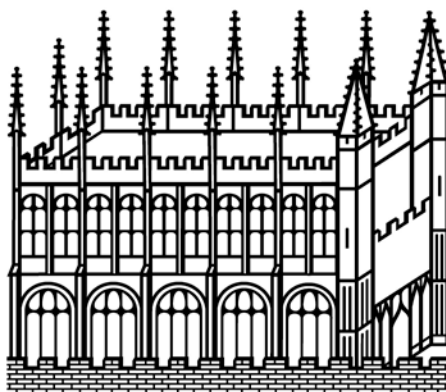




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With the Author's compliments^{20.}

A N S W E R S

TO THE

VARIOUS OBJECTIONS AGAINST ACUPRESSURE

OR THE

TEMPORARY METALLIC COMPRESSION
OF ARTERIES

ADDUCED BY PROFESSORS MILLER, ERICHSEN,
NEUDÖRFER, SPENCE, FERGUSON,
AND SYME.

(From Dr. Simpson's work on Acupressure, p. 241, sqq.)

16049. e. 3.



PREFATORY NOTE.

THE following two chapters were originally written in answer to the chief objections urged against Acupressure by various surgical authorities. They are reprinted in the present form merely in self-defence against the reiteration of some of these objections. I have retained the enumeration of the chapters and cases, the references to pages, etc., as they exist in my volume on Acupressure ; and have only altered a few of the paragraphs and added two or three footnotes to fulfil better the objects of this reprint. The principal change consists in the extension—perhaps altogether unnecessary—of the answer to the foolish ninth objection to Acupressure, discussed at pages 16 to 18.—
J. Y. S.



CHAPTER XV.

SPECIAL ARGUMENTS AGAINST ACUPRESSURE.

"WHOSOEVER," sagaciously remarks Dr. Henry Marshall, "proposes an alteration of existing usages, will meet from some men with a sort of instinctive opposition, which is influenced by no process of reasoning, by no considerations of propriety or sound policy, which defends the existing system because it exists, and which would have equally defended its opposite if that had been the oldest."¹

In accordance with this old and acknowledged principle of opposition, a variety of special objections have been urged against acupressure, in addition to those general objections to it which we have considered in a preceding chapter (see Chapter XII.)

Most of these objections, both general and special, might perhaps have been anticipated; for human thoughts and actions—being always fundamentally the same—are liable to be found repeating themselves in cycles; and the arguments against the proposed innovation of acupressure might have no doubt been discovered in the main, in the arguments long ago adduced against other analogous innovations. Indeed, we shall presently have occasion to observe, that almost all the leading arguments and objections which in olden times were urged against the introduction of the ligature, and in favour of the perpetuation of the heated iron, have been reproduced—perhaps unwittingly—against the introduction of acupressure, and for the perpetuation of the ligature. Names and men, and times and things, change, but the spirit of opposition ever continues wonderfully similar.

In the present chapter it will be necessary for us to consider a variety of special objections urged against acupressure, at some detail—however tedious and disagreeable the process may be; and in doing so, perhaps we may find that most of these so-called objections turn out as arguments in favour of acupressure rather than as arguments against it.

¹ *Marshall*.—See his *Essay on the Abolition of Flogging, etc., in the Army*, in his "Military Miscellany," p. 182.

FIRST OBJECTION.—*Compression of the Attendant Veins and Nerves.*

"In acupressure," observed Professor Miller, "it appeared to him impossible to limit the needle to the bleeding point, so as to avoid including along with it the vein, and probably also the nerve. But it was well known," he continued, "that veins were extremely intolerant of pressure, and could not be subjected to it without the most hazardous consequences."¹

The simple and direct answer to this objection, as a whole, consists in the fact, that acupressure has now been used in a large number of amputations and other operations, without any such evil consequences as those suggested by Professor Miller having ever been produced.

But let us take the objection in its two individual parts, as referring, *first*, to veins ; and, *secondly*, to nerves.

(1.) *Compression of Veins.*—Even *à priori* one would scarcely, I think, expect that the mere compression of the tube of a vein, for twenty, forty, or sixty hours, would be liable to excite deleterious results. In his very able work on surgery, Professor Miller, following the practice of Davat and Velpeau, recommends for the cure of varix, that a series of needles and threads, in the form of twisted sutures, should be placed around the dilated vein, so as to compress and obstruct its canal—not for some hours, as in acupressure, but for "some days." And he speaks of this as a "simpler and safer mode of treatment" than any other.² But if a diseased vein can stand such prolonged and strong pressure with comparative impunity, surely a sound vein may do so still more safely when the pressure is both much less in degree and much shorter in duration. After venesection, and wherever, in fact, there is venous hæmorrhage, we compress the sides of the vein together with a pad or otherwise—and, I think, usually without dreaming that any evil consequences are apt to follow the temporary obliteration of the venous tube by compression.

But, further, I am inclined to hold that the closure of the vein along with the artery is, perhaps, a gain from acupressure, instead of an objection to it. Dr. Watson, lecturer on surgery in Edinburgh, has advanced the opinion, that one great cause of the non-union of amputation-wounds by primary adhesion was the circumstance, that when

¹ *Miller.*—See the "Edinburgh Medical Journal," December 1860, p. 568.

² *Miller.*—See his "System of Surgery," p. 443.

the wounds were closed, "oozing ensuing afterwards, the cut surfaces were kept apart by a coagulum, which, acting like a foreign body, induced suppuration."¹ Surely any such deleterious coagulum of blood is much more likely to be mainly, if not entirely, venous than arterial in its origin; for every careful and conscientious surgeon takes due pains to close all the arterial orifices that are bleeding upon the surface of his wounds. He diligently ties these arterial orifices, though he usually avoids tying any venous orifices. Sometimes, however, though not very often, the veins in a stump-wound, as described by Chelius, Velpeau, Fergusson, Skey, and others, do bleed so profusely as to require to have their orifices occluded. If these orifices are tied with a ligature, the tissues of the vein are lacerated; and such physical injury may be apt occasionally to terminate in phlebitis. If, on the contrary, these venous orifices are closed by acupressure, they escape any direct physical injury to their tissues; and further, perhaps it may yet be found that the closure of the venous orifices in stumps, where acupressure is used, is a prophylactic measure of great importance in this respect—that hereby we prevent, to a certain extent, the introduction or absorption, by these gaping venous orifices, of deleterious and ichorous fluids existing upon the surface of the wound itself.

(2.) *Compression of Nerves*.—Mr. Miller's other idea with regard to the supposed deleterious effects of compression of the attendant nerves in acupressure is, I believe, equally groundless and hypothetical with that regarding the supposed injurious compression of veins. Patients whose wounds are acupressed have certainly not more pain than those patients in whom the ligature is used. I have seen the central artery of the sciatic nerve, and, consequently, the mass of the nerve itself, compressed by an acupressure-needle without any bad effects; and here the nerve compressed was the largest that can be met with in surgical wounds. The case in which this occurred was in the practice of Dr. Handyside, and was, in various other respects, interesting in reference to our subject.

CASE XI.—*Amputation of the Thigh at its Upper Fourth—Compression of Sciatic Nerve by Acupressure Needle*.—The patient was a strumous man, aged forty-one, emaciated and debilitated to the last degree, and labouring under high irritative fever, in consequence of an extensive ulcer from a burn. The ulcer was of several years' duration, and involved the right thigh, knee, and leg. Dr. Handyside ampu-

¹ Watson.—See the "Edinburgh Medical Journal," December 1860, p. 569.

tated the thigh at its upper fourth. The vessels which bled were acupressed with short needles. As the wound was about to be closed, a projecting portion of the sciatic nerve was clipped off, and its central artery began to bleed freely. To avoid the removal of the stitches which had been already introduced, a needle, five inches long, was brought down between the sciatic nerve and the os femoris, through the skin of the region of the hip, and made to emerge between five and six inches from its point of entrance. The effect of this acupressure was instantaneously seen in the bleeding being arrested. This long needle was removed from under the sciatic nerve twenty-five hours after the operation. The stump yielded a discharge of pus not great in quantity. Two months after the operation, both the stump and the entire body of the patient had become stout; and his pulse, which, long before the operation, had been extremely rapid and intermittent, was now seventy-two, and regular. On the night of the operation the patient had severe pain in the back—an effect produced more probably by cold, wetting, and exposure on the operating table, than by the acupressure of the sciatic nerve; for the withdrawal of the needle had no effect in lessening the pain; it increased subsequently, and was relieved, at his own suggestion, by the application of a strengthening plaster—a remedy which he had used successfully in previous similar attacks.

In the observations of Professor Miller, from which I have cited his objection regarding the deleterious compression of the veins by acupressure, he argues that, in surgery, innovations are not necessarily improvements. Shortly after arterial deligation was suggested, M. Gourmelen, Professor of Surgery in Paris, used the same argument, in nearly the same words, against Paré's "*new way to tie the vessells,*" and its "*farre greater perills.*" He maintained that the drawing out of the vessel for deligation would "bring no lesse paine than the cautering irons doe;" and he adduced Professor Miller's objection regarding veins and nerves—"for if the needle," says M. Gourmelen, "shall pricke any nervous part, yea, the nerve itselfe, when he shall by this new and unaccustomed way, absurdly constraine the veine by binding it, there must necessarily follow a new inflammation; from an inflammation a convulsion; from a convulsion, death."¹ No one, I fear, has any great respect now for these arguments against deligation, and in favour of the "burning and ustion of vessells," "much

¹ *Gourmelen*.—See the translation of Professor Gourmelen's Objections, in the English edition of Paré's works, pp. 1133, 1134.

praised and commended, and always approved by the Ancients." Perhaps the same argument, as applied against acupressure, is destined ere long to meet the same fate.

