

Observations on the method of curing the hydrocele by means of a seton.

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OBSERVATIONS

ON THE

METHOD OF CURING

THE

HYDROCELE,

BY MEANS OF A SETON.

By J. HOWARD, SURGEON.
-v

LONDON:

PRINTED FOR R. BALDWIN, AND T. LONGMAN, PATER-
NOSTER-ROW; AND J. DEBRET, PICCADILLY.

MDCCLXXXIII.

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OBSERVATIONS

ON THE

HYDROCELE.

THE ingenuity and laudable exertions of two excellent modern practitioners have within a few years past enriched the science of Surgery, with two very useful methods of curing radically, the Hydrocele of the *Tunica Vaginalis*; namely, the Seton and small Caustic. The advantages they evidently possess over incision, excision, and some other means, which have been recommended and practised, are great and obvious; and are now so generally allowed, that they have been adopted by the majority of Surgeons, as the safest and most certain methods

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thods of treatment. But even these, superior as they undoubtedly are to those which preceded them, might perhaps admit of some emendation, if the principles on which they operate in effecting a radical cure were thoroughly ascertained and established.

The Author of the following Tract acknowledges he has seen but few cases treated by the small Caustic, having collected almost all his ideas of it from Mr. Else's pamphlet. How much soever he may have been obliged to differ from that gentleman in opinion, he does with the utmost readiness allow, a great and uncommon share of merit to the small Caustic; but cannot be brought to believe, that it will ever be so extensively useful as the Seton. With regard to the latter, he has been guided solely by reiterated and faithful experience. Having for a considerable number of years been employed, as assistant to Mr. Pott, in attending some of his public
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and a great number of his private patients, who have submitted to his method; he has had many opportunities of observing the progress of the cures under different degrees of inflammation, and from thence has been induced to believe, that the inflammation raised by the Seton should be of short duration, and very moderate.

If, he has been able to suggest any thing new, on a method of cure, which has, he confesses, been pretty fully explained already by its admirable author, he hopes to stand excused, for endeavouring to make more clear what to some may perhaps appear so plain and explicit, as to need no kind of illustration. To those gentlemen, who are fully acquainted with this branch of practical knowledge, he has but little to offer; but to those who are not, he has endeavoured to make himself useful; and can assure them, that the following reflections on the method by Seton were the result of long and laborious attention to a

great variety of cases, which were treated with the utmost care, and noted with the strictest fidelity.

The Caustic, in order to cure, is to be applied for such a length of time as shall be sufficient to form an eschar through the integuments of the scrotum; and, if possible, affect the *tunica vaginalis* also; the intention being, to raise such a degree of inflammation on the membrane, immediately containing the water, as shall convert it into a slough, and consequently destroy it; the testicle itself, according to the account given by the late Mr. Else, being uninjured, either during the course of the cure or after it; and left still covered with the *tunica albuginea*, though deprived of its other coat. The Seton is employed, with intent to raise such a degree of inflammation only, between the surface of the *tunica vaginalis*, and that of the *tunica albuginea testis*, as shall bring on a firm coalescence between them, and thereby abolish the cavity containing the fluid,

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which

which constitutes the disease. By this method no part is destroyed, simple inflammation only being raised : but in the method by Caustic, this effect of irritation must proceed to the next stage ; and, if it does not, a radical cure cannot be obtained. The water, in the method recommended by Mr. Else, continues within the cavity during the whole progress of the inflammation, which must precede a sloughy state of the membrane ; and when this state is nearly produced, it is evacuated. In the method by Seton, the fluid contained is immediately discharged, and of consequence the *tunica vaginalis* contracts : there is, therefore, a course of distension existing, during the progress of inflammation, in the one method, which is wholly absent in the other ; namely, the contained fluid. It is believed, and I by no means intend to controvert the opinion, that the practice in general use, of suffering the action of the Caustic to slough the membrane before the eschar is divided, or air is admitted into the cavity, may moderate

derate the symptoms, and cause them to be no more alarming, than has been represented; and perhaps no other method of treatment by Caustic will produce the same favourable consequences. In the method by Seton, the inflammation raised, is not only mere inflammation in its most early stage; but it is accompanied, and that almost from the beginning, with a very powerful means of resolution; namely, a digestion, discharge, or increased secretion from the inflamed surfaces of the *albuginea* and *tunica vaginalis*. The Seton acts as an extraneous body between these surfaces, which it irritates, and slightly inflames; and to which, after a little time, it superficially adheres. Inflammation being thus raised, goes on; and is, in the space of four, five, or six days, if the case is properly treated, at its height. The discharge from the two orifices is at first almost clear, and small in quantity; by degrees it acquires a more purulent or pus-like appearance: it is inconsiderable in quantity, so long as

