A memoir on indolent ulcers, and their surgical treatment / by John Gay.

Fig. 1.

Fig. 2.

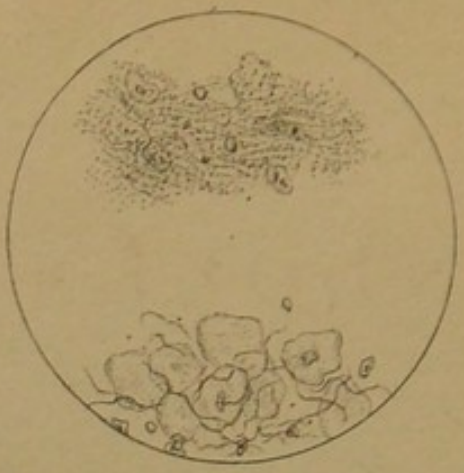

Fig. 3.

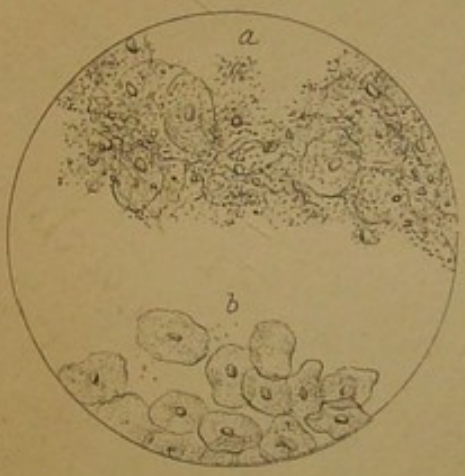

Fig. 4.

Fig. 5.

Fig. 6.

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Ford & West Imp.

A MEMOIR

ON

INDOLENT ULCERS,

AND

THEIR SURGICAL TREATMENT.

BY

JOHN GAY, F.R.C.S.,

ETC., ETC., ETC.

LATE SURGEON TO THE ROYAL FREE HOSPITAL.

Ἃ κόσα φάρμακα οὐκ ἰῆνται σίδηρος ἰᾶται, ὅσα σίδηρος οὐκ ἰᾶται πῦρ ἰᾶται, ὅσα καὶ πῦρ οὐκ ἰᾶται, ταῦτα χρὴ νομίζειν ἀνίατα.

HIP. APH. (INTERIT.)

LONDON:

SAMUEL HIGHLEY, 32, FLEET STREET.

1855.

PREFACE.

THIS little work is an amplification of a paper which I had the honour to read at a meeting of the London Medical Society during its last session. A rule of that Society wisely excludes from its meetings any paper the reading of which would occupy more than half an hour; and if its observance occasionally stands in the way of the full elaboration of an author's views, it has the more than equivalent advantage of securing for them the opportunity of an ample discussion. The subject of "indolence," in connection with ulcers, I felt to be so comprehensive as not to admit of more than very imperfect treatment in the space of time alluded to; and, as the views which I then advanced have been repeatedly brought under my notice by my professional brethren for further elucidation, I determined upon publishing them with, at the same time, the addition of such matter as may be required for that purpose. I confess to my having fallen very short of exhausting this interesting subject; and, moreover, that in the treatment of it I have been somewhat discursive and, perhaps, even capricious. Should any of my readers be disposed to find fault with my work on these accounts, I beg to state, that I did not con-

template making it a *Treatise* on "Indolent Ulcers;" but rather an exposition of those topics in connection with this subject which formed the basis of my original paper. The following, however, are the principal objects which I had in view; 1st, the enunciation of principles, in reference to ulceration and ulcers, which I deem to have been too much overlooked, as well by the pathologist as by the practical surgeon; and, 2nd, the expression of my full concurrence in the views of one, to whom the profession is, I think, largely indebted for the reformation which he introduced in the treatment of ulcers and breaches of surface generally, as well as for the assertion of *principles*, which can never be lost sight of, so long as Surgery is a Science as well as an Art,—I mean Mr. Baynton. I trust that these objects may be regarded as a justification of my undertaking.

J. G.

10, Finsbury Place South.
January 1, 1855.

A MEMOIR

ON

INDOLENT ULCERS,

AND THEIR TREATMENT.

AFTER the performance of Mr. Fergusson's very ingenious and effective method of operating for the cure of cleft palate, a hole occasionally remains in the line of union of the two halves of the flap, close to its attached border.* It results from the edges having failed to unite at that particular situation; is for the most part independent of constitutional disorder;

* In order to prevent this defect, I have recommended, as an addition to Mr. Fergusson's method of operating in these cases, that *a transverse incision* should be made through each of the flaps, by which they are to be disunited from the edge of the hard palate. These incisions should be carried so far *outwardly* as to allow of the flaps being brought together mesially without their being subjected to any strain. In this manner enough flap can be gained, even in the severest cases of cleft through both soft and hard palate, to make the former entire, as I have again and again demonstrated on the living subject. After making good the soft palate in such cases, an obturator may easily be fitted to the aperture left in the hard palate, unless it be closed by the excellent operation devised by my friend Mr. Avery.

and often very difficult of cure. As its persistence tends seriously to impair the advantages of this operation, my attention was specially directed to it, for the purpose of ascertaining its cause, as well as the means of its prevention.

A case occurred in the Royal Free Hospital, in which such a hole remained after the operation; and after watching it for some time with my intelligent friend, Mr. G. F. Lane, now of Highgate, this gentleman remarked that the hole continued to decrease in size, even after the complete cicatrization of its edge; and it became obvious that it did so, not in consequence of any out-welling of the edge, but at the expense of the laxity of the soft palate generally; for as the hole contracted in size, so the soft palate became more and more tense until the closing tendency appeared to cease altogether.

The inferences appeared to be as follows; that, for the closing of such an aperture two conditions are required;—1st, freedom on the part of the edge to contract; and 2nd, freedom on the part of the palatal flap at large to yield to whatever strain the edge in contracting may make upon it;—and that the process of closing cannot go on if either of these conditions be wanting.

A little reflection led me to conceive an analogy between the process by which such an aperture closes, and that by which ulcers, or any other breach of surface, commonly heal;—and to infer, that the arrest

occasionally noticed in the healing of an ulcer, to all appearance well disposed to cicatrize, is dependent on causes in respect to its edge and adjoining structures similar to those to which I have referred the non-closure of apertures in the soft palate.

It is my purpose in the following pages to inquire how far such an analogy holds good: and what are the practical inferences which its existence would suggest.

During the last century the attention of the French surgeons was specially directed to the subject of ulcers and their cicatrization.

Garengeot taught that the material or blastema which repairs the waste constantly sustained by the animal organism, also repairs the loss occasioned by wounds or ulcers; and that by the progressive conversion of this blastema into flesh, voids thus occasioned are eventually filled up. Quesnay objected to Garengeot's views, but only so far as they appeared to favour the doctrine of *perfect* regeneration: for he says, "Il est certain que les molecules de ce suc (le suc nourricier) qui s'appliqueraient les uns aux autres, ne formeroient, en allongeant les parties coupées, qu'ne concretion ou un massif informe au lieu d'un tissu organisé, tel que parvit être la substance carniforme qui s'éleve sur les plaies et les ulcers."*

* Traité de la Suppuration.

Fabre contended that in the process of cicatrization there is no regeneration of tissue whatever; but, from observing what takes place during the healing of a stump after amputation, of an ulcer, and of an abscess, that the parts themselves shrink, and finally heal, concludes that they did so, simply through the *drying* of the "suc nourricier," which is poured out on the surface of the sore or on the walls of the abscess. Regarding the surface-tissue of a sore as consisting of little else than vessels, Fabre surmised that these shrink through exhaustion of their contents, and this principally by the process of suppuration; the shrunk vessels, glued together by the "suc nourricier," forming, in fact, the basis of the cicatrix. The observations of M. Louis, contained in the same volume of the Memoirs of the French Academy, support in the main the views of Fabre; but differ a little in minor points. "Pour l'obtenir la consolidation des plaies,"—says Louis, "il faut constamment dessecher; *la cicatrice* n'est que la réunion des lames du tissu cellulaire pour former de la substance de la partie même, une pellicule qui tienne lieu de la peau qui a été detruite.*

The distinction between the views of Louis and those of Quesnay and Fabre, amounts simply to the negation by the former of the blastematous secretion,—"suc nourricier,"—which the latter writers considered

* Memoirs, tom. iv. p. 222. This view had been broached by Marc Aurelius Severinus.

essential to the process of cicatrization. Louis deemed all regeneration as inconsistent as well with observation as with theory; and looked upon the process, by which a wound with loss of substance heals, as consisting, first, in the "shrinking in" (*affaisement*), and, secondly, in the consolidation, of the laminæ of areolar tissue that form its surface.

There is much of general truthfulness in the views of these able writers. Those of Fabre and Quesnay most closely agree with the nearer approaches to truth which the use of the microscope has in later times helped us to make; and, indeed, so far as they go, appear to be susceptible of very little amendment. Mr. Syme says most rightly that, in reference to the subject to which they relate, these essays "leave hardly anything to be desired for its elucidation." "They show," continues Mr. Syme, "that there is never any real reproduction of lost parts, with the exception of bone, which in some circumstances is regenerated. The skin ought also, perhaps, to be excepted; but the difference as to appearance and properties between the substance that constitutes a cicatrix, and the ordinary integument of the body, would rather lead us to regard this structure as a new formation. In all other cases it will be invariably found, that when the cure is completed, there either remains a depression corresponding to the loss of substance, or such a contraction of the neighbouring parts as com-

pensates for the want."* Nelaton and others refer the healing of an ulcer to the instrumentality of a granular membrane which is first formed on its surface. This membrane draws the edge of the ulcer together concentrically; but as soon as it meets with insuperable resistance on the part of the surrounding skin, it organises into a cicatrix, commencing either from the periphery, or from islets which make their appearance in different parts of the ulcer-surface.

The views at present more generally accepted appear to be that, for the healing of an ulcer there is first, *some regeneration* of tissue by granulation through the formation, according to Mr. Paget, of nucleated cells; and, secondly, the conversion of this granulation matter into new skin-tissue. My own observations on the tissues which constitute the surfaces and borders of ulcers, lead me to differ somewhat from the views of this very distinguished physiologist, so far as the process itself is concerned.

On submitting a portion of a granulation from the centre of an ulcer in a *stationary* condition but with a vascular surface, to an object glass of 220 diameters, the appearances that usually present themselves are those of the *most delicate* fibrillated, or rather wavy-looking and finely granular semi-fluid matter (blastema?), intermixed with scanty minute fibrillæ and large granular and nucleated cells. On the addition of acetic acid, the appearances alter. The wavy-looking matter

* Principles of Surgery, p. 4.

disappears, leaving an abundance of very minute and distinct fibrillæ, granules either scattered about or collected in small groups, and here and there an epithelium scale (Fig. 1). A granulation from a stationary sore, upon an eczematous patch of skin, showed matter similar to that observed in the former specimen, with large, pale, and perfectly spheroidal granular cells, nucleated cells, blood, and apparently minute oil-globules; these elements were resolved by acetic acid into very delicate fibres, nucleated cells, nuclei, and a few delicate epithelia (Fig. 2).

A granulation from a healing sore—its surface stratum—presented the appearance represented in Fig. 3(*a*); upon the addition of acetic acid, nothing remained but epithelium scales (*b*).

A superficial lamina, from the extreme skin-border of an ulcer not healing, showed fibrillated tissue (Fig. 4, *a*), which was resolved by the acid into nucleated cells, disengaged nuclei, some with, others without nucleoli, traces of fibre, granules, and apparently minute oil-globules (*b*).

The extreme edge of the skin-border of a healing ulcer is composed of several distinct lamellæ. The superficial layer, from a border in which cicatrization had just commenced, consisted apparently of fluid material having a disposition to fibrillate, which was resolved by acetic acid into epithelium scales, with blood corpuscles (Fig. 5, *a*, *b*). The tissue taken from beneath the former

lamella showed very finely granular and *apparently* fibrillated tissue, seemingly composed of non-nucleated, elongated, and spindle-shaped fibres, arranged longitudinally with respect to each other (Fig. 6, *a*). On treating this with the acid, epithelia with disengaged nuclei, both with and without nucleoli and a few fibrillæ presented themselves. The spindle-shaped appearance of the tissue, prior to its being so treated was evidently due to the overlapping of the edges of the epithelium plates (*b*).* Are these nuclei liberated from used-up epithelium cells; or cells altogether distinct from those elements, and have some relation to the fibrillized material with which they appear to have been incorporated? I am inclined to think, adopting the views of Virchov and Donders as to the production of tissue otherwise than through cells, that those referred to are independent of the epithelium, since I have found them both with and without this element. Have they the power of communicating to the fluid blastema the disposition to develop itself into those forms which its resultant tissues respectively assume?

I do not attempt to explain the production of permanent tissue by the histological appearances I have so briefly narrated, but, inasmuch as I have constantly found the nucleated and granular cells† proportionally most

* I have repeatedly verified these observations.

† The pale granular cells I have repeatedly found in large numbers with tissues engaged in ulcerative action, where no attempts at or traces of repair can be seen.

abundant in connection with granulations from a stationary or non-healing ulcer, I am inclined to think that these are not adapted or designed for metamorphosis into cicatrix tissue; but that this tissue is developed out of the blastematous matter appertaining to healthy granulations in which these cells are imbedded, but which, as we shall see hereafter, can only arrange itself and become finally consolidated—organized—into fibrous tissue when in contact with cutaneous fibre either already formed or in progress of formation.

These two stages in the process of healing, or cicatrization, are in every respect distinct from each other, and respectively require distinct conditions for their accomplishment; inasmuch as healthy granulations may spring up and fill an ulcer to overflowing, but may refuse to undergo that further change which is necessary for its healing, viz., conversion into the elements of tegumentary tissue; and this appears to be the characteristic and essential distinction between the "indolent" and other forms of ulcer.

Mr. Chapman's able work on Ulcers contains some very interesting and able woodcuts from drawings of granulations injected by Mr. Quekett, which appear to confirm this view. The *healthy* granulation consists of little else but convoluted capillaries, elongated and enveloped in lymph; whereas in the granulation taken from a varicose ulcer—an ulcer in an indolent state—the capillaries are a little more elongated,

hyperæmic, and do not possess the lymph envelope. Mr. Quekett favoured me with a view of his specimens of successfully injected ulcer tissues, comprising the edges and surfaces of ulcers in connection with diseased bone, with varix, and with disease of Peyer's follicles. The papillæ of the border skin, apparently to the extent to which it was affected in each case by inflammatory action, were erect, distinct, and elongated, and had evidently been rendered so by vascular turgescence, for each papilla was overrun by loops of enlarged and tortuous capillaries that were not observable in the healthy papillæ. The surface of the healing ulcer displayed similar loops projecting in eminences, evidently those of granulations; but the vessels themselves were not so convoluted as in the papillæ. The surface layer of the stationary ulcer was not vascular; whilst the basement tissue was abundantly injected. Whence I infer that the apparatus requisite for reparation exists equally in the non-healing as in the healing granulation; but that in the former, from some cause to be determined, *the process* is in abeyance; the *materials* are present, but the *power* is wanting; the vessels and the blood—and, we may infer—the nerves and absorbents also are all there, but they fail to develop the tissues by which the ulcer is to be closed in.

If the constitution is sound, the *growth* of granulations takes place by virtue of an intrinsic force, which no external or local conditions can successfully resist;

but it is not so, however, as regards their further development; inasmuch as the inherent power by which this is accomplished, appears to be almost, if not wholly subordinated to influences, which I have yet to specify, that are exerted upon them by adjoining structures.

The healing of a sore, then, is simply a process by which its surface is furnished with a new skin; and the process itself appears to be as follows. On the basement tissue of a sore, granulations are thrown out, which, on examination, are found to consist principally of epithelia, nucleated cells, and blood-vessels enveloped by some plastic granular matter which has a tendency to fibrillate. These granulations increase until they become even with, or even surmount the edge of the sore, when, in this situation or elsewhere if the condition be favourable, a process commences by which, from apparently a homogeneous blastema, the peculiar fibrous structure—a cicatrix—is formed. In this process capillary turgescence takes an important part.

In endeavouring to arrive at a practical indication for the treatment of an "indolent ulcer," it will be necessary to examine a little more narrowly into the process by which the formation of this new skin-tissue is accomplished, and the influences by which that process may be affected.

If a granulation from the centre of a healing sore be examined at any period between the commencement and completion of that process, its elements will be

found in the same condition; *i. e.* stationary, so far as development is concerned. If, however, it be taken from the edge of the same sore, a change will be found in progress by which fibrous and ultimately cicatrix-tissue is in process of development. As this change takes place only at the edge of the sore (excepting under circumstances to which I shall hereafter refer), it might reasonably be inferred, that the elements out of which the cicatrix-tissue is formed must be in contact with already formed skin, in order to their becoming susceptible of co-equal development.

