The theory and practice of counter-irritation / by H. Cameron Gillies.

To Dr. Edmund Griffin
With the kind regards of
March 1901 The Author

THE THEORY AND PRACTICE OF COUNTER-IRRITATION

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BY

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COUNTER IRRITATION

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PREFACE.

In the following pages an attempt has been made to trace the history of an idea with the object of culling whatever instruction that history might reveal, and in the hope of determining the direction of the lines of indication to the end of having a clearer understanding of a very important branch of medical treatment. This was not quite an easy task. It entailed much reading and reference as well as all the discretion and patience I could bring to bear on it; and it could hardly be undertaken in more unfavourable circumstances as regards available time and opportunity. There must therefore be defects, for which I would ask forbearance; I shall be anxious to make them good.

I have had to criticise somewhat freely—it was my duty to do so—but I hope I have done so reasonably and justly. What there is of my own observations I submit with every feeling of deference to the educated judgment of my Profession, and with every

confidence that whatever there may be of truth will be received gladly, and whatever of error will be corrected kindly.

I do not wish to be esteemed an apostle of Counter-Irritation. I am perhaps more in sympathy with those who hold that "the Devil himself, old Beelzebub, is nothing but a great Cantharid" (*Baynard*), than with those who would commend twelve consecutive applications of actual cautery for the cure of sciatica (*Peter*), but I have had to reject both extremes in the desire to arrive at some truth. "Ille sinistrorsum hic dextrorsum abit, unus utrique error."

A good deal of reference is given, but a great deal that might be given is not. If I were sure that I found all that was worth finding, as I am sure that I found all I could, I should be glad to know that I might at least save others a labour which was not always pleasant or profitable.

Some people dislike theories, and they extol the evangel of *Don't think—act.* They forget, or perhaps because they don't think they don't know, that no man acts, or administers a drug, or applies any remedy without some theory as the motive and justification of his action, and it is evident that the nearer to correctness the theory is, the better he can perform his duty. The theorist is always the pioneer of scientific progress, and he stimulates and quickens

even when he is wrong. Our progress is the sum of our corrected errors by far more than it is the result of a pure or inspired reason.

I may say that I like the plan of this Essay very much. I can say so without reproach, because it came to me rather than I to it. I think it would be a good service to deal with other leading ideas bearing on medical practice in the same way—but more competently.

4th June, 1895.

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THE THEORY AND PRACTICE OF COUNTER-IRRITATION

Part I.—HISTORICAL AND CRITICAL

CHAPTER I.

INTRODUCTORY.

Very early ideas—"Empiricism of Necessity"—Hippocrates, Celsus Paracelsus, Van Helmont and the Archæus.

A CAPABLE modern author* has said that nothing is more needed in our day than the rejuvenescence of the commonplace. The remark is full of meaning to the student of medical science. The pressure on our life is so great, the demands on our time and understanding so severe and constant, that we have scarcely any leisure to think for ourselves; and we are in such hurry to advance towards things new and, as we hope, better, that we have no time to carefully observe what is actually taking place before our open eyes, nor for any retrospect, however profitable that also might be. There is, moreover, reason to believe that we are too ready to disregard and

* Prof. Drummond, "Natural Law in the Spiritual World."

depreciate old and old-fashioned means and methods merely because they are old and familiar, and not because we have satisfied ourselves that they are wrong. This is not a commendable spirit. The truth should never be too old or too commonplace for our regard. The sum of our solid medical knowledge is not such nor so great that we can afford to throw over established ideas merely because they are old. There is, indeed, a strong presumption in favour of an idea, or theory, or practice, in the fact that it has survived long enough to have become commonplace. The Koch cure and the Mattei cure, and the many forms of loud-mouthed, shameless quackery can never become commonplace. Such are always unnatural and delusive, and therefore short-lived, or are fraudulent and soon found out. Then, again, there is the immense loss resulting on the neglect or disregard of the historical continuity of scientific effort and discovery which comes of the too great anxiety to be original. Nature is never original in the sense of being exceptional or making a startling new departure, and, "if it were possible by a single arbitrary effort to break the thread of hereditary thought to which we are inseparably connected through language, the consequences would be only destructive." *

Counter-irritation is a familiar expression, almost, if not altogether commonplace. It has held an important position for a long time in our medical philosophy and speech, and it is even now with us in active use. We think that in it we have a light to direct us on certain

* Schlegel's "History of Literature."

safe lines for the effective treatment of disease; and the range of its application is very extensive. It is, therefore, very interesting, and it is desirable that we should endeavour to know what it means and what we mean by it.

Like all words that have a long history, counter-irritation has altered very much from its first meaning. It is, indeed, evident that in an inquiry of any great range over the history of scientific evolution as it bears on medical science, and especially on the interpretation of pathological phenomena, one of our first and most important difficulties will be met with in the seemingly simple matter of words and terms. The great mass of the most fundamental terms even now in active use are very old, and have had such a long life of vicissitude and change that it is only with difficulty we can learn what their true meaning and scientific value is. They came into existence no one knows when or how, away in the indefinite past. We can get somewhat near to the first ideas they embodied through their etymology, but beyond that they record nothing of their very interesting life story. Some have changed exceedingly from their first signification. Words like apoplexy, epilepsy, and melancholia have not a trace of their first signification in the present usage. Some again, like disease, health, and cure, after a complete cycle of changes in which they appeared in various meanings, have come back nearly to their original positions, to embody remarkably clear and intelligible conceptions. Others, again, have wandered

all over the earth, changing in signification with every doctrine, and still have not taken a definite meaning. Of these the term counter-irritation may be taken to be a good example. Although this is not very old, unless we can extend it back to the meta-syncrasis of Thessalus, ἰατρονικης, and the meta-poropoiesis of Galen, it may with perfect safety be said that it has had thousands of different meanings in its time. One might almost risk the assertion that it has a thousand different meanings in our own usage of to-day. When a discussion of the subject took place some years ago in the medical journals, Dr. Anstie, who took a leading part, had to confess that he was "fairly startled by the wide divergence of views that were shown to have been all along concealed under the external appearance of agreement in the orthodoxy part," and if we may judge from our text-books we are not much clearer on the matter now.

In the very inception and origin of the expression it seems to embody a theory, or perhaps two, or even three theories. There is plainly implied in it that irritation is the cause of inflammatory disease, and that inflammation is always an evil; and it is further implied that this form of remedy acts *counter to* or against the diseasing cause, to undo it or to prevent its operation, and so to bring about a healthy state.

Regarding the first assumption that irritation is the cause of inflammatory disease, whether it is right or wrong, or from whatever point we may view it, there cannot be any serious objection to it in this

connection. We must accept it that there is a cause or causes somewhere at the commencement of disease inducing or producing the diseased state. It makes no difference at this stage of the inquiry what name we give to that cause, and perhaps the more indefinite and comprehensive we make it the better. Whether we look on it as the mortal soul of Plato, the ψυχή of Aristotle, the πνευμα of Galen, or the Archæus of Paracelsus, or as any other form or expression of the excitable, irritable, or sentient *Ens*, it is all the same. Altering the name can in no sense or degree alter the thing named, and if the ancients thought well to irritate, or to stimulate and provoke this imagined first cause—the *impetum faciens*—in order to arouse it to a sense of the danger of disease invading its habitation, or to allay it, or soothe it when it was presumed to be in troublesome mood, we need not be too severe in our judgment, for we must not forget that our medical science of the present day uses the same word—irritation—as in some way expressive of the cause of inflammation, and counter-irritation as a curative means; but with less courage, or honesty, or logic, than the ancients, we omit to say who or what is irritated. A strumous or gouty knee is waiting for a trifling irritation to set up a violent process of disease. A slight blow or exposure to cold will do it. Now we may from our point of view, and with some propriety, look upon the blow or the cold, which is the immediate cause, as the irritation. But we can readily see that this does not cover the whole cause of the disease, which lay

further back in the life-conduct or even in the heredity of the individual. A similar blow or exposure would not affect a healthy knee. We therefore see that it is not quite correct to say that the blister or other counter-irritant we may use in such a case acts *counter* to the irritant part alone of the complex cause, but *counter* as we esteem it to the whole inflammatory process following on the disposition and on the irritation. In the fullest sense it is a counter-inflammation we set up. The modern theory, then, of irritation as the cause of inflammatory disease is too narrow, and is not much more serviceable in its practical application than ancient forms of the theory, even if we take them to have been all wrong. The effect of this is seen very plainly in our modern medical literature. One authority explains the physiology and purpose of counter-irritation at great length in that pseudo-scientific form of language which enables some to write bulky books without saying anything in particular. He gives no light on the matter. Another explains that various theories have been advanced, but he does not venture to say which, if any, is right. Another has the courage to say that we have no satisfactory theory. Dr. Risdon Bennett not long ago said that "The action of counter-irritants, although undoubtedly useful in pain and in causing absorption of chronic exudations, is little understood and belongs to the most mysterious department of therapeutics;"* and Mr. Chiene says, "Counter-irritants are as yet little

* *Practitioner*, June, 1869.

understood. . . . Our very ignorance regarding the action of a blister, coupled with the frequency with which we use it, makes it one of the most interesting questions that can occupy our attention as thoughtful physicians and surgeons." * A peculiar and very interesting effect of this uncertainty is that "some therapeutists have of late been disposed to question the value of counter-irritants on the theoretical ground of inability to explain their mode of action" ("Quain's Dictionary"). The remedy, or let us say mode of treatment, has fallen into disrepute not because it has failed as a remedy or mode of treatment, but for the very peculiar reason that we do not understand and cannot explain how it succeeds, for it is allowed that not unfrequently it does succeed.

Ringer in his "Therapeutics," and Stille, give scores of diseases in which counter-irritation may be, and is, applied with advantage. Gowers in his treatise on nervous diseases repeatedly asserts the extreme value of counter-irritation. He says regarding diseases of the spinal membranes, "Next in importance to rest is counter-irritation," and again regarding inflammation of the spinal cord, "There is, however, one therapeutic measure of unquestionable value in the treatment of the later stages, and that is the repeated application of the mild cautery." I could refer to not a few cases in my own knowledge in which the immense value of counter-irritation was altogether beyond doubt. The testimony of experience through-

* *Practitioner*, September, 1879.

out the whole history of medicine is absolutely conclusive on the value of this mode of treatment, when rightly used.

There can, however, be no doubt that counter-irritation may do harm. It is a powerful instrument for evil as well as for good. We do not understand its operation, and we are therefore not safe in applying it indiscriminately. Conscientious men, therefore, say that we had better not use it, but try to get on without it. This is a very commendable frame of mind, if it were not quite so exclusive. In this way we lose all the good that admittedly may come by this treatment, because we do not know how to avoid the evil that may come by it when used wrongly—that is, when and where it ought not to be used. This follows directly on our not understanding how it acts. On the other hand, if we can learn and know how it operates, we shall be put at once in safe possession of a proved powerful means of treatment free from all risk of danger coming by it. What we have to inquire and to determine if we can, is why counter-irritation at one time serves a good purpose and at another does harm. In saying this we say nothing new. Dr. Thomas Percival, writing in 1772, says: "Though blisters were known to the ancients they did not come into general use till the beginning of the last century. But though blisters are now almost universally employed, and though experience hath ascertained their utility in various disorders, the theory of their action, as well as the mode of their

operation, is yet undetermined, and a subject of litigation. Hence arises that diversity of opinions concerning the diseases in which they are indicated, the time of their application, and the parts to which they should be applied. Nor can we ever hope for uniformity in this respect among physicians, either with respect to their opinions or their practice, till a just idea be formed of their mode of action deduced from experience and an attentive observation of their effects on the human body. When this is accomplished a system of rules may be laid down for their right and advantageous application." * It will thus be observed that in respect of this matter we have made very little advance, for these words are as true and appropriate at the present time as they were when written 120 years ago. And it will not be difficult to see that until the need, here so well expressed, shall have been satisfied, while we use counter-irritants for any purpose, or however successfully, we are open to the sharp but pertinent remark of Richerand, that the physician who uses counter-irritation in the treatment of disease is like a blind man with a stick—hitting at one time the disease, at another the patient.

This is not the place to investigate fully the history of the idea of counter-irritation throughout its whole course in the medical literature of the past. The desire is to aim at the practical aspect as much as possible. It is without doubt very old. We cannot

* "Essays, Medical and Experimental."

know how old. The cautery was in familiar use in the days of Hippocrates,* and from his time to ours whatever sect or theory came or went, the scar of the red-hot iron, or of some of its kin, may be traced with little interruption the whole way down. "Nullum remedium præstantius est igne" seems to have been the first and most abiding article of medical faith in all times. There is no remedy or means that has been so universally and continuously adopted by all nations as this of cautery or irritation. What Virgil declared of the fruitful earth would seem specially appropriate to the human body:

> Omne per ignem
> Excoquitur vitium atque exudat inutilis humor.
>
> *Georgics* I. 88.

As moxa, plaster, or blister, or in some other of its many forms it has been found in common use all over the world, and away back into remotest antiquity. Some have thought that there is an attempt to philosophise on the matter in the forty-sixth of the Second Book of the Aphorisms:

> Δύο πόνων γινομένων ἅμα μὴ κατὰ τὸν αὐτὸν τοπόν ὁ σφοδρότερος ἀμαυροι τον ἕτερον.

We may take it as certain that to the early imagination the pain was the disease. It is so, indeed, in no small degree to the clearer conception of our own time. So the removal of the pain meant the removal of the disease, and there could not then, as there cannot

* ὅσα σίδηρος ἰᾶται οὐκ, πῦρ ἰᾶται. Aph. viii. 6.

now, be any objection to this way of looking at the matter, so long as pain is removed or undone by the removal or correction of the cause, and not by suppressing it with narcotics. But having regard to the physiological attainments of Hippocrates' time, and of considerably later times, when it was accepted that "Morbos vero ad iram deorum immortalium relatos et ab iisdem opem posci solitam,"* perhaps it would be better to look on this observation as a simple empirical, or rather say natural, discovery, in which there was no such philosophical intention as has been so assiduously given it down even to our day. It is only a few years since a well-known and competent man took his stand on it against all comers in defence of the practice of counter-irritation. This was not a safe position to take up—either historically or philosophically. We have seen people with much less knowledge and thought than Hippocrates is accredited with, cure the toothache by rubbing the cheek with nettles, and we have seen a by no means ineffectual remedy for rheumatism got from an acrid species of ranunculus made into a poultice and applied to the painful joint. It used to be a custom to stick an inflamed limb into an anthill. It would be just as easy to trace the rational origin of Hippocrates' treatment by cautery as of these. The idea and the practice "growed," and that is all that can with safety be said about it. Celsus opens his First Book, *De Re Medica*, with the assertion, "Siquidem etiam imperitissimæ gentes herbas aliaque

* Celsus. Quoted by Lettsom, Oration. Jan., 1778.

prompta in auxilium vulnerum morborumque noverunt." There is much that may rightly be described as instinctive in the beginnings of medicine.

To this earliest morning, then, of our science, which Lettsom has described as the stage of Empiricism from Necessity, the practice of counter-irritation may be referred. But even if we know that in its origin it had no theory, and that in its long history it was united to sometimes strange and sometimes contradictory theories, and that even now it has no reliable theory to appeal to, still we cannot easily or safely deny that there is some good meaning and merit in a method so long-lived, so universal, and so instinctive, if we can only understand it. But in those early days "there was no theory of vital action, of the nature of disease, or of the *modus operandi* of medicines; and medical inquiry was confined to the empirical search for substances possessed of curative properties," and any knowledge of even so much seems to have been an hereditary, entailed, and probably somewhat limited property. When Menelaus was wounded before Troy, Machaon, "Æsculapius' son," after sucking the wound clean:

> Then medicines wondrously composed, the skilful leech applied,
> Which loving Chiron taught his Sire, he from his Sire had tried.*

There is a most interesting thread of continuity running through the slow evolution of medical philosophy, and it always has reference more or less remotely

* Homer's *Iliad*, Book iv. 219.

to this idea of a special activity determined by or through some cause, the nature of which was not known. We might, perhaps, by the help of a good deal of fanciful interpretation, be able to indicate the thread of this idea from Hippocrates down to the middle or end of the sixteenth century, when Broussais holds that the first conception of irritation, as we understand it now, had origin. But to do so would not be pertinent to the present purpose, and it is doubtful if it would be a very profitable task. It was not till after the discovery of the circulation that any definite or practical theory of irritation was possible, and not till then therefore could there have been any theory of counter-irritation. There cannot be any doubt, however, that to the Archæus of Paracelsus and especially to the elaborate rehabilitation of it by Van Helmont, we may directly and easily trace much that is current with us even now in word and phrase. The human mind is not always patient of abstract ideas. It prefers a solid concrete entity if that is at all available. The Archæus was "an actual entity endowed with a personality, an intelligence, and the most lively emotions," as Dr. Anstie describes it. The quaint translation of Van Helmont's works, by Constable,* gives so graphic a portrait of the Archæus and so true a statement of the medical mind of the time that it may be quoted:

"But since every corporal act is limited to a Body, hence it comes to passe that the Archæus, the Workman

† Oxford, 1664.

and Governour of generation, doth cloathe himself presently with a bodily cloathing; For in things soulified he walketh thorow all the dens and retiring places of his seed and begins to transform the matter according to the perfect act of his own image: For here he placeth the heart but there he appoints the Brain, and he everywhere limiteth an immoveable Chief dweller out of his whole Monarchy according to the bounds of requirance of the parts and of appointments. At length that President remains the overseer and inward Ruler of his bounds, even untill death. But the other floating about being assigned to no member keeps the oversight over the particular Pilots of the members, being clear and never at rest or keeping holiday."

We cannot do better than join with this his definition of disease: "A Disease is a certain Being bred after that a certain hurtful strange power hath violated the vital beginning, and hath pierced the faculty thereof. And by piercing hath stirred up the Archæus into Indignation, Fury or Fear." A commentator* states the case clearly and briefly thus: "The Archæus therefore is that in us which first feels the pestilential *Ens* and becomes infected therewith." Diseases to this author are *Entia realia*, which entering the body cause the controlling spirit to become enraged and to send into the parts an irritating ferment which calls the blood into them and so causes inflammation. This is not a bad theory by any means, and a good deal might be said in its favour, in our advanced day.

* Simpson, W., "Philo-Medico-Chymic," 1665.

There is reason, however, to doubt that it in any way influenced the use of counter-irritation, even if we credit that in some sense it afforded a theoretical basis for the practice; and the same may be said of most of the theories of the seventeenth century, a century which was by far the most prolific in medical theories as in other philosophical speculation.

CHAPTER II.

LATER AND CLEARER CONCEPTIONS.

Haller and *Irritability* — Brown and *Excitability* — Broussais and *Irritation*—Hunter with an Axiom—Jenner with a Theory—Boyle on Moxa—Higginbottom on Lunar Caustic—The Views of Williams, Stokes, Fletcher, Granville, Atkinson, Henry Bennett, Willshire, and Dendy.

It is impossible to doubt that Haller's idea of Irritability was in some sense related to the use of external irritants in the practice of the time, but as already hinted, it is almost certain that the theory in no way affected the practice, so we pass it over. Brown also and his Excitability we should pass over if that were possible, but the teaching of this remarkable man touches the subject in discussion at one or two important points which we cannot well disregard. In order, however, that too much importance may not be attached to words it may be here pointed out that the Excitability of Brown, the Irritability of Winter and Haller, and the righteous wrath of the guardian Archæus, when "after that a certain hurtful strange power hath violated the vital beginning and hath pierced the faculty thereof," are one and the same thing. They are all x's,

fanciful conceptions of undetermined cause, and the one is just as good and as helpful as the other. They are all in the same line, and the distance between them is very small; as to the rest, it is only a change of words meaning essentially the same thing—even if undetermined. Brown's fundamental teaching that almost all diseases have their origin and principal cause in a general debility of the organism—touches very closely on the view of counter-irritation which is to be submitted in this essay, as does also his splendid generalisation that "Predisposition to disease and disease are one and the same thing." It is well, therefore, to recall so much. But the principal reason for introducing him here is that his teaching without doubt led to the invention of the "contra-stimulus" of the Italian schools, in which his doctrines took such deep root. The contra-stimulus is in idea closely akin to counter-irritation. It is, indeed, very difficult to distinguish between the irritant and the stimulus as used in these and other theories of that time. The contra-stimulant was designed to have an effect on the tissues contrary to what a stimulant had or would have. But the stimulant in its origin and earlier signification meant a *goad*, στιγμή, and between a goading or pricking and an irritation it was not easy to draw the line. The contra-stimulant acting within had a similar purpose and effect to the counter-irritant acting from without. It was perhaps about this time that the word counter-irritation had origin. Broussais' theory of disease, mainly directed to "explode" that of Brown, took irritation to be at

the bottom of every morbid condition, and held that this irritation always resulted in an increased flow of blood to the part. This was inflammation; and the seemingly reasonable way to act in such a case was, if possible, to prevent that flow of blood and that inflammation. An external irritant would serve this purpose. It would determine the flow of blood outwards and away from the diseased direction in which it might be going. It would stop the inflammation. Let it be called counter-irritant, therefore; and it was so.

John Hunter's extraordinary power of common-sense observation and almost insatiable desire to explain everything, could not miss the interesting difficulty presented by this matter. He at once saw the difficulty and took it up. He saw the difference between, or, perhaps we better say, the tending divergence of, the stimulus and the irritant, and he defined them in a way that we cannot take any exception to. He limited the meaning of the stimulant to whatever produces sufficient excitation to promote some natural function; the irritant on the other hand results in an excitation which promotes an unnatural action. We cannot say that Hunter's logical faculty or power of definition was his highest, but this seems to be a very good and useful distinction, and perhaps is as nearly as possible the meaning we attach to the words now. This will become plain from the observations of Dr. Chambers, Dr. Anstie, Dr. Ross, Dr. Lauder Brunton, and others which will follow. Hunter, too, had his

Archæus, only he called it the "vital principle" and the "sentient principle." It is, as usual, only a change in name and not in the thing meant. We are not, however, concerned with these terms at present. They have been gathered to their ancestors, the long succession of which has never failed from the very earliest times down to this day, when the only representatives are the malicious microbe called pathogenic and the "Hetero-morphous morbific principle" of Count Mattei.

Though so far as I know the expression counter-irritation is not used by Hunter, it is distinctly and frequently implied by him, as in the following, for instance: "The mode of cure by an irritation different from the disease, appears to increase the disease, but by destroying the first mode of action it produces another disease, and which more easily admits of a cure than the first."* He is not partial to this form of treatment, but prefers bleeding, depressant medicines, soothing applications, and cold—to contract the blood-vessels, and so to cure or to mitigate the inflammation. He surmises, and I venture to say rightly, that irritant and hot applications increase the disease, so he cannot see how they can do good. He admits that counter-irritants may cure inflammation by repulsion, sympathy, derivation, revulsion, and translation, and fortunately he admits also that "the operations denominated by these terms all belong to the same principle in the animal economy," but as to what that principle is he declares "we are totally strangers." That the matter

* "A Treatise on the Blood," 1812.

is of great importance he expressly states. "It is not to my present purpose," he says, "to go into the different effects of this principle; although I must own it might be as useful a part of the healing art as any, and even more, for it is probably the least known as being the least intelligible, and therefore, the more use may be derived from its investigation." Hunter was a giant. To see him labour through the vile bog of interminable nonsense that flowed from the humoral theory is grand but pitiful. It is sad to hear him, after his strong struggle and getting his foot on solid ground, declare that "Why inflammation of any kind should cease, after it has once begun, is difficult to explain or even to form an idea of, since yet we have no mode of counteracting the first cause or irritation." It is sad, but there is hope in it; a man could not stand long in that position without getting light on the difficulty. It is difficult indeed to explain. It is impossible to explain, for the best of reasons, that no inflammation ever was or can be stopped but through death, except by removing the first cause, or by allowing or assisting the purposeful intention of the process to work out the beneficent end for which it is by Nature established. There is abundant evidence in Hunter's later writings that he was brought to recognise this fact—the most fundamental, as it is by far the most important fact in all our knowledge.

There can be no doubt that to Hunter must be referred the most acceptable explanation we have of

the action of counter-irritants. We may find, on examining it closely, that it is no explanation at all, but as an old friend that has done long and learned service, we must view it kindly. In the introduction to his "Treatise on the Blood," Hunter makes this statement: — "As I reckon every operation in the body an action, whether universal or partial, it appears to me beyond a doubt that no two actions can take place in the same constitution, nor in the same part, at one and the same time; the operations of the body are similar in this respect to actions or motions in common matter. It naturally results from this principle that no two different fevers can exist in the same constitution, nor two local diseases in the same part at the same time." From this quasi-philosophical "principle" the expression counter-irritation derived a most respectable and learned significance. It alone in the whole wide range of medical means stood out clearly on a scientific foundation with a pat philosophism always ready at hand to sustain its position. There can not be two actions in the same part at the same time; so, and therefore, if there be an inflammation deep down in the tissues, let us by counter-irritation start one on the surface. We shall "destroy" the deeper action, and we have in place of it a superficial inflammation which we can deal with easily. That is an excellent way, simple, and seeming very reasonable. Still, "it is difficult to explain." Why was this action in the deeper tissues begun? What have we done that it should now cease? "It is destroyed." But

what is destroyed? Is it the first cause, or the action, or what? Have we killed the Archæus, or the micrococcus, or the heteromorphous morbific principle, or what have we done? It is surely difficult to explain. But the principle remains that there cannot be two actions in the same part at the same time, and to inquire why it is so would only result in unsettling the orthodox scientific mind, and perhaps also the orthodox practice of physic. And further, if by this means we cure the disease, what matters the explanation? Let it alone.

> It is no part
> Of prudence to cry down an art,
> And what it may perform deny
> Because you understand not why.
>
> *Hudibras.*

This would leave us exactly where we began, using strong means for all cases, without discrimination, doing good sometimes, and sometimes harm—the blind man with his stick, as before.

Van Helmont was said to have controlled the seventeenth century, Hunter may be said to have controlled the eighteenth and in no small degree the nineteenth century also. So far, as regards our subject, it may be said that it made but little progress from Hunter up to within the last twenty years. Still, sporadic efforts of more or less interest have always been directed to this question since Hunter's time, which, if we were to pass over, would destroy the feeling of continuity that is desired to be maintained in this essay. And, besides, we should miss many

interesting opinions, some of which our broader knowledge has come to confirm, and others of almost not less interest which our knowledge has not yet enabled us to refute conclusively, though they are doubtless erroneous. We shall, then, follow the idea from the beginning of the present century, but only touching lightly on a few of the most important references.

There can be no doubt that the use of the cautery and the stronger irritants was largely in abeyance in the end of the last and well into the beginning of the present century.* It was not long so. Baron Larrey early in the century stoutly asserted the value of Moxa, and Cupping, and gave abundant proof of their use and benefit. He maintained that they acted as revulsants, "drawing off or inviting the humors," and so doing good. His translator, Dr. Dunglison, does not appear to have been too much bound in to this view, but held the opinion that "It is not to credulity but to well-founded scepticism that we

* Everybody knows, or ought to know, that there is a periodic mania for the introduction of ancient practice and obsolete opinion. The rabies of the anti-contagionists comes regularly round after a term of years, and so it is with many other things, especially the employment of the actual cautery. Heaven knows this measure had a pretty fair trial, and had not been abandoned till after its merits had been tested by a long and dreadful experiment. Gentlemen would however, nowadays, persuade us that a red-hot iron is a pleasant thing enough, and by no means attended with those disagreeable sensations with which its application is associated in the eyes of vulgar prejudice. Mr. Syme has for some time past made much use of the cautery as a counter-irritant in that scape-goat, the "*morbus-coxarius*," but published results from such unmeaning terms are not worth one farthing.—*Medico-Chirurg. Rev.*, 1830.

are to look for those improvements in Medical Science which may enable us to treat diseases philosophically."

Edward Jenner while in pursuit of his favourite theme thought that nature indicated a process something like revulsion, in the cure of disease. "Whoever has observed the deranged state of health where vesiculated eruption has been called into action by an effort of nature, must have seen how often they arrest the progress of the original disorder; and may we not from this infer what appears to me to be a pretty general law of nature that she often gets rid of diseased actions affecting vital organs by exciting eruptions in other parts not vital?" * The stated observation is true and easily accepted, but the interpretation and inference is not so. The vesiculated eruption does not arrest the original disorder, but continues it and brings it to its natural termination, and if a vital organ is diseased, nature's only way of curing it is to restore it to the healthy state. This fanciful and vicarious transference of disease has nothing at all of proof to support it. The only explanation of this kind ever given that could be with any measure of reasonableness entertained was that based on the humoral theory of disease which Jenner refuses. "They (the humoralists) maintained the metastasis of disease, but instead of arguing that eruptive affections were *exchanges* of diseased action they consider them to be *drains* by which certain humors existing in a depraved condition of the circulating fluids were carried off." We can understand

* "On Artificial Eruptions," 1822.

something of the views he condemns, and can see some reason in them, but we cannot understand, nor have we any knowledge of, exchanges of diseased action.

A very sensible short article on "Blisters in Chronic Skin Diseases," by Mr. C. Thomson, of Whitehaven, appears in the *London Medical Repository* for May, 1826.

James Boyle, writing in 1826, gives very remarkable results from the use of Moxa—but of so mild a form that he does not consider it deserves to be called counter-irritation. He imagines that "the caloric dissolves deposits, and stimulates parts and excites the absorbents without (being strong enough to) increasing the action of the arteries. The very rapid manner in which chronic swellings have been observed to subside after two or three applications of Moxa scarcely causing discoloration of the parts acted on, decidedly proves that increased absorption is the cause of such change. It appears under these circumstances, that the heat is just sufficient to dissolve parts recently organised from deposition of coagulable lymph or morbid thickening of cellular substance without affecting the circulation." * It is not necessary here to discuss the physiology of this very fair and honest interpretation, as we have advanced very much since that time. We may see later on that his practice has good reason, as well as good results, to commend it.

About the same time Dr. John Higginbottom wrote a modest little book,† which is "presented to the medical

* "A Treatise on Moxa."

† "On the Application of Lunar Caustic," 1826.

profession with very humble pretensions," on the use of lunar caustic in the treatment of inflammations, wounds, and ulcers. He used the caustic over a very wide range of practice, and his own judgment of this treatment in 1869 is, "I may venture to say we have no therapeutic agent so safe, so powerful or efficacious as nitrate of silver in subduing external inflammations when properly applied. It has been invariably successful in my hands for the last forty years."* This must be considered excellent testimony from so unassuming yet so exceptionally competent a man. He does not venture on a theory, but his correct observation of fact and the rightness of the lines of practice he draws from them are none the less valuable and helpful. He says: "If inflammation be established it is increased at first by the caustic. But if this inflammation be not severe, and if the eschar remain adherent, all inflammation, both that produced by the application and that existing previously, entirely subsides. When the previous inflammation is, however, considerable, the application of the caustic would induce vesication, and it should in such case be avoided." This is exceedingly interesting, and it will be referred to again. It is not necessary to believe that lunar caustic has any special qualities or merit which other counter-irritants have not. It is not in the remedial means that the merit consists, but in the suitableness or sufficiency of the physiological action which it determines. Through the whole long line of such means as are variously

* *Practitioner*, January, 1869.

named stimulants, rubefacients, and irritants, the principle is always the same essentially, and only varies in the intensity of its action and in convenience of use.

In a Probationary Essay for the Royal College of Surgeons of Edinburgh in 1829, Dr. John Fletcher wrote "On the Action of Remedies reputedly Revulsant in the Cure of Inflammation." He accepts the theory of disease that had been advanced by John Brown, "the vagabond and despised but talented John Brown," and asserts that the whole rationale of counter-irritation is in that it stimulates an exhausted or failing system. "It must appear," he says, "that inflammation consists chiefly in a loss of balance between the weight to be moved and the powers destined to move it; and it must be equally obvious that the only means of relieving this state must be such as are calculated to restore the balance by either removing a portion of the weight or adding to the deficient moving powers." Blood-letting serves the first indication, and remedies that are immediately or intermediately stimulant serve the second; and these are therefore the essentials in the treatment of inflammation. It is not necessary to discuss the merits of this theory. The essay, notwithstanding, is very readable and quite up to date—for its time; and the practice, so far as it concerns counter-irritation, is, we believe, correct.

Dr. C. J. B. Williams writes in 1833: "Nature not rarely cures disease by counter-irritation; and it was probably from her example that Art first adopted the

practice." * We may perhaps accept this much, but it is all the light he gives. Dr. William Stokes, in same place, makes one or two points that are of interest. "We must admit," he says, "that external derivatives have two modes of action, one derivative, the other stimulant."† But this is exactly what we cannot admit and what it is not necessary to admit. We refuse the derivative interpretation for the present, entirely. He makes this very important observation: "We often find in cases of intense irritation of internal organs that blisters will not vesicate the skin, but that as soon as the disease has been modified they will produce their usual effect. Can this be explained by supposing that in consequence of the intense inward determination the surface has lost a portion of its vitality?" Yes, that is quite true, as will be more fully shown further on. It is also certain that blistering does no good in such a case, but will do much harm if it can divert the natural determination into other channels than where it is greatly needed. Nature prevents this, however, till the disease is "modified," that is partly or altogether cured — and then the blister may have its worse than useless "usual effect."