Let me here add, that the correlative argument of greater suffering being probably attendant upon acupressure than upon deligation, was, long after the age of Gourmelen, used against the ligature as compared with actual cauterization. Strange as it may seem and sound to us now, the ligature was viewed by many surgeons as more painful than the red-hot cautery. The binding or ligature of the vessels for the bleeding of wounds is—avows Cooke, in his "*Marrow of Chirurgery*"—"very painful and much unused."¹ "It is certain," observed M. Louis, "that the ligature is a painful operation" (*une opération douloureuse*).² And in his "*Critical Enquiry into the State of Surgery in England*," in the middle of the last century, Mr. Sharp tells us that some operators still employed the ligature sparingly, from their "horrid apprehension of compressing the nerves."³ When prejudice thus warped the professional mind so strongly against deligation, on the score of pain from compression of the nerves, as compared with the burning of the red-hot cautery, it is no wonder that a similar and equally groundless objection should be conjured up against the effect of acupressure as compared with the ligature.

SECOND OBJECTION.—*Acupressure only adapted for Occlusion of Small Arteries.*

Professor Erichsen, in his admirable treatise on "The Science and Art of Surgery," while admitting that acupressure is, in the case of small arteries, "unquestionably a safe as well as a convenient and easy method of suppressing bleeding," still maintains that "for arteries of large size, as the femoral, it yet remains to be shown that acupressure can be depended upon as a mode of restraining hæmorrhage equally safe with the ligature."⁴ Already, however, acupressure has been repeatedly employed in stopping hæmorrhage from the largest vessels

¹ *Cooke*.—See his "*Mellificium Chirurgiæ*," 1693, p. 105.

² *Louis*.—See the "*Mémoires de l'Académie Royale de Chirurgie*," tom. ii. p. 394.

³ *Sharp*.—See his "*Critical Enquiry*," 1761, p. 310. Some surgeons formerly argued for the use of the tenaculum instead of the artery forceps, on the ground that the tenaculum was less likely to include the nerve, and hence likely to avoid pain from the ligature. "The tenaculum," says Mr. Clare, "is now much used, and has the advantage of the needle and ligature, which give exquisite pain by including the nerve; no wonder, therefore, that the tenaculum is coming more into practice."—(See Clare's "*Essay on the Cure of Abscesses by Caustic, and on the treatment of Wounds and Ulcers*," 1779, p. 45.)

⁴ *Erichsen*.—See his "*Science and Art of Surgery*," 3d edit., p. 154.

ever opened in wounds, and that as readily, and as successfully, as from the smallest bleeding arteries. It has been used repeatedly in all the larger amputations. I know of some twenty cases of amputation of the thigh in which the femoral and all the other arteries of the stump were simply, easily, and successfully secured by acupressure.¹

THIRD OBJECTION.—*Acupressure applicable to Amputation Wounds only.*

Lately Dr. Neudörfer of Prague has stated, that acupressure is a process of arresting hæmorrhage, which "can be employed in amputation-wounds only."² This statement, in all probability, is the result of some imperfect notice of acupressure which Dr. Neudörfer may have seen. At all events, it is a misapprehension of the method; for, besides having been now employed in many amputation-wounds, it has been used successfully in numerous instances of excision of the mamma, after the extirpation of other tumours, and wherever, in fact, in surgical wounds, it was the object of the operator to strive for their primary adhesion, or to close a bleeding arterial orifice.

FOURTH OBJECTION.—*Great Number of Needles sometimes required.*

I have heard it urged that in some wounds, as amputation-wounds and especially where the operation has been performed for a chronic pathological disease, the number of bleeding arterial orifices is sometimes too great to allow of acupressure being employed. Usually, in the largest amputations, the number of arterial orifices that require to be secured does not exceed half a dozen, and they are often fewer; but Cloquet, Erichsen, Ballingall, and others have described some exceptional cases where twenty or more ligatures have been found necessary after amputation:³ that is, twenty or more points in which the surgeon voluntarily set up a process of local strangulation and sphacelation, of ulceration and suppuration in the stump; with

¹ See the details of some of these cases in Chapters VII., etc., and especially in Chapter XVIII.

² *Neudörfer*—See his "Handbuch der Kriegschirurgie," 1864, p. 213.

³ *Unusual number of bleeding vessels in some cases of amputation.*—See various instances mentioned by Cloquet in the "Dictionnaire de Médecine ou Répertoire Général des Sciences Médicales," 2me edit., tom. ii. p. 436; Erichsen, "Science and Art of Surgery," 3d edit., p. 19; Sir George Ballingall, "Outlines of Military Surgery," 4th edit. "In one case," says Sir George, "I have seen nine vessels secured upon the table and eleven afterwards; in another we had eight or nine vessels secured before the patient left the operating table, and the same number within an hour afterwards in consequence of hæmorrhage from the stump. In another recent case, I saw sixteen vessels secured before the patient left the table, and five afterwards in the course of the same evening" (p. 402).

twenty ligature or seton threads tied to these points! What chances are there of such a wound going on prosperously and successfully? If twenty or more needles were ever requisite, their use, at all events, would be followed by no such unfortunate local lesions as the ligatures inevitably produce. But, in such cases, acupressure further presents advantages that can scarcely be claimed for the ligature, for one needle is occasionally capable of stanching the flow of blood from two or more separate orifices. In proof of this, let me adduce a case of amputation of the thigh, performed by an eminent surgeon, Mr. Crompton of Birmingham.

CASE XII.—*Amputation of the Thigh for Scrofulous Disease—Needles removed in Fifty-two Hours—One of them Compressing Two Vessels.*—On February 29, 1860, Mr. D. Crompton amputated a young man's thigh for strumous disease in the femur, and consequent degeneration of the cartilages of the knee-joint. Two acupressure-needles sufficed to arrest the bleeding, one of them pressing on the femoral artery, and the other pressing upon two small muscular branches. After fifty-two hours the needles were all withdrawn. On March 29, or exactly four weeks after the operation, Mr. Crompton sent me a cast of the stump, with a note, stating that the young man was then quite well. In this case, no rollers, nor plasters, nor indeed dressings of any kind, were applied to the stump.¹

A case of another form of amputation—namely, that of the arm—has been published by Mr. Dix of Hull, in which that gentleman secured five bleeding arteries by the employment of three acupressure-needles.

CASE XIII.—*Amputation of the Arm.—Three Needles Occluding Five Vessels.*—The operation was necessary to save the patient's life, on account of severe and old-standing disease of the elbow-joint, etc. The patient was himself a very unhealthy, ill-conditioned subject, and prone to suppuration. Eight vessels were secured by the acupressure-needles. One of the needles was made to compress two vessels in the posterior flap, at some distance apart. The two needles placed in the anterior flap closed three arteries. The last of the needles was not withdrawn till five days after the operation. During the healing of the wound the whole amount of purulent discharge did

¹ Crompton.—See the "Edinburgh Medical Journal," May 1860, p. 1047.

not exceed two drachms, and this came exclusively from the tracks of the retained needles. There never was any from the surfaces of the flaps.¹

In reference to the objection we are considering, let me here add, that possibly the day may come when one acupressure-needle may perform the function of many ligature-threads. For, possibly, in some amputations an acupressure-needle or needles will yet be passed—immediately before the operation—half an inch, or an inch or more, above the proposed line of the wound, so as to shut the principal artery or arteries of the limb, and render the whole operation comparatively bloodless. If so, these needles would serve, at one and the same time, the double uses for which the tourniquet and arterial ligatures are now employed, and would, besides, leave the wound free from the presence of any hæmostatic foreign body whatever. In weak subjects incapable of standing any loss of blood, “a suggestion has been made,” says M. Velpeau, “to place a ligature upon the principal artery of the limb before commencing the incision of the soft parts. M. Blandin,” he adds, “gives an example of this practice, which is still followed at the Hospital of Beaujon by M. Marjolin.”² The deligation of the principal artery of a limb, as of the femoral, is an operation which itself is attended with considerable risk to life ; but the acupressure of it is probably, on the contrary, alike comparatively free from difficulty and danger.

FIFTH OBJECTION.—*Death of the End of the Bone.*

As an objection not so much against acupressure as against the probability of union by the first intention following its use in amputation, Mr. Spence—one of the most careful and most successful of living surgeons—has argued that the “difference of textures in the stump was the principal cause of the suppuration ; the end of the bone had to be rounded off ; in this process portions died, and it often happened that, long after the ligatures had come away, discharge was kept up by the presence of little bits of dead bone.”³

Now, that the end of the amputated bone does not offer anything like an insuperable obstacle to the primary union of stump-wounds, is proved by the admitted fact, that such wounds, when ligatures are

¹ *Dix*.—See the “Medical Times and Gazette,” June 2, 1860, p. 547.

² *Closing the arterial trunks before amputation*.—See Velpeau’s “Médecine Opératoire,” tom. i. p. 345.

³ *Spence*.—“Edinburgh Medical Journal,” Jan. 1864, p. 666.

employed, do sometimes, however rarely, heal at all points except where the ligatures are found. I have already brought forward in this essay a variety of cases of amputation-wounds, treated not by ligature but by acupressure, where the wounds *did* heal entirely by primary union. I have adduced, for instance, in Chapter VII., the details of several cases of amputation of the thigh, of the leg, of the arm, and of the forearm, in which the vessels were acupressed, and entire union by the first intention followed. These are instances of the four largest sets of bones divided in amputation, and in none could have "portions died" of the extremities of these bones; for, if that had happened, primary union would have been utterly impossible.