The acute eye of John Hunter noticed this peculiarity. "We find," says Mr. Hunter, "the new skin most commonly taking its rise from the surrounding old skin, as if elongated from it; but this is not always the case. . . . . Skinning is somewhat like crystallization, it requires a surface to shoot from, and the edge of the skin all round would appear to be this surface. Whatever change the granulations undergo to form skin, they may in general be said to be guided to it by the surrounding skin, which gives the disposition to the surface of the adjoining granulations, as adjacent bones give an ossifying disposition to the granulations that form upon them. This may arise from sympathy; and if it does, I should call it continued sympathy." *

In whatever part of an ulcer-surface, a particle of skin remains, there, it is obvious, cicatrization may com-

* Works by Palmer, 3rd vol., p. 501.

mence, independently of its commencing at the edge. Hence, the surfaces of ulcers, which consist of skin tissue, are observed constantly to cicatrize in all parts simultaneously; or, in isolated spots or islets, where the skin has been, in greater part but not entirely destroyed. Hence, also, in these superficial or skin-sores (as they should be called), it is only necessary, at times, to call the dormant energies of their surface-tissue into action by a blister, or some such irritant, and reparation will commence at once and from every point.

This fibre-making process at the extreme edge of the sore takes place concurrently with contraction of that edge in such a manner that the sore gradually lessens in size, and is ultimately closed in; but by a cicatrix of less dimensions than those of the original sore. Mr. Hunter did not satisfy his mind as to the relation between these processes, for he did not determine the precise nature of the changes by which the former is accomplished. His statement is, "Skin is a very different substance, with respect to texture, from the granulations upon which it is formed; but whether it is an addition of new matter, viz., a new-formed substance upon the granulations being produced by them, or a change in the surface of the granulations themselves, is not easily determined. One would at first be inclined to the former of these opinions, as we have a clearer idea of the formation of a new substance than such an alteration in the old."

Contraction of the edge is due to the consolidation

of the fibre in the course of development, and not to a process of desiccation, as Louis, Quesnay, and Fabre supposed—the *apparent drying* being due to a change in the function of the edge-tissue, whereby, for a time, it secretes an unusual quantity of readily desiccating and abortive epithelia.

From a careful examination of the marginal tissue of an ulcer it would appear that, whilst this process is going on, the power of creating further granulations ceases; so that the void occasioned by the conversion of their elements into fibre is not filled by fresh granulation-tissue. Hence the area covered by granulations is always more extensive than that of the fibres into which these become developed; or, conversely, the surface of a healing ulcer is unable to produce a cicatrix sufficiently extensive to close it in. To make up for the deficit, the ulcer must derive some portion of its covering from the surrounding skin.

As this call is made in accordance with the nature of, and through the fibre-developing process going on at the border of the ulcer,—so, as in the case of the palatal hole, freedom on the part of the tissues of that edge is essential to the first steps towards its cicatrization; and not only so, but carrying the analogy still further, the adjoining structures, especially the skin, must also be in a condition to yield to any traction that might be made upon them in the course of that process.

If from any cause these structures should refuse altogether, or at any stage in the healing of the ulcer

should cease to yield to that traction, the fibre-developing process in the border would cease also, and the ulcer remain in a stationary condition; *i. e.* it would become "indolent."

The force generated by the process just detailed is considerable, and the collective amount by a healing ulcer-margin exerted is, in a great measure, proportionate to its circumference and the resistance offered to it by surrounding structures. Sometimes, as Nelaton observes, the traction of a cicatrix is so great as to occasion partial or complete fixity of an articulation, luxations of bones, and deformities of other parts in its immediate vicinity.

The complete consolidation of a cicatrix is not accomplished at the time of its formation; hence its dimensions and firmness cannot be determined for some time after the skinning of a sore, and will ultimately depend materially upon the laxity of the surrounding parts. For, as Mr. Hunter states, "If the sore is in a part where the surrounding skin is loose, as in the scrotum, then the contractile power of the granulations being not at all prevented, but allowed full scope, a very little new skin is formed; whereas, if the sore be in any other part where the skin is not loose, as the scalp, shin bone, &c., &c., in that case the new skin is nearly as large as the sore." Thus from incompletion of the process an ulcer occasionally becomes covered in by a kind of pseudo-cicatrix, having but little advantage, if any, over the open sore.

For the healing of an ulcer it is therefore necessary;—1st. That a portion of entirely new skin-tissue be produced.

2nd. That, the extent of skin-tissue which a given sore is able to produce, being seldom, if ever equal to the area of the sore itself, the deficiency must be made up at the expense of the surrounding skin.

3rd. That, for the continuance of the cicatrizing process and in order to its perfect accomplishment, the tissues of the border of the ulcer must be free to contract, and their contiguous structures must also be free to yield to the traction thus made upon them.

From the remarks now made it is obvious, that we must look for the causes why an ulcer becomes "indolent," not within the domain of the sore itself, but chiefly in its skin-border and the contiguous surface tissues.

The foregoing remarks are applicable to *ulceration* in the abstract; but I purpose to apply them *especially* to ulcers which show a reluctance to heal, independently of all constitutional influences.

There is a generally recognized species of ulcer, the "indolent," which is included amongst the opprobria of the healing art. The accounts given of it by writers differ almost in every instance.

Boyer defines it as an ulcer, the base, edges, and adjoining structures of which are hard and permanently in a state of chronic inflammation; and Chelius, as an ulcer surrounded by a whitish, dry, insensible edge, not

unfrequently of considerable thickness and of a cartilaginous character.* Nelaton describes it as follows:—"Quoi qu'il en sort, le fond de l'ulcère est très deprime; il est grisâtre, et a peine recouvert d'une couche très mince de bourgeons charnus, fournissant, non pas du pus, mais un liquide fétide, séropurulent. Il est d'une dureté considerable, presque cartilagineuse, non œdemateuse; c'est la dureté du squirrhé. Les bords de l'ulcère sont tuméfié, irrêguliers, comme taillés à pic, et présentent la même dureté que la fond. Cette dureté s'etend fort loin. * * Indépendamment de cette dureté remarquable qui, jointé au volume excessif que présente quelquefois le membre, permet de les comparer à l'éléphantiasis, le pourtour de ces ulcères nous présente encore une absence complète d'elasticité; toutes ces parties sont insensibles, pales ou d'une coloration legèrement rosée, elles semblent complètement exemptes d'inflammation. Sur les membres ou ces ulcères existent depuis longtemps, le système pileux a subi un developpement remarquable. On voit quelquefois autour de ces ulcères des croûtes sèches, grisâtres, resemblant à du pus concret, que l'on parvient à détacher en les grattant avec l'ongle; ces sont, comme on peut s'en assurer, en les enlevant ainsi, des plaques très espaisses d'épiderme, dont la secretion le trouvé considerablement accrue. * * Les ulcères calleux sont indolens ou très peu doloureux; cependent

* Surgery, South's Edition—Article, "Ulcer."

lorsqu'une cause accidentelle d'irritation agit sur eux, ils peuvent devenir le siège de douleurs assez vives."*

Such is the account of this variety of ulcer as given by one of the most enlightened and accurate observers of the day. Its truthfulness cannot be impugned; but it is faulty, inasmuch as it combines essentials with non-essentials, and ascribes to the so-called "indolent" ulcer appearances which are contingent only upon certain conditions, and which belong equally to the description of every other species.

The account given by Mr. Hainworth in an interesting communication on the "Treatment of Callous Ulcers," recently published,† is open to the same objection; since it does not confine itself to those facts in connection with the "indolent" ulcer, to which its real or specific character is to be ascribed.

In truth, the aspect presented by such an ulcer is so variable, that it would be impossible to gather from it alone any set of objective symptoms that might be regarded as typical of the class to which it has been assigned. The surface, for instance, is said to assume every shade of colour, from a dirty white or pale ash, to a dull, deep red or purple, without the slightest apparent tendency to heal. Sometimes it is smooth and more or less glazed, or it presents an exuberance of granulations, but still without any disposition to scar; whilst under favourable conditions it may either

* Elemens de Pathologie Chirurgicale, pp. 328, 329.

† Medical Times and Gazette. Jan. 21, 1854, p. 56.

partially or completely cicatrize, but on the suspension of those conditions it will spread again to, or even beyond, its former dimensions. The discharges, too, are, if possible, more various than the aspect of the ulcer. Such a sore occasionally forms for itself a *loose, warty* cicatrix, which gives exit to a sanious discharge, is even more irritable and painful than was its former surface, and wants the usual elements of stability. Moreover, according to authors generally, the "indolent" ulcer is seen under both local and constitutional circumstances that are common to every other variety. These constantly varying conditions of the ulcer-surface are referable to agencies of an equally transitory nature; and as they have little or nothing to do with the indolence of the ulcer, are to be distinguished from those more abiding conditions, presently to be described, with which that quality is uniformly allied. The term "indolent" would, therefore, as well as for reasons which will hereafter be adduced, be more appropriate if it were used to indicate, not a supposed variety, but a definite condition or stage of an ulcer; for, as Sir Everard Home says, "It is immaterial whether in its origin an ulcer was healthy, weak, or irritable; if not healed within a certain time it becomes 'indolent.'"* I shall therefore prefer using it

* On ulcers of the legs, p. 189.

I cannot but think the existing classification of ulcers unsatisfactory; inasmuch as it is based upon a faulty generalization, or rather upon no generalization whatever.

in future as distinguishing a *condition* of an ulcer, not a *variety*.

If it be asked what are the symptoms which mark the period at which an ulcer is overtaken by a condition of indolence, I should not be able to give any that could be relied upon, excepting its refusal to heal or to remain healed, in obedience to that treatment which might have the effect of removing its exciting or remote cause.

Indolence cannot be looked upon as an unvarying or fixed quality in connection with an ulcer; but as a condition susceptible of many degrees—indeed of every degree—of intensity; and it is generally assumed so imperceptibly as to render it impossible to fix the date of its commencement. In that sense of the term, however, to which it should be restricted, indolence cannot be said to exist at all but in connection with organic change in some one or more of the textures involved.

The fact of an ulcer being indolent having been ascertained, it would be comparatively easy to refer its indolence to changes observable in the border-textures; but it would be difficult from such changes to determine the degree in which it exists, since this could only be inferred from a knowledge of their exact nature, the depth to which the textures have been affected by them, and the influence of a still more occult agent, viz., constitutional disorder. Ulcers having become indolent have been known to exist with alternations

of imperfect healing and spreading for many years; and have required in many instances, for the patients' comfort and usefulness, the amputation of the affected limbs.

Whatever appearance the *surface* of an indolent ulcer may present, its *situation*, *base*, *edge*, and *adjoining structures* will always disclose peculiarities, to which its indolence is to be referred. To these I must now call attention. 1st. The indolent ulcer is found for the most part in such parts of the body as have but little depth of soft tissue, as on the cranium, over the sternum, the great trochanter, tibiæ, malleoli, os calcis, &c., &c., or in parts which have but a small extent of loose contiguous surface, as in the small part of the leg, or about the elbow joint; in parts the skin of which has been put on the stretch in consequence of fractures unevenly united, or of osseous or other hard deposits beneath it; on the site or in the vicinity of cicatrices from burns, scalds, accidents, destructive diseases, or operations; or on portions of skin which have lost their normal elasticity from their being or having been the seat of chronic disease.

2nd. The *base* of the ulcer is either free or fixed, and more or less callous according, as it overlies hard or soft structures, or, to the changes which have taken place in its tissues. As Mr. Chapman has observed, such an ulcer is often imbedded in tissue, rendered unusually dense by a gradually augmented deposit of lymph amongst its particles. Ulcers so circumstanced are

usually superficial, and surrounded but by narrow areolæ of disordered skin.

When the ulcer is associated with a varicose state of the veins of the limb, its base is often traversed by a portion of vein in a state of advanced disease; instead of being dilated, attenuated, and knotty, in common with portions of the same vein in other parts of the limb, in this part of its course, its coats are often found thickened, and the vessel itself degenerated into little more than a fibrous-looking cord, from which, when cut through, little or no blood escapes. Its existence can only be surmised, by observing the direction which the veins take without the sphere of the ulcer; or determined, by passing the point of the finger over its surface.

3rd. The *skin-edge* differs materially in different cases; but its most important indications relate to thickness and fixity. It may be diseased alone or in common with the adjoining skin. If alone, it might become more or less thickened; assume a variety of shapes; and ultimately become fixed to the subjacent structures. In other cases the edge does not thicken at

* "The longer," says Mr. Chapman, "the case is neglected, the more does the obstruction (caused by this deposit of lymph) increase in amount, until it so interrupts the general circulation from beneath, that only a sufficient supply of blood seems to reach the surface through it to support a feeble vitality, but not enough to set on foot the reparative process."—*Medical Times and Gazette, March*, 1854. I do not think the indolence of such a sore is due to the cause here assigned, since the tissue referred to would, in all probability, be unusually vascular.

all; but either terminates abruptly, or, as it approaches the line of ulceration, bevels off until it is gradually lost in the thin pellicle by which that line is bounded. Ulcers, the edges of which have these features, are generally found in or adjoining portions of skin that have been altered by disease or injury, or that stand in the position of "re-productions," as cicatrices.

When the surrounding skin is the seat of disease the edge will, as a matter of course, participate in it, and may or may not be additionally affected by any diseased action going on in the sore tissues themselves. If that affection be of the eczematous kind, the edge will correspond in appearance and depth with the adjoining skin; if it be non-exudatory, it will thicken in common with the affected skin, or even to a still greater extent, or even alone, and assume the condition generally understood by the terms, "callous," "circumvallated," or "welted," and become either attached to or free of the subjacent textures.

The *welting* of a sore has obtained especial notice from those who have written on the subject of ulceration, perhaps more than it deserves. Mr. Syme regards the welt simply as "accumulated cuticle," a view in which Mr. Hainworth concurs. "The mode of formation of the callous margin," says Mr. Hainworth, "scarcely admits of accurate description, because it usually takes place while the ulcer is not under surgical treatment,

but while exposed to the many circumstances of neglect in dressing and cleanliness, errors in diet and excesses, over exertion and fatigue, or some of the many other injurious influences to which the patient may have been subjected. Any one of these may induce the degeneration or death of the granulations at a time when the cutis is vigorously forming new skin; and this process being suddenly arrested, the cuticle at the margin may continue to be formed more rapidly than in health, just as, under the irritation of unusual pressure, callous cuticle or a corn is rapidly formed on the hands or feet."*

Now the "welt," on careful examination, will be found to consist of a ridge more or less uneven, of hypertrophied *cutis*, surmounted by accumulated *cuticle;* the former frequently in nodules, the latter in distinct lamellæ, and composed of epithelia, with — in the lowermost lamellæ — fibrillated material, approaching towards that which constitutes true cicatrix. It presents itself most frequently at the periphery of ulcers, the surfaces of which have apparently a disposition to heal; but seldom of those ulcers which are surrounded by portions of skin extensively and actively diseased. I quite concur with Mr. Hainworth in his view of the causes of its production, so far as he has gone; but think, too, that it is sometimes produced by indiscreet surgery, especially by the constantly renewed

* Op. cit.

application of stimulating ointments and caustics, or by the long-continued pressure of an ill-applied or unnecessary bandage. It directly results, as Mr. Hainworth says, from the "stimulus of a morbid influence or abortive attempts at reparation;" and may be safely regarded as a sure indication of an *inherent readiness* on the part of the ulcer tissues to heal.

The thickness of the edge, as Mr. Syme remarks, is, alone, no criterion of the depth to which the ulcerative process has extended. In some instances, the edge is thickened in common with the adjoining skin, the swelling in both being due to one and the same cause; whilst in others—generally those in which the border disease is confined within a narrow compass and the edges "welted,"—the thickening appears rather to arise from disorder affecting principally the tissues in which the ulcer is more immediately imbedded. It is often greatest when these changes are limited simply to an addition of matter by inflammatory or passive exudation; and least, when they consist in a more or less abiding alteration of the integral constituents of the tissues themselves.

4th. The *surrounding skin* will generally be found affected by inflammatory disease in a more or less active state, and for a distance, more or less considerable, from the edge of the sore. It may present various grades and kinds of thickening by infiltration from that of simple or solid œdema to a state resembling elephan-

tiasis; or it may be the seat of some chronic change from former disease, by which it has become more or less dense, brawny or livid, and inelastic. Sometimes it is of a dull, copper colour, and rigidly contracted as though it had been subjected for a long period to the restraint of a tight bandage;—often forming in this way an entire ring around the limb, and being at the same time firmly adherent to the subjacent textures. Occasionally, after having been the seat of disease for years, the skin will very nearly regain a healthy appearance, and will recover some freedom of movement—its elasticity, in part only,—but will be found at the same time, so far as its texture is concerned, to be materially altered; its tissues having become more compact, and the proportion of its elastic fibre materially reduced; the edge alone affording more positive evidence of the changes to which the adjoining tissues, in common with itself, had been subjected. If the ulcer is associated with varicose veins, the diseased vessels will be traced more or less distinctly through the affected skin, some one or more generally traversing it in the direction of the sore. Or, if it be co-existent with cicatrices, these will be found either partially or wholly to surround it, or they may be situated at some distance from its edge.

