be poisoned by the matter or secretion of various kinds of sores, as well as by the juices of different vegetables.

The stings of wasps and bees, and other insects of this climate, although productive of much pain, seldom terminate in any symptom of importance: The application

of vinegar or spirit of wine to the part affected immediately after the injury, will often prevent the pain, tension, and inflammation, which otherwise would supervene: And when once these symptoms take place, they will for the most part be more effectually relieved by washing with cold water, or immersing the parts in water, than by any other remedy. For the sting of a scorpion, we are advised to kill the animal, and apply it to the injured part, or to cover the part with a dead toad or some other animal supposed to be of a poisonous nature. There is much cause, however, to imagine, that this practice is founded in prejudice; and we are told, that of late the same remedies have been found to prove useful in the stings of insects in warm climates, that we have just mentioned for the stings of bees and other insects of this country.

As the bite of a viper proves sometimes fatal, it deserves at all times particular attention. It is true indeed, that it often heals easily without any symptom of importance

portance taking place; for the poison of this animal being contained in a small bag at the root of each tooth, which it can discharge or retain at pleasure, it would appear that it does not throw it out if it be not much irritated. But as we can never judge with certainty whether the wound be poisoned or not, we ought in every case to be upon our guard. To prevent the poison from entering the system is the object we should have in view. This, however, can only be accomplished when the assistance of practitioners is procured immediately: For although there is reason to suppose that some other poisons, even when applied to recent wounds, do not immediately enter the circulation; yet we know from various circumstances, that this is by no means the case with the poison of the viper, which commonly begins to operate upon the system in the space of a few hours. The patient complains of a violent burning pain in the injured part, which soon begins to swell. Tension and inflammation take place, not

merely over the affected limb, but often over the whole body. The patient becomes faint and languid, the pulse low and feeble; he complains of giddiness, nausea, and vomiting; of a fixed pain in the region of the heart; the whole surface of the body becomes yellow like the skin of a jaundiced patient; the urine appears of a deep yellow, and is evidently strongly impregnated with bile; cold sweats take place, along with convulsive twitchings in different parts of the body; and if relief is not quickly obtained, death soon closes the scene.

With a view to prevent the accession of these symptoms, the injured part should either be cut out immediately or destroyed with the actual or potential cautery. The sooner this is done, the more effectual it will probably prove; but it should always be advised as long as no bad symptom has appeared. In former times suction was much employed for the removal of poison in wounds; in some cases by instruments kept for the purpose, but most frequently

frequently by the mouth; and it was found, where the skin of the mouth was entire, that it might be done with safety. This might frequently prove successful; but where the life of a patient is so nearly concerned, that remedy only should be trusted which will with certainty prevent the poison from entering the blood. We should not therefore hesitate to advise the injured part to be immediately cut out; and with a view to render the practice as effectual as possible, we should endeavour to excite a plentiful suppuration over the surface of the sore. This may be done by the application of stimulating ointments, when the patient does not complain of pain and tension; and by the use of emollient poultices, when much inflammation takes place.

But when it appears that the poison has already entered the system, this local treatment of the sore is not to be trusted. In such circumstances, the application of warm oil, not merely to the sore, but over the whole body, has been much recommended;

mended; and it is said that some advantage has been derived from the internal exhibition of oil: Two spoonfuls of fine olive oil, given every hour, is said to have allayed the most violent symptoms which the bite of a viper ever excites. From some late observations, however, the efficacy of this remedy is much to be doubted; and it would appear that a plentiful sweat, kept up for a considerable time, is the most certain method yet discovered, not merely of mitigating the symptoms, but of removing them altogether. By whatever means a sweat is induced, it is found to prove useful: But experience shows, that small doses of the volatile alkali, frequently repeated, is for this purpose more to be trusted than any other remedy. A particular preparation of this kind, eau de luce, has been much recommended; twenty drops of it to be given every hour. But there is reason to suppose, that any other form of the volatile alkali will prove equally effectual.

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All the varieties of theriac, as well as many other remedies, are recommended for the bites of vipers; nay, different remedies are advised for the bite of every variety of this animal. But as we do not find that any of them are to be trusted, it is not necessary to enumerate them.

The most formidable wound of a poisoned nature which we meet with in this country, is the bite of a mad animal: For although instances daily happen of these wounds healing without exciting any symptom of importance, yet whenever they terminate in the hydrophobia, the utmost danger is to be dreaded. Indeed the instances of patients recovering from this dreadful symptom are so rare, that we despair in every case of any remedy proving effectual. A variety of nostrums have been held forth to the public, by which we are told the hydrophobia may not only be prevented, but even cured when it has actually taken place. I have not heard, however, of any well attested fact of their proving useful.

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As a preventative of hydrophobia, nothing with which we are acquainted can be depended on, but an immediate removal of the injured part, either with the scalpel, or the actual or potential cautery; which, when accompanied with a plentiful suppuration upon the fore, has, in different instances, appeared to answer the purpose: That is, patients who have been treated in this manner have escaped, while others bit at the same time by the same animal have suffered.

The sooner that the part affected is removed after the accident, the more effectual the operation will probably prove: But we had better advise it even at the distance of several days, than deprive the patient entirely of the chance which it affords; and this especially as there is reason to imagine that this poison does not enter the system so quickly as a variety of others are observed to do; at least this must be the case if we can judge from the time at which it begins to operate. For we know, that in most instances none of
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the symptoms induced by the bites of mad animals appear till several weeks after the accident; and it has been known that a person has remained perfectly well after the bite for the space of six months, and at last has been suddenly seized with hydrophobia. Whenever we are certain, therefore, that a person has been bit by an enraged animal, we should advise the part to be cut out at whatever period this may be, provided no symptom has appeared of the poison having entered the system, at the same time that the sore should be kept open for a considerable time by the application of some irritating ointment.

While we place most confidence in this treatment, the advantages to be derived from other remedies should not be neglected.—Sea-bathing has in all ages been much famed as a preventative of these symptoms: We have few well attested cases, however, of any benefit being procured from it. By many practitioners, mercury is much depended upon, particularly frictions with mercurial ointment, and applying it as a dressing

dressings to the sores; and as this may be employed along with any other plan of treatment that may be adopted, it may be right in every case to advise it.

It will often happen, however, that neither these nor any any other means we can employ will prove effectual; and as the province of surgery affords no remedy for the symptoms which accompany hydrophobia, as soon as they take place, the unhappy sufferer should immediately receive all the assistance which physicians of experience and observation can give.

When wounds are poisoned by the matter of diseases, as sometimes happens to surgeons in the treatment of sores, particularly in those of the venereal and cancerous kinds, the best practice would be to remove the virus immediately, in the manner we have just mentioned in cases of poisoned bites, by cutting out the part affected, or burning it with a hot iron. With respect to the venereal poison, a timid patient may indeed

deed hesitate in the use of such a formidable remedy, when he knows that we are possessed of an antidote which seldom fails : Many, however, would endure the momentary pain of a burn or a cut, in preference to the slow operation of a mercurial course. And in cases of sores coming into contact with the matter of a cancer, we should not hesitate in adopting the practice immediately ; for hitherto we are not possessed of any remedy upon which dependence can be placed for the cure of this disease.

This would likewise be the most eligible practice in wounds infected with any of the vegetable poisons. We are told, however, that in those parts of the world where alone it can be necessary, antidotes are universally known for every poison of this kind ; and that the Indians, when they are wounded, can discover immediately whether the instruments with which they are hurt have been poisoned or not.

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With respect to the metallic poisons, they do not at present fall within our consideration; for however deleterious they prove when taken into the stomach, they do not appear to prove otherwise hurtful when applied to wounds, than by irritating or corroding the parts with which they come in contact. We are told, indeed, that instances have occurred of these poisons entering the system even when applied to wounds; and this is mentioned as a reason for our not using the different preparations of lead with such freedom as is now universally done. But although remedies of this class are now daily employed, I have not heard of a single well marked case of their proving noxious: Nay, it is to be doubted whether even the salt or sugar of lead, as it is termed, proves hurtful, even when taken in considerable quantities into the stomach. We know that in small doses it may be used with safety; and I have much reason to think that it
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may be taken even in large quantities with more freedom than is commonly imagined, from its having happened in different instances with patients of my own, who by mistake have swallowed and retained large cupfuls of a strong solution of saccharum saturni, without any bad symptom ensuing.

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SECTION XIV.

Of Gunshot Wounds.

AS wounds made by fire arms are supposed to be very different from others, they are usually treated of in separate chapters. I think it right in some measure to adhere to a custom which has long prevailed: But at the same time I must observe, that this difference consists chiefly in the symptoms being for the most part more severe and violent in gunshot wounds than in others. Till of late, most of the symptoms induced by gunshot wounds were supposed to originate from poison carried in with the ball; and it was also imagined, that the ball cauterized or burned the parts as it passed along. We now know, however, that these opinions are both

both ill founded ; that the injured parts do not suffer either by poison or from the immediate application of heat ; and that all the phenomena peculiar to gunshot wounds, proceed from the violent contusion produced by the passage of the ball. Of this we are rendered certain, from there being no poison contained either in gun-powder or any of the articles of which balls are usually made ; and from observing that symptoms of a similar nature are often induced by contused wounds produced by very different causes.

I would therefore conclude, that gunshot wounds are altogether of the contused kind ; an idea consonant to the method of cure, and which will tend to do away that mystery which has hitherto overshadowed this branch of practice. It has been a prevailing opinion, that there is something so singular in the nature of gunshot wounds, as to render it improper for any practitioners to take the charge of them, but such as have had op-

portunities of attending fleets and armies, and of serving as it were an apprenticeship to this branch of practice. There is no good foundation, however, for this opinion; and I have no hesitation in saying, that gunshot wounds should be managed upon the same principles, and in the same manner, with wounds of any other kind attended with an equal degree of contusion.

In gunshot wounds, the symptoms we have most reason to dread are, inflammation, gangrene, and a suppuration so abundant as to exhaust the strength of the patient. These are therefore to be chiefly kept in view, and our practice will be more or less successful in proportion as they are mild or severe. In some cases the contusion is so violent and extensive, that the patient suffers from the injured parts being immediately attacked with gangrene. But, for the most part, inflammation is the symptom from which the greatest danger arises; for if not kept moderate from the first, it seldom fails to terminate

terminate either in gangrene or in extensive collections of matter.

To prevent or remove inflammation should therefore be considered as our first object in the treatment of gunshot wounds: And as nothing tends with such certainty to accomplish this as local blood-letting, any veins or arteries divided by the ball, should be allowed to discharge freely before they are tied: Excepting indeed where some of the larger arteries have suffered, I believe it would be a good general rule for practitioners not to attempt to check any hemorrhagy that may take place. In this they would be warranted, not merely by the well known powerful influence of local blood-letting in preventing inflammation in general, but by many well attested facts, all tending to show that it proves still more useful in gunshot wounds. Among other proofs of this it may be mentioned, what almost every army surgeon has observed, that some of the most remarkable cures of gunshot wounds have happened where patients from necessity have been left for a

considerable time upon the field of battle; by which much more blood is commonly lost than is usual with such as, from their rank are more early taken care of. In all gunshot wounds, therefore, we should at once determine upon taking as much blood as the strength of the patient will permit; and where the parts are so much contused, that the vessels which have been divided do not afford a sufficient quantity, a circumstance by no means unfrequent, instead of taking it from the arm or any distant part of the body, it should be drawn off by the application of leeches to the injured parts; or when these are wanting, by cupping and scarifying the contiguous sound parts. In general, if this practice is carried a sufficient length at first, inflammation will not take place; but when the contrary happens, and when the parts afterwards swell and inflame, the operation should be repeated once and again according to circumstances.

Our next object is to remove any extraneous body that may be lodged in the wound,

wound, as far as this can with propriety be done. When a ball has not penetrated deep, and especially when the wound is left entirely open by a portion of skin and teguments being completely removed, there is little difficulty in clearing away whatever might prove hurtful. But when a wound is found to run to a considerable depth, and especially if a counter opening has not been made by the ball passing out at the opposite side, any search that is made for extraneous bodies should be done with much care and circumspection. When treating of Punctured Wounds in Section III. of this Chapter, the consideration of this was entered upon. We must now refer to the observations we had then occasion to offer; and at present shall only remark, that when extraneous bodies lodged in gunshot wounds can be taken away without injuring the contiguous parts, they ought always to be removed immediately; but when much pain is likely to be excited, or a high degree of inflammation endangered by

the attempt, we ought to desist. In such circumstances, it will be better to trust to the extraneous bodies being afterwards discharged along with the matter of the fore; to nature pushing them out; or to the parts in which they are lodged being accustomed to their residence. From much experience we know, that in almost every instance bullets should be allowed to remain in whatever part they are lodged rather than that much force should be employed to extract them. A ball lodged in the substance of a bone, is perhaps the only exception to this general rule: A ball cannot indeed be extracted from a bone but with much difficulty; and therefore it is in general allowed to remain. I have known several instances of this; but in all of them much pain and danger to the patient, as well as trouble and perplexity to the practitioner, ensued. The unyielding nature of bone, occasions, upon the lodgement of a foreign body in its substance, great pain, tension, and swelling over all the contiguous parts.

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To prevent these, the extraction of the ball, when it can be done without hazard of the patient's life, should be attempted, as soon after the accident as possible, and before the parts become swelled and pained.

Different forceps have been invented for extracting bullets from wounds, and some have proposed to do it with screws : Scarcely any of these instruments, however, have answered the purpose for which they are intended ; and excepting where a bullet can be easily laid hold of with common forceps, no instrument should ever be employed : For, besides tearing and irritating the injured parts, they are apt to catch the contiguous muscles, or other soft parts, by which much mischief is commonly done. There must always be a risk of this when the wound runs deep ; but it ought to be more particularly avoided in wounds of the thorax and abdomen, where laying hold of any of the contiguous parts would necessarily produce much danger. When

a ball is not deeply lodged, but lies near to the mouth of a wound, so that the surgeon can see it, the forceps may with safety be employed ; but whenever it lies deeper than this, if it is judged proper to extract it, a Counter Opening, as it is termed, should be made upon it, so as to admit of its being taken out with the fingers. It will commonly happen, indeed, that balls may be extracted with much more ease both to the patient and surgeon, by judicious openings of this kind, than by the use of forceps or any other instrument. The pain and terror which the making of these openings are supposed to excite, are the principal objections to them ; but it should be remembered, that in such circumstances, it is not the present ease and conveniency of the patient that so particularly merit attention, as his future advantage and safety. Nor will the pain induced by cutting directly upon a bullet be so considerable, as the tearing it out from a deep wound with forceps.

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Where the course of a ball is of a considerable length, this will always be the easiest method of taking it out, when the practice is not forbidden by the contiguity of large blood-vessels and nerves: But when the wound is only of a short extent, instead of cutting upon the ball, by making a small opening into it, it answers better to lay the wound open though its whole length; by which the ball is not only more easily extracted, but the cure is afterwards more readily accomplished. Indeed this practice should be generally adopted, even when the ball is not lodged. When the two openings made by the entrance and exit of a ball are not very distant from each other, and when with safety they can be laid into one, it should always be done as soon as possible after the accident; by which the vessels which have been injured will be more freely unloaded than they possibly could be in any other manner; every kind of extraneous matter that the ball may have carried in, will be brought in-
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to view ; and the sides of the sinus being allowed to collapse, the size of the fore will thus be diminished.

This being done, the parts affected should be covered with pledgits of an ointment formed of wax and oil, and an emollient poultice should be laid over the whole ; a practice which proves much more successful, as well as more agreeable, than the application of warm stimulating dressings ; which, till of late, were universally used in all cases of gunshot wounds. The pain and irritability which almost uniformly attend this kind of injury, point out the propriety of the most soothing applications. For the most part those we have mentioned answer the purpose : But in some cases the preparations of lead answer better ; particularly Goulard's cerate, or the common wax ointment impregnated with a small proportion of *Saccharum Saturni*. An opiate should now be administered ; and the part affected being placed in the easiest

fiest and most convenient posture, the patient should be laid to rest.

The formation of matter in every sore attended with contusion, is an object of the first importance; for till this takes place, there is often reason to suspect that gangrene may supervene. With a view to hasten it, the warm poultices should be frequently renewed: And they should be continued till the tension and swelling with which wounds of this kind are usually attended, is removed, and till the sore has acquired a healthy granulating appearance; when it will fall to be treated in the manner we have already advised for sores proceeding from any other cause.

Gunshot wounds are commonly described as being covered from the first with deep sloughs or escars; and various remedies are advised for removing them. Every appearance, however, of this with which they are attended, proceeds entirely from contusion; and excepting the injury is large and extensive, the slough covering the wound is
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not often perceptible; or it is so thin and inconsiderable, that it dissolves and comes away with the matter of the first or second dressing. In such cases, therefore, it requires no particular attention. And even when it runs to a greater depth, it commonly separates, so as to be easily removed as soon as a free formation of matter has taken place: For every flough of this kind is a real mortified spot; and we have elsewhere shown that nothing tends to separate mortified parts with such certainty from those that are sound, as a free suppuration being induced upon them.

In the early stages of gunshot wounds, emollient poultices prove more useful than perhaps any other remedy: But it is necessary to remark, that they should not be continued after the effects we have mentioned are produced: For when too long persisted in they not only tend to excite too much relaxation, and to render the parts soft and spongy, but are apt to induce too copious a formation of matter;
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from which the patient is often in greater danger than from any other circumstances attending his situation: For although it is a point of the first importance, in every gunshot wound, to encourage the formation of pus to a certain extent; yet we find universally, that in great quantities it proves very prejudicial, and when once excited, that it is with much difficulty checked. I think it also right to observe, that this superabundance of matter is very apt to proceed from a different cause, *viz.* from the inflammation being allowed to run too high, by which extensive effusions and consequent abscesses take place, among the contiguous muscles. This cannot in any way be so effectually prevented as by copious blood-letting immediately after the injury. It is chiefly with the view indeed of preventing this distressful occurrence, that I have advised the practice of early blood-letting in all gunshot wounds; and with those who have had opportunities of seeing the inconveniencies arising from those extensive suppurations that ensue

sue from this being omitted, no other argument will be required to show that in every instance it should be adopted.

In whatever manner a too copious flow of matter has been induced, the practice to be followed must be the same. Every collection that appears must be discharged by a depending opening; the limb should be laid in that posture which most readily admits of its running off; the patient should be supported by a light nourishing diet; and the bark should be plentifully exhibited. It is in this state indeed of gunshot wounds that bark acts with most advantage; when the inflammatory symptoms are mostly gone, and when the patient is suffering from too copious a discharge. In this situation it often proves highly serviceable; but in order to act with advantage, it should be given in considerable quantities. Elixir of vitriol proves in such cases a powerful addition to bark.

When, notwithstanding a liberal use of these medicines, and a proper attention to
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the other circumstances I have mentioned, the discharge still continues copious, we will often find that it is kept up by detached pieces of bone, or by pieces of cloth, or other extraneous bodies having been carried in with the bullet. In such circumstances, nothing will tend to lessen the quantity of matter till the extraneous body is removed; for while it remains, it will irritate and inflame the contiguous parts, and effusion and suppuration will be the consequence. The fore ought therefore to be again examined; and any loose body or detached pieces of bone that are discovered should be removed. When the irritation is kept up by pieces of cloth, as they are too soft to be discovered by the probe, they are apt to pass unnoticed. Hence, when there is cause to suspect that any article of this kind is lodged in wounds, some other method is necessary for extracting it: And when the parts are so situated that a cord or seton can be introduced along the passage made by the ball, nothing will prove more successful. I have met

met with different instances of pieces of cloth being brought out with the daily drawing of a cord, which were not suspected to be lodged; and in consequence of which the sores were soon cured, after various attempts to heal them had been made in vain.

I have already advised opium as an useful medicine in the early stages of gunshot wounds; and by tending more effectually than any other remedy to abate irritation, it proves often serviceable in lessening the discharge of these sores, even when they have been of long duration, and when various other medicines have been employed without any advantage. It should therefore be prescribed with freedom whenever the discharge appears to be kept up by pain or irritation.

Altho' extensive hemorrhagies do not always occur immediately, yet they sometimes take place afterwards. This seems to proceed from the arteries being left open and exposed, when the mortified slough which
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contusions usually produce, falls off. About this time, therefore, practitioners should be much on their guard against such an occurrence, and this especially when the injury is extensive, or seated near to any of the large blood-vessels. The hemorrhagy is often preceded by great heat in the injured parts, and with a throbbing pulsatory pain. At this period it may frequently be prevented by plentiful blood-letting, and especially by the application of leeches to the contiguous parts; but when once the hemorrhagy appears, if the vessels are of any considerable size, nothing will prove successful but a proper application of ligatures. As the discharge is often so sudden and violent as to induce much hazard before the assistance of practitioners can be procured, patients in such circumstances should be furnished with a tourniquet, with directions to the servant in attendance to apply it immediately on the first appearance of blood.

Hitherto I have not mentioned the scarifying of gunshot wounds; a practice recommended by almost every writer upon this subject, and till of late very universally adopted. By scarifying the fores, it was expected that the sloughs with which they are sometimes covered would sooner separate, and that the cure would thereby be hastened. Later experience, however, shows that this reasoning is fallacious; and instead of proving useful, that scarifications here very commonly do harm: They create additional pain and inflammation, at the same time that they evidently extend the surface of the sore, while they do not appear to be productive of any advantage. They should therefore be laid altogether aside. Even the dilatation of gunshot wounds, so much recommended of late, should be employed with caution. When the passage of a ball is not extensive, and the parts through which it has gone, can with safety be laid open, it would be right in every case to do it with freedom from one end
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of the sinus to the other: No harm could accrue from it; and I have found by experience, that it tends much to forward the cure: But I have never been able to discover what advantages are to be derived from the mere dilatation of the external opening of a gunshot wound: It is proposed with a view to give a more free discharge to the matter than it would otherwise have: But in deep narrow wounds, formed by pistol or musket bullets, increasing the diameter of one part of the sinus will have no effect whatever upon the rest of it; and as it must evidently do harm, by enlarging the wound, while no benefit can probably accrue from it, I do not hesitate in saying that the practice should be laid aside. Where a wound is either so situated that it would be dangerous to lay it open from one end to the other, or of too great extent for this practice to be adopted, the passing a cord, as I have already advised, along the sinus, will often answer our purpose. This, however, should never be attempted till the

first or inflammatory stage of the wound is over: For while any degree of pain or tension remains, the irritation produced by the cord is very apt to do harm.

But it sometimes happens even that a cord cannot be employed, owing to the situation and direction of the wound. In such cases, after the pain, tension, and other symptoms of inflammation are removed, and a free suppuration is induced, the fore must be treated in the manner I have advised when speaking of punctured wounds: A proper application of pressure along the course of the sinus will, in such circumstances, often effect a cure when it cannot be obtained in any other manner.

It might here be expected, that something should be said of the method of managing mortification when excited by gunshot wounds; but it appears to be unnecessary, as I have already treated fully of this symptom as a consequence of inflammation*. I think it right, however, to remark, that in gunshot wounds, nothing
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* *Vide* Chapter I.

in general proves so effectual in preventing mortification as plentiful blood-letting. It will not indeed prevent those parts from mortifying which have been severely contused: But it is not this that in such cases we have most reason to dread; for gangrene which occurs from contusion, is commonly circumscribed, and it is not apt to spread. It is that variety of gangrene which succeeds to the inflammatory stage of gunshot wounds, of which we have most cause to be afraid. But when blood-letting is freely practised, it seldom takes place; and the same remedy proves likewise the most effectual in preventing it from spreading.

As bark proves frequently useful in mortification, it is almost universally given in gangrene arising from gunshot wounds. I am satisfied, however, that the practice is often founded in error, and that much mischief is done by it. When gangrene takes place in debilitated habits of body, bark may be given with safety; and in such circumstances it proves often

the most effectual remedy. But mortification from gunshot wounds happens most frequently in strong plethoric patients, where tonics of every kind prove prejudicial, and where blood-letting and other evacuations are particularly useful. In the subsequent stages even of this variety of gangrene, if the disease continues to spread after all the symptoms of plethora and inflammation are removed, bark may be employed with propriety; and in such circumstances it should be exhibited with freedom; but it should never be given while the inflammatory tension and pain continue.

In offering these observations upon gunshot wounds, I have hitherto been supposing that they are circumscribed, or at least not so extensive as to preclude hopes of saving the injured limb; and it is proper to remark, that with due care and attention, wounds of this kind may be often cured, and limbs saved, where the first appearances were even very alarming. But when a limb is injured in such a manner

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that there is no reasonable hope of saving it, it would be improper to persist long either in these or any other means of cure that have yet been proposed. By doing so, the patient would suffer much unnecessary pain and trouble, while at the same time his constitution would be so much injured as to prevent him from recovering afterwards from the removal of the limb. But the attempt to save limbs which have suffered much by gunshot wounds, gives rise to a question of importance, that merits particular discussion.

In the various battles which occurred in the last German war, the number of wounded men was often surprisingly great; of course the amputation of limbs became frequently necessary. By many it was imagined that the practice was carried much farther than it ought to have been; and it was even alleged, that limbs were often wantonly removed, which with much ease and safety might have been saved. Among others who were of this opinion, Mr Bilguer, surgeon to the armies of his

Prussian Majesty, wrote a treatise, in which he endeavours to prove, that amputation of limbs is rarely necessary, as almost every injury for which it is usually advised will admit, he thinks, of a cure, by more gentle means.

As the removal of a limb should never be attempted but from real necessity, the public were much indebted to Mr Bilguer for endeavouring to prevent it from being too generally practised. There is much cause, however, to imagine, that the zeal with which he appears to be animated has made him carry his restrictions too far; and that numbers would suffer much unnecessary pain, trouble, and hazard, were they to be generally adopted.

Mr Bilguer thinks, that scarcely any case of gunshot wound can be so bad as to require amputation. Even where the softer parts are much lacerated, and the bones and joints much injured, we ought always, he thinks, to attempt to save the limb: And he asserts, that by this practice more lives will be preserved than by
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the usual method of proceeding immediately to amputate. After all the attention, however, that I have been able to give to a subject of such importance, in the course of my own practice, and after much information obtained from others of experience and observation, I am of opinion, that a great deal of mischief would be done by admitting this as an universal rule. I would advise in every case where the fleshy parts of a limb only are merely divided, to make some trials for saving it; and they will often prove successful. Where all the muscular parts of a limb are much lacerated and contused, it would no doubt be in vain to attempt to cure it; on the contrary, it should be removed at once. But when any considerable portion of soft parts remains unhurt, although the others may be injured in the severest manner, if none of the large joints have suffered, we should never despair of being able to save the limb. The contused parts may indeed mortify and throw off, and thus an extensive

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five fore will be produced: But we know from daily experience, that the largest fores will heal; and if in this we should be disappointed, we still have it in our power to advise amputation, while both the patient and surgeon have the satisfaction to think that nothing has been omitted that could probably have prevented the necessity of employing a remedy of such a disagreeable nature. And on the subject of Amputation we shall afterwards have occasion to show, that in such a situation the operation proves usually more successful when a fore has been of some duration, than when employed immediately after the accident.

But when any of the larger joints have been much injured by the ends of the bones which compose them being shattered or splintered, immediate amputation should always be advised: For the inflammation which succeeds to these wounds comes on quickly; and when inflammation takes place, the operation can never be employed till it is altogether removed.