Mr. Spence overrates greatly, I believe, the frequency of necrosis. "Exfoliation from the bone, once an invariable attendant on amputation, is," observes Mr. Lister, "now rarely met with—except as the result of mismanagement."¹ But perhaps there are few conceivable conditions more likely to lead to the death of portions of a divided bone, than having in their neighbourhood, or in contact with their surface, for a succession of days—as happens under deligation—irritating foreign bodies, such as the ligature-threads, and portions of strangulated and sloughing tissue. Bone is a tissue relatively of so feeble a type of organisation, that it cannot withstand the same amount of irritation as the more soft and vitalised textures. Hence, "in a majority," says Dr. Wilks, "of our cases of pyæmia the bone was involved, being, in the case of stumps, necrosed, and involved in a suppurating or sloughing process."² Surely, to save the bone, therefore, we should carefully avoid forming sloughs and suppuration in the wound. We do form them by using ligatures. We so far avoid forming them by using acupressure. Besides, according to Cruveilhier³ and other pathologists, pus or sanies in contact with the divided bones is specially dangerous, on account of the liability of the osseous veins (which do not readily close) easily absorbing such morbid materials. General pyæmia, in short, often, in the opinion of these pathologists, originates in pus formed in, or entering into, the unclosed osseous veins exposed in the cut ends of the amputated bones.

¹ *Exfoliation from the bone*.—See Mr. Lister's article on Amputation in Holmes' "System of Surgery," vol. iii. p. 70. According to M. Velpeau, "exfoliation of the bones, which was formerly regarded as inevitable at the end of every amputation, is now-a-days admitted to be an accidental result."—(See his "Médecine Opératoire," tom. i. p. 351.)

² *Wilks*.—See "Guy's Hospital Reports," 1861, p. 121.

³ *Cruveilhier*.—See the "Dictionnaire de Médecine et de Chirurgie Pratiques," tom. xii. p. 674.

With the exception of bone, the structures entering into the composition of the walls of a vesico-vaginal fistula—which usually, when operated upon, easily closes by primary union—are less bulky, but in regard to the mere number of their component tissues, are as complex as those of a stump, for they include the muscular walls of the vagina, the muscular walls of the bladder, two mucous surfaces—the vaginal and cystic; arteries, veins, absorbents, and nerves, and quantities of connective tissue.

My friend Professor Fergusson of London—perhaps the most eminent operator of our day—has suggested what may be regarded as two other arguments against acupressure.

SIXTH OBJECTION.—*Tracks of Ligature useful as Vents for Pus.*

The high surgical authority to whom I refer seems inclined to hold that deligation was preferable and useful, because “the tracks of the ligatures acted as vents for the discharge of pus.”¹

On the contrary, I incline to believe that one great and undoubted source of the suppurations in the interior of wounds is the very presence of the ligatures, and of the sloughs and irritation which they produce; and if primary adhesion were far more directly and distinctly aimed at, the formation of any considerable amount of pus would be a far more rare occurrence. In short, it is better, I am inclined to argue, to avoid having foreign bodies, as ligatures, left in the wound, and capable of producing pus, in order, as far as possible, to avoid the formation of pus, rather than lead the pus off by these foreign bodies after it is once formed. By their presence they tend to create the pus as well as evacuate it; but in surgery, as in other practical sciences, the principle of prevention is recognised as infinitely superior to the principle of cure.

SEVENTH OBJECTION.—*Acupressure might Heal Wounds too rapidly.*

Mr. Fergusson uses another, and, as I look upon it, a still stranger objection. He fancies the advantages of union by the first intention overrated. “Suppose”—to use his own words—“the stump did heal by first intention, it could not be used for weeks—for months—as it was, in great measure, new material, which would not bear pressure. In fact, the ligatures were of advantage in this way, that they prevented the patient using his limb too soon.”²

¹ *Fergusson*.—See the “Lancet,” Jan. 24, 1863, p. 95.

² *Fergusson*.—See the “Lancet” for Jan. 24, 1863, p. 94.

Now, if the mere speed with which a wound was completely healed were any objection to the method by which that speed was accomplished, it would be a strange paradox in professional ethics. It would be an argument, at all events, that no patient could appreciate or approve of ; for it would be difficult, I opine, to persuade him that his wounds should heal slowly under a chronic application of local disturbances, dressings, and discharges, rather than heal swiftly and kindly without any long continuation of pain, or vexation, or trouble whatever. The cure of a surgical wound, as much as the infliction of it, ought always surely to be accomplished, as Celsus writes it, "*tuto*;" but also as surely, wherever it is practicable, "*cito et jucundè*."

Mr. Syme's Four Objections.

The proposition of Paré that surgeons "bid eternally adieu to all hot irons and cauteries" in amputations, met, at first, with few or no followers ; and his beautiful and simple suggestion of using nothing but the deligation of arteries in amputation wounds, etc., seems to have excited little, except the strong ire and bitter persecution of most of his contemporaries. They opposed him in every possible way ; attacked him in their writings ; and petitioned the French Parliament to prevent the dissemination of his works. Without deigning even to name Paré, his cotemporary, M. Gourmelen, Professor of Surgery to the Faculty of Medicine at Paris, strongly and spitefully denounced him and his invention in a work on the Principles of Surgery. M. Gourmelen and other surgeons had been so long accustomed to their cautery-irons, and were so entirely and so *perfectly* satisfied with *their* power and effects, that they wanted no such disturbing innovation as this ligature. "It was then," writes Gourmelen, "very forward, rash, and presumptuous in a certain person to venture upon condemning the cauterizing of bleeding vessels (after cutting off a mortified limb)—a method so highly and continually commended and approved of by all the ancients ; teaching, in opposition to that, without any authority, without knowledge, without experience, without good sense, some new method of his own, of tying arteries and veins."¹ This same argument of the old Parisian professor—and in nearly the same words, too—was employed two or three years ago in the Medico-Chirurgical Society of London, by one of the present professors of surgery in the University of Edinburgh, when the subject of acupres-

¹ *Gourmelen*.—See J. Bell's "Principles," vol. i. p. 160 ; Paré's "Workes," p. 1133 ; or Gourmelen's "Guide des Chirurgiens," p. 158.

sure happened to be unexpectedly brought before them, at his suggestion.¹ But besides this personal argument or objection, Mr. Syme at the same time stated that he considered acupressure to be "objectionable on three (other) grounds." Let us consider these three grounds.

EIGHTH OBJECTION.—*The Ligature not Hurtful but Useful in the Healing of Wounds.*

Professor Syme's first ground of objection is triple in reality in its character, or includes three different items:—

(1.) "The ligature," according to Mr. Syme, "did not deserve the charges which had been brought against it,"² in regard to its alleged effects upon the artery and surrounding tissues. On this point I have already, in Chapter IV., cited a long array of our very highest surgical authorities, proving that, in deligation, the tied artery at the strangulated point does inevitably die, and become a mortified piece of tissue.³ On the present occasion I shall content myself by citing against this argument of Mr. Syme's one authority more—namely, the high authority of Mr. Syme himself—as to the state of the end of a ligatured vessel; for, as he correctly states, the ligature "at once *deprives* the part embraced within its noose of *vitality*."⁴ This devitalised, dead condition, whether we term it a state of mortification, as Mr. Syme seems to wish, or a state of gangrene—to use the meaning attached by Mr. Travers and other leading surgical pathologists to this last term—is doubtlessly the general and inevitable effect of every ligature applied to the extremity of a cut artery.⁵

¹ *The same argument*.—See "Medical Times and Gazette" for April 28, 1860, p. 425, and May 5, 1860, p. 459; and the "Lancet" for May 5, 1860, p. 446. This paragraph is extracted from the History of the Ligature in Chapter XIII.

² *Syme*.—See the "Lancet" for May 5, 1860, p. 445.

³ See the cited opinions to this effect, in Chapter IV., of Bell, Wise, Wells, Cross, Guthrie, Brodie, Hodgson, Erichsen, Roux, Pécot, Velpeau, Nélaton, Gross, Chassaig-nac, Miller, etc.

⁴ *Syme*.—See the "Lancet" for May 5, 1860, p. 445.

⁵ *Travers on the term Gangrene*.—See his "Physiology of Inflammation." "I do not employ," says he, "the term 'mortification,' because it is not technically explicit, and has been vaguely and indiscriminately used. Nor shall I use the term 'sphacelus,' because Gangrene is a sufficient synonym, if the term gangrenous inflammation be accepted, which presents the stages of recoverable and irrecoverable, threatened and devitalised texture. A gangrened part is never restored" (p. 208). See also South's translation of Chelius, vol. i. p. 53; and Paget's "Lectures on Surgical Pathology" (1863), p. 338. "On the Continent," says Sir Robert Carswell, "the term gangrene is employed to signify" "that state which has been induced in a part of the body by the complete and permanent extinction of its vital properties."—(See his article on Mortification, in the "Cyclopædia of Practical Medicine," vol. iii. p. 116. See also Gross's "System of Surgery," Philadelphia, 1862, vol. i. p. 168.) Speaking of the state of an artery deprived of vitality, when placed between two contiguous ligatures, Mr. John Bell remarks, that the ligatured portion of vessel "falls into gangrene."—See his "Principles of Surgery," vol. i. p. 219, etc., etc.

(2.) "It had been further said," argued Mr. Syme, "that the ligature caused injurious irritation subversive of the uniting process." Most certainly it is liable to do so, and often does so—especially to the parts more immediately near it. For any *excess* of irritation or inflammation subverts adhesion; and I have already shown (*ante*, p. 24, etc.), on the authority of John Hunter, Cooper, Lawrence, etc., that the bodies of the ligatures do excite suppuration by their presence; whilst their tied extremities also create small gangrenes and sloughs in the sides and depths of the wound. A ligature in its track is confessedly nought, in the language of Mr. Porter, but a small or miniature irritating seton. Would Mr. Syme, or would any surgeon, have the hardihood to propose keeping setons, however small, between the lips of wounds, for the purpose of *producing* adhesion? And surely it is strange to argue that their mechanical presence, and the chemical irritation which they are apt to produce in such a position, do not constitute very evident causes of the non-occurrence of adhesion along the course of their tracks and in their immediate vicinity.¹ The neighbouring surfaces have newly-formed organisable materials effused upon them; and, as Mr. Lawrence correctly tells us, "all newly-formed parts are weaker in vitality than the original structures, and ulcerate more easily."² The "*principal* obstacle," the same surgeon elsewhere observes, to the "speedy union" of wounds is the presence in them of the body of the ligature;³ and hence his well-known proposition to cut the ligatures short.