the parts are in a state of increasing inflammation; but when the latter has once passed its height, which it generally does within the time above mentioned, with proper care, then the discharge is greater, and continues increasing, until the inflammation, tension, and irritability of the scrotum, are very remarkably abated. This subsidence of tension and increase of discharge take place, notwithstanding the irritation of the Seton, which still continues within the cavity; and when the usual time for withdrawing it arrives, the membranes have been in a state of decreasing inflammation and diminished irritability for several days. The smallness of this secretion, during the progress of the inflammation, and its gradual increase, as the latter diminishes, sufficiently mark the resemblance between the *tunica vaginalis* and what are called mucous membranes; and clearly evince, that there is in this method naturally an evacuation immediately from the parts inflamed, and consequently a

powerful means of resolution applied ; and a minute attention to the appearance of this discharge, at different periods of the treatment, will convince any one, that it is a species of mucus. It has a peculiar fætor, somewhat like the sebaceous matter of the *glandulæ odoriferæ*. I have seen it issue from the upper orifice, early after the operation, of the colour and consistence of the white of an egg, and have noted, day after day, its change into a more purulent state ; till, by the time the threads have been withdrawn, and the orifices nearly healed, it has gradually altered again to its first complexion, and become at length perfectly limpid. Perhaps it will be said, that the secretion from this membrane bears very little analogy to that furnished by the pituitary, and some other surfaces that might be mentioned : to which I can only say, that the *tunica vaginalis* and *albuginea* are different, both in structure and use, from every other mucous membrane with which we are acquainted ; and this most probably
causes

causes a difference in the appearance of the secreted fluid. It is in a great measure owing to the extensive influence of this natural evacuation from the parts irritated, that the *tunica vaginalis* does not slough in the method by Seton; and may be one reason, why the symptoms it raises in the system are for the most part milder, than those brought on by the caustic.

When rest, an horizontal posture, and the use of antiphlogistics have lessened the inflammation, the discharge having been somewhat increased, in consequence of the subsidence of the tenderness and tension, a relaxation of all the parts affected in the operation is produced; but a state of preternatural irritability remains, in which the membrane, though extremely sensible, is not affected, with an increasing inflammation. This irritability may indeed be readily augmented, by any additional stimulus, so as to produce greater tension and uneasiness. But if nothing of this kind is applied,

applied, and when other circumstances, to be hereafter mentioned, are properly attended to, the inflammation continues diminishing, till the cure is compleated. When the tension begins to subside, the period commences, toward the close of which, the Seton may with propriety be withdrawn. This period begins about the fourth, fifth, or sixth days, and continues till the tenth, twelfth, or fourteenth. The threads may be all removed at one single dressing, or by degrees, at different times, as the case may require. The two surfaces being thus brought into a state fit for adhesion, and lodgment of the secreted fluid prevented, by a free discharge from both orifices, a firm and universal coalescence between the two coats takes place: the cure is then accomplished, and nothing more is required, but to heal the orifices by a superficial dressing.

The adhesion is effected in two different ways; in the one, there is a considerable
discharge,

discharge, which, at a certain period of the process, is accumulated in such quantity as actually to produce distension of the *tunica vaginalis*, and become thereby a secondary cause of inflammation. The symptoms are in this case comparatively higher, than in that, in which the discharge is too small, to occasion any perceivable distension. In the one, the adhesion takes place early; either, during the progress of the inflammation, within the first five or six days; or immediately afterward; but in the other, not till some days later; nor till the accumulated secretion has been fully evacuated; and such a degree of relaxation and collapse of the membrane brought on, as to enable it to come into immediate contact with the *albuginea*. In this case, the adhering surfaces are covered by a granulation, probably the effect of suppuration, or digestion: but when they adhere early, I believe they are not. However, in both cases, the tract of the Seton adheres precisely in the same manner, and in consequence

quence of the preceding digestion having produced a state of granulation on the two membranes.

If there should be a general accumulation of fluid within the cavity, the case will require particular attention. When the Seton has been passed several days, the secreted fluid becomes acrid, somewhat fætid, is sometimes in considerable quantity, and probably comes from every point of the irritated cavity. The threads serve both to absorb and retain it. Distension being thus produced, operates on a membrane whose natural irritability is now greatly heightened. Inattention to this circumstance, has, I am convinced, in many instances, produced a very sudden and unexpected increase of the symptoms, and sometimes been the cause of future abscesses, which have teized both patient and surgeon for some time, and protracted the cures considerably beyond the usual period. Besides the use of antiphlogistics, which are sometimes

sometimes in this case necessary, this distension may be taken off, by carefully removing a few of the centre threads of the Seton; which may be done without causing pain, or adding to the irritation. A way being thus made for the evacuation of the retained fluid, a considerable discharge sometimes immediately follows the extraction of the threads. But if not then, in a very short time after: relaxation, collapse, and a disposition every way favourable to adhesion, succeed. At this period the greater part of the remaining threads should be withdrawn; leaving, however, two or three within the cavity, to keep the orifices open a day or two longer, and serve as conductors to any portion of the secreted fluid that may have lodged: and, as a further assistant to these means, as soon as the tenderness of the scrotum, &c. is so far diminished as to allow the surgeon to handle the part, the discharge may be gently pressed out at every dressing.