In 1838 appeared "Counter-Irritation, its Principles and Practice," by Dr. A. B. Granville, F.R.S. Its theme is to prove that "It is not impossible, without the aid of internal medicines and without having recourse to poisonous ingredients as counter-irritants,

* Tweedie's Encyclopædia, Art. "Counter-Irritation."

† *Ibid.*, Art. "Derivative."

instantly to suspend, and in the majority of cases permanently to remove, by means of external remedies, every degree of pain however acute which shall depend on morbid affections of the nervous and muscular system or of the circulation." This *vulgare* is certainly a large order. The meaning of it will, however, be readily understood if we know that the object of the book is not to declare any truth or knowledge, but to laud certain "lotions" of which he alone knew, and would keep, the mystery. He was a man of some ability, however, and even if his "lotions" prejudice him exceedingly, we must admit that he recognised two important essentials in the successful use of counter-irritants. He saw that the support of the constitution was the first essential, and that counter-irritation "exalts the vitality of the part" to which it is applied.

In 1842 Dr. Gully published a small volume on "The Simple Treatment of Disease," with the apologetic motto, Μέγα βιβλιον μεγα κακον. It is a very good little work, giving an excellent *résumé* of the history of medical science by way of preface. His interpretation of Revulsion is very broad, comprehending almost all the old means and methods which we now class under counter-irritation. He says: "Revulsion then in modern meaning may be defined to be that process by which the vital condition of a part is changed either by exciting a new action in itself or in some other part. In the former case a changed degree of vitality and amount of blood is supposed on the part itself,

in the latter the same effect is produced by setting up a counteracting degree of vitality in some more or less distant portion of the system. Further, although nature sometimes effects a revulsive action for herself for her own salutary purposes, the awaiting for which constitutes the expectancy of medical treatment, the object of the treatment by revulsion is to anticipate, nay, often to thwart, the natural progress of the diseased symptoms, to force, as it were, Nature into the channel of relief which Art shall dictate. Thus the practice in question necessarily implies the employment of artificial means. It necessitates action in lieu of expectancy, and hence has been called by the French 'La Médecine Agissante' in opposition to the plan treated of in the last chapter—'La Médecine Expectante.' It leaves nothing to the powers of the economy, but trusts entirely to the efficacy of remedial agents, and it supposes the tendency of all disease to be towards the extinction of the individual." Change in the vital condition of a part would seem here to mean a diminution of vitality and amount of blood; but as this is the most common interpretation of the action of counter-irritants, it need not be discussed till later. To anticipate Nature is a very difficult undertaking; to thwart Nature is, we venture to say, a very foolish undertaking, even if it were possible, which we doubt very much. That Art should force Nature out of her own channels into channels that must therefore be unnatural would not appear to be a very wise proceeding, and the unfortunate

element in the matter would be that while Art might prescribe the treatment, Nature would dictate the result. Any theory or practice that would leave nothing to the powers of the economy goes too far. It need not be reasoned with. And again, the view that disease makes for the extinction of the individual is by no means certain. We prefer the very direct opposite interpretation, and not altogether without reason. Sidney Smith wrote to Miss Martineau: "What an admirable provision of providence is the gout! What prevents human beings from making the body a larder or a cellar but the gout? When I feel a pang I say, 'I know what this is for. I know what you mean. I understand the pint.' And so I endeavour to extract a little wisdom from gout." That is the view of disease which we prefer to take—that it is more for the saving and restoration of the individual than for his destruction. We are compelled then to refuse "La Médecine Agissante" if this is the philosophy on which it has been established.

Dr. I. C. Atkinson, in 1844, enunciated a "doctrine," as he called it, "entirely dependent on physiological action, and on its law that the greater the irritability of the constitution, the greater will be the sensibility of capillary cutaneous surfaces under the influence of counter-irritation." * If this means that the skin is more sensitive as the body is in a feverish state, perhaps it may be accepted; but if it means that a part which is inflamed responds more readily to irri-

* *Lancet*, 1844, Vol. I.

tation, it cannot be accepted without considerable reservation. It has been constantly observed that it is very difficult, when it is not quite impossible, to blister or irritate the skin over deep inflammations. Dr. Stokes indicated the right cause of this, as we have already seen. Dr. Lauder Brunton tells of a case in which repeated ordinary applications of iodine liniment had no effect on a gouty joint, but when the application was by accident upset over the joint, it had its effect at once. The writer has blistered a gouty toe six times in one day with a violently strong blistering fluid without producing the slightest sign of vesication and without any relief to the sufferer. It may be said that he would not do so now. The meaning in the matter was quite plain—so long as the inward determination towards the centre of inflammation was stronger than could be produced on the surface, the current of blood and energy could not be drawn outward, and it is well it was so. When the very angry toe and the whole limb was put into hot water the pain was soon relieved, and it was not long till it ceased altogether. This effort was not to force or to thwart Nature, but to assist the natural diligence, hence the much better result.

In the same year Dr. Henry Bennett wrote: "The phenomena to which counter-irritation gives rise in the human economy may now be considered as tolerably well known. There are few questions connected with medicine which have been more elaborately investigated than the doctrine of counter-irritation. But there

is still much, it must be confessed, that remains obscure. They are generally supposed to act in a two-fold manner; first, as derivatives by the local inflammation they create; second, as depletives by the serum which they abstract from the economy. There can be no doubt of the correctness of these views, which are universally adopted by the pathologists of the present day."* This is somewhat difficult to understand. How intelligible views that are without doubt correct can yet be obscure is not easy to comprehend. The two ideas of derivation and depletion will be rejected. Dr. Bennett was under Velpeau at "La Charité," where blisters were used "very large" and very freely, and he says he never saw evil but much good come by their use, which we may think was a better result than was merited by the kind of treatment. It is not necessary to discuss whether blisters should be used "very large" from a rigid unreasoning rule of practice. Blisters should not be used at all when they are not necessary, and even then as small as possible; that is, of course, as large as the case requires, but not larger.

Dr. James Turnbull, of Liverpool, in September of the same year, has a paper in which he follows Bennett's lines just given. The paper may be referred to, but we found nothing in it to note.

In 1852 Dr. Hughes Willshire read a paper to the Medical Society of London on "The *modus operandi* and value of Suppurative Derivation as a therapeutic agent."† He took a lesson from nature, exactly on

* *Lancet*, 1844, Vol. I. † Ibid., Dec., 1852.

the lines of Edward Jenner, already referred to, and was much in favour of the use of the stronger counter-irritants, and regretted that their use was "going out before a painless therapeutic." As far as can be gathered from a rather defective report, his fundamental idea seemed to be that there was a morbid humour in the system which could be "derivated" and withdrawn by means of an artificial suppurative process such as Nature resorted to in some diseases. This has always been the grosser way of interpreting the humoral theory into seeming harmony with recognised practice. It appeals to the understanding of "such as are of weaker capacity," and there may be a very small element of meaning in it, but it has done infinite harm. The discharging of a morbid essential of disease through the skin by means of irritant "remedies" is not worth discussing. The only interest it has or can have to honest men is how to stamp it out; for it is on this wretched and fraudulent basis that the charlatan quack builds his hope and his fortune. Mattei made his "pile" out of his "heteromorphous corruptive elements," and St. John Long out of his "acrid humours," and their loathsome kin are as busy to-day as ever they were. So long as we are without a scientific, natural, and simple theory of disease, so long shall this pest be the hateful complement of our profession and the abiding infliction of gullible humanity.

Dr. W. C. Dendy, in 1854, wrote on "Antistasis, or Counter-action." * He makes a new departure, but

* *Lancet*, 1854, Vol. II.

as will be observed, it is only another change of name. "There are," he says, "two grand modes of antistasis which Nature adopts to preserve and restore health, viz., elimination and vicarious action. Antistasis is the opposite of metastasis, which merely implies the transmigration of the same special action or quality from one locality or tissue to another, often of more importance, as from joints to pericardium, whereas antistasis implies the development or spontaneous establishment of another action in a remote and usually less important tissue. Metastasis is aggravating, antistasis is remedial." Nature certainly does adopt the grand mode of elimination to preserve and restore health, but whether this elimination is an antistasis we cannot say. As to vicarious action it is a very peculiar idea altogether. If a part is diseased it is not easy to understand how the institution of disease in another part will cure it. It is a very common occurrence that inflammation ceases in one part when it has begun in another; and it has been frequently observed that the outcome of a new disease seems to cause a previously active disease in another and perhaps remote part to cease. But is our reading of facts and our interpretation correct? Is it always because of the later inflammation that the earlier ceases? Does the one disease stop the other? And even if we must allow that they stand to one another in some degree as cause and effect, we must still ask if the one can rightly be esteemed to be the cure of the other, and whether we are acting reasonably and rightly in imitating this

that we consider to be a natural curative method? To answer these questions fully would take up more space than can rightly be given here. We may say, however, that the later action is the cause of the cessation of the earlier, because the organism can only efficiently perform one duty at one time, and it will always attend to the more urgent first. We venture also to say that there is nothing of a natural curative intention to be seen in the sequence of these events, and that we are therefore wrong to imitate the process in our treatment. Any theory of metastasis or antistasis implies the entity of disease, and we cannot afford to reason with that assumption.

CHAPTER III.

A DISTINCT ADVANCE.

Brown-Sequard and Nerve Reflex—Inman, an Able Essay—Chambers on "The Renewal of Life"—Budd and Davies on Rheumatism—Beale on Chambers, *et vice versâ*—Naumann's Observations—Johnson, Turner, Simon, and others on the Disposition of the Blood-vessels.

It was in May, 1858, that Brown-Sequard delivered his remarkable lectures on the nervous system to the Royal College of Surgeons. He introduced an entirely new element into the physiology of counter-irritation, and seemed to have raised the question to a much higher level than it had previously occupied. The nervous system had not been taken into account in studying or explaining this subject up to that time; but Brown-Sequard's demonstration of the laws of the reflex action of nerves came into the problem at once. He states the case thus: "When we wish to produce a modification in the condition of any organ, we must apply the means of irritation that we prefer to the parts of the skin or mucous membrane which have the most evident nervous relation to it. In most cases the parts acting with greatest power upon

another are those which receive the nerves from the same segment of the cerebro-spinal axis. If we wish, for example, to act on the kidney, the skin of the abdomen in its upper part is the best for the application of any kind of irritation. Do we wish to act on the eye, in case of amaurosis, due to insufficiency in the amount of blood, the irritant should be applied to the supra- or infra-orbitalis nerve. If the amaurosis co-exist with hyperæmia, the irritation of these nerves must be avoided, and the means of revulsion ought to be applied to the back of the neck, so as to act on the spinal cord, and through it by the sympathetic nerve which has on the eye an influence entirely different from that of the trigeminal." It will be noticed that he speaks of the irritant, and that all idea of the *counter*-irritant is dropped. This was made necessary by his new theory.

It is now over thirty years since these lectures were delivered, and though many competent men in that time directed no small effort to the subject, it cannot be said that the expectation which arose from Brown-Sequard's discovery was adequately, if at all realised. The nervous element, which then and thereupon came so very much into the interpretation of disease, was extremely delusive and unsubstantial. When we thought that we had hold on some solid fact, behold "A neurosis," perhaps the most "nebulous hypothesis" of disease ever imagined. That the principle of nervous reflex action is a factor in the mechanism of irritation is almost certain, but that it is the principal

factor has not yet been proved. So far as we know, the introduction of this element into our knowledge of the processes of irritation was not of any practical advantage. It did not make the slightest difference in our methods of treatment, nor did it bring any greater degree of certainty into our results.

Within the past few years, however, our knowledge of the nervous system has been greatly advanced in directions that would appear to bear on counter-irritation; and it is not unlikely that greater precision in the use of counter-irritants may result, even if such knowledge does not affect our conception of the meaning of the treatment.

In 1883,* Dr. Allen Sturge, in a very well reasoned essay, arrived at the interesting conclusion that "the sensory centres for the skin over any particular organ or part are associated more or less closely with those controlling the sensory functions of the subjacent organ or part," and on this he based and advanced a theory which may be stated as follows. When any internal organ is inflamed, the sensory centre for that organ is in an irritated state. There are two indications for treatment: soothe the centre by soothing means, or "tire it out by goading it to further action—so it rapidly becomes exhausted and its irritative action ceases." This is counter-irritation—in the author's own words. It is an extremely peculiar conception of disease and of its treatment. The same idea has met us already many times. The goading and irritating is now directed to the "centre" instead of the Archæus.

* *Brain*, Part xx.

It would seem to be a more tangible and scientific conception. We cannot, however, find any essential distinction between the interpretation that would goad and irritate the "centre" into exhaustion and helplessness to secure its peace, and that which was directed to whipping the rebellious Archæus into tolerable behaviour.

In 1877,* Dr. James Ross, in one of his remarkable essays, demonstrated among other things a close connection between internal organs and definite areas of skin surface through the *rami communicantes* — the sensory sympathetic fibres to such organs coming off from the same part of the spinal cord as the somatic nerves to such areas of skin.

This opened up new and most interesting paths of study which have been followed up with great success —notably by Dr. Henry Head, whose thesis† on "Disturbances of Sensation with Reference to the Pain of Visceral Disease" is nothing short of a triumph for the clinical method of investigating disease.

There would, therefore, appear to be good reason for anticipating that these valuable additions to our knowledge shall come in important ways to elucidate counter-irritation, though as yet their influence has not been felt.

On 30th June, 1858, Dr. Thomas Inman, of Liverpool, a man of great ability and learning, read a paper on "Counter-Irritants" before the Lancashire and Cheshire branch of the British Medical Association. Like every such effort of Dr. Inman, it was an exhaustive and

* *Brain*, January, 1888. † Ibid., Part lxi., 1893.

exceedingly capable inquiry. It is long and cannot be here quoted, but we would refer to it as to one of the few things written on this subject worthy of special attention. The following are his conclusions:

1. That there is no essential difference, except in degree, between the action of caustics and counter-irritants generally, when applied to the unbroken skin.

2. That these substances act intensely upon the part to which they are applied; more gently, but yet severely, upon the parts below and around it; and more mildly, yet still decidedly, upon the whole system.

3. That blisters, etc., are only useful in those cases in which stimulants would be locally applied by the surgeon if the parts diseased were on the surface of the body, or within reach of his hand.

4. That blisters, etc., are not essentially different in their *modus operandi* from such stimulants as iodide of potassium, arsenic, copaiba, the warm balsams, essential oils, resins, etc., except in degree.

5. That blisters are useful (in appropriate chronic cases) in proportion to the nearness of the diseased organ to the blistered surface.

6. That, as a general rule, blisters have only a temporary influence; and that, where they are really necessary and useful, they require to be repeated.

7. That the application of a vesicating irritant or stimulating material externally involves the idea of there being local or systematic debility in the sufferer, to correct which such stimulant is applied.

8. That counter-irritants of all kinds are physiologically incompatible with low diet, antimonials, purgatives, or other depressing remedies, inasmuch as it is manifestly absurd to stimulate locally, and yet depress generally.

Knowing where this question stood in Dr. Inman's day, we must regard these conclusions as positively remarkable; they are, indeed, almost final. With the exception of a few small matters on which we are even yet not certain, these generalisations are as good as, if not, indeed, better than any statement we have on the subject up to the present time. It is an excellent demonstration of how a clear, unprejudiced, strong mind, by applying a strictly logical method to even meagre details, may find its way to the truth.

We agree with the first conclusion, as may have been already observed. We should, however, like to add that we conceive the action here spoken of as referring to the parts under the skin, for we shall have to show that the action of caustics and counter-irritants on the tissues with which they are in immediate contact is very different. We consider the second and third findings as perfect. They state correctly observed facts as neatly and effectively as they can be expressed. From the fourth we must differ to this small extent, namely, that some counter-irritants, such as the warm balsams, essential oils, etc., have other actions beyond their simple counter-irritant action. The only pure counter-irritant is heat in its various forms — Baron Larrey thought that even heat gave off "un principe

volatil très actif." Perhaps all other counter-irritant substances have at least one secondary effect, as we shall see. The fifth is true, but it simply means that a diseased part may be so and so far removed from the counter-irritation as to be altogether beyond its special influence. This is what has left us so uncertain about the use of these remedies in diseases of the lungs and internal organs. Blisters may have to be repeated in many cases, but not necessarily in all cases. The seventh and eighth conclusions are correct and extremely valuable observations.

We have to express our sorrow that it is only very lately we came across Dr. Inman's paper, and our greater sorrow that in all our considerable research in connection with this subject, we have not once met with any reference to this excellent piece of work. It might as well have never been written for all the influence it has had on our literature or practice. If first-class men produce first-class work only to lie buried in dusty heaps of tomes in out-of-the-way corners of our museums, it is no wonder that medical progress has been so slow and so uncertain. Dr. Inman is one whose contributions to the literature of practical medicine should not be allowed to lie forgotten and unknown.

The paper attracted a little attention at the time, and some correspondence followed on it, but nothing of any practical value resulted. Dr. Spencer Thomson, of Burton-on-Trent, came forward to defend and extol croton oil. He used "this most valuable counter-irritant" for twenty years with every possible satis-

faction, and hoped that nothing said by Dr. Inman would prejudice people against its use.

Mr. Porter Smith wrote a letter which has some historical interest, and we reproduce it. "Whilst I perfectly agree," he wrote, "with that part of Dr. Inman's paper on Counter-Irritants which explains the effect of blisters placed directly over the inflamed part, I cannot so readily give up the belief in the really derivative and undoubtedly beneficial effects of blisters applied at some distance from an acutely inflamed tissue. It is the practice of Dr. Budd, of King's College Hospital, to apply blisters at the distance of several inches on the heart side of the acutely-inflamed joints in rheumatism, taking the precaution, however, to remove the blister in half the usual time, and apply warmth—it may be in the shape of a poultice. The effect is that a large quantity of serum containing the irritating *materies morbi*, lactic acid, is obtained from this temporary gland; whilst there has not been possibly time for the cantharidine to pass into the tissues and irritate the acutely-inflamed articular tissues, as it seems to do, in keeping with Dr. Inman's theory, if the blister be allowed to remain on the usual time, or if it be placed directly over the joint. Again, in rheumatic pericarditis, though a blister placed directly over the organ will, in consonance with Dr. Inman's theory and my own practice, increase the mischief, yet if it be placed at the distance of several inches from it, it will greatly relieve, in accordance with the doctrine of counter-irritation or revulsion. I am therefore

equally convinced of the positive truth both of Dr. Inman's theory of absorption and of the venerable doctrine of counter-irritation or revulsion."

This was written in March of 1858, and in 1864 Dr. Herbert Davies published his lecture on "The Value of Blistering in the Acute Stages of Rheumatism," which attracted great attention and caused a great deal of discussion. Davies' practice, which he set forth, and which was accepted as altogether a new departure in treatment, was, as we shall see farther on, quite the same in theory and in practice as that of Dr. Budd, here declared at least six years before. Yet we have no reason to believe that Davies knew anything about it, otherwise he would surely have acknowledged it.

It may also be here observed that Bartholow gives the credit, whatever it may be, of this treatment of rheumatism, by blisters, to a Frenchman — Dr. Dechilly — and maintains that the only credit due to Davies is that he introduced the French practice into his work at the London Hospital; but we are not at all clear on this point. Certainly the contemporaries of Dr. Davies in this country were not aware of the fact, if fact it was, for they gave him the whole credit.

A very interesting volume on "The Renewal of Life," by Dr. T. Chambers, appeared in January, 1863, in which what appeared to be new theories of disease and of counter-irritation were given. These were followed by a good deal of free criticism and comment,

most important among which was that of Dr. Lionel Beale. He assailed Chambers' whole position, and this led to an interesting little duel. Briefly, Chambers' opinion was that "Disease is a deficiency of action and partial death, and that every treatment and aid to cure is but a means towards the renewal of the measure of life that has been lost." This is a most excellent theory, exactly the same as John Brown's, of which we have already expressed acceptance. It is so philosophical, comprehensive, and simple that we doubt if it can ever be improved upon. He seems to have entertained the ordinary views of counter-irritation up to a certain point. He states the opinions then held as follows: "Counter-irritation substitutes one disease which is less dangerous and powerful, or whose disorganising tendencies are temporary, for another which may be dangerous or painful, and tends to destroy life." It is not clear that he departed from this position himself, but he gave it the colour of his theory by showing that even thus viewed it ministered to the renewal of life, evidently by reason of its depleting effects. He even goes so far as to say that the withdrawal of blood from the body ministers to the same purpose, though he admits that "this is difficult to understand," which it certainly is. We gladly accept his theory of disease, with a simple verbal reservation to which we shall refer again, and we believe that if he had anchored himself to it he would have cast more light on this subject than he can be rightly said to have done. The

only point worth recording which he contributed was that "the acceleration of circulation by counter-irritants results in absorption, on the well-known principle that endosmosis increases with increased motion in the fluids."

In the following month, February, 1863, came Beale's uncompromising assault.* He altogether denied the validity or usefulness of Chambers' theory of disease, and he denied that the interpretation of the action or intention of counter-irritants given by Chambers rightly represented the views of the time. "I have always been taught," he writes, "that by Counter-Irritation we seek to establish an increased action in one tissue or organ for the purpose of diminishing an increased action which is taking place in another tissue or organ, the performance of whose functions is of great importance to the organism." He then, after explaining the pathology of inflammation, proceeds to give his own conception of the action of a counter-irritant as follows:

1. It excites the centre in which afferent nerves are implanted, and it is possible that the calibre of the small arteries to the mucous membrane (and other parts) may be diminished in consequence.

2. In consequence of the contraction of the arteries, the walls of the capillaries would be relieved from the pressure of the blood, and provided their elasticity was not permanently impaired, they would recoil, and the blood they contained would be drawn

* *Brit. Med. Journal.*

on to the veins. The effusion of fluid would be diminished, the cells would increase more slowly, and time would be allowed for the production of formed material (cell wall) around each.

3. Crude materials in the blood may be taken up by cells which are multiplying with abnormal rapidity in any part of the body. So the skin cells, being under counter-irritation, overfed and active, may separate from the blood materials which would otherwise form the pabulum of pus-cells, etc., and therefore the evil consequences of inflammation are diminished.

It is not long before Dr. Chambers appears in order "to give the Professor of King's College a considerate answer."* In justification of the rendering he gave of counter-irritation, and which Beale condemned, he quotes Pereira, not as an authority in lieu of argument, but as an authoritative historian, and Pereira's definition is: "The production of an artificial secondary disease in order to relieve another or primary one." By this and by other means he plainly makes his position good, and when he turns on Beale's own theory he simply revels in its ruin. He works out an unanswerable *reductio ad absurdum* by setting the doctrinaires at one another. "Rokitansky thinks that 'irritation of the sensitive nerve centres causes antagonistic palsy of the *nervi vasorum*.' Dr. Beale thinks it makes them contract! Dr. Headland thinks the effect of blisters is to draw off the attention of the nerves from a morbid part. Dr. Beale thinks it draws it

* *Brit. Med. Journal*, 14th March, 1863, and 4th April, 1863.

on!" and so on. And he sums up thus: "For my own part, I think that when we talk about stimuli, irritation, attention, etc., we are using the language of allegory, and had better give it up." Dr. Beale has done his duty and served his profession honourably and well; and it is no disparagement to him if we are compelled to say that Chambers came out of the duel more than victor.

It has been an object in this essay not to go outside English works of reference, but the following, by Dr. Naumann, of Leipzig, may be excused, as it is, in one or two points, important, and has been frequently referred to by English writers. He asserts * that he proved:

1. That the therapeutic effect of cutaneous irritants is brought about by reflex action.

2. A strong irritation diminishes the heart's action.

3. A weak irritation increases the heart's action (a strong irritation has same effect at first).

4. The place of application makes no difference in the result.

5. A powerful irritation reduces the temperature remarkably (preceded by a rise).

6. In some the effects are marked, in others—as in the asthenic—little or none.

7. The amount of irritation must be regulated to the circumstances to get the best results.

These statements can be confirmed by experiment

* *Brit. and For. Med. Chir. Rev.*, April, 1868.

only, so they cannot be discussed, but they shall be taken as proved so far as they may come into the argument.

Dr. George Johnson, in 1868,* speaking of counter-irritation, says: "In my judgment a very common mistake is that of applying strong irritants so as to influence the skin in the early stage of acute inflammation of the viscera or their investing membrane. It should be borne in mind that the circulation through the vessels of an inflamed part is more or less impeded, more or less stagnant. If then, in a state of acute pleurisy or pericarditis, we excite inflammation in the skin over the chest, the result is the opposite to that brought about by local bleeding, cupping, or hot fomentations. For, whereas by these means we divert blood from the deeper tissues to the surface, the effect of an inflamed patch of skin is, through the arterial connections, to throw the blood back on the parts beneath." He looks to depletion for his good results. To empty the gorged vessels of inflammation is always the object. We do not admit the correctness of his interpretation of the action of the blister.

A very important anatomical fact may be recalled at this point, the knowledge of which might have saved not a little of what has been said and written on counter-irritation.

Sir William Turner, in 1863,† published a valuable

* *Brit. Med. Journal*, 7th Nov., 1868.

† *Brit. and For. Med. Chir. Rev.*, July, 1863.

paper, showing that he proved by injection "a very complete series of anastomosing arteries between visceral and parietal branches of the abdominal aorta." Yet not one of those men who took part in the controversy on the examination of which we are to enter knew anything about this discovery in 1869 and following years. The *British Medical Journal*, in 1874, knew nothing about it, for in a leading article it remarks: "Johnson and Simon have *suggested* the existence of this arterial connection." It only shows how easily and how soon facts of first importance may go out of sight and remain unknown. Johnson not only suggested but actually proved this arterial connection in the case of the mammary artery which supplies the pericardium and integuments of the heart. We think it was Ludwig who showed that the skin over the loins could be injected from the renal artery. The intercostal arteries supply both skin and pleura. It is well known that the blood supply to the skin over and about joints is intimately and directly connected with the circulation of the joints themselves. Mr. Simon also owns that this is the most important element in the interpretation of the action of counter-irritants. All this and the general law which it virtually proves, is very interesting, as will be seen from what is to follow.

CHAPTER IV.

A VIGOROUS DISCUSSION.

Dickinson condemns Counter-Irritation in Theory and in Practice—Anstie supports him—Several weak defences—Sturdy defence by Risdon Bennett—Ross philosophical—Dauvergne *père* condemns Velpeau.

We have now to consider the most important discussion that perhaps ever took place on this subject. It was commenced by Dr. Howship Dickinson and Dr. Anstie, in the end of 1868 and beginning of 1869, and was continued for several years. In the St. George's Hospital Reports, 1868, Volume III., Dickinson's first paper appeared. He assailed the practice of counter-irritation with evident relish, and with the clear intention of giving the tradition and the doctrine no quarter. Paris stated the rationale of the practice to be that, "In all inflammatory affections of the internal organs, a blister placed on the contiguous surface affords great relief, not only by the discharge it occasions, but by a transference of the inflammatory action to the surface;" and Headland that "A powerful impression on any surface of the body seems to be capable

of arresting and diverting, as it were, the attention of the system and thus for a time of checking the morbid process." Dickinson sets himself to demolish these views. "To suppose that excoriations of the surface of the body, in themselves trifling, can produce deep-seated alterations in unconnected though neighbouring organs, to imagine that bedaubing the chest with tincture of iodine can modify the course of tuberculous disease in the apex beneath, or that a superficial vesication can promote the restoration of a hepatised lung, are views founded probably on no better reasoning than that which ascribed a formation, the result of profound geological changes, to an artificial modification in the surface of the neighbouring soil."

It is to the logic of Tenterden Steeple and the Goodwin Sands he here refers. He does not accept, though he does not attempt to refute, Hunter's "contiguous sympathy" of parts, but he accepts it by inference, for he assails "those who have superadded an apocryphal creed in which antipathy has taken the place of sympathy, which asserts that a superficial inflammation tends to counteract a change of the same nature in deeper structures." After a long and careful review of the several channels by which counter-irritants may act — vessels, absorbents, nerves, and continuity or apposition of structure—he sums up thus :

"Although in certain specific diseases the morbid action sometimes transfers itself from one place to another, we cannot expect such a transference except in disorders which, like measles and scarlatina, depend

upon a circulating and erratic poison. And even under these circumstances we can rarely, if ever, produce artificially the desired transfer.

"A local application has a local action. It warms or cools, soothes or stimulates, or produces its appropriate effect, be it what it may, upon the tissues which lie within the short range of its immediate influence. If the skin be made to pour out a serous discharge, the serum may be withdrawn from a neighbouring accumulation, but we have no knowledge which will warrant us in ascribing any remote or indirect remedial action to the excoriations and other local inflictions which have been practised under the idea of counter-irritation. We have no reason to suppose that we can under any circumstances lessen an internal inflammation by exciting inflammation of the superincumbent but disconnected skin, unless there be some great undiscovered law of which pathology shows no trace, and of the existence of which clinical experience has given no proof.

"We cannot hope for benefit from counter-irritation. We may therefore cease to apply irritants to the skin of the head in disturbances of the brain, to the back in affection of the spinal cord, to the chest in diseases of the lung, and in general forbear to apply remedies to parts which have no direct vascular connection with the structure diseased unless the remedies are of such a kind and of such a magnitude as to bring the whole system under their influence."

Dickinson in this paper exposed himself to retort

by denying the actuality of experience, for experience is entirely against him. He also assumes too much—that things are not, because he does not know them to be, or because they are not known to be. These very things have come into our knowledge since—were, indeed, in our knowledge at the time he wrote. His reasoning is not always careful, still there is a good honest ring in his work.

In February, 1869, Dr. Anstie published a lecture on the same subject.* He compliments Dickinson on his courage, and on the substance of his paper, and declares that he—Anstie—entirely agrees with him, having entertained similar views and written them so far back as 1861. He ridicules the idea that counter-irritation can affect the deep or internal structures, for example, in pneumonia or peritonitis. "In fact, the whole leading idea of counter-irritation is a relic of notions belonging to times which were antecedent to the birth of scientific physiology. It is simply shaking a red rag at the 'demon,' and if not that, what?" He denies much if any advantage on the "vascular theory." The "nervous theory" he allows, if we happen to put the blister in the right place only. The "stimulation of the absorbents" may be admitted, but the effect is likely to be bad, not good, by reason of absorption from the wound we have made. He is altogether against strong counter-irritation, and prefers anything short of that to be named stimulant. "The popular use of the term

* *Lancet.*

counter-irritation is thoroughly bad, and it is not a mere negative fault, but a positive mischief." He allows just a possible benefit to it as a stimulant, but condemns the whole theory.

An interesting correspondence followed on Anstie's paper. John G. French, F.R.C.S.,* accepts the beneficial results, but explains thus: "It is effected by the corresponding diversion caused by the reparative processes of the new injury. So the point to study is, what is the reparative process peculiar to each remedial injury." John Hunter said something similar to this, but probably for different reasons, and with a different intention; and perhaps it is the same idea as underlies Trousseau's Substitution, with which we shall become acquainted later.

W. Sumptre, M.D., wrote:† "I now believe that blisters do immense good by diverting the patient's attention from the internal organ or part affected." This suggests the influence of the mind over the body, and points towards faith-healing. Up to this time some such conception as this, and probably for lack of any other, appears to have obtained very generally. We find one man lauding blistering of the spine in intermittent fever; and he was "disposed to attribute the benefits derived from the blistering more to its engaging the attention of the patient by its continuous pressure and action than to any therapeutic effect it had as a counter-irritant." We are not at all opposed to the opinion that very great good can be effected

* *Lancet*, March, 1869. † Ibid.

in the treatment of disease by influencing the mind favourably. The physician who does not recognise this, or knowingly disregards it, is placed at great disadvantage. It may, however, be doubted if any competent man ever does or ever can disregard so important an aid to the successful performance of his duty. It cannot be denied that counter-irritants may serve no small good in this way, but it must be remembered that any good effect they have in this direction arises from the reasonable belief in their efficacy which long experience has taught.

Dr. R. B. Painter would propone defences. "I wish," he says,* "to put in a plea in favour of a time-honoured practice." He makes five points in favour of the practice :

(1.) Congestion and inflammation through defective nerve force may be undone by stimulating the peripheral nerves. (2.) An inflammation in one part may by vicarious action cause another to cease. (3.) New action set up by an irritant may break the continuity of morbid nutrition, as a bad habit may be broken by a sudden necessity or shock. (4.) The artificially produced discharge may carry off the peccant humours. (5.) The products of inflammation may be absorbed by reason of the stimulation.

It will be observed that all his points are merely possible and hypothetical, and that he offers no proof for any of them. But as they have all met us already in various forms we need not now consider them.

* *Lancet*, April, 1889.

The best result of the discussion up to this time, however, was that it attracted the attention of the late Dr. James Ross. In a note to the *Lancet** he said that he had advanced the stimulus theory of counter-irritation even in his student days. In May of the same year, 1869, his pamphlet on "Counter-Irritation" was published. This was certainly and by far the most competent and effective effort ever directed to the question up to that time; and perhaps nothing better, if anything so good, has appeared since. It will therefore be excusable to pay special attention to it. The first position he takes up is thus stated: "I have cautiously employed counter-irritation in the first stage of inflammation, and seen it employed by others, but I never saw a single case in which the first stage of inflammation was followed by health; the invariable result has been the progress of the disease into the second stage. It may, therefore, be laid down as an empirical law, that when counter-irritation is employed in the first stage of inflammation, it has a tendency to develop the second stage, and has also a tendency which is not manifest on all occasions to extend and aggravate the disease." We must give close attention to this statement. The most important thing of all to observe is that the inflammation according to this view is a disease, and that the disease is an evil which it is most desirable to arrest by any or every means. But, and surely this also is important, he never saw inflammation cut short, not

* March, 1869.

even by counter-irritants. In this intensely significant observation he comes into line of thought with other men who have taken no mean place in the history of medicine. Hunter said it was difficult to understand how inflammation could be cut short without removing the first cause. Astley Cooper said it was not desirable, even if possible, to stop inflammation; and Hughes Bennett that an inflammation once established cannot be cut short. What then can be the object of our treatment? We acknowledge it cannot be cut short, yet we try to do so and fail, fortunately perhaps. Ross himself says, five years later: "In short, the counter-irritation has not checked the diseased lung, but merely assisted it through its natural progress." Is not this the right interpretation of his rightly observed fact, that counter-irritation on all occasions extends and aggravates, or promotes, the disease? We certainly think so, and we shall endeavour to prove that it is so.