But Mr. Syme himself, when *not* reasoning about acupressure, is ready, with his strong and practical evidence, to confute entirely these reasonings of Mr. Syme when he is arguing against acupressure. For before the introduction of acupressure he expressed opinions quite the opposite of the above regarding the effects of ligature-threads in the healing of wounds. I have already (p. 26) cited him as stating that the union of wounds by the first intention is liable to be frustrated instead of

¹ *Ligatures are small setons.*—See Note 1, p. 24, *ante*.

² *Weak resisting power of wounds.*—See Mr. Lawrence's "Lectures on Surgery," p. 181. John Hunter, when treating, with his own profound sagacity, of inflammation attacking new-formed parts or substances, had long before observed, "We shall find these parts more liable to dissolve than the natural parts are, having weaker powers of action. In proportion, therefore, to the quantity of new matter, is the part weaker; and these parts go through their diseases much quicker than original ones. When new-formed parts are under the necessity of inflammation, a very slight cause is sufficient; and the inflammation goes on more rapidly than in original ones; and it requires more attention and care to stop its progress."—(See his "Works," by Palmer, vol. i. p. 576.)

³ *Lawrence.*—See the Transactions of the Medico-Chirurgical Society of London, vol. vi. p. 172.

being promoted by the induction of inflammation. He himself, in his "Principles of Surgery," further correctly states, that besides inflammation being "preventive of primary union," the interposition of any foreign substance is "no less adverse to the process;" and in another part of his work he expressly places *ligatures* in the category of such foreign substances, telling us that "in wounds of the lips and cheeks, in which union by the first intention is very desirable," their use should be avoided, for "the coronary arteries, and other branches of the facial, cannot be tied without leaving threads *apt to disturb* the adhesive process."¹

(3.) Mr. Syme further alleges now, that, "so far from regarding ligatures as hurtful, he had long looked upon them as useful, by maintaining a connection between the bottom and surface of wounds, so as to prevent that accumulation of blood in the cavity which is so apt to happen, and substitute an abscess for primary union."² In regard to such a novel and singular reason for using and preferring ligatures, I must beg leave to remark, that if "accumulations of blood" in the cavities of wounds are so frequent as is represented in the sentence which I have quoted, there must assuredly be something very wrong either, *first*, in the ligature itself as a hæmostatic agent, to allow of any such common secondary escapes and collections of blood between the lips of wounds; or else, *secondly*, the wounds must have been closed too soon and before all the primary oozing had properly ceased. In the former case the ligature is used to repair its own hæmostatic deficiencies; in the latter, it is used to repair the unnecessary haste of the surgeon. And certainly a very imperfect reparative means it must prove in any way, if at all. Is it not far more likely, by its presence and by its mere mechanical irritation upon the vascular granular surface of the wound, to produce this internal oozing of blood—to create it rather than cure it? For it is difficult to see what curative effect it can possibly exert. If a systematic drain were really required from the depths and cavities of wounds, an actual small drainage-tube of the unirritating caoutchouc form, used so successfully in abscesses, etc., by M. Chassaignac, would surely be preferable to irritating, deleterious ligature-threads. But no surgeon has ever, as far as I know, ventured to propose to place such drainage-tubes for "accumulation of blood" between the lips of wounds; for the simple reason, I suppose, that no such provision is really required. The "accumulation" is a logical

¹ *Syme*.—See his "Principles of Surgery," pp. 40, 100.

² *Ligatures useful*.—See "Lancet," May 5, 1860, p. 446.

rather than an actual fact, and is advanced, perhaps, rather because there is a want of other or better arguments against acupressure, than because the thing itself is very apt to happen. Some large wounds, particularly if shut up too early, are liable, as we have seen in a preceding chapter (p. 106), to distil, from their surface, for a time, a coloured serum, but not "blood." Such reddish serum will always find free enough vent by the tracks of the acupressure-needles and wires; and the formation and discharge of it are usually finished long before these needles or wires require to be withdrawn.

Some of the olden surgeons, in contesting and battling for the alleged superiority of the cautery over the ligature, anxiously maintained in exactly the same way, that a wound treated with cauterization was in a better and safer condition than a wound where the arteries were treated with deligation.¹ For the limb, argues Fallopius, is dried, evacuated, and strengthened, by the charring of its surface with the red-hot cautery ("exiccetur, evacuetur, et corroboretur").² The burning cautery, when applied to raw surfaces is, avers Maggi, "attended with little pain (*parvo dolore*), it drains off the malignity of the part, and gives strength to it."³ "The cauter, or actual fire," gravely reasons the famous old Scottish surgeon, Peter Lowe, "draweth into it the virulency and malignitie of the humor which is in that part, and in that point it is more sure and better than knitting [or the ligature];" and the cautery "being made red hote," hath, he adds, when applied to the wound, "the vertue to drie and corroborate the same."⁴

The advantageous and profitable properties which were thus, in the olden times of surgery, claimed in the treatment of wounds for the hot cautery over the silken ligature, are evidently similar in

¹ "According to Mr. Syme's professed opinion, even if acupressure were used, ligatures also should, in addition, be duly lodged and fixed in the wound, for ligatures have a mystical, beneficial effect upon the wound, just as cauterization had a similar beneficial effect attributed to it in the olden system of surgery. These ligatures do not, in the opinion of Mr. Syme, 'cause injurious irritation subversive of the uniting process.' They are not 'hurtful,' but 'useful,' as they 'prevent that accumulation of blood in the cavity of the wound, which is so apt to happen, and substitute an abscess for primary union.' The old fire-button had analogous profitable properties attributed to it in its day." If he had lived when deligation was first introduced, like most others he would doubtlessly have "denounced the proposed ligature of arteries. Or possibly if he did adopt deligation of the arteries, he would (like the surgeon spoken of by Sprengel) have, *in addition* to this deligation, carefully frizzled and singed over with the red-hot cautery the remaining surface of the wound, that it might be thus duly 'dried, purged, and strengthened.'"—(*Medical Times and Gazette*, Jan. 23d, 1864, p. 82.)

² *Fallopius*.—See his "*Opera Omnia*," Frankfort, 1606, tom. i. p. 543.

³ *Maggius*.—See his treatise "*De Vulnere, etc., Curatione*," in Gessner's "*Scriptores Veteres de Chirurgia*," p. 267.

⁴ *Lowe*.—See "*A Discourse of the whole Art of Chirurgie*, compiled by Peter Lowe, Scottishman," and dedicated to "all such well experimented men in this Kingdom who are licens'd to professe the Divine art of Chyrurgerie," 1634, p. 93.

character to those which Mr. Syme claims under similar circumstances for deligation as compared with acupressure. For these ligatures do not, in his opinion, cause injurious irritation, subversive of the uniting process; they are not hurtful, but, on the contrary, useful in a wound; and they tend to promote and strengthen its healing, by keeping it dry and drained of that accumulation of blood in the cavity of the wound which is so apt to happen, and substitute an abscess for primary union. "They drier and corroborate the same," to re-state Mr. Syme's late argument in the old words of Peter Lowe.

How very different in philosophic spirit and wisdom are those views of Mr. Syme regarding the supposed *beneficial* effect of ligatures on the cure of wounds, from the observations made fifty years ago upon the same subject by the distinguished French surgeon M. Roux! In the account which he published of his professional visit to this country in 1814, when treating of the means of promoting union by the first intention, M. Roux makes the following remarks:—"The ligatures are extraneous bodies, which, as long as they remain in the wound, irritate it, determine and keep up suppuration. There is certainly no doubt but that their presence is the principal obstacle to an adhesion without any suppuration, in those cases where the immediate union of a wound of greater or less extent is attempted; and," M. Roux adds,—as if in anticipation of some such method as acupressure,—“if there were any means by which a wound that was to be united by the first intention should not be traversed by ligatures, the success of that immediate union would be still more certain.”¹

Professor Syme, however (who has never, as far as I am informed, used acupressure himself, nor seen others use it, and who is in consequence totally unacquainted with the subject practically), has, as I have stated, two other objections to this hæmostatic measure.

NINTH OBJECTION.—*Torsion, a Sufficient Substitute for Ligature.*

"But," again Mr. Syme argues, "if the ligature were objectionable, its place might be supplied by torsion."² In other words, if deligation is discarded, surgeons have another means of arresting hæmorrhage, namely, by torsion, which is yet as good, or better, than acupressure. But in adducing this strange and extraordinary argument or "objection," Mr. Syme seems to have supposed that his hearers or readers had

¹ *Roux*.—See his "Narrative of a Journey to London," English edit., p. 119.