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When the abolition of the cavity takes place early, and simply by inflammation, the discharge is in much less quantity than in the preceding case; there is no distension of the tunic from a general accumulation of fluid within the cavity; the inflammatory tension is slight, and the other symptoms, for the most part, so mild as to require but a very moderate share of attention. However, a fair and very considerable subsidence of the symptoms must be waited for, before the extraction of any part of the Seton; and the same precaution of leaving a few threads for conductors, as in the preceding case, will be often necessary, though I have frequently known it wholly disregarded; and without the smallest inconvenience,

The Seton certainly acts as an irritant; but it causes only such a degree of inflammation, when properly managed, as is necessary to bring on a firm and perfect adhesion between the two coats, and it produces

duces this effect in the most simple, and gentle manner. The tender membranes are so guarded by the canula in the operation, that the least possible injury is done to them; the pain being very little more, than what would arise from making two punctures in the palliative method of treatment; and when the canula is withdrawn, the Seton is simply deposited an extraneous body between the two surfaces, and in the situation in which it is left, it remains at rest; unless the surgeon chuses, at any time during the progress of the cure, to add to the prevailing irritation, by gently moving it. This is not all; it possesses these advantages in common with others, the most favourable that can be conceived, for an artificial inflammation. I have mentioned what has constantly appeared to me to be the fact, — That the discharge is a species of mucus, and though it may sometimes appear highly purulent, yet it never is, when the process has been properly conducted, either mixed with, or attended by the separation of a
 flough.—

flough.—When I say this, I take it for granted, that the treatment has been judicious; for whoever is acquainted with the laws of the animal œconomy will see, that, under improper treatment, the irritation of a Seton may cause a flough of the *tunica vaginalis*, as well as the irritation of a Caustic, or indeed as well as any other long continued local stimulant: but the production of a firm adhesion, neither requires that the inflammation should be kept up so long, as to have this effect follow; nor is it necessary that it should run near so high; and, upon the whole, I will venture to say, and that from observation made on a great number of cases, that this accident never can happen, in the method by Seton, but from some very striking misconduct in the management of the patient. It is really no easy matter to make the membrane flough in this method; and, if compared with the small Caustic, the Reader will immediately see why it is not. In the latter, the membrane suffers a considerable

siderable loss of substance, at a time when the inflamed parts are kept upon the stretch, by the contained fluid: but, by the Seton, no part is destroyed; the membrane is simply punctured, the evacuation of the water prevents distension, and there is besides a natural means of cure operating in its favour, which is never present in the other method. But there is one other circumstance still more convincing than any thing that has been hitherto urged, and more evidently points out, that a sloughing of the *tunica vaginalis* is not the general consequence of the operation by Seton. Mr. Else says, page 36, "That (in his method) the sloughs from the *tunica vaginalis* continue to come away for four, five, or six weeks; and that the hardness of the scrotum does not go off until they are all discharged." Now whomever reflects, that nothing like a slough is observable, in the discharge occasioned by the Seton, and that this method takes up no longer time than from sixteen days to three

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weeks,

weeks, to effect a perfect cure, will be satisfied, that a sloughing of the *tunica vaginalis* and *albuginea* is not a general occurrence; for the inflammation raised neither continues sufficiently long for the conversion of the membranes into this state, nor would the time taken up in the cure be sufficient for the necessary separation, if they really underwent this change. As to the time which this process of cure takes up, if we suppose the first threads of the Seton to be drawn away on the eleventh or twelfth day, and the whole to be removed on or before the sixteenth day, we may very reasonably expect that the orifices will be healed, and the adhesion effected, within three weeks. Such, under proper treatment, is generally the time requisite for a radical cure by this method: but experience will warrant me in going a step farther. I have withdrawn the whole of the Seton on or before the twelfth day, the adhesion has taken place universally, and the orifices been healed perfectly by the sixteenth

teenth

teenth day; and this, I will maintain, may often be done in particular cases. Will any gentleman venture to say, that in such instances the *tunica vaginalis* sloughs?

Mr. Else, in describing the appearances which follow the application of his Caustic, says, "That it is the *tunica vaginalis*, and no other part, which gives the sensation of hardness and tension." If this assertion was meant to convey an idea, that the inflammation and slough, tho' extending throughout the whole of the *tunica vaginalis*, does not affect either the *albuginea* or testicle, I am, I confess, at a loss to conceive what arguments can be brought in support of the hypothesis. Much, I am sure, may be said against it; for it is equally irreconcilable to anatomy, and the general course of nature, in every other inflammation.