His second position, which is not less interesting, is thus stated: "All are agreed that the beneficial action of counter-irritation is most manifest in the second stage. It promotes absorption of effused fluids, and tends to diminish the quantity and improve the quality of muco-purulent discharges." This is extremely clear, and it is a valuable confirmation that counter-irritation promotes the natural process in the best possible way. It is easy to see how by accelerating nutrition and healthy change, stimulation promotes the absorption of effused fluids, and how in

proportion as repair is brought about the quality of the discharges improves and their quantity diminishes.

His third observation is also very good. "There are morbid states, not inflammatory, over which counter-irritation exerts a beneficial influence, that is, a tendency to promote the return of the morbid structure to a state of health." This simply means that the vitality of the diseased part is so low that it cannot of itself initiate or carry out the desirable process of repair. The special activity brought about by the irritant, or say stimulus, determines to the part the measure of blood and nutriment that enables it to return to a state of health. Of course, there is always the necessary condition that there must be sufficient nutritive blood somewhere in the neighbourhood of the diseased part, or available to it from the general supply—otherwise the process fails. This is exactly Dr. Naumann's observation, that patients may be so low and weak that the organs cannot give any response to the stimulus.

There are a few other pregnant observations of his that we cannot pass over. He holds that a theory of counter-irritation is impossible without a clear theory of inflammation, and his theory is that the first stage of inflammation is a healthy, nutritive activity, but that after stasis defective nutrition results, and that stimulation is then and therefore desirable. We accept every word of this, with the one small reservation that we do not consider the stasis condition to be in any sense wrong or unnatural. True, the

special activity of the first stage may have so far exhausted the vitality of the part that some assistance is desirable, and this the stimulus affords.

"Both the beneficial and the prejudicial effects of counter-irritants arise from their power of increasing the nutritive activity of the structures in the neighbourhood of which they are applied." This we accept entirely. All are agreed that in the first stage of inflammation, so long as the organism is fit to carry on its own process with reasonable efficiency, stimulation would be out of place and wrong. It is when and where the natural process fails from exhaustion, or general debility, that the stimulus is called for and is rightly applied.

"If counter-irritation allays high action, it is difficult to understand why it should not be employed at the beginning of inflammation." It does not, however, allay high action, but may aggravate it even to paralysis or rupture of the capillaries, and therefore it should not, in such a condition, be used. It is surprising that Dr. Ross should have troubled himself with this groundless assumption.

"If it stimulate low action, the need for it in such case is plain." Certainly. "On the other hand it becomes very evident why counter-irritation should be employed during the second stage of inflammation and in other states of defective nutrition." He makes a clear distinction between counter-irritants, or as he would call them stimulants, and depressing revulsants, and he also justly condemns our old-wife nomenclature,

which pretends by counter-irritation to allay, control, subdue, or soothe inflammation, and says we should get rid of them all. In this also we heartily concur.

In June, Dr. Risdon Bennett came to the defence of counter-irritation. He admits that he was drawn by the papers of Dickinson and Anstie. He cannot endure "the Pyrrhonism which is the ruling philosophy of the day," and he smites its exponents without mercy. He quite justly asserts that "there may be much good in counter-irritation though all the theories supposed to underlie it have been found wanting." The whole history of the practice is proof of this assertion. He heaps incontestable proofs "from nature's own operations and from therapeutic experience," to show the value of counter-irritants. It may be said without doubt that he did not leave a fragment of Dickinson's position tenable. Theories may be innumerable, and may vary ever so much, but they do not touch the incontestable proof of the usefulness of the practice. Practical medicine, he maintains, "has a distinct domain of its own, into which physiology has not yet proved its right to intrude; and it has its own evidence, however much science may seem to dispute its validity." Perhaps this is not a very safe position to take, but it has little bearing on our subject. His definition also is not very strong: "Counter-irritants are agents which, by their irritant action, determine an increased attraction or flow of blood to one part of the body, and thus influence morbid action in some other part." It is the old refrain; withdraw the blood from the

inflamed part and so cure it. He evidently had not seen Ross' pamphlet when he wrote this—indeed, the pamphlet was reviewed in the same issue of the *Practitioner* in which Bennett's article appeared. The evacuant effects credited to blisters, cupping, leeches, etc., he altogether denies. So far, then, as Bennett's paper was a defence of the practice of counter-irritation it may be said to have been complete and unanswerable. Dickinson felt this, for so subdued and undone is he when he appears in his own defence in August that he is scarcely recognisable as the rampant Pyrrhonist of six months before. He sees the weakness of Bennett's definition, and, of course, takes his advantage; but to the practical proofs of Bennett he entirely gives way. He brings nothing new to the discussion in this second paper.

Anstie, in reviewing Dr. Ross' pamphlet, also refers to Bennett's definition, which he could not accept, but he differed from Ross on a point of considerable importance. The theory of Ross made inflammation and the results of irritation identical—in fact, anything which draws blood to the part, however it may appear to differ in character and degree, is, in effect, essentially the same. To this Anstie could not agree, for mild rubefacients and even warm water would by this view be esteemed irritants.

We have said that this is a point of considerable importance, not because we see any real difficulty in the matter either on the side of physiology or logic, but because we shall find five years after this, a man

whose opinions cannot be lightly disregarded, make this same distinction that Anstie makes, with considerable emphasis and no small appearance of reason.

We may, however, state that we altogether agree with Dr. Ross, for we believe that no one can say where rubefacients end and irritants begin, and it will take far more of fact and of reason than has yet been advanced to show that in their effects they are essentially different.

Dr. Alexander Davidson, of Liverpool, also took up the defence in a paper read before the Medical Institute of that town.* He maintains that, "the old theory of counter-irritation drawing away blood from the diseased organ to the surface is indefensible, but the view that disease can be modified by influences acting through the nervous system is quite consistent with our knowledge of the dependence of the healthy processes of circulation and nutrition on the nerves. As to the therapeutic evidence of the value of counter-irritation the evidence is as strong as it can be."

A translation, by Dr. Anstie, of a paper by Dr. Dauvergne *père*, on "The Dangers of Blistering, especially in Pneumonia,"† appeared in October. It is a very interesting paper, written with much enthusiasm. The author brings abundance of proof against the practice, not only from his own experience, but also from "Louis, the sceptical physician *par excellence*, the reasoner, the conscientious verifier; from

* Liverpool Med. and Surg. Reports, Vol. IV.

† *Practitioner*, October, 1869.

Andral and Trousseau, and from Malgaigne, making the arches of the Academy ring as he crushed vesication with the immensity of his science." The conclusion he arrives at is that where blisters do any good it is because of their genuine inflammatory action.

Velpeau states the effect of blisters well. "Their action," he says, "is limited to hastening and deciding a suppuration or a resolution which was previously uncertain. Blisters have their precious quality of bringing about resolution, if that be possible, and of provoking suppuration if that be inevitable." This is an excellent expression, but it appears at first sight to be much more precise and significant than we find it to be. The blister certainly hastens, but does not decide, suppuration. If a part is not in effect dead, the blister cannot determine its suppuration. The second statement is much better. If resolution or the restoration of a part to the *status quo ante* is in the natural intention possible, the blister will help to bring that about; and if the structures are so low in vitality that they cannot recover, the blister certainly aids and hastens nature to break them down and throw them off.

In the following year two admirable papers appeared in the *Practitioner*,* one by Dr. Ross, and one by the editor, Dr. Anstie. They are both directed to a summing-up of the discussion. Dr. Ross' paper is a powerful piece of destructive criticism. He assails Dr. Risdon Bennett's old-fashioned theo-

* February and March, 1870.

retical views, and rightly condemns Dickinson for his "universal negative," as well as Dauvergne for being too credulous and starting from too narrow a basis; but he brings nothing new to the discussion, nor does he, so far as we are able to judge, improve his own position. It is, indeed, very remarkably evident from this paper that Ross, keen logician and clear-minded man though he doubtless was, missed, or failed to grasp, all the elements of the problem. He entirely forgets or neglects the individual constitution as a factor in the results, and reasons as from the remedy alone. This of necessity leads him into wrong inferences and conclusions, and exposes him to Dr. Anstie's just retort, that "the influence of counter-irritants is not depressing but stimulating when they really produce a good effect, but I should deny at once that they never lead to lower vital action. On the contrary, I have seen them so lower it with most disastrous results." It will be at once apparent that this difficulty would not have arisen if the constitution had been taken into account. The irritant must be a stimulus always, but it must have a sufficient vitality in the body to stimulate, and a sufficient reparative blood to draw on, or it must fail and perhaps produce not good but disastrous results, as Anstie says. Anstie and Ross agreed on the main question, that counter-irritants act by stimulating the circulation in the part to which they are applied, but they differed on minor matters of interpretation. Ross

held that irritants acted in straight lines down into the tissues, regardless of structure; as some of his imaginative critics put it, "like bayonet thrusts." Anstie denied this, and held that they acted by reflex action on the trophic nerves of the part.

This brings the discussion to a close, and though the subject is not lost sight of for several years after, the personal element falls out of it, and our further reference shall be to the independent efforts and opinions of men who have contributed more or less to our knowledge of the matter. We can now in a measure understand the meaning of Dr. Anstie's expression that he was "fairly startled by the wide divergence of views that is now shown to have been all along concealed under the appearance of agreement in the orthodoxy part."

CHAPTER V.

LATER ESSAYS.

Fourneaux Jordan—A New Theory—Ainslie Hollis, Lauder Brunton, Zulzer, Chiene, Trousseau—A Theory of Substitution.

BEFORE proceeding, however, we must fall back a little to consider the work of Mr. Fourneaux Jordan. In February, 1869, he published a paper on "The Treatment of Inflammation," but strange to say, though this paper appeared in the *Practitioner*, of which Dr. Anstie was editor at the time, and was published in book form in the following year, Mr. Jordan never seems to have come into consideration at any time throughout the discussion which we have just reviewed. We have wondered whether his peculiar assumption of absolute superiority and independence might not account for this isolation. He says: "I have ceased to ask myself what books say, what teachers say, what friends say." Now it is very likely that we have been more or less disappointed with what books say, and especially medical books; with some of our medical teachers even we may not have always been satisfied, and perhaps the path of duty

was not always that pointed out by our friends; but still we should consider it neither safe nor wise to disregard them all. Mr. Jordan's attitude unfortunately recalls John of Gaddesden and his "Rosa Anglica":

> Et sicut Rosa excellit omnes flores,
> Ita iste liber excellit omnes practicas medicinæ.

We say that this feeling in the work is unfortunate, for Mr. Jordan says many excellent things, and brings a mass of evidence from practical results to support his views. With such expressions as the following we in great part agree: "The secret which underlies inflammation is unknown, but there is no single remedy which can check or destroy it, there is no evidence to show that inflammation is other than one process, however many its stages, degrees, products, and results." We must even accept the results of his practice to have been very successful, but we must differ from much of his method, and from all the reasons to which he imputes its success.

His object is to check inflammation and make it impossible; and to effect that end he commends the use of pressure and counter-irritation, an elevated position for the inflamed part, rest, and where it is practicable, the removal of the cause.

He gives his reasons as follows:

An absolutely essential condition to the existence of inflammation is increased space; therefore by pressure prevent increase of space, and inflammation becomes impossible.

Another essential condition is an increased quantity of blood; therefore, prevent this by pressure, elevation, and counter-irritation in the next vascular territory, so as to withdraw the blood from and deplete the inflamed area.

Again, when inflammation prospers there is no other inflammation present.

Again, every inflammation must have a cause, so remove the cause if you can.

And finally, give rest.

Regarding these elements in his treatment we must say that those considered of first importance and essential are of mere secondary importance, whereas those he regards as of minor importance are beyond all comparison the most essential. In any reasonable treatment of inflammation the removal of the cause is the first step; and putting the part at rest is the second, without doubt. In fact, these two steps alone constitute an ideal treatment, and all that is ever necessary, if the vitality of the organism be sufficient to repair the injury unaided. Pressure, which can only have one object, namely, to prevent an increased supply of blood to the part, we refuse entirely; not alone because we believe the increased supply of blood to be right and necessary, but because the pressure that would prevent circulation would destroy the part altogether; and if it is only sufficient to diminish the quantity of blood coming to the injury, it can only retard the natural process of repair. Perhaps, indeed, moderate pressure may help the circulation rather

than retard it; but any pressure that obstructs the circulation would be mischievous. Elevation is right. That, however, does not prevent blood coming to the part, but rather encourages it by securing a good flow from the veins and so preventing stagnation in the capillaries. We must interpret counter-irritation in the neighbouring vascular area, as he practises it, in a different way from Mr. Jordan. Let us take one of his own examples. "In chronic inflammation of the knee, synovial or osteal, or both, I cause two thirds of the thigh and two-thirds of the leg to be vigorously irritated with iodine, the knee itself less than the thigh and leg. Pressure, rest, and position are carefully attended to. Any language that would correctly describe the result would appear bombastic." We do not doubt that the result of this treatment may be excellent, but we cannot believe any sane human being would deny that the effect of it on the inflamed part is to increase rather than diminish the blood supply. Mr. Jordan's treatment is, with the exception of the pressure which he makes the essential in his treatment, altogether right and good, but for reasons entirely different from those he entertains. The following is a strange but very suggestive proof of this contention that Mr. Jordan misinterpreted his facts. He writes: "We should certainly see that the different organs are acting healthily, as the stomach, intestinal canal, liver, kidneys, and skin. On physiological and pathological grounds, still more because in actual cases I have

found most benefit from it, I give iron in all or nearly all inflammatory diseases, and I sustain the patient on a nourishing and suitable diet." In other words, he takes every reasonable means to secure an abundant supply of clean and nourishing blood, and then he tries to starve the part that needs it most.

Mr. J. V. Solomon writes in the *Lancet* for March, 1870, "On the Use of Counter-Irritation in Inflammatory and Congestive Diseases of the Eye." It is a scrappy effort, and shows very plainly how barren and unprofitable a very considerable experience and abundant opportunity for observation may become to the man who merely practises by rule of thumb.

Dr. Laycock, in his lectures in 1871, thus states his views: "All counter-irritants act either locally on the tissues, including the nerves and blood-vessels, or else on the nerve centres through the nerves, and thence by a reflex action on the same or a distant organ or tissue." But it will be seen that this is only saying nothing in a roundabout way. It shows how they may act, but not how they do or are known to act. He attaches great importance to reflex action on the trophic nerves, a matter which we have not been able to understand. He is, however, quite clear on the usefulness of counter-irritants, and the article is well worth reading.

Dr. Ross again, in March, 1874, read a paper on the subject before the Manchester Medical Society, but whether from a desire not to go too closely over his own lines, or from a desire to defer to the opinions of

others, the question is not nearly so well stated as it is in his pamphlet referred to.

A paper on "The Therapeutic Action of Vesicants," by Dr. Ainslie Hollis, appears in the St. Bartholomew's Hospital Reports for 1874. It is a very provoking essay—if the epithet, which is not used in any offensive sense, may be excused. He states his position as follows:

"In some experiments instituted by me, and detailed elsewhere, I have shown that throughout the animal kingdom, with few exceptions, there is a certain general similarity in the action of vesicants. In the lowest forms of animal life, such as the Actiniæ, contractility is the principal manifestation of the creature's vitality, and the application of a vesicant to the surface destroys this contractile power at the same time that it produces an œdematous enlargement of the tissues at the affected part. As nerves and blood-vessels are not found in these animals, such structural changes must take place without the intervention of the nervous or vascular systems. In the more highly developed annelids this loss of contractility with swellings of the tissues is supplemented by the widening and paralysis of their pulsatile vessels at the spot, and the stagnation of their non-corpusculated blood within them. The sensation of the injured parts is at the same time impaired, as is shown by their comparatively sluggish reaction when scratched with a needle. Bullæ containing a watery plasma are a later result of the application. The phenomena here

detailed differ only slightly from what takes place after the application of a vesicant to the skin of the higher animals, and I conclude that they are due to a similar cause, viz., the diminution or loss of the vital principle in the affected tissues. Even in the vertebrates the local action of a vesicant is restricted almost entirely to the tissue-elements at or near the point of application, and is probably independent of any vascular (and possibly nervous) influence.

"The following experiments demonstrate this fact clearly. If the fresh abscised tail of a newt be touched with strong *liquor ammoniæ*, then washed and placed in a shallow vessel containing water, in a few hours a large bulla filled with an albuminous liquid rises at the seat of injury. The production of serum after vesication is usually ascribed to osmosis of fluid through the walls of the distended blood-vessels of the part. In the above experiment, however, no blood can remain in the dissevered vessels of the tail, and we must therefore look elsewhere for the causes of the serum-filled bulla. I conclude that the liquid must have exuded from the atonic and swollen tissues immediately adjacent to the injured surface. In a somewhat similar manner vesicants will act on the segments of an earthworm after they have been spontaneously cast off by the creature. In these cases the phenomena are, as far as the circumstances will allow, similar to what is seen when a vesicant is applied to the perfect animals."

From this point he proceeds to refer to the ex-

periments of Naumann, and to Dr. Anstie's observations, and sums up: "We are thus left in the midst of conflicting theories. Clinical experience, however, shows that vesication does diminish the intensity of internal inflammation; and the experiments of Zulzer prove its depletory action. I therefore consider that the upholders of the Hunterian doctrine of Revulsion are for the most part right. Again, the hypothesis which maintains that the therapeutic influence of a vesicant is conveyed by the blood-vessels and nerves connecting the blistered skin with the diseased tissues, counts a considerable number of supporters. We may dismiss the doctrine of vascular dermal areas in immediate arterial connection with deeper visceral regions as requiring fuller anatomical support than is at present attainable." We may consider it proved for clinical purposes:

1. That the local action of vesicants consists in first diminishing and subsequently destroying the vitality of the parts with which they are brought into contact.

2. That this local action is also depletory—whilst increasing the amount of blood in the tissues immediately under the blistered surface, it renders the deeper subjacent structures very anæmic.

3. That, besides the depletory action, blisters influence the system generally by depressing the heart's action, slowing the blood-stream, and cooling the temperature of the body. The results are probably due to the reflex action of the central nervous system.

"It is more than probable that many, if not all the therapeutic advantages of a blister may be obtained by the application of less powerful epispastics. If, however, we have decided to employ the stronger remedy, let us remember that blisters injudiciously applied may induce the evil we wish to prevent."

We have said that this paper is provoking, and certainly it is confusing in a very remarkable degree. It is impossible for any one to read it closely and to know where he stands. There is a good deal of disordered truth in it, and a much greater measure, we venture to say, of error that seems to be truth. We gladly and readily accept the fact that throughout the animal kingdom, and with no exception, there is, as there must be, a similarity, or rather a relative identity in the action of vesicants. We also accept it that in the lowest as in the highest forms of animal life, contractility is not alone the principal but the only manifestation of the vitality of a creature. There is no other manifestation of life in the whole living creation but contractility and the power of movement. The statement that nerves and vessels are not found in the lower animals, and the inference that even in higher animals these structures are not concerned in the response to irritation, are so hopelessly inconsequential as to be quite unreasonable. The newt's tail is put forth as a conclusive demonstration. Now, we must admit that we are prejudiced against all such experiments, not alone on moral and humane grounds, but on the ground also that we have not been able to make sure that any

good has come by them. We hope to be able not to allow that to affect our judgment in any way in dealing with this case. We have, however, to point out—what we have had reason to notice more than once before now—how reason is always enslaved to the seeming instruction of experiment. Experiment is assumed to be rigidly unequivocal. Whatever is right or wrong, experiment is always right; and so everything that disagrees with the results of the experiment is at once wrong, and can have no consideration in the reasoning of the experimenter. How very necessary, therefore, to know and to be sure of the conditions of the experiment, and how necessary to read the result and to interpret the instruction aright. It is at any time most difficult to be sure that the conditions of an experiment, and especially so in biology, are true and unvitiate, and the very knowledge of this ought to be sufficient to make us most careful in the interpretation of results. Let us examine this experiment. What does it prove? It proves that strong *liquor ammoniæ* irritates and vesicates or destroys a living animal tissue, or chemically alters the integrity of dead tissue. That is the whole possible instruction. The tail is either dead or living. If living, the result only shows that it is a living result; and if dead, we are not, as physicians, concerned with the chemistry of the action. Of the mechanism of the living action we have no clear knowledge, and it is not certain that we can ever know it fully; but it is certain that these experiments have thrown no light whatsoever upon the matter. They have, however, not

been altogether devoid of effect; they have misled, as we shall presently see, a man who thinks and reasons with exceptional clearness, and by so much at least they have done harm.

An extremely valuable essay on irritants and counter-irritants,* by Dr. Lauder Brunton, appeared in 1875. Before explaining the action of these agents, he thought it advisable to clear the way by correcting a common error regarding congestion and its relation to inflammation. After doing so, and after reviewing the mechanical theories of inflammation, he discusses the action of irritants, and sums up his conclusions as follows:

1. That dilatation of the blood-vessels and a rapid circulation through them is advantageous for the tissues, and leads to increased growth and more rapid repair. While this active congestion is beneficial, venous or passive congestion is injurious.

2. The application of an irritant induces dilatation of the vessels and a free current to flow through them. This will help to repair any injury done to the tissues by the irritant, so that the injury to a certain extent brings its own remedy.

3. Artificial congestion and inflammation are entirely different from, and independent of each other, although they generally occur together.

4. Artificial congestion passes into inflammation when stasis begins to occur in the capillaries.

5. Stasis is not due, as supposed by the brothers

* St. George's Hospital Reports. Vol. XI., 1875.

Weber, to coagulation of the blood in the capillaries, the coagulation being induced by changes in the tissues composing the walls of the vessels or immediately surrounding them.

We may break here for convenience to consider these five statements before giving the others. We accept the first and second entirely and without any reservation. They state the whole case for counter-irritation. The irritant induces dilatation of the vessels and a free current to flow through them; a free current is advantageous for the tissues and leads to increased growth and more rapid repair; therefore, plainly enough, the irritant leads to increased growth and rapid repair. This is all we shall claim for it, but we shall claim all this for it.

The conclusions stated third and fourth we refuse and deny almost altogether. That artificial congestion and inflammation commonly go together we accept; that they are entirely independent of each other we cannot accept; and that congestion passes into inflammation when stasis begins we cannot understand. Active congestion and inflammation go together, not commonly or frequently but always and inevitably. Active congestion is a state in which there is dilatation of the blood-vessels and a rapid circulation through them. What is inflammation? It is active congestion when stasis begins to occur. But there may be abundant active congestion and yet no stasis—therefore they are essentially different and independent of each other. Let us find the proof for this in the essay. "Active

congestion is frequently regarded as almost synonymous with inflammation, whereas the two are widely different. Congestion may, and very frequently does, exist without inflammation, and inflammation sometimes without congestion. Nothing is easier than for any one to convince himself of the fact that arterial congestion may exist without inflammation."

We are not anxious to be convinced, but to know what is true; and we care not whether it is simple or difficult. A state of active congestion may doubtless exist without inflammation, that is, without arriving at the condition named stasis, *if there is no injury* to repair. In fact, there never will be stasis of the blood or its elements if there be no injury. In other words, there is no such thing as inflammation without a reparative purpose. Therefore, inflammation and repair are one and the same thing; and the congestion ministers to the purpose by supplying the nutritive and necessary elements, and there is not nor can there be any such result as reparative inflammation without congestion in this sense.

We may have a general activity of the circulation, as after a good dinner, but that cannot be named congestion. There is no special or local reparative need for it. Our whole confusion and trouble has arisen from our unreasonable determination to separate the processes of ordinary nutrition from those of the ordinary or extraordinary, but never unnatural, processes of repair which we have named inflammation.

"That inflammation can take place without con-

gestion is shown not only by the fact that it occurs in non-vascular tissues such as the cornea and cartilage, but even more strikingly by the remarkable observation of my friend, Dr. Ainslie Hollis, that textural changes similar to those produced by inflammation in higher animals follow the application of irritants to anemones which have no vascular system whatever." "*No vascular system whatever*"! That unscientific and dangerous "universal negative" again. Dickinson got wrecked on it, and we fear even Brunton does not escape. Whether cornea or cartilage or anemone has any vascular system is not the question, though the absolute denial of the existence of any such shows a peculiar barrenness of scientific imagination. Cornea and cartilage and anemone nourish, grow, and develop, and they cannot do so without some mechanism analogous to, and in effect equivalent to, what we have named a vascular system. And if inflammation is, as we believe it to be, simply an accelerated or specialised nutritive activity, arguing from the well-known and established basis of the recognised blood system, the inference from the facts relied upon by Brunton must be taken to be erroneous. We submit, then, that there cannot be any inflammation without congestion—meaning by that an acceleration of the processes of nutrition; but we allow that there may be an increased activity of circulation, which, even if essentially the same as congestion, need not be called by that name or by the name of inflammation unless directed towards the repair of an injury or structural disease.

We believe that the fifth statement is correct. It seems to be based on direct observation; and it is consistent with what we must take to be the natural intention in the process.

Dr. Brunton's further conclusions are:

6. Pain in an inflamed part is probably due to distension of the vessels and pressure on nerves by the blood being pumped with violence through the dilated arteries against the obstruction in the capillaries.

7. Pain may be relieved by lessening tension in various ways; by position, cold, warmth, blood-letting, and by counter-irritants.

8. Cold probably relieves tension by contraction of the arteries going to the inflamed part; warmth by dilating the capillaries of surrounding parts, and thus drawing the blood away from the seat of inflammation.

9. At the same time that an irritant causes dilatation of the vessels in one part to which it is applied, it causes contraction of the vessels in other parts of the body.

10. It is probable that it does not cause contraction in all parts alike, but that definite areas of skin correspond to definite sets of internal vessels.

11. The relief of pain produced by a blister in pleurisy, pneumonia, or rheumatic inflammation of a joint, is probably due to reflex contraction of the arteries in these parts.

12. Blisters are useful in lessening congestion in the pericardium and in relieving the pain of inflamed joints in rheumatism.

13. The benefit derived from their use in young persons, especially those suffering from a first attack, is very great. In elderly persons it is inconsiderable.

14. The beneficial action of a blister in callous ulcer is probably due to the increased supply of blood induced to the part by the application.

The explanation given of the pain of inflammation that it is caused by pressure may be accepted, but with considerable reservation. The characteristic pains of neuralgia so-called, are not easily, if at all, referable to the pressure from active congestion.

It has indeed been frequently observed that in such cases when inflammation has well set in, the pain ceases. It has been argued that pain is the expression of defective nutrition. Neuralgic pains are best explained in this way, and even in such cases as Lauder Brunton refers to, it would not be difficult to infer a similar cause. A state in which any degree of obstruction or of passive congestion exists is a state of defective nutrition, however active the processes may appear to be. The admitted means of cure teach a lesson of some such import. A good position, warmth, and irritants or stimulants we can, without difficulty, bring into line as means which facilitate and accelerate the active nutrition of the reparative process. Cold, blood-letting, and depressant poisons, on the other hand, may stop pain certainly, but they do so by diminishing or depressing the vitality of the part, and frustrating the natural intention. The "relief of pain" by these is an altogether different matter from the natural cure

or promotion of the intention in pain by those other means.

The statements ninth to twelfth are based on the idea that an irritant, while causing dilatation where it is applied, causes contraction in other parts that are perhaps anatomically related through reflex action from vaso-motor centres.

It is this more or less remote contraction that is the object of counter-irritation according to this view. It is by depletion that the cure is supposed to be brought about. It is exactly the same view as we met with some hundred years ago, and have not altogether lost sight of at any time ever since. It has been derided, discarded, and exploded very many times indeed; yet here we meet with it again, fresh as ever, and with better scientific authority than it perhaps ever had before. Yet it is difficult to understand how any inflammation can be made to cease without removing the first cause. A knee tendon is injured and torn; we apply a blister to the skin over the injury, and put the limb at rest. It repairs quickly and well. What has the blister done; how has it acted? According to the view in discussion it causes a contraction of the vessels of the injured or inflamed part, and so relieves pain and determines cure. But we know that contraction of the vessels would retard or impede that vascular activity of the part which is so necessary to the repair of the tendon and the injury. This, then, cannot be the explanation, for we have repeatedly found the blister hasten recovery in a very

remarkable way. The only possible explanation, not to say the only reasonable one, is that in this familiar case the blister hastens repair by accelerating the circulation and, therefore, the nutrition of the parts injured. We cannot, then, accept this depletion view, and that specially as applied to the cases mentioned.

Dr. Brunton depends for support of this theory on the observations of Ludvig, which he accepts and confirms, and on an experiment of Zulzer. This experiment is intended to show that if an irritant is applied to the vascular area of one of two neighbouring arterial branches the area of the other is depleted through the reflex contraction of its blood-vessels.

Taking two neighbouring arterial branches with their vascular areas, which we may, for convenience, name A and B, Zulzer found that the application, and especially the continuous application, of an irritant over the skin of the vascular area of A determined a depletion of the whole of the vascular area B with marked diminution of the vessels, and a blanching of the whole area. The vessels in the area of A, on the other hand, were enlarged and multiplied, and the area was by so much the better nourished. It is reasonable enough to believe that an irritant applied to the area of A will produce these results in the area of B, but for other reasons than can rightly be named depletion. Depletion seems to imply a withdrawing from area B of blood that is there already in assumed excess. But is it not as reasonable to suppose that this state of B arises from the diverting of the current away from B into A

at its point of origin from the main artery? This seems, indeed, much more reasonable, for we cannot understand how an area can possibly be depleted except through the veins passing from it. We cannot surely suppose that the course of the current in the arterioles of area B is *reversed* by reason of the irritation at A. Hence there appears much reason why this idea of depletion should be given up. Diversion, with which, by the way, we met before, but in another sense, would be a much better term.

But allowing that the irritant at A somehow produces a diminution of the blood supply in the area of B, what is there in this, or is there anything in it which can lead us to expect that an injury or diseased state in B will be assisted to repair because of it? We cannot see any reason for the assumption, but we can see much reason against it.

We do not deny that when a given portion of blood is drawn into one part it cannot be in another part at the same time. And we can readily see how the simple elasticity of the vessel walls is quite sufficient to account for a contraction to the extent that their contents have been diminished or withdrawn.

In cases of passive congestion arising from the over-distension and exhaustion of the blood-vessels, we can easily understand how counter-irritation at some little distance may do great good by stimulating and improving the nutrition of the part, and by perhaps withdrawing or diverting so much blood as will enable the vessels to recover their natural calibre and activity.

This is the only condition in which we can see the depletion view to have any meaning, and even at this, it does not mean much.

The thirteenth conclusion is almost correct. The observation is right, but the interpretation is only partially so. Vitality and not age is the determining factor. A healthy man at seventy may respond to a blister more quickly, and with better effect, than a weakly child of seven. It is only then so far as age and vitality run *pari passu* that the observation is true.

The last statement is without doubt correct.

Although we have had to differ from some of Dr. Brunton's statements, that does not prevent us acknowledging the admirable method and precision of this article, and of his observations in his text-book on therapeutics. Every thought, even when it goes wrong, as we have ventured to say, yet goes straight; and so his errors, when they are clearly such, are almost as useful for our instruction as are his correct conclusions.

Mr. Chiene, in 1879, wrote a very interesting essay on "A Counter-Irritant: its Action."* His idea is that "the counter-irritant comes under the class of remedies which relieve or cure inflammation by blood-letting, by relief of the vascular tension directly or indirectly, as the case may be." And after admitting that counter-irritants are as yet little understood, he adds: "Our very ignorance regarding the action of a blister, coupled with the frequency with which we use it, makes it one of the most interesting questions which

* *Practitioner.*

can occupy our attention as thoughtful physicians and surgeons." He advances what we must be excused for saying is a peculiar theory. It seems to have its basis in the reflex action of nerves; but he allows a direct effect of the counter-irritant on the tissues much the same as Ross contended for against his opponents who maintained the theory of reflex action. We cannot do better than state a case, as Mr. Chiene himself puts it: "When the kidney is inflamed the blood-vessels of the organ are dilated with a slow low congestion—the vaso-motor centre has lost control of the blood-vessels of the kidney—its function therefore is in abeyance, it is congested. If we now apply a counter-irritant to the skin, as a result through the sensory nerves, we have a change in the vaso-motor skin-centre with a corresponding change in the blood-vessels of the skin. There is increase in the amount of blood in the vaso-motor centre; there is a flow of blood to the vaso-motor centre—the neighbouring parts are bled. The vaso-motor centre of the kidney is in close anatomical relation to the vaso-motor centre of the skin over it. The kidney vaso-motor centre which is congested is bled. It supplies blood to the skin-centre. The result is that the vaso-motor kidney centre gradually regains its function. The kidney vessels, as a consequence of the change in the vaso-motor centre, pass from congestion to determination; a free flow of urine takes place, and from determination to one of relative anæmia the kidney is restored to a normal condition." As we must confess that we do not understand this, we refrain from any

comment on it. The essay, however, is written in an excellent spirit, and is well worthy of perusal.