² *Syme*.—"Lancet," May 5, 1860, p. 446.

utterly forgotten—or possibly he had himself unaccountably forgotten—that it has been long fully demonstrated as an established principle in surgery, that when the tube or mouth of a large artery is seized with the forceps, and torsion is applied to it, the effect of the repeated twisting and inevitable physical laceration of the tube and coats of the vessel is generally such, that the suppuration and death of some part of the contorted and torn arterial tissues are almost as certain to occur as after ligature.¹ Our common English text-books on surgery sufficiently enunciate the principle. Thus Professor Miller, when treating of the effects of torsion, tersely and truly remarks—“The twisted portion of the vessel *must slough* and separate; the noose of a ligature is not more truly, or to a greater extent, a foreign body.”² “There can be doubt,” as stated by Professor Erichsen, “that hæmorrhage from the largest vessel may be efficiently stopped by torsion.” But the result of the process is, that ultimately “the twisted end *sloughs* off.”³ Nor can we wonder at this result, when we consider that the occlusion against hæmorrhage of a large artery by this process requires the artery to be twisted round by the torsion-forceps, on its own axis, several successive times. To arrest hæmorrhage by torsion, “in small arteries,” observes Chelius, “four, in larger six, and in the largest ten, turns may be made.”⁴ M. Amussat recommends the torsion-forceps to be rolled between the fingers till the surgeon effects upon the vessel seven or eight rotations of its tube upon its axis. Fricke speaks of eight or nine complete rotations or torsions of the vessel as necessary.⁵ If these numbers of complete rotations upon its axis were made of any part or structure of the human body—as, for example, of a finger or toe, of the uvula, or the appendix vermiformis—would it not inevitably end in the laceration, destruction, and sloughing of the contorted part? In his elaborate and masterly work on the ligature of arteries, M. Manec, when speaking of the effects of torsion of them, remarks, as the result of his observations :—“In consequence of the bruising and trituration which torsion occasions in the

¹ “In his first objection, Mr. Syme merely betrayed an excess of perhaps unblamable professional prejudice. In this second objection, however, he affects an amount of professional want of knowledge regarding torsion that is scarcely commendable in an old teacher of surgery; for most modern text-books for students of surgery contain the information which—as far as his published observations go—he lacks on this point.”—(*Medical Times and Gazette*, 23d January 1864, p. 83.)

² *Miller*.—See his “*System of Surgery*,” p. 224.

³ *Erichsen*.—“*Science and Art of Surgery*,” 3d edit., p. 152.

⁴ *Chelius*.—See his “*System of Surgery*,” by South, vol. i. p. 309.

⁵ *Amussat and Fricke*.—See Malgaigne’s “*Manuel de Médecine Opératoire*,” 6th edit., p. 46.

arterial parietes, some portions of its component membranes are destroyed and *deprived of vitality*. These become a cause of inflammation, which, in addition to the longer and more painful manipulations of the torsion than of the ligature, terminate in producing a suppuration which is equally as great and lasting as that which can be caused by the application of a ligature."¹ "By the tearing," says Chelius, "and bruising of the arterial coats in torsion, separate fragments of the coats *die off* and suppurate."²

Seeing that torsion of large arteries produces so much physical injury of the contorted parts, it is little marvel that we find Chelius adding that, as regards the chances of early and primary union, the wounds in which vessels were stopped by torsion were, according to his observations, followed more by suppuration than wounds in which the ligature was used (p. 310). A late German author, Professor Weber of Bonn, in writing on the same subject, pointedly observes:—"A much longer piece of the vessel *infallibly becomes mortified* in torsion than in the use of the ligature;" and besides, he continues, the suppuration of the wound is "much more extensive than in deligation." "A mass," he adds, "of tissues necessarily decomposing by a gangrenous disintegration, is left by torsion in immediate contact with the walls of the thrombosed veins, and may so far favour putrid infection."³

The torsion, then, like the deligation of any large bleeding arteries, produces great and direct mechanical injury and laceration of the coats of occluded vessels—leads on to the formation of a slough at the end of the artery—necessitates around these local sloughs those processes of disjunctive ulceration and suppuration which are requisite to separate and eliminate any slough or dead piece of tissue from the living body—and exposes the patient to all the mischances of the imbibition of septic or putrid matter from these dead sloughs lodged in the depths of a recent and absorbing wound. All these formidable evils—common alike to torsion and to deligation—acupressure so far avoids, as it places the sides of the tube of the artery merely in contact without producing any physical laceration of its coats; without leading on to mortification, ulceration, or suppuration at the constricted point; and without necessarily exciting by the presence of the needle any degree of inflammation higher than the adhesive.

¹ *Manec*.—See his "Treatise upon the Ligature of Arteries," translated by Garlick and Copperthwaite, pp. 97 and 110.

² *Chelius*.—"System of Surgery," by South, vol. i. p. 310. See also Sanson's essay, "Des Hémorrhagies Traumatiques," p. 161.

³ *Weber*.—"Handbuch der Chirurgie," von v. Pitha und Billroth, I. Band, I. Lieferung, s. 165.

TENTH OBJECTION.—*Acupressure only very limited in its Action.*

"He was persuaded," added Mr. Syme, "that the field for using the needle process would be found of the most limited extent, since it could only be adopted in cases where the vessel lay in the integuments or textures adhering to them."¹ This last objection of Mr. Syme merely proves that, at the time of making it, he simply and entirely misunderstood the whole subject. Acupressure has been successfully and repeatedly employed in the deepest and largest wounds, and in all forms of wounds. The great aim and object of acupressure is, it must always be remembered, twofold—namely, (1) to arrest surgical hæmorrhage, and (2) to promote the primary union of surgical wounds. I know of no wounds that can be possibly healed by primary union where acupressure cannot be applied with as great facility as the ligature, and certainly with far greater hopes of success. In wounds systematically intended from the first to be healed by suppuration and granulation, it is of much less moment whether the bleeding be originally staunched by acupressure or deligation.² Perhaps there may be

¹ Syme.—"Lancet," May 5, 1860, p. 446.

² *Healing wounds by the second or by the first intention, etc.*—In Paré's time, and for two hundred years after him, amputation and other wounds were systematically healed by the second intention. In this method of healing, with the wound left dressed internally and unclosed, the ligature was so far unobjectionable, as the lips of the wounds were not brought together till after the threads and sloughs had separated. But matters are altogether changed *now*, when surgeons professedly attempt systematically to unite their amputation and other wounds as far as possible by the first intention. Under this condition of circumstances, a means, like acupressure, which leaves no inevitable sloughs and no foreign bodies within the wound, becomes a matter of simple necessity, in order that the proposed object may be attained. Nothing, as I have elsewhere (p. 406) observed, in the whole round of professional practices and customs, seems to me to be a more curious anomaly and paradox, than to watch surgeons sew up with the greatest artistic exactitude and nicety the lips of an amputation or other wound with metallic sutures, while they have waywardly and designedly left, buried in the interior of the wound, a series of silken ligatures, each of which will inevitably produce ulceration and sloughing at the ligatured points. The finished wound is apparently all tidiness and neatness without; but within there are minute strangulated sloughy portions of festering tissue, the sphacelation of which must inevitably be attended by ulceration and suppuration. It is like enforcing cleanliness, as it were, and the best hygienic measures outside a house, whilst within doors there were retained and locked up filth and decomposition, and the explosive elements of destruction and disease. It is, in short, the old story of the "whited sepulchre," "beautiful outwardly," but within "full of all uncleanness."

I know some great and gifted surgeons who are perfectly alive to all the startling perils which their patients, after operations, would undergo, if they allowed them to be laid up in a room the air of which was infested with effluvia from dead and putrefying animal matters,—and who would feel utterly startled at the very idea of these patients being recklessly subjected to such unsanitary and unnecessary dangers, especially at a time when their systems were already lowered and depressed by the previous shock of the operating knife. Yet how few—how very few—of these same surgeons hesitate at this moment, in designedly and deliberately submitting these same patients to the

cases and circumstances in wounds where the ligature would answer and the needle not; but, if any, they must be few indeed. On the contrary, I know of several instances where acupressure has at once arrested the hæmorrhage after a fruitless trial of the forceps and ligature. In evidence of this important remark, I shall in the following chapter adduce several illustrative cases.

CHAPTER XVI.

INSTANCES OF ACUPRESSURE SUCCEEDING WHERE THE LIGATURE HAD FAILED.

AMBROSE PARE first proposed the ligature of bleeding arteries in amputations in 1564. In 1638, in his excellent "Treatise of the First Part of Chirurgie, containing the methodical doctrine of wounds, delivered in Lectures in the Barber-Chirurgeons Hall," Dr. Alexander Read, "of the famous Citie London," still strongly denounced the "deligation of the vessell which sendeth forth blood" as in his judgment nothing but "a troublesome and dangerous *toy*, as he shall find who shall goe about to make triall of it."¹

Earlier in the contest for the perpetuation of the red-hot cautery, and against the employment of the ligature, another objector to deligation, in another capital, the Professor of Surgery to the Faculty of Medicine in Paris, M. Gourmelen, remarked, "If any man who has been subjected to this new butchery [of the ligature] has escaped in safety, that man ought to feel the profoundest gratitude, and give thanks for ever to Almighty God, through whose goodness he has been preserved from such cruelty and murder."² It would perhaps be

analogous but still greater perils, which are inevitably produced by needlessly entombing dead and putrefying animal materials within the depths of those very wounds which their scalpels have inflicted! They take all possible means to prevent any dead animal materials from being inhaled by the lungs of their patients,—and no pains whatever to prevent similar dead animal materials from being imbibed by the open surfaces of their wounds. Nay, in strangulating the ends of the bleeding arteries by their ligatures, they determinedly place and plant dead and festering animal matters in the closest possible contact with the fresh absorbing surfaces of their patients' wounds, and sew and lock them up there, as if for the very purpose of enforcing and assuring their imbibition, whilst they equally determinedly preclude the inhalation of any such materials by the process of respiration. It is impossible to account for such strange and paradoxical inconsistencies; and yet I fear human nature and human practices are full of them.

¹ Read.—See his "Treatise," p. 12.

² Gourmelen.—"Si quis novum hunc laniatum expertus incolumis evaserit, is Deo Opt mo Maximo ejus beneficentia crudelitate ista et carnificina liberatus est, maximas

difficult for any modern opponent of acupressure to equal or exceed, at least, the bitterness of heart and irascibility of temper of the old Parisian professor against the detested innovation of the ligature.