I advance to inquire how the act of ulceration is promoted by these conditions of the skin, and to show why an ulcer becomes indolent.

Whatever be the cause of ulceration, the act is, in all benign cases, accomplished through the medium of the same processes.

Mr. Hunter regarded ulceration as an action of the absorbent system, connected with the formation of pus, either as a cause or a consequence, and almost constantly attended with inflammation.* Dupuytren believed it to consist essentially in purulent degeneration or metamorphosis of the ulcerating tissues. Key, from some experiments on the thigh of an ass, was at first led to look upon ulceration as a species of progressive absorption, effected through the agency of the extreme branches of the venous system; but abandoned this for a theory more consistent with our advanced knowledge of minute pathological changes; viz., that it is a degeneration or softening of tissue, differing from gangrene in being a vital action.† "In gangrene," says this lamented surgeon, "the supply of blood to the part altogether ceases, whilst the integrity of the tissue is preserved; under ulceration, the circulation in the vessels continues during the action, and the part still belongs to the living mass, and remains under the influence of vital action until its separation is completed."‡ There appears to be little or no difference between

* See Works by Palmer, vol. i. p. 424.

† Medico-Chi. Trans.; vol. xviii. p. 26.

‡ Id. vol. xix. p. 137.

the views of ulceration enunciated in the foregoing passage from Key's paper, those of W. J. Earle,* and those of modern pathologists, by whom for the most part it is regarded—to use the expression of Vidal—as consisting simply in a process of "chronic molecular gangrene." This distinguished pathologist, says Nelaton, "fait remarquer avec raison qu'il existe entre l'ulceration et la gangrene de nombreux points de contact; ces deux états pathologiques lui paraissant avoir entre eux d'étroites affinités. Ce ramolloisement extrême qui précède toute ulceration est certainement, dit-il, une forme de la mortification, l'épiderme que se soulève, la préférence qu'affectent la plupart des ulcères pour les parties affaiblies; l'âge avancé, la faiblesse des sujets qui en sont le plus souvent affectés rendent cette opinion très soutenable, pour lui l'ulceration ne serait *qu'une gangrene, pour ainsi dire, moléculaire;* les tissus, au lieu d'être absorbés, comme l'enseigne la théorie de Hunter, seraient éliminés d'une manière insensible."†

I believe ulceration to be nothing more or less than molecular disorganization or destruction of tissue, equivalent with Vidal's process of "chronic molecular gangrene;" a process that might at any time be more or less affected by collateral circumstances of a constitutional or local nature, but which depends upon specific and strictly local conditions for its immediate production.

* London Medical Gazette, 1835, vol. xvi. p. 254. † Op. p. 343.

If, as I have attempted to show, the repair of an ulcer cannot be accomplished unless certain freedom of movement exists in the edge and adjoining structures, together with similar freedom amongst their constituent elements; then, I think, there is every reason for concluding that the absence of those conditions, in the tissues which the ulcer is destined to remove, is the direct and sole cause of its production. And were I to trace diseased into healthy action, I should infer that the process itself is immediately preceded by a loss, on the part of the succumbing tissues, of that power by which the waste constantly taking place amongst their elements is repaired, attended by, in some instances, a more than ordinarily rapid wasting of the elements themselves. In other words, it is a state of healthy action, converted, by some modification affecting both the duration and intensity of its component forces, into a state of disease.

I may for a moment digress here in order to say that it is to the peculiar deviation from the normal standard, which the tissues directly engaged in this ulcerative process present in particular instances, that the surgeon might look for most important indications to guide him in his treatment. These peculiarities will often inform him how far the ulcerative process depends either upon constitutional or local disorder or upon an union of both,—and sometimes as to the essential nature of the disorder itself. The œdema, the thickness, the

colour, the temperature, and other physical conditions of a disorganizing ulcer-border, furnish valuable information on these points; and to the histological and chemical surgeon, the ulcer-surface, by affording opportunities of analysing, at every step of its progress, as well its solid tissues as the fluids these eliminate, can supply yet more important information, inasmuch, as by its aid, he is enabled to gain still nearer access to a knowledge of the source of the disease, or, at all events, of its immediately exciting cause.

I shall not here enter into the details of this very interesting department of pathology, as it would carry me beyond the limits of my present purpose; but I beg most strongly to recommend its cultivation to all who are desirous of advancing their art beyond the dreary trammels of doubt and speculation.

But what is *indolence*, and by what is it produced or maintained in connection with an ulcer?

An ulcer will often refuse to heal, and in the general sense of the word, be indolent, in consequence of the continued existence of a simply ulcerative disposition in its border textures;—in other words, an ulcer may remain obstinately open in obedience to the persistence of simply functional disorder in those textures;—but indisposition to heal under such circumstances must not be mistaken for *indolence*, in the specific application of the term.

In order to render an ulcer really *indolent*, something

more than mere *ulcerative disposition* is wanted, inasmuch as an aggravation of that disposition would only lead to extension of the ulcer. The supervention of another kind of action is required, whereby those more permanent changes are effected, with which, as I have endeavoured to show, indolence on the part of an ulcer-surface is alone associated. And it is somewhat remarkable that whilst these further changes tend to exert a conservative influence on the ulcer, they, at the same time, act as a preservative against the inroad of ulcerative action upon the structures affected by them; so that the more indolent the ulcer becomes, the less likely is it to enlarge. For instance, the infiltration of the textures with mere serum or any other fluid or semi-fluid material, not of a nature to undergo the process of organization, will render the ulcer much less indolent than their infiltration by materiel susceptible of becoming organised, or the production of such changes in the component tissues as would affect their elementary structure. That is, indolence is due to conditions in the one instance much less enduring, if we regard them in the abstract, than in the other; and therefore it is that those disorders render it most intense, which are associated with organic changes of the highest character in and amongst the elements of the basic and border tissues of the ulcer. Thus, an enormously tumefied, dull, red, perhaps

œdematous, or actually sloughy state of the skin surrounding an indolent ulcer, is, so far as its influence on its intractability is concerned, of much less importance than a contracted, hard, immoveable, copper-coloured, or perhaps even healthy-looking portion of skin—a portion of skin having, in short, hardly any objective indications of disease but its fixity and sole-leather hardness.

It is on this account that the extent of an ulcer margin is greatest along that portion of the skin which has been rendered most dense by the causes now referred to; and, should the skin surrounding an ulcer be uniformly dense, the long diameter of the ulcer will most frequently correspond with that of the diseased skin, and generally indicate the direction of its principal tension.

The difficulties to be contended with in overcoming the indolence of an ulcer will therefore depend, not upon the size of the ulcer; nor, *per se*, upon the severity of the local disorder through which it has been produced; but upon the essential nature of the changes which its border textures might have undergone.

It has been the object of the foregoing details to show:—

1st. That ulceration, in its benign form, is one and the same process, although it may present itself under many varieties as to circumstance and external indications.

2ndly. That these varieties are referable to accidental

conditions, either constitutional or local, which may arise in the course of the disease.

3rdly. That whatever be its remote cause the production of an ulcer is immediately preceded by a state of the skin, or parts to be destroyed, incompatible with the further maintenance, in connection with their tissues, of that equilibrium between the processes of waste and repair, which is essential to the preservation of their integrity.

4th. That the same state of predisposition to ulcerate exists in the skin adjoining the ulcer to a greater or less extent, and also in those structures with which that skin, as well as the tissues of the ulcer-surface are allied; — and that its persistence keeps in check the forces that are favourable to the process of healing.

5th. That, whatever the nature of this condition may be, *indolence* on the part of an ulcer is brought about by means of ulterior changes which take place in the elements of its border-tissues, whereby these become incapable of supporting those processes that are essential to the act of healing.

6th. That the obstinacy, or indolence of an ulcer is proportionate to the durability of the changes just referred to, and to the extent to which the affected tissues might thereby have become deprived of qualities —principally those of elasticity and mobility—which are proper to them in a state of health.

7th. That no ulcer can be truly deemed "indolent",

until the deviation of its border-tissues from a healthy standard becomes independent of constitutional causes; —in other words, until it is maintained by local changes which remain unaffected by the removal of their exciting cause, whatever that may be.

To whatever *remote* or *exciting* cause (with the exception of malignant disease) the indolence of an ulcer may be traced, its *immediate* cause will in all cases be recognized in some one or more of the several conditions of its edge-tissues, and of the structures immediately surrounding it, which have been described. By these conditions the tissues are deprived of that capacity for molecular change, of that elasticity or freedom of action, or of that general mobility in relation to adjoining parts, which is essential to the maintenance in them of the processes of healthy nutrition and consequently of those of repair.

The *exciting* causes of indolence must be looked for amongst those local affections by which abnormal conditions, such as those which have just been described, may be induced in the structures involved. Of this description are burns and scalds, other local injuries, operations, &c., which favour the accession of a state of indolence on the part of ulcers situated either within the domains of their cicatrices, or in their immediate vicinity, by impairing or altogether destroying the elasticity of the skin. Such also are various forms

of inflammation of the skin,—the simple, erythematous, erysipelatous, or eczematous,—irritability, established in connection with an old ulcer-surface, &c., &c., the results being proportionate to the extent and permanency of the changes which these disorders severally induce.

As any ulcer may become indolent, it follows that whatever stands to an ulcer in the relation of its *remote* cause, might ultimately assume the same relation in respect to its *indolence*.

Impaired states of the constitution generally, and varicose veins locally, are the most constant and important of this class of causes.

As it is not within the purpose of this Memoir that I should enumerate constitutional causes or make them the subject of minute or even distinct consideration, I shall content myself with saying that, when a constitutional ulcer becomes indolent, there is much reason to apprehend some very serious lesion of an important organ, most frequently of the kidneys or of the liver; and that with such complications very little good can be expected primarily to accrue from local treatment. There are, however, cases in which these causes are more general in their seat, and less severe in their nature, such as those which are associated with functional derangements of the chylopoietic viscera; and to these the attention of the physician might be directed, with much confidence that his treatment will go far towards curing the local disease.

It not unfrequently happens that ulcers, constitutional in their origin, cease to be so either in consequence of treatment, or through natural resolution of the primary disorder, but become, and remain indolent, strictly owing to conditions which they themselves have called into being. Again, an ulcer-surface, especially if made the subject of injudicious interference, may assume a state of inflammation or irritability, sufficient of itself to give rise to an unhealthy state of the surrounding tissues, or to maintain such a condition if it already exist; and in this manner to induce those changes with which the indolence of an ulcer has been shown to be so directly associated. I believe that in this way many a sore is made indolent, which, of itself, would never have become so. Moreover, the whole system may be affected by an ulcer secondarily, and thus an originally simple ulcer may become complicated with, and re-acted upon by, constitutional disorder.

Of the *indirect* causes of a *local* nature, a varicose state of the veins of the affected limb may be said to be of the most frequent occurrence. Mr. Vincent states that, with the exception of specific ulcers, he had rarely met with any other than the varicose ulcer on the leg, during the whole of his hospital practice.* This is, however, not the result of the experience of Mr. Chapman, nor of myself; but as varicosity is generally understood to have a close, although, I

* See "Observations on Surgery."

think not a distinctly intelligible relation to indolent ulcers, I shall draw especial attention to it.

The subject of *varicose veins*, and their relation to ulcers and their intractability, is one of very considerable interest and importance.

The frequent coincidence of indolent ulcers and varicose veins in the legs of persons of advanced age gave rise to the *belief* that such ulcers are directly due to the disease in the veins; and to the *practical inference* that it is only necessary to obliterate the veins and the ulcer will heal.

The corollary has not, however, been fully borne out by experience; consequently the practice in these cases of operating on veins for the purpose of their obliteration, has fallen much, but undeservedly, into disrepute. I purpose therefore to inquire briefly into the facts with respect to these coincident affections, with the view of ascertaining the real nature of the relation which exists between them, and the value of any treatment that has for its object the cure of the ulcer by the method alluded to.

A varicose vein by no means necessitates the formation of an ulcer; nor do I think that *simple* varicosity, existing even in an extreme degree, can of itself produce an ulcer. "Certainly," says Mr. Skey, "ulcers of the leg are frequently accompanied by a varicose condition of the saphenæ and their tributary branches; but that by no means proves their relation as cause and effect. We have frequently ulcers without varix and

varix without ulcers, and both of these forms of disease occur more frequently alone than do the two conjointly; nor do we observe any relation as extent between them, when they do co-exist; the ulcer may be small, and the varices extensive, and *vice versâ*."* I go so far as to think with Mr. Skey, that occasionally the coincidence of ulcer and varix is accidental; but cannot concur in the seeming inference to which that gentleman's observations have led him, viz., that because there is a want of proportion between the size of the sore and the extent of disease in the vein, the general dependence of the one upon the other is problematical.

Although there might have been no relation, but that of locality, between a varix and an ulcer at first, the two cannot, long exist on the same limb without contracting a close and powerful sympathy with each other. The ulcer will sooner or later derive some influence from the varix,—if it be simple, it will in all probability become indolent, and if indolent, its indolence will thereby become aggravated.

As far as my observations have gone, the facts with regard to these coincident affections may be stated as follows:—

Dilated veins may exist, and that for a long period, and reach an extreme degree of severity, yet the skin of the limb on which they are situated may be free from disease.

Ulcers, having the appearances generally ascribed to

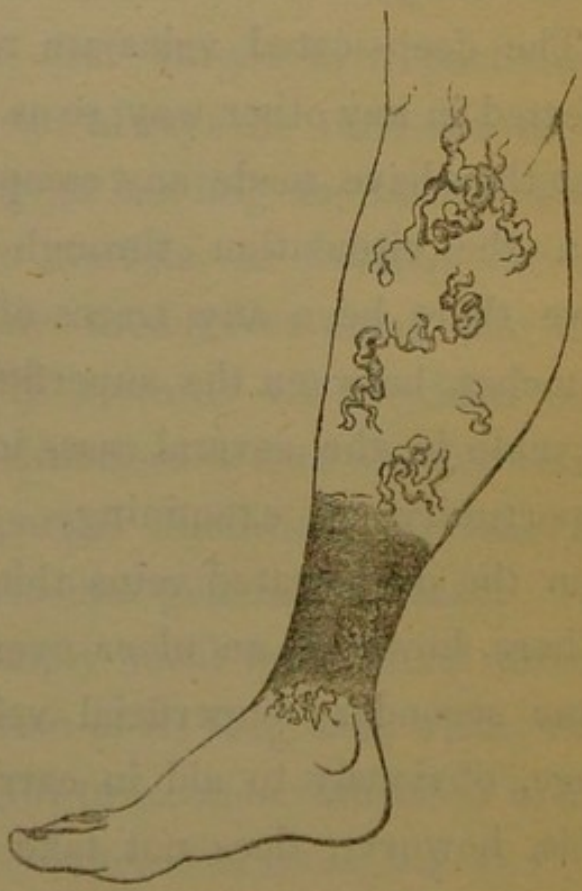
* Skey on Ulcers, p. 9.

the varicose variety, may exist without any apparent disease of the veins.

When ulcers co-exist with disease of the veins, there is no accordance between the size or intractability of the ulcer, and the extent of the varicose affection, or its severity, so long as the affection is limited to mere dilatation.

When an ulcer forms in connection with a varicose vein, it will be found most constantly on some part of the trunk, or on a large and diseased branch;—never at the periphery of its tributary branches, although these may at the same time participate more or less in the disorder affecting the vessel to which they converge.

The veins are generally most tortuous and salient in that part of the limb that is otherwise healthy (see accompanying wood cut). As they approach the sphere of diseased action, so they generally become less obvious, and within that sphere to the edge of the ulcer they are either altogether lost sight of, or their ex-



istence is only to be recognised by, here and there, a small bluish white patch of skin, slightly raised above the adjoining level, corresponding to a varix; or by one or more boggy spots, detectable by the point of the finger only. If any veins are found to be dilated within the confines of the skin affection, they are generally those that are situated just within its margins, most frequently within the lower margin.

Whatever be the degree or extent of disease in these veins, or the size and depth of the ulcer, it very rarely happens that, in the case of the lower extremity, the foot or other parts distal to the seat of disease are œdematous, or show any abnormal deviation from a condition of health, with the exception of a few dilated venous twigs.