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The height to which inflammation is in such cases apt to proceed, is a powerful argument in favour of early amputation: For when the large joints are materially hurt, the parts soon become highly inflamed, notwithstanding of all that can be done to prevent it; so that no time should be lost in putting the operation in practice. It must indeed be allowed, that out of a great number of patients, some few might in such circumstances have their limbs saved, even where the joints have suffered in the worst manner: But we cannot allow, with Mr Bilguer, that this is a sufficient reason for the practice which he recommends being generally admitted. It is not the success which may attend a few cases, by which practitioners should be directed, but that which ensues from a general course of practice. And this I think may be considered as certain, that in the circumstances we are now considering, more lives would be lost by attempting to save the injured limbs, than by removing them as quickly as possible
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after the wounds have been received ; at the same time that the practice would be attended with much less trouble and pain to the patient : For the fore produced by the amputation of a limb is trifling indeed, when compared with extensive lacerated wounds of the large joints. In the present improved method of operating, the former often heals in the course of two or three weeks ; whereas wounds in the joints, even when they terminate most favourably, often continue obstinate, and produce much perplexity and distress for several months, or even for years.

With respect to fractured bones in gunshot wounds, when a large bone is fractured or splintered through its whole extent, and when this is accompanied with much laceration of the corresponding soft parts, immediate amputation of the limb will be the best practice, and ought to be advised. But where a gunshot wound not very extensive is merely accompanied with a simple fracture of a contiguous bone,

bone, or even where the bone is fractured in different parts, if the injury does not extend to the joint, we ought in perhaps every instance to endeavour to save the limb. By removing the detached pieces of bone, and treating the sore with attention, we have often the satisfaction to accomplish a cure, and to restore patients to the use of their limbs, who otherwise might have remained lame for life, or who might have been deprived of them entirely.

It is proper, however, to remark, that although this should always be attempted where a patient is to remain in a fixed situation, and where the regular attendance of practitioners can be procured, yet after engagements, whether at sea or land, where the wounded must be frequently moved about, and where a deficiency of surgeons and nurses very commonly prevails, I believe it would be a good general rule to proceed to immediate amputation in every case of gunshot wound accompanied with fractures of any of the contiguous

guous large bones. By doing so, a few limbs would possibly be removed, which with much care and attention might be preserved; but I am convinced that more lives would be saved by it than by attempting in such circumstances to pursue any other method of treatment. We shall have occasion, however, to enter more fully upon the consideration of this subject in the Chapter upon Amputation.

C H A P-

CHAPTER IV.

Of Burns.

BURNS assume different appearances, according to their degrees of violence, and manner in which they are produced. Thus, burns which merely irritate the surface of the skin, differ materially from those which corrode or destroy it; while those again have a different aspect from such as affect the muscles, tendons, ligaments, and other deep seated parts: And we know that such as are produced by boiling water, and other liquids, differ

differ materially from those produced by the direct contact of hot metallic bodies, or of burning combustible materials.

Burns which do not destroy the cuticle, and which irritate the skin only, act nearly in the same manner with cantharides and other vesicantia. The irritation with which they are accompanied, excites an increased action in the exhaling vessels of the parts affected, by which vesications are formed in extent and number proportioned to the violence of the cause. But when the skin or subjacent parts are destroyed, no vesicles take place. A black mortified slough is first observed; and when this separates and is thrown off, an ulcer is left of a depth corresponding to the degree of heat by which it was produced.

In every case of burn, the pain is severe; but in general it may be observed, that it is more considerable where the skin has been merely much fretted or irritated, than where such a degree of heat is applied as to destroy the skin entirely.

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In deep extensive burns mortification sometimes takes place to an alarming degree very soon after the injury is inflicted; but for the most part the symptoms we have most cause to dread are pain and inflammation. The pain and irritation which burns excite, are in some instances so violent, that all our efforts are apt to fail in preventing them from inducing the very highest degree of inflammation: And when the surface of a burnt part is extensive, the effects of this inflammation are not confined to the spot which has more immediately suffered; they are apt to excite fever; and in many cases such a degree of torpor is induced, as at last ends in death.

In the treatment of every variety of burn, our first object should be to procure ease as quickly as possible. Where the skin is not destroyed, but seems to suffer merely from irritation, an abatement of pain may be procured by the application of remedies of very different and even of very opposite natures: By

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dipping

dipping the part affected in very cold water, and keeping it for some time immersed in it, the pain will often be rendered very supportable; while on the other hand, a considerable degree of ease is often procured by plunging the injured part suddenly into hot water: Emollients are often employed, and in some cases they procure immediate relief; but in general, astringent applications prove more successful. One of the best applications to this variety of burn is strong brandy, or any other ardent spirit: It excites a momentary additional pain; but this soon subsides, and is succeeded by an agreeable soothing sensation. This remedy proves most effectual when the parts can be kept immersed in spirits; but when this cannot be done, they should be kept constantly moist with pieces of soft old linen completely soaked in it. Of late strong vinegar has been much employed for burns; *Acetum Lythargyrites*, a strong solution of *Saccharum Saturni*, and Goulard's saturnine water, make useful applications

applications for the same purpose ; and as a proof that it is the astringency of the remedy from which the effects result, the same benefit is derived from a strong solution of alum, or even from common ink.

It is the common opinion, that remedies of this kind prove chiefly useful by preventing those vesications or serous exudations with which superficial burns are usually attended : But I do not find that the observation is well founded ; for I have always remarked, that they procure an abatement of the pain sooner where these vesications have already appeared, than when they are employed so early as to prevent them from rising, which they frequently do when applied immediately after a burn is inflicted.

Whatever remedy we employ, it ought to be persisted in as long as the pain continues ; and in extensive burns, where the irritation is great, along with external applications, opium should be prescribed in doses adequate to the degree

of pain. Even that stupor with which patients in this situation are sometimes attacked, is more readily removed by opium than any other remedy. As this symptom is probably induced by some degree of effusion upon the brain, and as we are to consider this as an effect of the irritation which always accompanies burns, we may readily conceive that opiates should prove particularly useful in removing it: And I have found in a variety of instances that they do so.

With respect to the management of the vesications; by some we are advised to open them immediately, while others assert that they should never be meddled with. In judging from my own observation, I would say, that they should never be opened till the pain arising from the burn is gone: For during this period, the pain becomes always more severe on the air getting access to the cavities of the vesications; but when the irritation produced by the burn is subsided, they may be opened with safety: And at this
period

period it ought always to be done; for when the serum is allowed to rest long upon the skin beneath, it is apt to render it tender, and even to induce some degree of ulceration, which in this manner we prevent. Even at this time the vesicles should be opened with small punctures, instead of large incisions, so that as little air may be admitted as possible. And after the serum is discharged, the best application that can be made is a thin liniment of wax and oil, or Goulard's form of a saturnine ointment. Oil by itself is too thin, as it runs quickly off; and ointments of the usual consistence give more pain than liniments, as their stiffness prevents them from being applied or removed so easily.

In this manner all such burns as we are now considering may in general be cured, excepting where they are so extensive as to excite much inflammation and fever. In such circumstances, blood-letting, and other remedies adapted to the particular symptoms, must be advised; and when

the injured part is found to ulcerate, which often happens in severe burns, those remedies must be employed which the nature of the sore may render necessary, and for which we must refer to the different sections of Chapter V. where every variety of ulcer will fall to be considered.

When, again, burns are from the first attended with loss of substance, as usually happens when they are produced by hot metallic bodies, cooling emollient applications prove most effectual: The part being kept constantly moist with a liniment composed of equal parts of lime-water and lintseed-oil often gives immediate ease; and the easiest way of applying it is, to daub the parts frequently over with a soft pencil well soaked in it. The application and removal even of the softest coverings excites much pain; and I have always found in this kind of burn, that no harm ensues during the first two or three days from the parts affected being exposed to the air. On the contrary, it often gives relief when no advantage
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is derived from any application. But as soon as the pain and irritation produced by the burn are removed, the parts should be covered and treated in the same manner as ulcers arising from any other cause. The liniment I have mentioned of lime-water and lintseed-oil, is perhaps the best that has yet been employed in this kind of burn. In some cases, however, I have found that more immediate ease has been procured from the application of a saturnine ointment, and bathing the parts in a weak solution of *Saccharum Saturni* in some instances gives relief.

In burns arising from the explosion of gun-powder, some of the grains of the powder are apt to be forced into the skin. At first they produce much irritation; and if not soon removed, they commonly leave marks, which afterwards continue fixed and permanent. They should therefore be picked out with the point of a needle, or any other small instrument, as soon as possible after the accident; and with a view to prevent inflammation, as

well as to dissolve and carry off any particles of the powder which might remain, the parts affected should be kept covered for a day or two with emollient poultices. In other respects, injuries of this kind are to be treated in a similar manner with burns produced in any other way.

When parts which lie contiguous are burnt, they are apt to adhere to each other, if means be not fallen upon to prevent them. This is more particularly the case with the fingers and toes, and with the nostrils and palpebræ. The surest method of preventing it, is to keep pledgits covered with any proper dressing inserted between them during the course of the cure.

In the treatment of ulcers arising from burns, it is proper to remark, that the parts are apt to become soft and fungous, and to rise considerably above their natural level. When this is observed, any emollient applications that have been previously used should be laid aside: Such as are moderately astringent should be employed instead of them; and gentle compression

pression with a roller proves particularly useful. Bathing the parts with a common saturnine wash, or with lime-water, or a solution of alum, often proves serviceable; and one of the best ointments for this purpose is the common *Ceratum e Lapide Calaminare*. By persisting in these means, any fungous excrescences that arise will, for the most part, be soon removed; but when they prove obstinate, they must be taken down by the application of burnt alum, blue vitriol, or lunar caustic.

CHAP.

CHAPTER V.

On the Theory and Treatment of ULCERS.

SECTION I.

General Observations on Ulcers.

VARIOUS definitions have been given of the term Ulcer, but what I understand by it is, a solution of continuity in any of the softer parts of the body, discharging either pus, sanies, or any other matter.

Ulcers

Ulcers have been distinguished by different appellations, according to some particular circumstance attending them; and different methods of cure have been pointed out for each: And if these had been taken from characteristics sufficiently distinct, and of any real importance in the cure, they would certainly have been material, and ought to be retained. But as it is evident, that many of them are taken from circumstances either not very obvious, or from such as are merely accidental, and that do not afford any real distinction; to adhere to these would be improper, as it would lead to complex and difficult practice, when more simple treatment would answer better.

The following arrangement of ulcers, while it appears to be simple and natural, comprehends every variety of sore that can occur.

Ulcers may be divided into two general classes. In the first, may be comprehended all such as are merely local, and that do not depend upon any constitutional disease; and,

and, in the second, all those that proceed from any general affection of the system.

The varieties of local ulcers are,

1. The simple purulent ulcer.
2. The simple vitiated ulcer.
3. The fungous ulcer.
4. The sinous ulcer.
5. The callous ulcer.
6. The carious ulcer.
7. The cancerous ulcer ; and,
8. The cutaneous ulcer.

And in the second class of ulcers are included the Venereal—the Scorbutic—and Scrophulous ulcers.

The importance of this distinction of ulcers is in nothing so obvious as in the method of cure. The neglect of it indeed may be considered as the chief cause of our treatment of ulcers being often tedious and uncertain ; for we must necessarily fail by treating with local applications only, all such ulcers as originate from disease in the system, while remedies directed to the habit of body are altogether unnecessary,

necessary, and often do harm in ulcers entirely local.

In the ensuing sections I shall endeavour to point out with accuracy the different appearances of these varieties of ulcers, together with the method of cure best adapted to each of them; but before proceeding to do so, I shall offer a few general observations upon ulcers, and chiefly upon the causes, prognosis, and method of cure.

The causes which, in different circumstances, may give rise to ulcers, are exceedingly various; but in general they are found to proceed from one or other of the following.

1. From such as may be termed Occasional or Exciting Causes: Of which kinds are, inflammation, from whatever cause it may have arisen, when it terminates either in gangrene or the formation of matter,—wounds—bruises ending in suppuration—and burns.

2. From such as may be considered as Predisposing Causes; of which kind, are all disorders

disorders of the system, attended with determinations to, or affections of, particular parts: such as fevers of every kind that terminate in what are called Critical Abscesses—also Lues Venerea—Scrophula—and Scurvy.

3. Ulcers may proceed from a combination of the two foregoing causes. Thus a slight scratch, or excoriation, that in a sound person would heal easily, in a habit tainted with disease, will frequently produce a very disagreeable and tedious ulcer.

The causes of ulcers being various, the prognosis to be given must also be so.

1. It must depend upon the nature of the different exciting causes.

2. Upon the situation of the fores; and,

3. On the time of life and habit of body of the patient.

With respect to the first of these, it is evident, that the occasional cause must have considerable influence on the nature and duration of ulcers. Thus an ulcer produced by a simple wound, inflicted
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with a clean cutting instrument, will, *cæteris paribus*, heal more easily, than one that ensues from a severe bruise, or from a wound produced by a foul or ragged instrument.

In Chapter III. we had occasion to see, that punctured wounds are of more difficult cure than such as are freely laid open: And ulcers produced by punctured wounds are, in like manner, of difficult treatment, but the causes of this having been pointed out, when speaking of punctured wounds, it is not necessary at present to consider the subject farther.

The cure of ulcers may be influenced by their situation in two different ways.

1. With respect to the nature and organization of the parts on which they are seated; and,

2. From their being situated on the trunk of the body, or on the upper or lower extremities.

Thus it was long ago remarked, and the remark has since been confirmed by observation, that ulcers in fleshy parts heal
more

more easily, than when tendons, aponeuroses of muscles, glands, periosteum, or bones, are injured.

The pain occasioned by sores in soft muscular parts is not so considerable, the discharge is generally better-conditioned, and the cure commonly advances more quickly. And whether ulcers are seated in the cellular membrane, in the tendons, periosteum, or bones, the cure commonly proceeds more easily in the trunk of the body than in the extremities.

The depending situation of the latter seems to be the chief cause of this; for the fluids having, in the extremities, to proceed in a direction contrary to their own gravity; whenever the solids lose their tone, or suffer in their arrangement, swellings of the œdematous kind very naturally occur. And, when serous swellings arise in the neighbourhood of ulcers, they tend not only to increase the quantity, but to vitiate the quality of the discharge; and thus the cure is protracted, till the
parts,

parts, by rest and proper management, have again recovered their natural tone.

Hence a material part of the cure in ulcers of the legs is obtained from the limbs being kept in an horizontal posture : And on the same principle we account for the effects of the laced stocking in the cure of ulcers, where it seems to act entirely by preventing this kind of swelling : This, however, will hereafter be more particularly considered.

The situation of ulcers, with respect to the contiguity of large blood-vessels and nerves, from the danger of these at last becoming affected, should, likewise, influence our prognosis : And ulcers seated upon, or very contiguous to, any of the large joints ; or upon either of the cavities of the chest or abdomen, will always be considered as more hazardous than ulcers in other parts of the body.

We had also occasion to observe, that the prognosis in ulcers should be much influenced by the age and habit of the patient.

Thus, in young healthy people, the secretions are commonly better conditioned, than in the old and unhealthy, in whom the secreting organs seldom perform rightly their different functions: And as the varieties of matter discharged from ulcers are to be considered almost entirely as secretions from the general mass of blood, their being of a good or a bad quality, must of course depend greatly on a healthy state of the solids, so that we need not wonder at their being so much influenced by the general health of the patient.

The cure of ulcers depending, therefore, upon such a number of circumstances, a just prognosis, it is evident, can only be obtained from a due attention to all of them.

The first circumstance to be ascertained in the management of ulcers, is the propriety of attempting to cure them or not: That it is proper to endeavour to heal every recent sore, is universally allowed; but when ulcers have been of long duration,

duration, or when they appear to have had any effect in carrying off, or in preventing any disease to which the system has been liable, it has always been considered as dangerous to remove them: And, accordingly, almost every author who has written upon the subject, has expressly determined against it, as being an uncertain and dangerous practice.

Such ulcers as afford a copious discharge, and have been of long duration, it would no doubt be imprudent suddenly to heal up, as the system might probably suffer from the retention of a considerable quantity of fluids, which for a long while had been thrown off by means of these drains. Many cases, indeed, have ended fatally, from such ulcers drying up suddenly, either of their own accord, or by the imprudent use of astringents.

On the other hand, however, the distress arising from an extensive sore, disagreeably situated, and which will not perhaps terminate but with the life of the patient, is an inconvenience to which few

are willing to submit, and makes it an object of importance, the discovery of such a plan of treatment as may render it safe for patients in this situation to have them removed.

With due caution, the cure of every ulcer, may, I think, be attempted; the only requisite precaution, in habitual sores being the introduction of an adequate drain in the form of what we usually term an issue.

An issue being introduced, and brought to discharge nearly equal to what the ulcer afforded, the cure of the latter may be carried on with safety; and if the sore has not been of long duration, the size of the issue may be gradually lessened, and at last perhaps removed entirely.

But where an ulcer has been of long continuance, or seems to have been instrumental in preventing any other disease, the issue should without hesitation be continued of the same size for life: But even this may be done with little inconvenience

inconvenience when compared with the trouble attending a large ulcer.

This practice might, from reasoning alone, be considered as safe. For, if a drain equally copious is first introduced, and afterwards kept running, the healing of the ulcer for which it was inserted, however old it may have been, could never probably do harm. But from experience I can say, that nothing proves more effectual in the cure of old ulcers, than issues; and I have not known an instance of any patient being injured by the oldest sores being cured, where the precaution was taken of having an issue inserted.

The objections made to this practice, are,

1. That an artificial issue gives nearly the same trouble as a natural ulcer. And,
2. That nature having been long accustomed to the discharge of a particular kind of morbid matter afforded by the ulcer, we ought not, by innovations, to run any risk of diverting her stated and usual operations.

The first of these arguments is easily answered; for it cannot be admitted, that a simple issue, for which we can choose the most convenient situation, will ever prove so troublesome as ulcers usually do. Of this, indeed, we daily meet with various proofs; there being few complaints more perplexing to patients than ulcers in general are, while we seldom hear of any real distress from issues.

The other objection alleged against the practice of healing old ulcers, is the supposed danger to the constitution, from the retention of a particular kind of morbid matter, which by their means it had been accustomed to throw off.

By those who support this objection it is also said, that although the matter of an issue may be equal in quantity to that of an ulcer, still the difference to the constitution may be material, from the matter which they afford being different; for while the discharge of issues is commonly a mild bland pus, the

the matter of many ulcers is thin, sharp and acrid.

At first view this argument appears to be of importance, and it has probably, with many, been the chief cause of the practice in question being rejected. Upon due consideration, however, it will not appear to be of much weight; for it can be easily shown, that it is more by the quantity than the quality of the matter discharged by ulcers and issues, that they prove useful or otherwise to the constitution.

Thus it is observed, that the stoppage of even a pea-issue, that has discharged nothing but the mildest and most simple pus, proves equally dangerous, as the stoppage of an ulcer discharging nothing but matter of the most acrid kind; a circumstance which would not happen, if the common opinion upon this point was well founded.

And, that the quantity discharged by ulcers should have an important effect

on the system, will not appear surprising, when we reflect on the large proportion of fluids requisite for the supply of an issue, of even a moderate size, with pus. For, besides the quantity that appears and is discharged at the different dressings, a large exhalation and absorption likewise, of the more thin serous parts is constantly and at all times going on; which circumstance alone accounts for the debilitating effects frequently produced by issues, which in point of size are very inconsiderable *.

Were we, indeed, certain that such acrid and putrescent matters, as are frequently discharged by ulcers, previously existed in the blood, and that such sores served merely as drains for these; this would,
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* Upon this subject Sir John Pringle remarks: "As
"near as I could guess, an ounce of serum, upon stand-
"ing some days, did not furnish more of this matter,
"viz. Pus, than what might be produced by the daily
"running of a pea-issue, or of a seton." Vid. Exper. xiv.
Appendix to diseases of the Army.

no doubt, prove a very weighty argument: But as it is probable, nay, I may say, certain, that it is by the ulcer only that such kinds of matter are formed, and that none of them previously existed in the blood, we are induced therefore to consider this argument as of little importance.

Very little consideration, indeed, will make it appear, that no such varieties of matter, as are frequently observed to flow from ulcers, ever existed in the blood. No analysis of the blood has ever been able to discover them: Nor can it be conceived, how fluids so acrid, and so different from the blood of a healthy person, can circulate in the delicate and irritable vessels of the human frame, without producing dangerous or even fatal effects. Now it is well known, that the discharge from some ulcers, especially from those generally termed Phagedenic, is often so acrid, as not only to excoriate the surrounding parts, but even sometimes to render it dangerous for a surgeon to apply the necessary dressings.

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The discharge which in some instances of ophthalmia takes place from the eyes, has been known to be so acrid, as to corrode the neighbouring parts ; and the ferrous evacuation of blisters, although commonly inoffensive, is sometimes possessed of so much acrimony as to produce deep ulcerations in the parts to which they have been applied.

In some cases of scurvy, indeed, a considerable degree of putrescency, even of the blood itself, no doubt, frequently takes place : But it is not in the ulcers which occur in scurvy, that such corrosive humours, as we are now describing, are ever observed ; the phagedenic ulcer of authors, being materially different from the true putrid ulcer, as described by Lind and other writers on scurvy.

Besides, though it were really proved that these kinds of matter actually existed in the blood, even in a completely formed state, how is it possible, that by means of ulcers, or any other drains, the morbid

bid fluids chiefly should be evacuated, and those only left behind that are mild and innoxious? A circumstance which, however improbable it may appear, has always been asserted by those who support the opinion in question.

The obvious insufficiency of this theory should induce us to reject it, though we could not propose a more satisfactory opinion in its place. But, as the various appearances and alterations which take place in the discharge of ulcers, seem evidently in a great measure to depend on some peculiarity of the solids, we are therefore more easily induced to conclude, that other suppositions do not merit much attention.

The general seat of ulcers is in the cellular membrane. Now it is well known, that naturally there is secreted into the cells of this membrane, as there is into every cavity of the body, a thin transparent serum, the principal intention of which is to keep these moist, and to facilitate the
action

action of such muscles as are connected with them. It is this chiefly, with a greater proportion of the coagulable part of the blood, which, with a due degree of heat, as we have elsewhere shown, forms that matter which we call pus; and which we suppose, and indeed find, to be, the natural discharge of ulcers in a sound healthy state of the body; and it is some change induced upon the nature of this fluid which occasions the varieties in the discharge from ulcers, and from the same ulcer at different times. Such changes, though they may frequently be, in some degree, influenced by different circumstances, as will hereafter be observed, must yet, in a great measure, depend upon some particular affection of the vessels that separate such fluids from the blood: For, by means of an external topical application, we can often change the appearance entirely of the matter of an ulcer; which in this manner could not be done, were the change produced upon it to depend on an alteration
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to be effected on the general mass of blood.

Very considerable differences we may suppose will occur in the discharge of ulcers from the difference of the causes by which they are produced: Thus, it may readily be conceived, that a burn will produce a very different effect from a cut, a bruise from a puncture, &c.; and that some difference may likewise occur from the state of health in which the patient may be at the time.

In what manner these different causes operate in producing such various effects upon the solids or secreting vessels of ulcers, is not, perhaps, to be easily explained, nor can we determine precisely what the particular changes they induce upon such parts really are. But, as all the causes of ulcers, with which we are acquainted, are of an irritating or stimulating nature, it is probable that they all act by producing some inflammatory affection on the extremities of such vessels as empty into the sores; and therefore that the nature

ture of the discharge will depend much upon the degree of inflammation that in this manner is excited.

I have already endeavoured to shew, that one certain effect of inflammation is to propel a greater quantity of the red globules of the blood into the smaller sets of vessels, than naturally they are intended to transmit *. This, when it takes place in vessels opening into ulcers, and especially when the inflammation is considerable, will render the matter very different, both in colour, smell, and acrimony, from genuine pus, which I have already endeavoured to prove, is produced from pure serum only.

Upon this principle it is evident, that many of the varieties of matter met with in sores, may be accounted for: But other circumstances likewise occur, which may have some influence in accounting for these. The degree of heat, in which the part is kept, as will afterwards be more particularly remarked, and the remora of the

* *Vide* Chapter I.

the fluids for a longer or shorter time in the cavities of sores, must have no small influence on the consistence of the discharge.

From one or other of these circumstances, or from different modifications of all of them, the various appearances of matter afforded by wounds and ulcers, are very clearly explained, without having recourse to that inexplicable doctrine of their pre-existing in the system. But although it were otherwise, and that the differences observed in the matter could not be so easily accounted for; yet that they depend in a great measure on some peculiar action or conformation of the vessels in the part affected, seems to be still more probable than any other opinion that has yet been advanced; and is just as certain as various circumstances under our daily observation, for which we cannot in any way account, but of whose reality no kind of doubt can be entertained.

Thus, in what manner the nerves, which in their structure are all so similar, act in the

the production of hearing, vision, taste, and all the different senses, is, perhaps, impossible ever to determine; as is also the action of the liver, secretory organs of the mouth, ear, &c. in producing fluids of such different natures from the same mass of blood, and which did not previously seem to exist in it: Only that the facts are so, no body will doubt: And till the contrary is evidently shewn, we have the same reason to believe, that the different appearances of ulcers with respect to the variety of matter which they afford, are at least more frequently owing to some of the local causes I have enumerated, than to any indisposition of the general mass of blood.

I have said, more frequently only, from there being some particular cases of scurvy and other putrid diseases, as has been remarked above, in which the blood is so much dissolved, as to run off by ulcers and other drains in the form of a bloody ichor: such cases, however, are not frequent, except in high degrees of the true scurvy,
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which are not often met with in any country ; and, were they even more frequent than we find them to be, they could never account for all the varieties of matter which we meet with in ulcers.

The principal objection, therefore, that has been made to the healing of old ulcers, seems, on being examined, to be no better founded in theory, than it is, as I have formerly remarked, on real experience. For, although we find it strongly inculcated by authors, never to attempt the cure of these sores, yet all of them have probably been either biassed by that favourite opinion of morbid matter in the system ; or, a few having led the way and laid down principles, the rest have indiscriminately copied from them, without paying any regard to experience.

Nay, I think it may be shown, that long continued ulcers, instead of proving useful, are not unfrequently attended with much risk and danger. Thus, it is common for ulcers on the shin and other parts immediately above the bones, to penetrate

so deep as to affect the periosteum, and sometimes even the substance of the bones themselves; a circumstance we never meet with in an issue, at the same time that every advantage is obtained from it as a drain.

The constitution must likewise, in another point, suffer more from the long continuance of an ulcer, than it probably can do from the substitution of an issue: For it must be admitted, that a considerable part of the matter secreted by ulcers, must be again taken into the system by the lymphatics; and when it happens to be of an irritating or acrid nature, as in sores of long duration is often the case, not only the general mass of blood, but even the solids themselves, must thereby in time be injured.

Accordingly, very considerable obstructions are daily met with in such external glands as are situated in the course of the lymphatics, leading from these ulcers; and as the glands seated internally are, from the same cause, liable to the same affections,

fections, it will not be denied, but that, from this circumstance alone, considerable danger may accrue from ulcers of long duration.

Thus it appears, from every consideration, both of convenience and safety, that the cure of every ulcer should be attempted; and, with the previous caution of inserting an adequate drain, it may always be done without any kind of risk.

This much I have judged necessary to say in general, with respect to the propriety and safety of attempting the cure of ulcers; and I have insisted the longer upon this part of our subject, from the opinion generally received upon this point appearing to be ill founded, and not adopted from experience, but founded on hypothetical reasoning alone.

When the healing of an ulcer, then, is to be attempted, the method to be pursued for effecting it next requires our attention. By almost every author who has written upon this subject, four different states, as they are termed, are enumerated, as being

necessary for an ulcer to pass through in its progress towards a cure, *viz.* those of digestion, deterfion, incarnation, and cicatrifation; and various remedies have been recommended as proper for the different states, and for these only: And, upon this part of the subject, it may be observed, authors have spoken with as much certainty and precision, as if every circumstance in the treatment of ulcers could be regulated at discretion.