Nearly a hundred years after Paré proposed the deligation of vessels, that patriarch of German surgery, as he has been termed, Hildanus, tells us that the use of the ligature was very limited. For even in amputations it could only, he avers, be employed in strong and plethoric patients, as so much blood was usually lost in attempting deligation, that it could not be tried without danger upon the delicate and emaciated subject ("in delicatulis verò et extenuatis absque periculo administrari non potest").¹ The reputed father of English surgery, Wiseman, had apparently, more than a century after the ligature was introduced, still more contracted views of its applicability in hæmorrhage; and it is doubtful whether he ever employed it. But, at all events, "in heat of fight," he adds, "it will be necessary to have your actual cauterie always ready, for that will secure the bleeding arteries in a moment, and fortifie the part against future putrefaction."²

Mr. Syme's ideas as to the field of applicability of acupressure seem to be equally limited, as we have seen in the last paragraph of the last chapter. He is aware, however, we believe, that it has proved apparently most salutary and successful in a case of amputation of the thigh which we have already recorded (see Case I., p. 71), and where the patient, when seeking advice in Edinburgh, immediately before the operation, was deemed, in the language we have cited from Hildanus, so "delicatus et extenuatus," that amputation was refused. Yet the wound healed entirely by the first intention.

But I have further to remark that there sometimes occur, in amputation and in other wounds, complications which render the application of the ligature to the bleeding vessels very difficult or indeed impossible. "It sometimes happens," observes Mr. Fergusson, "that the vessels cannot be readily got hold of with the forceps, or cannot be drawn out of their sheaths so as to allow a thread to be

gratias et habere et semper agere debet." See these words—the "Words of the Adversary" (as the rubric styles them), in a quotation from the original Latin work of Gourmelen, given in the English edition of Paré's "Workes," p. 1133; and Comperat's "Replique à une Apologie publiée sous le nom de M. Ambroise Paré," edition of 1647, p. 14; or Gourmelen's "Guide des Chirurgiens," p. 159. "O! what sweete words," observes Paré, "are heere from one who is sayd to be a wise and learned Doctor!"—(See his "Workes," p. 1134.)

¹ *Fabricius Hildanus*.—See his "Opera Omnia," Frankfort-on-the-Maine, 1646, p. 814.

² *Wiseman*.—See his "Chirurgical Treatises," 1676, p. 453. "The ligature," says Professor Lister, "though known to Wiseman, seems not to have been adopted by him."—(Holmes' "System of Surgery," vol. iii. p. 54.)

applied."¹ The retraction of the bleeding vessel is sometimes so great, and its orifice sunk so deeply, that it cannot be reached and laid hold of by the ordinary means. Diseased states of the tissues occasionally add to this difficulty. In some such cases acupressure has succeeded where deligation had previously failed. Of this circumstance let me adduce a few examples.

CASE XIV.—*Amputation of the Thigh—Difficulty of securing a deep Vessel—Acupressure.*—In one of the last cases of amputation of the thigh which I witnessed, Dr. M'Bain, Mr. Tait, and others were present. With his usual great rapidity and dexterity Mr. Edwards amputated the limb and secured by acupressure all the arteries exposed except one. This vessel bled most profusely whenever the compression of the femoral artery at the groin was relaxed. The bleeding orifice which was retracted, appeared to be situated very deep in the angle formed by the flaps of the stump, and apparently at the upper end of the divided apex of a sinus that had run up alongside of the femur. It was, probably, a deep obturator branch. Mr. Edwards turned to me with the remark, that this was an example of a deep retracted bleeding vessel which only the ligature could secure. Of course, I made no remark, as the case was his and not mine. He tried to seize the bleeding orifice with the forceps and ligature over and over again, but without success. He then observed that it would be necessary to dissect up the flap somewhat to reach the bleeding artery, that its orifice might be properly laid hold of. I now ventured to ask him to try an acupressure-needle before doing so. The needle—a long one, of the form Fig. 5 (p. 52)—was passed through the skin, and at once and effectually closed the vessel, being so introduced as to compress it against the bone (see *ante*, p. 56). The needles, six in number, were all removed in twenty-one hours—perhaps a date that would have proved too early for freeing such a vessel as the femoral from acupressure, had it not been that the patient was very young—between seven and eight—and the vessels correspondingly small. The boy's recovery was complete before the fourth week.

Surgeons know well that—especially in amputations in the upper part of the leg—the arteries sometimes retract, so as to be difficult to catch and secure with the ligature. Both Mr. Guthrie² and Mr. Fer-

¹ *Fergusson*.—See his "System of Practical Surgery," 4th edit., p. 37.

² *Guthrie*.—"Commentaries on the Surgery of the War in Portugal," etc., 5th edit., p. 96.

gusson,¹ in describing amputation below the knee, speak of having seen cases where the divided tibial arteries retracted so much that the efforts to catch them for ligature ended in a kind of "despair." The following is an example of this complication, in which acupressure at once succeeded :—

CASE XV.—*Amputation below the Knee, with a retracted Artery.*—In a case of this kind, which occurred in 1862 in the practice of Dr. M'Kinlay of Paisley, several attempts were made to seize a bleeding tibial artery, both with forceps and with tenaculum, but without success. In order to reach the retracted artery, Dr. M'Kinlay then cut off a piece more of the bones, and again attempted deligation, but in vain. At last he procured a long "darning" needle, and immediately and successfully compressed the artery against the bone. Two other vessels were secured by ligature. The needle was withdrawn on the third day, and the patient made a good recovery; the wound healing, in great part, by first intention.

In another case of amputation below the knee, Dr. Clayton of Banff acupressed the posterior tibial artery in consequence of being unable to secure it by the ligature.

CASE XVI.—*Amputation for Injury of the Leg—Acupressure.*—A distillery servant met with a severe injury of the leg. Erysipelas and extensive suppuration followed. Sixteen days subsequently, at a consultation, it was believed that amputation below the knee afforded him his only chance of escape. After the limb was removed, two arteries were secured by ligatures; but the orifice of the bleeding posterior tibial could never be seen, in consequence of the extent to which it had retracted, and several unsuccessful attempts were made by Dr. Clayton, and by a professional gentleman assisting him, to secure and tie the vessel. At last "I adopted," writes Dr. Clayton, "the mode of securing the vessel by acupressure with a common sewing-needle, threaded with the silk I was using. This was perfectly successful in a single moment." The needle was withdrawn in two days. One of the two ligatures did not come away for upwards of three weeks. The man made a very slow recovery.

Sometimes, as in the following example, the same difficulty has occurred in amputations performed lower down in the limb :—

¹ *Fergusson*.—"System of Practical Surgery," 4th edit., p. 492.

CASE XVII.—*Amputation at the Ankle.*—After removing the foot, Dr. Henderson of Leith secured by acupressure the two largest vessels that were opened. The ligature was applied to two small ones situated close to the cut extremities of the bones. A fifth vessel began to bleed freely when the stump was about to be closed. This vessel could not be secured by the ligature, which always slipped, owing to the dense nature of the tissue. At last a small acupressure-needle was used, and easily secured it.¹

For the following note of a case of retracted fibular artery, where the ligature failed repeatedly, I am indebted to Mr. Edwards:—

CASE XVIII.—*Amputation of Ankle—Retracted Fibular Artery.*—“The patient, a young man aged 22, had chronic disease in the ankle-joint. He was much exhausted by the malady. I removed his foot above the ankle. My chief reason for doing so was the exsanguine condition of the patient, and this prevented my attempting the then new method of acupressure. I *tied* several vessels, therefore; *but* the fibular artery had retracted, so that I could not seize it without further dissection. Professor Simpson, who was present, took a needle from his case, and secured the artery at once. This poor weak lad rapidly recovered; his stump healed in a great measure by first intention, except where my ligatures hung out; but to my amazement Dr. Simpson's needle healed *in*. Around it there was no suppuration, and when I withdrew it after two weeks, the eye was full of new material—granulation substance, I suppose. The patient left Edinburgh in three weeks, and I saw him recently, well, with a good stump. I would venture to add, that although I could have tied his fibular artery, doing so would have put him in greater danger, while it would have put me to some trouble in the way of additional dissection, and prolonged the operation.”

The cases which I have hitherto cited in this chapter all refer to difficulties which are occasionally met with in securing the arteries divided in amputation-wounds. But in various other forms of wound, also, acupressure has been found useful, where there was more or less difficulty in the deligation, or in the dissection required for the deligation of the bleeding arteries.

Few lesions, for instance, seem more simple, but at the same time have proved more perplexing and puzzling in practice, than divisions

¹ *Dr. Henderson's Case.*—See the “Edinburgh Medical Journal,” February 1861, p. 698.

of the radial, ulnar, and palmar arteries—an accident that not unfrequently occurs from pieces of broken glass, cuts with knives, working-tools, etc. These lesions are occasionally attended with recurrent and distant attacks of great hæmorrhage; and the patient's limb, and even his life, may become endangered by the losses of blood. "Many cases," observes Mr. John Bell, "may be found in White, O'Halloran, Aitken, etc., where a person wounded in the radial artery has bled for three weeks or a month, till the blood was little better than a reddish serum." The rule of treatment with most surgeons in such cases is, I believe, to secure at once with ligature both ends of the divided artery. But sometimes one or other of its extremities is found retracted when searched for, so that it cannot be reached without more or less antecedent dissection—an operation that often cannot be very easily nor satisfactorily performed, by the country surgeon particularly, as he is often far away from proper assistants and proper instruments. And "though the operation of tying the radial or ulnar artery does not range in the catalogue of important operations, along with trepan and amputation, yet," observes a very high surgical authority, Mr. John Bell, "if I be not deceived, it is more difficult than either, and certainly more frequently required." In these lesions "there is," he remarks, "no safety in trusting to compression, sponges, or astringents, for you are, yourselves, never free from anxiety, nor your patients from danger." If the surgeon is not successful at once, "if he oppose the blood by slight compresses," continues Mr. Bell, "permitting it all the while to bleed within, the artery will shrink, the cellular substance will be crammed with blood, and the skin thickened also by inflammation. The seeking out of the artery among such a confusion of parts will be inconceivably difficult."¹

The use of the dissecting-knife is often therefore required as a necessary preliminary step towards securing and tying the arterial extremities in such cases; and even when simple compresses are trusted to—as they are at first by some surgeons in wounds of the hands and feet—the wound, as pointed out by Mr. Syme, "should, if necessary, be dilated sufficiently," by the knife, "to admit the lint" of the compress to be "placed directly on the orifice of the artery."²

But, assuredly, it must be acknowledged as a sound principle in general medical practice—and even in surgery—that whenever we can accom-

¹ *John Bell*.—See his "Principles of Surgery," vol. i. pp. 183, 191, 451. For a further account of the dangers and fatal disasters occasionally arising from wrist-wounds, see pages 181 to 185 of that work.