Trousseau wrote very sensibly and very practically on the question of counter-irritation; indeed, his chapter on irritants is among the best things ever written on the subject. But he introduced an idea of Substitution into his writing, which we think has confused his teaching not a little. His mind is strongly set in the direction of giving to disease a specific character almost amounting to entity, for "it is not the quantity but the quality of a seed that determines the nature of a crop; quantity only gives more or less, quality gives species." He apprehends that disease is to be cured by Substitution, which he thus explains: "The progress and duration of a phlegmasia being known, if we could place in contact with the inflamed tissue a modifying agent, itself an irritant, which should change the mode of irritation and shorten the duration of the disease, we should be rendering a great service to therapeutics"—and might we not say to the sufferer also, for unfortunately he is too often lost sight of. This, then, is Substitution, which, with its relation to disease, is further explained: "We intentionally lay weight on the specific nature of disease, because this question rules in pathology, and we could not make substitutive medicine understood unless we had previously established the great pathological principle that a special modification corresponds to the action of each modifier. All irritants determine an irritation of a severity and gravity which are dependent upon their own essential nature."

This, if we understand it rightly, means that a disease which has a specific character may be cured by a specific irritant remedy of appropriate quality and quantity; and it means that this cure is brought about by the substitution in some vicarious way of so much remedial irritation for so much of the irritation that is esteemed disease. This, it will be observed, is a most rigid assertion of the case for the principle of *similia similibus curantur*, though Trousseau either does not recognise it or does not acknowledge it. He blames Hahnemann for allowing a principle to carry him away into unreason, whereas he himself becomes a helpless slave to a mere word. If the word substitution be demagnetised of the conception with which it was charged by Trousseau, it is quite harmless, and may mean as nearly as possible the same thing as counter-irritation in the sense in which we desire to use it.

We do not here concern ourselves with Trousseau's theory of disease, though we disagree with it altogether. We simply wish to point out the error of his logical method. He begins by getting this idea of Substitution out of the *Ewigkeit*, and not by any process of reasoning or observation—so far as we know, and then he proceeds to establish principles of disease to suit his idea. It is only in this path of mental perversion that it could be possible to assert that the course and duration of a phlegmasia is known or even knowable beforehand. It was necessary to the validity or safety of Substitution that this statement should be made, and it was made without regard to its utter unreasonableness.

CHAPTER VI.

MODERN TEXT-BOOKS.

Modern Text-books and their Teaching—A State of Uncertainty.

We have not been able to lay hands on anything written expressly on the subject since that time, so we can now only refer to the text-books of the day. It would not be difficult to review them all so far as this matter is concerned, but it is not necessary to do so, especially because there is nothing new in any of them that has not already met us in one form or other. And as we have had occasion to refer to several of them incidentally, we shall confine ourselves to one or two, merely to show more exactly what our present position is in regard to this question. "Here, then," says one of our best works on surgery,* "is a considerable channel of influence for counter-irritant applications that through inter-arterial sympathies which vaso-motor nerves maintain or contribute to maintain, and in some cases through the general circulation, they tend to divert blood from flowing into the inflamed part." This confirms and justifies our comment on Dr. Lauder Brunton,

* Holmes' "System of Surgery."

but it leaves the essential part untouched. It does not show how the diversion of blood from the inflamed or diseased or injured part can help towards repair and recovery. There can be no mistaking this idea or the intention underlying it, for refrigerants are strongly commended in the same chapter as a most effectual means for alleviating pain and promoting a healthy state by preventing the inflammatory process. This interpretation and this treatment we cannot accept, as has been already sufficiently explained.

Another of our best known books * states the matter thus: "The value of counter-irritants is recognised by practical surgeons, and they are undoubtedly among the most effective local remedies we possess for combating chronic inflammation, yet their mode of action is difficult to explain. The theory that by exciting a local inflammation in the skin it was possible to draw the disease away from the deeper and more important parts is no longer tenable. The theory that by stimulation of the sensory nerves of the skin a dilatation of the superficial vessels is produced, accompanied by a corresponding contraction in the deep parts, cannot be supported by scientific evidence. In fact, as Billroth has pointed out, it is probable that in many cases, especially in extremely sluggish chronic inflammation, the good produced is probably rather by an increased afflux of blood to the affected part than by a diminution of the blood supply."

We are extremely pleased to be able to agree with

* Erichsen's "Surgery."

all of this expression, and our whole object and desire is, so far as it may be in our power, to remove the matter from the unscientific and unsatisfactory state of mere probability into that of simple certainty, for we see no reason why it should not be so placed. That there is a great need for this must be apparent to any one acquainted with the teaching of our very latest texts on the matter.

One asserts that counter-irritants have their undoubted good effect because of their derivation—whatever that means—and their evacuant effects. Another that they influence inflammation by checking it or causing absorption of chronic inflammatory products, and another, one of the most recent and most familiar authorities, presents the subject somewhat fully as follows :

"The doctrine of counter-irritation may be said to be that when a part at some distance beneath the surface of the body, such as a joint, or even remote from it, such as the lungs, is in a condition of inflammation, pain, unnatural activity, or overgrowth, an alterative effect may be produced upon its nutrition by alterating the condition of an area of skin superficial to it, or even at a distance from it. A second 'counter' seat of irritation is set up to relieve the deeper and more vital part. Now, we may conclude, with respect to this theory :

1. "That rubefacients and vesicants will afford relief to the circulation of parts in immediate *vascular connection* with the selected area by attracting blood

and draining off plasma; to the same extent the general circulation will be depressed, visceral congestion or inflammation will be diminished. At the same time, the heart will be relieved.

2. "That the irritation of the cutaneous nerves will modify in a simple reflex way through the centres in the brain and cord, the circulation and nutrition generally of the parts beneath; the impression which passes in, being immediately reflected along the vascular or trophic nerves.

3. "That possibly the irritation of the local nerves and vessels may affect *the vaso-motor and trophic centres* in the brain and cord presiding over the area of skin, and that this disturbance may so influence a neighbouring trophic centre (say of a joint) as to produce through it a change in the nutrition of the tissues (such as a joint) in the neighbourhood of the area to which the irritant was applied.

4. "That vesicants and pustulants may *produce a flow of plasma or pus* which will relieve the blood or tissues of organised or other poisons, which are the cause of disease. This is the old humoral view, founded on the pathology that humours of the blood are the origin of disease."

This is a very good example of our old and abiding danger of offering mere words instead of definite information. The best comment upon it is in the author's own words: "These measures seem to be very simple, but their action is, on the contrary, extremely complex, and indeed still very obscure."

An author whose works are in the hands of every practitioner states the position as follows, from which we can realise the confusion in which the subject still remains, notwithstanding that we are in possession of solid facts which ought to make a true interpretation clear and comparatively easy. "It has long been a practice in the art of medicine to resort to agents capable of exciting activity, and especially vascular activity, in a part when applied locally, to relieve abnormal action going on elsewhere. This artificially excited action was supposed to relieve and reduce the pre-existing malady, and this line of treatment has been denominated variously, according to circumstances, irritation or counter-irritation. It took its origin probably in observations of the following kind: (1) in the exanthemata the more copious the eruption the less the internal complication—ordinarily, at least; and that any retrocession of the eruption was followed by gravescence in the internal affection; (2) in the metastasis of gout, mumps, etc., as soon as another part became affected the part originally implicated was relieved; and (3) in the relations of cutaneous maladies to internal diseases—in chronic disease the disappearance of the rash often being followed by a distinct acerbation in the visceral ailment. By a far from unintelligible induction our predecessors concluded that to set up artificially some irritation elsewhere would exercise a beneficial effect over the disease they were essaying to treat. There was an element of truth in

their conclusions, and unquestionably hot pediluvia do often relieve head symptoms, and blisters to the legs are found useful in diminishing congestion of the contents of the cranium."

We may conveniently break here to examine these observations. We see that the idea of *counter*-irritation is still maintained in the old sense of counter-morbific. The conjecture regarding the rational origin of the practice we know and have already shown to be in large measure correct historically; but the interpretation of the observed and ascertained phenomena has been altogether wrong. It is true within certain limits that the more copious the rash of measles, for instance, the less risk there is of internal congestions, as they are called. We should, however, prefer to say that the more of the measles poison comes out, the less of it remains in—which is a very simple philosophism, but has the advantage of being true. Given a certain quantity of exanthematous poison, it must either be out or in. If it is out, it is well, but if in, whether because it never came out or because it has gone back, it is equally wrong and dangerous. Counter-irritation, even if intelligibly originating from such observations, yet has no place in the treatment of exanthemata on this basis.

The metastasis of gout, mumps, etc., is, we believe, an exploded idea. It is admitted to have been a wrong interpretation of fact; and any reasonable basis of appeal which counter-irritation may have been supposed to have in the idea also passes away. Gout, like every

other disease, manifests itself at the weakest part; that is the meaning of metastasis.

The admittedly correct observation that certain so-called skin diseases may, if checked, cause internal mischief, is only one other proof that Nature knows best how to proceed. Whatever she finds necessary to throw off by the skin is better out than in, certainly. But it is extremely doubtful how far treatment by counter-irritation is of service in such conditions—so long especially as the constitutional causes which produce the skin disease continue to operate.

Whatever claim to attention these fanciful inductions may have possessed in the past, we cannot see how they can be any longer or with any reason entertained. But to continue:

"The advocates of blistering could also take a pretty firm stand on the ground that such treatment did relieve and diminish accumulations in the serous sacs, as of the thorax, the abdomen, and the articulations. The good effects here are distinctly intelligible by the law of Schroeder van der Kolk that the vascular supply of the deep-seated parts is derived from the same arterial trunks as that of the superficial parts. Any dilatation of the cutaneous branches and increased blood-flow in the superficial distribution will diminish directly the current in the deep-seated vessels. This is clear enough." Yes, quite clear, with the exception of one point, namely: *How does this diminution of the blood supply to the diseased part conduce to healing?*

"In the same way dilatation of the cutaneous vessels of an articulation (say the knee) will be followed by a lessened blood-flow in the deep arterial branches of the trunk common to both. Further, Brown-Sequard found that the renal arteries contracted on irritating the skin over the kidneys. This indicates that there is something more in this matter than the mere hydraulic side of the question." Of course there is, and a great deal.

"Max Schüler has found that the application of large mustard blisters to the cutaneous surface produces first a passing dilatation of the vessels of the pia mater, and then a more persisting contraction of them. We all know that plunging the hand in cold water will lower the temperature of the other hand, and that cold applied to a part of a bat's wing causes contraction of the vessels of the corresponding part of the other wing. From all this we can comprehend how it may be that counter-irritation may exercise a beneficial effect in cases of inflammation where the vascular supply of the inflamed part is not derived from the same arterial trunk as is that of the cutaneous surface operated upon. But while admitting this, we must own that the *modus operandi* here is far from being so clear as it is in those cases where the common vascular supply exists."

It will be observed here again that whatever else may be in doubt, one thing never is and must not be, namely, that the one thing necessary to cure an inflammation anywhere is to diminish its blood supply,

and especially that excessive and active supply which comes with the inflammation—which is, indeed, the essence of the process. So much of observation as can by any seeming reasonableness be brought into line with this conception, is not only maintained but magnified inordinately, whereas so much as does not come into line but plainly contradicts this fundamental doctrine, as by far the greater part of established experience rightly interpreted does, is minimised by every doubt that ever so remotely presents itself.

Having now submitted as much of the enormous literature of this subject as seemed necessary, or useful, or appropriate to the purpose of the essay, we will endeavour to sum up the matter with as unprejudiced a mind as possible, in the hope of being able to clear it up to some extent, however small. It was in order to avoid complicating issues at this point by too much or too frequent reference backward that we made somewhat full comment on the more important views in the course of the retrospect we have given of the question. It cannot be denied, notwithstanding all the effort and attention which has been directed to the elucidation of this subject, that it is yet in a most uncertain and unsatisfactory state; nor can it be doubted that it is of very highest practical importance to have it cleared up and brought to a reasonable and scientific position. We may not be able to accomplish so much, but we hope to be able at least to deliver it from part of the great mass of antiquated fanciful doctrines which have been imposed upon it

and have so tenaciously clung to it down to the present day, when it is admittedly as obscure as ever it was. The study of the question has suffered not less from a lack of scientific imagination than from the over-abundance of a lame sort of imagination that was not scientific. There is infinitely less excuse for the defect of the one in our day than there was for the excess of the other in the past, when the knowledge of the structure and functions of the organs of the body was incomparably less than it is now.

It is not necessary, and it would serve no useful purpose, to further discuss such ideas as that counter-irritation brings about the cure of disease and a healthy state by reason of any such assumed effects as have been variously named metastasis, revulsion, derivation, vicarious change, etc., and if there is a modicum of meaning in the reputed evacuant influence of these remedies it must be very small. We feel that it is altogether insignificant, and that it may with advantage become a negligible quantity in our calculations. We shall have to allow farther on, as regards idiopathic acute inflammations especially, that in some diseased states in which a localised poison is the cause, it may serve, and indeed seems in actual experience to serve, an evacuant purpose for good.

Hunter's axiom, that there cannot be two diseases, or two actions, or let us say two special activities, in the same part at the same time, we take to be correct, but we attach a very different meaning to the expression from that given it by Hunter and since his time.

The practical interpretation of the idea has been that a deep inflammation may be checked or stopped by setting up a second inflammation in another and superficial position in the same part. We do not doubt that this can be done. It is a simple question of vital kinetics. If there is an injury and a centre of inflammation in the deeper tissues the blood is determined, or for our purpose, attracted to that point with a certain force. If we set up another centre of inflammation at a little distance in the same part, the blood will be determined in that way also, with a certain force. In the same body, and especially in the same part, we may take it that the force of determination is closely proportionate to the injury. It will therefore be evident that unless the second injury is more severe than the first, a determination from the first inflamed area into the second will not result. But if the irritation is sufficiently strong this reversion of the determination will take place. It is a familiar observation that irritants fail to take effect in proportion as the deep inflammation is acute and intense. Dr. Stokes noticed this and gave the right interpretation of it some fifty years ago. There cannot be two actions or two inflammatory determinations of blood in the same place at the same time. That is the whole meaning that can now be given to the maxim.

The most important question, however, remains. If we can in this way stop a deep inflammation, is it desirable to do so? *Cui bono?* Are we sure we act intelligently and to a good purpose, or is it the in-

tention only that is correct? If the whole process in the deep parts is an evil and working evil, any thing or any means that will stop it must be for good, and the proceeding by counter-irritation is reasonable, but if there is the slightest cause to suspect that this deep process has the merest fractional intention towards good, our treatment comes at once under suspicion; and if there is anything like sufficient reasonable cause to believe that the process is altogether for good, then any treatment that would prevent it is worse than inexcusable. This last is our position. The inflammation in the deeper parts is the effort to repair, and it is wrong to interfere with it in any way that would prevent it.

It will be at once clear that any means like, say fomentations and stupes, which would promote and accelerate the circulation in a whole limb or part, act in a very different way from a limited local irritant. This does evil in the hope that good may come by it, a principle which, by the way, we fear has not its best basis of appeal in natural law; those others assist the natural process to improve nutrition, and Hunter's dictum is quite inapplicable.

The imitation of Nature, to which appeal is so often made, is a right enough proceeding, but we must be sure that we interpret Nature and not ourselves or our prejudices and unscientific imagination. It would do no harm if medical theorists remembered Heine's equation that in Nature as in morals the *Ego* equals the *Non Ego*, and that we are constantly exposed to the

danger of projecting ourselves into even our scientific investigations. If Nature eliminates the poison of small-pox and of measles largely by the skin, that affords no reasonable basis for the use of suppurative evacuants say in case of typhoid fever or the ague, and there is, if possible, less excuse for them in cases of injury or local disease. The only imitation of Nature that is justifiable and of practical use is when we assist Nature by bringing our means and diligence into line with the natural intention and effort to sustain it or to assist it, when perhaps it is failing. This imitation, or rather following of Nature, we are most anxious to maintain and to bring to our service in the views we venture here to advance. Let us imitate and assist Nature in her process of inflammation, and that is all we contend for. We feel that we have not to contend for even so much, for we believe that we have been actually assisting Nature for a very long time indeed, while we hoped and thought we were doing something the very opposite—"to thwart Nature and to force her into the paths which Art dictated."

The depletion theory of the action of counter-irritants we have already dealt with. It seems to be quite untenable.

With extremely little exception all our medical teaching, past and present, has made inflammation a violent disease and an altogether unnatural process which by every diligence and effort we have endeavoured to prevent or cut short and undo. The result has been, as we have endeavoured to show, much

confusion and uncertainty. Even when abundant facts and observations of the most evidently conclusive significance forced men like Ross and Lauder Brunton to prove and practically admit a case which would necessitate an interpretation directly contrary to the accepted teaching, they refused to take the indisputable verdict of their own facts, but fell back on the ancestral tradition—and there we remain. We have no right theory of inflammation. It is still in mystery. And without a correct theory of inflammation we never can have a right theory of the action of irritants. It is admitted that the effect of stimulants and irritant applications is to accelerate the circulation and to produce a state of inflammation, so when we know the meaning of the one, we shall know the action of the other, but not till then.

CHAPTER VII.

A NEW THEORY STATED AND DISCUSSED.

Let us by way of hypothesis assume that inflammation is a natural effort directed to the repair of injury or of a diseased state, and see how the known phenomena and the results of the process fit in with the assumption. Every proved fact, without exception, that we have met in the whole course of our inquiry falls so readily into order and harmony by this assumption that to reason them into place would only confuse a beautiful simplicity. We are, therefore, limited to the examination of the few points which seem to disagree with it and to indicate a difficulty to its acceptance.

At the very outset we are met by the most significant fact that an inflammation never occurs in the body, or in any part of it, but when and where there is some injury, or what is the same thing, some diseased state, that needs to be repaired and restored. Surely this coincidence itself, if it is nothing more, indicates a connection close enough and constant enough to justify a suspicion that the disease and the inflammation are

related as cause and consequence. But it may be said that this is a truism which all recognise and admit. Why then interfere with the process? Why all this diligence by depletives, evacuants, revulsants, refrigerants, and the rest, to check the process and to prevent it, if we recognise its good purpose? We are surely inconsistent, or there is no meaning in words nor validity in reason. It is only "when the pain and inflammation is excessive and when there is unnatural activity or overgrowth" that we interfere. But if pain is the prayer of a part for food, as one of our highest and most philosophical authorities declares it to be, that surely is not to be prevented or the need for it undone by any means, but by the one reasonable method of supplying the need it so eloquently expresses. As to inflammation being excessive or being an unnatural activity or producing overgrowth, we venture to say that inflammation is never excessive, nor tends to produce overgrowth except where unrest or irritation, or some other preventible or removable cause perverts or vitiates the process; and we should be careful when we speak of unnatural activity that our observation or judgment is not at fault, for there must always be a presumption that Nature knows its own needs better than we do or can, and it must therefore be difficult and unsafe to say that any natural process is unnatural. The fault is much more likely to be in our interfering unnaturally, or in our unnaturally not interfering how and when we should.

"The prejudicial and beneficial effects of counter-

irritants," says Dr. Ross, "arise from their power of increasing the nutritive activity of those structures in the neighbourhood of which they are applied."

This observation is right, and it seems to present a difficulty. But it comes easily into line with the other accepted observations to prove our hypothesis to be correct. If increased nutrition is beneficial, it can only be so when the part concerned is insufficiently nourished. We have therefore a valuable confirmation that defective nutrition is a fundamental element in chronic local disease, and that the proper treatment and rational cure is to provide sufficient nutrition. There are only two possible ways in which this can be done; namely, by keeping the blood of the body sufficient and sufficiently nutritive by appropriate nourishment, and by getting a fuller supply into the part to supply the special need. Irritants serve this latter purpose by stimulating the local circulation, and so accelerating nutrition. In other words, the irritant application produces an inflammation which the part of its own unaided power was not able to produce. It must seem strange that we endeavour thus to procure a condition, which had it existed naturally, we should have esteemed a disease, and treated perhaps by antimony and refrigerants in order to allay, or soothe, or check it.

The prejudicial effects also come by reason of increased nutrition. This would appear to be a contradiction of the observation we have just considered, but it is not so. If the natural effort to supply increased nutrition—in other words the inflammation

—is sufficient, there is no reason for our interference, and we can readily understand how the further acceleration of an already sufficiently active process may do harm in nutrition as in everything else. So the seeming difficulty resolves itself into this, that stimulation is beneficial when and where it is necessary, and prejudicial when there is no need for it.

"Arterial congestion passes into inflammation when stasis begins." (Brunton.) "The first stage of inflammation is a healthy nutritive activity, but after stasis, defective nutrition comes." (Ross.) These statements again are closely related, for arterial congestion is advantageous to the tissues, and leads to increased growth and more rapid repair. There is then no doubt about the early stage of inflammation up to the point of stasis. It is a healthy nutritive activity. It will be noticed that Brunton would not call this stage inflammation, but he is the only authority who ever attempted this distinction so far as we know. Dr. Ross' view that defective nutrition comes on at the point of stasis seems to mean very nearly, if not exactly, the same thing as Brunton does, in the assertion that inflammation begins at this stage, for to Brunton inflammation is an evil state, as it is to Ross—from this point.

Whether a difficulty really arises here is not quite certain. There is cause to suspect that it is more a matter of words than reality. It is most interesting, however, to see that the evil effect of inflammation is getting narrowed down. The whole of the stage

of Active Congestion is allowed to be a good and desirable nutritive process, and it is not likely that the Resolution stage would be considered an evil. At any rate we have not seen it so characterised. All, then, that remains under suspicion would seem to be the stage of Stasis. This is very suggestive. How very reluctant we are to be driven from our old positions! There is nothing in the stasis of inflammation to justify our looking on it as a wrong state. It is impossible for us to believe that a natural and continuous process can be right and beneficial in its first stage, and in its last stage, but wrong in the middle stage towards which the first works, and from which the last has origin. The arrest of the circulation and the seemingly slow activity of this stage is the basis of the assumption, but it is almost certain that the interpretation is wrong. If we could be excused a macroscopic analogy, we might endeavour to show how exactly identical are the steps, stages, and results in the building or repair of a house in one of the streets or avenues of a municipal organism with those in the process of repair in the living human body; and we should be able to suggest, by very apposite inference, that the stage of stasis or seeming standstill is not in the one, as it is not in the other, by any means the diseased or unprofitable condition which superficial observation and a wrong interpretation would take it to be.

"The benefit derived from their use, in young persons, especially those suffering from a first attack,

is very great; in elderly persons it is inconsiderable." (Brunton.) "There are morbid states not inflammatory, over which counter-irritants exert a beneficial effect, that is, a tendency to promote the return of the morbid structures to a state of health." (Ross.) It has been a frequent observation that irritants have less effect in "asthenic" conditions.

These interesting statements are of very nearly identical signification, as we have already hinted. The more active the vitality of a part, the more readily it inflames in response to an injury or to an irritant, hence the readiness with which the young benefit by counter-irritation when rightly used. On the other hand, as vitality fails with age in a somewhat regular ratio, we can see how the effect on elderly persons may be insignificant or even *nil*. We saw some years ago an old woman of seventy-five operated on for strangulated hernia. The operation was quite successful, and everything would have been right if the wound had healed. Five days after the operation, when the patient died, the edges of the wound stood clean apart, without the slightest trace of an attempt at inflammation. We can see now that the proper proceeding in this case would have been to apply perhaps a blister round the wound, in the hope of producing sufficient inflammation to close the cut, though we have a doubt that even a blister would have had any effect, the vitality being so low; and besides, a wound is its own sufficient irritant presumably, when repair is at all possible.

Again, a morbid state that is not inflammatory is

always a state of defective nutrition, and the reason why stimulation helps is evident enough.

There is nothing more that we can think of which calls for comment. We are, ourselves, thoroughly satisfied, not less by the actual facts of practice and experience than by the indications of reason which we have endeavoured to state, however inadequately, that every process of inflammation is a natural effort directed towards cure, and that the beneficial effects of counter-irritation always result from their facilitating or accelerating that process.

In this, as in any treatment, the first consideration is to be sure that we do no harm, whether we can or cannot do any good.

The outcome of practical experience, regardless of theory, goes to show that irritant applications are contra-indicated in all states of acute inflammation, whether in deep or in superficial parts.

Experience again has shown that the stimulation of chronic diseased states, in which vitality is low and nutrition slow and defective, always gives good results if the part or the organism is not altogether too weak to respond to the application, in which case, so far as can be seen, it can do no harm even if it fails, so long as it is not too violent.

In cases of local passive congestion resulting on general debility, or on a failure or exhaustion of vasomotor control, stimulation is also, and perhaps always, beneficial.

After acute inflammation in the latter stage of stasis and in resolution, gentle stimulation will certainly do good by accelerating nutrition and hastening the natural

process to its termination, especially in such cases as tend towards debility and failure of the natural effort.

We are content to leave it in doubt whether inflammatory conditions of the lungs and liver and other internal organs come within the range in which counter-irritation is useful. The indications seem to be that it may serve good in such conditions. Our experience of the treatment of acute affections of the stomach and kidneys would seem to point distinctly in this direction. We need scarcely point out how readily these general conclusions come into harmony with the theory of inflammation and of counter-irritation which we have ventured to propose. Our confidence must be excusable if we assert that we cannot detect a single flaw in the argument. We have in a sense pitted reason against prejudice in the matter, yet we are compelled by every evidence to accept the truth of our hypothesis. We are exceedingly impressed with the far-reaching importance of the matter, and it is in no sense of false humility that we conclude with an expression of our conviction that the subject is worthy of far more competent treatment than we have been able, however desirous, to bring to bear upon it.

The sum and the substance of our inquiry so far may be fairly stated as follows:

By abundant proofs counter-irritation is shown to be a most valuable mode of treatment—when rightly used.

It is freely admitted that the principles underlying the practice are not well understood, and that therefore

counter-irritation may sometimes be wrongly applied and do harm.

All such interpretations as were implied in such words as revulsion, derivation, evacuations, vicarious action, metastasis, etc., have been disproved, and should be allowed to fall out of medical terminology. Diversion is sometimes possible, but perhaps always wrong. Counter-irritation itself is a misnomer; it does not in any sense check or divert or act counter to the processes of inflammation. It does not *counter*-irritate when it serves any good purpose.

Inflammation is the reparative process; and the intention in the process is the same at every step—in congestion, in stasis, and in resolution.

Active congestion is essentially the same as inflammation—the same in process and the same in effect. It may, however, be convenient to retain the term inflammation for that physiological activity *which is directed to the repair of an injury.*

All external stimulant or irritant applications act essentially alike. From the mildest rubefacient to the actual cautery they produce active congestion in the degree of their intensity; and if they are violent enough to injure the tissues there must be a further inflammation to the extent of the injury.

Whatever good comes by the use of counter-irritants is because, by their irritant effects, they stimulate the activity of the tissues of the part to which they are applied and accelerate the blood supply thereto, so increasing nutrition or repair as the need may be.

The response to an irritation is as the vitality of the part or of the individual. Therefore, to produce desired effects in the aged and weak it may be necessary to apply stronger irritation than in the case of the young and healthy. Logically, an irritant applied for a reparative purpose should never be so strong as to become itself a cause of disease; and perhaps this would be a good rule in practice also.

In practice, the kind of stimulant and the strength to be used must be regulated or determined by the conditions and circumstances of each case.

The pain of an injury in the young and healthy is always the natural and sufficient irritation to determine repair, but if there be lasting pain and no responsive acceleration of function in a part the assistance of counter-irritation is plainly called for. On the other hand, if in response to the pain of the injury, active inflammation has set in, further stimulation is not necessary—so long especially as the inflammatory activity is sufficient.

Disease is always the expression of defective nutrition or textural decay, and degeneration or death, so the support of the constitution is the first essential in all treatment.

Regarding internal inflammations—as of the serous membranes and viscera—reasons are daily accumulating to indicate that they will come under the same general rules of treatment as inflammation in other and superficial parts.

CHAPTER VIII.

ON WORDS.

It is a fatal error in philosophy to attach only a slight importance to words. In leading propositions words are of the highest moment, and their sense ought to be so clear that their use in discourse should never check the comprehension of the hearer. This is an observation of Trousseau with which we entirely agree. A great deal of misunderstanding, and unfortunately also of ill-feeling, arises from the wrong use and the wrong acceptance of words. We must remember that a word coined for the first time and put into circulation, is stored with a new meaning of which only the author knows the kind and degree. We must remember, also, that of current words no word, not perhaps the most severely mathematical, can have exactly the same signification to any two minds. The man who utters and the man who hears gives each his own complexion to the utterance. The word counter-irritation is a good example of this. For scientific purposes, however, it is desirable and necessary to have such a common understanding of the value of the words which we use

as may, as nearly as that is possible, approximate to their simplest meanings. It is especially desirable that on matters of determined or determinable fact, intelligent men should not flatly contradict one another merely because they give different or various values to the terms in which communication is instituted between them. A number of words have been used, and are now used, in connection with our subject, that we wish to simplify as we may be able, having regard chiefly to their first or etymological meaning, with reference also of necessity to the conceptions of disease obtaining in their time and embodied in them.

Dr. Wendell Holmes makes some admirable observations on what he calls the magnetisation of language, and especially of words, in the process of time, by which he means that words which have been in long use are apt to take on and incorporate meanings so very different from their simple signification, that they become unreliable, if not even misleading, instruments in scientific exact reasoning; and he commends a preliminary process of "demagnetisation," or reducing words to their simplest value, before using them in any particular logical process. Let us endeavour to do this for a few of the words that occur more frequently in this connection.

Counter-irritation and *Counter-irritant.*—As we have already said, these expressions embody a theory that irritation is the active cause in all inflammatory disease, and we have briefly traced the origin of the conception. But we have seen to how great an extent

they got magnetised by the theories of disease which have been current at various times and in the minds of different teachers, throughout the long period of their active use in medical terminology. As we have, rightly or wrongly, rejected the theory they embody, as also the many forms of "magnetism" to which they have been at various times subjected, we offer them now as simple names for a large and comprehensive class of remedies, and for a mode of treatment, without any implied theory of action or of purpose. It might be better to get rid of them altogether, if that were possible; but we have not been able to see that it is possible so long as we can offer nothing better in their place. The variety and range of their application is such and so great as to make it extremely difficult, if not quite impossible, to offer any one expression that would be at once correct to any theory we might suggest, and at the same time sufficiently comprehensive to embrace all the numerous remedies and the whole field of treatment to which they are rightly applicable. We therefore must retain them, but we retain them not only in their demagnetised state but thoroughly disinfected of all theory, and simply as a name without any reference to correctness or appropriateness—altogether as a matter of convenience.

Stimulation and *Stimulant*.—These are words that more correctly than any others express the conception of the use of counter-irritants which is before our mind in this inquiry. They embody a theory of a vital nature, the conception of a stimulable and therefore

living entity that in diseased states is indisposed and will not, or exhausted and cannot, work its healthy and proper functions without the quickening influence that comes by the applied remedy. The roots of this idea go very far back ; and it is an admirable illustration of the fact that even our imagination is but a projection of our concrete conceptions into the province of what we are pleased to call the abstract. We have, and we believe reasonably, satisfied ourselves that counter-irritation has no place in treatment except where the vitality is low and where, consequently, healthy function fails, and we are satisfied by the abundant testimony of the best records of medical history, as well as by personal experience, that counter-irritant applications which determine a manifest activity in parts so diseased are certainly and always beneficial. With this knowledge and conviction it matters not if our conception of a stimulated entity or force be or be not correct. Something is stimulated, an activity is determined, and repair is brought about, by the intelligent use of means that we are agreeable to name stimulants ; and that is all we are concerned about. The guesses that have been made at the mechanism of the process we neither accept nor refuse ; they are of no consequence in this place.

Irritation and *Irritants.*—These embody a theory, also of a vital nature, which is probably similar to or identical with that in stimulation. It is the same object that the stimulus and the irritant is conceived to bear upon, and the difference in effect seems to

be a matter of degree. An excessive stimulation becomes an irritation. By stimulation the conscious entity is conceived to be moved forward agreeably to its ordinary direction and function, in which from inertness or exhaustion it lags or fails; but too much stimulation or goading determines a retrogressive resentment which is irritation. The objective manifestation of this disposition is supposed to be seen in the effusion which an irritant determines on any sensitive mucous surface, and which is perhaps rightly interpreted as the instinctive effort of the organism to protect itself against injury. An irritation is always more or less an injury; a stimulation rightly considered should never go that length. It is difficult to deny that stimulation may be of great service when properly used, when and where an increased physiological activity is needed; but that an irritation is ever necessary in such conditions is very doubtful. We are logically and otherwise prejudiced against the practice of doing evil that good may come; and in medical treatment we have reason to believe that the province in which the doctrine is admissible is getting daily narrower without any loss of benefit.