Thus all the different kinds of turpentine, as likewise the unguentum *Ægyptiacum*, powders and tinctures of myrrh, euphorbium, aloes, &c. are pointed out as digestives: as detergents, basilicon, linimentum *Arcaei*, mercurius precipitatus ruber, and other escharotics: with a view to promote incarnation, or the growth of new granulations, powders of mastich, thus, and olibanum; and as cicatrifiers to accomplish the cure, we find recommended a variety both of simple and compound applications, particularly all the astringent boles, earths, lime-water, &c.

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Such a number of divisions, however, in the several states or stages of ulcers, with the consequent indications of cure, and remedies recommended for the accomplishment of these, has had the effect of rendering the treatment more complex than we find from more late observation it ought to be. The indications pointed out in the following sections, will, I hope, appear to be just and simple; and I can say from experience, that the method of cure I have ventured to recommend, will be found much more certain than what commonly results from a more complicated mode of treatment.

We now proceed to a particular consideration of the different varieties of ulcer; and in pointing out the several distinctions, it will be observed, that it is obvious circumstances only, and such as at the same time indicate and require some peculiarity in the method of treatment, that I have allowed to have any influence in characterizing a species.

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Thus, ulcers of the first class, will all of them, in their appearances, be found different from one another; and all of them will likewise require something peculiar in the method of cure: And again, those of the second class will appear to be equally well distinguished, and by similar circumstances, not only from each other, but from those also of the preceding class. The first to be taken notice of is the simple purulent ulcer.

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SECTION II.

Observations on the simple purulent Ulcer.

§ 1. *Of the Symptoms, Causes, and Prognosis, of the simple purulent Ulcer.*

THE simple purulent ulcer is entirely local, attended with no great degree of pain or inflammation, and the discharge which it affords is mild and purulent. The granulations which form in it are firm, and of a red healthy appearance, and the cure, when properly conducted, proceeds regularly with little or no interruption, till a cicatrix is obtained.

The simple purulent ulcer may be produced by various causes, but it will be understood, that they must all be such as act locally, and without affecting the system.

In this view we are to consider wounds of every kind that do not immediately unite without the formation of matter; and this whether they may have been attended with loss of substance or not. Under this head we rank all chirurgical operations attended with incision into any part of the body.

Among other causes of this ulcer, may be mentioned, burns, in whatever manner they are produced, whether by fire, hot metallic bodies, or scalding liquids: also bruises; and every external accident that terminates in suppuration, and a subsequent discharge of matter.

I do not, however, mean to assert, that a simple purulent ulcer is always a necessary effect of the application of these causes; for the very reverse of this sometimes happens. Thus burns frequently produce very troublesome vitiated ulcers; and the same kind of sore is apt to occur from contused wounds, and occasionally from all the causes I have mentioned. I only mean to say, that one or other of these

these will in general be found to be the primary or original cause of all such ulcers, whatever appearances they may exhibit before they are brought into the simple purulent state.

With respect to the prognosis in this species of ulcer, it should almost in every instance be favourable; more or less so, according to the loss of substance that has taken place, and according to the situation of the sore, age, and habit of body of the patient. These circumstances being considered, together with what has been mentioned in the last section, when speaking of ulcers in general, no doubt will ever remain of the prognosis to be given.

Before proceeding to a particular investigation of the means to be employed in the cure of a simple ulcer, it will not be improper to offer a few general observations upon the manner in which nature seems to act in accomplishing the cure of sores, and on the effects of such assistance as may be given by art for the same purpose.

§ 2. *Remarks on the Growth of new Parts in Sores.*

THERE is evidently in every ulcer, in its progress towards a cure, a growth of new parts that tends considerably to diminish any vacancy which the disease has produced. This substance, from the granulated form which it assumes, has been generally termed Granulations; and it appears, more or less, in every wound, according as the patient is young or old, healthy or otherwise; insomuch that, in the young and plethoric, this increase of parts is often so considerable, as to rise above the level of the neighbouring teguments, and to require the use of escharotics to repress it.

When the loss of substance is thus, as far as possible, supplied, the remaining part of the cure consists in the formation of a cicatrix. This is effected, either by nature alone producing an exsiccation, as it were, of the surface of the new granulations, and in this manner forming a kind
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of cuticle or scarf-skin; or, it is obtained by art from the use of drying astringent applications.

By the formation of new parts, or granulations, I do not mean to insinuate, that real muscular or other organised parts are ever regenerated; but merely to express that production, which, if the constitution is sound, takes place to a certain degree in the cure of every ulcer.

The real nature of this production is not, perhaps, easily to be determined: but, from the texture and appearances which it exhibits, it is obviously very vascular; from which it is probable, that it consists in an elongation or extension of the small blood-vessels that have been divided, with a considerable proportion of inorganic cellular substance; which, again, is most probably formed by a matter secreted from the mouths of such vessels, to which it chiefly serves as a support or means of connection.

We must not imagine, however, that any very extensive loss of substance is ever
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to be entirely filled up in this manner: for although, in particular circumstances, nature has been known to supply very great accidental deficiencies; yet, in general, her operations of this kind are very limited. In youth, indeed, before the different parts have arrived at their full growth, and while the several vessels are yet daily extending, considerable losses are, often, almost completely repaired: but we ought not, even at this period of life, to attribute, as is commonly done, the cure of sores entirely to the growth of new parts; a process perfectly different seems here to have an evident influence, namely, the decay of the contiguous sound parts, a circumstance that merits particular consideration.

§ 3. *Of the Decay of the contiguous sound Parts in the cure of Ulcers.*

ALTHOUGH, in the cure of ulcers, whether they are attended with loss of substance

stance or not, a growth of new parts, to a certain degree, generally takes place; yet the deficiencies are evidently more diminished by the decay or decrease of the divided parts that remain, than by any other cause. Indeed, the effect of this with respect to a cure, is ultimately the same as if all such deficiencies were actually supplied with a new substance: for, if the cavity of an ulcer is diminished, or even entirely annihilated, by the subsiding or wasting away of the parts with which it is surrounded, the formation of others thus becomes unnecessary: And, accordingly ulcers are often cured, especially in old people, without any evident growth of parts taking place.

This part of nature's process in the cure of ulcers, is to a certain degree obvious even in the smallest sores, but the larger the ulcer, the more evident it becomes: We observe it most remarkably in the cure of that extensive ulcer produced by the amputation of the thigh and other extremities.

ties. In such cases indeed, no considerable formation of new parts ever takes place, while the cure advances, just in proportion as the skin is allowed to contract by the wasting away or decrease of the parts which it surrounds: Nor is this decay or diminution of bulk confined to one set of parts only: it extends equally to all, the bones perhaps only excepted.

Thus, after the cure of a stump, every vessel, even the largest, is almost entirely obliterated for a considerable extent: At least nothing is found to remain of them but the thin membranes that composed their coats, now shrunk into small inconsiderable cords: The fibres of the different muscles are, in the same manner, much diminished; and the cellular substance seems frequently to be almost entirely annihilated. I have happened to meet with several opportunities of dissecting the stumps of patients after death, and the appearances were uniformly what I have here represented.

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There is yet another case of ulcer, in which the cure seems still more evidently to be chiefly effected by the influence of this cause. In a large incised wound, with little or no loss of substance, its edges, in the course of a short time, become swelled and tumefied; they are thereby kept at a considerable distance from each other, and the whole exhibits the appearance of a large foul ulcer. In this situation it would remain for a considerable time, were it either neglected, or treated with acrid irritating dressings: As soon, however, as by warm emollient poultices, and other proper applications, a free discharge of pus is obtained, the inflammation diminishes—the swelling of the surrounding parts subsides—and the fore gradually contracts to such a degree, that its edges, which before were much separated, are now brought near to each other.

The same phenomenon is, in a remarkable degree, to be perceived, in the cure of every ulcer attended with much inflammation; where the chief part of the
treatment

treatment consists in removing the pain, irritation, and swelling, which, in such cases, always take place.

Every small boil is found to exhibit the same appearances: On a boil being laid open, an ulcer is always left, and the cure depends chiefly on the removal of the inflammation and swelling of the surrounding parts.

These, however, it may be said, are only instances of preternatural swellings, perhaps originally excited by the presence of some acrid irritating cause; upon the removal of which, they may be expected to subside, and the ulcers occasioned by them to contract and heal. The same circumstance, however, has been shown to take place even with respect to the substance of sound parts; particularly, as I have already remarked, after the amputation of a member; the blood-vessels, nerves, and muscles, in all such cases, being constantly found to suffer a very considerable decay.

The same thing is likewise known to happen in deep transverse wounds that
penetrate

penetrate through the different muscles to the depth of the bone ; for a cure in these cases, is seldom to be obtained by the first intention, especially when any loss of substance has been produced. In the cure of ulcers which remain after these wounds, an evident decay of the divided parts always takes place : And what shows it in a remarkable manner is, that the vacancy occasioned by a wound of this description, is never so large and conspicuous immediately after the cure, while the patient yet remains lean and emaciated, as it afterwards becomes, when, in the course of time, by the recovery of health and appetite, all the parts of the body, and, among others, those which have been divided, come in a great measure to regain their former bulk ; and when, accordingly, any vacancy occasioned by the wounds, appears to be more considerable.

When, indeed, a wound penetrates only the cellular membrane, or does not entirely divide the muscles, the cavity which it produced at first, in the course of time,

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becomes gradually less, and at last disappears often entirely. This, however, is in consequence of the parts below extending in their diameters; which, in the case of a wound with loss of substance penetrating to the bone, never can happen.

This opinion, with respect to the cure of wounds, depending in a great measure upon the decay of the surrounding parts, was first suggested by a very ingenious French practitioner, Mr Fabre: And, like every new doctrine, it has by some been denied to have any sort of influence; whilst, by others, more extensive effects have been supposed to result from it, than, on examination, it will be found to produce.

Thus Mr Fabre, and Mr Louis, another surgeon of eminance in Paris, assert, that wounds of every kind which do not heal by the first intention, are cured entirely by an *affaïsement*, as they term it, or a wasting away of the extremities of such parts as have been divided; and they absolutely affirm, that there never occurs any
lasting

lasting production of new parts in the healing of fores *.

This assertion, however, is in opposition to daily observation; and seems to be merely the effect of a lively imagination applied to the support of a favourite doctrine: For, although it will be allowed, that a considerable part of the cure of ulcers, especially in old people, is effected by the wasting or decay of the contiguous sound parts, yet all practitioners must admit, that in a great proportion of cases, the formation of that vascular granulated substance we have mentioned, takes place to a considerable extent: In some, particularly during youth, we can scarcely suppress it but with the daily application of escharotics.

As a farther confirmation of this, some remarkable instances might be enumerated from authors, of deep and extensive losses being almost entirely regenerated: This appears, however, to be unnecessary, as

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* Vid. Memoires de l'Academie de Chirurgie, tom. 4.

every candid practitioner will admit that it is so.

But while the opinion cannot be admitted in such an extensive latitude, as some might incline ; yet, from the various reasons which I have given, it will appear in a certain degree to be well founded ; and from all that has been said with respect to it, this inference, I think, may be drawn, that although ulcers are in most instances supplied with a new production, yet to a certain extent the cure depends upon the contraction of the surrounding skin, in consequence of the parts beneath becoming less bulky than they were before.

This, when any preternatural tumefaction has been induced, as is usually the case in scrophulous sores, is effected by the discussion of the swelling alone ; but in others attended with real loss of substance, the extremities of the contiguous sound parts are in the progress of the cure also much diminished.

§ 4. *Of the Effects of Compression in the Cure of Ulcers.*

By these observations on the theory of the cure, a point of much practical importance in the management of ulcers comes to be explained: I mean the use of the laced stocking; a remedy long ago recommended by Wiseman and others, for preventing those œdematous swellings to which patients with ulcers in the legs are almost always liable.

For the removal and prevention of these swellings, the laced stocking is no doubt to be considered as the most effectual remedy; but it proves, I am persuaded, much more frequently useful, by serving to promote that diminution of the adjoining parts, which we have seen to be so necessary in the cure of ulcers: As in this respect its acts merely by the degree of compression which it gives, it must evidently prove equally beneficial in whatever part

of the body fores may be feated ; and accordingly, I have found, that ulcers in the arm, and wherever a constant moderate preffure can be applied, have received more benefit from this than from almost any other remedy.

Preffure for this purpose is moft conveniently made, both in the legs and elfewhere, by a broad roller applied fpirally, from the under extremity of the member to a little above the difeafed part. In ulcers of the legs the roller fhould commence at the toes, and be carried to the knee joint, or at leaft to two inches above the difeafed parts : And, even in ulcers of the thighs, the bandage fhould commence at the toes, otherwife it is apt to produce œdematous fwellings of the parts beneath. With a roller, compreffion can be made more directly on a particular fpot, than with the laced ftocking ; it is more conveniently applied, and it generally gives lefs uneafinefs to the patient. It is likewise more eafily obtained : For the difficulty of fitting a laced ftocking, with that exactnefs
which

which it requires, is so great, that we can seldom get it done, whereas a roller may at all times be easily procured.

Rollers, for this purpose, should be about two inches and a half broad; and on experience we find, that they answer better of cotton, or thin flannel, than of linen or silk. They not only keep the parts warmer, which, in every ulcer, proves useful; but the softness and elasticity of the flannel and cotton prevents them from fretting and galling the parts to which they are applied; an inconvenience we daily meet with in using bandages of linen.

In the application of this bandage, it will be understood, that it should be done in such a manner as particularly to support the skin, and thus to draw the edges of the sore as near as possible together. For as no regeneration of new skin ever takes place, it comes to be an object of the first importance, both in the treatment of wounds and ulcers, to prevent as much as possible the retraction of the divided

skin, for all such parts as it cannot be made to cover, have afterwards for their protection a thin scarf-skin only, which, both in point of strength and appearance, is much inferior to the cutis vera.

From due attention to this, much assistance may be obtained in the cure of wounds and ulcers ; for, in most situations, every wound not attended with much loss of substance, may be made to heal by the re-union of the divided parts ; a practice which in every wound that can occur we are to consider as the most eligible method of cure : When it can be done immediately on a wound being inflicted, it should always be advised ; but when it has either at first been neglected, or considered as impracticable, it may frequently be accomplished afterwards in a later period of the disease.

For, in large wounds, when a free supuration has come on, and the inflammation which originally took place has partly subsided, the sides of the wounds, or ulcers as they then are, may by proper
compression

compression be either entirely united, or brought so far to approach each other, as greatly to diminish the vacancy ; a circumstance which tends much to shorten the cure, and to render it in every respect more easy.

In the application of pressure for this purpose, it will be understood, that it is not to be employed while much inflammation remains ; but as soon as this symptom is nearly removed, it may always with safety be put in practice.

The application of moderate pressure proves so generally useful, that after the inflammatory stage of ulcers is over, it ought in, perhaps, every instance to be employed : Cures may no doubt be accomplished by other means ; but I will venture to say, that in the most troublesome of all sores, viz. habitual ulcers of the legs, more lasting cures will in general be obtained by a proper application of pressure, than by any other means with which we are acquainted.

§ 5. *Of the Advantages to be obtained from Art, in the Production of Granulations in Sores.*

THE chief advantage which in this respect accrues from art in the cure of sores, is the removal of such causes as tend to retard the natural exertions of the system; and although the different obstructions which nature meets with in her progress are exceedingly various, yet they may all with propriety be reduced to two general heads, namely, to such as may be considered entirely as internal, and those again which operate merely as external or local causes.

Under the first of these heads are included all diseases of the constitution, for we find by experience, that a sound healthy state of the system only, is capable of producing proper granulations.

Hence the cure of ulcers occurring in lues venerea, scrophula, and scurvy, can
never

never be properly effected unless the general affection of the habit is first corrected or removed.

We also find, that the growth of new parts is impeded by the system being either too much emaciated, or in such a height of tone and vigour, as to be particularly liable to inflammatory complaints. And I may here observe, that to obviate the effects of either of these states of the constitution, is no inconsiderable part of the method of cure in ulcers of every description.

The local obstructions, again, which occur to the formation of new parts in ulcers, are of various kinds: But they may all be reduced to two general heads; namely, to such as act solely in a mechanical manner by exciting irritation; and those that are evidently of a corrosive nature.

From daily observation, we find, that granulations in sores, are, *cæteris paribus*, most quickly formed when the part is kept free from pain; and the cause is obvious. For irritation, in whatever way it is produced,

duced, must excite in the extremities of the divided vessels, a preternatural degree of spasm or stricture; a state entirely opposite to what we have shown to be the most favourable for the production of new parts; for as this very probably depends, as we have already had occasion to see, on an elongation of the divided vessels, the more completely that these are relaxed, the more readily will such an extension advance.

And we accordingly find, that whatever tends to keep up much inflammation in sores, has a certain effect in putting a total stop to the production of new parts.

Hence the necessity of removing from wounds and ulcers, every extraneous body, or whatever tends to produce irritation; and from this also we account for the great advantage of dressing seldom, and of using mild applications, instead of continuing the ancient practice of dressing frequently, and often with very complex irritating applications.

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The other set of local causes that tend to obstruct the formation of new parts, are chiefly all those vitiated discharges, which, by neglect or improper management, are so apt to occur in every ulcer. For, almost every variety of matter, that differs much in colour or consistence, from good pus, is found to be more or less acrid: Inasmuch that in some instances it not only prevents the granulations from rising, but corrodes and destroys the contiguous parts.

In all such ulcers, our chief object is to correct this acrid matter, which we most readily do by whatever is capable of converting it into what is termed laudable pus; the means best adapted for which will in the ensuing sections be particularly enumerated.

These obstacles to the growth of new parts being removed, nature will always, as far as possible, carry on their formation; and when, in due time, the vacancies produced by sores are supplied, the only part of the cure that remains to be completed,

completed, is the formation of a cicatrix. This, too, is commonly an effort of nature; but it may frequently be promoted by art.

Whilst any deficiencies in sores remain to be filled up, and whilst the parts are for this purpose still shooting and extending, the mildest applications, as I have observed already, are the most proper; but, when the loss of substance has either been repaired entirely, or to such a degree as the strength and other circumstances of the patient will permit, those applications, which, in the extending state of the vessels would have been prejudicial, now become proper and necessary.

Thus, mild styptic powders and washes, by contracting or corrugating the extremities of such vessels as have been divided, and producing an exsiccation of that inorganic cellular substance in which these vessels are enveloped, tend to induce over the surface of sores, that thin covering we term Cicatrix; which, though at first always tender and delicate, yet in
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course of time it commonly acquires greater strength, by receiving a farther addition of thickness from the same cellular membrane by which it was at first in a great measure produced.

Having premised these general observations upon the manner in which the cure of sores seems to be accomplished, and which apply in a great measure to every variety of ulcer, we now proceed to the more particular treatment of the simple purulent ulcer.

§ 6. *Remarks on the Indications of Cure, and on the Remedies employed for the Cure of the simple purulent Ulcer.*

IN the cure of this variety of ulcer, as there is little inflammation, and no preternatural swelling supposed to take place, but merely a vacuity, either from a real loss of substance, or from a retraction of parts simply divided, the discharge at
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the same time being of a mild purulent nature; the only indications that occur, are,

1st, To diminish, as much as possible, any vacancy the ulcer may have occasioned; and,

2^d, To promote the formation of a cicatrix.

For the more effectual accomplishment of the first of these, the concurrence of two circumstances is required; namely, The formation, to a certain extent, of new granulations; and the diminution or decay of such parts as lie immediately contiguous to the ulcer.

We have formerly shown, that either a considerable degree of inflammation, or the presence of acrid matter, are alike detrimental to the production of new parts; so that this part of the cure should consist chiefly or entirely, in such a mode of treatment as tends most effectually to the prevention of both.

In the first place, we should avoid the use of the several warm gums, balsams,
and

and spirituous tinctures, recommended by all the old writers, and still too generally continued by many modern foreign practitioners.

For although, in some varieties of ulcer, remedies of this class may be used with safety, and in certain circumstances with advantage, yet, in the simple purulent ulcer, they very commonly do mischief, and ought to be laid aside; as ought also every application that can irritate or excite much pain: For whatever has this effect, must increase the inflammation; and, consequently, for the reasons we have formerly given, must necessarily retard the cure. Even the common basilicon and linimentum Arcæi of the shops, are, for the same reasons, improper; for every ointment with any large proportion of rosin or turpentine, always excites irritation.

The only advantages that we are here to expect from ointments, is their allowing the dressings to be renewed with less pain than they otherwise could be: And

hence a composition of the blandest materials, is, for such purposes, preferable to every other.

In this view, any ointment similar to the unguentum ceræ of the Edinburgh Dispensatory may be employed: It is prepared with pure white wax, spermaceti, and fresh olive-oil, without any other addition.

The quantities of each of the articles, as there prescribed, are, four ounces of wax, three ounces of spermaceti, and a pound of oil, which form an ointment of a proper consistence, that ought to be kept in every shop, as one of the most useful dressings for all the more simple kinds of ulcers.

In cases of this description, ointments impregnated with the preparations of lead, sometimes prove useful; and as Goulard's cerate is a very neat preparation of this kind, I think it right to insert the prescription which he gives for it.

Take four ounces of refined wax, and one pound of oil; and keep them over a
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flow fire till the wax is melted, taking care to stir them gently. Having previously mixed four ounces of *extractum saturni*, with six pounds of water, add it by little and little to the wax and oil, now cooled in a vessel of a proper size *. Let them be well incorporated together with a wooden spatula, always taking care to let the quantity of water first put in, be thoroughly absorbed before more is added: This cerate may be made stronger or weaker, by adding more or less of the extract. This, as well as every ointment, should be prepared in small quantities, as it is of much importance in the treatment of sores to employ such dressings only as are perfectly fresh and free from rancidity.

Pledgits of lint, spread thin with either of these ointments, seldom excite pain, nor do they ever produce any kind of inconvenience; for although oily applications to sores have been condemned by some,

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* For the preparation of the *extractum saturni*, see page 41.

from an apprehension of their turning rancid ; yet I can say, from experience, that under proper management they never become so. Nor is it easy to suppose that any such preparation, as these we have mentioned, when composed of fresh materials, can ever become putrid between the different dressings of sores, which very rarely ought to be more distant than twenty-four hours from each other.

The frequent dressing of sores is now very generally, and very properly, condemned ; but as practitioners are apt to run into opposite extremes, we find by some it is said that once in five, six, or eight days is sufficient. It rarely, if ever, happens, however, that this can be proper. It affords no advantage to the sore : and I can assert, from frequent evidence of both methods, that the cure proceeds more easily when the dressings are changed daily, than when not renewed so frequently ; and it is besides attended with this advantage, that the patient is kept clean, and the air of his apartment preserved in a more pure state than it otherwise possibly
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can be. I am therefore clearly of opinion, that although the dressings of sores ought not to be frequently renewed, yet that the contrary extreme would prove still more prejudicial: In hospitals especially, where the air is with difficulty kept pure and untainted, this is a circumstance which merits attention; more indeed than we commonly give to it. The circumstance by which we should be chiefly directed in the dressing of sores, is the quantity of matter which they afford: No application should be removed till it can be done with ease; but whenever there is any considerable quantity of matter in the cavity of an ulcer, the dressings should be renewed daily.

The chief inconvenience supposed to arise from the frequent dressings of sores, is the effect which much exposure to air is known to produce upon them; but if new dressings are prepared so as to be immediately applied on the others being removed, every inconvenience from this cause may be avoided. This we may remark, however,

is a point of such importance as to deserve very serious attention; for the too free admission of air to fores, always interrupts the cure, not only by acting as a powerful cause of irritation, but by tending to vitiate the nature of the matter which they discharge.

Another objection has been made to the use of unctuous applications in fores, namely, that they are apt to render the parts soft and flabby, and thus tend to prevent the new granulations from being so firm as they ought to be.

This I know, indeed, to be the effect of a long-continued use of warm emollients, especially of fomentations and poultices: but an ointment of the kind I have mentioned, very thinly spread, never acts in this manner, and it always proves a more agreeable application than dry lint or charpee; which, unless the fores to which it is applied are plentifully covered with matter, are apt to excite much irritation, and in some degree produce the same effects as gentle escharotics; a circumstance
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that seems to have been well known to the writers of the last century, who frequently recommend dry charpee for suppressing the undue growth of parts, when, in the cure of fores, it takes place in too great a degree.

I have long been an enemy to the indiscriminate use of dry charpee or lint in fores. This will appear from the preceding paragraph, which was published several years ago, and I have not had reason to alter my opinion. The effect of custom, however, is so powerful, that it may be long before the use of dry lint is so universally laid aside as it ought to be: but, after much experience, I am clearly of opinion, that a general use of it as a dressing, tends greatly to retard the cure of ulcers; and whoever will have the resolution to deviate from established practice, and will employ any mild ointment instead of it, will receive much satisfaction from doing so. When speaking of mild dressings, I wish to have it understood, that it is in the simple purulent state of

ulcers only, in which they chiefly prove useful. After all that has yet appeared to the contrary, not only in the writings of ancient authors, but even in those of some modern practitioners, I am perfectly convinced, that, in this state of an ulcer, a cure will be more easily and more quickly obtained by mild dressings, than by any other: but in the sloughy foul state of some sores, dressings of this kind it must be owned, have little or no effect; and in such circumstances some of the warm irritating ointments, to be afterwards pointed out, are the only means from which relief is to be expected.

The next circumstance requiring attention, is the means to be employed for preserving the matter of ulcers in a purulent state; and as purulent matter is the mildest and least acrid discharge that ulcers ever afford, nothing should be omitted that can tend to preserve it in this state.

In the variety of ulcer now under consideration, the principal attention which this requires, is the preservation of a due degree

degree of heat in the part affected. This, in every part of the body, is necessary; but more particularly in the extremities than elsewhere, for the natural heat of the extremities is not so considerable as in the trunk and other parts where the action of the heart has more influence.

In Chapter I. when treating of inflammation, I have endeavoured to show, how necessary a due degree of heat is for the formation of pus in cases of abscess. It is equally so in the treatment of ulcers, and therefore merits particular attention: The want of this indeed is not an unfrequent cause of the most simple ulcers degenerating into those of the most inveterate kind.

Whilst any degree of inflammation remains in ulcers, the best method of applying heat, is by the frequent renewal of warm emollient cataplasms; but, as soon as the inflammatory symptoms are nearly gone, these should be laid aside: For they prove so powerfully relaxing, that a long continued use of them is apt to induce, as

I have already observed, too much laxity or want of tone in the parts to which they are applied: And the same purpose may be then answered equally well, by applying over the dressings, compresses of cotton, flannel, or any other covering that most effectually retains heat.

The benefit resulting from due attention to this mode of management, I have frequently experienced; and although not of so much importance in the treatment of simple ulcers, as in those of a worse kind, yet even in the slightest it should never be omitted.

In almost every ulcer, poultices prove highly useful in one stage or other of the cure: and although in those attended with much inflammation, they may no doubt prove serviceable as emollients; yet the degree of heat which they afford, by tending to promote a good suppuration, is, I am persuaded, the chief advantage which they ever produce.

But poultices, when used with this intention, if not frequently renewed,
rather

rather do harm than good ; and, in order to obtain all the advantages that may be derived from them, they should be renewed at least every three hours. But this subject having been more fully treated of in the first chapter, it is not now necessary to enter upon it ; for, the same observations we had then occasion to make on the effects of heat in promoting suppuration, apply with equal force and propriety here.

These different circumstances, namely, the prevention of irritation by mild dressings, and the preservation of a proper degree of heat in the part affected, are the most certain means both of promoting the growth of new parts, and for obtaining and keeping up a discharge of good matter. They should both, therefore, be all along kept in view ; either till there is no farther deficiency to fill up, or till nature appears to have effected as much in the production of a new growth of parts as the circumstances of the case will permit.