² *Syme*.—See his "Principles of Surgery," p. 99.

plish our object without applying the knife to the living flesh of our patients, it is our duty to avoid it. And from what has been stated to me regarding more than one case of division of the arteries of the wrist¹ and palm, I believe that by acupressure, and without any skilled assistants, the general practitioner will usually be able to command these cases far more easily and surely than even by the knife and ligature; and that, too, without leading to those large cicatrices and contractions of the wrist and palm which I have seen left as permanent results of the awkward and deep dissections made in anxious and painful pursuit of the bleeding arterial tubes or orifices. In such a case the acupressure-needle serves at once, as it were, the function of an internal compress upon the artery—whilst it shuts it up as effectually as a ligature. The following case is an instance of this application of acupressure :—

CASE XIX.—*Wound of the Wrist, and Division of the Radial Artery.*—A young man of 16 received a wound from an axe in his left forearm immediately above the wrist, and had his radial artery completely divided. He was sent, with the wound and forearm very tightly bandaged, into the Carlisle Infirmary, where Dr. Hamilton² easily tied the distal end of the vessel, but failed to secure the cardiac orifice by ligature, owing to its great retraction. Instead, then, of extending the wound upwards with the knife, and exposing the artery so as to be able to place a thread round it, he had recourse to acupressure, passing a needle below the artery, and casting externally a wire-thread around it. This immediately produced the desired hæmostatic effect; and when the needle was withdrawn after thirty-four hours, the vessel proved to be quite occluded.

In such instances as the preceding wrist-wound, and in other similar injuries, acupressure assuredly offers no small advantage over ligatures; and under such circumstances, it is certainly far simpler and safer to use acupressure, or the thread-compress as described in our next chapter, without any dissection at all, than deligation with its

¹ *Acupressure in arteries of the wrist, etc.*—Abroad the practice has been used in some cases. In a case of wound of the radial artery, M. Foucher employed an acupressure-needle, which sufficed to arrest the hæmorrhage without producing the slightest inconvenience. M. Foucher successfully used also the same means to stop the hæmorrhage in a case of wound of the temporal artery.—(See the "Bulletin de l'Académie Impériale de Médecine, tom. xxv. p. 1087.)

² *Hamilton.*—See his "Reports" in the "Edinburgh Medical Journal," January 1864, p. 636.

precedent and sometimes difficult dissection. Even on the dead body the great contrast between the deligation and the acupressure of these arteries is most striking.

Wounds of the arteries of the ankle and sole of the foot, are perhaps on the whole more easily managed than those of the wrist and palm. But, from the depth at which some of the larger arteries of the leg lie, they have generally proved to be less easily secured than the corresponding vessels of the forearm. In Case XVIII. we have seen acupressure restrain bleeding from a fibular artery, in a case of amputation, where it was found impossible to use the ligature. Sometimes, in other operations upon the leg, the artery has been secured by acupressure after deligation had failed, as in the following instance :—

CASE XX.—*Division of a Tibial Artery—Acupressure.* A man, aged 21, received a compound fracture of the bones of his right leg. About two months afterwards the shafts of the bones had so completely reunited that the patient was able to walk ; but there remained two sinuses, one on either side of the tibia, leading to portions of diseased osseous structure. The man became a patient of the Edinburgh Hospital. Mr. Edwards made incisions down to the site of the diseased bone, and removed some dead pieces. During the required incisions and extraction, an artery was divided, which yielded considerable hæmorrhage. Mr. Edwards thought the wounded artery was the posterior tibial. He made attempts to secure the bleeding point by means of the artery forceps and ligature, but was unsuccessful. He then passed a long acupressure-needle through the cutaneous surface down towards the bleeding point, and compressed it. The hæmorrhage was at once entirely and successfully controlled, and in forty-eight hours the needle was withdrawn.

In the following interesting and important case of recurrent and dangerous hæmorrhages after aneurism and amputation of the lower extremity, the needle succeeded ultimately in closing the vessels in an instance where ligatures were followed several times by dangerous secondary hæmorrhage. The patient was under the very able and skilful care of my friend, Mr. Page of Carlisle.

CASE XXI.—*Popliteal Aneurism and Amputation, with Repeated Secondary Hæmorrhages—Ligatures and Acupressure.*—The patient,

aged 30, who had served in the army for nine years, was admitted into the Carlisle Infirmary on account of a double popliteal aneurism. Compression of the femoral artery was tried for a time, but had to be desisted from on account of the severe pain it occasioned, and the artery was tied. The ligature came away on the thirteenth day, and secondary hæmorrhage took place. Both extremities of the artery were then ligatured, but secondary hæmorrhage recurred several times, till at last Mr. Page was driven to amputate the thigh at its upper third. Ligatures were applied to the vessels. They separated in the course of a week. On the ninth day secondary hæmorrhage once more supervened, and after about twelve ounces of blood were lost, the bleeding artery was compressed against the bone by means of a needle with perfect success. The application of a ligature was at first contemplated, but this project was abandoned on account of the manifest difficulty of seizing the orifice of the vessel in the midst of the mass of exuberant granulations which surrounded it, and the very weak and depressed state of the patient. Five days subsequently, another artery which had taken to bleeding was secured by a second needle. After that, there was no more hæmorrhage, and in three weeks the man was discharged cured. In talking over the case, Mr. Page stated to me that he believed acupressure was the means of saving the man's life.¹

In a very interesting case of repeated and recurring secondary hæmorrhages after amputation of the thigh, reported by my friend Dr. M'Kinlay of Paisley,² acupressure-needles were applied in a position somewhat different from Mr. Page's case, namely, upon the course of the artery or arteries leading to the bleeding points, and not upon the vessels at the bleeding points themselves. The patient was a miner, aged 30. Compound fracture of the tibia of the right leg, and extensive bruising, were produced by the fall upon the limb of an enormous stone, which required to be broken into pieces before the limb could be extricated from below it. In consequence of extensive cellulitis with suppuration, amputation was performed in the lower third of the

¹ *Page*—See the "Edinburgh Medical Journal," January 1864, p. 630.

² *M'Kinlay*.—See his "Case of Secondary Hæmorrhage, in which the Femoral, External Iliac, and afterwards the Common Iliac Arteries were tied," in the "Edinburgh Medical Journal," March 1864, p. 808. Few practitioners have greater opportunities than Dr. M'Kinlay of trying a new surgical practice, such as acupressure. Writing me lately on the subject, he observes:—"At this time I cannot speak too highly of the benefits which I have derived from acupressure; as, from the number of wounds brought under my care in the course of fulfilling my various public appointments, I never am at any time without *needles* in my pocket-book, and now seldom, if ever, do I use ligature-threads."

thigh, twenty-three days after the injury. The arteries were easily secured by ligature. Four days after the operation profuse bleeding supervened, which ceased when pressure was applied to the femoral artery. Next day hæmorrhage again recurred, when it was again restrained by pressure, and "the artery was subsequently secured by means of an acupressure-needle." The needle was not removed till seven days after its introduction. During those seven days there was no bleeding, and the stump was granulating very well. On the third day after the removal of the needle, another large bleeding took place. The acupressure-needle was buried deep in the flap, so as to secure the main trunk, when the hæmorrhage entirely ceased. On the second night afterwards hæmorrhage recurred, when compression upon the femoral artery was had recourse to, and an acupressure-needle was introduced higher up in the stump, with the effect of at once controlling the bleeding. Without any hæmorrhage having recurred, it was deemed right not to trust to the acupressure, but tie the femoral artery. On the 10th day after the application of the ligature to the artery much hæmorrhage again recurred, and a tourniquet was used to restrain it. On the third night hæmorrhage set in once more, and on the next morning a ligature was placed upon the external iliac artery. In performing the operation, little more than a teaspoonful of blood was lost. After twelve days, however, sudden bleeding again supervened, and recurred four hours afterwards. Next day it was resolved in consultation to tie the common iliac artery, which was accordingly done. After this time there was no recurrence of the bleeding, and the patient recovered steadily without a bad symptom. The ligature separated on the thirty-eighth day.

This case cannot be adduced, like Mr. Page's, as an instance where acupressure proved successful after deligation had failed. But in its treatment the needle was as successful at least, if not more so, than the ligature; for during the seven days' use of the first needle, no hæmorrhage took place, and when the second or rather third application of acupressure was in successful use, that hæmostatic method was set aside, and tying of the femoral artery adopted—an operation which did not prevent the recurrence of the secondary hæmorrhage. The compression of the arterial tubes leading to the bleeding point by the acupressure-needles was not apparently found by Dr. M'Kinlay to be attended with any difficulty, and did not require the use of any dissection. The compression, on the other hand, of the femoral artery by the tying of a ligature round it did necessarily require the precedent

use of the knife, and of careful dissection—a matter of some note in contrasting the two methods of treatment adopted in the case. Would a continuance of trust, in this instance, in the acupressure-needles—which, at the time of their rejection, were acting successfully in controlling the hæmorrhage—have prevented the necessity of having recourse to the ligature of the femoral, of the external, and of the common iliac arteries?