To those who are not of the profession it may be necessary to remark, that the testicle has two coats; namely, the *tunica*

vaginalis and *albuginea*. The latter is the innermost, and covers immediately the body of the gland. The *tunica vaginalis* is exterior to this, and between the two membranes the fluid constituting the Hydrocele is contained. In the fœtus they are both parts of the same parent membrane; namely, the *peritonæum*. The testicle, during its continuance within the cavity of the belly, having the same covering with every other peritoneal viscus, and in the adult there is no natural line of separation between them, nor can any one say precisely where the one ends or the other begins; so that they are, in fact, though commonly called by two different names, continuations of one and the same membrane. It is this close and intimate connection of the two membranes which renders it highly probable that the *albuginea* is frequently injured in Mr. Else's method. In truth, when the inflammation is extended over a large thickened *tunica vaginalis*, and is violent, I do not see how
 this

this accident can be avoided; and if we reflect on what happens in inflammations of the external covering, or true skin, which is also a membrane, though indeed of a very different kind, we shall see that the event can very seldom be otherwise. We frequently cannot, by means of evacuations, sedatives, &c. prevent an inflammation of the skin from extending a considerable way, though it is only in its first stage, though we have it perfectly within our reach, and can apply powerful topics immediately to the part diseased. Let any one suppose the Caustic applied to an Hydrocele containing half a pint or pint of fluid, the whole *tunica vaginalis* containing which, is not only to inflame but slough throughout, the patient being of an highly irritable or phlogistic diathesis; let him, I say, suppose such a case, and tell me whether it is probable that the *tunica albuginea* should escape the very same affections, in the method by Caustic.

From what has been said, it will, I believe, plainly appear, that a sloughing of the *tunica vaginalis* and *albuginea* is not easily producible, even under mismanagement, in the method by Seton: but if it were really to be dreaded so much as some practitioners would make us believe, it is extremely clear, that a radical cure by Caustic cannot take place without sloughing the *tunica vaginalis*, in every instance whatever; that the *albuginea* will consequently be very frequently affected in a similar manner, and the testicle thereby suffer very material injury. I will very readily allow, that the small Caustic is greatly preferable to some other methods formerly employed, and that it occasions as little hazard as can possibly be expected to accompany a sloughy state of the *tunica vaginalis*, produced through the medium of a Caustic: but at the same time I must beg leave to observe, that there are circumstances attending the cure by Seton which induce me to believe it is less

hazardous, painful, and tedious, than that by small Caustic.

Inflammation is necessarily raised in both methods; the attendant circumstances in each are, however, very different. In the method recommended by Mr. Pott, we have only to bring on such a degree of inflammation as shall cause a perfect union of the two surfaces; that being once accomplished, the inflammation need not proceed further, or to a more advanced stage, but be immediately lessened by sedatives, &c. and during the whole of the treatment, from the passing of the Seton to the time at which it is withdrawn, the same means, if necessary, may be employed with great propriety and effect, as moderators of inflammation; and that without counteracting the main intention. There will therefore be a great difference in the consequences resulting from the application of our remedies in the two methods; for anti-phlogistics and sedatives will often greatly

assist the radical cure by Seton. In the Caustic, if they act powerfully, they may prevent the formation of a slough. I say assist; for, from all the information I have been able to get on the subject of the Seton, those cases have succeeded with the fewest inconveniences and greatest certainty, in which the inflammation has been extremely slight. I have seen some trouble arise from suffering it to run too high; and I believe that in general we err on this side, but have never yet met with a relapse from too slight an inflammation; though I have heard of this accident having happened to others, who have withdrawn the Seton too early. This may be one cause of failure, and perhaps want of sufficient inflammation may be another. But the fact undoubtedly is, that cures are effected with great certainty, when there is neither much local inflammation nor remarkable general affection of the system. In order to this, if the adhesion does not take place early and simply by inflammation, the surgeon must wait for the digestion

tion and granulation of the two surfaces already described, before he attempts to remove the Seton.

Perhaps it will be urged, that if a flough of the *tunica vaginalis* is produced by the Caustic in a good habit, it may answer in some measure to a fair suppuration formed in the cellular membrane, and may consequently be as free from every symptom of hazard as an ordinary collection of matter; but even this is questionable. However, in a bad one it certainly will not; for in this case the nature of the attendant symptoms will clearly point out the immense difference between a method, in which a moderate degree of inflammation is all that is requisite for a cure, and that in which the inflamed membrane must necessarily flough: so that taking the matter on Mr. Else's own ground, and allowing that no other part but the *tunica vaginalis* suffers by the extension of the flough, yet this very circumstance, so essential to a radical cure by
 Caustic,

Caustic, must unavoidably, in many debauched habits, besides other inconveniences, be attended with a species of danger from which the Seton is wholly and absolutely free : I mean the great, and in many cases certain, danger of mortification.

A superficial view of external inflammation, when it occurs in two very different states of the sanguineous temperament, will explain my ideas, and illustrate this very important truth. The states alluded to are, when this constitution is found and healthy, and when it has been viciated and altered by a variety of causes, as intemperance, dram-drinking, gout, &c.