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The other most material part of the first indication in the cure of ulcers, is to be obtained, as I already observed, from gentle compression: and this, it may be remarked, is to be employed at the same time, and to be used along with the several applications we have just been considering; for as soon as the inflammatory state of an ulcer is over, and a discharge of good matter induced, slight compression, by means of a roller, may be immediately applied, and should be continued during the remainder of the cure. It should be applied in such a way as not only to produce gentle pressure upon the parts immediately surrounding the ulcer, but also to serve as a support to the skin and other teguments, so as to prevent their retraction, which otherwise, in large ulcers, is very apt to happen.

When, by due perseverance in the various means of cure we have thus pointed out, any loss of substance in ulcers is at last as far as possible supplied, the next indication of cure comes then to require attention,

tention, and that is, the formation of a cicatrix.

For the most part, we observe, that fores cicatrise soon after the process of incarnation, if we may so term it, is at an end; but this does not always happen, for in some instances, even where every deficiency appears to be supplied, still a cure is difficult to accomplish: The surface of the fore remains raw, and at the same time discharges considerable quantities of matter. In such cases, it becomes necessary to lay aside the ointment employed for the preceding part of the cure, and to use applications of a more styptic or astringent nature.

In this view, unguentum album prepared with cerufs, and cerate prepared with lapis calaminaris, are commonly used; but they answer best when the fores are at the same time bathed with lime water, a solution of saccharum saturni, or any other astringent wash: By bathing the fores with one or other of these, two or three times daily, and dressing with one of these ointments,

ointments, a cure will frequently be effected, when it cannot possibly be obtained by emollients: Ardent spirits, too, often answer the purpose, of putting a stop to the discharge of sores in this state, and of drying or corrugating the soft cellular substance upon their surface into a firm cicatrix.

In some instances, again, a proper cicatrix is prevented from forming, by the new granulations being so considerable as to rise above the surface of the contiguous parts. In such cases, we depend upon a proper application of escharotics: Of these the best for common use is blue vitriol and calcined alum; and when these do not prove successful, nothing weaker than lunar caustic will prove effectual.

In slight cases, indeed, a cure is often accomplished by the use of dry charpee alone; a pretty tight bandage being at the same time applied over all.

This, we must observe, however, is a stage of ulcers which frequently proves more perplexing than any other part of the cure: for it often happens, even in
the

the most healthy constitution, and when the preceding part of the cure has gone very properly on, that a cicatrix cannot be induced, and the granulations newly formed continue raw, and do not show any tendency to heal: In this situation, when the means I have mentioned do not prove effectual, compresses moistened in French brandy, being applied under the roller, will often accomplish a cure; or spirits used in this manner, may be alternated with tincture of myrrh, or with a solution of blue vitriol in water: a practice which in different instances I have found to succeed, when the means usually employed have failed.

In the preceding observations I have enumerated such local applications as prove most effectual in the treatment of these ulcers; but in the course of the cure, other circumstances sometimes occur, which likewise merit attention.

In every ulcer, even in those of the most simple nature, rest of body is particularly requisite: insomuch, that, when neglected,

neglected, no remedy with which we are acquainted can be depended upon for a cure; and in ulcers of the legs, it is particularly necessary to keep the diseased limb as much as possible in a horizontal position. Rest and a horizontal posture have indeed been considered by almost all practitioners, both ancient and modern, as necessary for the cure of ulcers in the legs. But in some late publications, it is asserted, that rest is so far from being necessary, that a cure is just as easily performed whilst patients are going abroad, as when under strict confinement.

In some very slight ulcerations, this may sometimes be the case; and, with the assistance of a tight bandage or laced stocking, applied so as completely to support the parts, even sores of a worse kind may be cured, and the patients at the same time allowed to move about. But, in general, so far at least as my experience goes, the regulations upon this point, enjoining strict confinement in ulcers of the extremities, as handed down to us by ancient

cient writers, appear to be well founded; for, according as they are more strictly followed or not, the cure commonly advances quickly or otherwise.

It often happens, indeed, as I have observed above, that ulcers even of a bad nature, are cured without any assistance from confinement or a horizontal posture of the limb. This I have frequently met with; and at this time I have different cases under my care, of ulcers going on towards a cure, whilst the patients are daily going abroad. But their being allowed to take this liberty, has always arisen from necessity; as there is nothing of which I am more convinced, than that ulcers of the legs will cure sooner, more easily, and to more real advantage, whilst the limb is preserved in a horizontal posture, than when the patient continues to take exercise. But when the circumstances of patients prevent us from receiving the advantages to be derived from confinement, we are reduced to the necessity of attempting the cure of ulcers by other

means; and, in such circumstances, nothing answers so well as pressure applied with a roller in the manner I have uniformly mentioned in this, as well as in the former editions of this work.

As confinement, during the cure of ulcers on the legs, proves always inconvenient, various means have been proposed for rendering it unnecessary; and it has not only been said, that cures may be performed without any assistance from confinement or a horizontal posture, but by some it is alleged, that these points of attention are even prejudicial*.

I have already remarked, that ulcers of the legs may be healed while patients are daily going abroad; and especially if a due compression is continued. But, notwithstanding all the arguments adduced in favour of the practice, I have not yet heard of any which ought to set aside the opinion

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* This has been asserted by other writers; but it has been more fully enlarged upon of late, in a very ingenious Treatise upon ulcers of the legs, by Mr Underwood of London.

I have endeavoured to inculcate, namely, that a horizontal posture is highly proper for the cure of every ulcer of the lower extremities. The means proposed by Mr Underwood, I have tried on various occasions; they have sometimes proved successful; but, whatever may have been the case with others, they have never, in the course of my experience, effected cures so easily and speedily, or which have proved so permanent, as the means I have recommended, of employing mild dressings to simple sores, together with a horizontal posture in every ulcer of the leg.

In almost every ulcer, directions have been given by practitioners, for the regimen of the patient; and, in general, a low spare diet is prescribed. Such regulations, however, very commonly do harm; for they seldom fail to relax the habit of body, and to hurt the nature of the discharge. Full living ought certainly to be avoided, for whatever excites fever, proves in the management of ulcers always hurtful; but while this should be duly guarded against,

it is equally proper to avoid the pernicious consequence of living too low. The discharge of purulent matter is so apt to produce debility, that in large ulcers, this circumstance alone proves always hurtful, if the constitution is not at the same time enabled to support it by a proper diet. We always find indeed, that the cure of ulcers goes on more easily when the patient is kept in his usual habit of body, than when his system is much reduced by a low regimen: nay, I have had many opportunities of observing, that ulcers even of the worst kinds, may be soon made to heal by the use of a nourishing diet alone, after having obstinately resisted all the usual remedies.

For the same reasons that a low regimen is improper, the use of purgatives, and whatever tends to excite debility should be avoided. Nor have I ever perceived, that in this variety of ulcer, internal medicines prove useful. I know that medicines of various kinds are frequently given, particularly bark, nitre, and cooling
purgative

purgative salts. But in the simple purulent ulcer, which we are now considering, I never find it necessary to employ any remedy directed to the system at large: The affection is merely local, and local remedies ought to be depended upon for the cure. When, indeed, the matter of a sore is in too great quantity, and especially when thin and acrid, bark, steel, and other tonics, may be given with advantage: But when the local applications I have mentioned do not prove effectual in correcting this, it will commonly be found to originate from some general disease of the constitution: a different species of ulcer will be therefore produced, and other remedies will consequently be required.

SECTION III.

Observations on the simple vitiated Ulcer.

§ 1. *Of the Symptoms, Causes, and Prognosis
of the simple vitiated Ulcer.*

I Consider every ulcer as vitiated, in which the discharge is materially different from that of the purulent ulcer described in the last section.

The most frequent appearances of the matter of ulcers in this vitiated state, are,

1. A thin green coloured discharge, termed Sanies.

2. A somewhat red, and generally very acrid matter, termed Ichor. And,

3. A more viscid glutinous kind of matter, called Sordes.

This last is frequently of a brown appearance, somewhat resembling the grounds of coffee, or grumous blood mixed with water. They are all of them much more fetid than purulent matter, and none of them are altogether free from acrimony ; but that which we generally term Ichor, is the most acrid of any, being frequently so sharp and corrosive, as to destroy the contiguous parts.

From the acrimony of this kind of matter, the ulcers do not fill up with new granulations : They rather become more extensive : And, instead of a red healthy complexion, they are either of a dark brown, or of a black sloughy appearance. The pain in all of them is considerable ; generally more or less in proportion to the acrid state of the matter.

This variety of ulcer may be induced by wounds, burns, bruises, and every other

cause that can produce the simple purulent ulcer ; for even that variety of ulcer, however mild it may have been, if either neglected, or improperly treated, is apt to degenerate into the vitiated ulcer which we are now considering.

It is here also proper to observe, that this alteration in ulcers, from the simple to those of a more inveterate kind, happen more frequently in particular parts than in others : Thus, from the tendons and aponeurotic expansions of muscles not affording the serum required for the formation of purulent matter, ulcers seated in these parts commonly prove more troublesome and inveterate than those seated in the cellular membrane, where the secretion of a fluid proper for this purpose generally takes place.

In vitiated ulcers, that are merely local, and not connected with any disease of the system, when not of long duration, and more especially in healthy patients, our prognosis should always be favourable. But, when the reverse of this takes place ; when
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the patient is old; the ulcer extensive, inveterate, and of long standing; the prognosis should always be doubtful, at least, in such circumstances the cure will always be tedious, and for the most part uncertain.

§ 2. *Of the Cure of the simple vitiated Ulcer.*

I HAVE already remarked, that the matter of ulcers becoming vitiated, proceeds, in general, from some particular affection of the solids or secreting organs in the parts diseased, whereby such fluids are separated from the blood as cannot be converted into good pus. The cause of this I have also endeavoured to explain; and, from the arguments I have advanced, it appears, I think, to consist in different degrees of inflammation, or of increased action in the vessels of the parts diseased, occasioned by one or other of the exciting causes which give rise to ulcers.

Besides the arguments already adduced in support of this opinion, it seems to be farther

farther confirmed by the nature of the remedies found to prove most effectual in the cure, which are chiefly such as prove most powerful in easing pain and abating irritation.

Thus, warm fomentations and poultices frequently prove useful, not only by the relief which they afford from pain, but in altering the nature of the discharge, and converting it into purulent matter: This I have known happen from the first or second application of a poultice, nor should poultices ever be long persevered in after the inflammation for which they are applied is removed, as they are apt to render the ulcerated parts too soft and spongy.

In severe degrees of pain remedies of this kind will not always prove successful. And while much pain continues, the matter will not become better, nor will the fores assume a healing appearance: It therefore becomes an object of the first importance in this variety of ulcer to remove the inflammation, by which the cure is for the most part chiefly impeded.

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When warm emollients fail, we employ opiates, local blood-letting, and escharotics.

In this view, we frequently derive advantage from the internal exhibition of opium; and I have also known pledgits of soft lint dipped in laudanum, and applied to the surface of an ulcer, remove the pain, and induce a favourable appearance over the whole. This purpose is also frequently obtained from the application of leeches to the edges of a sore, which, in some instances, I have known give relief when every other remedy has failed. When the leeches can be made to fix upon the sore itself, they commonly answer best; but when this cannot be done, they should be applied as near as possible to the pained parts.

In this vitiated state of ulcers, when the symptoms do not soon yield to emollients, we frequently succeed by the use of caustic and escharotics. These, when first applied, excite more pain than emollients; but this soon subsides, and leaves a pleasant soothing sensation over the whole parts.

When

When this kind of dressing succeeds, the quantity of matter soon becomes less; from being thin, acrid, and offensive, it becomes bland and purulent; fresh granulations of a healthy appearance sprout up over the whole surface of the ulcer, which soon begins to contract. I am now, therefore, in the daily practice of using remedies of this class, which I constantly employ as soon as emollients appear not to answer the purpose.

In some ulcers, a mixture of red precipitate, or any other escharotic, with basilicon or wax ointment, answers all the purposes I have mentioned; but when they do not succeed in this form, they commonly answer when applied in dry powder over the surface of the sore: Occasionally, however, we meet with cases in which even this does not answer, and in these the application of lunar caustic often succeeds. The caustic should be applied not merely to the edges of the ulcer, but over the whole surface, and renewed every third or fourth dressing, till the matter becomes

comes thick and purulent, and the granulations assume a healthy appearance. Immediately after touching an ulcer with caustic, the parts should be covered with dry lint, as ointments of every kind tend to blunt the action of the remedy. For the intermediate dressings, nothing answers better than a mixture of basilicon and red precipitate, in the proportion of a dram or four scruples of the latter to an ounce of the ointment.

For general use, as an escharotic, in ulcers, red precipitate, or Hydrargyrus Nitratum, as it is now commonly termed, is perhaps the best we can employ; verdigris finely levigated, is also used occasionally for the same purpose, likewise corrosive sublimate, and even arsenic; but all of these excite more pain than precipitate, while they do not in any circumstance appear to be preferable.

For the purpose of changing the nature of the discharge in this vitiated state of ulcers, and converting it into a state of purulency, a variety of other applications have

have at different times been recommended. At one period the gastric juice of sheep and other animals was much extolled as a dressing for this kind of sore, and of late the powder of rhubarb has been recommended; but after having amply tried them both I have not found that either of them answer any good purpose.

While with local applications we endeavour to bring ulcers into a healing state, the habit of body should not be neglected. When the patient is much reduced, his strength should be supported by a full allowance of food, while any tendency to plethora and inflammation should be kept down by a low regimen.

When this vitiated state of ulcers occurs in weak or emaciated patients, Peruvian bark proves commonly useful. In order, however, to answer any material purpose, it should be given in larger doses than we commonly employ. In the quantity of four or five drachms daily it not only gives tone to the system, but for the most part has an obvious influence in correcting the nature of the discharge.

But,

But, in plethoric habits, and especially where there has previously been much tendency to inflammation, the bark should be used with caution: In these circumstances, indeed, it should seldom be given to any extent, till the tendency to inflammation has in a good measure disappeared.

With due perseverance in the remedies and plan of management thus pointed out, if the system is not otherwise unhealthy, the discharge will at last become purulent, and this being accomplished, the most material part of the cure will in a great measure be completed; for the parts being no longer corroded and kept down by constant immersion in acrid matter, they commonly soon put on a healthy appearance; and new granulations being now at liberty to form, any loss of substance produced by the ulcer is soon, as far as possible, supplied.

Ulcers being thus brought to a healing condition, are to be treated during the remainder of the cure exactly in the manner pointed

pointed out in the preceding section, that is, with mild dressings, with due attention to the preservation of a proper degree of heat in the parts affected, together with the application of gentle pressure with a roller, from the time of the inflammatory symptoms being removed.

It frequently happens, however, in this, as in every ulcer of long duration, that although the parts, with proper management, may be brought to put on a healthy appearance; and although the discharge may be converted into the best kind of pus; yet still the sore cannot be made to cicatrise, but continues to discharge as plentifully as ever.

In such circumstances issues often prove effectual, and where ulcers have been of long duration, as the cure will seldom prove permanent, if an adequate drain is not introduced, we ought in every instance to advise it.

For, besides the danger which arises from the practice of healing old ulcers before

fore new drains are inserted, any cicatrix we can obtain generally soon bursts open, as the necessary effect of that redundancy of fluids induced by the retention of those which for a great length of time the constitution had been accustomed to throw off, for a supply of pus to the ulcers.

In every ulcer, therefore, of long duration, the first part of the cure should consist in the introduction of an issue of such a size as may afford a quantity of matter in some degree proportioned to the discharge of the sore. And although the situation of such drains has commonly been chosen as near to the part affected as possible; yet, provided the same quantity of matter is discharged, the situation of the issue need not be an object of attention; and therefore, that which is most convenient for the patient may be fixed upon.

Since the first editions of this work were published, the advantages to be obtained from issues in the cure of habitual ulcers, have in various instances been experienced. In some, cures were obtained by

issues, when every other means of relief had previously failed; and in others, the sores broke out again upon allowing the issues to dry up, and were again cured by having recourse to the same means.

Various instances might likewise be given from authors, not only of the difficulty of curing habitual ulcers unless an issue is previously inserted, but of very pernicious consequences resulting from it. But as the experience of every practitioner must have furnished instances of this, I do not think it necessary to refer to books for authorities.

In sores which have not been of long continuance, however extensive they may be, it would be highly improper to put the patient to the trouble of an issue for their cure. In recent ulcers, the system has not been so long accustomed to the discharge, as to induce any risk from a stop being put to it; but in ulcers of long continuance, I must again say, that a cure can never be attempted with safety, unless an issue of an adequate size is previously inserted.

As

As issues of every kind are attended with some inconvenience, they seldom prove agreeable to patients ; and from this consideration, practitioners are frequently induced to dispense with them : The least consideration, however, must render it evident, that no motive of this kind should meet with attention.

It is chiefly in the vitiated ulcer, that the internal use of nitre has been so much recommended ; but, although I have given it, in this as well as in other varieties of sores, in very considerable quantities, and with every necessary attention, I cannot say that I ever observed any benefit produced by it. Sores, indeed, have been cured, in which nitre was used ; but unless the roller and other local applications were employed at the same time, this remedy, in any of the trials I have made of it, never accomplished a cure.

SECTION IV.

Observations on the Fungous Ulcer.

§ I. *Symptoms and Causes of the Fungous Ulcer.*

BY the term Fungus, I here mean to express every preternatural rising of the parts in sores. For the most part, this kind of excrescence is soft and spongy, but in some instances it is of a more firm texture than healthy granulations.

The pain attending these excrescences is not commonly considerable; though, in some instances, it is otherwise; and the discharge which they afford varies according

according to the variety of ulcer with which they happen to be connected.

Thus, when a hyperfarcosis, the term commonly given to fleshy excrescences in sores, occurs merely from neglect, in a simple purulent ulcer, the discharge frequently continues good; while, on the contrary, when connected with an ulcer discharging vitiated matter, as sometimes happens, the discharge usually continues to be of the same nature.

With respect to the causes of this formation in sores, I have already observed, when speaking of the simple purulent ulcer, that in healthy young people, the new granulations are apt to push forward too much, so as to rise above the surface of the neighbouring parts. This, by pursuing the directions which were then given, may often be prevented; but when these are neglected, as is often the case with poor people, a degree of fungus is thus produced, which frequently proves very difficult to remove.

Another variety of fungus is produced in wounds, by the new granulations being allowed to rise and advance before they are sufficiently found at bottom. In this manner, whether from matter lurking beneath, or from extraneous bodies lodging in the diseased parts, the granulations still continue to advance; but, instead of cicatrising when on a level with the contiguous parts, they go on rising beyond them, till the disease we are now considering is of some duration.

When in this manner a fungus has commenced, it continues to increase, till the cause is discovered by which it was produced, and on this being removed, if the constitution is otherwise sound, the fungus for the most part subsides quickly.

§ 2. *Of the Cure of the Fungous Ulcer.*

THE cure of excrescences in ulcers must in a great measure depend upon the cause by which they are induced: When
produced

produced merely by an overgrowth of parts, and where no disease is found to lurk at the bottom of the sore; when the tumor is extensive, and does not rise to any great height, we should immediately have recourse to escharotics.

Of these a great variety are recommended: By many, even the actual cautery has been proposed, and by others, we are directed to remove at once all fungous parts with a scalpel.

Either of these would in every case prove effectual, and more expeditious than perhaps any other that can be mentioned: But they have such an appearance of severity, as to deter almost every one from submitting to them; especially as it is well known that all such excrescences as we are now considering, can be just as certainly, though perhaps not so quickly, removed by more gentle remedies.

Excrescences of a soft texture may frequently be removed by calcined allum alone: Covering the parts affected with the powder once every two days, will of-

ten prove effectual ; but when the protuberant parts have acquired much firmness of texture, allum alone does not answer : In this case, one of the most effectual applications I have ever employed is a powder composed of equal parts of calcined allum and red precipitate finely levigated : Scarcely any fungus, however firm it may be, resists the power of this escharotic. For several years past, I have been in the practice of using it frequently, and it seldom fails to answer the purpose. Next to this is lunar caustic, which acts more quickly, and does not produce more pain than caustic of the weakest kind ; it seldom fails to produce the proper effect, which is not the case with the others ; and it is not so apt to run and spread over the contiguous parts, which is frequently a very troublesome circumstance attending the other.

The caustic should be melted in water ; and a small brush or pencil being dipt in it, in this manner it should be applied to such
parts

parts as are to be destroyed : And this being done either daily, or every second day, the fungus will be removed in a longer or shorter time, according to the size and firmness of the tumor. A strong solution of verdigrise in water, of crude sal ammoniac, or blue vitriol, will also occasionally succeed in removing these excrescences.

Cases, however, sometimes occur, in which some variety of practice becomes necessary : I have made trial of various articles ; but none ever proves so generally useful as lunar caustic, or the mixture I have mentioned, of calcined alum and red precipitate. I have sometimes used strong solutions of silver and crude mercury, in spirit of nitre ; and the effects of these, as may readily be imagined, are always powerful : They are nearly the same, indeed, being only somewhat more powerful than those we commonly experience from lunar caustic, this kind of caustic being merely a solution of
silver

silver in the nitrous acid, evaporated to dryness.

One ounce of pure quicksilver will dissolve in an ounce and a half of strong spirit of nitre; and this forms, perhaps, as strong a caustic as can be prepared. For other purposes, where milder preparations are necessary, the strength of the remedy may be reduced by using a smaller proportion of mercury and a weak nitrous spirit: But for the removal of a hard callous excrescence, the strongest solution should be employed; it gives no more pain than the weakest, and it always proves more effectual: But in using it, either for warts, or those fungous excrescences we are now considering, it ought never to be applied to any extensive surface at once. When the fungus is inconsiderable, a small quantity of the solution may be applied over the whole of it: But, in extensive affections, it answers better to apply it to a small portion at once; and if different parts of an excrescence are touched daily, the whole will in general be soon removed.

ved. After the application of any kind of caustic, the parts should be covered with dry lint; and not, as is commonly done, with any kind of ointment, which always destroys the activity of caustic.

We have hitherto been supposing, that the surface of the fungus is of considerable extent, and not much raised above the contiguous parts: But whenever the base is narrow, and the height of the excrescence considerable, the most expeditious and easiest method always is, to take it off with a ligature.

When the excrescence is narrow at the base, and in any degree pendulous, a ligature can be applied and easily kept on; but when the tumor is broader below than above, it requires some attention to prevent it from slipping off. It may always, however, be done in the following manner.

A strong needle, with an eye near to its point, and fixed in a handle, being pushed through the tumor at its base, two waxed ligatures must be introduced at its eye,
when

when the needle must be again drawn back, so as to leave the threads with their ends hanging out at each side of the excrescence. In this situation, a firm ligature is to be formed round one half of the tumor, by the two extremities of one of the threads; and in like manner the other half is to be included by the other two, and each of the ligatures being from time to time properly tightened, both halves of the tumor will for the most part soon fall off. The hint of this practice was taken from the description of a curved needle recommended by Mr Cheselden, for the extirpation of diseased tonsils, which, in certain cases, without some such contrivance, could never with safety be attempted.

The fungus being, in this manner removed, the sore is afterwards to be treated in the manner already pointed out for the management of simple purulent ulcers.

The other variety of fungus proceeds, as I have observed already, from matter or other extraneous bodies lodging in sores,
by

by which the granulations which form above them, instead of being firm and healthy, are of a soft spongy texture, and of a pale unhealthy aspect.

The cure of this consists entirely in giving vent to any matter that may be lodged, or removing any portion of bone, or other extraneous body from the sore. This being done, the excrescence begins soon to decay, and healthy granulations forming from the bottom of the sore, a cure is afterwards obtained with common dressings alone: Escharotics have no influence in the cure, for while any extraneous bodies remains concealed in sores, the granulations sprout up almost as quickly as they are destroyed, and on these being removed, all the newly formed parts disappear so quickly, that it is not necessary to apply caustic for the purpose.

These are the only varieties of fungus, which, in local ulcers, ever prove troublesome; excepting, perhaps, that which occurs as a symptom in carious ulcers, and of which an account will be given in its proper section.

SECTION V.

Observations on the Sinuous Ulcer.

§ 1. *Of the Symptoms and Causes of the Sinuous Ulcer.*

WHERE a small portion only of an ulcer is exposed to view, the matter which it affords, collecting either in the cellular substance immediately below the skin, or among the contiguous muscles, and discharging itself by one or more openings, gives rise to what we term a sinuous ulcer.

These sinuses serving as reservoirs, both for the matter formed in the body of the sore, and for that which proceeds from their
their

their own cavities, makes the discharge when the matter of the sinuses is pressed into them, appear to be more considerable than their extent of surface would give cause to expect.

A sinus, as thus described, is the most simple state of the disease: But, by long continuance, or by the use of astringent applications, it is liable to become hard and callous through its whole course; and, in this situation, from its supposed resemblance to a pipe, it is termed a fistula; of which nature is the fistula in ano, a well-known troublesome affection.

The most frequent cause of the formation of sinuses in ulcers, is the want of a free vent to the discharge; which, naturally falling to the most depending part of a sore, if it does not there get easily off, it is apt to insinuate into the soft yielding substance of the cellular membrane, in which it proceeds, till it somewhere or other makes an opening for itself, either upon the surface of the body, or into some of the neighbouring cavities.

Tight

Tight bandages, when applied directly upon ulcers and not made to act likewise upon the neighbouring sound parts for some way both above and below the fores, are not unfrequently attended with this effect: They should always therefore be applied with much care and attention.

In all recent sinuses, and even in those of longer duration, when the parts are so far accessible as to admit of being properly treated, and when the constitution in other respects is healthy, we may very commonly give a favourable prognosis. But when of long continuance, and especially if the sinuses open into any of the joints, or when the parts are of difficult access, the cure, in such cases, becomes both difficult and doubtful.

§ 2. *Of the Cure of the Sinuous Ulcer.*

IN cases of recent sinus, we are directed by all the ancient writers on surgery, and likewise

likewise by many of the moderns, to make use of what they term vulnerary or healing injections. And, in the more advanced states of the disease, when by long continuance the sides of the sinuses have become callous, escharotic injections and powders are recommended. But none of these are to be trusted; and the too frequent use of them has often rendered hard and callous such sinuses as before were of the most simple nature.

Others again have advised to lay the different sinuses open from one end to the other, and, by cutting out all the hardened parts, to convert the whole into one common ulcer, and to proceed afterwards with the cure in the ordinary manner.

In this manner, a cure might no doubt be frequently accomplished; but, besides the great pain, and very unseemly cicatrix, which it never fails to produce, it cannot, in every case, with safety, be put in practice.

Thus, when sinuses run far up the rectum, it can never be attempted; and when,

as is frequently the case, they penetrate deep, and run below either large blood-vessels, tendons, or nerves, this mode of treatment becomes altogether inadmissible.

But although the practice was even free from danger, it ought in almost every instance to be laid aside ; since we can, by a more simple and less painful operation, be always as certain of proving successful, as by simple incision, or by an entire destruction of the parts.

The intention of cure in all cases of sinus, is to produce a coalescence of their sides, so as to destroy any vacuity that may have been occasioned.

The easiest and perhaps best means of accomplishing this, is, first to make a depending orifice for a free exit to the matter ; and then, by gentle irritation, to induce, on the internal surface of the sinus, a slight degree of inflammation, which by experience is known to be the state most favourable to the production of adhesion between the divided parts of an animal body ; so
that

that a firm union of the sides of the sinus may in due time be obtained.

Now both these intentions are fully answered by the introduction of a seton, from the orifice in the ulcer along the course of the sinus, to its other extremity ; where an opening, large enough to receive it, ought to be made in the manner already pointed out in cases of abscess.