Dr. Culbard of Dunkeld has related to me a case of wound of a mammary artery, the bleeding from which he found it impossible to arrest either by the use of the ligature or by compression, but where the bleeding was at once and permanently stanchd by having recourse to acupressure. I shall give, however, the account of the case in Dr. Culbard's own words.

CASE XXII.—*Mammary Abscess—Artery divided in opening the Mamma—Ligature—Acupressure.*—"I was called," writes Dr. Culbard, "to attend Mrs. L. I found her suffering from a very large mammary abscess in her left breast, which I opened, and gave exit to a quantity of healthy pus. After the abscess had emptied itself fully, active hæmorrhage occurred, which I was unable to arrest without plugging the wound. In about two hours I was again sent for, as the hæmorrhage had recurred. I removed the plug, dilated the wound, and attempted to secure the bleeding point by means of a ligature, but was unable to do so. At this time my patient was very faint from the loss of blood. I applied pressure by passing my index finger into the wound and compressing it against my thumb. This I continued to do for about three-quarters of an hour, and as the bleeding had apparently ceased, I again plugged the wound. In about half-an-hour the bleeding returned. I again tried to apply a ligature, but with no better success than on the previous occasion. My patient was very weak, almost pulseless, with cold sweat standing on her. I now passed a common darning-needle through the outer wall of the abscess, making it bridge over the bleeding point and emerge on the surface. This at once arrested the hæmorrhage. On making my visit in the morning I found my patient comfortable. She had lost no more blood. In the evening I removed the needle, but no bleeding recurred, and her recovery went on steadily and favourably."

Many surgical authors have described how necessary it is, when we try to stop a hæmorrhage from a wounded vessel by external com-

presses, to pack and accumulate these compresses upon the vessel with great accuracy and steadiness from *without*. The acupressure-needle is a more direct, simple, speedy, and effective compress applied to the wounded artery from *within*.

Sometimes acupressure succeeds where it is difficult to use the ligature with success,—in the instance of small vessels situated in awkward positions, or where there is not enough of the arterial tube projecting to seize with the forceps, as in the following :—

CASE XXIII.—*Ovariectomy*.—*Vessel bleeding on the Inner Surface of the Abdominal Walls*.—In an instance in which I saw Mr. Spencer Wells perform ovariectomy with his usual great skill and dexterity, the ovarian tumour was pretty firmly fixed to the abdominal walls by old adhesions. After these adhesions were severed and the tumour removed, there were two points on the abdominal peritoneum which bled considerably. One of these bleeding orifices was closed by the application of a silk ligature, which was cut short. The other bleeding orifice was so flat that the attempts to seize it with the forceps and ligature failed; but it was readily closed by passing an acupressure-pin through the abdominal walls, so as to bridge over and compress the bleeding vessel. This mode of arresting the hæmorrhage had the further merit in such an operation, that the head of the needle being left externally, it could be withdrawn at will; while, if the ligature had been used, it was of necessity permanently left within the cavity of the peritoneum.

Occasionally, when the coats of an artery are much diseased, cartilaginous, or ossified, they are so brittle and friable, that they will not bear the strain of the common silken ligature. In these circumstances, when deligation thus becomes very dangerous or utterly impossible, Petit, Dupuytren, Roux, Manec, and others, recommend the introduction of a piece of bougie, a small roll of wax or charpie, or any other body of tolerable consistence, into the gaping orifice of the ossified artery,¹ with the hope, either of mechanically shutting or plugging up its bleeding mouth, or of allowing a thread to be placed around its now filled and distended tube. Under the same circumstances Chelius recommends, as a security against after-bleeding, try-

¹ *Plug for ossified arteries*.—See Cloquet in "Dictionnaire de Médecine, ou Répertoire Général," etc., tom. ii. p. 436; Manec's "Treatise upon the Ligature of Arteries," p. 102; Velpeau's "Médecine Opératoire," tom. i. p. 314; etc. etc.

ing to tie the vessel with a broad tape, the smart application of the actual cautery, or the ligature of the principal trunk, above the amputation.¹ But, in such a grave complication acupressure has been found quite safe and sufficient, as seen in the following instance :—

CASE XXIV.—*Acupressure capable of closing an Ossified Artery.*
—For mangling of the left foot by a waggon, M. Foucher performed, at the Necker Hospital, Paris, amputation at the lower third of the leg by the double flap method. He acupressed four bleeding arteries. “It was evident,” he says, “to me, as well as to the *Internes* of the Hospital present at the operation, that acupressure constitutes a hæmostatic method speedy and easy of application.” On the third morning two of the needles were removed ; but gangrene spread rapidly up the limb, pyæmia supervened, and the patient ultimately sank. The needles placed over the anterior and posterior tibials were allowed to remain till the patient died. “At the autopsy,” says M. Foucher, “we were enabled to satisfy ourselves that the two needles compressed firmly the anterior and the posterior tibial arteries ; and that, on a level with the needles, the walls of the arteries had not undergone the slightest alteration nor destruction. In the interior of the vessels was found an obliterating clot, which, in the case of the posterior tibial, was firmly adhering to the extremity of the cut arterial tube. I may add,” he continues, “that the two arteries were ossified for a considerable distance above the wound, and that their walls were rigid and friable. This disposition,” he concludes, “or condition of the vessels, which is altogether unfavourable to the employment of the ligature, did not interfere in the slightest degree with the success of acupressure, which, up to the last moment, gave us all we asked of it—to wit, complete arrestment of hæmorrhage.”²

I learn from M. Chassaignac’s lately published “*Traité des Opérations Chirurgicales*,” that M. Foucher has successfully used acupressure in another case of ossified artery.

CASE XXV.—*Amputation of the Thigh—Main Artery Ossified.*
—An old woman at the Hospice des Incurables had amputation of the thigh performed in May 1860. M. Foucher was not dreaming at that time of employing acupressure in the case, but when he wished

¹ *Chelius*.—See his “*Surgery*,” by South, vol. ii. p. 899.

² *Foucher*.—See the “*Edinburgh Medical Journal*,” May 1860, p. 1048.

to apply a ligature upon the femoral artery its indurated and friable walls broke under two successive trials. He then passed below the artery a strong ordinary needle, and the bleeding instantly ceased. The patient made a perfect recovery.¹

In answer to the third of Mr. Syme's three objections against acupressure—namely, its alleged "most limited extent"—I have already stated, that under one or other of its forms, it was applicable to most if not to all the wound-complications in which deligation was used; and in the present chapter I have further shown that "the needle-process," as Mr. Syme not inaptly terms it, has already—during the four years that have elapsed since I first suggested it—succeeded in various cases, and under various circumstances, both in primary and in secondary hæmorrhage, in which the ligature had already failed. As another proof of this last statement, let me in conclusion adduce one instance of secondary hæmorrhage from the umbilical cord, treated and recorded by Mr. Syme himself. In this case, after the cautery, etc., had failed, he adopted a plan previously described and tried by Dr. Radford, and which consisted of a kind of rude acupressure—applied not to the bleeding artery but to the "the conical cavity" or sac of the wound from which the blood was issuing. The case is recorded by Mr. Syme in the third edition of his "Principles of Surgery."

CASE XXVI.—*Secondary Hæmorrhage from the Umbilical Ring, in an Infant.*—After describing the arrestment of bleeding from leech-bites by Anthony White's plan (see footnote page 171, *ante*), namely, by transfixing the wound by a sewing-needle, and tying a thread tightly round it, Mr. Syme proceeds:—"In the same way was subdued a hæmorrhage from the umbilicus of an infant, two weeks old, which I saw with Dr. Begbie, and where the actual cautery had been used in vain, at the suggestion of the late Dr. Hamilton, who said that the very few cases of the same kind previously seen by him had proved fatal. I passed," adds Mr. Syme, "two sewing-needles, crosswise, as deep as possible through the *conical cavity* from which the blood proceeded, and then tied a thread round them."²

I have said that the acupressure used in this case was of a rude

¹ *Foucher*.—See M. Chassagnac's "Traité des Opérations Chirurgicales," 1861, tom. i. p. 400; see also the "Bulletin de l'Académie Impériale de Médecine," tom. xxv. p. 1087.

² *Syme*.—See his "Principles of Surgery," 3d edit., p. 91.

kind. But, in truth, it was the acupuncture that was effected, and not the acupressure of the conical cavity into which the blood oozed from the hæmorrhagic vessel. For the use which Mr. Syme made of the cross needles was not, as in acupressure, to compress with *them* the tube or mouth of the open artery, but merely to prevent by them the thread which, like a purse string, was employed for this purpose—or rather for the purpose of shutting and closing the sac or cavity, as in epistaxis, into which the blood flowed—from slipping off. The resulting compression was not applied to the single bleeding vessel, but to the whole cavity of the bleeding wound. At the very most it had the same kind of indefinite relation to true acupressure as ligature of a vascular part *en masse* or in slump has to the ligature of individual vessels. The surgical ligature of single arteries was only practically introduced, according to most writers, three centuries ago, in the time of Paré; but others maintain that it was sufficiently known some seventeen or eighteen centuries ago, in the time of Galen and Celsus. Yet no one has ever been found who was frivolous enough to argue that the credit of the discovery of deligation did not belong to the era of Paré, or to that of Galen, or Celsus, because the wholesale ligature of three vessels *en masse* had been practised for many, many long ages earlier than the earliest of these authorities, in that oldest perhaps of all old surgical operations—namely, in the ligature and division of the umbilical cord of the new-born infant.