The diseases to which persons of a sanguineous temperament are naturally predisposed are of the inflammatory kind. In them both local and general inflammation will sometimes be very readily raised by the slightest causes ; and, when once brought on,

on, they continue with a degree of permanency, and run to a height, not commonly met with in more temperate and less irritable habits: and the circumstance which renders inflammatory diseases so dangerous to them is the great and exquisite irritability of their nervous systems. An inflammation of a membranous part, in a constitution of this kind, will sometimes cause so great a degree of inflammatory diathesis, as to bring on delirium. Symptoms of real strength generally accompany those of inflammation, the patient bears evacuations well, and symptoms of debility and gangrene do not so readily take place as in most other habits. But to this there is an exception. When a membrane has been long inflamed, the irritability of the part and system being at the same time great, with considerable tension, then gangrene will sometimes supervene even in this healthy state of the sanguineous temperament; a state the least disposed of all others to debility. In this case, mortification does not

come on from a viciated habit, but from the violence and length of the preceding inflammation, which of itself, without any the smallest predisposition in the constitution to debility, causes prostration of strength, small frequent pulse, &c. and in fact, these symptoms arise merely from the change which has taken place on the part.

But there is another and very different species of gangrene, too frequently met with in practice, which is really and truly a disease of the habit, proceeding from the abuse of spirituous liquors, and other stimulants, &c. In such a case, gangrene does not arise so much from the local irritation, considered abstractedly (though, no doubt, the greater the irritation on the part, the more will it add to the violence of the other symptoms) as from a certain acquired general indisposition, in which the nervous power seems not only weakened, but altered from its natural state, and incapable of bearing a very slight degree of irritation,

without

without endangering the production of this most alarming consequence.

If I was to enter minutely on an enquiry into the properties of our food, and into the effects which temperate and intemperate living have on most constitutions, I should be carried far beyond the bound allotted to these papers. Let it suffice, therefore, to say, that a knowledge of the very pernicious effects of vinous or spirituous liquors, and high living, may be gained by carefully attending to the alteration produced in the state of that wonderful and subtile power on whose influence every action, both small and great, in the irritable parts of the body, depends; I mean the nervous power. It is this which gives sensation and motion to every, the most minute part, and animation to the whole machine. The modifications it undergoes, in diseases, may be often very readily traced, though it be extremely difficult to determine by what means, or upon what principles,

ciples it acts, so as to cause this or that particular motion. The plain and obvious effect, produced by the causes above assigned, more especially when inactivity is joined to them, is to quicken the circulation universally. The arterial, venous, and lymphatic systems, all feel the power of the stimulants. That the two former are affected, must be sufficiently evident, from the increased quickness and strength of the pulse; and, if the lymphatics are irritable tubes, no doubt the same causes will operate upon them. But these, though important, are but secondary and subordinate agents, in the œconomy of the human frame; for they, themselves, are regulated by an higher power, on which the causes above-mentioned exert all their baneful influence. The nervous system is not only stimulated; but is, if I may be allowed the expression, over heated; and all its motions are performed with an irregularity, and an energy, inconsistent with a natural and healthy state of the body; instead of a cool

cool head, and an equable circulation in every part, the reverse take place. All fermented and spirituous liquors not only stimulate, during the time of their immediate action; but when that action ceases, they leave the system more irritable, and weaker, than it was before. If such are the genuine effects of a single act of inebriety, or intemperance, what shall we say to the life of man; the whole of which consists of a chain, formed by the same kind of link: in whom a greater or less degree of irritation is daily acting upon the constitution; though, perhaps, in no very perceptible, yet in the most effectual manner. Can it be supposed, that that power, whose very important office it is to actuate and controul the movements of the whole, can be thus freely stimulated, without material detriment? Is it not clear, that its natural state must be nearly annihilated, and a new one, in time, generated; in which the irritability of the whole body is very considerably increased, and a latent or
apparent

apparent debility prevails. Besides these pernicious effects on the nervous power, intemperance produces another mischief, no less destructive to the general health: it greatly weakens the tone of the stomach, and does a manifest injury to the other chylopoietic viscera. The natural appetite is considerably diminished; perhaps almost wholly lost; and thus is the body deprived of its most salubrious and necessary means of support. It is robbed of this too, under the most disadvantageous situation; a situation, in which the general system is constantly irritated, and weakened, by very active stimulants. In many instances, these circumstances, which of themselves are sufficiently hurtful to the constitution, are made still more so by inactivity, passions of the mind, study, &c.

External inflammation, in such a habit, is attended with peculiar circumstances. The whole system being preternaturally irritable, a degree of stimulus, which, in a
more

more healthy person, would occasion no kind of ill consequence, will, in one thus predisposed, sometimes bring on very untoward symptoms; so also, a much slighter cause will increase a local inflammation, already subsisting in such, than in a more temperate constitution. The nervous power having acquired a degree of irritability, incompatible with a state of health, a small spark, applied to the inflammable matter, will readily put the whole body into a flame. This kind of irritability is very different from that arising in a healthy constitution. Thus, for instance, in the pure sanguinous temperament, it is accompanied with symptoms of real strength: but here the case is most frequently otherwise; for though an aptitude to inflammation is generated, and though there may be evident marks of inflammatory diathesis, yet, together with them, there is a latent debility. The pulse being usually hard, small, and frequent, seldom hard, full, and strong; or if symptoms of strength appear, and eva-

evacuations are employed, those symptoms of debility, which were before, perhaps, only obscure, will immediately show themselves. It is true, that age, and other circumstances, may cause considerable variation in the symptoms; but the grand and fundamental fact, I must beg leave to insist on, is, that such people do not bear evacuations well. A very small evacuation of blood; nay, even a stool extraordinary, will sometimes so lower the *vis vitæ*, in the most debilitated of these cases, as to sink the pulse irrecoverably; for that principle, which, in a healthy man, gives strength to the whole system, is so weakened, or exhausted, as to be incapable of restoration to its natural state by the united power of tonics and stimulants, though aided by opium, and the best regulated diet.