The cord of cotton or silk should at first be sufficiently large for the size of the sinus ; to be diminished gradually, as the cure advances, by taking away a thread or two from its thickness every second or third day. At last, when the discharge is much lessened by the vacuity occasioned by the sinus being filled up, the seton should be totally withdrawn ; and a bandage being applied with some tightness over the part, and continued for a sufficient length of time, a complete cure will thus for the most part be effected.

The first step to be taken then, in all cases of sinus, is to discover the direction in which they run ; which commonly we

can easily do, either by the introduction of a probe, or observing where the matter points on being allowed to collect for some time, and from whence it comes, on the part being pressed. And into every sinus opening into the ulcer, a seton should be introduced.

This method of curing sinuses, by the use of the seton, is free from all manner of danger, and is admissible in a great proportion of cases: Even when sinuses run deep among muscles and blood-vessels; and when it would be unsafe, therefore, to use either the scalpel or acrid injections; a seton, introduced by means of the director, in the manner I have already pointed out, may be always employed with safety and advantage.

Neither is the practice confined to cases of recent sinus: It answers nearly equally well in those of long duration: Hence, there is reason to think that it would answer in fistula in ano, were it not rendered inadmissible from the situation of the parts affected. In similar affections in perineo,

I have known it used with much advantage: And in this situation, indeed, it is particularly proper; as the cicatrix produced by the opening of a long sinus in the usual way, with a scalpel, proves in these parts frequently more troublesome and painful to the patient, than even the original disease it was meant to remove.

The sinuses being at last filled up, the ulcers with which they were connected, must be cured in the ordinary way, by the means pointed out in the different sections of this chapter.

SECTION VI.

Observations on the Callous Ulcer.

§ I. *Of the Symptoms and Causes of the Callous Ulcer.*

AN ulcer is said to be callous, when instead of contracting, its edges keep at a stand, turn ragged, and at last, by acquiring a preternatural thickness, rise considerably above the level of the contiguous parts: And, as it is generally from neglect, or improper treatment, that ulcers turn callous, the discharge which they afford is commonly a thin vitiated matter.

It

It is chiefly in this ulcer too, that varicose veins occur as a symptom, especially when the complaint is seated in the legs. This seems to be owing, not only to the difficulty which the blood, in this situation, meets with in its return to the heart; but, in a great measure, to the stricture produced by the callosities on the course of the veins.

By many, this variety of ulcer has been commonly termed varicose; from their supposing them to proceed from, and to be as it were fed by, matter furnished to them from these swelled veins, which frequently have the appearance of opening into them.

This error, however, must have arisen from want of attention to the cause of these swellings in the veins; together with the mistaken notion which has hitherto prevailed of the formation of pus, which was formerly supposed to circulate with, and to be deposited from the blood; but which I have endeavoured in Chapter I.

to demonstrate to be an opinion void of foundation.

Ulcers seldom become callous from any other cause than neglect and improper treatment. When injudiciously treated, either by irritating or relaxing applications, or when entirely neglected, so that fungous excrescences are either allowed to arise, or dressings and other extraneous bodies permitted to remain too long in their cavities; such substances come at last to act as impediments to the farther contraction of the ulcers. And, the small vessels of their edges being thus prevented from proceeding farther in a right direction, are forced to push upwards, and sometimes even backwards, till, by the effect of pressure produced by the necessary bandages, they naturally come to acquire a morbid hardness or callosity; which, as long as it may be allowed to remain, very effectually prevents the farther progress of the cure, however judiciously the sores may in other respects be treated.

§ 2. *Of the Cure of the Callous Ulcer.*

IN our treatment of callous ulcers, the first step towards a cure should be the removal of their edges; for till this is accomplished, however well the disease may be otherwise managed, the process of cicatrification will not take place.

In recent cases, warm emollient cataplasms, when continued for a due length of time, by softening the callosities, will frequently, without any other application, answer every intention of cure. But it is only in the earliest periods of the disease that these prove effectual: for when of long duration, and the edges of the sore have acquired much preternatural hardness, no emollients, or any other discutients, ever produce any obvious advantage.

The only remedies upon which we can place dependence, are the scalpel and caustic: And as the last, when properly managed,

naged, is equally certain with the other, it should, as the easiest, for the most part be employed; and, for reasons mentioned in a former section, the lunar caustic should be here likewise preferred. The solution of silver or of mercury, of which a description was given in the section on fungous ulcers, may be used with equal propriety here: Either this, or the lunar caustic, should be applied every two days to the callous edges of the sores, by which they will be soon destroyed. In this manner, and by continuing the poultices as long as the sores remain foul, they soon assume the state of simple purulent ulcers, when by common treatment a cure is for the most part easily accomplished.

In the list of symptoms, varicose veins were mentioned as one. These, we might imagine, when the cause which produced them was removed, would likewise disappear. This, however, is seldom the case; for when blood-vessels by distension have been deprived of their tone, they do not often recover it soon. In the treatment,
therefore,

therefore, of the callous ulcer, it is not enough to remove the cause which originally produced these swellings in the veins: some support must be given to the weakened parts, in order to enable them with more certainty to recover their natural strength.

Nothing has ever proved so effectual for this purpose as the laced stocking, or spiral bandage, which we have already recommended so frequently for different circumstances in the cure of sores. In order to prove useful, it must, however, be continued for a great length of time. With this attention, it never fails to palliate any inconvenience produced by the disease, so as to render unnecessary that painful operation, so frequently recommended, of extirpating, as in cases of aneurism, the diseased or swelled parts.

The effects of pressure in the cure of sores, I have already taken different opportunities to mention; but they are particularly remarkable in ulcers with callous edges. In sores of this description, the
hardness

hardness or callosity of their edges, is not the only impediment to a cure: the contiguous parts are always much tumefied; and this tumefaction must be entirely removed, before any permanent cure can be obtained.

This swelling of the contiguous parts originates most probably from obstruction in the smaller vessels of the edges of the sores, in consequence of pressure produced by the callosities which surround them: And accordingly it sometimes subsides entirely by the application of emollient poultices alone. But when this does not happen, pressure obtained by a proper and continued use of a flannel roller, will very commonly prove successful.

SECTION VII.

Observations on the Carious Ulcer.

§ I. *Of the Symptoms and Diagnosis of the Carious Ulcer.*

EVERY sore seated upon, or communicating with a caries of a bone, may be termed a Carious Ulcer.

A caries appears to be the same disease in a bone with sphacelus or gangrene of the soft parts; a circumstance which I think is obvious, both from the symptoms, causes, and method of cure.

As the bones are not so plentifully supplied with blood-vessels as the softer parts
of

of the body, the anastomosing of different vessels does not occur so frequently in them; so that, when any considerable artery of a bone is destroyed, the parts which it supplied naturally suffer more than any of the softer organs would do from an injury of a similar nature.

And, as all the blood-vessels of bones are known to pass to them through their surrounding membrane the periosteum, upon which they generally run for a considerable way before penetrating deeper, it is not uncommon for a bone to become carious which has not otherwise been injured than by having a small portion of its membrane destroyed.

I do not, however, mean to say, that a caries must necessarily succeed to the destruction of part of the periosteum; for the contrary frequently happens: And unless the injury has been so considerable, as at the same time either to affect the structure of the bone itself, or to occasion, as I have already observed, the destruction of some principal artery, a caries will
never

never occur from the periosteum being abraded ; but whenever an accident has produced either of these effects, the other will almost constantly take place.

From the first appearance of a bone after being laid bare, if it has not been much injured, we can never at once determine precisely, whether a caries will succeed or not. In mere abrasions of the periosteum, I would from a number of observations, conclude, that there is at least an equal chance that it will not : A short time, however, will commonly resolve the uncertainty.

For if, at the end of the fourth or fifth day, a bone that has been denuded still retains its natural appearance, we may in general with certainty conclude, that no carious affection will succeed ; and may accordingly proceed with the treatment, as if the wound was of the most simple nature, which we could never with propriety do, whilst any uncertainty continued of the state of the bone : And hence the importance of being soon able to determine,

mine, whether a bone laid bare is to be attacked with caries or not.

For, if a cure should be attempted in a case where caries is to follow, and if the fore should be made to cicatrise, all the new parts would be again to destroy, much unnecessary pain would be given to the patient, and a permanent cure much longer protracted than if proper measures had been taken at first.

In general, however, when a denuded bone is to become carious, it usually shows itself in a very short time. By the end of the fourth or fifth day, the bone begins to lose its natural healthy appearance: It turns first of a pale white, and then gets a slight tinge of a yellow complexion; and whenever this begins to appear, there can be no farther doubt of what will ensue.

It sometimes remains, however, in this state, for a considerable time, and by degrees gets a more deep tallow-like appearance; in which state it commonly continues for a longer or shorter time, according

ing to the degree of violence with which the injury has been inflicted: Afterwards it goes through the different stages of brown and dark, till it has acquired a black of the deepest dye, a period at which we may suppose this portion of bone to have arrived at, perhaps, the highest degree of mortification.

The discharge is never of the consistence of good pus: It is generally considerably thinner; and from the first appearance of a caries, it acquires a very disagreeable fœtor, which always turns more considerable as the different stages of caries advance; and at last becomes dark, or even black, at the same time that it is frequently exceedingly acrid.

As the several degrees of blackness or mortification go on, small foramina or holes seem to form in the diseased parts; and by degrees these increase both in size and number, till even the most solid bones acquire a kind of spongy appearance. In this situation, the mortified portion generally becomes loose, and, when pressed

upon, a considerable quantity of greasy kind of matter, with an intolerable fetor, can commonly be forced out from the different openings ; which so taints the whole discharge from the ulcer, and gives it such a very peculiar smell, as renders it scarcely possible for any practitioner who has once known thoroughly what it is, ever to be deceived with respect to the existence of latent caries. Indeed this circumstance alone affords almost as certain a distinction in cases of latent caries, as any that can be pointed out.

In ulcers attended with a carious bone, the new granulations never have a healthy appearance ; they are soft, and more flabby than natural ; and, instead of being red and florid, they have commonly a dark brown complexion.

The granulations, however, commonly advance quickly enough ; and they would frequently proceed too far, if not prevented by art ; a piece of attention always necessary, till the diseased parts of the bone are either cast off by the efforts

efforts of nature, or are cut out by art, so as to admit of the sore being firmly healed from the bottom. And, when neglected for any considerable time, these soft productions frequently increase so remarkably, as to form very large and troublesome excrescences.

We have hitherto been supposing, that only a portion of the substance of a bone is affected; in which case a cure is sometimes obtained by a single lamina only casting off. But the same phenomena take place when a caries has been so considerable, as to affect the whole circumference of a bone. Only, in this case, the caries generally advances more quickly; and, in the course of the cure, it is often necessary that the whole substance of the bone, in the diseased part of it, should be removed.

Such are the appearances of caries, produced by external accidents, laying a bone fairly open to view: But caries likewise occurs in a more latent manner, particularly in ulcers of long duration.

Ulcers of long continuance above the tibia, and other bones not thickly covered with soft parts, by the matter insinuating to the periosteum, and there producing inflammation and suppuration of that membrane, by which the bone itself is apt to be eroded, very often give rise to caries ; and this, as long as it continues, prevents effectually the cure of the ulcers, notwithstanding the use of every remedy that can be employed. For when, by the application of astringent remedies, a cicatrix is in such circumstances induced, the cure never proves permanent ; for the disease, in the course of a short time, always breaks out again.

In cases such as we are describing, when the ulcer is neither deep nor extensive, and the bone still remains covered, a caries is not always easily discovered ; so that practitioners are frequently, for some time, at a loss how to proceed in the cure : With due attention, however, and especially with the aid of experience in similar circumstances,

circumstances, the state of the bone may, in general, be easily discovered.

When by the introduction of a probe at any opening that may be formed, if a roughness is discovered on the surface of the bone, the case at once becomes obvious.

Such information, however, is not always to be obtained ; for frequently there is no evident opening in the surface of the fore ; so that no instrument can get admission. And at other times, even when an opening sufficiently large is met with, and when a caries certainly exists, yet the diseased part cannot be reached with the probe, on account of the obliquity or winding direction of the sinus which leads to it.

Although in such cases, however, the bone itself cannot be immediately reached ; if sufficient attention is given to the appearance of the fore, and to the nature of the discharge, we will not often remain long in doubt.

When the bone is carious, any new parts which may have formed in the ulcer, are commonly, as I have remarked already, soft and flabby; and, instead of forming a regular surface, the new granulations sprout up unequally, and, instead of a healthy red appearance, they have a dark-brown complexion.

These circumstances, when they take place, together with the discharge of a thin, dark, greasy matter from the ulcer, accompanied with the peculiar offensive fetor, which caries always affords, point out the real state of a bone, with almost as much precision as if the bone itself was clearly exposed to view.

§ 2. *Of the Causes and Prognosis of the Carious Ulcer.*

ALL those accidents that can occasion either denudation, loss of substance, or erosion of a bone, have commonly been enumerated as the causes of caries. But
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it is a circumstance well known to practitioners, that the common teguments and periosteum are frequently destroyed, without any degree of caries ensuing; and that even a very considerable loss of substance in a bone may occur, without being followed by this appearance.

The causes, therefore, of caries may, in general, be said to be, whatever can, by erosion or otherwise, destroy the circulation in the whole or in any part of a bone.

In this view, may be mentioned, wounds affecting either the periosteum or bones; violent contusions; and inflammation of the periosteum, from whatever cause it may proceed, when it ends either in abscess or gangrene; the acrid matter of ulcers penetrating to and destroying the periosteum; and the application of acrid spirits and powders to bones merely laid bare; a practice recommended very universally by almost all the ancient writers on this part of surgery. Blood effused upon a bone by the rupture of an artery

tery or a vein, is very apt to produce caries; and I may also mention as a frequent cause of caries, the pressure produced upon bones by large deep-seated tumors, which evidently act by destroying the circulation in the periosteum and bone beneath.

I have observed above, that loss of substance in a bone does not always produce caries. Thus, very considerable portions of the cranium, are frequently taken out when fractured, without any caries of the remaining part of the bone ensuing: And, that the same circumstance likewise happens in many instances, in other parts of the body, I have had various opportunities of observing.

That such occurrences, however, do not so frequently take place in other bones as in those of the cranium, cannot be denied: And the reason probably is, that by a greater proportion of blood-vessels going to the bones of the skull than to any of the long bones, any violence which might otherwise be sufficient for
putting

putting a stop to the circulation in the injured part, may by this mechanism be prevented; and if no stoppage is given to the circulation, no caries will ensue, for it is to this alone, as I have already endeavoured to shew, that in a great proportion of cases this disease of the bones is to be attributed.

In every instance of caries, the prognosis must depend upon a variety of circumstances: The principal of which are,

The situation of the diseased parts; the nature and organisation of the affected bone; the nature and degree of the inflicting cause; the extent of the disease; the age and habit of the patient.

Thus it will readily be allowed, that caries in any of the bones of the skull, ribs, or vertebræ, by these parts being situated above or upon organs so immediately necessary for life, must be attended with more risk, than a disease, in every other respect of a similar nature, in any of the bones of the extremities.

For

For a similar reason, too, caries seated near to any of the joints, from the danger of these becoming affected, is always attended with more risk than when the disease is confined to the middle of a bone.

The consistence or texture of a bone, too, has no small influence in every case of caries; exfoliations being much more tedious, in the hard and compact bones, than in those that are soft and vascular. Thus, although caries is attended with more risk in the skull than elsewhere, if it admits of a cure at all it never in this situation proves near so tedious as in the humerus, femur, or tibia.

The nature of the cause by which caries is produced, should likewise have some influence on the prognosis. Thus, a wound with a sharp cutting instrument, that may have destroyed not only some of the periosteum, but even part of the bone itself, does not generally produce such a deep or extensive caries, as we commonly find succeed
to

to severe contusions of bones, with perhaps no immediate loss of substance.

The extent of the diseased part, is also a circumstance of much importance in the cure. This is, no doubt, the case in every ulcer, but it is more particularly so in all cases of caries; for we constantly find that much more time, in proportion, is required for the separation of a large piece of spoiled bone, than what in general is sufficient for the removal of a smaller portion.

And, lastly, the patient being young or old, healthy or otherwise, are circumstances which necessarily have much influence on the progress of the cure. This happens indeed in every ulcer, but in a more remarkable degree where caries takes place than in others, owing to ulcers of this description being commonly so tedious, that few constitutions are able to support the discharge, if they have not previously been robust and healthy.

These are the leading circumstances requiring our attention, in the treatment of
ulcers

ulcers attended with carious bones ; and it is from a due attention to all of them that a just prognosis is to be formed.

§ 3. *Of the Cure of the Carious Ulcer.*

CARIES being a disease of the same nature in the bones, with mortification in the soft parts, no cure can with propriety be attempted, till the removal of the diseased parts is accomplished.

For if an union of the soft parts should be obtained, the dead portion of the bone beneath not having any connection with the contiguous sound parts, by thus acting as a cause of irritation, would soon produce an abscess or collection of matter, and in this manner would force open the parts newly united.

In a healthy state of the constitution, the separation of mortified parts from such as remain sound, is, in general, accomplished by a natural exertion of the system.

The

The course which nature follows in effecting this, seems, as I have formerly remarked when treating of gangrene, to be through the intervention of a slight degree of inflammation, which forms as it were, a boundary between the sound parts and such as are diseased.

Inflammation thus induced is soon succeeded by a serous exudation from the mouths of the sound vessels: To this supuration ensues, together with the formation of new granulations over the surface of the sound parts below, by which, all the diseased parts are soon completely separated and thrown off.

This happens in the most evident manner in mortification of the softer parts of the body; and it requires very little attention to discover the same phenomena in every case of caries. Only, from there being in the bones, as I have formerly remarked, a more sparing distribution of blood-vessels, and consequently not such a disposition to inflammation, the exertions of nature, for the removal of caries, are
seldom

seldom so obvious or so quickly accomplished.

From these considerations, it is obvious, that our chief indication in the cure of caries, is to excite, and continue as long as may be necessary, such a degree of inflammation in the adjoining sound parts of the bone, as may be requisite for the total separation of those that are diseased.

With a view to this, the diseased part of the bone must be laid freely bare. In some instances this may be done by a simple incision along the course of the caries, but in others we find it necessary to make a crucial incision, or even to take away part of the teguments altogether. And till the disease of the bone is entirely removed, it is necessary, from time to time, to prevent the formation of new parts, at least in so far as might obstruct the separation of the caries.

In former times, it was the prevailing practice, when a bone was laid bare, and whether carious or not, to cover every part of it with powders and tinctures of
aloes,

aloes, euphorbium, myrrh, and other warm gums. This was probably suggested with a view to correct the fetor and putrefaction that always take place in caries; and from custom only it has by some been continued; for the only effects which these applications can produce, farther than that of correcting putrefaction, is to irritate and inflame the soft parts of the fore, without having the least influence on the more material disease of the bone.

For, when the caries is not quite superficial, these substances can never penetrate to, or affect the sound parts of the bone, where alone, by the irritation they would excite, some benefit might accrue from them.

And again, when no caries has appeared, these applications to bones merely denuded of the periosteum, can never, in any respect, be necessary; while they may frequently be the means of inducing disease which otherwise would not have appeared.

Another

Another remedy much recommended by almost every author, in the more advanced stages of caries, is the actual cautery. It ought, however, to be entirely exploded; for, in whatever way we suppose it to be applied, it must certainly do harm.

If applied in such a manner as entirely to destroy the diseased parts of the bone, the sound parts beneath, from the degree of heat necessary for this purpose, must commonly be so much injured, as to be soon rendered equally carious with those intended to be removed.

And, on the contrary, when used in a more limited manner, the diseased part of the bone will not be removed, whilst at the same time much risk will be incurred of retarding the natural exertion of the system for the removal of the disease: for even a very moderate heat will effect the destruction of such granulations as nature may for this purpose have already formed; and the just degree of heat, it may be remarked, necessary for destroying the morbid,

morbid, without affecting the sound parts, it is scarcely possible to determine.

When, for any particular reason, the actual cautery may not be judged proper, it has been recommended by many, to employ artificial caustic preparations; and by others, we are advised, as the shortest process, to strike off at once all the diseased parts with a chisel and mallet.

But the objections to the use of the cautery, which we have stated above, hold equally strong with respect to these: so that every application of this precarious nature should be entirely laid aside; especially as we have it in our power to accomplish the same indication in a much more safe and certain manner.

For the purpose of exciting the necessary degree of inflammation, the most effectual method, and which, in slight cases of caries, proves always sufficient, is to make a number of small perforations over all the surface of the diseased bone, to such

a depth as to give the patient a slight degree of pain, and no farther.

This operation being renewed every third or fourth day, the diseased portion of bone, in the course of a short time, not only loses cohesion between its own parts, but a gentle inflammation being, by the same means, raised and kept up till a free suppuration is produced, the whole mortified mass is generally, in a short time thereafter, entirely thrown off from the sound parts beneath.

These perforations are very conveniently and effectually made by a pin or perforator, such as is used for fixing the head of the trepan; which being fixed in the handle of that instrument, it is thereby wrought with much ease and expedition.

Although this operation, in general, answers the purpose in slight cases of caries, when not of great extent, and which do not penetrate deeper than the first or second lamella of a bone; yet when the disease is extensive, and goes deep into the substance of a bone, it shortens the process

cess considerably, if, instead of the perforator, a small head of a trepan is employed.

This instrument being applied at proper distances over the surface of the caries, and carried to such a depth as to excite a slight degree of pain, that degree of inflammation which we have shown to be so necessary for the cure, is thus very quickly induced: And, at the same time, by converting, as it were, an extensive caries into so many distinct parts, the separation of these from the sound bone below comes to be more easily accomplished, than if the whole surface had still remained in one continued piece.

As soon as any of the parts become loose, their final separation may be always hastened, by daily insinuating below them the end of a common spatula or levator, so as to press their edges gently upwards.

The head of a trepan is frequently employed for taking out a piece entirely when bones become carious through the whole substance of their different lamellæ; but, in the state of the disease which we

are now considering, the caries is not supposed to have penetrated to such a depth, and consequently such a practice cannot with propriety be recommended.

After the use of either of these instruments, the ulcer is to be dressed in the usual manner. Only, as long as any of the caries remains, the putrescency and fetor of the matter are commonly so considerable, that it becomes necessary to employ some remedies to correct it. For which purpose, a strong decoction of Jesuit's bark and walnut-tree leaves is frequently used with advantage: and a solution of camphor in weak brandy is also an application by which this fetor of morbid bones is very effectually corrected. The carious part of the bone should be daily dressed with pieces of soft lint soaked in either of these, whilst the rest of the sore is treated in the manner we have directed in Section II. for the simple purulent ulcer.

This putrescency of the discharge afforded by carious ulcers, is likewise much corrected by the application of lime-water:

ter: If the sores are frequently moistened with soft cloths dipt in lime-water, the matter seldom becomes very offensive; and as this remedy seems to have some influence in destroying the cohesion of offensive matter, it should in most instances be employed. Since I first employed lime-water in ulcers attended with carious bones, I have met with different instances of exfoliations being much promoted by it.

As soon as the carious parts are all removed, the whole being then in the state of a simple purulent ulcer, will fall to be treated accordingly: For, although we are particularly directed by authors, never, in any case of caries, or of denuded bone, to make use of ointments, or greasy applications; yet, as there was never any just reason given for this prohibition, I long ago made trial of ointments in every case of caries; and, no inconvenience ensuing, I have since that period been in the daily practice of applying them as freely to bones as to other parts.

Of the great variety of books I have had occasion to consult upon this subject, none have afforded me more satisfaction than a treatise on carious bones, by the late Dr Monro; and I am happy to find, that the practice I have ventured to recommend, is supported by the authority of such an eminent practitioner; who, after speaking of the application of unctuous substances to bones, not only admits of it as safe, but recommends the practice as exceedingly useful; and says, “I can now, after a great many trials, assure you, that no medicines so effectually prevent the corruption of bones laid bare, and assist to cover them so soon with flesh, as ointments*.”

Hitherto we have been supposing, that the disease does not penetrate far into the substance

* In the same ingenious Dissertation may be seen a particular account of the several species of caries; with a list of authors in different ages, from Hippocrates downwards, who have written upon it, with the several methods of cure proposed by each of them. *Vide* Monro's Works, 4to, Edin. 1781, p. 283, &c.

substance of a bone : but when the reverse of this is the case, and a considerable portion, perhaps, of the whole circumference of a bone is affected ; or when the disease extends even round a whole bone, as in many instances is the case ; the shortest process in this situation is, to take out at once all the diseased parts, either with the head of a trepan frequently applied, or by means of a small spring-saw.

Many inventions have been proposed for cutting out portions of carious bones which lie deep : With a view to protect the contiguous parts from the operation of the saw, it has been advised to cover them with thin plates of steel ; and saws of various forms have been invented for dividing the bone.

Almost every part of surgery is already too much loaded with machinery ; but no operation with which we are acquainted, seems to require less aid from new instruments than the removal of a portion of carious bone. In whatever part of the body the disease is seated, the teguments and

muscles which cover the caries, should be freely divided; and, when the bones of any of the extremities are affected, if this is done to a proper extent, so as to admit of a piece of firm leather being inserted below the bone, for the purpose of protecting the soft parts on the opposite side of the limb, a common straight saw will answer, in almost every case, better than any other. But when the bone lies deep, a small spring-saw of a circular form may be employed for dividing such parts of it as cannot be easily reached by the common saw.

Thus, either by the use of the trepan, or with a saw, any portion of a diseased bone may be removed; a practice which may frequently be employed to much advantage in the skull, in the bones of the hands and feet, and in those of the legs and arms, when the caries does not run into the necks and heads of the bones, so as to affect the joints: In which event, if an anchylosis does not ensue, or if nature does not by some means or other effect a
cure,

cure, amputation of the limb must almost always become necessary at last; a caries of the extremities of large bones being one of the many complaints for which art has not as yet discovered a remedy.

But, whenever a caries is confined to the middle of any of the bones of the extremities, excepting, perhaps, in the thigh, where the thickness of parts is considerable, amputation of the member should never be advised for it: For, with due perseverance and attention, if the patient's health is not much injured, nature may, in general, be so far assisted by removing the diseased parts, that a complete cure will at last be obtained. And in no case whatever should we despair, when the carious part can, with safety, be removed: For, however extensive the disease may be, if we can completely remove it, nature will seldom fail on her part to fill up the vacancy; there being many instances on record, even of whole bones being regenerated.

I have observed above, that in carious affections of the larger joints, amputation of the diseased limb is almost the only remedy upon which we can place dependence: It has, however, been proposed, and even attempted, to save limbs affected in this manner, by cutting out the ends of the carious bones. Mr Park, an ingenious surgeon of Liverpool, has published a treatise upon this subject, in which he gives the history of a diseased knee-joint, where this operation succeeded. Although much merit, however, is due to whoever makes any probable attempt for saving limbs which otherwise would be amputated, and although the public is much indebted to Mr Park for the trouble he has taken to promote the success of this operation, yet, from various circumstances, there is much reason to think, that it will never prove to be of general utility: Besides, of other objections which occur to it, the risk which attends it is evidently greater than what usually results from the amputation of limbs: The extent of ulcer induced

induced by it is greater ; the suppuration is of course more plentiful ; and the matter not so freely discharged. I do not here, however, think it necessary to enter more fully into the discussion of this point, as we shall have occasion to speak of it more particularly in the chapter upon amputation.

During the treatment of a caries, it must be understood that the same attention is requisite to the habit of body of the patient, to his diet and regimen in general, as we have recommended in other varieties of ulcers.

Thus, if he is of a full inflammatory constitution, all heating and very nourishing articles of food should be abstained from ; and, on the contrary, if the system is low and emaciated, as from the long continuance of caries is most frequently the case, a nourishing diet should always be allowed. In such cases, too, as tonic remedies are much wanted, Peruvian bark becomes particularly useful, and it should
always

always be advised in considerable quantities.