Epispastic (from ἐπι-σπάω, *to draw, allure*). This word seems to have had its origin from the humoral theory of disease. It implied in its original signification that the morbid humours were, by the agency of epispastic applications, drawn *to* the surface at which they were applied, and by implication away *from* the diseased part. It is doubtful whether many in the present day,

if indeed any, entertain this meaning of the word. It seems to be used as almost identical with Blister, a word which implies no theory of physiological action; and if some do unconsciously attach anything to it of its old and etymological meaning, it is because it is conceived to draw, not a morbid humour but blood from the part in which it is supposed to be in such excess as to be the essence of the disease. We know that some, and especially French writers, extend the meaning of the word to almost all counter-irritation, and especially to cupping, which is a typical *hæmospasie* or means of drawing blood to the surface. Mons. T. Junod extended the practice exceedingly in his *Hæmospasia*. By means of a special apparatus he removed the atmospheric pressure from large portions of the surface, by a dry cupping on a large scale. "To produce an intense determination from the deep to the superficial parts of the body, to dissipate congestions, to counteract morbid accumulations, to relieve any organ which may be oppressed with a surcharged circulation, such is the aim of hæmospasia."

So far as we know, the practice never took a place in this country, and we have not been able to learn that it has been accepted or is continued even in France. As embodying a theory we believe it to be incorrect, or rather, incomplete. By cupping, of which this is only an extension, not only the blood, but all the fluids are determined or drawn to the surface; but whether this is for good, we are not sure. It seems to be at best but a temporary effect, and on the removal

of the instrument, the circulation must go back to its previous state; and if there was a centre of irritation—which is not removed—we can imagine that the blood goes back to that part, and produces a state of congestion as before. The fact of the practice having fallen into disuse with us would indicate that experience had not found it sufficiently encouraging.

Derivation and *Derivative.*—These words seem to embody the same idea as that in epispastic, and had a similar origin doubtless from the humoral pathology. Like the conception in epispasis, that also in derivation has passed from its earlier meaning, and in the same direction. The primary idea had, no doubt, reference to the deriving or withdrawing of morbid humours from the centre of disease; the modern signification has reference mainly, if not altogether, to the effect on the blood circulation of the derivative applied. In its etymology the word derivative seems to imply not so much a direct drawing of the blood or fluids towards the point of its application, as a diverting towards itself of a current directed towards and intending towards another part. It has its primary application in the diversion of a river from its ordinary channel into another channel—from Latin *de* and *rivus*—an idea to which we have already expressed ourselves agreeable for reasons that we have given. We can understand how a derivation or a diversion of blood in this sense may relieve a part that is in a state of passive congestion, and enable nutritive activity to be improved and restored; but in cases of acute congestion we confess we cannot see how

it can operate for good. The derivative must be stronger than the determining cause of the inflammatory congestion before it can divert or turn the blood-current out of its set way into a new path; and when it can so divert, which is not always easy, there is nothing in reason to show how the diseased need is thereby satisfied.

Revulsion.—This word, and the idea it embodies, is gone almost altogether out of use. Perhaps the tendency to use it in common speech in another if even kindred sense, did as much as, if not indeed more than, clearer conceptions of its incorrectness to determine its subversion. It is a very old idea implying belief in a positive entity or even material substance which could be drawn or plucked or tugged out of the body. There seems to be a feeling of almost violence about the word in all its usage. It is etymologically the opposite of repulsion; but strangely enough the distinction is not well observed, for the word may be met frequently in positions in which it can only mean a driving out or away of the imagined evil.

Evacuant would appear to refer to an imagined humour or "morbific principle" which by this means could be turned out of the system. The idea has been already referred to.

Counter-inflammation, which has been of late used by some, needs not to be explained. Whatever inflammation is conceived to be or is known to be, this is an exactly similar thing set up by art on the supposition and in the hope that it will undo, or destroy, or some-

how mitigate inflammation in another part. There can be no doubt that the treatment tends to cause, or does cause, an inflammation, but there is very much reason to doubt that it acts in any way *counter* to the diseased condition towards which it is directed.

Counter-morbific also has been used, but it is perhaps the most grossly fanciful word of all that have been used in this connection. It is impossible to imagine a grosser conception or a more obtuse use of language. It is of no interest, and there is no need at all for it.

Part II.—PRACTICAL.

CHAPTER I.

THE USES OF COUNTER-IRRITATION—GENERALLY.

The Essential Action of a Counter-Irritant is to quicken the circulation in the part to which it is applied and towards the point of application. It is on this action that almost all beneficial results from this mode of treatment follow.

There are a few subsidiary uses of counter-irritation which do not come directly under this general principle. These will be considered by themselves.

The more important indications for the employment of counter-irritants, with a short statement of the principles involved, may with advantage be given first; and afterwards a more detailed examination of cases under each head. Though it must always be difficult to draw severely exclusive lines in the classification of disease or of treatment, we may on grounds of practical expediency refer diseased conditions to various classes, according to their general character and to the main principles underlying their treatment by this means.

Counter-irritation may be applied for the following purposes, namely:

1. *To Quicken the Processes of Repair.*

In a perfectly healthy person, and especially in parts well supplied with blood, all the treatment an injury needs is rest, and in the case of open wounds, cleanliness. Cleanliness is truly implied in physiological rest. The natural effort is in ordinary circumstances sufficient for repair; but, in weakly constitutions and in the aged, repair may be so slow or so insufficient as to need the aid of stimulation even in vascular parts; and injuries to parts not well supplied with blood, even in the young and vigorous, will repair and heal very much quicker with the use of a stimulant irritation. For some time past I have treated sprains by the aid of blisters with most conclusively satisfactory results. The joint is put rigidly at rest on a splint, and after the active inflammatory state is past, a small fly blister is put over the seat of the injury. When this has healed another is put on, and perhaps another, if the injury be severe. I have not seen the slightest symptom of harm come by this method, and the good result from it has in every case been apparent. It will be readily observed that the possible ways and conditions in which this principle may apply must be very numerous, but this illustration will for the present suffice.

2. *For the Relief of Pain.*

Pain is perhaps the best, as it certainly is the

most comprehensive indication for the use of counter-irritants. This very comprehensiveness of pain as an indication for this treatment exposes us to a danger. It must not be taken that all pains call for counter-irritation, even if we could allow that most pains do. This is a statement so simple as to be scarce worth making, only that we know there is some need for it. Many pains do not call for counter-irritation; such, for instance, as arise from gross destructive injury of parts by progressive disease or by violence, from obstruction of ducts or viscera, or from irritation caused by foreign and poisonous substances. The duty in such cases is to correct and remove the material local cause or condition first, and this may be all that is necessary. If counter-irritation is at all called for, it will be in the last or later stages as an aid towards the repair and restoration of the injury done to the tissues.

Neuralgias, so called, in which "no morbid condition can be discovered beyond what the persistent neuralgia itself induces," and idiopathic inflammatory states generally, call for counter-irritation in such form and degree and with such reservation as each case suggests or demands.

These two classes of painful disease comprehend almost all pain with which the physician has to deal, and perhaps nearly all to which counter-irritation is applicable.

We venture to suggest that in all these painful states

there is defective local nutrition, with textural degradation and perhaps molecular death, and that counter-irritation in all such conditions has good effect in the simplest and most direct manner by bringing more blood to the part, and so improving nutrition and raising the vitality. The pain is the prayer for nutrition; therefore anything that will minister to that need will be on the line of right treatment, and will relieve the pain by satisfying its cry. We might venture on a general statement that the use of any means or remedy which helps to relieve pain and procures comfort is right treatment, apart, of course, from narcotics or means that deaden sensibility. It satisfies the natural need. And if we understand the action of our remedy which affords relief, we can safely infer the intention in the disease to the furtherance of which we apply our remedy. If a pain is relieved by a hot poultice or by any stimulant application which we know determines an activity of circulation and nutritive change, we must in reason believe that the object of the pain was to induce this condition of physiological activity which we have helped to bring about.

3. *To Promote the Absorption and Removal of Pathological Products.*

That counter-irritation serves an excellent purpose in this way cannot be rightly denied. By means of judicious blistering large quantities of fluid may be cleared away from the pleural cavity in a comparatively short time; and we have had similar results in the treatment of other serous cavities. Under the same

treatment extensive deposits of fibrous tissue also may be absorbed and disappear; and glands that have been for years hard and useless may be softened, cleaned, and made healthy.

In order to have some reasonable understanding of this part of the process and of these results, we must believe that all natural nutritive activity tends always to restore diseased parts to their healthy state, and that the presence of pathological products is always obnoxious to the healthy textural instinct of the parts in which they lie, and that there is always a tendency and effort to remove them. It is only on the basis of this assumption that we can have any intelligent conception of an act of corrective repair—unless indeed we impute special merit or specific action to the drugs we use as means. Nature cures or the drug. The drug "forces Nature into the channels which Art dictates," or simply helps Nature to move and to act in its ordinary channels more effectively. The charlatan quack says the drug does it all, and that Nature is at his bidding obedient to his nostrum. It is not so, but otherwise. "Art, whenever it offers violence to Nature in order to conquer, subdue, and bend her to its purpose by tortures and forces of all kinds, seldom obtains the end proposed; yet upon great struggle and application there proceed certain imperfect births, lame abortive works, specious in appearance but weak and unstable in use, which are nevertheless with great pomp and deceitful appearances triumphantly carried about and shown by impostors."—BACON'S *Ericthonius.*

It is not necessary to make any strict distinction between the absorption of fluids and that of more solid products; it is but a matter of degree—it is the same process.

4. *To Aid and Accelerate the Natural Effort to throw off Dead Tissues.*

The principle underlying this action is the same as that just referred to, namely, that healthy tissues and healthy parts always strive to get rid of unhealthy products. Elements like serum, fibrous tissues, fat, and even salts of lime, which are in themselves healthy, but which by their presence in excess and in wrong places cause disease, are, if possible, got rid of by absorption. Dead tissues of all kinds are still more obnoxious, and must be thrown altogether out of the body. John Hunter looked upon carbuncles and boils as provisional excretory organs designed to throw off obnoxious matter by their discharges. This is the view we have taken of these very troublesome affections for some time back, and in order to hasten the process in them we have applied a blister over their whole surface with the very best results. Processes that would take two or three weeks if left to themselves are gone through in as many days, and with the saving of a great deal of useless suffering. This is only one illustration, though a very good one, of the application of this principle. In hard, lifeless ulcers, a sweep with a reliable blistering fluid will do more good in a few days than months of ointments and dressings. Patches of old eczema and psoriasis, which nothing seems to

touch, may be similarly thrown off, and quite a healthy skin is in their place in a few days. Lupus ulcers also are cleaned and healed in the most interesting manner —but we shall come back on this.

5. *To Remove a State of Passive Congestion.*

Consistently with the views maintained in this essay so far, we can only admit of two forms of congestion—active and passive. For convenience we may divide active congestion again into two forms, namely, (1) that which occurs without substantial injury, as in a limb when actively employed, or when an organ is functionally active, for instance, the stomach in the time of active digestion; and (2) that which occurs when there is an injury which needs to be repaired. This latter condition is always the first stage of inflammation. Logically these two conditions are but different degrees of the same physiological process. The need in the first case is general for the whole limb or organ; in the second it is special to the diseased part. It is, however, the same intention in both—in the one case to maintain, in the other to determine, repair. With the first we have nothing to do—it is a state of health always; with the other our whole essay is practically taken up.

Passive congestion, again, when not due to mechanical obstruction, is always due to debility, which may be general or only local. If the whole health is low it manifestly will not do much good to stimulate the circulation locally without at the same time, or rather previously, doing the utmost to improve the

general condition and to strengthen the heart. But if it be a local congestion only, and dependent on local defect, the stimulation of the part may be all that is necessary—and that especially if the general health is good, or such as may be with safety and advantage drawn upon.

In a state of passive congestion the vessels are in a flaccid, atonic condition, full of defectively nourished blood moving with little or no force; and we may imagine that the vital changes of nutrition are also in the same degree prevented or altogether suspended. Any healthy stimulus is good in such a condition. It is well to replenish the blood and to strengthen the heart from within, and it is plainly desirable to stimulate any part that is weak into nutritive activity by means of counter-irritation or otherwise from without.

This condition is, perhaps, most commonly met with in the last stage, or as an after condition, of acute inflammations in persons whose health is low and poor. The vitality of the body in such cases, though sufficient to carry the inflammation through its earlier stages, fails to complete the process, and assistance at this point becomes necessary to a complete restoration. In other cases the vitality may be so low as not to be able to carry the process through even the first stage, and so an active congestion becomes a passive condition directly.

Habitual active congestion, again, whether from over-work or from irritation, so dilates and weakens the vessels that they come to remain in a state of

passive congestion or chronic inflammation. In such cases it is necessary to stimulate the vessels to contract, and to empty to some extent, so that they may be able to recover their tone and their natural calibre. Counter-irritation is one of our best aids, if not, indeed, our most effective means to bring about this improved condition.

It may be well to bring under this head certain uses of counter-irritation which have been directed to divert the blood out of what may be called a diseased course. The blood-vessels, like any other organs or tissues, may take on a wrong and diseased habit in which they tend to continue even after the first cause of the error has been removed. A primary irritation may have caused acute active congestion of a part, and that continuing may have so and for so long dilated the vessels beyond their right and natural condition that they tend to remain in that state. This condition is removed a short way from passive congestion, inasmuch as the force of circulation is good, though the state of the vessels is very much alike in both cases. In serous cavities which from diseasing causes take on a habit of pouring out an excess of serous or fibro-serous fluid, a persistent irritation in the neighbourhood of the place of diseased action, or in "the neighbouring vascular area," may divert the blood supply to such an extent that the morbidly dilated vessels may contract, and the effusion of fluid will be to that extent diminished. We have taken advantage of this fact in cases of ascitis and hydrocele,

and have had reason to be satisfied. It is well worth further attention.

It may be said that there is no new principle involved in this, and that it is only another manifestation of the general effect of counter-irritant action to which we have already referred as leading to absorption of pathological products. To this we altogether agree; but it does no harm to present the general effect from various points of view.

6. *To Rouse from a State of Unconsciousness.*

The application of mustard to the soles of the feet in cases of apoplexy is a practice of considerable antiquity, and we need not here stop to inquire what the first intention in the proceeding may have been. It is supposed that by this means some blood is withdrawn from the head, so lessening the pressure on the ruptured vessels of the brain. If it be true that blood can be so withdrawn, it is plain that the practice is reasonable and right, and that much good may come by it. But it is very difficult to understand how any appreciable quantity of blood can be withdrawn in this way; and it is certain that we can withdraw blood from the head, when we wish to do so, by other and better ways. In the fact, however, that this has come down to us from the far past, and in the fact that even in our scientific day it still remains in use, there is sufficient reason to expect that there is something in it of good, and more so, indeed, than the revellent theory explains.

One of our modern text-books states the effect of

an irritant upon the nervous system thus: "A local irritation affords us means of rousing the highest centres, and what is more important, therapeutically, the whole of the impressions conveyed from the irritated spot does not become converted into a painful sensation or act of consciousness. A portion of it, whilst traversing the gray matter of the spinal and medullary centres *en route*, disturbs these and causes reflex impulses which rouse the muscles and viscera. In this way sensory and especially painful impressions are a powerful and readily available means of stimulating not only consciousness but the cardiac, vasomotor, and respiratory centres, and through them the great viscera themselves. In other words, local stimulants may become powerful general stimulants."

This use of the mustard, then, seems to be as an irritant pure and simple, which by its very painfulness works its way through the numbed channels of sensibility towards sensation, waking the sleepy sentinels each to his duty by the way, and finally reaching and rousing consciousness to activity—to order and to regulate the springs of life. It is a στιγμή or *goad* in the simplest physiological sense.

The question arises here, how far in such a case as apoplexy, can we reasonably believe that such irritation serves a good purpose? We have much reason to doubt that it always acts for good in such a case. We can readily see how the irritation and disturbance of a life, which, in the circumstances, needs above all things peace and rest, may greatly prejudice the chances of

recovery. In any and every condition in which there is dangerous bleeding, it would seem that stimulation, whether by irritation from without or by alcohol from within, is clearly contra-indicated. If, however, the bleeding is arrested and the risk from it is removed, stimulation may become a right and necessary treatment. In states of apoplexy, concussion, shock, and syncope from injury or from loss of blood, we cannot be too cautious in the use of stimulants from without or within. That they are often most useful there can be no doubt; that they are sometimes dangerous there is no doubt; and our great difficulty is to determine the point and the time at which they can be applied with safety, so that the benefit by them may be realised without risk.

In states of unconsciousness arising from epilepsy, suffocation, passive congestion, alcoholic and other narcotic poisoning, this element of risk is not present, and the use of a stimulus in such conditions may do much good and deserves careful attention.

7. *To Draw Poisons and Poisonous Products from the Tissues.*

Some years ago a boy, badly bitten by a dog, was brought to me. On the spur of the moment it occurred to me to brush the wound with a strong blistering fluid which was ready at hand. This was in the hope that any possible poison in the wound would be abstracted in the fluid of the blister. The application took effect instantly, and the result was entirely satisfactory. After repeated and frequent use

of the same means in other cases, and after giving the matter careful consideration and attention for several years, nothing has occurred to throw doubt on the efficacy of the treatment. It seems a very reasonable proceeding, and it is altogether harmless; certainly it is more reasonable and less harmful by far than any of the other methods commonly commended.

If there is just and sufficient reason for the use of a blister in this way, other similar conditions will readily occur to us in which it might be used for a similar purpose.

The inflammation of erysipelas seems to indicate an effort of nature to throw off by the skin some poisonous matter in the system. Not long ago in a typical case, I suggested that it should be blistered in the hope of staying the progress of the inflammation, but the patient objected. Within a few hours, however, the intensity of the inflammation produced a very large blister which "discharged pints," as I was informed, and the disease was thereby and at once cured. We have already said that we are prejudiced against the interpretation which gives a depletive and derivative intention to counter-irritation, so any observations under this head may be taken to have been very clear.

CHAPTER II.

GENERAL OBSERVATIONS ON THE USE OF COUNTER-IRRITANTS.

WHENEVER counter-irritation is used for the purpose of accelerating local nutrition, it must be remembered that the local benefit is at the expense of the rest of the body. We draw on the general store of vitality for a special purpose. It is therefore necessary to sustain the general nutrition to the utmost. This should be a condition precedent to all local stimulation. Nourishment of a kind that is readily available to the system is the most essential element in all diseased states.

Logically, the conservation and augmentation of vital energy should come first in our treatment of every disease which comes by exhaustion or by which exhaustion has come. Rest, therefore, and conservation of strength is as important and necessary in all such conditions as is an improved nutrition. We mean rest in its most comprehensive meaning—the withdrawal from, or the removal of, every cause of disturbance, care, and anxiety, and from every form

of mental dispeace as well as from physical activity. The more nearly a sufferer from acute disease approaches the vegetable condition, the better his resources are economised, and the better his chance of recovery. We are almost disposed to believe that even the utter prostration and mental inaction that obtain in the crises of acute diseases may have a conservative intention.

It may be stated as a general principle that counter-irritation should not be used in febrile conditions. The only seeming exception supported by any evidence is acute rheumatism.

In the acute stages of specific fevers, there would not seem to be any place for counter-irritation or for stimulation of any kind. The fever is the natural effort to throw off the poison in the system, and so long as the natural activity is sufficient, there does not appear to be any need for interference in this direction; but when the vitality is failing, anything that will support and sustain it is plainly called for, and it may even be necessary in desperate conditions to stimulate the little life that is left into a special effort in order to avert imminent fatality.

In non-specific febrile states, again, stimulation is not necessary and not desirable, so long as the fever is active—so long as the inflammatory state continues. The object of the disease here is to bring about repair of some textural injury. There is no elimination of a poison as is the case in the disease of specific fevers, unless, indeed, of some low products of de-

generative changes, but the powers at work are the same, and the end in view is the same. They both make for health. The one cleanses; the other repairs —they both restore. When the acute stages of such conditions are, however, past, there may be need for stimulation both from without and from within.

Excessive or violent counter-irritation is rarely desirable. A slow and gradual stimulation is always safe, and in most cases it gives better results than a strong irritation. Where we intend a revellent or violently irritant effect, as in poisoned wounds, and in certain forms of unconsciousness, it may be necessary to resort to vigorous measures that shall act quickly and decisively. With the exception of these and such special cases of an urgent nature, the nearer we approach to a natural reaction in our treatment by this means the better.

The great number of those who have given any competent attention to this subject are agreed that it is not well to use strong counter-irritants with young children, and that the younger the child the more undesirable such remedies are. There can be no doubt of the correctness of this observation. Experience is conclusive on the point, and it is altogether reasonable. Counter-irritation is very rarely called for in young persons. Local idiopathic inflammations in such are extremely uncommon if we except inflammations of the lungs, and even these are impossible, we take it, in a perfectly healthy child. Whenever inflammation does result from any cause

it is always acute, and does not need stimulation. But if a chronic condition should occur as the consequence of an acute disease, or from one of the few rare causes that may determine a chronic slow inflammatory state from the first, and if counter-irritation be considered advisable, it should certainly be mild and continuous rather than short and sharp.

It is also generally agreed that it is not well to use strong irritants in the old and cachectic. We think it necessary, however, to make a distinction between the healthy old and the old cachectic. The vitality of healthy age is in its own measure and degree always of a good and reparative quality, and will tend towards repair so long as the body will respond to stimulation. But the constitution that is dominated by a diseased bias, as by the exhaustion and tendency to degradation that marks the later stages of cancer, will not respond well or profitably to stimulation. In both such conditions, as in all weakly tissues, a violent irritant that may directly injure and destroy the tissues with which it is in contact without determining a reparative activity on the subjacent tissues, may cause ugly, and useless, and dangerous wounds. In the cachectic the value of any stimulation is always doubtful, and certainly so in proportion to the cachexia; but in healthy old persons a gentle stimulation is quite reasonable, and while it cannot do any harm, it may do and not infrequently does much good.

It is generally agreed, also, that the use of cantharides blisters in cases which show any symptoms

of Bright's disease, is not desirable. This consensus seems to be based not so much on observation and experience, as on a prejudice having origin from the fact that cantharides taken into the system in any quantity causes an irritation of the kidneys and albuminuria. We never saw any sign of evil coming by the use of blisters, but we have always been alive to the possibility that evil might come, and have always, though not altogether for this reason, avoided large blistering. Notwithstanding the commendation of several men who have left their mark on the record of medical progress, we cannot see that any circumstance or condition can arise which will rightly need a blister of more than twelve square inches at the very outside, and most purposes can be best served by applications of half this size repeated if necessary. It is difficult to imagine how from such a small surface so much can be absorbed as can in any appreciable way affect the kidneys, and that especially with our clean and quickly-acting blistering fluids.

Whether a blister or strong counter-irritant ought to be applied immediately at, or at some little distance from, an inflamed part has been frequently discussed and variously determined. Some think it right to apply the irritant immediately over the seat of the disease; but the stronger feeling is in favour of placing it at some small distance. We have said that we do not consider it right to use any irritant in the acute state of inflammation; and in the chronic state we should with comparatively equal mind apply a mild counter-irritant at the seat of disease, or a stronger

application at some distance, for the physiological result on the diseased part would be manifestly the same. Some have suggested, and with these we agree, that for the purpose of causing absorption of deposits, as in glands, the application should be placed over the gland; and in dealing with boils and carbuncles, we have always applied the irritant over the whole swelling to hasten resolution and the separation of the core.

The proper time to apply a painful counter-irritant is also of importance. We may take it that rest is essential to obtain the full effect of a counter-irritant, because any diversion of the forces of the body, by labour or any unrest, will interfere with repair, whether that be spontaneous, or determined by the aid of irritants. Night, for this reason, would be the best time, only that the pain of the application may interfere with sleep—which should be avoided. For gentle applications, such as will not by their painfulness interfere with sleep, night for various reasons is the best time. A gentle warm stimulation is not infrequently an excellent aid to sleep.

It is not desirable to use painful irritants near a meal-time, or during the performance of active digestion, for the pain will doubtless interfere with, and may even altogether arrest digestion.

In pregnant women strong counter-irritants are to be avoided, especially blisters; and at menstrual periods in weakly subjects all such applications as may, in any degree, divert the natural congestion of the uterine organs may, by so much, do harm.

CHAPTER III.

THE USES OF COUNTER-IRRITATION IN DETAIL.

1. *The Acceleration of Repair.*—When, in case of injury, the ordinary powers of repair are adequate and sufficiently active, there is no reason to interfere in any way. Injuries to the young and healthy heal without any further assistance than simple attention to cleanliness and rest—that is, if there be no local interruption of nutrition. It is otherwise with the old and feeble, in whom, however carefully an injury may be attended to, it may fail to repair from defective vitality. The first consideration in such cases is to improve the general health, which alone may be all that is necessary. It is not long since a seemingly strong man of fifty-six consulted me regarding a varicose ulcer which had been open for several months. It would, perhaps, be more correct to say that he came to me in mental distress. He had been kept for many weeks on a low diet, "so as to prevent inflammation." Inflammation was certainly prevented, but the wound did not heal, and the sufferer, who was a "hearty" man, got desperate and rebelled. He had resolved not to put up with

this line of treatment any longer, and had indulged in a substantial steak, with stout and other things. His conscience smote him, however. He had disobeyed his doctor's very reasonable orders. "Would it do much harm? Would he die?" No, I thought not. I went even the length of suggesting, that if he did not feel anything worse for the day's indulgence, he might repeat a similar course from day to day—which he did. His ulcer healed in a week without any treatment.

An old lady of sixty had a varicose ulcer of the leg for many years. She considered it incurable, and had come to believe that it would be wrong to close it. She lived in a charitable institution, and came under my observation for another illness. After she recovered I attempted to heal this wound. I used stimulant lotions and ointments to no purpose, and went even so far as to apply a blister without any good effect or attempt to heal. The wound kept on festering and lifeless, with occasional attacks of an erysipelous nature, but no healing. She was about that time sent to a convalescent home at the seaside for a few weeks, and on her coming back I again treated the wound with exactly the same means as before. It would not respond to mild treatment, however, and so I again resorted to blistering and rest. A good effect was at once apparent. A small local inflammation was the result. The old and dead surface was thrown off and new tissues began to form, and continued to form under gentle stimulation till the

wound was quite healed. There could be no mistake as to the meaning and the teaching of this case. The general vitality was so low, before the beneficial change to the seaside, as not to be able to respond to any irritant means, but with the improved health consequent on the change the *vis medicatrix* was increased, and the special demand made on it for this special purpose was answered by an activity sufficient to repair the wound. Two things are clear: namely, that the earlier condition of the general health was such that no means could bring about repair, and that even in the latter improved condition strong means were necessary to determine sufficient local activity for the reparative need. This case brings out very clearly the importance of always taking into account the two factors of repair in such cases—the constitution and the remedy. It may doubtless be assumed with safety that if the age and circumstances permitted a higher health, the wound would have healed under milder remedies.

The two determining factors in such cases are then apparent: they are (1) the state of the general health, and (2) the strength of the irritant remedy applied. The strength of the remedy must be somewhat inversely proportioned to the general vitality. A perfectly healthy organism needs no stimulation, in a perfectly unhealthy organism no stimulation is sufficient; and as between these extremes there lies an infinite variety of states of health, so there is equally various need for difference in the strength of irritant application. It

may be taken as certain that the milder the remedy used the better, so long as it is sufficient.

A caution is necessary with regard to strumous subjects. In persons of this constitution, in whom the tissues are ever biassed towards degradation, to lash them into activity is always dangerous. True, such cases will somewhat readily respond to stimulation, and we may by such means determine an increase of tissue elements, but these are of a low type, of low vitality, and of little or no reparative value. Without a long preliminary improvement of the general health, counter-irritation in such subjects can only give very disappointing results. A young lady in apparently good health injured the inner ligament of the knee-joint in dancing. She was ordered to lie up. The knee was put on a splint, and after a few days a mustard-leaf was applied with a view to accelerate repair. It caused an inflammatory activity, certainly. The bones in the neighbourhood increased in size, and the whole joint got packed with callous products. The superficial appearance of irritation, which ordinarily passes away in two or three days, took more than as many weeks to disappear. The whole result was anything but satisfactory. She was a stranger to me. I knew nothing of her heredity or previous history. Her seemingly healthy physique and appearance led me to think she was a good subject. The result was, however, so disappointing and so different from my ordinary experience that I was compelled, unfortunately too late, to inquire into her heredity and previous health, when the meaning of the

whole event became very plain. She was a strumous subject of the worst type. A previous injury of a somewhat similar nature, which in a healthy person would be all right in one month, incapacitated her for eighteen months. On learning these things attention was immediately directed to her general health, and soon the whole complexion of things changed for the better. She made a good but slow recovery. The old lesson was once again and effectively brought home: *don't trust to appearances*, even when they seem to be exceptionally good.

Experience of this kind, if not rightly interpreted and understood, might bring a valuable mode of treatment into discredit; and if my previous experience had not been such and so satisfactory, this case might have been sufficient to make me chary of counter-irritation.

It was on purely theoretical grounds that some years ago I tried this method of treatment on a young football player who had sprained his knee. After fixing the joint on a splint, and after the acute pain had, with the assistance of fomentations, passed away, a series of small blisters were applied over the injured ligaments. The result was sufficiently satisfactory to have surprised the patient, who had previous experience of such injuries.

There is a very instructive sequel to this case. About a year after this injury to his knee, the same man fell at tennis and sprained his elbow very badly. A neighbouring practitioner was good enough to attend to the injury in my absence from home. The joint was carefully fixed and slung, and I did not think

it necessary to suggest counter-irritation, thinking that as the joint could be put so carefully at rest it would repair all right—especially in a young and healthy man. At the end of three weeks, however, he came begging that the joint might be blistered, because it was progressing so slowly and keeping so painful. It was blistered. The pain at once ceased, and the injury repaired forthwith.

One other case is worth mentioning in this connection—that of another young man who also injured his knee at football. For years the limb was troublesome. The most trifling slip or false step laid him up for weeks at a time. He was repeatedly under treatment, still the joint would not get strong. On my suggestion he took advantage of a three weeks' holiday to lie up. The knee was put on a splint, and a succession of small blisters were applied over the weak part. It is now three years since, in which time he has freely indulged in outdoor games without the slightest trouble from this joint.

These must suffice. Of the great value of counter-irritation rightly used in such cases there cannot be any doubt.

In all cases of sprain it is necessary to put the patient to bed, and to fix the limb during treatment in such a position as will relax the injured ligaments, and it is necessary to keep it so fixed and at rest until the plastic state of the ligaments induced by the irritation has passed away and solidified into the fully formed tissue. If this is not done our treat-

ment must fail of the desired result, for the ligaments will be longer and looser than is natural however strong they may be made, and the joint will be liable to displacement by comparatively little violence.

2. *The Relief of Pain.*—We have said that neuralgias and idiopathic inflammatory diseases comprehend, perhaps, all pain to which counter-irritation is applicable.

The signification of the pain of idiopathic acute inflammation we have already endeavoured to explain. It is the prayer for nutrition and repair; and counter-irritation ministers to the prayer in the measure that it stimulates and induces the local nutritive activities towards the needy part. Every possible local inflammation coming on without apparent cause is of this signification, and there is no need for illustrative cases.

Neuralgias, on the other hand, seem to be different and more difficult to understand. In such cases we are taught that "no morbid condition can be discovered but what the neuralgia induces." It is admitted that a neuralgia may bring about morbid changes. "A persistent neuralgia of the head may turn the hair of the part gray." The neuralgia caused the hair to turn gray, we say; but what caused the neuralgia? Is it not more reasonable to maintain that the same cause which led to the turning gray of the hair was that which also caused the neuralgia? Can we by any possibility separate the two consequences, whether they be concurrent or consecutive, from the earlier cause without which we should have no neuralgia? There is surely

a morbid condition before the neuralgia, and concurrent with it while it lasts, whether we discover it or not. It may be, and indeed very frequently is, an old diseased tooth irritating the nerves and perverting nutrition; it may be pressure on a nerve trunk from inflammation following an exposure to cold or from a morbid growth; it may be from too much loss or by too much labour producing exhaustion; and it may be from bloodlessness, malarial poisoning, and a hundred other causes and conditions — but there is always a morbid cause. These always precede or accompany neuralgias; and these induce the neuralgia, not the neuralgia them. These are the diseasing causes; the neuralgia is the voice of nature crying for relief from them. To treat the neuralgia as an evil is altogether short-sighted and unreasonable, especially if we are satisfied to believe that no morbid condition can be discovered. All reasonable treatment should be for the removal of the evil, and not for the suppression of the good counsellor pain, however disagreeable its monitions may be. But what is most important, however, to observe in this connection is that all causes of neuralgia, however near and manifest, or however remote and obscure they may be, operate in one and the same direction to produce a condition of defective nutrition. The defective nutrition is, in the chain of cause and effect, next before the neuralgia, and by good inference we may believe that the condition continues concurrently with the pain and so long as the pain lasts. For this reason, then, all neuralgias

come under one simple law already expressed, namely, that "Pain is the prayer of a part for food." We may easily see how, therefore, counter-irritation becomes a valuable aid to treatment—along with an improvement of the general nutrition.