The deep-seated veins are rarely found dilated, or affected in any other way, so as to justify the conclusion that they have made any compensatory effort to maintain the circulation through the affected limb; nor have there been any traces of enlarged anastomosing branches, between the superficial and deep trunks, observable in the several cases in which I have had an opportunity of examining. Nelaton, however, has seen the deep-seated veins thickened, but not dilated. Where, however, an ulcer overtakes a varicose trunk, some secondary superficial veins sooner or later enlarge, obviously to aid in carrying on the circulation. This, however, does not take place until the patency

of the original channel is, to a certain degree, interfered with by the results of advancing disease, such as I shall presently describe. Hasse says that, "the dilated portions of the saphena and its tributaries are connected with the deeper seated veins accompanying the arteries, through the medium of numerous and not inconsiderable anastomosis, whilst amongst each other (the dilated portions of the saphena) they are woven into a net-work of vessels, which ramify and inosculate with each other in the most complex manner."* I have not seen an instance of such anastomosis, although I have looked for it in several cases of ulcer with extreme varicosity.

The progress of a varicose vein is generally as follows:—

The vein becomes at first turgid in a particular part of its course, and can always be rendered more so by the act of standing or bending the knee. Two or three, or even more varices, or isolated dilatations, begin next to show themselves along the affected segment,—generally towards its proximal extremity, and mostly in situations where smaller veins unite with it. These partial dilatations increase in number until the vessel becomes generally dilated. Its coats do not, however, simply yield in a lateral direction, but also in the direction of its long axis, whilst the vessel at the same time begins to accommodate itself to its

* Hasse's Pathological Anatomy, Sydenham Edition, page 42.

increasing length by forming itself into coils or convolutions. These coils are often seen in clusters (varicose tumours);—in the lower limb, upon the upper part of the leg, especially just below the knee-joint.* The coats of a vein, in this stage of its varicosity, present no marks of disease; for, if the vessel be emptied of its contents, they will generally be found to return to their normal condition in every respect; and in case the dilatation has been extreme and of long duration, the change effected will be found to amount only to a little longitudinal rugosity of the inner coat. As the disease progresses, so, important pathological changes take place, which have obviously a relation to the final extinction of the vein as a part of the circulating system. The vessel inflames and thickens, but the processes by which this thickening is effected commence irregularly throughout its coats. Hence the resistance to the dilating force becomes unequal in different parts of the vein; and its contour becomes a second time marked by irregular dilatations in the form of lateral bulgings or of distinct varices. At the same time nodosities form in connection with its lining membrane, but not, as has been asserted, exclusively, or even chiefly, in connection with its valves. † The valves, participating in the disease,

* See Wood cut, p. 39.

† These nodosities will often be observed in connection with the coats of veins that are irregularly thin, red, and dilated, but which have not, so far as can be ascertained, been subjected to inflammatory action.

become incapable of their proper functions, and usually degenerate into mere shreds of fibrous tissue.

It is during, or with the commencement of the inflammatory stage of a varicose vein that the neighbouring skin usually begins to show symptoms of disordered action.

If it take the form of an exudative affection, such as eczema, the affected vein, will often remain for a long period in a comparatively stationary condition, thickened and contracted in some parts, thin and bloated in others, but still capable of performing, although it may be imperfectly, its functions, so far as the circulation is concerned.

If the skin affection be non-exudatory in its character, that portion of the vein within its domains appears to become more prone to undergo those further changes that are incidental to the establishment of varicose disease in its coats. And these changes are determined by the pathological idiosyncrasies of its component membranes—the inner having a tendency to thicken, and, of the three, the greatest amount of extensibility; the middle being less disposed to thicken, more friable, as well as more ready to assume those changes which result in its *ramolloisement*; whilst the outer (the areolar) has a disposition either to condensation or atrophy. Hence, if thickening and contraction of the vein takes place, each of its tunics contributes proportionately, and in its own peculiar way, to these

ends; but if dilatation, each is affected differently, the inner yields, the middle attenuates, and sometimes softens or gives way, whilst the outer wastes, and in this wasting the skin covering it often participates. With the progress of the disease, the tunics of the vein generally lose their elastic qualities, thicken, and contract; the gloss natural to the inner membrane disappears, abrasion follows, and shreds of lymph and fibrin attach themselves to its surface, presenting a certain amount of hindrance to the current of the blood. These gradually become absorbed, or, with other morbid products, become intimately and permanently incorporated with the ulcer coat of the degenerating vessel; whilst the vein itself shrinks and consolidates until it reaches a condition in which it resembles a mere fibrous cord. In the immediate vicinity of an ulcer, and underlying its surface, this condition of the vein very usually obtains, especially if the skin affection shall have gone to that state in which its tissues have likewise become shrunk, consolidated, and fixed—a state already alluded to as marked by a contraction of the part of the limb in which it occurs, as though it had been subjected to the long-continued influence of a tight bandage (see p. 26). It is most generally within the limits of these non-exudatory or depositive affections of the skin that veins become subject to the changes just described; but, even here, small segments of the vessel will occasionally remain as distinct varices.

It is not, however, uncommon for the skin to become diseased, and even for an indolent ulcer to have formed, before any dilatation of the veins has taken place, whilst the coats of the vein are simply in a state of subacute or chronic inflammation, attended, at the same time, in the instances I have seen, with severe pain on pressure, and thickening.*

The changes in the skin which prepare it for the process of ulceration are, with the exception of some cases, perhaps, which have a traumatic origin, of an inflammatory character. This inflammation assumes various especial forms, according to age, temperament, peculiarities—natural or acquired—of constitution, and sometimes to the treatment by which its first indications are met. The whole depth of the skin, and even its subjacent tissues may become involved in the disease and participate in the consequences.

Not only is the commencement of this affection of the skin generally concurrent with changes in the coats of part of the vein, preparatory to the development of disease; but the courses which the two affections subsequently run have, as I have endeavoured to show, striking points of resemblance and mutual relationship.

For a time, the morbid action in the skin is so intimately associated with the disease in the vein as to disappear immediately upon the obliteration of the

* See case, page 68.

vessel; but sooner or later that dependence ceases, and the former affection becomes self-existent.

How then does varicosity in a vein affect a portion of adjoining skin, so as to set up in it that disease which disposes it to become the seat of ulceration?

Care should be taken not to confound the varicose condition of an isolated portion of a cutaneous vein, as Baillie, Sir B. Brodie, and Cloquet appear to have done, with those general dilatations of the veins of the extremities which follow upon compression of their common trunks; since they have little in common, either as to their origin, progress, or results. Beclard, Delpech, S. Cooper, and others, have shewn this, too commonly accepted analogy to be untenable, by remarking that varices of the saphenæ are comparatively of rare frequency in connection with diseases which compress the iliac vein; and are even not clearly due to compression made upon these veins themselves by the long continued use of garters.

There can be little doubt but that the tendency to dilatation in the saphenous veins is most generally due to the difficulties which they have to contend with in carrying on the reflex circulation of the blood in the lower extremity, arising from their length, their distance from the heart, and their anatomical and dynamical peculiarities. It certainly is not often dependent upon any cause of obstruction in the femoral or iliac veins; for, if this were the case, œdema of the limb would certainly be one of

its symptoms; moreover, obstructions acting on these trunks usually affect, *not the saphenous* veins, but,—as Hasse has shown, by comparing the veins most constantly affected in women with those which usually suffer, that in men,—the finest cutaneous branches of the foot.

Despite these difficulties, the circulation *is* carried on by a vein even dilated to an extreme degree; for such a vein, if cut across, will bleed, and that as profusely as any other. And, in the event of a vein becoming incapacitated from changes of a contrary tendency, anastomosing branches will arise to free the limb from any embarrassment to its circulation that might accrue to it from that source. In by very far the majority of cases, therefore, whatever be the state of the veins, there is no evidence that the circulation in the affected limb is thereby rendered inefficient.

Nor is there any evidence that either the excessive dilatation, or the functional extinction, of a vein is followed by ulceration through consequent capillary dilatation; for the seat of disease in the skin does not correspond with the situation of the capillaries that are tributary to the affected vein; nor is the nature of the disease such as would be likely to result from a condition of passive hyperæmia in these vessels.* I

* In Mr. Quekett's beautiful injections, to which I have already alluded, the capillaries of non-varicose are enlarged equally with those of the varicose ulcer.

have sometimes fancied an analogy to exist between the exudative form of skin affection which is so frequently observed in connection with varix, and that form of albuminuria which is associated with capillary hyperæmia of the cortical substance of the kidney; but there are peculiarities in these respective affections which render the presumption of such an analogy, for the purpose of illustrating the one by the other, untenable. Moreover, no traces of any affection at all, resembling capillary hyperæmia, have (as far as I have observed) been detected in the spot where the skin first shows evidence of ulcerative disease in connexion with a varicose vein.

Is there reason to apprehend, with Rima, that in connection with varices there is generally a retrograde movement of the blood? His reasons are—1st, the fact of hœmorrhage taking place from both ends of a divided varix. This may happen on the division of healthy veins.

2nd. That a varicose vein will swell, on being tightly delegated, more above than below the seat of construction. This also may happen with a healthy vein.

3rd. That on destroying a segment of a varicose vein, either by ligature or excision, its distal portion shrinks and disappears, whilst the proximal remains stationary. This would only be the case where the disease of the vein has made some progress; still, when it is observed, it shows that the vein has, to a certain extent, lost its power of maintaining

of the circulating current; but it only follows as the *result* of advanced disease of its coats.

I cannot, therefore, adopt the views most generally accepted, that the *disease* in the vein is the result simply of dilatation of its coats from dynamical causes, and that the ulcerative affection of the skin arises from an extension of that dilatation to its radicles and capillaries. It is not to passive disorder, but, on the other hand, so far as my observations have gone, to actual disease in the coats of the vessel, that a varicose ulcer succeeds. Such disease uniformly commences with phlebitis of a more or less chronic nature, and may invade either an already dilated vessel, or a vessel previously healthy. In the latter case it may, and generally does, lead to dilatation; although dilatation is not a necessary precursor to the formation of an ulcer. The skin affection I regard as principally due to the propagation of diseased action, either directly or indirectly, from the diseased vein to the structures in its immediate neighbourhood; and the two affections together, as an illustration of that kind of reciprocal or consentient action, for remedial purposes, which is often established in the animal economy, either between organs more or less closely associated in function, or between structures, remotely related in this respect, but in close proximity to each other. In the instance before us, the vein, if I may so speak, calls on the skin for aid, and the skin responds by assuming generally that kind of disease which tends to consolida-

tion of its own tissues, and, consequently of those of the vein and other structures with which they are incorporated. The *ulcer* is simply incidental to the process, but accidental to the general purpose; and might be considered as analogous to those well-known secondary affections, which result from a similar combination of efforts at repair, in other departments of the animal economy.

I now advance to the consideration of the means which have been employed in the treatment of these ulcers: and shall endeavour to show that the non-recognition of the principles, which I am desirous of establishing, has been the chief reason why some of the methods that have been suggested—excellent in their way—have failed of realizing the advantages which their authors have severally claimed for them.

The treatment of ulcers by the ancients consisted in little more than the application of medicaments and plasters, principally for the purpose of *drying* their surfaces. Hippocrates, however, all of whose conceptions are more or less imbued with the leaven of truth, discerned rightly, though perhaps dimly, the real principles on which the kind of ulcer under consideration can alone be successfully treated. In his treatise "*De locis in homine*," he directs us to treat the "callous" or "Cheironean"* ulcer in the following manner:—

* On account of its requiring the skill of Chiron for its cure.

"Septic medicaments are to be applied to it, by which the hard parts are made to slough off, and then the edges are to be brought together;" and goes on to say, "ulcers which are not cleansed are not disposed to unite if brought together, nor do the lips thereof approximate of their own accord. When the parts adjoining to an ulcer are inflamed, the ulcer is not disposed to heal until the inflammation subside, nor when the surrounding parts are blackened by mortification, nor when a varix occasions an overflow of blood in the part, is the ulcer disposed to heal unless you bring the surrounding parts into a healthy condition." For a circular sore, obviously indolent, Hippocrates also ordered a part, or the whole of the edge to be scarified.*

Celsus advised "Vetus autem ulcus scalpello concidendum est, excidendæque ejus oræ et quidquid super eas livet atque excidendum. Si varicula intus est, quæ id sanari prohibet, ea quoque excidenda."

In later days, Wiseman, referring the indolence of leg-ulcers to the effect of dependent posture upon the veins, recommended that this should be counteracted by the use of *bandages*, so applied as to keep up equable and persistent pressure on the affected limb.

Baynton also advocated the employment of a bandage upon a principle, novel in his time but Hippocratic in

* In the East, the indolent ulcer is still treated, and that with advantage by scarifications, or, as it is now termed, "*starring*."

origin, to which I shall hereafter more fully advert. This principle, however, has been impugned both in this country and abroad, because the practice deduced from it has occasionally failed to produce the good results which its followers, more sanguine than its author, anticipated; and this, not unfrequently, I venture to surmise, from a misapprehension of the objects which it contemplates, as well as of the precise mode by which these are to be attained. Rust deemed Baynton's mode of bandaging dangerous on account of the risk of strangulation to which the vessels of a limb were thereby exposed; but I will undertake to assert that Baynton never intended, under any circumstances, that his views should be carried out at such a risk. Blandin regards the plan as very useful, when combined with other treatment, but as treacherous, and not to be depended upon, alone. I have quoted these views from Mr. Critchett's able work "on Ulcers," in order to show that the most important part of Baynton's labours, viz., the enunciation of a great principle, has been overlooked in the less important consideration of an arbitrary method of putting it into practice. Mr. Critchett goes further, and asserts Baynton's principle to be "false,"* whilst Mr. Skey goes further still, and believes he had no distinct view of a principle at all. Mr. Critchett agrees with Rust and others in thinking that Baynton's

* On Ulcers, p. 19.

mode of strapping the limb has, "a *decided* and direct tendency to impede the circulation through the limb, and to produce stagnation, with its train of evils," strangulation, sloughing, &c., &c. I cannot but think it hard to charge such evils upon Baynton because he recommended the use of strips of plaster to an ulcer "for the purpose of bringing its edges nearer together," although he certainly directed the force, employed in applying them, to be gradually increased, "*when the parts are restored to their natural ease and sensibility*," till it become as much as "the calico will bear or the surgeon can exert." It is much more just to charge them, when they do occur, either to a misapprehension of Baynton's meaning, to its too liberal interpretation, or to ignorance of the ordinary rules of surgery; for Baynton certainly never meant to recommend that an ulcer should be strapped so tightly as to render imminent, amongst other ills, the formation of another. Sir Charles Bell directed the "welt" to be destroyed, without which, in his opinion, the callous ulcer could not be expected to heal; and more recently, Liston, Mr. Marshall informs me, considered it necessary, in cases of indolence, to clear the edge of the ulcer from its attachment to the subjacent tissues.

Sir Everard Home attempted to improve the treatment of ulcers, by classifying them according to some fancied perversion of their inherent powers; and whilst he modified local treatment in accordance with this

classification, he, to a certain extent, anticipated Abernethy's views, by commending constitutional remedies as well.

The basis of Home's treatment of "indolent" ulcers may be gathered from his arrangement of them into—

"Ulcers in parts whose actions are too indolent to form healthy granulations, whether this arise from the state of the parts, or of the constitution.

"Ulcers in parts which have assumed some specific action, either from a diseased state of the parts or of the constitution.

"Ulcers in parts which are prevented from healing by a varicose state of the superficial veins of the upper part of the limb."

The hypotheses implied in the foregoing classifications have reference either to some supposed modification of the powers of the tissues involved, in accordance with certain appearances presented by their surfaces; or, to facts which exist in connection with ulcers, the mutual relation and dependence of which have not been very correctly apprehended, or if apprehended aright, have not been set out in that relief to which their importance entitles them.

The objection, which I take to any treatment founded upon such classifications, arises from the insufficiency of proof that the hypotheses, which they involve, have any foundation in histological or pathological facts. I have endeavoured to show that the reparative forces

of an ulcer do not vary with the varying amount of healing disposition observable on its surface, but that they are overcome or restrained by other powers, which tend to maintain it. These forces might certainly be weakened in common with those of the organic functions generally; but, in connection with indolent ulcers, they can only be said to be so affected, and that by local influences, as to be incapable of exerting themselves. The power to repair is still in the tissues, but, according to the followers of Home, feeble or debilitated. It is not so, however. The power exists, not necessarily or generally enfeebled, but *under restraint.* For instance, if a man, with such an ulcer on his leg, be constantly running about, the ulcer will refuse to heal; if he lay the limb up, indications of healing will very speedily show themselves. The different aspect of such ulcers simply betrays, in each case, the degree of restraint to which, from whatever source, its reparative powers are subjected, and not the measure, or degree in which these may be said to exist.

Mr. Syme has included the "indolent" ulcer in a class with "ulcers which are prevented from healing by defect of action," but recommends the horizontal posture and pressure by bandaging, inasmuch as "they allow the healing action to proceed, by inducing an absorption of the swelling which occupies the limb, and which, when once established, must oppose the contraction requisite for the process of cicatrization." These observations

contain a practical truth, which is of the utmost importance, and far in advance of the views generally entertained; but the theory involved in the terms "defect of action," appears to be somewhat irreconcileable with it, and, therefore, open to the same kind of objection as that which I urged against Home's views.