In a debauched habit, the progress of the local inflammation is generally rapid, the part itself, and the general system, being highly irritable; and if resolution is not
speedily

speedily accomplished, soon terminates in suppuration or gangrene. If the former takes place, it is ill conditioned, and not infrequently of the semigangrenous kind. The part, during the increase of the inflammation, generally retains the impression of the finger; and when it is arrived at its termination, instead of a fair collection of matter, we have often a slough: and as this period draws nigh, so are the symptoms of weakness, as prostration of strength, frequent low pulse, &c. more or less pressing. But when inflammation is about to terminate in gangrene, then the transition from one stage to the other is amazingly quick: the one follows so close upon the other, that they can hardly be distinguished; so that even a state of inflammation may sometimes be said to be a state of incipient gangrene.

From the foregoing description of external inflammation, it will, I believe, clearly appear, that if a slough of a membrane were

really as safe as a common suppuration, I mean in a good habit, yet, in a bad one, it must partake more or less of the nature of a gangrene. The single circumstance, which gives safety to the former, and, too often, fatality to the latter, is the sound or debilitated state of the patient. It is true, we have in these habits all the gradations from the case of a young free liver, in whom symptoms of strength accompany real weakness, and that not apparent till after the use of evacuations, to one more advanced in life, whose system has been debilitated not only by the natural consequences of age but by intemperance. But this latent or apparent debility exists, and is a distinct origin of mischief in them all, and increases as the inflammation advances.

Whoever has seen the progress of inflammation in the last state of the sanguineous temperament above mentioned, will, I hope, allow, that the picture I have attempted to draw is not overcharged, nor

the colouring too much heightened: and, from the whole of what has been said, it may be fairly inferred, that inflammation in such habits is frequently a state of hazard. It is hazardous, sometimes, when seated in the skin or cellular membrane, even when produced by the slightest cause; but it will be much so, when its seat is a very irritable membrane; and such is the *tunica vaginalis*; a membrane of considerable consequence in the system, and which approaches, in the effects resulting from its inflammation, nearly to the nature of an internal one.

I have seen the simple puncture of this tunic, when performed in the most judicious manner by the surgeon, and when no irregularity had been committed on the side of the patient, either immediately before or after the operations followed, twice in the same subject by high inflammatory symptoms. The gentleman, whose history I am about to relate, was between forty

and fifty; one, who, to use the common phrase, had generally lived well, and of a temperament highly sanguinous. He was tapped in the usual manner by a small trocar, and the *tunica vaginalis* was thereby emptied of the contained fluid; the operation was followed by a slight pain, which gradually increased, but without any fresh accumulation of any kind. The inflammatory symptoms continued, and ran sufficiently high, to affect an adhesion between the two coats, and of consequence a radical cure. About two years afterward, the same gentleman perceived a second Hydrocele on the other side. The water was discharged by a puncture, made with a lancet. From this operation, pain, inflammation, and distension of the parts about the testicle followed. The two former having, to all appearance, been removed by antiphlogistics, rest, &c. the distension remained; and the *tunica vaginalis* plainly contained fluid. He was tapped again, and the fluid evacuated was of a dark bloody kind, somewhat like thin chocolate.

chocolate. A more considerable degree of pain and tenderness followed from this, than from the former puncture, though he was kept low, and confined to his bed; and the symptoms, after forty-eight hours, increased with astonishing rapidity, notwithstanding the usual antiphlogistics; and the inflammatory diathesis soon got so high, as to bring on a very violent delirium, which continued two or three days, and then, very fortunately for the patient, terminated by an hæmorrhage from the nose. The danger from inflammation being thus removed by nature, a new one, of a no less alarming kind, soon commenced: the inferior part of the scrotum became discoloured, and the whole of the *tunica vaginalis*, from the feel, appeared to be in a sloughy state. The pulse, at this period, was extremely frequent and low; the depression of strength great, with cold colliquative sweating. By bark, wine, and a well-regulated diet, these symptoms were properly counteracted, the mortified scro-

tum separated, and the whole of the *tunica vaginalis* came away, at different times, in the form of putrid sloughs.