We imagine that it is nothing short of an insult to tell a man of any intelligence that he is suffering from neuralgia. It is a Greek way of explaining to him that he is alive. All such words as neuralgia, myalgia, cephalalgia, hysteralgia, and all that cacophony are only fit for our philological museums. They have no intelligible meaning now and no use. They never had any real meaning. They interrupt true scientific progress in medicine more than we can easily believe; they are the sanctuary of the thoughtless, the shield of sheer ignorance, and the strong tower of the knave. We must get rid of them; they are in the way. We are glad that we are not alone in this feeling. Dr. Robert Barnes, in another connection, makes the following healthy and very pertinent remark on this form of professional accomplishment: "Another expression which is often adopted as a conventional substitute for correct diagnosis is 'neuralgia of the uterus, or hysteralgia.' These terms really mean nothing more than pain in the uterus. To employ Greek compounds to express the idea seems superfluous, unless it be to lull the spirit of inquiry by fostering the false belief that these terms embody a pathological entity. It must not be forgotten that these terms, seemingly so definite and yet so vague, took their rise at a time when the precise and minute

methods of investigation at present in vogue were comparatively unknown. These imposing terms, therefore, are the reflection of imperfect pathological knowledge. They no longer satisfy any but those who are satisfied with the imperfect pathological knowledge of the past. Advancing knowledge has gradually contracted the proportion of cases in which pain cannot be referred to its cause, and with this advance we are less under the necessity of treating pain as an essential disease—we are more able to attack successfully the real disease of which the pain is the symptom. Neuralgia of distant parts, as of the face or breasts, is often, if not strictly symptomatic, certainly consequent on uterine and ovarian disease. This dependence is often quite overlooked by physicians who devote special attention to neuropathy. Neuralgia, studied apart from its antecedents, is apt to assume much of the importance attached to an idiopathic or essential disease, and being treated accordingly it persists rebellious against all the artillery of the pharmacopœia."

This is well expressed, and it certainly is not too strong, nor too pointedly put. We are sure Dr. Barnes could give many a cruel proof of the truth of his statement. He is charitable enough to believe that our better knowledge of pathology saves us in this day from the dangers he indicates, but it is not very long since we saw a young woman, who had been treated by a well-known neuropath in one of our best known hospitals for six weeks without doing any good. An examination discovered an immense tumour filling the

whole pelvis, on removal of which all her "neuralgias" disappeared. This is not only without excuse, but it is also very sad. Less of theory and a little more of methodical care would make such an occurrence quite impossible.

Purely functional disease does not exist and cannot exist in the form of neuralgia or in any other form. It must be organic or related to the organism from the very beginning, else we should suffer no dis-ease. If a perfectly healthy man takes some food that disagrees and goes wrong in his stomach, from the first moment at which he becomes conscious of the matter he is logically and in fact diseased; and the healthy action of the organism is interrupted and injured as surely as if he had a violent inflammation or a morbid growth. It is only a question of degree. There must be a beginning to every state of disease, and a continuity of cause. There can be no gross organic disease but as the result of, or rather continuous with functional derangement, the consequence of antecedent error. A man has gorges of fat foods and heavy drinks from day to day, and does no work. After a comparatively short time his body is loaded in every channel with unassimilated perverted food elements, which must be got rid of if at all possible. If he stops his excess even after he has become dis-eased, it is likely that his healthy organs may be able to overcome this foul state of things. But if he perseveres in his old ways, every organ gets choked up, overworked, and exhausted, and they fail. Albumens, sugars, and loads of other things

appear in the urine. This is functional disease of the eliminatory organs, according to the usual interpretation. But in truth it is not a diseased but a healthy state of things. It is the evidence of a healthy activity up to a certain point—up to the point at which the finer structures are actually destroyed by the excessive and unnatural labour thrown upon them. It must be, however, manifest that at no point in the whole course of the dis-easing excess can the line be drawn which will rightly separate the so-called functional state of disease from that which is grossly organic. The excess is a cause of organic disease—and of organic injury from the very first moment that it exists.

3. *To Promote the Absorption and Removal of Pathological Products.*

As in every other good result from counter-irritation that depends on the acceleration of local nutrition and physiological change, the absorption of pathological products under stimulation is quicker according as the health is good. Absorption of diseased deposits is a healthy process, the reverse, in a sense, of the diseased process which led to effusion or deposit. The diseased process with its results is a departure from normal and natural function for a special reason, and it may be for a special purpose. We may safely say that if the health had been good, such effusions would not have occurred or would not have been allowed to remain ; and whatever we can do by special general nutrition and local stimulation is only restoring and calling into activity powers which, had they been

previously present, would have prevented the condition of things that we now desire to remove.

Absorption is the natural return to the healthy *status quo ante*. Being a healthy or a healthward process, it is as evident in reason as it is manifest in act and effect, that the higher the health, the more effective is and must be the result. Hence, again, in every case in which our object is to remove effusions or deposits, the first consideration must be to raise by every means in our power the general vitality on which we are to make a special demand for a special end. It follows on this in theory as in fact, that if the products of disease are degenerate and dead, no effort of ours can call them again into life, and they cannot be taken into the healthy body, so they must be dealt with as foreign elements which cannot be absorbed but must be thrown off by healthy pathological process—if the expression can be excused—or removed by surgical art. It is a very difficult matter, but it is by no means impossible, to know whether an effusion is healthy, or has undergone degradation, or is dead and purulent. It is most important to be sure of this, for it is only on our clear knowledge of the exact state of things at this point that any treatment by counter-irritation or otherwise is at all reasonable. Without taking our bearings with every possible exactness, all our treatment must be simple guess-work, hitting, as of old, sometimes the disease and sometimes the patient. If there is clear and sufficient proof that a pleuritic effusion, for instance, has become purulent, counter-irritation is altogether

out of consideration, for in such a case it is useless. If, on the other hand, there is clear and sufficient proof that the effusion is healthy and in itself absorbable, he would be a bold man who would undertake to say that it cannot be got rid of without surgical interference—however extensive it may be. It is extremely difficult to say what may not be effected in this way with caution and judgment.

In simple pleurisy, for instance, counter-irritation is a most valuable and powerful means of getting the effused fluid reabsorbed. On general principles it is, as has been already remarked, far more than doubtful if strong counter-irritation should ever be used in the early inflammatory stage. Hot fomentations with anodyne soothing remedies are much more clearly indicated at this stage. But when the acute inflammation is over, and when the fever has subsided, if fluid is present in the pleural cavity in any considerable quantity, blistering should be resorted to without delay before the fluid has become consolidated or organised. It will depend on the state of the general health how far we may think it wise, or find it necessary, to postpone the application of severe and doubtless exhausting means until we have by every diligence improved the health and raised the general vitality; for in this, as in every other weakly stage, caution is necessary that we may not force the tissues into more activity than they can bear, and so induce disintegration instead of the desired restoration and repair. If, however, the health is fairly good, if there is no marked

cachexia or constitutional disease, and if the sufferer takes nourishment and assimilates it well, we may begin the use of counter-irritants without fear or risk. The blister is, without doubt, our best means in such a condition. It is far and away more effective in such cases than any other remedy we possess.

If the effusion is excessive, blistering may have to be repeated ; but until the irritant effect of one blister has disappeared, another should not be put on. The good effect from this treatment depends very much on the activity with which the part responds to the counter-irritation, and this power of vital response is apt to get exhausted if we follow one irritant too closely on another. It may be also remarked that when our object is to produce absorption a blister should not be repeated on the same spot for a long time, and not at all if it can be avoided. It is desirable also not to put the blister over the part in which the greatest accumulation lies, but near the margins of the effusion where the tissues are presumably more healthy and more readily stimulated to healthy action.

Four years ago a patient had a violent attack of pleurisy while I was on holiday. There was a very large effusion into the right pleural cavity, and it remained so long and gave so little promise of going away that my *locum tenens* after consultation determined to tap it. The patient, through simple preservative timidity, asked that the operation should be postponed for three days till I came home, which was done. More than two-thirds of the cavity was full of

fluid, with fibro-serous thickening all over that area more or less; but as the sufferer was nourishing well, and had no fever nor any indication of degenerative change, it was resolved to try what counter-irritation would do. I used a large mustard application to the diseased side. It made the part admirably active, and by the time the superficial irritation had passed away, the effusion within had sensibly diminished. Whenever the irritation from the one application disappeared, another was put on another part of the side. This was repeated perhaps half-a-dozen times, making the plaster less as the effusion got less, with the result that the cavity was cleared of the fluid, and the pleura of all detectable thickening. The man has been in perfectly good health ever since.

For the removal of solid, or rather say less fluid products, the conditions of success are essentially the same. They disappear more quickly as the health is good, and if they are degenerate and dead they cannot be absorbed, but must be discharged.

The reabsorption of the hardening of glands is a most instructive illustration of the principles underlying the success or failure of treatment by counter-irritation. Glands, it must be understood and remembered, are filters—living, intelligent, discriminating filters—placed in the course of the main channels of nutrition to eliminate, and to elaborate into innocuous elements, any poisonous matters that may find their way into the system. An inflamed and suppurating toe-nail may, by reason of the absorption from it, cause a

swelling of the glands up the leg and even in the groin; and if the supply of poison is not stopped at its source by proper treatment, the glands may break down from destructive poisoning and overwork. They discharge the foul load that they have prevented from going farther, and also as much of their own substance as has been destroyed—a most admirable operation, surely. But if, even after the glands are enlarged, the suppurating sore is cleansed and made pure, the swelling may resolve and disappear; or, as we should rather interpret it, the glands may be able to overcome and render innocuous as much poisonous matter as they have intercepted, and go back to their previous condition. The application of a counter-irritant to glands acutely inflamed from such a cause, and especially if the cause is not attended to at the source, would be quite wrong and unreasonable, and would certainly do harm. But if the cause has been treated effectively, counter-irritation may with every advantage be applied after the acute condition of the glands has passed away. Glands, like every other organ and tissue of the body, can do a certain amount of work, and no more, without suffering themselves; and in such cases of poisoning they doubtless suffer not alone in their function but in their structure also, even when they do not break down, and anything we can do to assist them by improving their nutrition and stimulating them when they are exhausted and diseased is on right and reasonable lines. Experience comes abundantly to support reason in our treatment of such conditions by means of counter-irritation.

Some years ago a young lady consulted me regarding a large glandular swelling of the neck, which was not only very unsightly, but also caused her a good deal of suffering by reason of its pressure on the nerves and even on the windpipe. She had consulted a surgeon, who advised the removal of the tumour by operation. She was very reluctant to take this course if it could be avoided. Without much hope of success I suggested that we might give counter-irritation at any rate a trial. The gland was kept in a state of constant physiological activity by means of an ointment of the red iodide of mercury, and the general health also was carefully attended to. After a short time she was allowed to use the ointment herself, at discretion, never excessively, but just sufficiently to keep the part actively red. For a long time there was no sign of resolution, but after a month or so it appeared to be less hard, and from that time it gradually resolved. Though it took a full twelvemonth to go away, still every particle of hardness and swelling disappeared, and we had in its place a luxuriant if undesirable growth of hair on the neck, from the long course of stimulation. It is now nearly five years since, and there has not been at any time any indication of a tendency to the return of the swelling. The hair also has gone back to its normal state without any treatment.

Another similar case in point is that of a student who is on my care at present. He consulted me some months ago for his health, which was anything but

good. I noticed that he had a pair of enlarged, hard glands in the neck, but no attention was paid to them at that time. When his health had considerably improved by the rest and change which his condition made necessary, he was anxious to get rid of these swellings. I found that one of them had broken down in part, and a small opening had to be made in order to discharge a little pus that formed. It was doubtful if the skin over this part would survive, for it had a very unhealthy appearance, and was, indeed, almost dead. Wishing to avoid the puckered scar which the destruction of the skin would entail, we commenced mild stimulation by means of mustard-leaf, and continued the application just sufficient to keep up a gentle blush of the part until the skin was quite restored and had adhered to the tissues beneath. Then we used a strong blistering fluid at intervals of about ten days. The hardness got less and less with each application, and now, after a little more than two months of a treatment which caused no pain to speak of, nor inconvenience, the swelling is quite gone, and there is no mark whatsoever, nor indication that anything ever was wrong.

Another class of cases in which I have used counter-irritation with complete success is that in which the skin hardens and contracts about the ankles of women who have suffered from a varicose condition of the veins, without going the length of ulceration. This condition of the skin is doubtless the result of defective nutrition arising from the rupture perhaps, and

occlusion of the vessels supplying it from beneath, and the idea in using counter-irritation is to revive the skin by increasing local nutrition, and forcing a new circulation into the almost dead and bloodless tissues.

Several of these cases occur to me, but one must suffice. It was that of a lady of about fifty, of very indifferent health. She had suffered severely from varicose veins, and even had ulcers which were then, however, healed. The skin had hardened in a ring round both ankles, and as it contracted it pressed on the blood-vessels, so that the feet were always stone-cold and exceedingly painful. This state of things had been gradually coming on for thirteen years, and was fast getting worse, indeed seriously so, when I resolved to try what a blister could do. With the first application the band, which was about an inch and a half wide, got red, and soft, and vascular to a depth of half an inch from both sides, and the second application completed the process. The other leg was treated in the same way, and with the same result. A little occasional massage has been sufficient to keep the skin healthy and soft, and all the evil consequences of the pressure have disappeared.

4. *To Throw off Dead Tissues.*—If we consider the state of things in an old ulcer, we may more easily understand the operation of this principle. From the absolutely dead surface of the ulcer downwards to the healthy parts, we must believe that there is a gradual improvement of the vitality of the tissues. If we imagine a vertical section through an ulcer we may, for

convenience, distinguish four layers from above down —the most superficial A quite dead, B moribund, C more or less unhealthy, and D healthy, or at any rate as healthy as the rest of the body. Now if we suppose that the conditions which produced this ulcer remain and continue, this is what must happen : A will dissolve and be washed away, and B, getting further devitalised and degraded, will take its place, dead ; C will take the lower place of B, and D will pass from health to unhealth to take the place of C, a new healthy layer now becoming D.

But if the diseasing conditions are altered in any way for the better, the result will be better also. Let us say that the sufferer was up till this time ill-fed and ill cared for, but that now he is to be well provided for in food and comforts. The process of degradation in these tissues will certainly stop ; D will improve in health and tone, and so also will C ; but B may be so far down vitally as to be beyond recovery, and it may die and be thrown off after A. This is not all. By this improved vitality the instinct and power of self-preservation in the living tissues is also quickened and strengthened, and in the same degree the dead parts are thrown off more quickly and more cleanly.

Let us now suppose that a strong counter-irritation or stimulation was used in both these states of nutrition. In the first state the application would do no good. It could only hasten the course and progress of degradation towards which the tissues tended, for it had no healthy nutrition anywhere to draw upon. It could

only do violently and quickly what nature unaided would do with time; and in any case it could do no good, but it would most likely do harm. It might destroy weakly tissues that by gentleness and care might be improved or even restored.

In the second state of better nutrition, the result of a violent stimulation would be somewhat different. The deepest layer D would most likely not only survive the violence, but greatly improve in strength, by reason of the fuller and better nutrition determined for it. The layer C, which under gentler treatment might recover; would almost certainly perish and be thrown off with B and A, leaving a clean and healthy surface D which, if the nutrition is well kept up, heals and closes the wound.

In these remarks may be found the philosophical basis of any meaning that underlay the great Koch Cure, which shook Europe not so long ago—though, so far as we know, neither Koch nor his disciples thought it worth while to inquire into the meaning of their cure. Koch, by throwing a strong poison directly into the system, brought about a violent fever—it will be remembered that the cure had no effect if it did not produce a strong fever—a strong inflammation, so to put it, of the whole body. In the physiological storm thus conjured, the weakest and the weaker tissues that were already on the down grade of vitality must perish. Not only A, but B and C also of lupous and tuberculous parts were destroyed and cast off, whether internally or externally. In external parts the same result was de-

termined as if an irritant had been applied at the place, but the proceeding was altogether unnecessary and unreasonable. It was going round the world in order to get to the other side of the street—and doing, besides, a terrible amount of evil by the way. This cure, like too many others of its kind, might have survived and flourished, notwithstanding its manifest unreason, if it had only been used for parts superficially situated. But when it was used to produce disintegration internally, in parts and positions from which discharges could not escape, the cure killed with too much precision to have any chance of being permanently acceptable.

Let us now consider a lupus ulcer. There are two elements in the progress of the disease which we admit and upon which we act in our practice. First it is allowed that the most essential part of the treatment of lupus is to sustain the nutrition of the tissues by the best forms of food and blood-making medicines; in other words, to increase the resistance of the body to disease. We put so much of resisting strength in place of the weakness that even invites disease and decay. On the other hand, all manner of means are used for the removal of the ulcerous diseased tissue, suggesting that there is a progressive and specific infection from the diseased to the healthy parts. The two elements in treatment, then, are (1) to raise the health and increase the resistance of the healthy tissues, and (2) to remove the diseased and presumed infectious parts. We shall not inquire how the first indication may be

best served, it is with the second only that we have here to do. Every one of our strong counter-irritants and escharotics has been at one time or other commended for the removal of lupus tissue, but the authorities at present seem to prefer the scraping spoon. Now we must be excused for saying that from the first day we saw the spoon used we have disliked it, and have thought that surely there must be a better way. We never have used it, and we think we have been able to do our duty without it.

A few words here about escharotics. These are altogether different from stimulants and irritants in their effect. An escharotic destroys the organic structure of the tissues directly and immediately. The stimulant irritant, when it destroys, does so through physiological exhaustion, by goading the tissues to work till they can work no longer, but it does not injure their structure directly. The one crushes to death, so to put it, the other drives to death. It is most important to remember this difference. It is interesting also to notice that stimulant irritants are of the organic kingdom, but that caustics and escharotics are of the inorganic. Some one has said that an escharotic acts chemically, but an irritant physiologically, and that is a very good statement indeed of the facts. The escharotic from the very first disintegrates and tends to destroy even strong and healthy tissues; the stimulant at first increases the activity and life of the tissues, and if it is not excessive it need not do any harm, but may rather improve them and make

them stronger. Tissues, however, which are already on the verge of disintegration will fail under the influence of the most gentle stimulus, as we have already seen.

Now whether we believe that lupus tissues have a specific infection in them which they can communicate to the healthy tissues next them, or whether we take it that they only indicate a progressive local death without infectious cause, it is evidently not desirable to remove any healthy tissues, nor even such tissues as can by proper treatment be restored. The spoon has no power of discrimination, and not even the most skilled eye and hand can determine what tissue is absolutely healthy, or what is altogether hopeless. It is therefor we object to the use of the scraper. The escharotic also is equally if not even more blind and indiscriminating; it attacks and destroys the healthy and the diseased, the weak and the strong alike. In a proper stimulant, on the other hand, and when properly used, we believe we have a most effectual and desirable instrument for our purpose. We can, to any degree of conservative exactness, remove the diseased tissues; and we need not destroy one cell that is healthy or even hopeful. We can see at once how important it must be to save every particle of skin tissue that we possibly can, if we would avoid the ugly scars that must result on its destruction.

We can now understand the meaning of Velpeau's excellent observation that "Blisters have their precious quality of bringing about resolution if that be possible,

and of provoking suppuration if that be inevitable." This means that the blister, by improving the local nutrition, restores parts that are low, but not too low to recover, and hastens the disintegration of tissues that cannot be restored. This also is the meaning of Mosetig and Hortmann's expression that "Lactic acid applied to such ulcers seeks out lupus tissue as a dog does game—and as surely finds and destroys it—but does not touch the healthy tissues." If lactic acid does this, and the evidence is very strong in its favour, surely there is no need for the spoon or for escharotics. Lugol was equally eloquent in praise of iodine, and others have praised other remedies, but none, so far as we know, ventured to declare the reason in their practice. We cannot suppose that the remedy used has any special affinity for the diseased tissue "as a dog has for game." The true and correct explanation of the result is that which we have given, namely, that the disintegration of weakly tissues is accelerated under stimulation, while the healthy tissues not only do not suffer but may be strengthened and improved.

I myself have used blistering fluid in all such cases as have come my way for some years, and I am thoroughly satisfied with the results; and I am further satisfied that if the health is rightly cared for, the blister leaves the scraper, in such conditions, with far worse than no excuse. I have no desire to say that other stimulants may not do as well, but I have not found it necessary to resort to them. The reason underlying them all in such cases seems clear. It is

a matter of choice and of judgment which of them we ought to use in any given case. Lactic acid (with an equal part of kaolin, on linen) has given good results, and so has iodine, and so has the cantharides blister.

5. *The Removal of Passive Congestion.*—An acute inflammation terminates in resolution and repair, or it may remain, as it frequently does, in a chronic state for a considerable time without definite issue, or it may pass directly into gangrene and destruction. In inflammations that naturally lead to the first result, little or no assistance is necessary, and in the third, which fortunately is not frequent, any assistance is useless—unless we are on our guard sufficiently to foresee and forestall it, which we believe may be done in most cases, if not indeed in all, by sustaining the strength and never depressing it. It is in the second of these events that, having sufficient warning and a reasonable understanding of the conditions, we are without excuse if we do not come intelligently and effectively to the rescue. It is from exhaustion that this condition comes, and it is only by restoring the general vitality that it can be got rid of. Any violent forcing on it of an activity for which it is not fit, without first restoring its energy, will only hasten it to the destruction which it has just escaped. We must therefore be diligent with our nourishment and sparing of our counter-irritants.

In pneumonia, to take an important and interesting illustration, it is by no means clear whether counter-irritation is markedly or at all beneficial. Our results

for several years have been altogether and completely satisfactory without the assistance of any such means in the acute stage. We have no hesitation whatever in at once condemning, with all the emphasis we can, the use of poultices in every stage and condition of this disease. We hope to be able to show sufficient reason for maintaining this position farther on. We are also and quite as strongly opposed to the use of croton oil, antimony, or other pustulants. It is a violent, barbarous, and altogether unreasonable proceeding, which we are sorry to know is not yet fallen into disuse; for it is inconceivable how it can do any good to compare with or to compensate the immense evil of pain and exhaustion which it certainly entails.

We would not choose to use blisters in pneumonia, not alone because we believe their essential action is unsuitable to the indicated need, but for the reason also that such a limited local irritation as would be justifiable, even if it could be admitted to be unquestionably for good, cannot be anything like adequate to the extensive general congestion or stagnation which obtains in the lungs; and it is by no means certain that an irritation of the skin can influence or affect parts which, like the lungs, are anatomically separate from it except by indirect and distant ways. True, some effect may come by the stimulus which the pain of the application may give to the whole system, but this is too small a return and does not justify the treatment, very especially because any desired effect of this kind can be determined by other and more desirable means.

Stimulation may, however, be desirable and sometimes even necessary, but as in all other inflammatory states it will have best use and effect in the stages of stasis and resolution; and in pneumonia we always prefer to use a large and gentle stimulation rather than a small intense one, so that while we cannot do harm we may have any benefit that may come by it.

6. *To Rouse from a State of Unconsciousness.*—The causes of unconsciousness and the significance of the unconscious state are so various and so very different that the possibility of doing harm by the injudicious use of counter-irritants is always and easily within reach; still, we are certain that in many cases we should not be doing our full duty if we neglected their use. It is therefore of great importance that we should have a sound knowledge of the pathology of unconsciousness first, and after that a clear understanding of the way in which our remedies of this class will operate with regard to the diseased conditions present in each case. It is safe to say that in no other province of medicine are we bound to exercise more judgment and care than in the treatment of conditions attended with insensibility. It is clearly not within our present duty, however, to review the complex pathology of this state, but in order that our observations may be better understood, or at any rate understood as they are meant, it is necessary to just refer to the causes of unconsciousness. We have tried to classify these causes for convenience, but have found it very difficult to do so in a satisfactory manner. The evil of a confused nomenclature is here plainly

manifest. One name, for instance alcoholism or uræmia, is an expression of the *cause* of unconsciousness at some distance antecedent to the effect; another, such as compression or encephalitis, is a *condition present* and concurrent with the unconscious state; while another, such as catalepsy or fainting, is simply *an expression of the fact* without any reference to cause—just as the word unconsciousness itself is. A classification of words so indefinitely and so differently used, even if it were possible, would be useless from a scientific point of view. Our duty and our difficulty is to know what circumstances or accidents in the pathology of named diseases call for or contra-indicate the use of counter-irritants.

We have already said that where the unconsciousness and the danger is from hæmorrhage, as in extravasal apoplexy, from ruptured aneurism within the cranium or in other internal parts, from uterine flooding, or, indeed, from any severe hæmorrhage beyond reach of direct surgical control, stimulation of any kind with the object of restoring consciousness is wrong. We have seen a woman in miscarriage pumped almost to death by giving her brandy every time she fainted from loss of blood, and that, too, under medical advice. We cannot understand that stimulation of any kind is called for in such a state, where the fainting and unconsciousness, the slowing down of the functions of life, would seem to be the best thing that can happen, where activity certainly and excitement would be the worst. There may, however, even in such cases, be a point at which assistance by this way may become

necessary, but it can only be in most desperate circumstances where there is reason to fear that the vital functions are about to fail. It needs not a little intelligent courage to withhold the sensible comfort of stimulant means in such conditions, but it is the better way certainly.

There are other conditions also, such as recent concussion, contusions, and injuries of the brain and other important organs in which, even if there is no bleeding nor any apparent injury to texture, we are more or less reasonably prejudiced against stimulation. We believe that the peace and rest, the shock indeed, which the injury itself determines, provides the most essential part of treatment and should not be interfered with. We can imagine that in every moment of such a time of quiet rest, a great deal is being done to repair injuries of minute structures which full functional activity would interfere with or perhaps make impossible. Our senses are set to appreciate injuries in the gross, and our judgment can never altogether be liberated or dissociated from the prejudice or prepossession of the senses; so we are apt not only to underestimate and disregard injuries that do not involve organs or tissues in the mass, but also to believe that what we do not see and know, does not exist nor take place. But it does not need a great effort of reason to understand that in such concussion of the brain or in such contusion of the liver as is attended by shock, there must be a considerable degree of structural derangement and injury, however molecular

it may be, and beyond our grosser observation and measurement; and it is as easily understood that a great deal of such injury can be repaired in an extremely short time provided here, as in grosser injuries, that the parts are at rest. We cannot apply a splint to a Malpighian gland or to a cerebral cell, but Nature does it. A fractured thigh may take a month or more to heal and be repaired, a leg takes less time, a finger still less, and a small cut which may be a thousand times more destructive than the unit of injury in the conditions under consideration may heal in an hour; why not these in a few minutes—or during the period of shock? This we conceive to be the meaning in and the teaching of shock in such conditions; and so we are prejudiced against anything that would interrupt this admirable peace. It is therefore that in such cases we avoid the use of stimulants both internally and externally.

7. *To Draw Poisons from the Tissues.*—As already stated, the use of cantharides for dog-bite was with me almost an accident. The result appeared to me at the time to have been so satisfactory that a note was sent to one of the medical journals—which, as it states the case for the practice somewhat concisely, is here reproduced:

"The occurrence recently of cases of hydrophobia has led me to think that I should do well to make known a very simple method of dealing with dog-bites which I have followed for some time back. I am not aware that it has ever been proposed before.

"I have always been dissatisfied with the use of acids and caustics. They not only destroy the diseased or injured tissues, but the healthy tissues also, to the extent of their application; and it is difficult to see how they serve any good at all. They make nasty wounds and leave permanent ugly scars which are an abiding cause of evil, for the imagination admittedly plays an important part in these accidents and in the evils that sometimes follow.

"What we should aim at in any treatment of the bite is (1) to remove the injured tissues and only these, and (2) to withdraw, if we can, the poison which we assume to be planted in these tissues and which may have made its way into neighbouring healthy tissues also.

"To effect this purpose I have for some time applied a strong fly blister over and around the wound. I prefer the fluid forms of blister, though I must say that I have found the B.P. fluid very unreliable. It often fails, and even when it succeeds it is too slow in its action. What is wanted is to turn the current of the fluids *outwards* at the point of injury and assumed infection. The sooner and the more vigorously this is done the better. To this end the wound should be thoroughly bathed with as hot water as can be tolerated, from the very moment of being bitten if possible; and this should be continued till the blister is procured. It will be well also to hold the part tightly in order to slow or to prevent circulation. When the blister comes to hand the part should be quickly and well dried, and

it should be applied at once. It should be applied freely over and outside the bite for, perhaps, two inches. Of course this must be regulated by the position and extent of the injury. It will be likely to take effect immediately—in a healthy young person. But if it does not rise well, a hot poultice, or, if need be, several successive poultices, applied over the blister will hasten and assist the effect desired. Whenever the blister is well risen it should be punctured at the lowest point and drained. If a warm poultice is then put over it, it will fill two or three times, and the result will be by so much better.

"The points I wish to indicate in commendation of this method are:

"1.—By the quick obstruction and local reversion of the fluids the assumed poison is prevented from getting into the general circulation.

"2.—The poison is presumably withdrawn from the tissues in the fluid of the blister.

"3.—The tissues that are destroyed by the bite, and in which the poison would more certainly lie, are immediately and entirely thrown off.

"4.—No healthy tissue is destroyed, and there is no scar—that is, from the blister.

"5.—It is readily within the reach of all, and as a matter of urgency it needs no special skill.

"This, I venture to say, is no small commendation. It seems reasonable, and so far as I know, that is more than can justly be said of any of our present methods."

CHAPTER IV.

SOME SPECIAL USES OF COUNTER-IRRITATION.

THERE are a few exceptional and even remarkable experiences with the use of counter-irritants which I prefer not to attempt to bring under classification. It is better they should stand by themselves on their own merits — or fall. If the results professed are constant and reliable, our power over disease is immensely increased, and such valuable knowledge should not lie neglected and forgotten as it practically is. These results can be easily proved or disproved by actual experience — and the importance of doing so should not be lost sight of by any one who takes an intelligent interest in his profession and especially in his duty.

Dr. Herbert Davies' results in the treatment of acute rheumatism by blistering are so remarkable as to deserve special attention. He did without "the aid of alkalis, nitre, lemon juice, bark, opium, colchicum, or in fact any of the internal remedies which are and have been considered as specifics in this affection. The treatment has been absolutely and entirely local." He

"ordered blisters varying in width, but of considerable size, to be applied round each limb and in close proximity to the parts inflamed, and hoped to relieve the affected joints partly on the principle of derivation, but mainly and really by affording through the serous discharge from the blistered surface a ready means of exit for the animal poison. Armlets, wristlets, thighlets, and leglets, and even fingerlets were applied near to, but not upon, every joint inflamed, at the very height of the inflammatory stage, when the local pains were most severe and the constitutional disturbance the greatest. The results—rapid relief of the pains, quick convalescence, and freedom from cardiac disease — were highly satisfactory." This is a very peculiar record. We are not aware that it was ever conclusively corroborated or disproved. There should be no difficulty in bringing it to proof as it ought to have been brought. Dr. Davies worked on a theory. Lactic acid in the blood is the cause of the disease and of the inflamed joints. The poison is chiefly localised in the inflamed joints, and the inflammation is in some proportion to the amount of the poison. By blistering and determining a free discharge he believes the acid is eliminated in such quantity that any administration of alkali is worse than useless. The urine becomes neutral or alkaline, and the temperature rapidly falls.

An illustrative case: "A large-made, plethoric, beer-drinking carpenter was admitted one Thursday evening with most severe articular rheumatism affecting seven

joints. The pulse was 120 and hard; the temperature in the left axilla was 102·5; the urine, perspiration, and saliva intensely acid; appetite *nil*, tongue foul. He had had no sleep for four nights. Seven large blisters were applied next (Friday) morning, around each limb affected and in close proximity to the inflamed joints. I saw that they were carefully put on. On the Saturday morning they were removed, and linseed-meal poultices kept on for sixteen hours. By this means a large amount of serum flowed away, and on that (Saturday) morning the pulse had fallen to 86 and the axillary temperature to 99·5. The urine had become absolutely alkaline, and although the thirst was still great, he had some return of appetite. He had lost all pain in his limbs, and his joints were freely movable. On Sunday he was dressed and sat up for three hours. On Monday he was so far recovered as to be able to walk with the aid of a stick, and on Tuesday morning on entering the ward I found that he had risen and dressed himself of his own accord. The appetite was then good, and he declared himself to be only weak. He had eggs on the Monday, fish on Tuesday, meat on Friday, and was discharged quite well on June 18th, after being sixteen days in the hospital. His heart was perfectly sound at the time of his discharge."

In comment on his cases, Dr. Davies remarks: "I must forcibly impress upon you that the success of this treatment depends entirely on the blisters being well applied and allowed to remain till they have

thoroughly acted. Linseed-meal poultices subsequently applied will be found very serviceable in promoting a sufficient flow of serum. The blisters should be placed entirely around the affected limb. When the knees are inflamed I order the blisters at least three inches wide. You need have no fear of strangury supervening. In one case only did this inconvenience occur, but to so slight a degree as to be unworthy of mention compared with the benefit afforded by the free vesication.

"It will be observed that in none of the cases was any medicine given beyond an occasional purge. At one time I associated in some previous cases the alkaline with blister treatment, but I found no advantage to result from the combination. On the contrary, I came to the conclusion that when a full discharge of serum had been established, the addition of alkalis to the blood did not cut short the inflammation and its attendant agonising pain, but rendered the period of convalescence more protracted. The altered constitution of the blood produced by perseverance in an alkaline treatment leads to a depression of general power too well known to require comment. I think it is reasonable to infer that if the acid *materies morbi* be really eliminated bodily and the system rid of its prejudicial influence by the blister treatment, any amount of alkali internally administered would be not only useless but injurious to the patient; and that the poison is really thrown out may be deduced as well from the rapid and permanent relief

resulting from the local treatment as from the neutral and even alkaline condition of the urine which is the usual and early consequence of the treatment. The most important result observed in the cases thus locally treated was the rapid diminution in the force and frequency of the pulse, and the immunity of the heart from inflammatory mischief. In no case where the heart was sound at the time of admission did any organic lesion subsequently develop itself; and in two cases in which a soft but distinct mitral murmur was audible when the patient came under treatment, every trace of the sound rapidly disappeared as soon as free and abundant serous discharge had been established. I have already hypothetically explained this favourable result by supposing that a change effected in the alkalinity of the blood by the removal of the acid *materies morbi* from the discharging surface, enabled that fluid to redissolve the lymph recently deposited on the surface of the valve."