Nelaton, after enumerating those varieties of ulcers which have been recognized by the older surgeons; viz., the simple, cutaneous, atonic, gangrenous, œdematous, fungous, verminous, callous, fistulous, &c., &c., says, "Il est facile de voir, d'aprés cette enumeration, que l'on admettait comme espèces distinctes des ulcères presentant certaines complications que peuvent d'ailleurs se montrer dans toutes les variétés, tels sont la gangrene, l'œdème, les fongosites; nous n'aurons donc pas à traiter d'une manière speciale des ulcères gangreneux, fongueux, atoniques, œdémateux, vermineux; les ulcères vénériens, dartreux, cancereux, ne pourraient sans inconvéniens être sépares de l'histoire, de la syphilis, des dartres et du cancer." * He then arranges the species of ulcers in this wise:—1st. The simple; 2nd. The scrofulous; 3rd. The scorbutic; 4th. The callous; and 5th. The varicose ulcer.

Leaving out those species of ulcer included in this classification, which it was not my purpose to take into consideration on this occasion, the species of M. Nelaton

* "Pathologie Chirurgicale," tom. i. page 314.

are reduced to the simple, callous, and varicose; and these, it will be obvious, I have treated of without any reference to distinctions, of which their separate classification might be suggestive. On the other hand, it has been my aim to show that no distinctions exist to warrant the classification M. Nelaton has adopted, inasmuch as the callous ulcer is simple in its earliest stages, and the ulcer, which co-exists with varicose veins, does not differ from the simple ulcer in any particulars sufficient to justify its separate classification, and with it, is equally prone to become callous.* I have made these —apparently somewhat irrelevant—remarks, because the principles upon which it is my purpose to base the treatment of indolent ulcers, are not those suggested by an arbitrary and inconsistent classification, but by changes that are definite, and to which every condition of an ulcer, during its transition from a simple state to one of the most aggravated callosity, is to be traced.

At the present time, incapacity, on the part of the minute arteries appertaining to the ulcer surface, to provide and organise lymph necessary for its repair (Skey);—disease affecting the textures adjoining the ulcer (Syme); the insulation of the ulcer, to a certain extent from the general circulation, by the lymph which is gradually deposited in its subjacent and adjacent tissues (Chapman);—the embarrassment to which the circula-

* I fully agree with Mr. Chapman that, "We ought to discard the term *varicose* ulcer from our classification altogether."

tion in the lower limb is subjected in consequence of the varicose condition of its veins (Wiseman, Critchett);—and "the welt" (Bell, Chelius, and others);—are regarded as the chief impediments to the cure of indolent ulcers.

It will appear, from the foregoing very rapid survey of the principles are modes of treating indolent ulcers, that there are direct, as well as implied references to causes of indolence supposed to exist, either in the ulcer-edge and surrounding skin, in the venous system of the affected limb, or in some modification of the organic forces appertaining to the ulcer surfaces. It remained, however, to determine the real causes, and to bring these out into relief; and, by showing their exact relation to ulcers and their indolence, to supply a key to the apparently anomalous results of past experience, as well as to furnish rules for the more satisfactory treatment of these cases in future.

There can be no doubt but that some truth is embodied in each of these views: but instead of attempting to reconcile them by bringing all under the governance of some general principle, efforts have been made rather to place them in antagonism, and to give a pre-eminence to one by altogether decrying the rest. In some cases, constitutional treatment,—in others, pressure,—in those of a third class, destruction of the welt,—in a fourth, approximation of the edges,—will heal the ulcer; but the principle upon which this one effect is produced by a variety, and apparently, a contrariety of means, is one and the same,

and only required to be clearly and fully apprehended in order that these might be brought into harmony, and that each might have its due place and value affixed to it.

The direct obstacles to the entire and permanent healing of these indolent ulcers are to be found in the condition, either of their edges, or of the adjoining tissues, or in that of both conjointly,—either the edge of the ulcer is not free to contract, or the adjoining textures are not free to yield to the traction which the edge, in order to close in, must make upon them.

The objects to be kept in view, in the treatment of the indolent ulcer, should therefore be—

1st. To remove any existing disorder, constitutional or other, which might have the effect of maintaining local disease.

2nd. To restore those textures belonging to or adjoining the sore, which have become the seat of disordered action or of structural change, as nearly as possible, if not entirely, to a state of health.

3rd. If this be impossible of accomplishment, to such an extent as to remove the whole of the obstacles to the cure of the ulcer—not to its healing merely,—to adopt such local measures as might have the effect of neutralizing those which remain.

The first of these indications refers to constitutional sources of obstinacy; the second to temporary, and the third to fixed, causes of indolence of a local nature.

Although it is not within the scope of this Memoir to

dwell at length upon the constitutional treatment of ulcers, I cannot omit a few remarks on this subject, the necessity for which will appear from the following remarks.

Should an indolent ulcer exhibit a surface in a state of absolute "molecular gangrene," or ulceration, this disorder will generally be of a temporary nature only, and be produced by constitutional or local causes, either singly or conjointly, which have but little connection with its indolence. Its existence calls for the employment of constitutional measures, upon those principles which usually guide us in the treatment of "local diseases" that have a "constitutional origin." There are few indolent ulcers, brought under the surgeon's notice, the boundaries of which are not thus enlarged and which cannot, by appropriate remedies, be made readily to assume a healing disposition. Cicatrization will commence but will not go further than that point, beyond which the ulcers become subjected to other influences, viz., those that are immediately concerned in rendering them indolent.

If inflammatory action, dependent upon a constitutional source, should exist, it must be subdued by suitable remedies. If it be simple, by venesection or local bleeding, by the ordinary salines either with, or without tartar emetic, according to its activity and any allied feverishness of system; and with, or without calomel or blue pill, according to such indications as the state of the

secretions may afford. There is one rule, which I have found of more advantage in the treatment of both local and general disorder than any other, and that is, first to attend to the state of the secretions. There is very little disorder without their being more or less deranged, and very little good to be expected from any treatment which does not keep their correction primarily in view.

Sometimes this kind of action will require ammonia; or bark, iron, or other tonics, with wine or other stimuli; the first kind of remedies being indicated by temporary exhaustion, with a tendency to local sloughing; the second, by exhaustion of a more persistent kind—general debility.

The presence of gout in the system often maintains collateral disorder in connection with that which is essential to an indolent ulcer, and requires colchicum, the mineral acids, alkalies, with or without bark, and saline aperients, according to the state of the tongue, qualities of the pulse, &c. &c.* Vicarious affections sometimes influence these ulcers, and render them additionally intractable. Women, at that period of their lives when the function of menstruation ceases, often experience an aggravation of local disease, especially if that disease should happen to belong to the class under consideration. An ulcer, under such circumstances, will often show a periodical tendency to spread or to

* On the subtle and multiplied forms in which gout can display itself in the system, I beg to refer to Dr. Garrod's important researches, and to Mr. Spencer Wells' recent work.

become hæmorrhagic. The state of system leading to such results must, of course, have most attentive consideration. Stomach, renal, cardiac, and other disorders will often, in this way, influence an indolent ulcer, although it may be second in the order of its production; and will aggravate it in proportion to their severity, and to the degree in which the vital powers generally may have become affected by them.*

These general disorders must be cleared away before any treatment can be satisfactorily adopted for that local disorder, to which, the indolence of the ulcer may be due.

Having thus very cursorily directed attention to the subject of the general or constitutional treatment of indolent ulcers, I shall proceed to consider the treatment of their frequent concomitants, varicose veins.

The results of the numerous experiments which have been made on varicose veins, enable us to arrive at some positive and valuable inferences respecting the effects of any treatment to which they might be subjected, for the purpose of healing their allied ulcers; and the anomalies, which these inferences supply, will be found to have their full explanation in the principles I am endeavouring to establish.

However close may be the relation of cause and effect between a given varix and its accompanying

* I must refer the reader here to the admirable lectures of Dr. Bence Jones, published in the recent numbers of the "Medical Times and Gazette."

ulcer, the destruction of the one by no means ensures the cure of the other; and should any advantage ensue to the ulcer surface from the obliteration of the vein, its amount will vary in almost every individual case. In some, the ulcer will heal more or less perfectly, and that at once; in others, the surface will show signs of more or less disposition to heal; whilst in a third class, the good effects might be altogether inappreciable, these being, *ceteris paribus*, in inverse ratio to the permanence of the changes which have taken place in its border tissues, or to their independence of the cause which excited them. Unless the condition of these tissues be favourably affected by such a procedure, the ulcer will remain stationary, and the fact of its being essentially indolent is thereby established.

The two following cases, from my note book, will illustrate these positions.

Case 1st. A lady had an ulcer of the size of a sixpence situated over the inner malleolus, which had been indolent for years, notwithstanding almost every attempt had been made to heal it. It was surrounded by a broad patch of eczematous skin which had almost ceased to be exudatory, but was still somewhat inflamed and dense; its edge was welted, but not what might strictly be termed callous; and its surface concave, of a dull red colour, and exuding a small quantity of sanio-purulent discharge. It was very painful, and the

patient consequently very desirous to have it healed. The saphenous vein was somewhat varicose from below the knee as far as the limits of the sound skin; but within the boundaries of the disease it had become contracted in some part of its course, considerably dilatated about half an inch from the upper edge of the sore.

After applying leeches and blisters, and administering opium with such other remedies as were necessary for her general health, with little effect beyond a partial remission of the pain and inflammation, I put three ligatures on the portion of vein within the area of the diseased skin, one being on that part of the vein just referred to as being about half an inch from the ulcer edge. The ulcer healed, and with it the wounds made by the ligatures, except that near the cicatrix, which remained open with the same indisposition to heal as that manifested by the original sore. A ligature was then applied to a vein observed to be running towards this sore, and close to its edge. The same results followed; the ulcer healed, but the sore made by the ligature gaped, and became indolent and apparently incurable. After a few months the whole leg was attacked with erysipelas, followed by vesication of the diseased portion of the skin. On the subsidence of the inflammation, the skin assumed a perfectly healthy condition, and the ulcer immediately healed.

Case 2nd. was that of a corpulent, but in other

respects healthy, woman, in her fifty-fourth year, who came under my care in the Free Hospital. She had suffered for eight years from an eczematous affection of the skin of the right leg, extending from the upper part of the calf to below the ankle, and three parts around the limb. She had a small but indolent ulcer just above the ankle, which had existed for three years. The external saphenous vein was varicose, but not severely so, excepting that portion included within the limits of the diseased skin. Here the vein appeared less convoluted than elsewhere, but extremely bloated; its coats in several places being exceedingly thin. The ulcer was alongside the vein, but did not overlie it; nor were there any dilated venous radicles, so far as they could be seen, running towards the edge of the sore. The eczematous disorder appeared to be, to a very great extent, independent of systemic disorder, for it was not symmetrical, and had defied the most appropriate constitutional treatment. It occurred to me, that the only other plan of treatment that could be pursued, with any hope of success, was that of obliterating the diseased portion of the vein that was observed within the boundaries of the diseased skin.

For reasons which I shall hereafter give, I determined upon effecting this object by an incision through the skin, in the direction of the long axis of the limb, and close to the ulcer border, which completely cut the vein through in two places. Dr. Knox, and other gentle-

men were present on the occasion. The bleeding was profuse, but most easily and perfectly controlled by filling the wound, which gaped considerably, with a pledget of lint, and enveloping the whole by a moderately tight bandage.* The plug was removed on the third day; the wound looked unhealthy, and had begun to discharge profusely. It continued in this state for rather more than a month, when signs of granulating presented themselves. From that period, the eczema gradually disappeared; and after the lapse of seven weeks more, the health of the limb was restored, cicatrices only remaining on the sites of the former ulcer and of the incision. I have seen this person recently; the leg is perfectly sound.

* Some years since, I made a series of experiments on the veins of horses and dogs, with the view of ascertaining the best means of arresting hæmorrhage from them when divided. The results of these experiments, and the preparations by which they were illustrated, I laid before Mr. Lawrence and other gentlemen, at the time. The conclusions arrived at were—1st, that veins of themselves, if cut across, made little or no effort to stop the hæmorrhage that ensues; 2nd, that the bleeding is most profuse from the distal mouth of the vein, but that it is, sometimes equally so from the proximal; 3rd, that in the event of either of the mouths of the vein ceasing to bleed, the arrest will be due, rather to a collapsed and partially exhausted state of the vessel, than to any changes in its coats; 4th, that the changes, observable in the vein, consist in slight longitudinal rugosity affecting its inner tunic, and a slightly contracted state of its orifice; and 5th, that twisting the end of the vein, compressing it at the same time so as to bring its inner surface into apposition, and the ligature, are the best means of closing it against hæmorrhage. The effect of twisting appears to be promoted by the tendency in the vein to becoming rugose; for in several instances in which I twisted the internal jugular of the dog, and

In the first of these cases the skin disease was unaffected by, in the second it yielded to, the obliteration of the vein; whilst in both the ulcer healed, as soon as, but not until, that disease had entirely subsided.

Notwithstanding the uncertainty as to its immediate results upon the ulcer surface, I do not hesitate in advising that, in all cases compatible with safety to the patient, the obliteration of the affected veins should be procured; for unless this be done, no security can be given, either that local treatment will be of any avail, or that if it succeeds in *healing*, it will really *cure* the ulcer.

The object, then, is the *closure* of the vein; for as soon as this is effected, the cord that remains becomes freed of diseased action, or at any rate ceases to be a source of local irritation or other kind of harm.

The *curative* means of treatment that are usually recommended, may be stated as follows:—astringent applications, puncture, incision, excision, caustics, ligature, compression, and galvanism.

Local applications are, for the most part, useless, excepting the diseased vein be, as is often the case, in a state of active inflammation; for which, leeches and blisters should be applied, and that repeatedly if required, preliminary to the use of more direct and potent

the corresponding vein in the horse, the twist remained after complete obliteration and consolidation of the vessel had taken place. There is some risk of inflammation following the use of a ligature, but on this subject I refer the reader to page 78, et seq.

remedies. Whatever method of obliterating the vein the surgeon might determine upon, all acute inflammatory action should be, by these and other appropriate means, subdued prior to its adoption.*

The only topical application, that I know of, which has the power of coagulating the blood so as to form a plug in a vein, is that which I had the honour of first bringing under the notice of the profession of this country, in 1852, viz.: the solution of the perchloride of iron.† This powerful fluid will, if added in a small quantity, solidify the blood; but, in a larger quantity will, redissolve the clot. It will transude thin membranes, and in this manner may be made to affect the blood in the vessels in cases of aneurism by anastomosis, especially in infants, and hæmorrhoidal tumours. It

* *Case.*—I have at present under my care an instructive case of a woman, aged thirty-eight, who had an indolent, callous sore, an inch and a quarter in diameter, above the inner ankle, in the centre of a slightly inflamed and tumid portion of skin. No enlarged veins were visible, but for three inches upwards, in the calf, a hard cord-like substance could be felt,—evidently a vein,—extremely tender to the touch, but not dilated. In this case, leeches and blisters have succeeded in curing the ulcer, and the vein is assuming a condition of health but the skin remains in a condition prone to ulcerate, and will in all probability continue so, until all traces of active disease in the vein are obliterated.

† The paper on this subject which, Baron Larrey communicated to the Société de Chirurgie of Paris, was obligingly forwarded to me by my friend Dr. Costello, the able editor of the "Cyclopædia of Surgery," and read at a meeting of the London Medical Society. I do not think that the powers of this extraordinary styptic have been appreciated as they deserve. I cannot think the term "coagulation" is applicable to the effects of this remedy.

will sometimes obliterate varicose tumours, the vessels of which have very *thin* coats, and is the more valuable, inasmuch, as to this class of varices, as I shall hereafter explain, more severe remedies cannot with impunity be applied. It should be applied, by means of lint, after well bathing the surface of the part with *hot* water, and retained on the spot for some hours, or even days, if necessary, by a moderately tight bandage.

Puncturing the vein in one or more places, whilst a bandage is firmly applied over the remainder of the limb in order to exhaust the vessel of blood, and to prevent, if possible, its re-admission, will sometimes procure its obliteration; but this practice cannot be relied upon, although Petit and others have advocated it.