To what can we attribute the rise of inflammatory symptoms, at three distinct periods, in this case, if we are not to place it to a constitution previously disposed to inflammation? The habit certainly gave the predisposition; but having never seen, either before or since, the inflammatory symptoms so high, in any affection of the *tunica vaginalis*, as in this, I suspect, that, at the time the last puncture was made, when the chocolate kind of fluid was let out, neither the system, nor tunic, had perfectly recovered from the inflammation raised by the first operation with a lancet: perhaps the increased irritability of the membrane had never wholly subsided. But, be that as it may, it was evident, that there were two very different sources of danger; one, from general inflammation, which was most alarming, when the membrane was at
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its utmost degree of tension, and verging toward a sloughy state; another, which arose partly from an inherent debility, and partly from the tendency of the *tunica vaginalis*, to gangrene. And, to be candid, I do not think, that either the Seton or Caustic would be safe, in such a habit, without first reducing it to a more secure and temperate state; and it seems to be the kind of case, in which a small Seton would be greatly preferable to a large one. With this alteration in the process, permit me, for a moment, to suppose these two methods applied to two persons in the same circumstances with this gentleman. From the Seton, one would naturally expect high inflammatory symptoms; from the Caustic, the same would more certainly follow. But mere inflammation only, being required by the Seton, and that of the most moderate kind, is it not evident, that by antiphlogistics, &c. we should have a better chance of preventing the termination of the inflammation in mortification, in the Seton, than
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the Caustic? In the one case, a slough should not be produced; in the other, it is indispensibly necessary; no modification, short of that effect, according to the opinion of Mr. Else, being to be depended on, for a radical cure by Caustic. In the above case, the usual means of lowering inflammation, though employed early, produced no apparent alleviation, either of the general or local symptoms. How very unreasonable then would it be to suppose they could be more successful, when applied to the inflammation raised by the Caustic; an inflammation, which must necessarily continue for many days, and at last terminate in a slough. Is not every inflammation more difficult of resolution, and consequently less manageable, in proportion to its date? But granting that the above means could moderate the inflammatory symptoms from the Caustic, would they prevent the gangrene, which would most probably follow, in a constitution thus strongly disposed to it, both by its debility
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and irritability. In a distempered habit, in proportion as inflammation advances in its progress, so is the danger of mortification; the truth of which is sufficiently evident, from the history just given, though the subject was in the prime of life, and, at the time of his illness, but little hurt by intemperance. But the hazard from supervening mortification would have been much greater, if he had been older, and more weakened by this cause, because both the part and system would, in that case, have been more irritable, and less able to bear the effects of inflammation. When the skin and cellular membrane are inflamed, and show early marks of distemperature, if they retain the impression of the fingers, if they have a deep erysipelatous hue, every one sees the imminent danger of gangrene. These alarming appearances sometimes come on from a very slight injury done to the skin only: they frequently, however, go off, by proper treatment, because the irritation is slight, and inflammation of short continuance.

nuance. But let such an inflammation go on, as in the method by Caustic, till the parts slough, and then observe the event. Far be it from me, to make a danger where is none. But I cannot conceive how the small Caustic, with every appliance to boot, and allowing its advocates every advantage from the peculiar method of avoiding the introduction of air into the cavity of *tunica vaginalis*, recommended by Mr. Else, can be applied to a very irritable and debauched habit, without incurring the usual inconveniences of every other long continued inflammation, terminating in a putrid slough; and if a very slight degree of inflammation only is requisite to effect a radical cure by Seton; and the fact, I believe, cannot be controverted; it is no difficult matter for an unprejudiced man to determine which is to be preferred, the Caustic or the Seton.

And this leads me to consider the two methods in a new point of view, as means of curing radically the Hydrocele, when
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some further improvement has been made in the management of the two processes.

If a very slight degree of inflammation will be sufficient for the production of a firm and lasting adhesion, in the method by Seton, perhaps in all those cases in which there is a predisposition to inflammatory diathesis, the end may be fairly attained, by using a Seton smaller than that employed by Mr. Pott. In this method, there is a circumstance requiring very particular attention, and is principally observable when the adhesion takes place late, and in consequence of a previous digestion and state of granulation. Though the water has been fairly evacuated, and the *tunica vaginalis* collapsed, the extent of the future inflammation will bear an exact proportion to the original size of the tumour: the immediate collapse of the membrane, after the evacuation of the water, would incline one to think, that by carefully moderating the symptoms, the inflammatory tumour
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might be prevented from being large, or considerably extended; but I believe, that when the operation is performed on an Hydrocele, containing a large quantity of fluid, that this is by no means the case: it is, therefore, a matter of considerable advantage, to chuse that period of the disease for the operation, in which the *tunica vaginalis* is small in size, and but little distended with fluid. And the same observation is equally applicable to the small Caustic. But if we except this circumstance in favour of the Caustic, and some alteration which may be made in the method of applying it, what further improvement will Mr. Else's method bear? Mr. Else was particularly careful, that his Caustic should be well guarded, after its application by plaister, as it is apt to spread more than is necessary: and the whole, for the greater security, is confined on by a roller passed round the body. How well these precautions may answer the purposes intended, I leave others to determine: but
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I should imagine, that a roller, only moderately tight, upon a distended *tunica vaginalis*, would be, in most cases, inconvenient, and the occasion of considerable pain: the whole of which may be dispensed with, if the Caustic is used in a manner different from that laid down by Mr. Else. The intentions to be fulfilled are two; namely, to make a deep eschar through the integuments and *tunica vaginalis*, and to prevent the Caustic spreading further than the operator chuses: both which may be readily effected by the surgeon grasping the tumour in such a manner as to make the scrotum tense, and then rubbing, whilst the hand is in such situation, the part of the tunic, the most depending and proper, with a piece of good *lapis infernalis*. And I have no doubt, but that a fair eschar may be thus made, through integuments, sac and all, in a few minutes.