The bark indeed is almost the only medicine which, in caries, should ever be given internally : But in some instances, the soft parts which cover a carious bone, become so swelled and painful, that we are under the necessity of advising opiates : And as the pain appears in a great measure to proceed from the distension of the periosteum, in consequence of the bone becoming enlarged, I have frequently been induced to try the effects of slight scarifications, or of bleeding with leeches directly on the pained parts ; by which means relief is frequently obtained, when it cannot be procured by any other means. I may here remark, too, in addition to what has been said upon this subject in a former section, that in every variety of ulcer, attended with much pain, leeches applied either upon the edges of the sores, or directly upon the parts affected, are often attended with the best effects, insomuch that I am now
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in the daily habit of using them, whenever a sore becomes so inflamed and painful as to resist the influence of poultices and the other means usually employed for relief.

In every carious ulcer, as soon as the diseased part of the bone is extracted, the sore which remains is to be treated in the manner already pointed out for the management of that variety of ulcer, to which, at the time, it may appear to belong.

S E C.

SECTION VIII.

Observations on the Cancerous Ulcer.

§ 1. *Of the Symptoms and Diagnosis of the Cancerous Ulcer.*

CANCERS have been generally divided into occult and open. By the former are meant those hard glandular swellings accompanied with frequent shooting pains, and which at last for the most part terminate in an open cancerous ulcer, the usual appearances of which are these: The edges of the ulcer are hard, ragged, and unequal

unequal, very painful, and reversed, being sometimes turned upwards and backwards, and in other instances inwards. The whole surface of the fore is commonly unequal: In some parts fungous excrescences arise, whilst in others we meet with deep excavations. The discharge for the most part is a thin dark-coloured, fetid ichor; and often so acrid as to excoriate, and even to destroy, the neighbouring parts. In the more advanced stages of cancer, from some of the blood-vessels of the ulcer being eroded, considerable quantities of pure blood are often discharged.

Patients labouring under the real cancerous ulcer, universally complain of what they term a burning heat over the whole ulcerated surface; and this we may remark is for the most part the most tormenting symptom attending the disease.

These are the most frequent symptoms of cancer; but the appearances which this disease assumes are so various, that it is almost impossible in any description to comprehend all of them.

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In addition to this, however, I may remark, that we derive some assistance in the diagnosis of these ulcers from their situation, for although cancers occasionally occur in every part of the body, yet we meet with the greatest proportion, either evidently in the substance of one or more glands, or in those parts where glands are known to be most numerous. Thus, six times the number occur in the lips and breasts of women, than in all the rest of the body besides.

§ 2. *Of the Causes of Cancer.*

VARIOUS circumstances have been mentioned by authors as the cause of cancer, and various remedies have been recommended for the cure. But the little success which still attends our treatment of cancer, shows evidently, that the opinions which have been formed of it, have been more founded in theory alone, than on practice and observation; for there is no
disease

disease to which the human frame is liable, that has baffled the power of art more than this variety of ulcer.

Although a thorough acquaintance with the theory of cancer might probably throw some light upon the method of cure; yet as all that has hitherto been offered, or perhaps as yet discovered upon the subject, is merely speculative, and not supported by experience, any account we could give of it, would neither afford entertainment nor instruction. Before going farther, however, I shall examine with attention the opinion that has hitherto very commonly prevailed, of cancer proceeding from a general affection of the system.

This is a point, I may remark, of much importance in practice: For if it was once established, that cancers are at first always local, no objection could be made to their cure by extirpation, as at present there is by many, who contend, that cancers, in every instance, proceed originally from some disease in the system; and consequently, that removing them can have no

other effect than to make the disease again break out in the same or in some other part of the body. In which they say they are confirmed, from attending to the little success which we commonly derive from the extirpation of cancer; the disease, as is alleged, generally returning, in a great proportion of all that are cut.

If this argument were founded in fact, it would no doubt merit some attention; **though**, even in this case, it ought not to be considered as conclusive against the operation, as will hereafter more evidently appear. It will soon however be demonstrated, and to many indeed is already known, that a much greater proportion recover and do well after the extirpation of cancers; and it is probably the fault of surgeons, or of patients, only, who generally delay the operation too long, that the number of those who recover is not greater than hitherto it has been.

It is of the more importance to have the point in question considered, as the
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only account of the success from extirpation, which, till lately has appeared in this country, gives so bad a prospect of recovery, that it seems to have had the effect of deterring many from submitting timeously to this operation; which, for every case of cancer, is the only remedy upon which we can depend for a cure.

I think it probable too, that the same publication, as coming from good authority, has had much influence, even with practitioners, in making them much more backward in undertaking the extirpation of cancers, than they otherwise probably would have been.

The publication to which I allude, is that of the late justly esteemed Dr ALEX. MONRO, in Vol. V. of Edinburgh Medical Essays; where the Doctor says, "Of near sixty cancers which I have been
" present at the extirpation of, only four
" patients remained free of the disease at
" the end of two years: Three of these
" lucky people had occult cancers in the
A a 2 " breast,

“ breast, and the fourth had an ulcerated
“ cancer on the lip.”

The Doctor likewise observes, that of the few he had an opportunity of seeing the disease relapse in, it was always more violent, and made a quicker progress, than it commonly did in others on whom no operation had been performed. He therefore proposes by way of question, “ Whether ought cancerous tumors to be extirpated, or ought the palliative method only to be followed when they cannot be resolved?” and, upon the whole, he concludes against their extirpation, except in such as are of the occult kind, in young healthy people, and that have been produced by bruises or other external causes. In all other cases, the Doctor observes, it should be the patient’s earnest intreaty only, after the danger of a relapse has been explained, that should make a surgeon undertake the operation.

That Dr Monro, from observing the disease return so frequently, should be of this opinion, is not surprising: And if no
better

better success should, in general, attend the extirpation of cancers, it would no doubt be an objection to the practice; and this especially, if all the cases which relapse, should be attended with more inveterate and more painful symptoms, than either occurred before the operation, or than probably would have taken place, if the tumors had not been extirpated.

But the experience of many practitioners since Dr Monro's publication, has been attended with much greater success; and one late publication upon the subject, of which we shall afterwards take notice, puts it beyond a doubt, that a much greater proportion have recovered from cancers by means of extirpation, than of those which were treated in the same manner in the course of his experience. It will not therefore appear to be improper, to attempt to discover the reason of the Doctor's great want of success in such cases, in comparison with what others have met with: And

this, it is presumed, will not be difficult to do.

It may, I think, be considered as certain, that the sooner cancerous ulcers are removed after their appearance, the greater will be the chance of the operation proving effectual, and vice versa. Now, it is probable, that the high rank which Dr Monro bore in his profession, both as an anatomist and surgeon, would be the means of his being applied to for more bad and old cases of cancer, as well as of other complaints, than perhaps any other practitioner of his time. Patients in the country, with slight cases of cancer, have them generally taken off by their own surgeons; but whenever they become of an inveterate nature, by long standing or otherwise, they always resort to a town; to the capital, when they can conveniently do so; and there the most eminent in his profession is naturally consulted. This being the case, we need not wonder at the want of success in many of the operations performed in such cases of
cancer

cancer as occurred to Dr Monro. From the cause to which I allude, a great proportion of these would be of the worst kind; so that we need not be surpris'd either at the bad success of the operations that were advis'd, or at the opinion which the Doctor afterwards form'd of them.

While such unfavourable cases as these we have represent'd, would most frequently occur to Dr Monro in private practice; those which he would meet with at the Infirmary would, in general, be equally bad. For, in every hospital, it is commonly the worst cases that are met with; as, before applying for this kind of assistance, private surgeons are usually consult'd, who generally retain the patient under their own management, if the case does not appear to be desperate, or if any reputation is likely to be got from an operation: While, on the contrary, when the disease is evidently inveterate, and when an operation therefore would probably be attended with much risk, the patient is

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always

always sent to a public hospital. So that no fair judgment, from the result of such experience, in cancerous cases especially, can ever be formed, unless at the same time these different circumstances are properly considered, and due allowance made for them.

This, in my opinion, is the only way in which the great want of success which attended the extirpation of cancers in the course of Dr Monro's experience, can be accounted for; and it explains it, I think, in a very satisfactory manner: So that the only conclusion that can be drawn from this part of the Doctor's paper, is, that there is little chance of success from extirpation in the more advanced states of cancer; a circumstance which ought, therefore, to make us advise the operation in the earliest stages of the disease, when there is much reason to think that in general it would prove successful.

Such expectations will probably, by many, be considered as too sanguine; and they no doubt would be so, if the success
which

which in general attends the operation, was all that could be attained: But its proving, for the most part, unsuccessful, should by no means be imputed either to the nature of the disease, or to the fault of the remedy; but entirely to its being, in a great proportion of cases, delayed too long, till the system has become so much infected, that we should rather wonder at the operation succeeding so frequently, as even in the general course of practice it is found to do.

This being a very important practical question, I think it right, in support of the opinion which I have given of it, to introduce a short abstract from a late publication on cancers, by the late Mr James Hill, an eminent surgeon in Dumfries, who, in the course of an extensive practice, had more experience in the treatment of cancer, than often falls to the share of an individual.

In the year 1772, the date of this publication, Mr Hill had extirpated from different parts of the body, eighty-eight
genuine

genuine cancers, which were all ulcerated except four ; and all the patients, except two, recovered of the operation.

Of the first forty-five cases, only one proved unsuccessful ; in three more, the cancer broke out again in different parts ; and in a fifth there were threatenings of some tumors at a distance from the original disease. These tumors, however, did not appear till three years after the operation, and the woman was carried off by a fever before they had made any progress. All the rest of the forty-five continued well as long as they lived ; or are so, says Mr Hill, at this day. One of them survived the operation above thirty years ; and fifteen were then alive, although the last of them was cured in March 1761.

Of the next thirty-three, one lived only four months ; and in five more the cancer broke out afresh, after having been once healed. The reason why, out of forty-five cases, only four or five proved unsuccessful, and six out of thirty-three, was as follows :

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"The extraordinary success I met with," continues our author, "made cancerous patients resort to me from all corners of the country, several of whom, after delaying till there was little probability of a cure by extirpation or any other means, forced me to perform the operation contrary both to my judgment and inclination."

Upon a survey in April 1764, made with a view to publication, the numbers stood thus: Total cured of different ages from eighty downwards, sixty-three; of whom there were then living, in all thirty-nine. In twenty-eight of that number the operation had been performed more than two years before, and in eleven it had been done in the course of the two last years.

So that, upon the whole, after a course of thirty years practice, thirty-nine of sixty-three patients were alive and sound; which gives Mr Hill occasion to observe, that the different patients lived as long after the extirpation of the cancers, as, according to the bills of mortality, they would

would have done, had they never had any cancers, or undergone any operation.

The remaining twenty-five, which completes the eighty-eight, were cured since the year 1764. Twenty-two of these had been cured, at least, two years; and some of them, it may be remarked, were seventy years, and one ninety years old.

In the year 1770, the sum of the whole stood thus: Of eighty-eight cancers, extirpated at least two years before; not cured, two; broke out afresh, nine; threatened with a relapse, one; in all twelve, which is less than a seventh part of the whole number. At that time there were about forty patients alive and sound, whose cancers had been extirpated above two years before.

I have been the more particular in giving this account of Mr Hill's success in cases of cancer, as it is the latest, and perhaps the most considerable, even in point of number, that the public was ever favoured with: And I am the more readily induced to it, from having assisted at many
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of the operations ; and from knowing that no fallacy or mistake could occur in the relation, Mr Hill having been so exact, as to keep a register of every case of importance that came under his management.

From these and other authentic facts, which if necessary might be adduced, of the success attending the extirpation of cancers, there is much reason to conclude, that the disease, in general, is local ; and that a general cancerous taint seldom, or perhaps never, occurs, but in consequence of the cancerous virus being absorbed from some local affection.

The particular nature of the cancerous virus, I do not pretend to know ; nor will it perhaps be ever discovered : But it is not unreasonable to suppose, that external accidents merely, may produce such an effect upon particular parts, as to induce the formation of a matter, even as acrid as that of cancers appears to be.

Thus we have daily instances of vitiated sores producing very acrid matter, which could not previously have existed
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in the blood : And, if this is the case, why may not some peculiar affection of a part contribute to the formation of a cancerous matter? The one may be conceived *à priori*, just as probably to occur as the other ; and it does, I apprehend, as certainly do so.

The ordinary situation of cancers may, in some measure too, account for the discharge which they afford being even more acrid and virulent than that of any other kind of ulcer. For being in general seated in the glands, which are known, even in more simple affections, never to produce good matter, it is not improbable, but, by some peculiar irritation applied to a gland, that such a disposition may be induced in it, as to terminate in the formation even of the cancerous matter ; which being allowed to remain, and absorption to take place, the whole system comes at length to be as it were saturated with it ; and, thus, a general affection, or what may be termed the Cancerous Diathesis, is produced,

duced, from what at first was only a local ulcer.

I have thus endeavoured to show, that cancer may be produced by external accident merely, without having recourse to the supposition of any internal affection. But those who think that the latter always previously takes place, allege that, "Although external violence sometimes apparently excites cancer; yet that it would never be produced in this manner, unless a predisposition subsisted in the habit at the same time; and that, although cancers from this cause succeed in some instances to external accidents, yet that in most instances they occur without the intervention of any violence whatever."

That this is the case will not by any practitioner be denied: But it may, however, be explained upon very different principles from what it commonly has been; and in a manner, too, that will rather tend to confirm the opinion of cancer being, in general, a local affection.

I have already observed, that, in a great proportion of cases, the glands appear evidently to be the seat of the disease; which renders it probable, that, in all, they are the parts originally affected; and that the neighbouring soft parts come only to suffer in consequence of their vicinity to these: Or perhaps, in some few cases, cancerous ulcers may break out in parts not glandular, from the whole system being tainted by the absorption of diseased matter from the long continuance of a cancerous gland in any one part.

This being the case, we may easily conceive how single glands may become affected, without the intervention of any evident external cause: For the circulation in the glands, being carried on by a set of vessels much more minute than those with which other parts of the body are supplied, obstructions will more readily and easily form in them; and a gland being once obstructed, the stimulus and irritation which it excites, may, it is probable,

ble, have nearly the same effect, and be attended with the same consequences, as commonly occur from a blow or a bruise.

In this manner, too, may be accounted for, without having recourse to any peculiar cancerous disposition in the system, all those cases of cancer that occur from inflammation in the breasts of women; as likewise those which so frequently happen to women about the period at which the menses leave them; and also such as sometimes succeed to fevers and other diseases, and of which, in some instances, they seem, as it were, to be the termination.

In every affection arising from any of these causes, there is always a preternatural flow of blood, or of some other fluid, to the affected part: which, when it happens to be to the cellular substance, an abscess is produced; when to the pleura, membranes of the eye, or any such parts as from their firmness of texture do not favour the extravasation of fluids, violent inflammation ensue; and, when the substance of a gland

is the part to which a determination is made, it being neither, as we know from experience, so proper as the cellular membrane for the formation of pus, nor from its softness so susceptible of inflammation as a membrane, an indolent hard swelling, is, merely by the obstruction and distension of the vessels of the gland, very naturally produced. And a tumor of this kind having once taken place, it generally remains for some time in its original indolent state, till, by increase of bulk, or perhaps from external violence, an irritation sufficient to excite some considerable degree of inflammation is applied to it; which, being prevented by the nature of the affected part from ending in suppuration, generally at last terminates in what we call Cancer, as in other soft parts of the body it would in gangrene, if not previously resolved, or brought to suppuration.

This objection, therefore, of cancer appearing more frequently without than with the intervention of external accident, does
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not, when properly considered, appear to be of any importance: and from the whole of what has been said, this conclusion, I think, may be drawn, That cancers, in very few instances, perhaps in none, ever arise from a general affection of the system; but, on the contrary, are, at their first appearance, almost always local.

Such a conclusion, were we better acquainted with the nature of cancer than as yet we are, would, it is probable, appear to be founded in fact. The reasons for adopting it, appear to be stronger than any that have been adduced in support of the contrary opinion: And, at any rate, it can never prove so detrimental to mankind, as the contrary opinion would do, were it universally adopted; for, by preventing patients with cancer from having the disease extirpated, it would, as long as it prevailed, be the means of their neglecting the only remedy which, so far as we know, ought ever to be trusted.

With respect to that circumstance, taken notice of in the paper lately quoted

from Dr Monro, of cancer being always more violent, and making a quicker progress upon returning after extirpation, than in patients on whom no operation had been performed, this may in some instances be the case, although I have met with no instances of its being so: But were it even to happen frequently, yet still it would not be a valid objection to the practice of extirpation; and would appear only to be an additional reason for our advising the operation at an early period of the disease, in order to guard as much as possible against the possibility of a return.

§ 3. *Of the Treatment of Cancer.*

FROM all that has been hitherto said, it is evident, that little is to be expected in the treatment of cancer from internal medicines: Nor is any dependence to be placed upon external applications, farther than

than with a view to palliate particular symptoms.

A variety of remedies have at different times been held out to the public as cures for cancer; but none, it is probable, was ever more extolled than cicuta; a remedy, however, which, in this country, has by no means answered the expectations that at first we were led to form of it.

The inefficacy indeed of cicuta has now proved so universal, that there seems little occasion here to say any thing with respect to it: I shall only just observe, that although in various instances I have known it exhibited with all manner of attention; yet, in real cancer, I never knew it, nor indeed any other remedy, produce a cure.

In simple cases of indurated glands, I have frequently, indeed, known cicuta prove useful; and in the advanced stages of cancer, where excision has been determined against, I have in different instances known it give relief, and render the discharge less acrid than it was

before : But this is all the credit that it merits, and the removal of cancer by extirpation being the only remedy upon which dependence should be placed, it ought in every instance to be advised almost as soon as the disease is known to exist.

Some remarks will be offered on the mode of operating for the removal of cancer when we come to treat of cancer of the mamma and testis. It may not, however, in this place, be improper to introduce a few general observations on the subject.

1. The removal of cancer should, even in the slightest and most trivial cases, be done with the scalpel in preference to caustic ; the use of which, though in one form or another much recommended by many, ought, for obvious reasons, to be laid aside.

The irritation generally produced by caustic, together with the pain and inflammation which ensue from it, are in all cases of cancer very strong objections

jections against it. Plunket's remedy, which is evidently a kind of caustic, and which appears to consist chiefly of arsenic, has, like every other medical secret, been greatly extolled; but it is not probable, if the cases in which it has been used were known, that it would be found to have produced any advantages which might not more speedily, and with more certainty, have been obtained from the scalpel.

2. In whatever part of the body cancer is seated, every part of it should be removed, otherwise no advantage will be derived from the operation. Even every indurated gland in the neighbourhood of a cancerous sore, should just as certainly be taken away as the ulcer itself; for if allowed to remain, a return of the disease may with certainty be looked for.

Although it is always proper, however, to extirpate every part that is diseased, none of the external teguments should be ever unnecessarily destroyed, nor should more of them be taken away than is al-

together requisite : For the smaller the cicatrix that remains after the cure, the less will be the consequent irritation : And perhaps from this circumstance, too, the chance will be less of the disease returning.

At least, in the Infirmary of this place, the extirpation of cancerous lips has of late proved much more successful than this operation usually does ; and the only obvious cause for it is, that during that period, in a great proportion of cases, the operation has been performed in the manner commonly practised for the hare-lip ; whereby not only a very narrow cicatrix is left, but the deformity attending it is inconsiderable : And another very agreeable circumstance to the patient, is, that he can always retain his spittle, or any other liquid, just as well as before the operation ; which is not the case when any considerable portion of the under-lip has been extirpated in the ordinary way.

I also think it right to observe, that very extensive ulcers in these parts admit
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of being treated in this manner; for the lip being composed of parts of easy extension, it cannot, but from experience, be imagined, how far they may be brought to stretch. In some instances, where more than half of the under-lip has been taken away, I have brought the remaining parts to stretch so far, as to admit of a cure being effected in the hare-lip form, and with little deformity being produced. And, in like manner, in cancers of the mamma, when the external teguments are not wholly diseased, so much of them may, in general, be preserved, as will be sufficient for covering a considerable part of the wound, by which the cure will be accomplished, both with more certainty and expedition than it otherwise would be.

When the skin and teguments which have thus been preserved, can be retained in their situation, either by the uniting bandage, or pieces of adhesive plaster, it ought always to be done; but in general it answers better to secure any loose portions of the parts which have been divided,

vided, by means of the interrupted or twisted futures. The difference of pain produced by this is inconsiderable; and we are always more certain of securing the skin with ligatures, than by any other means.

In the ordinary method of extirpating cancerous breasts, a very extensive sore is always left: By the retraction of the divided skin it frequently appears to be at least twice the size of the tumor newly removed: By this means a copious supuration takes place, which in weakly constitutions proves alway prejudicial; the cure is always tedious; and the cicatrix which remains, being of considerable extent, the parts are afterwards much exposed to injuries. No more skin should therefore be removed than is really diseased: If a simple incision is made through the skin and cellular substance along the course of the tumor, all the sound teguments which cover it may thus be separated from it; and on the tumor being extirpated, and the teguments again replaced,

placed, they may be retained in their situation in the manner we have mentioned, either by ligatures, the uniting bandage, or with the assistance of adhesive plasters. In this manner I have in different instances accomplished the cure of sores remaining after the extirpation of cancerous breasts, in the space of three weeks or a month; which, in the usual method of performing this operation, would not have healed in less than eight or ten weeks.

3. After all the cancerous parts have been removed, if the sore cannot be entirely covered by such portions of the skin as have been saved, and if any considerable quantity of blood is discharged by the smaller vessels, the remaining wound should be dressed in the usual manner with dry lint; but when this does not happen, no dressings answer so well as pledgits of one or other of the mild ointments I have already pointed out: And when the dressings can be easily removed, by a free supuration coming on, the sore being now in the state of a simple ulcer from any
other

other cause, must be treated accordingly, and a cure promoted as quickly as possible.

4. But some little time before the sore heals up, an issue should be introduced, so that it may come to discharge freely before the cicatrix is formed. This is particularly proper when the disease has been of long duration, or produced by a redundancy of fluids in the system, either from suppressed menses, or any other cause. In this manner, issues I conceive may frequently prove useful in preventing the return of cancers after extirpation.

It has been sometimes advised, as the best method of forming an issue, to keep the part open from whence a cancerous tumor has been extirpated. I strongly suspect, however, that the irritation produced by an issue, directly upon the old seat of a cancer, may sometimes do mischief: And as all the advantages attending the practice are probably to be obtained from issues wherever they are seated,

ed, I would therefore always advise the sore itself to be healed quickly, and an issue introduced in some other part. After cancers of the mamma it was at one time a frequent practice in the Royal Infirmary here, to put a seton into the side, near to the original seat of the disease: As it appeared to produce considerable advantages, and as the side is perhaps as convenient a situation for a drain as any other, it may therefore be preferred.

These are in general the different circumstances requiring attention in the extirpation of cancers: And as, from what has already been said, the removal of the diseased parts seems to be the only effectual remedy in cancer, there are few circumstances only, which should ever prevent us from putting it in practice: And these, in general, are,

1. When cancerous ulcers, and scirrhus glands, have appeared in different parts of the body, the removal of one of these, as it would not probably prove effectual, so,

so, in such circumstances, the operation ought not to be advised.

2. When a cancerous tumor adheres so firmly to the parts beneath, that the whole cannot be removed, whilst at the same time it might be dangerous to extirpate along with it those parts with which it is connected, extirpation can never be advisable. Thus cancers adhering to the trachea arteria, or to the coats of a large artery, can never, without much hazard, be extirpated.

One instance of the rashness of a surgeon, in attempting an operation in such circumstances, fell within my own knowledge. In an attempt to cut out a large scirrhus tumor, seated upon, and lying immediately contiguous to, the femoral artery, and so high in the thigh, that a tourniquet could not be applied, the artery was unfortunately opened, and the patient died immediately.

But the attachment of cancerous tumors to the circumjacent muscles or tendons, should never entirely prevent their extirpation;

extirpation; for considerable portions of these may, without much inconvenience, be taken away along with them. Thus we are often under the necessity of taking away large portions of the pectoral muscle, along with cancerous tumors of the mamma, and for the most part without any important consequences.

In a paper upon cancer, by the celebrated Monsieur le Cat of Rouen, inserted in the first volume of Memoirs of the Academy of Surgery at Paris; the author is clearly of opinion, that extirpation is the only remedy to be depended on, and advises it in the most desperate cases. On the point which we are now considering, he goes a much greater length than from experience I could venture to do: But independent of such a respectable author, and of the instances he mentions of the success of his practice, I think there is no cause to doubt of its being better to follow his advice, than to allow a patient labouring under cancer to remain with the certain prospect of suffering a miserable death, without making

making trial of the only remedy which art can afford. For, however fixed a cancerous tumor may be, if the parts to which it adheres, can without much danger be removed, and if the case is otherwise favourable, the operation ought undoubtedly to be advised *.

This was my opinion several years ago, when the first edition of this work was published. Since that period, I have met with many instances of very bad cancers, particularly of the mamma; in some of which, attachments occurred to the periosteum of the ribs; and in others, the disease was found to extend to the corresponding clavicle, and frequently by a chain of indurated glands to the very bottom of the arm-pit. Very few cases, however, have occurred, in which, by cautious dissection,

* Upon this subject M. le Cat expresses himself thus :
“ L'adherence d'un cancer aux muscles pectoraux, aux cotes même, ne fera pas un excuse valable, si ces muscles, si ces attaches de la tumeur aux cotes peuvent être emportés, de façon qu'il ne reste, que de sain au delà.”
Loco citato.

dissection, the diseased parts were not totally extirpated; and in every instance where this was found to be practicable, much advantage was evidently derived from it: In many, no return of the disease has been as yet experienced; and, even in those which relapsed, much relief has been derived from the operation, by the pain and misery of the patient being for some time removed by it; whilst, in no instance, were the symptoms which ensued from a return of the disease, more severe, than those to which the patient had previously been liable.

3. But, an operation ought never to be advised, where the diseased parts are so situated as to prevent them from being totally extirpated; as is the case in cancers of the uterus, of the liver, rectum, &c.

When, from the existence of one or all of these causes, a cancer cannot with propriety be removed, our next object is to palliate the different symptoms, so that the disease may be rendered as easy as possible to the patient.

Whatever might excite heat or inflammation, should be carefully guarded against: A diet consisting almost entirely of milk and vegetables I have found to answer best: Animal food, spirits, wine, and fermented liquors of every kind, excepting small beer and spruce beer, do harm. And I have uniformly found, that the progress of cancer has been hastened by bodily fatigue, and whatever excites anxiety, or an uneasy state of mind.

The fetor of cancerous ulcers being at all times disagreeable, and the matter usually thin and acrid, are circumstances which, in the treatment of this disease, merit particular attention. In this view, hemlock frequently proves useful, both as an internal medicine and an external application. For internal use, two preparations of the remedy are commonly used; the powder, and extract: But as the powder seems to possess all the virtues of the extract, and not being liable to be injured in the preparation, it should for this reason be in general preferred. The extent
of

of the dose, and number of repetitions, can only be determined by trial; and are circumstances to be at all times regulated by the strength of the patient, and state of the stomach at the time.

When recent hemlock can be procured, a quantity of the juice being mixed with the common emollient poultice, affords a very convenient and effectual application for cancerous sores; and in the winter-season, when the juice cannot be obtained, the dry powder made into a poultice in the same manner, answers nearly the same purpose. Carrot poultices are frequently used for lessening the fetor of the discharge; and in this view they often prove useful. I have commonly found, however, that hemlock proves still more effectual.