Cutting the vein across by an incision through both skin and vein and applying compress and bandage in order to affect its obliteration, was, I believe, in recent times, recommended by Abernethy, and afterwards practised by Sir B. Brodie, Beclard, Velpeau and others. This practice was abandoned by the former of these distinguished surgeons, on account of the death of a patient from typhoid symptoms whose saphena had been treated in this manner; and is now rarely adopted from the fear of its being followed by similar evils. To prevent such results, Sir Benjamin recommended, for

the smaller veins,—not, for instance, for the saphenous,—*subcutaneous division;* and to this suggestion the principle of subcutaneous operations, now so generally applied, is, I believe, to be traced. In this manner Sir Benjamin cut through clusters of veins; but the results were not in the main so satisfactory as to lead him to continue the practice or to recommend it to others. "The wound, in most instances, healed by the first intention. The varicose veins were obliterated, and, usually in a few days, the patient suffered no inconvenience from the operation. However, in some cases the wound suppurated instead of healing by the first intention, which protracted the cure. In some instances in which I had recourse to this operation a remarkable occurrence took place. Although I was satisfied that the cluster was divided, the disease was not cured. It seemed as if the veins healed without becoming obliterated. As the *ductus choledochus*, or the intestinal canal, will heal after the application of a ligature, without the continuity of the canal being destroyed; so it appears to be with divided veins under certain circumstances."* The object of the subcutaneous section was to save the vein from contact with the air or with foreign bodies; and this Lisfranc and Ricord afterwards attempted to accomplish by dividing the vein and cutting off a portion of its extremities. This proceeding, how-

* Brodie's Lectures on Pathology and Surgery, p. 189.

ever, does not appear to have answered the purpose better than others of the same class.

In cases unfitted for ligature I have been in the habit of employing *longer incisions, by which the vein, and skin, to the extent of the disease, have been cut through*,—the former, if possible, in two or more places by the same cut—leaving a gaping wound to heal by granulation; and I have not, with the requisite amount of caution, met with any but the most favourable results.*

Excision of portions of the affected vein is an ancient, but *sure* remedy; it does not, however, in these days, find many advocates. Celsus says:—"Igitur vena omnis, quæ noxia est, aut adusta tabescet, aut manu eximetur. Si recta, si quamvis transversa tamen simplex; si modica est, melius aduritur. Si curva est, et velut in orbes quosdam implicatur, pluresque inter se involvuntur utilius eximere est."

The evils to be apprehended from these, and indeed from all other, methods of treating veins by operation are phlebitis and its consequences. Celsus and Heister exposed portions of veins, and destroyed them by means of the *actual cautery*,—a proceeding now supplanted by the milder plan of forming sloughs along the course of the vessel by some kind of caustic. Sir B. Brodie applied the nitrate of silver so potently as to cause the vein itself to slough; Gensoul, and Bonnet of Lyons used the potassa fusa, whilst Laugier and Berard employed

* See case, p. 64, et seq.

the Vienna paste for the same purpose.* These several caustics were applied so as to obtain long and narrow eschars; and if one application failed of reaching to the required depth, a second or third was made. In order to insure their early efficacy, Laugier advised incisions down to the vein, preliminary to its application. The immediate results,—severe pain, inflammation followed by suppuration, perhaps hæmorrhage (although this is readily controlled by compression), the obstinacy of the consequent sore, and the uncertainty of ulterior advantage,—led Sir B. Brodie and others to decry this mode of proceeding also. "Nous ne croyons pas davantage aux guerisons radicales obtenues par cette methode," says Nelaton, who, at the same time, very wisely recommends that the same end be obtained by simpler means.

Mayo suggested that the caustic should be applied over the vein only to such an extent as to set up inflammation of its coats, and thereby to cause its obliteration. "Having," says Mr. Skey, "tested this practice for many years, and adopted it largely in the out-patient ward of St. Bartholomew's Hospital, and also repeatedly in private practice, I can unhesitatingly say, that the treatment is both efficient and safe."† Mr. Skey applies the caustic along the track of the vein, in spots about the size of a split pea, one such eschar being, says Mr. Skey, "sufficient to cause obliteration of the vein in that

* Made of equal parts of caustic potash and lime.

† Operative Surgery.

particular spot." This is the safest and best mode of treating the vein by caustic; but it is not always successful.

Sir Everard Home, I believe, first suggested the use of the *ligature* for the same purpose. Sir Everard cut down on the vein, and passed a silk ligature around it. Beclard and Dupuytren, after tying the vein according to Home's method, cut it through immediately below the ligature. These plans of treatment, as they also exposed the patients to the risk of hæmorrhage as well as of phlebitis, were given up, and Velpeau introduced the method, now most extensively adopted, of tying the vein, by passing a pin under it and crossing it with a silk, or other ligature, in the form of the figure 8.* The included parts inflame, suppurate, and slough; and the ligature comes, or may be taken, away in the course of five or six days, leaving the vein cut across, or, if still entire, in a condition in which a stroke of the bistoury will accomplish its division.

Compression, by an instrument so adapted as to bear, with more or less force, upon one or several points in the course of a vein, has been recommended by Colles of Dublin and by Sanson; but has not, I understand, been found to succeed.

Galvano-puncture has also been employed, from the known power of electricity, under certain circumstances,

* See Fig. 1, page 95.

to effect the coagulation of the blood. Steinlin has recently contributed an article to the "Weiner Zeitschrift," on the mode of applying needles for this purpose.

I have thus brought before the reader the different modes which have been suggested for the obliteration of varicose veins, in order to show the amount of interest which has been attached to the subject, and to draw some conclusions which I trust may be acceptable for the guidance of my professional brethren.

Of these plans, after trying several, I have found that of Velpeau, in all respects, the best; its object being to interrupt the continuity, by destroying a small segment, of the vein, and to obtain the closure of the ends of the severed vessel by adhesive inflammation.

A needle of soft steel is passed behind the vessel, including, between the points at which it passes through the skin, as little integument as possible; a firm piece of silk, or hempen ligature should then be wound around its extremities, crossed in front, and drawn so firmly as to strangulate the included parts (Fig. 1, p. 95). On the fourth day, both ligature and needle should be removed, and the constricted portion of tissue, if not already divided, cut through.

I prefer the ligature, to simple division of the vein, for several reasons; the liability to hæmorrhage is an objection to the latter plan, unless that amount of caution is observed, after the operation, which is

incompatible with the circumstances of persons who monopolize varicose disease in this country; whilst the ligature not only effects the division of the vein as certainly as the knife, but this result is more likely to be permanent. Moreover, if it be absolutely necessary, a patient, with two or three ligatures on the saphenous branches, may resume his ordinary labour, immediately upon their application, provided it is not of such a nature as to require unusually vigorous exercise; and this is an important item in connection with the curative treatment of varicose disease. To set up inflammation in a vein, as by the superficial use of caustics, whilst a current of blood is passing through it, is, in my opinion, to expose the patient to the risk of danger from the blood becoming charged with purulent matter. This risk is, to a certain extent, avoided by the use of the ligature, inasmuch as it ensures, as one of its *immediate* consequences, the perfect closure of the vein at the point operated upon.

The objections to operations upon veins arise from the probability of their inducing dangerous phlebitis; and from their alleged frequent failure to produce either the obliteration of the vessel, or, even if this be attained, the cure of its disease.

After having operated on veins a great number of times, and, on the lower limbs, in almost every variety of situation, and under almost every condition

of the vessel, I believe that, with the exercise of ordinary discretion, these objections are of little force.

The simplest operation on a vein is, doubtless, hazardous, unless the site and condition of the portion of vein selected, as well as the state of the patient, be well considered. As a rule, I now seldom venture upon applying a ligature to a vein above the knee joint, having found the superficial veins of the thigh more susceptible of phlebitis than those of the leg. I have deligated veins in both situations at the same time, and observed that the inflammation has been comparatively most severe in connection with the injury to vessels in the former situation, and almost uniformly attended with more or less urgent disturbance of the system at large. Fortunately, the obliteration of the trunk of the saphena in the thigh is seldom required, since it is rarely so diseased as to become of itself a source of mischief to neighbouring parts; and not only so, but, in the event of its becoming diseased to that extent, it would generally become pathogenetically as well as functionally inert, upon the closure of its tributaries in the leg.

A ligature should not be placed on any portion of a vein, the coats and cutaneous covering of which have become so thin as to be incapable of supporting those processes that are required for its subsequent repair. The blue, bloated, and attenuated portions are unsuitable for ligature. Instead of adhesive inflammation, and subsequent obliteration of the vessel, its application would,

in all probability, result either in erysipelas, suppuration, or ulceration, with hæmorrhage and other attendant ills, of more or less moment. The ligature might, however, with comparative impunity, and indeed should, as a matter of selection, be placed as near to such a segment of vein as is consistent with a regard to the nature of the processes designed to be set up.

The other objection has appeared to me to be equally untenable. Although a vein has been completely divided by a ligature, its continuity is said to have become, in the experience of some surgeons, after a longer or shorter time, restored; and, in the event of one portion of a vein having been obliterated, other portions of the same vessel, or some of its collateral branches, have been known to enlarge and become the seat of similar disease. This seeming transference of varicose disease from one vein, or section of a vein, to another having followed several successive operations on the same leg, has led to the inference that the hope of eradicating varicosity, when once established, is illusive.

Whenever, in my experience, a portion of the entire calibre of a vein has been destroyed by the ligature, no such result as that which forms the basis of the *first* part of this objection has followed; the continuity of the vessel having been, in every case, permanently interrupted. Not so, however, in those cases in which the ligature has been applied with less force than is sufficient

to effect the destruction of the tissues included in it. As to the *second*, it must be remembered, that it is the *diseased*, not the simply *dilated* vessel which it should be the surgeon's immediate object to destroy; for so long as the coats remain simply *dilated*, the vessel will be comparatively harmless: and, although the destruction of a portion of diseased vein may be followed by the compensating enlargement of its collateral branches, it by no means follows that these will in any way injuriously affect existing disorders, or of themselves become the seat of such disease as may be followed by ulceration. The ligature should, therefore, be applied only to such portions of veins as are *diseased*, not to those, as a rule, which are merely *dilated*, the support of a bandage being, in general, all that is required for such as remain in this condition. Should diseased processes commence, or, having commenced, should they proceed in a portion of vein that might have become consecutively affected by varicosity, that portion of vessel must be subjected to the operation of the ligature, or the advantages obtained by the first operation will be uncertain, both as to their extent and duration.

The number of ligatures required must be in proportion to the extent of the disease. If the larger veins of an extremity be generally affected, and circumstances are favourable, three or four might be applied at first, selecting such spots for their application as will, if possible, bring the whole of the disease within

the sphere of their influence. Should these prove to be insufficient, other ligatures must be placed upon such intervening portions of the vein as remain unaffected by the former operation; and, in this manner, the whole of the diseased vessel may, in the end, be safely and completely obliterated.

It must not, however, be forgotten, that the course of a deligated vein "does not always run smooth;" and, moreover, that in case unexpected symptoms, either of a topical or of a general character, should arise, these will generally be such as to demand the most prompt and judicious attention. On looking over my note book, I find notes,—of phlebitis with erysipelas and constitutional disturbance of a more or less severe type, having occurred on some occasions;—of hæmorrhage with ulceration, on another;—of symptoms of purulent infection and subsequent death by lobular pneumonia, in a third instance;—of changes in the aspect of the sore, concurrent with the approach and duration of these attacks respectively;—and, in others, of sloughing of the skin at some part of the edge of the sore, so as, in one case, to require incisions in order to prevent its extension. These cases, however, (with the obvious exception alluded to, in which case the ligatures were placed on an extremely attenuated vein in connection with a large eczematous ulcer) ultimately did well; and, as far as I have been able to discover, there has been, in no instance, any indication of returning disorder.

Cases will present themselves in which the diseased portion of vein has become uniformly so attenuated as to render the application of a ligature to any portion of it hazardous; but in which, from the co-existence of an indolent ulcer and, in all probability, of long standing eczema, it is desirable that it should be destroyed. In such cases I have been in the habit of making a long, and tolerably deep, incision through the vein and integument, parallel, if possible, with the long axis of the limb, and so directed as to divide the vein in two, or even more places.* This practice I can confidently recommend. The case, given at page 64, supplies the details of others on which I have tried this plan; the results having been, in all, uniformly favourable. The hæmorrhage is generally profuse, but may be easily arrested by a pledget of lint and a bandage. The wound should be kept open for the purpose of establishing suppuration, whilst gentle compression should at the same time be maintained along the vein, for some distance from its cut extremities, in order to keep it collapsed. After three or four weeks, that improvement will, *ceteris paribus*, generally show itself in all parts of the limb, from which its complete and early restoration to a state of health might be confidently prognosticated.

The *second* indication, viz., the restoration of those

* I do not know why, but vertical incisions appear always to heal more readily than those in any other direction.

texures, belonging to or adjoining the ulcer, that are in a state of disease, as nearly as possible to a condition of health, is to be fulfilled by a variety of remedies; principally by those which writers have extolled in the treatment of ulcers. In the selection of these, the surgeon will be guided by the nature and stage of the disorder in each case respectively.

Inflammmatory action must be subdued by leeches, scarifications, or, if the part be very tumid, by incisions; and, should it exist in an aggravated form, or be associated with constitutional derangement, by the employment, at the same time, of appropriate general treatment. I have found small but repeated doses of the sulphate of magnesia, with either the hydriodate of potash, an alkali, or an acid (especially the nitric or nitro-muriatic), according to the indications of the tongue, urine, pulse, &c., &c., to answer remarkably well under such circumstances; and, in the event of there being any syphilitic taint in the system, the bichloride of mercury in minute doses with decoction of bark twice or three times a day. In still severer cases, mild purgatives, with calomel and opium at night, pushed even so far as to render the gums slightly affected, have been most generally successful. These remedies should be followed by bandaging, if the disorder is accompanied by œdema, or by blistering, if by the infiltration of more solid matter.

It will be obvious that the constitutional treatment

of the various forms of local disease which exist in connection with indolent ulcers, can receive but very limited consideration here.

The modern introduction of the *blister*, by Mr. Syme, is a signal addition to our means of treating ulcers. I have employed blistering for years; and from my experience of its efficacy, in cases to which it is appropriate, I cannot commend it too highly. I am in the habit of using it;—1st, in cases in which some lingering inflammatory disorder remains in connection with an ulcer, after the exhaustion of more general remedies and blood-letting; 2ndly, in cases in which the surrounding skin is thickened by infiltration, especially before the effused fluid has had time or opportunity to become solid; and 3rdly, in languid *skin ulcers*, to the surface of which, as I have before remarked, the blister becomes a most useful *stimulant*.* Its power in reducing the more tractable forms of chronic thickening, when it exists either in connection with the basic, or border tissues of an ulcer, is very great; and there are few ulcers that may not be signally benefited by its use. It may be applied to the surface and border of an ulcer at the same time, or to either, separately; and it should be repeated again and again, until its good offices appear to have become exhausted.

* I am in the habit of using Browne's "cantharidine plaster;" other surgeons, Mr. Mac Whinnie, Mr. Startin, and Mr. Chapman, use various forms of blistering liquid.

The *bandage* is often an excellent remedy in mild cases of eczema, especially if unaccompanied with advanced venous disease, as well as in those cases in which the ulcer is accompanied by an œdematous state of the skin, without the co-existence of inflammatory action. But its good effects, in these affections, are derived from the uniform and moderate *pressure* which it makes on the limb, especially upon its diseased tissues; and this, through the support it gives to the vessels, as well as through the stimulus it unquestionably offers to the local absorbent system.

And here I must digress for a little to say a few words on the bandage.* According to Baynton, the objects which the bandage is adapted to fulfil, are—1st. "The removal, from the diseased tissues of an ulcer, of those matters which the diseased absorbents fail of removing, and thus to restore them to their natural situations and dimensions, and render them again subservient to each other's actions;" and 2ndly. "The approximation of the edges of the ulcer." Soon after Baynton's time, these principles were either lost sight of, or merged into a general idea that the good offices of the bandage are to be secured, either by the pressure it is, according to the views of Wiseman, adapted to maintain on the ulcer; or, according to modern authorities, by the general support which it is adapted to give to the limb at large, especially to its vascular apparatus.

* I use the term in a general sense.

There is too much reason to think that, in applying the bandage, both principles and objects are too frequently altogether overlooked; and that, thus, the use of a valuable instrument has degenerated into a matter of experiment, instead of having risen to a rule of treatment, with corresponding and exact notions of how much, or how little it is able, in any given case, to accomplish.

The bandage can render essential service towards the healing of an ulcer; first, by promoting the absorption of extravasated matter from the interstices of its adjoining tissues; secondly, by so disposing the skin as to favour the tendency, on the part of the edge, to convergence; thirdly, by giving support to the coats and coverings of the dilated vessels; and, fourthly, by furthering the consolidation and *quasi* perfectibility of its cicatrix. If the bandage be applied to an irritable or inflamed ulcer—with the exception of some instances in which that inflammation is of a *low* and languid form, evidenced by a dull bluish tinge and an absence of the ordinary warmth of the skin—or to a perfectly indolent ulcer with an indurated skin margin, the tissues of which are undergoing, or have undergone, the process of solidification and contraction, harm rather than good will result; for those conditions, by which ulcer surfaces respectively are kept in a state of supineness or indolence, will thereby be aggravated rather than relieved.