As we have said, Dr. Davies' treatment and his results attracted a great deal of attention here, and on the Continent. Some were opposed to it, but it found favour with a great many in the experience of actual practice. An editorial in the *Lancet* of July, 1865, deprecated the treatment and the declared results. It would be impossible in private practice because of its disagreeableness and severity; such large applications of cantharides would certainly cause strangury; five cases in which it was tried in Bartholomew's Hospital gave disappointing results; and the alkaline treatment

was quite sufficient and quite good enough, so a new treatment so severe and so disagreeable as this was without excuse and unnecessary. This was the position of the *Lancet*. Dr. Davies replied in August defending his principle and his practice, and giving further proofs, not only from his own treatment, but also from that of several competent practitioners in various parts of the country. His letter is too long to give here, but it certainly should be referred to. So far as we can judge, reason seemingly, and certainly facts, are largely in his favour.

In January, 1869, Drs. Gull and Sutton submitted to the Royal Medical and Chirurgical Society some "Remarks on the Natural History of Rheumatic Fever," in which they said, among other things: "With regard to Dr. Herbert Davies' treatment by blistering, it relieves the pain and suffering of the patient in some cases, but does not appear to curtail the rheumatic process. . . . It appears to us that there is not sufficient evidence to prove that any of the advocated systems of treatment have power to prevent the heart becoming diseased." To the "Remarks" Dr. Davies replied:

"In contrast with these statements, I would beg to draw attention to the following passages from the Clinical Histories by Dr. Day, physician to the County Stafford Infirmary. 'Although,' he says, 'so many especial remedies have been prepared for the treatment of acute rheumatism, and although without doubt they may each of them prove of service in properly selected cases, yet there is one that in my

hands has never disappointed me in affording marked and almost immediate relief from those agonising articular pains which, with very few exceptions, are found to be present in acute rheumatic fever; and that remedy is the blistering method of Dr. Herbert Davies. Furthermore, I can fully endorse his opinion that where the remedy is made use of sufficiently early, and before any pericardial or endocardial symptoms are apparent, immunity from cardiac complications will be obtained. In every case in which I have adopted it, the relief from the rheumatic pain has been beyond all doubt immediate, and for the most part permanent; and in no case have I seen supervention of pericardial or endocardial inflammation after the application of the blisters; so that, as far as I can judge, it seems to endue the patient with a sort of immunity from these complications.' And lastly: 'The effect upon the urine is very decided; for, however acid this secretion may have been before the blisters have been applied, it very speedily becomes, after their application, either neutral or alkaline, and this, too, in cases treated without the administration of any alkalis whatever.' Again, in the Hospital Reports on the Treatment of Acute Rheumatism published in the *British Medical Journal* for Jan. 9th, 1869, it is stated that at St. Thomas's Hospital Dr. Peacock has latterly employed blisters freely in such cases as admitted of their use; and provided several joints are affected, so that four, five, or six blisters can be applied at the same time, the beneficial effect is most striking;

the local symptoms are very markedly and rapidly relieved, the constitutional disturbance is lessened, and the disease *cut short*; so that cardiac symptoms are prevented, or arrested if in process of development. He has not, except in very exceptional cases, relied wholly on the local treatment, but has added it to the constitutional measures which were previously in use, and the additional benefit gained is often most striking. It is applicable especially to the more intense cases of rheumatic fever, but is also very useful in those cases which are of such common occurrence where the disease develops itself in persons previously most reduced in health, and more particularly in persons who have previously had the disease, and often with cardiac complication. . . . At the Westminster Hospital Dr. Fincham has employed the treatment by blisters for some time, and he is satisfied that by this plan the relief produced is very great, and the duration of the malady shortened. He is in the habit, however, as a rule, of combining it with alkalis in full doses.

"I might readily refer to many other members of the medical profession who have given their testimony to the value of the blister treatment in acute rheumatism; and those who have had no experience of this method I would take the liberty of referring to my communication on this subject contained in the London Hospital Reports for 1864. I can truly assert, after an experience in the use of this method during a period of four years, that I have had no patients who have complained to me of the severity of the blister treatment. On the

contrary, they have stated that their agonising pains commenced to disappear *as soon as the effects of the blisters were established*; and many, while expressing themselves grateful for the rapid relief obtained, have added that they would rather suffer the pain of forty blisters than undergo the terrible agony of a severe attack of acute rheumatism. It is evident, therefore, that my conclusions, founded upon practical experience, differ *toto cælo* from those of Drs. Gull and Sutton. I believe that well-marked, undoubted cases of rheumatic fever are under the control of medical art; and having learnt the value of the blister treatment in this affection, I feel that I should be acting unjustly to my patients in adopting the expectant plan which the authors of the 'Remarks' are disposed to advocate."

This treatment certainly has a most remarkable body of testimony in its favour, and we naturally wonder how it has fallen altogether into disuse, as we believe it has—that is, unless we have a better, of which, so far as I am aware, we have no proof. Mr. D. McGregor, writing in the *Lancet* for November, 1865, says: "In every case of acute rheumatism coming under my care for some time back, I invariably order the application of blister to all the joints chiefly affected, and with the best results. I have now tried it in a good many cases, and never in a single instance found it fail to give relief.

"One case, that of a man who had a severe attack two years ago, laying him up for more than six weeks, with most agonising pains in his joints and great

constitutional disturbance, was lately admitted with an attack similar in all respects, according to the patient himself, to the first. Blisters were at once applied to all the principal joints complained of, both in the upper and the lower extremities, giving only a purgative internally. The following day he was free from pain except what was caused by blistering the surface. No bad symptom followed, and in five or six days he was dismissed well.

"Here, therefore, was an attack of acute rheumatism similar in every way to a former one in the same patient, which incapacitated him for six weeks, cured in as many days. The heart was slightly affected by the first attack, but was certainly not aggravated by the second. From my experience in all the cases I have treated this way, I think that blistering is the most speedy and effectual mode of treatment yet adopted for this most painful malady. I find the blistering liquid the most simple and easily applied preparation of cantharides. It may be painted over the surface, however uneven, while there is often a difficulty in keeping the ordinary *Emplastrum Cantharidis* in contact with some joints, as the knees. It acts quicker also, which is an advantage in very painful cases."

That this practice was not a mere unreasonable and useless temporary craze or fashion, as too many loudly-heralded "cures" and treatments are, is manifest from the hold it took, especially in the provinces, where the same interests do not exist as do in large centres of

competition to maintain, if even for a time, a remunerative but artificial and false appearance of success. Dr. G. K. Barton, writing so late as February, 1880, says: "Mustard plasters, if applied the first day the pain is felt, will stop rheumatism at once without medicine. Where mustard fails blisters may be used. The old and well-tried system of counter-irritation by mustard and blister seems laid aside in the search after new remedies, which are no sooner heard of than they as quickly die out and are forgotten." Mr. E. Ilott, in June of the same year, writes: "The remedy in acute rheumatism I most trust to, and in my own experience hardly ever in vain, is the attacking of every joint with *Liq. Vesicatorius.* This treatment will nearly quite remove both pain and fever in forty-eight hours." In January, 1883, Dr. Davies himself, after twenty years' experience of the treatment, is as confident of it as ever.

"In answer to the question put by Dr. Ashburton Thompson as to the constitutional effect of the blister treatment of acute rheumatism, I beg to say that I have never attributed the good results of the plan to the absorption of cantharides from the blistered surfaces. On the contrary, the well-established fact of the rare occurrence of strangury shows that the cantharides did not find its way into the system, although very many square inches of surface had been exposed to its action. Supposing even absorption had taken place, how did it come to pass that the urine usually lost its characteristic morbid acidity, and even

in some cases exhibited an alkaline reaction? To my mind, had the cantharides been the active element, the urine would have shown an intensely increased acidity, in consequence of the acid *materia morbi* being directed from the tissues of the affected joints with the renal secretion. Clinical observation proved that the reverse was the satisfactory result. In describing the *modus operandi* of the plan, I said it was (1) local in relieving quickly and effectually the pain and swelling of the inflamed joints, and (2) that it was *constitutional* in reducing the temperature of the body and protecting the heart from mischief."

A matter of considerable interest presents itself at this point. If, as Dr. Barton asserts, mustard will stop the rheumatism at once, what comes of the elimination theory of Dr. Davies? Mustard does not blister, there is no abundant nor any discharge of serum laden with the *materies morbi*, so another explanation must be sought for the results which we are not disposed at all to call in question. Another thing that has been persistently present to our mind is that there is no apparent reason why this doctrine of elimination should be left so long in a state of hypothesis. In the free flow of serum so abundantly charged (theoretically) with lactic acid, we have the easiest possible means of proof. Let it be tested with precision, and if it is shown that a remarkable excess of the acid is eliminated in this way, there is an end to the matter, and the intention in this treatment is at once confirmed and justified. This has not, to our knowledge, been done.

The importance of this matter must be our excuse for referring to it at such length.

In 1881 Dr. Harkin, of Belfast, reported "thirteen consecutive cases of rheumatism in which by means of a topical remedy, and without a single dose of medicine, the cure was in every instance simple, rapid, and complete." All Dr. Harkin's observations that we have been able to discover are very interesting and well worth referring to. We are not certain whether he was practising Dr. Davies' teaching or working from a theory of his own; but however that may have been, his confirmation of the experience of those who followed Davies' suggestion is certainly important.

An even more interesting, and, so far as we know, quite original observation of Dr. Harkin was that "an over-sensitive condition of the cord in that portion covered and limited by the fourth and fifth dorsal vertebræ concurs with certain diseased states," and he found that counter-irritation of that part gave what must be esteemed very remarkable results. "Among the ailments which yielded so speedily to counter-irritant treatment were trigeminal neuralgia, facial paralysis (Bell's); acute hysteria; dysmenorrhea; the reflex vomiting, the toothache, and the pruritus pudendi of pregnancy; gastralgia and other neuroses; and when vesication was the method adopted, I was generally able to ensure the invalid that in five hours coincident with the formation of the blister all painful symptoms would permanently take their departure. Chorea has almost always yielded to this form of

treatment with some important exceptions, including the chorea of pregnancy and that form depending on organic cardiac disease. The dysmenorrhea of neuralgic type yields readily, and I have not once failed for many years with a single vesication over these vertebræ to put an end at once to the sickness of pregnancy for the whole remaining period of gestation, no matter at what stage I was consulted. The neuralgic toothache and the pruritus pudendi of the puerperal condition yields as readily to one application." That is surely interesting, and most important if true; and it ought not to be left in doubt. It has a new interest also in the light of recent investigations into the mechanism of the nervous system to which we have already referred.

Somewhat akin to these observations were those of Dr. Buzzard published in the *Practitioner* for October, 1868. He applied encircling blisters to limbs which were the seat of marked epileptic aura. Of the four cases then reported, the following were the results: "In one a tickling of the left arm had always preceded the fit. After the application of a blister encircling this limb the tickling was transferred to the left leg. In another, characterised by a similar aura, the fits as well as the tickling ceased after the application of an encircling blister. In a third a sense of numbness in the left wrist was transferred to the right wrist. A fourth patient was a woman whose fits were always preceded by cramp in the right hand, and who after the blister was affected with cramp in both hands

before the fits. In one of these cases necropsy showed cerebral tumour."

More recently he applied encircling blisters to some other cases with the following results: "In a patient whose fit was always preceded by cramp in the left foot and shaking with numbness of the left leg, an encircling blister was applied to this limb, and it was the right limb that now shook and was numb. In another, tingling in the left arm was the symptom, and after blistering there was jerking of both arms and the left leg. In a third the attacks were preceded by cramp in the left hand. The patient had a severe fit two days before observation, and the left hand was quite powerless. An encircling blister was applied to the left forearm. Next day the left hand had quite regained its power, but the patient complained that the right arm had *ipso facto* become weak. The dynamometer showed 40° as the grasp of the left hand and only 18° with the right." This also has a new interest in the light of modern observation.

CHAPTER V.

MEANS OF COUNTER-IRRITATION.

We do not think it necessary at present to go beyond the better known counter-irritant means—the Actual Cautery, Spanish Fly, Mustard, Turpentine, Iodine, and a few others. It must not be forgotten that these several agents, though classed under the one head of counter-irritants, and have an irritant action in common, more or less, still are very different from one another, not alone as regards their irritant strength, but as regards also their secondary effects, which, though not counter-irritant, are often of great importance. The essence of the effect of the Actual Cautery, for instance, is in that it burns, in that it produces a wound which is most difficult to heal, and to heal which not only the local but the general "sympathy" is called upon. In this way not only is the wound benefited, but the whole locality also in which it is placed, and especially weak parts therein. The Cautery is the purest possible irritant, and the strongest. It has no secondary effect; it is pure heat. Cantharides affects the deeper circulation very considerably, but does not cause nearly so much

superficial pain as Mustard, or even Capsicum, which has but a very slight epispastic effect. Mustard is a very painful application, and it influences the circulation very considerably; it seems to irritate and to stimulate in somewhat equal degrees. Turpentine has a healing, soothing, and stimulating action long before it becomes an irritant and causes pain. Iodine has a long-standing reputation which credits it with dissolving pathological deposits, so expediting their absorption under its counter-irritant influence. So it is with others of the class of Counter-irritants; each agent has its own special character over and above the common character of irritant, and this must be taken into account when we judge which should be used in any given case or condition.

THE ACTUAL CAUTERY.

This is the most violent, and it is believed, in certain cases, the most effectual of all counter-irritant remedies. It is, as we have seen, a remedy of great antiquity, but as it could not be anything but repulsive, it frequently fell into disuse. With modern means of producing unconsciousness the disagreeableness is, however, in great measure removed, and the cautery becomes a much more acceptable and available remedy. By universal assent it is allowed to be our most potent instrument in certain deep-seated diseases. In chronic low inflammations of the hip-joint, spinal cord, and vertebræ, there can be no doubt that it has done extremely good service.

The principle underlying the action of the cautery must be the same as we have generally stated for counter-irritants; it determines a better blood supply into the diseased parts, and so a better and more active nutrition and repair. We cannot reasonably impute anything of a specific influence to a piece of red-hot iron. Baron Larrey did believe that the cautery emitted "un principe volatil très actif," but we have no good reason to entertain the belief. The action of a red-hot iron is always and everywhere rigidly the same, and any variation in the effect must be referable to the tissues on which it acts, and the state of the health and constitution on which it draws. It has not, as other counter-irritants have, any secondary properties. It is pure heat, it simply burns, and on that there follows any good that comes of it.

It is scarcely necessary to say that the cautery should not be used if anything short of it will serve the purpose. To recommend, as some have, a course of twelve consecutive cauterisations for the cure of lumbago, is pure bedlam. *Fuge medicos et medicamenta.* Too much heroic treatment, surely.

A milder form of counter-irritation by pure heat was practised considerably some fifty years ago, which was variously named thermic treatment, firing, etc. In our day it seems to have gone altogether out of use, and almost out of memory. We have not been able to see why it should be so forgotten. There can be no question that it is an admirable means of counter-irritation, handy, cleanly, and efficient, and quite harmless, which

is much more than can be said of several of our other means. We have been so interested in it that we give a short statement of it by itself, and apart from the cautery, though they are in principle the same.

"FIRING."

In 1826 was published "A Letter to Sir Gilbert Blane, Bart., Physician to the King, from Sir Anthony Carlisle, Surgeon Extraordinary to His Majesty, on Blisters, Rubefacients, and Escharotics, describing the Employment of an Instrument to effect those several purposes." The method of treatment set forth in this letter "consists in the applying of a metallic instrument, heated to a temperature of 212 degrees by immersing the head of it in boiling water for five minutes, to the part intended to be blistered, previously covering the part with a piece of silk moistened in warm water. The instrument requires to be gently pressed against the part, and if the blisterer has not been more than five minutes out of the boiling water, the pressure need not be continued longer than three or four seconds. The first effect is a corrugation and paleness of the skin, the red blood soon returning an inflamed redness appears, which gradually proceeds to discharge a fluid (serum) and to detach the cuticle.

"Applying the instrument immediately at its highest temperature, and holding it firmly on the parts ten seconds, it will produce an escharotic effect, and the size of the eschar may be determined by applying one or more of the surfaces of the instrument.

"If a rubefacient effect only is required, the part must be covered with dry silk, and the instrument moved slowly over the surface until a sufficient degree of pain and redness arise."

It was not as a rubefacient, however, nor as an escharotic that the "blisterer" was commended, but for its sudden and powerful action as a vesicant. This Carlisle explains in a letter to the *Philosophical Magazine* in November of the same year. The editor, in reviewing the "Letter," wrote: "Were we to offer any objections to the use of the 'blisterer,' they would be merely conjectural; but we will venture to ask whether the slow action of the common blister is not more likely to extend its influence deeper than the quick process here recommended, and whether, as the body is obnoxious to severe and sudden pain, bad consequences might not sometimes follow from a sudden burn, as this in fact is." Carlisle, on the contrary, maintained: "Where counter-irritation is required, the more sudden and intense the diversion, the greater will be the power and the relief obtained." In this matter we may say we are altogether with the editor and against Carlisle. It is remarkable that, so far as we are aware, this treatment did not come much into use till it was presented in its mildest possible form by Dr. Corrigan some twenty years later. This is Corrigan's method, as stated by himself: "The iron used is very portable, consisting of a thick iron wire shank, of about two inches long, inserted in a small wooden handle, having on its extremity, which is slightly curved, a disk or button

of iron, a quarter of an inch thick and half an inch in diameter, the whole instrument being only six inches in length. The face of the disk for application is quite flat. This, trifling as it may seem, must be attended to. In the French cauterising irons, as they are sold by the cutlers, the buttons for the cauterising are spherical; and the consequence is that they must be either pressed long and deeply into the skin, to bring them into contact with an extent of surface equal to their diameter, or they can be made only to touch at a single point. Another objection to the French iron is the great length of its iron handle. This is necessary in the French instrument, as the iron is intended for being heated in the fire—but it terrifies the patient, whereas this little instrument will hardly attract attention. The only other portion of apparatus required is a small brass spirit lamp; so small that it can be carried in the waistcoat pocket. Mr. Milliken, of Grafton Street, made the apparatus for me. To use the instrument it is only necessary to light the lamp, and hold the button of the instrument over the flame, keeping the forefinger of the hand holding the instrument at the distance of half an inch from the button. As soon as the finger feels uncomfortably hot, the instrument is ready for use; and the time required for heating it to this degree is only about a quarter of a minute. It is applied as quickly as possible, the skin being tipped successively at intervals of half an inch over the whole affected part, as lightly and rapidly as possible, always taking care

to bring the flat surface of the disk fairly in contact with the skin. In this way the process of firing a whole limb, or the loins, making about one hundred applications, does not occupy a minute, and the one heating by the lamp suffices. You can ascertain at once whether the heat be sufficient. If you look sideways at the spots as you touch them, you will observe that each spot the iron has touched immediately becomes of a glistening white, much whiter than the surrounding skin. In the course of a quarter of an hour, or sometimes of a very few minutes, the whole skin becomes of a bright red, and the patient feels a glow of heat over the part. The iron, I need hardly observe, is never rendered red-hot. It is, indeed, very little hotter than boiling water, and I never make an eschar with it, and very rarely indeed raise a blister. There are merely seen upon the skin, next day, a number of circular red marks, the cuticle not even being raised, and the surface ready, if required, to receive a fresh application; and what is of no trifling consequence, where such an extent of counter-irritation has been used, there is no discharging surface to interfere with the motion of the limbs, or the comforts of the patient. Indeed, in most cases, the patient is quite unconscious of what has been done. This, you will at once see, is a considerable improvement on the actual cautery, whether as regards the horror of the patient on seeing a red-hot iron drawn out of the fire, or the deep ulcer produced by its application."

A good deal of very reliable testimony has been

given to the success of this practice of "Firing" according to Corrigan's method. We can only refer to one or two. Dr. J. McCormack, in the *Lancet* for November, 1846, gives his observations as follows: "My attention has been directed," he writes, "to an extract in the *Lancet* of May 2nd, 1846, taken from the *Dublin Hospital Gazette*, of a new form of counter-irritation, recommended by my friend Dr. Corrigan. I think it the duty of every medical man to collect and publish the result of his experience, especially whenever he has been induced to employ a new remedy on the recommendation of another. I have, with this view, for some months past extensively applied he form of counter-irritation which is the subject of this paper, and have carefully noted the result in every case. I am thus enabled to lay before the profession an array of facts which will be, I trust, of sufficient weight to induce others to employ it likewise. I have no hesitation in asserting that they will find it a remedy which will not disappoint them, and which certainly has no equal in the forms of disease which I would recommend it to be employed in."

After citing several cases of rheumatism, torticollis, lumbago, sciatica, neuralgia, etc., he concludes: "It would be a useless repetition to detail any more cases. I need only say that I have practised this remedy constantly now for the last twelve months, and I can with truth affirm, with never-failing success in all the diseases I have before enumerated, and also with very marked benefit and temporary success in many cases

of chronic rheumatic and obscure pains of a nervous origin. Even this last day or two I have succeeded in curing a man who has been for months prevented from earning a shilling (his trade is a stone-cutter) by paralysis of the deltoid muscle, and pain in the shoulder-joint. After a single 'firing' his astonishment was not less than the pleasure he felt in being able to again earn his bread, and that by so apparently simple a mode of cure. My sole object in putting these few remarks together, has been to present such an array of facts as may warrant others in employing this means, which I can recommend as being a certain quick remedy (and by no means so painful as a blister, issue, or moxa) in all such forms of disease as I have above enumerated. Should any of my medical brethren be induced to give it a trial, I am confident they will not be in a hurry to abandon it. The success which they will be sure to find will reward them for the trial of it."

After a practical study of this remedy, Dr. Hubbard, writing in the *Boston Medical and Surgical Journal*, December, 1848, concludes in its favour for the following reasons:

1st. It is perfectly safe. No secretion is deranged or internal organ embarrassed.

2nd. It interferes with no other treatment. We can use internal remedies for the same or any co-existing disease.

3rd. It is painless. The patient feels only a warm glow over the part, no smarting or any other disagreeable sensation.

4th. It can be often repeated. All external effect is so far gone as to admit of a renewal of the application in ten or twelve hours, which is not the case with any other mode of counter-irritation.

5th. It is easy of application, is the work of but a few minutes, and to the zealous practitioner its application can be no task.

6th. We have one more resort when other treatment fails—a resort which will cure some otherwise incurable cases, and will do much to lessen the misery of multitudes of our fellow-men.

Dr. Brown-Sequard * also speaks very favourably of this method: "The application of heat in many other ways (by Mayor's hammer, for instance) is very useful in a great many cases of nervous affections. In a case of coma with convulsions, due to a complete arrest of the urinary secretion after an attack of renal hæmaturia, in 1851, Dr. Tholozan and myself, after twenty-four hours of unsuccessful treatment, decided to apply heat on the skin of the loins and sides of the abdomen. A large silver spoon was dipped into boiling water and was applied on eight or ten places. To our surprise and delight we soon found the respiration improving, and in less than a quarter of an hour the convulsions ceased, and the patient came to his senses and passed a little water. The return of the urinary secretion had saved him. No doubt the irritation of the skin had acted by reflex action on the secretory nerves of the kidneys and produced the

* *Lancet*, November, 1865.

secretion of urine." That this case was not an accident or a misinterpretation was proved some time after by the patient, who was himself a doctor, in a similar case in which equally happy results were obtained.

We should be extremely glad to know that this very simple and reasonable remedy would be given an intelligent trial.

CANTHARIS—BLISTERING FLY.

The Fly Blister affects the circulation deeper and more strongly than any other irritant, if we except the actual cautery, and it causes much less pain than some which have but a very superficial effect. It is to this fact that our choice must be referred in any case in which we may think it well to use an irritant. When we wish the circulation quickened or diverted in deep parts, or when we wish to hasten activity in any organ within reach, the blister is our most valuable means; but if we only desire a superficial or slow activity, another and milder application may be sufficient and more appropriate. For purely excitant or rubefacient purposes, preparations of cantharides are not nearly so effective as some others of the counter-irritant class; but to determine an epispasis or a strong diversion of the circulation they are our best means, and are sufficient for every purpose short of such deep and profound diseases as justify the use of the cautery.

These remarks so far have reference only to the purely irritant effects of cantharides, though like all other counter-irritants, except applications of simple

heat, they have a secondary effect, and perhaps more than one effect that become important determining elements in our judgment. However much reason we may have to doubt that good results come of blisters by reason of their eliminative power in many conditions, there are cases in which reason would seem to give cause to believe that they serve a good purpose in this way. At any rate, till we have more light on the matter we prefer not to attempt to deny the possibility of such good effect; and we take advantage of it when and where we reasonably can.

In order to learn which form and in what manner cantharides may be best used in given conditions, we may here review some of the more familiar ways in which they are prepared.

The Blister Plaster (*Emplastrum Cantharidis*) is the oldest and the commonest form in which the fly blister is applied. It has been largely superseded by other cleaner and more convenient preparations. When spread on adhesive plaster it is fairly convenient to work, and perhaps it has this in its favour, that its action is more gradual and less severe than that of the more modern and more effective fluids which blister almost immediately they are applied. But it has several undoubted disadvantages. It is always troublesome to prepare, and it is not always reliable nor uniform in its action. In cases of emergency it is practically useless. There is also a danger, when taking it off, that the raised cuticle will be torn and come away with the plaster, which is rarely desirable;

and very often small pieces of the fly will adhere to the skin or to the raw surface, causing troublesome and useless irritation. Again, there is reason to believe that absorption takes place more from this application than from any of the others, which in some diseased conditions would altogether preclude its use. Various ways and means have been proposed to obviate this risk of absorption. Some have suggested that a layer of tissue paper should be placed between the plaster and the skin; others have sprinkled powdered camphor on the plaster, and others bicarbonate of soda. Cornil, who devoted special attention to the study of the effects of cantharides on the system, holds that a fly blister should never be left on for longer than three or four hours, and that on removal it should be at once followed by a simple hot poultice. From every consideration, and especially because we have so many better preparations that seem to be entirely free of the risk by absorption, there does not appear to be much advantage from the plaster form, and it certainly has considerable disadvantages. There is one thing, however, in its favour, in that it can be at any time removed and its active effect terminated, which cannot be done by the etherial fluid blisters.

Cantharides are put in ointment form also (*Unguentum Cantharidis*), but this preparation does not seem to be of much use. As a stimulant or rubefacient it has little or nothing to commend it against several other remedies to which we shall have to refer. It is not cleanly nor effectual, and it is rarely used. The

old practice of applying it for the purpose of keeping wounds open and discharging, it is not necessary to discuss here. The cases in which the continuation of a discharge is, with any appearance of reason, desirable are very rare and exceptional. They have been referred to in their proper place. Even if we were quite clear that such a proceeding was right or necessary, there are other and better ways in which it could be determined.

Cantharides in any form cannot be esteemed a good means of counter-irritation if we wish to avoid or do not intend to vesicate, and the ointment would certainly be the worst form for that purpose.

Blistering Paper (*Charta Cantharidis*) is clean and in many respects convenient. It is sometimes difficult to keep on the exact place at which we want it, and we have not found it to be always reliable in its action. Its action is very slow, and this, while in some cases it might be a considerable advantage, would in many cases altogether preclude its use. Its uncertainty, however, is the greatest objection to it. When we aim at the production of a definite physiological effect, it is above everything important that the means we use should be quite reliable, else time and opportunity may be lost, entailing, it may be, most serious consequences. With this reservation the form of blistering paper may be commended; it is certainly a great improvement on the old plaster.

Blistering Fluid (*Liquor Epispasticus vel Vesicatorius*) is without doubt the most convenient, the cleanest, and the best means of applying a blister. We

have found the B.P. preparation quite unreliable and insufficient—altogether so uncertain that we never use it now. The strength may of course be increased, and it is found that 1 in 3 is a much more useful strength than 1 in 4. There are some excellent preparations of blistering fluid made by several good druggists, all of which we believe may be relied on.

The violence, or rather say the quickness with which this form of application acts may, and sometimes does, become a disadvantage; and once it is applied it cannot be entirely removed. In chronic conditions of old age, and especially in weakly constitutions, it is quite possible to do harm by the use of blisters, and in such cases we should use strong irritant means with every caution, if we use them at all. Strong blistering fluids are not to be as a rule commended in such cases, but sometimes the danger from acutely progressive disease, such as erysipelas, for instance, may demand and justify their use regardless of secondary consequences.

On the other hand, in some conditions the whole good effect of a blister depends on the quickness or even violence of its action, and a strong fluid in such cases is our best means. In order to get an almost immediate response to the irritant, we have found it an excellent way to bathe the part in water as hot as it can be borne before applying the fluid.

From the several preparations of epispastic fluids it is comparatively easy to choose that which appears reasonably appropriate to any given case. A list of

preparations and formulæ are given, from which, by some slight modification of strength or of composition, a remedy may be chosen appropriate to any possible condition in which an epispastic may be called for.

We have already said that we do not attach much importance to the pain caused by applications of cantharides; we have not often found it to be very severe, but in some cases, as of carbuncle, for example, we have thought that the pain caused by blistering was severe enough to make it desirable to diminish it, and we therefore resorted to the anodyne forms of blister. We cannot say that we have been quite satisfied with the results. We are in no way prejudiced against this form of application, though it always reminds us of the man who took his shower-bath with his umbrella up, and if it is proved that preparations of cantharides act quite as effectively when the pain they would cause is eliminated, we shall readily accept these anodyne forms as fully justified; but on this point we are not yet as clear as we should wish to be.

Of cantharides in the form of Liniment we are not able to say anything from experience, for we have never used cantharides in this way. A liniment of any kind is never very cleanly. It seems to have its best excuse in that it may convey some drug through the skin into the tissues, and in that the rubbing by which it is administered may be advantageous. If nothing enters by the skin, any oil is equally good as a liniment to facilitate the rubbing.

But whether drugs can or cannot enter the system in this way matters not at all as regards cantharides. We do not wish this drug to be absorbed; that would do evil. It can therefore be of no benefit as a liniment. But it may be said that the desired action by this form of preparation is on the nerve-endings, and that it acts entirely by the nervous system. To this we have no answer, for we have no proof that it does or does not so act. We may, however, say that even if we allow that it so acts, still there is no excuse for the liniment, because there is in such case no need for the rubbing. That has been our way of looking at the matter. We may be wrong so far, but we do not think that we are wrong in saying that any possible benefit which can be expected from a liniment of cantharides may be got much more effectively and without any risk from other kinds of liniment. It is to be remarked, however, that such preparations have been and even now are largely used by competent men; so we give a few examples:

Official Preparations.

Acetum Cantharidis . . .	1 in 10	Acid. Acet. Glacial. 1; Acid. Acet. 9; Cantharis 1.
Charta Epispastica . . .	1 in 12½	Cantharis 1; Cera Alba 4; Cetaceum 1½; Ol. Olivæ 2; Resina ¾; Terebinth. Canadensis ¼; Aqua 6.
Emplastrum Calefaciens .	1 in 30	Cantharis 1; Ol. Myristicæ 1; Cera Flava 1; Resina 1; Emplast. Saponis 8; Emplast. Resinæ 13; Aq. Bullient. 5.

Emplastrum Cantharidis .	1 in 3	Cantharis 4; Cera Flava $2\frac{1}{2}$; Sevum $2\frac{1}{2}$; Resina 1; Adeps 2.
Liquor Epispasticus . . .	1 in 4	Cantharis 5; Æther Acetic. 20.
Collodion Vesicans . . .	1 in 20	Liquor Epispastic. 20; Pyroxyllin 1.
Tinctura Cantharidis . .	1 in 80	Cantharis 1; Spirit. Tenuior 80.
Unguentum Cantharidis. .	1 in 7	Cantharis 1; Cera Flava 1; Ol. Olivæ 6.

Some Other Preparations.

Ceratum Cantharidis (U.S.)	1 in 3	Containing Yellow Wax, Resin, and Lard.
Cerat. Extract. Cantharidis	1 in 4	The extract of 5 ounces of Cantharides with 3 ounces of Resin, 6 of Yellow Wax, and 7 of Lard.
Charta Cantharidis (U.S.).	1 in 25	Only half the strength of C. Epispast. B.P.
Collodion Cantharidatum (Germ.) .		is made by dissolving Gun-Cotton in Ether which has been allowed to stand over Cantharides.
Collodion c. Cantharide (U.S.) . .		is very like the German preparation.
Emplast. Lyttæ Co. . . .	1 in 12	Emplast. Canthar. ℥j; Emplast. Picis Co. ℥iv.
E. Picis c. Cantharide (U.S.)	1 in 12	Contains Burgundy Pitch and Cerat. Cantharidis.
Linimentum Cantharidis (U.S.)	1 in 10	Cantharis ℥j; Ol. Terebinth. ℥x: digest and strain.
L. Cantharidis Co. . . .	1 in 15	Cantharidin gr $\frac{1}{8}$; Æther Acetic. ♏20; Ol. Lavand. ♏3; Ol. Ricini ℥iss; Spt. Vin. Rect. ad ℥j.
L. Canth. c. Ammonia . .	1 in ℥iv	Tinct. Canth. ♏80; Ol. Amygdalæ ℥vi; Sol. Ammon. Fort., Glycerin. āā ♏160; Spt. Rosmar. ♏20; Aq. ad ℥iv.