A good discharge being obtained, the common unguentum cereum is the mildest and most simple application we can employ, and the parts should be dressed with it more or less frequently, as the discharge is more or less copious: Care, however,

should be taken at the different dressings, to prevent as much as possible the admission of air, which in every ulcer, but more especially in cancer, always does harm, both by exciting irritation, and in vitiating the discharge.

The violent shooting pains which prove always so distressful in cancer, are frequently rendered moderate by a continued use of *cicuta*; but when this does not happen, it becomes necessary to employ opiates in doses sufficient for the purpose. These pains, too, are sometimes relieved by warm emolient fomentations; and, in other instances, by bathing the parts from time to time with a weak solution of *saccharum saturni*.

One very distressful symptom of the late stages of cancer requires to be more particularly taken notice of. I mean the hæmorrhagy, which, in some instances occurs from the arteries, corroded by the acrimony of the matter, and in others from the veins on the surface of the tumor becoming turgid, and bursting from time
to

to time: When blood proceeds from arteries destroyed by the progress of the disease, dossils of soft lint dipped in tincture of myrrh or æther, and applied with gentle pressure, is perhaps the best remedy we can employ; but when it proceeds from the bursting of turgid veins, we have it in our power to prevent it, by opening one of them occasionally with a lancet, so as to take away an ounce or two at once: This relieves the painful burning sensation with which patients labouring under cancer, are often severely distressed, and it prevents that sudden eruption of blood to which they are liable, and which by coming unexpectedly, proves much more alarming than when they are prepared to receive it: Neither does the operation appear to be hazardous: It was first proposed and adopted by a patient who I saw along with Dr Gilchrist and Mr Harley of Dumfries: The lady herself, from being frequently alarmed, and incommoded with the blood bursting out in the night time, and in some instances when in

company, insisted at last on the turgid veins being opened ; it answered the purpose completely ; and I have since that period advised the same operation to others, with equal advantage : It gives little or no pain ; the relief derived from it is considerable ; and it is done without hazard, for the flow of blood from the orifice made with the lancet, is, for the most part, inconsiderable.

With due attention to the circumstances I have pointed out, particularly to the preservation of a well-conditioned discharge, and by a well-timed use of opiates, very bad cases of cancer may in some instances be so far palliated, as to render them, in some measure, tolerable ; though never to such a degree as to prevent the sufferers from regretting daily their not having, in due time, had recourse to extirpation.

Various remedies have at different times been proposed for the cure of cancers, of which, in the course of this treatise, I have taken little or no notice. Of these,
cicuta,

cicuta, belladonna, and different preparations of arsenic, have been most frequently employed. But although cicuta, as I have observed above, has, in some instances, appeared to correct the discharge of cancerous sores, yet neither this nor any other remedy, so far as I know, has ever accomplished a cure.—We have heard of arsenic proving useful in cancers, not only as an external application, but as an internal remedy: But although I have employed it in various cases, the result of these trials has never proved in any degree adequate to the accounts which have been given of it; while even the smallest doses, when long continued, have excited severe degrees of nausea, pains in the bowels, and other symptoms of poison.

In a publication on cancer by the late Mr Justamond of London, we find an escharotic much recommended. It was long employed in Vienna and other parts of Germany; and as Mr Justamond, whose experience in cancer appears to have been extensive, speaks highly of it, I think it

right to mention it. Although I have often used it, however, I have not as yet observed any real advantage to ensue from it; but as no remedy should be hastily rejected, when recommended by an author of reputation, I am resolved to give it a farther trial. This application is a composition of steel and sal ammoniac infused in spirit of wine, with a certain proportion of oil of tartar and spirit of vitriol. The edges, as well as the hard tumors or excrescences which frequently arise in cancerous ulcers, are by Mr Justamond's method kept constantly moist with this liquid; and during the use of it, he likewise recommends an internal use of steel and sal ammoniac in the form of flores martiales.

In other ulcers attended with a discharge of thin fetid matter, and in which tonics appear to be indicated, I have in different instances used the flores martiales with advantage; but, as I have already observed, neither this, nor any other medicine, has ever, in the course of my experience,

experience, produced any material benefit in cancer.

The flores martiales, may be given either in the form of pills, or in powders. They seldom produce sickness, and may therefore be given in much larger doses than are commonly employed.—The first doses should not exceed twelve or fifteen grains; but they may be increased, in a gradual manner, to half a drachm or more, to be repeated three, four, or five times daily. In every case where steel medicines are proper, the flores martiales, by conveying the remedy in a very subtil form, is perhaps preferable to any other preparation*.

S E C-

* To such as have not an opportunity of perusing Mr Justamond's treatise upon this subject, it may prove acceptable to have the prescription for the liquid which he recommends so warmly as an application in cancer. It is as follows:

R. Ramentor. ferri lotor. et supra ignem in vase aperto siccatorum et minutissime contuforum, salis ammoniaci in pulverem redacti, āā unc. iv. Mixta ſentur in retortam terream optime in fundo et circumferentia lege

SECTION IX.

Observations on the Cutaneous Ulcer.

§ 1. General remarks on Cutaneous Affections.

FEW complaints are less understood by practitioners, than diseases of the skin. This, indeed, is the case, both with such as are attended with fever, and those that

lege artis minutam, imponatur hæc capellæ, admoveatur vas vitreum recipiens, quod bene lutetur : detur ignis in gradu digestionis ; et dum retorta calefieri incipit, augeatur successive ad sublimationis, finitaque sublimatione ad calcinationis, gradum. Hoc facto successive refrigeratione committatur retorta, et ex refrigerata fractaque accipiat calcinatum in fundo hærens, caput mortuum teratur, et subigatur minutissime in mortario lapideo ; dein subactum

that are not: It is, however, more especially so with the latter, which only we are here to take notice of; those of the exanthematous kind, as they are termed, belonging more properly to the province of medicine.

The

subactum imponatur in vas vitreum, et affundantur spiritus vini rectificatissimi empyreumaticum odorem non redolentis lb. ij. Agitentur sæpius primis octo horis: post viginti quatuor horas agitatis denuo instilletur tribus quatuorve interstitiis observatis, acerrimi, ut vulgo vocatur, olei vitrioli nigri unc. i.—ad quamvis instillationem semper mixta agitando; deinde in quiete permittantur per viginti quatuor horas, his elapsis decantetur tinctura, residuo vero in fundo affundantur prioris spiritus vini lb. ij. Agitentur iterum pluries, dein extractio de novo relinquatur per viginti quatuor horas; his transactis instilletur iterum, ut prius, olei vitrioli supradicti unc. i. Effervescentia finita vero infundantur spiritus tartari simplicis unc. iv. Agitentur, et finita agitatione aliquoties repetita relinquuntur in vase per viginti quatuor horas; his elapsis secunda hæc solutio misceatur priori decantatae et optime simul agitentur, tunc parata est ad usum PANACEA NOSTRA ANTI-CANCROSA.

This was originally published by Dr Francis Xavier de Mare, in a treatise which he published some years ago at Vienna.—He had long kept this liquid a secret, but at last made it public in the year 1767.

The appearances of skin diseases are so various, and the descriptions given of them by authors so confused and intricate, that it is scarcely possible, from all that has yet appeared upon the subject, to collect any thing satisfactory. By different writers, different names have been given to the same appearances; eruptive diseases are enumerated by old writers, which are now never to be met with; and diseases of a similar nature, though still, in some respects, different, are described by modern authors, which do not formerly appear to have been known. It is therefore to be wished, that a more complete investigation of the subject was attempted, as no part of medicine appears to be more defective than that which relates to the history and theory, as well as to the treatment, of cutaneous affections.

To give a particular detail of all the varieties of these complaints, would of itself require an extensive volume, and it would also be foreign to our purpose; all that I propose is to give a few general observations

servations upon such eruptions as, when neglected or improperly treated, are apt to give rise to ulcers.

A variety of eruptive affections have, by different authors, been described under the term Herpes, from their being apt to spread, or to creep, as it were, from one part to another; and by the same appellation have been distinguished, by late writers, several diseases which, though not entirely the same, yet bear a considerable resemblance to the lepra of the Greeks, and to the several species of impetigo enumerated by Celsus. As none of these, however, are now in their true form ever to be met with, at least in these climates, it is not here necessary to mention them, especially as very minute descriptions of them may be met with in many of the old writers, and nothing new, I have reason to think, can now be said upon the subject.

§ 2. *Of the different Species of Herpes.*

I have already remarked, that a variety of cutaneous affections have been described by authors under the general term of Herpes; but many of these are taken from very trivial circumstances, and from such as have no influence on the cure. Every necessary distinction is, I think, comprehended in the four following varieties, *viz.* the Herpes Farinosus, Pustulosus, Miliaris, and Exedens.

The first of these, the Herpes Farinosus, or what may be termed the dry Tetter, is the most simple, both in its consequences and method of cure. It appears indiscriminately in different parts of the body; but most commonly on the face, neck, arms, and wrists, in pretty broad spots of small red pimples. These are generally very itchy, though not otherwise troublesome: and after continuing a certain time, they at last fall off in the form of a white powder

powder fimilar to fine bran, leaving the ſkin below perfectly found; and, again returning in the form of a red efflorefcence, they fall off and are renewed as before.

The ſecond variety of the diſeaſe, *viz.* the Herpes Puſtuloſus, appears in the form of puſtules, which originally are ſeparate and diſtinct, but which afterwards run together in cluſters. At firſt they ſeem to contain nothing but a thin watery ſerum, which afterwards turns thick and yellow; and, exſuding over the whole ſurface of the part affected, it at laſt dries into a thick cruſt or ſcab: When this falls off, the ſkin below frequently appears entire, with only a ſlight degree of redneſs on its ſurface; but occaſionally, when the matter has probably been more acrid, upon the ſcab falling off, the ſkin is found in a ſtate of ulceration. Theſe eruptions appear moſt frequently on the face, behind the ears, and on other parts of the head; and they occur moſt commonly in children.

The

The third variety of Herpes, *viz.* the Miliaris, breaks out indiscriminately over the whole body; but more frequently about the loins, breast, perinæum, scrotum, and inguina, than in other parts. It generally appears in clusters, though sometimes in distinct rings or circles, of very minute pimples, which, from their resemblance to the millet seed, has given rise to the denomination of the species. The pimples are at first, though small, perfectly separate; and contain nothing but a clear lymph, which, in the course of the disease, is excreted upon the surface, and there forms into small distinct scales: these at last fall off, and leave a considerable degree of inflammation below, that still continues to exude fresh matter, which likewise forms into cakes, and so falls off as before.

The heat and itching in this variety of herpes prove commonly distressful; and the matter discharged from the pimples is so tough and viscid, that any dressings applied

plied to them adhere firmly, and excite much uneasiness on being removed.

All the varieties of herpes are usually, in England, distinguished by the names of Tetter, Shingles, and Ringworm; but the last is most frequently applied to that which we are now considering, the herpes miliaris.

The Herpes Exedens, so called from its destroying or corroding the parts which it attacks, appears commonly at first in the form of several small painful ulcerations, all collected into larger spots of different sizes and of various figures, with always more or less of an erysipelatous-like inflammation. These ulcerations discharge large quantities of a thin, sharp serum; which sometimes forms into small crusts, that in a short time fall off; but most frequently the discharge is so thin and acrid, that it spreads along the neighbouring parts, where it soon produces the same kind of affection.

Though these ulcers or excoriations do not, in general, go deeper than the cutis

vera, yet in some the discharge is so very corrosive, as to destroy the skin, cellular substance, and occasionally even the muscles. It is this which should properly be termed the Depascent or Phagedenic ulcer, from the great destruction of parts with which it is accompanied; but herpetic ulcerations of every kind being commonly, though improperly, supposed to be connected with scurvy, they have in general been distinguished by the appellation of Scorbutic. Whereas, there is nothing more certain, than that herpes is generally, if not always, connected with that state of the system, probably the most opposite of any to that which takes place in true scurvy. The symptoms are all of the inflammatory kind; whilst in scurvy they proceed evidently from a high degree of putrefaction.

And besides, the real scorbutic ulcer, hereafter to be described, exhibits appearances perfectly different from herpes; inso-much that there is scarcely a possibility of mistaking the one for the other; and
the

the remedies necessary in the two diseases are just as opposite as their several symptoms and appearances are different.

Herpes exedens appears, at times, in every part of the body, but most frequently about the loins, where it often spreads to such a degree as to surround the whole circumference of the waist. It seems to be easily communicated by contagion, that is, by the application of the virus, either through the intervention of clothes, spoons, or other table-utensils. This indeed is the case, in some degree, with herpes in every form; but we do not meet with it so frequently with herpes farinosus as with the others, probably from the skin remaining dry, and not discharging matter.

§ 3. *Of the Cure of the Cutaneous Ulcer.*

TILL of late, it was very universally believed, that every variety of herpes arose from a morbid affection of the system; and various internal remedies have accord-

ingly been recommended by every author who has written upon the subject. It has even been considered as dangerous practice to attempt the cure of these eruptions, in any other way than by correcting the original disorder of the fluids, by which they were at first supposed to be produced.

That this, however, should so long have remained uncontroverted by regular practitioners cannot be accounted for, as from the writings of many of them, it appears, that cutaneous affections were in former times frequently and easily cured, as they still are by itinerants, with local applications alone.

This might have been expected soon to have overturned the opinion which prevailed of the nature of these diseases, and which seemed to have no other foundation than antiquity for its support. Modern practitioners, however, not being shackled by such authority, have, in many instances, ventured to dispute, and boldly to deviate from, the opinions of their predecessors;

fors; and the improvements which have universally resulted from this free spirit of inquiry, have never yet given them cause to repent their having done so.

This, in no instance, has been more remarkable, nor attended with more useful consequences, than in the treatment of cutaneous affections, which, from having been very perplexed and intricate, will soon, there is cause to hope, become a very simple and easy part of the practitioner's employment.

Instead of the tedious and debilitating courses of medicines which patients were formerly put under, and which they are still perhaps too frequently obliged to undergo, it is now found, that herpetic eruptions are much more certainly and speedily removed by local remedies alone. This, probably, is one reason, among others, why all these complaints are classed among local disorders, in the *Genera Morborum* of our late justly celebrated professor Dr CULLEN; and which, without any other sanction, would, of itself, be sufficient au-

thority for their being here inserted among such affections *.

That internal remedies may sometimes prove useful in cutaneous eruptions, will not, probably, ever be doubted; but that they act by correcting particular kinds of acrimony supposed to exist in the mass of blood is very improbable. Nor does the benefit sometimes derived from medicines given internally, render it less certain that cutaneous affections are entirely local.

Thus, in many diseases of the skin, antimonials frequently prove useful. But the chief advantage we derive from them, seems, in a great measure, to depend upon the determination which they produce to the skin, and the perspiration which they keep up; which frequently, from want of cleanliness, and sometimes from other causes, being long retained on the surface of the body, and
there

* The character given by Dr Cullen of the class *Locales*, in which herpes is included, is, "*Partis, non totius corporis, affectio.*" Vid. *Synop. Nosolog. Method. Edinburgi.*

there turning acrid, may often, I conceive, give rise to cutaneous affections. And accordingly we find, that all such remedies prove more or less useful, according as they are more or less powerful in keeping up a free perspiration.

By those who maintain that acrimony of the fluids is the most common cause of these diseases, it is supposed, that the beneficial effects of antimonials and other diaphoretics depend entirely on their evacuating or carrying off the morbid matter, with which the blood is imagined to abound.

Many arguments, however, evince the futility of this opinion. It cannot be shown how morbid matter, supposing it really to exist, can be more readily evacuated by sudorifics, than the other parts of the blood with which it must in the course of the circulation be intimately mixed. But what puts it beyond a doubt that all such medicines act by preserving a free perspiration, and not by evacuating any fluids particularly morbid, is, that the same advantages

are frequently obtained from warm bathing, and other remedies applied to the parts affected only.

From this view of the theory of herpetic eruptions, many of the symptoms can be more clearly explained than on any other supposition. We cannot here however enter upon the full discussion of these, and I shall only observe, that by this may be accounted for the partial appearance of these eruptions, an occurrence we daily meet with where they form in single spots, without affecting any other part of the skin. This we cannot suppose would happen, were they produced by a general affection of the system; while it may readily occur from a local stoppage of perspiration, occasioned by the application of such causes to particular parts as we know to be generally followed with this effect. And upon this principle, as I have already remarked, we account for, much more obviously, than on any other, the operation

tion of the several remedies employed in the cure of herpes.

In conducting the cure, the chief circumstance requiring attention, is, that not only the parts affected, but even the whole surface of the body, be kept as clean and perspirable as possible: For which purpose nothing is of more importance than frequent warm bathing, accompanied with gentle frictions with clean linen cloths; which, in dry herpetic affections, may be applied even to the diseased parts; but in the others, especially where the skin is tender, or in a state of ulceration, those parts only can be rubbed which have not been attacked.

With due attention to cleanliness alone, almost all the slighter degrees of herpes may be cured: I often succeed with no other remedy but washing the diseased part daily with soap and water: In all varieties of the disease, particularly in dry herpetic eruptions, lime-water is an useful application: The parts affected should be bathed with it three or four times a-day,
and

and in like manner we often employ a saturnine solution with advantage.

In the more inveterate varieties of herpes, the most effectual wash I have employed is a weak solution of corrosive sublimate, in the proportion of ten grains to each pound of distilled water.

A due perseverance in the use of these remedies very commonly proves successful in the milder varieties of these eruptions; but when the disease is inveterate, of long duration, and discharging large quantities of matter, other remedies must be employed.

The internal exhibition of antimonials frequently proves useful, particularly when conjoined with a decoction of sarsaparilla, mezereon, or gum guaiacum. Fifteen or twenty drops of the vinous tincture of antimony taken three or four times a-day in a cupful of decoction of guaiacum, seldom fails to excite a free discharge by the skin, from which in all cutaneous affections, much advantage is commonly derived. It is chiefly in affections of the
herpetic

herpetic kind, that Plummer's pill, a composition of sulphur, antimony, and mercury, proves useful.

In this view too, crude antimony proves likewise useful, whether by itself or conjoined with gum guaiacum: It should be finely levigated, and it may with safety be given to the extent of two drams daily.

Where plethora prevails, laxatives prove particularly useful, and we chiefly prefer those of the saline kind, such as soluble tartar, Glauber's salt, Rochelle or Brazil salt, or cream of tartar; and sea-water is often employed for the same purpose.

In all herpetic affections of long duration, issues prove useful: We do not advise them in slight degrees of the disease, but a permanent cure can seldom be obtained without them, where the eruption is either extensive or of long continuance.

Parts affected with herpes, particularly with herpes exedens, are very apt to inflame, and the remedies most frequently

quently employed for this are, warm fomentations and poultices: I have seldom found, however, that they answer the purpose, and in no case whatever does the superiority of saturnine applications appear more conspicuously than in this. Emollients very universally promote the secretion of that acrid humour which always prevails here; and thus, instead of removing inflammation, they rather in such instances tend to promote it: Whereas the different saturnine applications appear not only to correct the acrimony of the matter, but tend greatly to prevent it from spreading so far as it otherwise would do.

In all superficial ulcerations of the herpetic kind, the saturnine and sublimate solutions already pointed out, prove in general effectual; but whenever the ulcers have penetrated to the muscles and other deep-seated parts, an ointment prepared with calcined zinc I have commonly found to answer better: About two drachms of zinc in fine powder, to fix
drachms

drachms of axunge or simple ointment, seems to be in general a proper proportion. It lessens the inflammation, and has often a considerable effect in altering the nature of the discharge from a thin acrid sanies to a thick purulent matter.

Goulard's form of unguentum saturninum, for which I have already given the prescription, is also, when newly prepared, a very proper application for the same purpose. But it ought never to be used after being long kept: For the lead seems thereby not only to lose its activity, which it in some measure, in unctuous preparations, always does; but that ointment, probably from being prepared chiefly of axunge, or of wax and oil, without any addition of the antiseptic gums and resins, is more apt to turn rancid than almost any other ointment in common use.

By a due continuance of the remedies I have pointed out, whilst proper attention is at the same time given to cleanliness, the most troublesome varieties of
herpes

herpes will in general be removed. But in some instances, notwithstanding the use of these, and every other remedy, they still continue obstinate, and instead of yielding become still more inveterate.

In this situation, sulphureous mineral waters often prove useful, such as those of Harrowgate and Moffat, by which I have known cures accomplished, where every other remedy had previously been tried in vain. It is proper, however, to remark, that it is not from the internal use of these waters that we derive advantage, but from the frequent application of them to the parts affected. The eruption should be bathed four or five times in the course of every day, and every second night the whole body should be immersed for the space of fifteen or twenty minutes in the water, heated to eighty or eighty-five degrees.

Herpes frequently continues to resist the remedies employed for it, from being combined with other diseases: In some instances we meet with it combined with
lues

lues venerea, but more frequently with itch: Connected with itch it forms a very obstinate disease, what may be considered as a tertium quid, or a production of the two: This in its appearance is exceedingly loathsome, not less so perhaps than the lepra described by the ancients, and it frequently proves almost as inveterate.

When combined with lues venerea, no remedy will be of any avail till a course of mercury is employed, and in all cases of this kind the most effectual preparation of mercury is corrosive sublimate, now termed Hydrargyrus, Muriatus, Corrosivus. Besides bathing the parts two or three times a-day with a weak solution of this preparation, such as I have mentioned above, the patient should take as much of the medicine internally as he can easily bear: I think it right, however, to remark, that it answers much better in very small doses than in those usually given: A grain of corrosive sublimate being dissolved in three ounces of distilled water, from one to two teaspoonfuls

spoonfuls of the solution may be given three times a-day, and continued with safety for a considerable time, but more than this very commonly excites sickness, retching, and pain in the stomach and bowels.

In herpes conjoined with itch, sulphur is the most effectual remedy, particularly in those herpetic eruptions to which children are liable. When the usual remedies therefore do not succeed, sulphur should always be employed: and to practitioners of experience, it is scarcely necessary to remark, that Sulphur Vivum, as it is termed, in fine powder, proves more certainly effectual than the flowers of sulphur. As this remedy evidently loses much of its strength by the process of sublimation, this preparation should never be employed for any cutaneous eruption. Even in this variety of herpes, sulphur sometimes fails: In such cases I have known a cure accomplished by a due perseverance in the internal exhibition of corrosive sublimate, as mentioned above,
which

which appears indeed to be nearly, if not entirely the same, with some of the antiscorbutics so liberally dispensed to the public by the itinerants of the present day.

There is a variety of herpes to which, in some constitutions, especially in females, the face is particularly liable; and no variety of the disease proves either more distressful to patients, or more perplexing to practitioners.—All the common preparations of sulphur, as well as different ointments and washes of the mercurial kind, are commonly employed with little or no advantage; but the following combination of sulphur with saccharum saturni, I have seldom known fail.

Rx. Lac. sulphuris	3ij.
Sacch. saturni	℥j.
Aq. rosarum	℥viij. m.

The eruption to be bathed with this morning and evening, care being taken to shake the vial when used.

In what manner this remedy acts, I know not: But I have known different instances

of a complete cure being obtained by a frequent use of it.

When, however, it may be thought proper to make use of mercury instead of sulphur, an ointment termed in the dispensatories *Unguentum Citrinum*, may be employed with advantage. But as this ointment is prescribed with too great a proportion of mercury, it frequently acts as a caustic, and excites much irritation. This, however, is easily prevented, whilst at the same time all the advantages of the remedy are preserved, by lessening the quantity of mercury: Half an ounce of mercury dissolved in an ounce of strong spirit of nitre, mixed with a pound of axunge or fresh butter, have, upon trial, been found to be proper proportions: Or, as this ointment is apt to become too hard, it may at first be made with a double proportion of mercury and spirit of nitre; and, by adding an equal quantity of axunge at the time of using it, the same strength of the remedy is preserved, whilst,

whilst, at the same time, an ointment is obtained of a better consistence.

This makes a very effectual and perfectly safe ointment for all such eruptions as are combined with lues venerea or itch, and may be used for itch in preference to other mercurials, by those who, on account of its offensive smell, or for other reasons, do not incline to employ sulphur. Indeed no preparation of mercury, in the course of my experience, has ever proved so useful as this ointment; not only in real herpes, but even in common itch. It only indeed requires to be more generally known, in order to be very universally employed in every affection of the herpetic kind.

By a proper and continued use of the several remedies I have mentioned, and particularly by due attention to cleanliness, almost every herpetic complaint may at last be removed.

Children are liable to eruptions, which by authors are described as distinct and different diseases, but which may all be

traced to one or other of the varieties of herpes which I have enumerated: Thus, *tinea capitis*, and *crusta lactea*, are commonly described as distinct diseases, and as different from each other; but they are of the same nature, and are only to be considered as varieties of the same species of herpes: They seem evidently, indeed, to belong to the second, or what I have termed *Herpes Pustulosus*, and appear to differ only in situation; the *tinea* being exactly on the hairy scalp, what the *crusta lactea* and other such eruptions are upon the face.

The means of cure I have enumerated for herpes in general, apply with equal propriety to any of these; but in the *tinea capitis* a peculiarity occurs from its situation, which, in the treatment, requires attention, the hair, by occasioning a more considerable remora of the exsuded matter than is met with in any other variety of herpes, produces in it a greater degree of acrimony, which sometimes gives rise to bulbous swellings at the roots
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of the hair; and hence it has been supposed, that these swellings, by being perhaps the first parts affected, tend to produce and keep up all the other symptoms of the disease: So that we are advised in the cure of tinea, to extract entirely all the hairs by the roots, either with pitch-plasters, or some other adhesive application.

This, however, is always attended with much pain; it sometimes produces very troublesome inflammation; nor is it ever a necessary measure in the first stages of the disease: For though in long continued cases of tinea, these tuberosities at the roots of the hair sometimes become so considerable as to render the cure more tedious than it otherwise would be; yet, merely by keeping the hair short, and the parts affected clean, a cure may always be accomplished without having recourse to that disagreeable and painful operation of extracting the hair.

I have already recommended a watery solution of corrosive sublimate as an ex-

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ternal application for different eruptions ; but in no variety of herpes does it prove so obviously useful as in tinea capitis ; inso-much that, except in very inveterate cases, a cure may generally be obtained by the use of this remedy alone.

Issues have been already advised in eruptions of every kind when of long duration ; but in those which prevail in childhood, they seem to be still more necessary, and more useful, than in the advanced periods of life ; for, as children particularly liable to such eruptions are commonly of gross plethoric habits, it is scarcely possible often to remove those eruptions to which they are liable, without in the first place introducing adequate drains.

Indeed issues alone, with due attention to cleanliness, will frequently in the first years of childhood, get the better of all these complaints, without the assistance of any other remedy ; and they do not prove so hurtful to the constitution as the frequent use of purgatives, which
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in such cases are commonly employed. Purgatives no doubt, frequently prove useful by unloading the system of fluids which might probably do harm, if allowed to remain, but never in such an easy gradual manner as is done by issues.

An objection is commonly made to issues, that they are apt to become so far habitual as to prevent them from being afterwards healed, without considerable risk. No hazard however of this kind occurs from them in childhood; for, about the fifth or sixth year, when children are able to take more regular exercise; when the system, having acquired a firmer tone, is rendered more capable of preserving a due balance between the solids and different contained fluids; and when, in fact, the latter are never so abundant as in the preceding years of childhood; there is not then the same necessity for such drains, and it might even in some instances prove hurtful to continue them longer. We accordingly observe, about this period, that many

of the eruptive diseases which had prevailed before, now disappear entirely: Nature then requiring a greater supply of fluids for the different secretions, throws off by their means, what had formerly been discharged by eruptions upon the surface.

S E C.

SECTION X.