As a rule, the *compression* that can be made by a bandage is invaluable in all ulcers, the adjoining textures of which are rendered dense and consequently rigid by materiel that is capable of being absorbed; and in order to secure the full advantage of this instrument, it should be applied, not in the partial way recommended by Baynton, but from the toes upwards, according to one of the several methods advised by the late Mr. Scott, by Mr. Chapman, and Mr. Critchet. It cannot, however, as a compress, *directly* promote the cicatrization of an ulcer; on the other hand, if it has any influence on that *process*, it would, to a certain extent, retard it by the additional restraint to which it subjects the compressed textures.

Irritability must be treated by opium, narcotine, atropine, hyosciamus, belladonna, either with, or without, iron, quinine, and the other adjuvants usually given for the purpose of relieving this symptom.

Sir Everard Home and Sir Astley Cooper recommended the internal and topical administration of *opium* for the "irritable" ulcer; and its virtues cannot be too highly extolled.

Mr. Skey recommends this drug in the cure of ulcers generally, especially if they be accompanied by indolence, inasmuch as it "compels the unaided powers of the constitution to perform its own work, and exhibits, at the same time, a gauge of the general health, by rousing the reparatory energies of the circu-

lation." "It will be found most effective," says Mr. Skey, moreover, "in cases of chronic ulcer, in old persons inclined by habit for spirituous drinks, and the leuco-phlegmatic, who have not been similarly addicted. I have given it, with certain limitations, in all ages between fifteen and eighty, and its effects have been favourably exhibited on all parts of the body, least strikingly, as regards time, on the legs, and most so on the head or trunk." *

The suggestions of one, so well known, and so highly esteemed by his professional brethren, as Mr. Skey, cannot be hastily passed over. If, however, his cases be analysed, and brought into correlation with the principles I have laid down, they will not, I think, quite bear out the conclusions, with respect to the *modus operandi* of this important agent, for which that gentleman contends. On looking through them carefully, I cannot but think that the opium contributed its quota in the healing of the ulcers described, by allaying either local irritability, or those several forms of inflammation which are so well known to be amenable to its influence,—whether in the skin or the peritoneum,—or by overcoming that rigidity of parts which often follows in the wake of old ulcers, especially if they happen to be in the occupancy of some of the less sensitive of our fellow brethren. In this way, opium would correct those *conditions* of textures, in connection with ulcer-

* Skey on Ulcers, pp. 50 and 53.

surfaces, which often prevail and are precisely adapted to restrain any inherent tendency on their part to heal. I have ventured, albeit with diffidence, to express an opinion somewhat at variance with that of Mr. Skey, upon a matter of comparatively trifling moment in reference to this agent; but I fully agree with him as to its therapeutical value in the treatment of these cases, assured that, from no one remedy, may the surgeon derive a larger amount of benefit.

Should a thickened edge—a "*welt*"—stand in the way of the healing of an indolent ulcer, it might be removed either by blistering, caustics, or the knife. The acid pernitrate of mercury, fused potash, chloride of zinc, and the nitrate of silver, are the best caustics for this purpose. I have alluded to Liston's plan of cutting such an edge away from its subjacent textures, and to the ancient plan of incising it at several points —*starring* it—which is still practised, I am told, in the east. It must be remembered, however, that the "welt" has been referred to abortive attempts on the part of the skin-edge to repair the ulcer. It will, therefore, disappear as soon as the tissues bordering the ulcer are restored to a condition compatible with the free exercise of its healing powers. Mr. Hainworth speaks most favourably of his method of peeling off the indurated cuticle without, if possible, injuring the cutis; but I cannot speak of its merits from my own experience.

Wiseman advised very firm pressure by the dandage, for the purpose of removing "the lips of an ulcer

which do not lie level with its surface;" and Else, in order to attain this object more effectually, recommended a piece of sheet lead, or some such material, to be interposed between the edge of the sore and the bandage. Even yet, this practice is adopted; but with what success, the advanced solidity of the welt, and the less controllable condition of the adjoining skin, will generally show.

There is a peculiar state of the skin, often met with around old ulcers, characterised by tumefaction, with a tendency to solidification especially in the direction of their borders, by a deep purple colour, evidently the result of old-standing congestion, and, most usually, by varicosity of the smaller, as well as of the larger venous branches throughout the limb generally. As a "dernier resort," especially after bleeding, blistering, and other local as well as constitutional remedies have done their utmost, a free incision, or even two incisions, through its entire length, not sparing the vessels, will generally prove of the greatest advantage. Such incisions will unload the vessels, as well as the tissues, and set up entirely new action in them, so that the skin will often, in a most unexpected manner, become thereby restored to very nearly its normal condition.* They will also, as I shall show hereafter, favourably influence the immediate ulcer tissues.

* My friend, Mr. Jones, of Jersey, informs me that he scarifies the surface, as well as the edge, of similarly congested ulcers, by means of an instrument in the shape of a rake, having four or five lance blades arranged on a bar with a handle attached to it.

The surfaces of ulcers, of the class under consideration, rarely derive much benefit from ointments and lotions. I have, however, known cases in which the thickened tissues appeared to have been considerably reduced by the application of an ointment composed of the Ungt. Hyd. Fort., ℥iß.; Ext. Conii, ℥iß., or Pulv. Opii, ℈j.; Adipis, ℥v. M. Fiat Ungt.; especially if it be applied after blistering. Sometimes it appears desirable to relieve the tissues by exciting the ulcer-surface to increased action; for which purpose, I have generally applied the Ungt. Elemi, or the Cerat. Resinæ. If an ulcer is obstinately irritable, the surface might be brushed over with a solution of the Argent Nitrate, gr. j.—℥j., Aq. Puræ; or be lightly touched by the pure salt. Or, should an ulcer appear to require some slight, but direct stimulus, I have occasionally employed, and generally with advantage, a lotion composed of Acid Nitric Dil., ℥ß.; Aq. Puræ, ℥vi.; or of Creosot, m ij.—Aquæ Puræ, ℥j. As a general application to these ulcers, I prefer either the common water dressing, or a poultice made with carrots, boiled down, and reduced by mashing to a soft pulp. The ordinary bread, and linseed poultices are, in general, nuisances, to say the least of them; and, if applied for any length of time to the surrounding skin, are more likely to set up, than to promote the cure of, disease in it. The exposure of healing surfaces to the air, for several hours in the course of a day, I

have found to be very serviceable in cases where the process of cicatrization is tardy.

Should the removal of all active disease from the structures adjoining an ulcer, as well as of such of its products as have not become permanently incorporated with their integral elements, fail to produce in its surface a disposition to the formation of a perfect and permanent cicatrix, it will be obvious that the causes of indolence are of so fixed or stationary an order, as to require the use of other and more potent measures.

Under such circumstances, "strapping" the ulcer, upon the principles which Baynton contended for, is the first and most suitable means to be tried. "After having experienced repeated disappointments in my endeavours," says Baynton, "to obtain permanent cures for some patients with whom I had taken more than common pains, and for whom I had tried rest in a horizontal posture, exercise, precipitate, and Mr. Else's 'method of treating sore legs' by bandages, and every other remedy I was acquainted with that authors had recommended, both alone and conjoined with the most approved internal medicines, I determined on endeavouring *to bring the edges of those ulcers which might in future be placed under my care nearer together*, by means of strips of adhesive plaster; having frequently had occasion to observe that the probability of an ulcer continuing sound depended much on the size of the cicatrix which remained after the cure appeared to be accomplished; *and believing also that the*

natural shield of the part, the true skin, afforded a much more substantial support and defence, as well as a better covering than the frail one supplied by nature in the common methods of cure."* "For it must be admitted," says Baynton further, obviously referring to Hunter's views, "that the skinning process is materially assisted by the efforts made to bring forward the retracted parts, which efforts contract the granulations."

Such are the views that Hippocrates taught; which Baynton revived, and modern Surgery must establish, if the treatment of wounds and ulcers is to be based upon a correct apprehension of the nature and direction of the processes, by which their repair is to be accomplished.

But, if correct, it may be asked, why has the practice not been uniformly successful? It was not long, as we have seen, after Baynton's precepts were made public, before complaints were urged against them on account of the occasional failures which followed their adoption; but it is not a little curious to observe that no one of the still more recent "systems" of treatment has been more fortunate in instructing us how, generally, to grapple with the difficulties that lie in the way of curing the old callous ulcer. The explanation is to be found in the fact, not that the principles involved in those precepts were false, but that the means for carrying them out were, in the refractory cases, inade-

* Baynton on Ulcers, p. 10.

quate; in other words, the attempt to approximate the opposite sides of the sore, and the means of enforcing it, were, in principle, strictly right; but the resistance on the part of the edge and adjoining textures was, in the cases alluded to, greater than those means could overcome.

It was objected that adhesive plaster cannot fulfil Baynton's intentions, and, therefore, that whatever advantage might have accrued from his plan, in a given case, was due to the pressure made by the bandage on the limb at large. But this objection is overruled by the fact that, after the application of the plaster bandage, the limb is enveloped in a roller;—without which, indeed, the "strapping system" is incomplete;—so that, supposing, as was alleged, the plaster cannot retain its hold upon the edge of a sore, the bandage would keep the vertical portions of that edge in constrained approximation, by compressing the whole limb, to a certain extent, within its wonted compass. But plaster—provided the adhesive matter is good—*will* retain its hold upon the skin even to the margin of the sore; and, by applying it in the following manner, is well adapted, in mild cases, to answer Baynton's purpose. Instead of one strip of plaster, wherewith to surround the limb, two should be employed. These should be fixed to the limb at a point directly opposite the ulcer, and then be brought around it somewhat diagonally. As soon as they have taken a

firm hold upon the skin, it is obvious that, by crossing them in front and drawing them towards each other, the opposite margins of the sore will be made to approach each other. This should be done with a discreet amount of force, and the ends of the strips attached over each other. In this manner the requisite number is to be applied; the first just below the sore, and the others successively — each being made slightly to overlap that which preceded it — until the sore is wholly covered in. Strapping an ulcer, "upon the most improved principle," does not, however, always answer its purpose.

This leads me to the consideration of that further treatment which should be adopted in the case of ulcers which remain indolent, or stationary, in defiance of those means of procuring their cicatrization which have now been reviewed. I refer to the *third* class of cases, in which the edge and adjoining tegument are so altered, by changes of a permanent nature either in their integral elements, or in the tissues which connect them with contiguous structures, as to have become devoid of that elasticity and independence of movement which, as in the case of the hole in the palate, are necessary to their healing.

This class includes,—such ulcers as are situated in the immediate neighbourhood of cicatrices which exert a traction on some part of their margins, — those which are situated within the boundaries of a cicatrix, or

over tense bands—such as succeed to burns,—and others which are situated within the sphere of permanently disordered skin.

The seat of resistance or fixidity in these cases lies either in the skin edge, or in the adjoining skin, or in both conjointly—*i. e.*, 1st, the edge may be free to contract, but be under restraint through the tension or fixidity of the adjoining skin; 2ndly, the adjoining skin may be elastic and free, but the margin fixed; or, 3rdly, the skin-margin and vicinitous integument may be simultaneously inelastic, or immoveable.

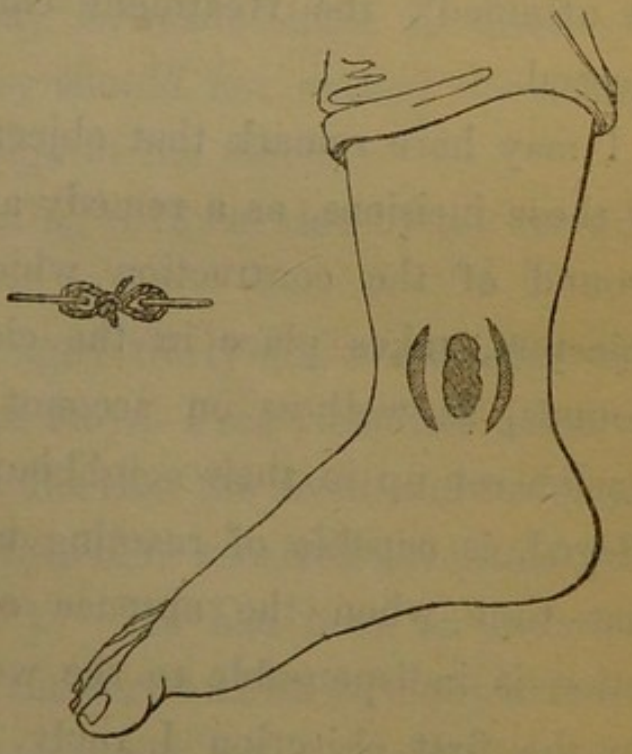
In these cases, as the cicatrix of an ulcer is compounded partly of new and partly of border skin, its formation, as I have attempted to show, is obstructed because the requisite supply of the latter is not to be obtained; and the surgeon will have to supply it, either —1st, by releasing the edge of the ulcer from any restraint to which it might be subjected by the surrounding skin or other textures; or, 2ndly, in cases to which this method is inapplicable, to supply the ulcer with skin from the neighbourhood by a *plastic* operation.

The *first* object is to be attained by incisions *through* the skin; the *second*, by transplanting portions of skin.

The first object—*the release of the edge of the ulcer from the restraint imposed upon it by surrounding tense*

skin — is to be accomplished by *incisions*, made, at right angles to the manifest line of tension; this being, in ulcers of the leg, usually in the line of shortest superficial area, viz., transversely to its long axis. If the ulcer be small, one incision, on the side corresponding to that of the greatest tension, will suffice; but if large, one on either side will be required, as in Fig. 2, of the adjoining woodcut.* Moreover, if the ulcer should commence healing, but, as in some cases which have come under my care, should cease to proceed as soon as the supplemental incisions shall have cicatrised, fresh incisions will have to be made, the surgeon being guided, as to their situation, according to the seat and direction of the tension which remains; for this tension must be relieved, or the ulcer will not permanently heal. Again, as in other cases which have come under my care, should the ulcer heal and one or both incisions

Fig. 1. Fig. 2.



* Since writing the above, I have adopted curved instead of straight incisions.

remain open, these must be treated as the original ulcer; *i. e.*, by incisions, one for each sore; and, as, in all probability, the last wound or wounds are either made in, or closely adjoining, healthy skin, the whole will then heal readily. This will, however, still depend upon the degree in which the tension may have been relieved by the incisions; for until it be so far overcome, as to give entire freedom to the ulcer edge (and there are few cases in which this end might not be attained), the treatment cannot be expected to succeed.

I may here remark that objections have been taken to these incisions, as a remedy against tension, on the ground of the contraction which, according to the objectors, takes place in the cicatrices of these new wounds, as well as on account of the inflammatory tension set up in their neighbourhood, and which, it is alleged, is capable of reacting upon the ulcer just at that time when the absence of all such disordered action is indispensable to the well-doing of the ulcer. To the first objection I reply, that the cicatrices of clean cuts, which heal by granulations, are formed entirely of new skin tissue, and that they tend somewhat to increase the superficial area of the part in which they are situated. If there is any contraction, it is in the direction perpendicular to the surface; hence I recommend the incisions to be made no deeper than is necessary for the purposes intended, although it is

better to err on the side of depth, than to leave any restricting bands undivided. To the other objection I reply, that, whatever tension the inflammatory action consequent upon the incisions may occasion, such tension, by expending itself on their edges and causing them to separate, is serviceable to their objects than otherwise; whilst its duration is, in general, so short as not to interfere with those processes in relation to the ulcer upon which its healing must ultimately depend.