L. Canth. c. Opio	1½ in ʒii	Tr. Canth., Tr. Opii āā ʒii; Sol. Ammon. Fort. ʒiv; Lin. Saponis ʒj.
L. Camphor c. Cantharide .	1 in ʒj	Tr. Canth. ʒiiiss.; Tr. Opii ʒii; Lin. Camph. ʒxivss.
L. Crinale (*Squire*) . . .	1 in 30	Cantharidin gr i; Æther Acet. ʒvi; Ol. Ricini ʒj; Ol. Lavand. ♏15; Spt. Vin. Rect. ad ʒxii.
L. Cantharidis (*City Chest*)	1½ in ʒj	Tinct. Cantharidis ʒii; Liniment. Saponis ʒvi.
„ (*Dr. Ashwell*)	1½ in ʒj	Tr. Canth., Æther Sulph., Spt. Camph., Tr. Opii āā ʒiv.
„ (*Dr. Gregory*)	1 in ʒii	Tr. Canth. ʒj; Ant. Pot. Tart. gr 40; Aq. Rosæ ʒxii.
„ (*St. Bartholomew's*)	9 in ʒj	Acet. Canth. ʒvi; Acid. Acet. Glac. ♏40; Glycerin. ʒvi; Spt. Rosmar. ♏20; Aq. ad ʒiv.
Lotio Cantharidis (*Neligan*)	1½ in ʒxii	Tr. Canth. ʒii; Aq. Sambuci ʒxi; Ess. Rosmar. ʒvi.
„ (*Eras. Wilson*) .	12 in ʒj	Acet. Canth. ʒiv; Aq. Coloniensis, Aq. Rosæ āā ʒj.
Ung. Stimulans (*Eras. Wilson*)	1 in 5	Pulv. Cantharidis 3; Adeps 12.
A Pomade (*Trousseau*) . .	⅛ in ʒj	Tr. Canth. ʒss, Bals. Nervini (Fr.), Medulla Bovis, āā ʒj; Acid. Tannic. ʒss; Ol. Amygdal. ʒv; Spt. V. Gall. ʒiii.
An Anodyne Vesicant . .	1 in 6	Pulv. Canth. 1; Camphor. 2; Chloral Hydrat. 3.

MUSTARD.

Mustard is perhaps the most valuable of our means of counter-irritation. It has the advantage of being

almost always readily available, and it is cleanly and convenient. Its intensity can be regulated to any degree, which also is a great commendation. It is a good irritant and a good stimulant. The indications for its use are numerous and frequent, much more so indeed than for any other irritant, and the range of its application also is very extensive. A clear understanding of the principles underlying its proper use is therefore very desirable.

The action of mustard is widely different from that of cantharides. It irritates and excites much more, but its epispastic effect is much less. In this respect the two become complementary to each other in practical use to a very valuable extent. When we desire an epispastic effect primarily and chiefly, we should use cantharides; but when our intention is to produce an excitant or irritant effect principally, we should use mustard. But just as there is more or less of pain with the epispastic blister, there is always a degree of epispastic effect with the superficial irritation of the mustard, especially if the latter is used in a mild form and for a long time. We may put it that according as we diminish the superficial irritant effect of mustard, we increase the stimulation of deeper tissues—the regulating factors being the strength of the application and the length of time it continues. The action of mustard appears to be more on the nerve terminals and superficial; that of cantharides is on the circulation and deeper down. We should never use mustard to the length of blistering, and

we should not use cantharides merely for its pain. If we want a sharp excitant in a case of coma or stupor, mustard is best; but if we wish to remove an effusion of the knee-joint, it cannot be compared to the blister.

Mustard may be used in various forms and in various ways. The mustard poultice (*Cataplasma Sinapis*), made of equal parts of linseed meal and mustard, is perhaps the most common form in which it is applied. The relative proportions of the ingredients may, of course, be altered at discretion, according to our intention and to the need of any given case. This arrangement combines the stimulant or irritant action of the mustard with the action of the ordinary simple poultice, but with the important difference that while the purely irritant effect of the mustard is diminished, its stimulant effect is carried deeper down, and so accelerates the circulation in deep parts. This application, then, is more of an epispastic than pure mustard, and more of a stimulant than the simple poultice. In certain positions and conditions it is a very useful form. It is very frequently applied to the chest in cases of troublesome cough, bronchitis, and pneumonia; but from this practice we have to dissent strongly.

I have the strongest possible objection to poulticing the chest, and that for what seems to me to be the very best of reasons. Some ten years ago I happened to have on my care quite a number of children suffering from the ordinary form of simple broncho-pneumonia.

Some died and some survived in the usual order, and in perhaps the usual proportion. I got dissatisfied with my results, and I set about to examine ways and means. One healthy little fellow of two years old, the only child of devoted parents, died. I was satisfied that the nursing and attendance was without suspicion and all that could be desired. I was clear that any medicines I used were quite harmless, even if they did no good. The child was poulticed thoroughly—with every discretion, regularity, and care that ordinary medical skill and more than ordinary parental affection could direct and determine — and yet the result was the worst possible. Reasoning from the facts I could suspect nothing but the poulticing, and I resolved not to resort to it in the next case which came into my hands. This case did admirably well—a simple liniment being used instead of the poulticing. To put the matter briefly, since that time I have not poulticed a single case and have not lost a single life from lung troubles, though I have had to treat not a few very desperate conditions. I have made it my duty to go outside my own experience in the matter, and I have found with sadly convincing regularity that poulticing in most cases preceded fatality; and I have even thought that the more diligent the poulticing, the more hopeless appeared the issue. It is, perhaps, not necessary to say more about the matter here, but there is very great reason indeed for reconsidering the teaching and the practice with regard to poulticing. The theories put

forth in even our leading text-books are not creditable to any just conception of scientific medicine. A poultice, says one, "bleeds the lungs into the skin"; it "imprisons a quantity of blood in the skin," says another—and so it does good. But these results are purely imaginary, for they are utterly impossible in a living being, and the good resulting on them is imaginary also—but not so the evil.

A poultice of pure mustard—the ordinary mustard "plaster"—may be used, and it is perhaps the best form in some urgent cases; but it should only be applied when an emphatic excitant or irritant effect is desired. It should never be used with the intention of affecting the deeper circulation; and it should be carefully watched, especially in a person in a state of unconsciousness, for if left on too long it may cause an ugly sore, or even a sloughing of the part.

Mustard may be applied in various other ways. The "Mustard Leaf" is a very convenient and very useful form, and may be used for most cases in which a superficial or a comparatively superficial stimulation is all that is desired. If we desire a deep rather than a superficial effect, the application must be left on for a longer time than even the leaf can be borne, in which circumstances it is therefore not suitable.

The most useful way that we have tried for the application of mustard is to put it inside brown paper. A sheet of thick, porous, "old-fashioned" paper, a little more than twice the size of the desired plaster, is taken and folded double. So much soft mustard paste is

then made with cold or tepid water as will be sufficient to cover the inside of half the paper, leaving a margin of about an inch that may be turned over sharp so that the paste will not escape. After spreading the paste and folding the edges, the paper should be laid on a warm plate until the lower side is permeated with the moisture. It should then be applied, but if it "bites" too soon a single sheet of soft paper or of blotting-paper may be interposed in order to diminish the intensity, for the best results by this means are certainly got from a long, gentle application of six or eight hours. We have no doubt that even better substances than porous paper could be made to serve the same purpose of attenuating the action, but we have always found paper to serve the purpose quite well. In chronic inflammation of the throat, and bronchi, and pleura, and peritoneum, and in many other similar conditions, this is the form that we always and with confidence use.

Mixed in hot water for a foot-bath, or hip-bath, or even in a general bath, mustard is of great value as a derivative and stimulant in conditions of congestive headache, suppressed menses, severe cold and exhaustion.

Official Preparations.

Cataplasma Sinapis . . .	Mustard and Linseed Meal equal parts. The former is mixed with tepid, the latter with boiling water, and then are well stirred together.
Charta Sinapis.	Mustard in Powder dissolved in Solution of Gutta Percha and spread on Cartridge Paper.

Oleum Sinapis	The Oil distilled with water from Black Mustard Seeds after expression of the fixed Oil.
Liniment. Sinapis Co. . .	Ol. Sinapis 1·4; Ext. Mezereon. Etherial. 1; Camph. 3; Ol. Ricini 7; Spirit. 44.

Other Preparations.

Charta Sinapis (U.S.) . .	is made from the Powder of Black Mustard (the fixed Oil being previously removed by percolation with Benzine) dissolved in a solution consisting of India Rubber 1; Benzine 10; Carbon Disulph. 10.
Emplast. Sinapis (*Shacklin*)	is an extremely good and convenient preparation.
Pediluvium Sinapis . . .	Sinapis ℥ii, iii, or iv to sufficient hot water.
Emplast. Sinapis Co. . . .	Sinapis ½lb.; Pulv. Capsici, Pulv. Zingiber. āā ℥j; Acid. Acetic. Pyrolig. *q. s.* ut fiat Cataplasma. Dein adde Ol. Terebinth. ℥ii. Misce.
Fomentatio Sinapis c. Papavere	Decoct. Papav. Fervent. Oii; Sinapis ℥iii.

TURPENTINE.

This also is a very useful counter-irritant, the secondary effects being specially important. For some time after the application of even the unmodified oil it rather warms and soothes than irritates; and as it is readily absorbed by the skin, there is good reason to believe that in this early stage of its influence its admitted antiseptic effect is not insignificant, in such conditions, for example, as septic peritonitis. Observed facts go to show that in many inflammatory conditions

turpentine may have the full desired effect without producing any irritation to speak of. It cannot, therefore, be regarded as a simple excitant or irritant, as mustard may be. Then as regards its further action, when it has been applied long enough and strong enough to produce an irritant or inflammatory effect on the skin, there is room to doubt that its epispastic effect is very great, or extends far down. The intense inflammation that it causes seems to be a pure dermatitis, not extending far beyond the structures of the skin. The very intensity of the local inflammation and its peculiarly definite character would alone lead us to suspect that its deeper influence is comparatively little. We have for some years watched the effects of turpentine as a counter-irritant, and the result of our special study, if it may be so called, is exactly the same as the general impression of its usefulness that seems to have grown in the course of time, and perhaps more or less unconsciously, into the practice of medicine. We have applied it in most conditions in which a counter-irritant is ordinarily applied, and we gradually found ourselves limiting its application till now we find that we prefer other counter-irritants to it in all conditions excepting two or three, in which, however, we prefer it to all others. For all inflammatory diseases of the peritoneum and abdominal organs we certainly prefer it to any other external application; and in such conditions the stupe is the best form. We are quite satisfied that in every case the full effect for good may be attained without going nearly as far as to cause the

peculiarly severe inflammation which is characteristic of the irritant stage. In fact, though we class turpentine among the irritants for convenience, we much prefer to impress the greater importance of the effects that we have esteemed secondary.

The directions given for the preparation of a stupe are to "place a tin cup containing turpentine in a vessel containing hot water, so that the turpentine may be warmed without coming near the flame. Dip a piece of flannel into very hot water and wring it out till no water drips from it, then dip it into the turpentine and wring it out to free it from excess of the drug. The cloth while hot should be applied locally and allowed to remain till discomfort ensues but no longer, as it will blister if left too long."—HARE.

We believe this arrangement will be found to be too strong. The ordinary way of sprinkling turpentine on a flannel wrung out of hot water will do in most cases. We have also been extremely pleased by the results, especially in children, of the following method, namely: wring a piece of flannel of the size necessary out of hot water, and lay it on the skin; then wring another piece out of the hot turpentine and lay it on the top of that and cover down. It is practically impossible to do harm by this way, and it gives a very good stimulating result. The great thing is to have the flannel wrung, so as not to have any drip from it that will wet the bed-clothes and make the sufferer very uncomfortable.

The action of a stupe is doubtless a complex matter. The heat itself is a good local stimulant, and moist

heat is perhaps the best so long as it is uniformly continuous. Turpentine, too, is a good stimulant, and it is readily absorbed by the skin. We can imagine then how, with the skin so open because of the moisture, and so active because of the heat, the turpentine will be much more readily absorbed, and find its way freely by anastomosing vessels into subjacent tissues and organs, and into the whole system. In this way we obtain not only its local stimulant effect, but also what is often much more important, its whole physiological action on the entire system.

Turpentine may be combined with almost anything: with bland fixed oils for the purpose of making it milder, or with camphor, ammonia, acetic acid, etc., to make it more vigorous; but for most purposes it does very well alone.

Official Preparations.

Confectio Terebinthinæ	Terebinth. 1;	Ext. Glycyrrhizæ 1;	Mel 1.
Enema	„ „ ℥j;	Mucilag. Amyli ℥xv.	
Linimentum	„ „ 16;	Camphor 1;	Sapo Mollis 2; Aq. 2.
„ „ Aceticum	„ 4;	Acid. Acet. Glac. 1;	Lin. Camphor 4.
Unguentum	„ „ 8;	Resin 1;	Cera Flav. 4; Adeps 4.

Other Preparations.

Linimentum Terebinthinæ Co.	Ol. Terebinth. ʒiss; Liq. Ammon. ʒii; Spt. Meth. ʒiii; Sapo Moll. ʒiv; Ol. Marjoram. ♏vi; Aq. Dest. Fervent. ad ℥iv.
L. Terebinth. et Chloroform.	Chlorof. ʒii; Lin. Terebinth. ad ℥j.
L. Terebinth. c. Camphor.	Ol. Terebinth. ʒiii; Lin. Camph. Co., Lin. Saponis āā ʒiv.

L. Terebinth. c. Acid. Sulph. (*Pearson's*)	Ol. Terebinth. ʒiv; Acid. Sulph. ʒiss; Ol. Olivæ ʒxii.
L. Terebinth. c. Ammonia (*Copland*)	Ol. Terebinth., Liq. Ammon. āā ʒiv; Ol. Olivæ ʒi; Ol. Limonis ℥xxx.
L. Terebinth. c. Acid. Acetic.	Ol. Terebinth. ʒiii; Acid. Acetic. Fort. ʒss; Ol. Limonis ℥v; Ovi Vitellus *q. s.*
L. Terebinth. c. Acid. Oleic.	Ol. Terebinth. ʒviii; Camphor ʒiv; Acid. Oleic. ʒiii; Aq. Destil. ʒj; Liq. Potassæ ʒx.

IODINE.

Iodine has had a very wide application. It is difficult to recall any chronic or subacute condition in which it has not been used in some form or other, and it would seem almost always with more or less benefit. It is remarkable, however, that of late years it is not so extensively nor so frequently used as its reputed success in the past would lead us to expect. Its secondary properties are so important as to almost entirely eclipse its action as a counter-irritant, and that no doubt explains how it has been so widely applied, and so extensively written upon as to have a considerable literature of its own.

M. Lugol was certainly the chief apostle of treatment by iodine. His results at the Hôpital St. Louis were so striking that a Commission of the Royal Academy was appointed to report upon the practice. They found "not only the cure of scrofula in the first and second degree, but also the successful treatment of disease in its

most aggravated forms. Deep-seated alterations of the glands and various other organs, serious lesions of the bones and their principal articulations accompanied by those general symptoms which forebode a speedy death, have been cured in great numbers in the space of a few months, leaving the patient in the best possible state of health, and free from every vestige of the malady except the ineffaceable scars it had already caused. Moreover, these results are rendered still more valuable by the fact that the majority of the cases subjected to M. Lugol's practice were previously in a desperate state, and only admitted into his wards as deplorable examples of the ravages of an irremediable disease." The report is signed by Dumeril, Magendie, and Cuvier, and is therefore entitled to every credit.

Lugol used iodine in his treatment both externally and internally. Internally he gave to adults from half a grain up to a grain, beginning with the small dose, and increasing it as he found it agree. He always used it in combination with the hydriodate of potash. His formula for internal administration was : Iodi gr. i., Pot. Hydriodat. gr. ii., ad Aq. ℥viii.—he preferred to give it well diluted.

For external application he used the following five forms :

1. A Simple Rubefacient Ointment.	Iodi gr vi ; Pot. Iod. gr xl, ad ℥j.
2. A Syphilitic Ointment	Iodi gr xv ; Pot. Iod. gr lx, ad ℥j.
3. A Simple Healing Wash . . .	Iodi gr iii ; Pot. Iod. gr vi ; Aq. ℥xx.

4. A Rubefacient Solution . . . Iodi gr 240; Pot. Iod. gr 480; Aq. ℥vi.
5. A Caustic Iodine, containing one part Water, one part Hydriodate, and one and a half of Iodine—giving 18 of Iodine to 28 of Liquid.

The first lotion (3) he used for injection into fistulæ, the nasal cavities, lachrymal ducts, etc. The second, which by means of pledgets he applied in Coryza or painted on old ulcers, was also used in a poultice for "bad tumours that obstinately resisted all other treatment." The poultice is first made in the ordinary way, and when sufficiently cool a quantity of the liquid is poured on. His results by this method were very remarkable.

The *Caustic Iodine* is the most concentrated solution of iodine that can be prepared. "It only differs from the Rubefacient Solution in its greater force, and is only employed when the other formulæ have failed or have been found insufficient. I have used it repeatedly for touching the eyelids and nasal fossæ to repress excessive granulations, to modify the state of the red hypertrophied skin impregnated with pus surrounding certain scrofulous ulcers and tubercles. The celerity, in short, with which it improves the appearance of the soft and fungous tissues in these cases almost surpasses imagination. Sometimes, indeed, the ulcers are healed too soon—that is, closing before a sufficient change is worked on the general constitution. In the esthiomenic scrofula the pustules are touched with the *Caustic Iodine*, the *Rubefacient Solution*

having been used previously. The application may be made twice or thrice a week, sometimes even daily when the surfaces are extensive and can only be touched in small portions at a time."—LUGOL.

Lugol had many imitators and followers in this country. A considerable number contributed of their experience in praise of iodine, but beyond the actual facts of their stated cases they brought no new light to bear on the matter. We are glad, however, to make an exception in this respect of Dr. J. Davies, of Hertford, whose small book is altogether most interesting. His cases are well observed and clearly stated. His purpose is entirely honest, and his reasoning is always good, even when from defective knowledge of the full significance of his premises he comes to wrong conclusions. He states a general case as follows: "Suppose we are called to a severe case of inflammation of the leg in a stout, robust person. The limb is intensely red, hot, swollen, and glossy all the way from the toes to above the knee. It is double the size of the corresponding one, and so painful as to disturb the general health, causing a quick pulse, white tongue, thirst, etc. We immediately paint the whole limb with the tincture of full strength, from the toes to a few inches above the upper margin of the inflammation. The remedy is applied by means of a camel's-hair brush. This is all the local application required for the present. The limb is kept in a horizontal position, either lightly covered with a sheet not in contact, or left exposed if the weather is not cold. In less than twenty-four hours

the swelling may be found to have diminished; the skin is corrugated, showing its contents to have become less in bulk, and the circumference will measure some inches less than the day before. The diminution will be found to have taken place more particularly towards the upper margin of the swelling. We now repeat the application of the same strength. In another twenty-four hours the reduction of the swelling will have gone on rapidly, and only a remnant of the disease will be found to exist." It might be thought that there are elements of fallacy in this statement. The factors of absolute rest, horizontal position, and coolness, cannot be altogether ignored as aids towards the cure. But as we learn in another place that the statement has particular reference to a case of erysipelas, these conditions, which in a case of simple inflammation might be almost sufficient in themselves to bring about a cure, cannot be credited with the whole result. In another case of erysipelas of the head and face, in which rest cannot be supposed to have influenced the result in the same degree, applications of iodine determined a cure in an equally short time. It is with erysipelas that Dr. Davies had his most characteristic results, but he used the same treatment in dealing with phlegmon, acute and chronic inflammation of joints, inflammation of the absorbents, boils and carbuncles, ulcers, sloughing wounds, lupus, scrofulous glands, etc., with most satisfactory results. One case of his is interesting as an illustration of the protective action of the absorbent glands, which he evidently did not under-

stand. "A gipsy was bitten on the finger by a horse. Some purulent matter from an abscess on another horse got into the wound. The arm inflamed rapidly along the course of the absorbents up to the axilla. When we saw him the disease was of a fortnight's standing. There was an abscess discharging below the bend of the arm, another in the middle of the upper arm, and a third in the axilla, and there was a path of inflammation all the way from the wound to the axilla along the line of the abscesses. The man was reduced to a mere skeleton. Tincture of iodine full strength was applied along the inflammation and over the abscesses daily, and the abscesses dressed. The inflammation was subdued in two days, the wounds healed quickly, and the man recovered without delay." We have no doubt, though he does not record it, that these abscesses appeared in order from below upwards, and that they were the lymphatic glands broken down under a load of poison. There can be no doubt that the intention in their discharge was to throw the poison out of the system. If the poison had been destroyed in the original wound at an early stage, this break-down of the glands would not have taken place; and we have no doubt that the best effect of the iodine was not so much to subdue or control the inflammation as to destroy what remained of the poison which made the inflammation necessary. The same may be a principal element in the action of iodine in such diseases as erysipelas, lupus, sloughing ulcers, and the like, in which an organic poison is, if not the whole cause, at

least no inconsiderable part of the totality of cause that determines the progress of the disease. In other conditions, as of simple inflammation of joints and glands, we must believe that the action of iodine is entirely counter-irritant.

We have already, in the more theoretical part of this essay, made reference to the very remarkable results obtained by Mr. Fourneaux Jordan by means of counter-irritation. We have ventured to differ from his interpretation of the phenomena of disease and of the *modus operandi* of his treatment, but we never doubted his facts nor the reasonableness of his practice. His "Surgical Enquiries" place him well up among those who have contributed something of abiding value to the literature of medicine. No practitioner can be justly ignorant of Mr. Jordan's work, and especially of that part of it which concerns the present inquiry. The great array of seemingly conclusive cases which he gives in proof of his contentions we cannot repeat here, but must refer the reader to them. When we meet with such statements as the following from a man whose word we have not the slightest reason to doubt, we must pause and consider: "*Great enlargement of the cervical glands; counter-irritation at the back of the neck; recovery in three weeks after three years' treatment with every known treatment.*" This is only one of a great number of similar remarkable results. We cannot safely disregard facts of that kind, and we are not disposed to disregard them, for we have seen them with our own eyes. Iodine

is Mr. Jordan's favourite remedy, but he uses others also as he may think best. The essential in his treatment is that counter-irritation must be made over "the next, or another, or an independent vascular trunk or territory"; and his conception of the good result is that "a second and a smart inflammation in an adjacent patch of skin over an independent vascular region *will vigorously divert the blood-stream from the primary inflammation and develop a new outlet for pathological force.*" We have shown some reason for dissenting from this interpretation, and only refer to it here in order to explain his practice, which has a good illustration in this case: "Ellen S., aged thirty-seven, married, came to the hospital with a large carbuncle on the side of the neck. The hardness, pain, tenderness, and almost purple skin were striking. A broad horseshoe of Iodine Liniment was freely applied in front, below, and behind the swelling. In consequence of some misunderstanding, she did not repeat the application. After the single application, however, the pain ceased immediately, and the tenderness and discharge and swelling rapidly diminished. When she came on the fourth day, a small yellow slough, without discharge or swelling, projected through an opening in the skin. A second application of iodine was made, and six hours after the slough fell out, leaving a healthy ulcer which quickly healed. *Remarks*: I am surely justified in speaking strongly here. No case, having reached the same stage, ever got well so quickly before." Certainly there is good excuse

for speaking strongly in this case, and it is only one out of many different cases in which the treatment was equally successful. Simple inflammations of all kinds and in all positions are cured forthwith ; abscesses, carbuncles, bubos, erysipelas, syphilitic ulceration, paronychia, whitlow, periostitis and osteitis, synovitis, in short every form of inflammation and every diseased result of inflammation is directly cured or improved under this very simple and harmless treatment.

As a counter-irritant pure and simple we can only study iodine inferentially, for it is impossible in application to separate its stimulant or irritant action from the specific powers with which it is credited of being able to cause a resolution of pathological deposits, and also of specially stimulating inert and diseased glands. But if we dissociate these, and consider it as a pure counter-irritant only, we do not see, and we have not seen, any reason for esteeming it better than, or even as good as, others of the class. In fact, we should never of choice use it as a simple counter-irritant ; but whenever we have a condition in which counter-irritation is indicated, with pathological thickening that we wish to remove, we certainly use iodine so long as there is any reason to believe in its reputed specific influence ; and in such conditions as call for stimulation and cleansing at once, we always and with every confidence use a preparation of iodine.

It is said to stimulate the absorbents, both when applied externally and when administered internally, in such special manner and degree as to deserve the

name of a specific to this end. This teaching we accept, or rather, we do not refuse, because, though we have had no sufficient personal proof of it, the testimony in favour of the teaching is so universal that it would not be wise or safe to reject it without more reason than we can at present adduce. That it stimulates the absorbents when applied externally there can be no doubt, but this is true also of all other counter-irritant means. The only question, therefore, is as to which is the best to use in any given case; the difference would seem to be a mere matter of degree. We know from abundant observation that other counter-irritants serve this purpose quite as well as, and in many cases better indeed than, iodine, hence our difficulty with regard to its supposed specific effects.

The solvent action on pathological deposits with which also it is credited, gives it an even more specific character than its stimulation of the absorbents. It must, however, be apparent that any such effect cannot result from its purely external action except on the general principles which we have already stated and explained. As an external application it cannot have an internal effect but in the same way as other irritant means have, namely, by stimulating and accelerating the circulation and the nutrition of the parts. But if it is absorbed by and through the skin into the deeper tissues, it is easy to understand that its irritant effects are continued in these deeper parts, just as if taken internally; and if it is true that it enters into a soluble combination with the albuminoid tissues we have a sufficient explanation of

its action, and perhaps a sufficient reason that it should in this respect be esteemed a specific. We must, however, say that we have seen reason to doubt this specific action in the fact that when iodine is applied short of producing irritation it does no good. If it had this specific action its mere contact with the tissues ought to be sufficient, without any irritation.

Its undoubted strong antiseptic properties come in line with its stimulant action when applied to fistulæ, foul cavities, and chronic sores, and this combination is in such conditions exceedingly desirable.

In elderly persons and others in whom vitality is low, we have not found iodine to act at all well. The tendency of the tincture and liniment forms is to dry and desiccate the tissues, and when this happens the counter-irritant effect is very little or nothing. For this reason we prefer an oily or an ointment preparation. These save desiccation and cracking of the skin, the drug is much more effectively carried into the tissues, and counter-irritation is more surely produced. It must always be remembered that iodine is not a pure stimulant, but partakes largely of the character of a caustic, injuring or even destroying the tissues with which it comes in contact. The combination with glycerine, oil, or fat, prevents this to a very considerable degree. The best of such vehicles is Lanolin. Too strong an application may cause blistering, especially in young persons, and that is very undesirable, for whatever is strong enough to blister is strong enough to destroy the more delicate textures of the true skin and

leave an ugly scar. For iodine, as for all counter-irritants, it is better to use a mild form continuously than a strong form for a short time.

Official Preparations.

Linimentum Iodi	1 in 9½	Iodum 5;	Pot. Iodid. 2;	Glycerin. 1; Spirit. 40.
Liquor „	1 in 20	„ 10;	„ 15;	Aqua 200.
Tinctura „	1 in 40	„ 1;	„ 1;	Spirit. 40.
Unguentum „	1 in 30	„ 7;	„ 7;	Glycerin. 12; Adeps 191.

Other Preparations.

Cataplasma Iodi		Two drams or so of Tincture to a poultice.
Causticum „ (B.S.H.) . .		Iodum gr 180; Pot. Iod. gr 60; Spt. Vin. Rect. ℥j.
Collodion „		Thirty grains, more or less, of Iodine to an ounce of Flexile Collodion.
Glycerinum „ . .	1 in 24	Iodum gr 20; Glycerin. ℥j.
Iodum Carbolisatum . . .		Liq. Iodi ℥ii; Acid. Carbol. gr 44; Aq. Ferv. Oj.

Lotions.

Lotions and Washes may be made any strength from even a grain to a pint up to the caustic form—preferably with distilled water, and with *Pot. Iodid.* to keep the Iodine in solution. Opium may be added or Spirits of Wine with advantage, according to circumstances.

Linimentum Iodi . . .	1 in 24	Iodum gr 20; Ol. Olivæ ℥j.
	1 in 48	Iodum gr 10; Liniment. Saponis ℥j.
	1 in 80	Tinct. Iod. B.P. ℥j; Liniment. Saponis ℥j.
Liquor Iodi Ammoniat. .	1 in 150	Iodum gr 10; Pot. Iod. gr 20; Liq. Ammon. Fort. ℥ii; S. V. R. ℥j.
Oleum Iodatum . . .	1 in 10	Iodum gr 96; Ol. Ricini, Alcohol āā ℥j.
Pasta Iodi et Amyli .	1 in 200	Liquor Iodi ℥ii; Glycerin. ℥iv; Amylum gr 240; Aquæ ad ℥iss.

Pasta Costeri	1 in 4	Iodum gr 120; Ol. Picis Rect. ʒj.
Pigmentum Iodi . . .	1 in 2	Iodum gr 45; Pot. Iod. gr 20; Glycerin ʒiss.
Parafinum Iodatum . .	1 in 19	Iodum gr 20; Paraf. Liquid. gr 380.
Phenol Iodatum . . .	1 in 4	Acid. Carbol. ʒj; Iodum ʒii.
Steatinum Iodatum . .	1 in 24	Iodum 1; Spt. Vin. Abs. 3; Ol. Ricini, Sevum, Cera Flav. āā 7.
Tinctura Iodi Oleata .	1 in 11	Iodum 1; Spt. Vin. Rect. 9; Ol. Ricini 2.
Tinct. Iodi Decolorata		Iodum C. 250; Spt. Vin. Rect. ʒvss; Liq. Ammon. Fortior ʒx.
Unguentum Iodi . . .	1 in 50	Iodum gr 20; Pot. Iod. gr 60; Cerat. Cetacei ʒii.
„ . . .	1 in 80	Iodum gr 12; Pot. Iod. gr 80; Adeps ʒii; Ol. Nicot. ♏iv.
„ . . .	1 in 32	Iodum gr 30; Pot. Iod. gr 30; Lanolin ʒii.

Capsicum is a very acute irritant, but it is not of much service as an epispastic, except in its mitigated forms and combinations. Fluid extracts and tinctures of various strength have been commended for rubbing into rheumatic joints, or to be applied sprinkled on flannel or spongio-pilin in cases of bronchitis and pneumonia. There can be no doubt that capsicum is an excellent stimulant in the purest sense, and in certain low conditions this, as well as its convenience, might lead us to prefer it to mustard.

Liniment forms have been at various times very highly commended. Sir James Sawyer commends an etherial tincture as against the alcoholic B.P. preparation. "An excellent and powerful liniment may be

made of equal parts of etherial tincture of capsicum, liq. ammoniæ, oil of turpentine, and linseed oil."

The "Liniment. Capsici" of *St. Mary's* is also good: "Tr. Capsici ʒiii; Lin. Camphor. Co. ʒiv; Spt. Vin. Meth. ad ʒi."

Ointments of various forms have also been commended. "Chili Paste," of which capsicum is the active element, is highly thought of by even intelligent people—for the relief of colds, neuralgic pains, and rheumatism.

The plaster forms are very useful, but there can be no doubt their good effect depends upon the slowness with which they act. They are less irritant and therefore more gently stimulant.

Acetic Acid.—There cannot be any doubt that acetic acid is a most valuable counter-irritant, though not so much used by the profession as it might be. There may be a prejudice against its use because it is a notorious heal-all; but it is wrong for any such reason to neglect a very useful remedy. It is quite certain that great benefit is often derived from its use in conditions of a neuralgic or rheumatic nature after orthodox things have failed to give relief. It is unwise and unreasonable to ignore it. The only B.P. preparations for counter-irritant use in which it finds a place are in *Linimentum Terebinth. Aceticum*, perhaps the best liniment in the Pharmacopœia, and in *Acetum Cantharidis* already referred to. A 33 per cent. strength is perhaps the most serviceable to keep;

it may be combined with oils or reduced by distilled water as may be considered best for the intended purpose.

AMMONIA we do not like for purposes of counter-irritation. We have tried it and found it very troublesome. It is too intense, acting suddenly and all at once, and not gradually as a good counter-irritant should. A preparation that will fail of any effect in one person will in another cause sudden and severe blistering of a most painful kind. It is practically impossible to regulate, and therefore we have ceased to use it for this purpose. It is remarkable that the Pharmacopœia has discarded several forms of external applications of ammonia — *Liniment*, *Ointment*, and *Plaster*—and that now only one remains, the *Linimentum Ammoniæ* (one part of liquor ammoniæ in three of olive oil). It is also used in the *Linimentum Camph. Co.* (Liq. Ammoniæ Fortior 40 ; Camphor 20 ; Spt. Vin. Rect. 120 ; Ol. Lavandulæ 1). So far as we know, the first form is not much in use, and the second may owe a good deal of its success to the other ingredients.

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