Observations on the Venereal Ulcer.

§ 1. Varieties of the Venereal Ulcer.

BY venereal ulcers, in general, are meant, such as proceed from a syphilitic affection of the system. But as chancres may with equal propriety be termed Venereal Ulcers, although not always connected with a general infection, yet, in order to prevent confusion and ambiguity, it will here be proper to enter upon the consideration of these also.

Venereal

Venereal ulcers, then, may be divided into two varieties; namely those which appear as primary symptoms of the disease, and such as may more properly be considered as symptomatic.

Of the former kind are chancres in general, whether upon the parts of generation, communicated by venereal intercourse; upon the nipples and breasts of women, by nursing infected children; or on the lips and parts adjacent, communicated by salutation: For all such sores, though seated on different parts, are of one and the same nature. Those ulcers, too, may sometimes be reckoned primary, which remain after the opening or bursting of buboes arising from infection lately communicated, and before there is any probability of the whole system being affected.

These ulcers, again, I consider as symptomatic, which proceed from the matter of infection having entered the system. Of this kind are those which succeed to old buboes, or appear along with other
venereal

venereal symptoms a considerable time after infection; the most ordinary situations for which are, the throat, palate, nose, the parts immediately above the bones of the cranium, tibia, humerus, and other hard bones thinly covered with flesh.

Although this distinction cannot always be made in venereal sores, yet in many cases it may be easily done, either by information from the patient, or from the appearances which the ulcers exhibit.

If, soon after exposure to infection, an ulcer appears upon the parts to which there is cause to imagine the virus may have been applied, together with swellings of the glands in the course of the lymphatics, we may be almost convinced that these are local affections, and that they should be considered accordingly as primary symptoms. Ulcerations thus produced by the immediate application of the venereal virus, are in general termed Chancres: they appear, at first, as small miliary spots, which soon rise and form little vesicles, that discharge sometimes a thin acrid

crud serum; and at other times a more thick yellow matter. Chancres are generally hard and painful; and, together with the glandular swellings already described, are commonly attended with more or less inflammation.

Ulcers produced by the virus having entered the system, are distinguished from chancres, as likewise from every other variety of ulcer, by information from the patient; by their situation; and by their appearances.

Whenever an ulcer is suspected to be venereal, certainty with regard to it may frequently be obtained from the patient. Thus, if a person, at the time labouring under other symptoms of syphilis, is attacked with one or more ulcers, whether in consequence of external injuries or not, if they resist the common methods of cure, there will be no reason to doubt of their being venereal.

It sometimes happens, however, that such information is not to be obtained: For patients infected with lues venerea often

ten refuse to acknowledge it; while others are infected without having suspicion of their being so. In such circumstances, we must be directed by the situation and appearances of the ulcer itself.

A great proportion of venereal ulcers from an old infection, appear, as I have already remarked, immediately above the bones, and particularly upon those most thinly covered with muscles. They first appear in the form of a red, or purple-coloured efflorescence, not circumscribed, but in general rather diffused. This at last forms into a number of small pustules, which ooze out a thin fretting serum. At first these pustules, when observed through a glass, appear perfectly distinct; but they at last run together, and form one large ulcer, whose edges are commonly ragged and somewhat callous; accompanied with a copper-coloured appearance of the skin for a considerable space beyond the boundaries of the ulcer.

These ulcers have frequently a very remarkable appearance, being hollowed as it were

were into the form of a cup, generally narrow and contracted at the bottom, with the edges rising gradually till they reach the outward circumference. This at least is generally the case, unless the bones beneath are carious, and then the sores are for the most part filled up with soft fungous excrescences.

Venereal ulcers are not commonly attended with much pain; at least, not with so much as, from their extent and appearances, might be expected. In some instances, however, it is otherwise; and the discharge, though at first thin, at last commonly assumes a very particular and characteristic appearance, being of a consistence rather more tough and viscid than good pus; with a very loathsome foetor though not the ordinary smell of putrescency; and a very singular green colour.

These are the most common appearances of old venereal ulcers; and when they occur upon any of the situations I have mentioned, we may almost always, with certainty,

certainty, conclude that they proceed from lues venerea.

The distinction I have proposed of venereal ulcers into primary and symptomatic, is, in the treatment of the disease, a matter of considerable importance: For the primary ulcer might be frequently removed without the aid of internal medicine, merely by converting an incipient chancre into the state of a simple ulcer, either by cutting out the spot, or destroying the venereal matter contained in it with caustic.

But although a cure might in this manner be in some instances obtained with safety, yet having no means of distinguishing whether the virus has entered the system or not, the cure even of the slightest chancre should never be trusted to any other remedy than the internal use of mercury; with this material difference, however, that in this incipient stage of syphilis, a very small quantity of the remedy commonly proves sufficient, instead of a
much

much larger quantity required for the cure of old venereal ulcers.

Another circumstance of importance is also pointed out by this distinction: In ulcers from an old infection, we should never make use of mercurials and other dressings, with a view to heal them quickly; but should rather trust to the internal exhibition of mercury, and in the mean time continue to apply such remedies only as are necessary for keeping the parts clean and easy.

By healing ulcers of this description with internal medicines only, we obtain the most convincing proof of the virus being eradicated: But while for this reason I judge it to be the best practice in venereal ulcers of long duration, I do not agree with those who think that it should be applied to chancres: In recent ulcers, produced by the application of the venereal virus to a particular spot, and not connected with any disease of the system, mercury given internally does not act with such certainty in the cure,

cure, and accordingly we often find, that, after it has been used in this manner for a great length of time, we are obliged to employ external remedies at last.

This however, is not the greatest objection to the practice: For as long as a chancre continues open, there is much more reason to suspect that the system may be injured, than if the chancre or source of that matter had been healed soon after its appearance.

But in answer to this it is said, that if the practice was adopted, of treating chancres with the internal use of mercury only, no risk would occur from their being kept open; as mercury, by acting as a certain antidote to the venereal virus, would soon exert its influence on the system, in such a manner as to prevent the virus from having any farther influence.

Such reasoning, however, is, in practice, not to be trusted. For, in the first place, though mercury in general proves a certain cure for venereal complaints already subsisting in the constitu-

tion; yet, even where it has been previously exhibited in considerable quantities, it does not prevent a new infection from taking place: Of this I have met with many instances, and every practitioner must have done so.

But again, although we were even certain, if a proper quantity of mercury was thrown in, that no farther infection could take place from the introduction of a larger portion of venereal matter; yet we can never be sure that the medicine will so soon enter the circulation as to produce this prophylactic effect. For when we consider how frequently practitioners are disappointed in attempting to introduce a sufficient quantity of mercury, either from the fault of the preparation, from its running off by stool, from its flying too quickly to the mouth, or from some other cause, no dependence, it is evident, ought to be placed upon this.

Upon the whole, therefore, the cure of chancres and of all venereal ulcers of the same kind, should be hastened as much as possible,

possible, not only by internal medicines, but by the aid of external applications.

§ 2. *Of the cure of the Venereal Ulcer.*

IN all cases of chancre our object is to destroy the virus in the part to which it has been applied, and to throw in such a quantity of mercury as may prevent the system from being injured: In common practice caustic is applied to chancres as soon as they appear, for the purpose of converting them as speedily as possible into the state of simple sores; but I have elsewhere endeavoured to shew, that it answers better to give mercury for several days before applying the caustic, as the irritation produced by caustic applied to chancres before mercury is employed has an evident influence in promoting the absorption of the virus, and in thus producing buboes *: After mercury has been

F f 2 given

* *Vide* a Treatise on Gonorrhœa Virulenta and Lues Venerea, lately published, in two volumes 8vo, in which this as well as various other points relative to the venereal disease are more fully considered.

given for five or six days, lunar caustic may be applied with freedom, and it should be done in such a manner as to form an eschar of considerable thickness: This being thrown off, the sore may be dressed with simple wax ointment as long as it continues clean, but on the least appearance of becoming foul, the ointment should be mixed with a sixth or eighth part of calomel or red precipitate finely levigated.

In this manner almost every chancre may in general be cured, and with much less mercury than if allowed for any considerable time to remain open.

By long continuance, however, and from neglect of proper remedies, even these primary ulcers, come to put on all the appearances of such as depend upon a general infection; in which situation their treatment must vary accordingly: Instead of placing much dependence upon external applications, we in this case trust chiefly to a well directed course of mercury.

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Two different modes are employed for throwing mercury into the system; the one by the mouth, and the other by introducing it through the absorbents on the skin by means of friction: But, as the first of these is liable to many inconveniencies which do not attend the other, the latter should in general be preferred. When the first editions of this work were printed, I entertained a different opinion upon this point, but I think it fair to acknowledge, that more extensive experience has convinced me, that I was wrong, and that the best method of using mercury is in the form of unction, by which we for the most part avoid, that sickness at stomach, pains in the bowels, and violent purging, which mercury, given by the mouth, is very apt to induce, and by which the constitution is often greatly injured.

Occasionally, however, we are under the necessity of giving mercury by the mouth: In such instances these preparations should be preferred that we obtain

from simple triture, and of these the quicksilver pill of the Edinburgh Dispensatory is perhaps the best: They prove commonly more effectual, and are seldom attended with any of the inconveniencies which often ensue from the exhibition of the calces of mercury.

But whatever preparation of mercury is employed, it should be always continued till the mouth becomes sore, this being the most certain indication of the medicine having entered the system: Nor is it proper to stop at this point, as is commonly done: It has hitherto been very universally supposed that venereal ulcers, as well as every other symptom of syphilis, will be cured with as much certainty by such a quantity of mercury, as is merely sufficient for making the mouth sore, provided it be continued for a due length of time, as by the greatest quantity we can give: I own too, that at one time I was also of this opinion, but after much experience in this branch of business, I am now convinced,
that

that our practice in syphilis would prove much more certain, were we in every instance, and particularly in all symptoms of long continuance, to give as much mercury as the patient can with safety bear: In the treatise to which I have already referred, I have endeavoured to shew, that it is not upon the long continuance of a course of mercury that we ought to depend, but upon the quantity of the medicine thrown into the system in a short space of time: An alterative course as it is termed, in which mercury is given only so far as to render the gums slightly sore, will frequently prove effectual in recent cases, but even in these, it often fails, with whatever care it may be conducted, and in those of long duration, no dependence should be placed upon it.

The quantity of mercury to be given, and the time to which the course should be carried, are circumstances to be chiefly determined by the effects of the medicine, and must ultimately rest on the judgment

of the practitioner in attendance ; but I may observe in general, that the mercury should be continued for two or three weeks after every symptom of syphilis is removed.

It sometimes, however, happens, that venereal ulcers do not heal, although the virus by which they were produced is removed : In this case we depend upon due attention to local management, and chiefly upon the repeated application of caustic, which in sores of this description proves often the most effectual remedy : It not only acts by destroying that tendency to fungous excrescences, which often prevails in these sores, but it also proves useful by acting as a stimulus to parts which have long remained in a state of inaction : By a proper application of caustic, I have known such a healing tendency induced in a sore, that a cure has been accomplished in a very short space of time, when all the ordinary remedies had for a considerable time before been used in vain. While the
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whole surface of the ulcer is touched with lunar caustic every second or third day, it ought to be dressed daily with basilicon or wax ointment, impregnated with a sixth or seventh part of red precipitate, finely levigated.

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SECTION XI.

Observations on the Scorbutic Ulcer.

§ I. *Of the Symptoms and Causes of the
Scorbutic Ulcer.*

THE several varieties of scurvy enumerated by authors, viz. the Muriatic, the Alkaline, &c. so named from the nature of the causes supposed to produce them, are now known to be false and improper distinctions ; the true scurvy being always of the same nature, and always produced by the same causes, wherever these occur, in whatever climate, and whether at sea or land.

Among

Among other symptoms of scurvy enumerated by Dr Lind in his ingenious treatise on this subject, the ulcers which are so common in that disease, are particularly described; and as he gives a very clear and distinct idea of them, I shall here transcribe verbatim the Doctor's description of them.

“ The distinguishing characteristics of scorbutic ulcer are as follows: They afford no good digestion; but a thin fetid sanious stuff, mixed with blood; which at length has the true appearance of coagulated gore lying caked on the surface of the ulcer, and is with great difficulty wiped off or separated from the parts below.

“ The flesh underneath these sloughs feels to the probe soft or spongy, and is very putrid. No detergents or escharotics are here of any service; for though such sloughs be with great pains taken away, they are found again at next dressing, where the same sanguinous putrid appearance always presents itself: Their edges are generally of a livid colour, and puffed up with
excrescences

excrefcences of proud flefh arifing from below under the fkin.

“ When too tight a compreffion is made in order to keep the fungus from rifing, they are apt to leave a gangrenous difpofition; and the member never fails to become œdematous, painful, and for the moft part spotted.

“ As the difeafe increafes, they at length come to fhoot out a foft bloody fungus, which the failors exprefs by the name of Bullock’s Liver; and indeed it has a near refemblance to that fubftance when boiled, both in colour and confiftence. It often rifes in a night’s time to a monftrous fize; and, although deftroyed by cauteries, actual or potential, or cut finooth with a biftoury, in which cafe a plentiful hæmorrhagy generally enfues, it is found at next dressing as large as ever. They continue, however, in this condition a confiderable time, without affecting the bones.

“ The flighteft bruises and wounds of fcorbutic perfons degenerate into fuch ulcers: Their appearance, on whatever part
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of the body, is so singular and uniform; and they are so easily distinguished from all others, by being so remarkably putrid, bloody, and fungous; that we cannot here but take notice of the impropriety of referring most of the inveterate and obstinate ulcers in the legs, with very different appearances, to the scurvy *."

This accurate description of the scorbutic ulcer comprehends almost the whole appearances ever observed in such affections. Only it may be remarked, that at land, unless in very particular situations, and from a constant exposure to all the more active causes of scurvy, such inveteracy as is described by Dr Lind is not often met with: But in every country, and none, perhaps, more frequently than in some parts of this kingdom, slighter degrees of the same kinds of sores very often occur, forming what by practitioners in general are termed Foul or Malignant Ulcers.

In

* See Lind's Treatise on the Scurvy.

In the Royal Infirmary of this place, sores of this kind are frequently met with, accompanied sometimes with the most characteristic symptoms of scurvy, soft spongy gums. In the worst cases, however, that I ever met with here, there never was the appearance of such a high degree of putrescency in the system as we are told happens frequently in long voyages at sea.

The reason of this may be, that such complaints of the scorbutic kind as occur in this country, appear generally among the lowest class of people, and proceed rather from the want of a sufficient supply of food, than from confinement to any that can be considered as particularly septic, or as predisposing to scurvy.

In such patients, the putrid diathesis seldom ever prevails to such a degree as to produce ulcers in parts previously sound; but it never fails to show itself in ulcers either already formed, or in such wounds as happen to be inflicted while this state of the fluids subsists. Indeed, many of
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the ulcers upon the legs, and other parts of our poor people, frequently partake, more or less, of the real scorbutic disposition; as is evident both from their appearances, causes, and particularly from the method of cure; a good nourishing diet contributing more towards a cure, than all the applications we usually employ.

The immediate or proximate cause of these ulcers, as well as of every other scorbutic symptom, may be referred to a certain degree of putrescency in the fluids; which again may be induced by a variety of causes, but of which the most material are, living constantly upon salt provisions; a total want of vegetables; with exposure to a cold moist atmosphere. Many other exciting causes of scurvy might be mentioned; but as this would lead to a more extensive discussion of the subject than is here intended, for farther information, Dr Lind, Sir John Pringle, Huxham, and other authors who treat more directly on the subject, may be consulted.

§ 2. *Of the Cure of the Scorbatic Ulcer.*

THE cure of scorbatic ulcers, it is evident, must depend chiefly upon the putrid diathesis by which they were produced being corrected; for which purpose vegetables of all kinds, but especially those of an acescent nature, with milk and whey, are found to be almost certain remedies. The different secretions, especially those by the skin and kidneys, should be gently promoted: And as the former in a particular manner is commonly much obstructed in scurvy, our being able to restore it, is found to have a considerable influence in the cure; probably by carrying off many of the putrid particles with which the fluids in such cases always abound. Gentle laxatives too, for the same reason, prove useful, and, as such, Tamarinds and Cream of Tartar with Manna, answer well.

These, together with a total abstinence from salted food, and guarding against
other

other exciting causes of the disease, very commonly effect a cure of every scorbutic symptom, and, among others, of these ulcers ; the best external applications for which, are, antiseptics of the most powerful kinds. Lind recommends Unguentum *Ægyptiacum* and *Mel Rosarum* acidulated with *Spiritus Vitrioli*.

These in general are the remedies which prove most effectual, and which are commonly employed in very bad cases of scurvy ; but in the putrid ulcers most frequent in this country, the septic state of the fluids, as I have observed above, seldom advances to such a high degree, as to render it particularly necessary to confine patients to what may properly be called an antiscorbutic course.

The common malignant or scorbutic ulcer of this climate proceeding more frequently from a real deficiency of food, than from any other circumstance, putting the patients by degrees upon a full allowance, with a daily, though moderate, pro-

portion of generous wine, has always a powerful influence on their recovery.

This, I must observe, is a point of more importance in the cure of these ulcers than is commonly imagined, and the attention of practitioners should be more directed towards it than we generally find it to be. Instead of prescribing medicines for the cure of ulcers of this description, much more advantage would be derived from a nourishing diet, and especially when to this is conjoined a moderate proportion of wine, or, what I have frequently imagined has answered better, a proper allowance of porter or strong beer. The foul old ulcers of poor people in every country, are most frequently induced by indigence, and are kept up by a real want of nourishment. In all such cases, therefore, the practice of hospitals would probably prove more beneficial, by laying the use of internal medicines almost totally aside; and employing the savings thus produced, in furnishing such a diet as I have ventured to suggest.

Peruvian

Peruvian bark, however, is a remedy which, in ulcers of this kind, proves frequently useful; it commonly indeed proves more serviceable here than in any other variety of ulcer. When given in sufficient doses, a circumstance to be entirely determined by the state of the stomach, it seldom fails of producing in the course of a few days, a considerable change for the better. In the scorbutic ulcers indeed of this country, the bark is almost the only internal medicine I have ever found necessary.

With respect to the use of mercury in this kind of sore, it ought to be kept in view, that in ulcers really scorbutic, instead of acting as a remedy, if given in any considerable quantity, it proves always hurtful. Lind, from a great deal of experience, says, with respect to this point, "Mercury, in a truly scorbutic ulcer, is the most pernicious medicine that can be used *." So that a proper distinction between sores of this nature,

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and

* Vide Treatise on the Scurvy, Part II. chap. 11.

and the several varieties of herpes or eruptive diseases commonly termed Scorbatic, appears in the method of cure to be a matter of no small importance: In the latter, mercury may not only be given with impunity, but in some instances with much advantage; whereas, in the former, this can never be done but with much hazard.

Peruvian bark, as an external application, too, answers exceedingly well in these ulcers; pledgits dipped in a strong decoction of bark, and applied to the sores, have generally a considerable effect in correcting the fetor and putrescency of the discharge: But the best application for this purpose is the carrot poultice, which when conjoined with the internal use of bark, and a proper regimen, in the course of a short time, generally corrects the putrescency which prevails, so effectually, that the sores being dressed for a few days longer with pledgits of basilicon and red precipitate, with a view to procure the removal of any sloughs that remain, a cure

is

is afterwards commonly easily obtained, merely by attending to the directions formerly pointed out for the management of ulcers in general, and particularly to the introduction of an issue, along with moderate compression with a roller.

What has hitherto been said with regard to the treatment of scorbutic ulcers, applies, in a great measure, with equal force to all sores connected with a putrescent state of the fluids, from whatever cause this may have arisen. Thus, those ulcers that remain after critical abscesses succeeding to putrid fevers, require the same general method of treatment: And the same will probably prove most effectual in those which succeed to the plague; but as we have no opportunities of seeing the plague in this country, I cannot from experience venture to assert it.

SECTION XII.

Observations on the Scrophulous Ulcer.

§ I. *Of the Symptoms and Causes of the Scrophulous Ulcer.*

SCROPHULOUS ulcers, are such sores as remain after the opening or bursting of those swellings which appear in different parts of the body as symptoms of the scrophula or evil.

From the frequent occurrence of scrophula, it is such a well known disease, that it is almost unnecessary to describe it. It begins with indolent, somewhat hard, colourless tumors; which at first chiefly affect

affect the conglobate glands of the neck; but, in process of time, it attacks the cellular substance, ligaments of the joints, and even the bones.

In scrophula, the swellings are much more moveable than those of the scirrhus kind; they are generally softer, and seldom attended with much pain: They are tedious in coming to suppuration: In some instances they disappear in one part, and again form in other parts of the body. I may likewise mention, as characteristic circumstances of this disease, a fine soft skin, a kind of fulness of the face, with generally large eyes, and a very delicate complexion.

Scrophulous ulcers seldom yield a good discharge; affording, upon their first appearance, a viscid, glairy, and sometimes a whitish curdled matter, that afterwards changes into a more thin watery sanies. Their edges are frequently, though not always, painful; and are constantly much raised or tumefied. As long as the scrophulous diathesis subsists, these ulcers of-

ten remain for a great length of time, without showing any disposition either to heal or to turn worse; at other times they heal quickly, and again break out in some other part of the body.

A variety of causes have been mentioned as tending to produce scrophula; namely, a crude indigestible food; bad water; living in damp situations; the disease being hereditary, and in some countries endemic.

Many other causes have been enumerated by authors; but these we cannot propose to consider at present: This, however, may be observed, that whatever may, in different circumstances, be the exciting, or predisposing causes of scrophula, the disease itself either depends upon, or is at least much connected with, a debility of the constitution in general, and probably of the lymphatic system in particular; for it very commonly at first appears in the conglobate or lymphatic glands: And that debility has at least a considerable influence in producing it, is probable,

probable, not only from the evident nature of many of the causes which appear to give rise to scrophula, but from such remedies as prove most serviceable in the cure, which are all of the tonic invigorating kind.

§ 2. *Of the Cure of the Scrophulous Ulcer.*

IT was long supposed, that scrophula depended upon an acid acrimony of the fluids; and this, it is probable, gave rise to the use of burnt sponge, different kinds of soap, and other alkaline substances, as being the best correctors of acidity. But although a sourness of the stomach and primæ viæ is a frequent symptom in scrophula; yet this ought not to be imputed to a general acescency of the fluids, but merely to that relaxation which so universally prevails in this disease.

Nor is it probable, that acrimony of any kind occurs in scrophula, of which we have a proof in the long continuance of
matter

matter collected in the different swellings which take place in this disease, without occasioning either much pain, or showing any tendency to corrode the surrounding parts ; there being many instances of these collections subsisting, even for years, without exciting uneasiness : And in fact, the several remedies recommended for correcting the acrimony supposed to exist in scrophula, never have, at least so far as I have seen, any influence in the cure.

Gentle mercurials and cicuta have sometimes appeared to prove useful, as resolvers, in scrophulous swellings ; but nothing has such influence as a frequent and copious use of Peruvian bark, conjoined with sea bathing. Chalybeate and sulphureous waters, too, have frequently proved serviceable in scrophula ; and a long continued use of mild aperients of the saline kind has likewise had some influence in resolving the tumor. Moderate exercise proves always useful, particularly in dry air, and in a moderate climate.

Till

Till the scrophulous diathesis is eradicated, no permanent cure of the ulcers can be looked for, and all that should be done to the sores, is to give a free vent to the matter, so as to prevent effectually the formation of sinuses.

The best applications for common use in scrophulous ulcers, are the different saturnine preparations: Of which the watery solution of Saccharam Saturni, Acetum lythargyri duly diluted, Goulard's Cerate, and Unguentum Saturninum, are to be preferred; for they tend to prevent the spreading of scrophulous sores, which otherwise is apt to happen, and to remove that inflammatory complexion which they so frequently put on when relaxing applications are long continued.

When the granulations become fungous, as often happens in scrophulous ulcers, any ointment we employ should be strongly impregnated with red precipitate, and in some cases, it even becomes necessary to apply more powerful escharotics, such as
calcined

calcined allum, either by itself, or mixed with red precipitate, finely levigated.

In some instances scrophulous sores prove more obstinate than usual, and at the same time the granulations cannot be kept down, from one or more of the contiguous bones being carious. In this case, no cure can be expected till the diseased parts of the bone are thrown off, which sometimes happens when the middle parts of the large bones are affected, but never when the disease extends to the joints.—When the bones of a joint are diseased, our only resource is to amputate the member, a practice seldom adopted in scrophulous constitutions, from a dread of the disease returning in some other part of the body; but I have elsewhere endeavoured to shew, that in various instances, it may be proper to deviate from this, as I have often done with the most obvious advantage.

In the cure of scrophulous ulcers, tonics of every kind prove useful: Peruvian bark, of which I have already made mention, should be continued, together with
sea

sea bathing, and an invigorating diet: Of late, a preparation of Terra ponderosa has also been used as a tonic: I am at present giving it in upwards of thirty cases; in some with many appearances of success, but I have not yet given it such a complete trial, as to be able to speak of it decisively.

In long continued scrophulous ulcers issues prove always useful, and the pressure, which we derive from a proper application of the laced stocking, or of a spiral roller, is often one of the most useful remedies we can employ: It prevents those fungous granulations, to which ulcers connected with scrophula are particularly liable, and by which alone a cure is often prevented, which otherwise would take place.

SECTION XIII.

General Corollaries relating to the Management of Ulcers.

IN the preceding sections, I have endeavoured to point out every circumstance of importance in the cure of ulcers: At present I am to exhibit, by way of conclusion, such general corollaries as seem to result from what has been said.

1. It appears, except in a few instances, namely, in Lues Venerea, Scrophula, and Scurvy, that ulcers are always to be considered as local.

2. That, excepting in one or other of these diseases, the varieties in the matter of ulcers, depend always on some particular affection of the solids in the part diseased,

eased, and not on any morbid state of the fluids.

3. That ulcers appear to be useful or prejudicial, not by the quality of the matter which they discharge, but by the quantity : And accordingly, that the cure even of the oldest ulcer is rendered safe by the introduction of such an issue as will yield the same quantity of fluids which the system, by means of the ulcer, has been accustomed to throw off.

4. That, in the cure of ulcers, the first circumstance to be determined, is, whether they are to be considered as general or local. If they appear to be of the former kind, such remedies must be advised as are known to be most effectual for removing the disease with which they are combined : In other respects, the treatment of these is nearly the same with that of local ulcers.

5. That, in the treatment of ulcers of every kind, the chief object to be kept in view, is, to reduce them as quickly as possible to a state of purulency ; for which
purpose

purpose the remedies have been pointed out in the several preceding sections.

6. When brought to this situation, the cure is to be accomplished by due attention to the three following circumstances.

1st, The introduction of an issue, of such a size as may carry off nearly the same quantity of fluids which the system, by means of the fore, has been accustomed to throw off.

2^d, The preservation of the matter in a purulent form, the several means for which have been already pointed out; but the most important, it may be remarked, are, obviating every kind of irritation, and preserving, in the parts affected, a proper degree of heat.

3^d, The application of gentle pressure, not only upon the ulcer itself, but on the neighbouring sound parts also.

In the course of this work, I have often had occasion to advise the application of pressure in the cure of ulcers. In addition to what has already been said upon this point, I think it right to observe, that

This remedy is not as yet sufficiently known, otherwise it would be more generally employed. Those who have not used it, would scarcely give credit to the accounts which I could give of its universal utility in the cure of sores; but, from much experience of its effects in almost every variety of ulcer, I can venture to assert, that those who have not employed it, have deprived their patients of the most powerful application hitherto proposed for the cure of ulcers.

These are, in short, the principal points to be kept in view in the cure of ulcers; and which, in different parts of the preceding sections, have been more fully explained.