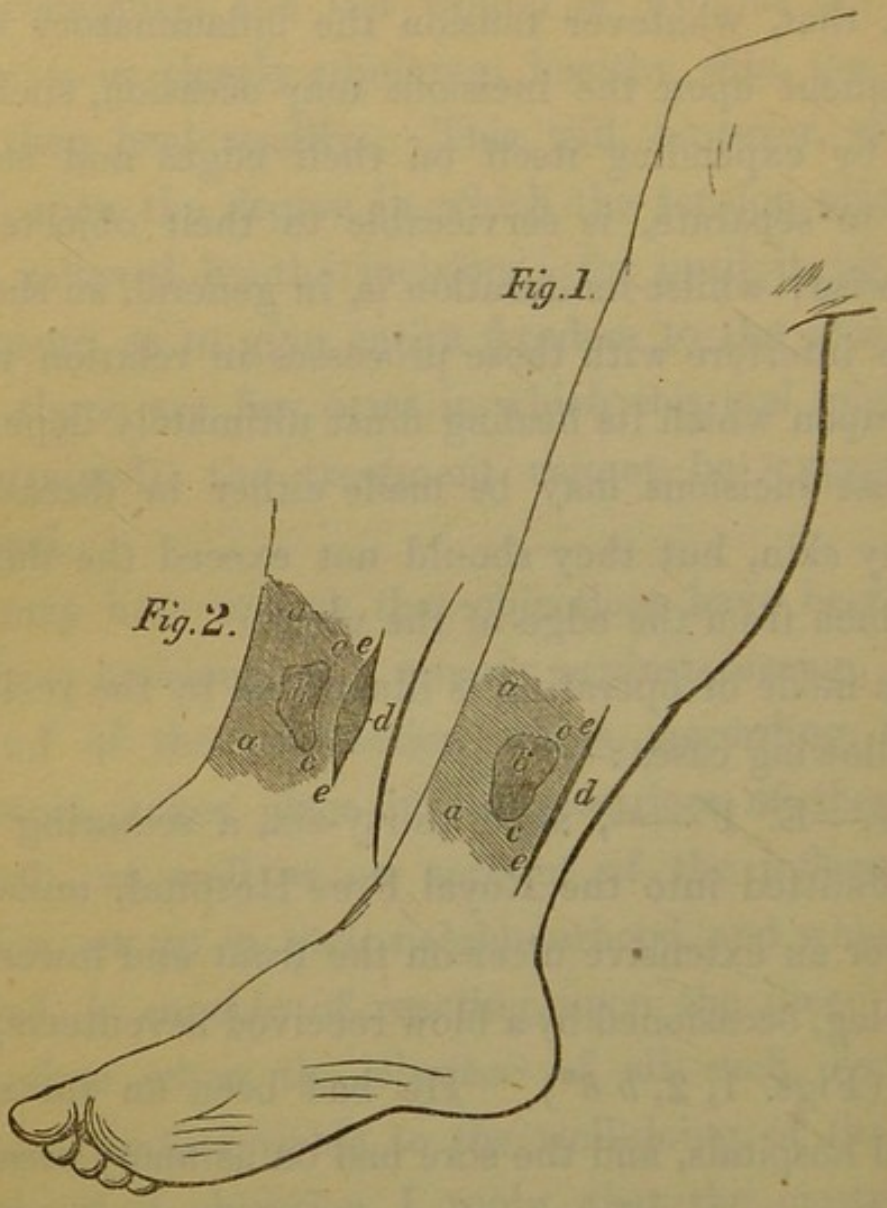
These incisions may be made either in diseased or healthy skin, but they should not exceed the distance of an inch from the edge of the ulcer.

The mode of operating is illustrated by the recital of the following cases:—

Case.—E. F——, aged thirty-six, a seafaring man, was admitted into the Royal Free Hospital, under my care, for an extensive ulcer on the front and lower part of the leg, occasioned by a blow received seventeen years since (Figs. 1, 2, *b b**). He had been an inmate of several hospitals, and the sore had on as many occasions yielded to rest and treatment up to a certain point; but, after diminishing to the size of, or rather larger than a shilling, the process of healing invariably ceased, and no means could bring about its re-establishment. And not only so, but on resuming his usual occupation, the ulcer, on each occasion, began to enlarge; so that, in despair of obtaining a cure, the poor man

* For woodcut see next page.

requested that his limb might be amputated. Instead of acceding to his request, I had him placed in



The dark shadow indicates the disordered portion of skin.

bed, and the ulcer treated with water dressing. It began to close in, but after a while the process of healing again suddenly ceased, and, in despite of strapping, bandages, and topical application of all kinds, refused to proceed any further. It was observed that, at the part where the ulcer was situated, the leg was

contracted in size, as though it had been surrounded by a tight bandage. The skin immediately around the sore (Figs. 1, 2, *a a*) was of a dusky brown or copper colour, tense, and inelastic, but not quite immoveable, although any attempt to converge the edges of the sore was well nigh futile. I therefore made an incision (Fig. 1, *d*, *e e*) through the healthy skin and superficial fascia, within a short distance of the edge of the sore, and in a direction parallel to the long axis of the limb, this being at a right angle with the line of principal tension. The wound gaped; the ulcer, however, began immediately to close. On the third day the wound gaped still more: and it was interesting to observe that the edge against the ulcer exactly followed the outline of the ulcer-edge (Fig. 2, *c c*, *e e*) as it varied its shape in the course of healing,—manifestly the result of the traction which this edge made upon that of the wound. After the fourth day, by which time the sore had almost closed up, the process of healing was less rapid; still, its cicatrization was completed within twelve days, and, after twelve days more, that of the supplemental sore likewise.

The following case is taken from the "Medical Times and Gazette."

Case.—"Grace Golipher, aged sixty-four, was admitted into the Leeds Infirmary, under the care of Mr. T. P. Teale, August 3, 1853, suffering from chronic ulcer in the leg. Four years ago, she received a blow

on the right leg, above the ankle. The bruised skin was discoloured, and soon became ulcerated. Poultices were applied, and the limb was partially rested. The ulcer extended, and became indolent, the edges of it being thick and hard."

"In January, 1850, the sore had increased to the size of a crown-piece. For two years after this date, she was under regular surgical treatment, and was once confined to bed for four months, after which the sore was reduced to the size of half-a-crown, but beyond this it could not be made to heal."

"In August, 1853, she was admitted into the Infirmary, the sore being of the size of half-a-crown. It had an indolent aspect, the edges were thick and hard, and the surrounding skin appeared shining or glazed, and was perfectly immoveable from adhesion to the subjacent structures. The veins of the leg were not varicose. Confinement to bed, water-dressings, and aperients, were employed for a fortnight without benefit."

"August 18.—Mr. Teale made a free incision in the skin on each side of the sore, after the manner of Mr. Gay. The incisions were carried through the skin and aponeurosis, and a few fibrous bands beneath these structures were divided, so as to loosen the skin on each side of the ulcer. The wounds, and the original sore, were depressed with lint, moistened with warm water, and covered with oil-silk."

"In a few days after the operation, the ulcer was much

contracted in size, and was freely granulating. The edges of the incisions had separated considerably. The case proceeded remarkably well, and in one month from the time of operation, the ulcer, as well as the incisions, were healed."*

Case.—A young woman is under my care at the present time, who had an obstinate ulcer on the shin, about two-thirds down the leg, which had existed for eight years, although the usual means had been rigidly adopted to induce it to heal. The sore, when I first saw it, was surmounted upon a broad patch of indolently-inflamed, and puffy skin; the edge being thick, but not fixed to the subjacent textures. I made an incision on either side. Neither sore nor incisions showed any disposition to heal, but exuded a thin sero-purulent fluid; nor did the state of the skin materially change. This was, probably, owing to the state of the patient's health, which was not, I discovered, quite so good as it should be. I proceeded to correct this by suitable remedies, to apply blisters in succession to the skin and ulcer surface, and subsequently to bandage the limb, for the purpose of promoting the absorption of any matter that might have been effused into the interstices of its tissues. These means had the desired effect, for the ulcer and wounds soon began to show healthy, granulating surfaces; the former, however, contracted at the

* "The notes of this case were taken by Mr. Hardwick."—*Medical Times and Gazette*, Nov. 19, 1853.

expense of the latter, for the wounds continued to gape for some little time after the ulcer began to close in. Both are now completely cicatrized; the ulcer having healed before the incisions.

In this case, as in others, the skin, which appeared beforehand to be irreparably tense, ultimately lost its tension, and recovered a condition closely bordering upon, if not absolutely that of perfect health. I have narrated it principally to show that, in analogous cases, unless the disordered tissues as well as the general health are prepared by suitable treatment, the incisions will be comparatively unavailing.

The foregoing plan of treatment has now been adopted by myself, as well as by other surgeons, on many occasions, and with almost constant success; so that I do not deem it necessary to add the details of other cases.*

Indolent ulcers, in the neighbourhood of cicatrices from operations, diseases, or burns, will have to be freed from their influence by means of one or more incisions, so made as to have the effect of intercepting

* Since the above was in type, my friend, Mr. Borlase Childs, has done me the favour to show me a case in which the incisions were followed by the best results. A. N. aged 60, had suffered from an indolent ulcer, over the internal malleolus, for twelve years, for which he had been in most of the London hospitals. The surrounding skin was of a dusky red colour; hard, inelastic, and raised at the edge into a thick "welt." Mr. Childs made a circular incision on either side of the sore; the wounds bled freely; but the sore commenced immediately to heal. In the space of four weeks it had almost entirely healed in, and that by the axial convergence of the edge, as well as by cicatrization. The skin has already, to a great extent, recovered its wonted elasticity.

it. Should the ulcer be in the neighbourhood of a cicatrix, and only indirectly affected by it, *i. e.* through the medium of any tension made upon the skin generally by the cicatrix, it is only necessary to make an incision along the border of the sore, in such a situation as to neutralize the effects of the tension, and, other conditions being favourable, the ulcer will heal. Sometimes such an ulcer is found to overlie a tense and thick subcutaneous bridle, the result of a burn; in which case the incisions should be made so as to allow of its being removed at the same time.

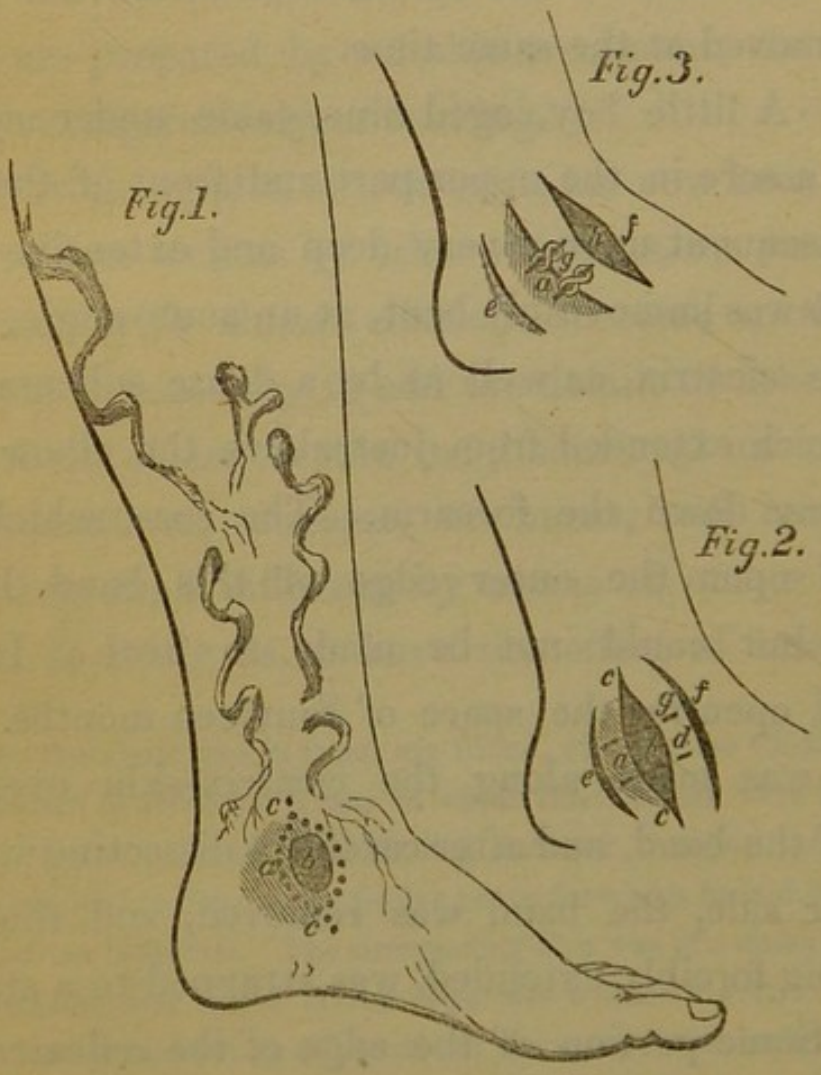
Case.—A little boy, aged nine, came under my care for such a sore in the upper part and front of the forearm, consequent upon a very deep and extensive burn. The limb was immoveably bent, at an acute angle, by an extensive cicatrix, as well as by a dense subcutaneous band, which extended from just above the elbow joint to midway down the forearm. The sore, which just bordered upon the outer edge of this band, looked healthy, but could not be made to heal. It had remained open for the space of fourteen months. An incision was made along the cicatrix-skin over the centre of the band, and after carefully dissecting it back on either side, the band was removed, and the arm, after being forcibly extended, was strapped to a straight splint. Some portion of the edge of the reflected skin sloughed, but the wound ultimately healed, and, with it, the ulcer. This lad is now recovering the use of the joint. The persistence of the ulcer, in this case,

depended upon the tension which the band maintained on a portion of its border.

Indolent ulcers, the *edges* of which are, either alone or in conjunction with the adjoining skin, immoveably fixed to the subjacent parts, require another kind of surgical treatment; viz., a *plastic operation*.

The plan I adopt in these cases may be gathered from the recital of the following case with the aid of its accompanying diagram.

Case.—A. B——, aged twenty-nine, a domestic ser-



vant, had a sore over the inner malleolus, of the size of half-a-crown (Fig. 1 *b*). It had existed for twelve years,

and was supposed to be due to large varicose veins, which were to be seen running down the leg towards the ulcer. On three separate occasions I tied the veins, and each operation, with rest, appeared for a time to be successful; the ulcer, however, re-opened on each occasion, shortly after her return to work. On examination, it was observed to be shallow, and disposed to heal; but the skin-edge of the ulcer was hard, and immoveably fixed to the subjacent tissues. Towards the heel, the adjoining skin was a little thickened, of a purplish colour, and also fixed (Fig. 1, *a*); in the opposite direction and immediately beyond the edge of the ulcer, it was, however, perfectly healthy and loose.

It will now be obvious that, in some important respects, this case differed from those narrated at pages 97 *et seq.*; for whereas in these the edges of the sores were free, but the adjoining skin fixed, in the one under consideration the edge was fixed, but the adjoining skin, at least on one side, was free. This ulcer was therefore treated in the following manner:—After excising its tissues entirely, by means of incisions close to the edge (Fig. 1, *c c**), two other incisions were made through the adjoining skin, one on either side of the new sore and about an inch from it (Fig, 2, *e f*). The portion of sound skin towards the surface of the foot,

* The dotted lines show the course of these incisions. The posterior incision should have enclosed the whole of the *shaded* skin.

included between the sore and the front incision, (Fig. 2, *g d*,) was then dissected from its subjacent connexions, shifted over on the site of the ulcer, and its edge united to that with which it was now brought into contact by means of hare-lip needles (Fig. 3, *a g*), rendering the incision a gaping wound (*h*). The incision towards the heel (Fig. 3, *e*) was made for the same purpose as that for which the analogous incisions in the former cases were made—viz., to relieve tension. By the fourth day the transplanted flap had united to the base of the sore, and, with the exception of a very trifling slough of a portion of the opposite edge around the needle, all was going on perfectly well. This case is given, so far, as an illustration of the practice which I have thought proper to recommend in accordance with the principles I have advocated. A severe attack of typhus fever overtook this patient, and, with its accession, the reparative processes, which had been going on most satisfactorily, were interrupted. They were, however, soon satisfactorily renewed, and the flap of healthy skin, which supplied that lost by ulceration, became re-united to the base of the sore, and took an important part in the composition and stability of the cicatrix. The wounds ultimately healed, and, to this day, there is not the slightest apparent disposition in the skin to become again the seat of ulceration. Some slightly dilated veins are seen, here and there, on the leg; but those

which were made the subject of operation, appear to have been rendered permanently inert.

Those ulcers, the border diseases of which are confined to comparatively narrow rims of skin, are alone fitted for this method of treatment; because it is essential that the whole of the neighbouring diseased tissue should be cut away; and it would be difficult, perhaps, to supply the vacancy thus created, if it exceeded certain limits. The form of operation may be varied according to the state of the parts, care being taken to select the most healthy portion of skin which the neighbourhood presents, wherewith to fill up the gap. Both the edge and basic tissues of the sore should be carefully excised; and any portion of diseased vein or of tissue that might have become indurated or callous which may be found to traverse them, should likewise be cut away. In the case just recited, a portion of diseased vein was discovered and removed. Some portion of the wound, made by the excision of the ulcer, may be allowed to fill up through the medium of granulations, in case a sufficient quantity of healthy skin cannot be gained from the immediate neighbourhood wherewith completely to close it in; but almost any difficulty of this kind can be overcome by the ingenuity now applied to plastic surgery.*

The rules which I have proposed for the permanent

* See Mr. Spencer Wells' excellent papers in recent Nos. of the "Medical Times and Gazette."

cure of ulcers, which appear to defy all other methods of treatment, are now obvious. They are—1st, to relieve the tension of the adjoining skin or other tissues, where that is opposed to the healing of a sore, by incisions at a right angle with the line of tension, as in the first three cases; and, 2nd, to supply new skin altogether, by a species of plastic operation, where, as in the last, the obstacle to the cicatrization of an ulcer lies in an irremediably fixed condition of its skin border.

THE END.

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