Having already fully described the two general ways, in which adhesion takes place,
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in the Seton, I have only to repeat in this place, that in both, the degree of inflammation should be very moderate. I have, for more than ten years back, paid a great deal of attention to this matter, and have constantly observed, that those cures were the most speedy and certain, in which the local and general symptoms were very slight. In many, I could not distinguish, at any time during the progress of the treatment, an increase in the quickness of the pulse of more than four or five strokes in a minute. And I am of opinion, that we seldom or never need fear the want of sufficient inflammation; for even, in the most temperate habits, such is the natural irritability of the membrane, that we shall always have enough, with a full-sized Seton, for the attainment of adhesion, either within the first five or six days, or later, when granulations have arisen on the two surfaces:—that the thing to be principally guarded against, is the suffering it to run too high: an horizontal posture, a suitable regimen,

regimen, both in respect to diet and medicine, and in particular, immediate and perfect suspension of all the parts, should be carefully enjoined: that in more inflammable constitutions, what is defective in the habit, should be, if possible, corrected before the operation, and properly moderated during the treatment; and it will be particularly requisite, to make choice of that period of the disease, in which the *tunica vaginalis* is small in size, and but little distended: and it may be well worth the enquiry, how far a small Seton may, in these habits, be with propriety employed in preference to that in general use. The suspensory should be made of old soft rag, or thin flannel, rather than of new dimity, and should be fastened to the belt, which goes round the body by tapes. In regard to the use of poultices, much has been said on the inconvenience of these kind of topics. When the symptoms are mild, a pledget of any cooling cerate, with a compress or two of soft tow, will answer every purpose. But

when they are not, notwithstanding all that has been said against poultices, they are certainly more easy and comfortable, than any other kind of application, and should, therefore be preferred. It has been a common practice, not to employ them, till some degree of inflammation is actually come on; perhaps not till twenty-four hours, or more, have elapsed from the operation; I suppose, under the false notion, that without such method of proceeding the symptoms may not be sufficient for the purpose of adhesion; but, in most cases, in which they become necessary, I am of opinion, they should be used as soon after the introduction of the Seton as possible.

I have been, for many years, convinced, that the Seton might be so managed as to become itself, the regulator of that inflammation, which it is intended to produce; and that, merely by increasing or diminishing the number of threads, it might be adapted to every possible temperature,

perature, from the most indolent, to the most highly irritable.

All the circumstances under which a considerable diminution may be advisable I am not able to point out, fully. But whenever high inflammation is to be apprehended, perhaps eight or ten threads, or even a less number, may compose a Seton of sufficient thickness, to answer the purpose of a radical cure, and that, even in old, and full sized Hydroceles. The diameter of the conducting canula may be made, for these cases, of the size of a common trocar canula used in the palliative method. When the tunica vaginalis contains but a small Quantity of fluid, more especially if the habit is very irritable, probably a Seton of the smallest size, would be attended with the most favourable consequences.

The usual way of extracting the Seton is by the inferior orifice. But having once obtained a radical cure within a fortnight, when I removed it from the superior, I am

inclined to think the last is the best and most unexceptionable method. The lower orifice generally heals before the upper; and as the latter is not, from its situation, depending, a trifling lodgment of mucus will sometimes keep it open for some days, and unavoidably protract the cure. The alteration proposed, will, I believe, obviate this inconvenience.

The question of superior excellence of this mode, over that by Caustic, may be brought into a small compass, and settled, by observation made on a number of cases, treated by the two methods, under nearly the same circumstances, with respect to habit, age, and state of the Hydroceles. But such observation should be as general as possible; for no fair conclusion can be drawn from a few particular instances of successful, or unsuccessful cases. Constitution, the state of the *tunica vaginalis* and testicle, &c. will cause a variation in the symptoms, and without the utmost care, on the side of the surgeon,

surgeon, pervert his judgment: and the enquiry should, I apprehend, be principally directed to two points—to ascertain whether the usual means, commonly employed for the cure of inflammation, when assisted in the manner above described, can so far act on an habit disposed to be irritated, as to keep the symptoms within proper bounds, And whether there is a greater probability of their having a full effect in an inflammation, which, in order to cure, should never go beyond the first stage, nor be considerable; than in one, in which it must continue much longer, and ultimately end in a slough of a very dense, irritable membrane.

WHEN the foregoing Observations were ready for the press, I had an opportunity of reading Mr. Vaux's Appendix, affixed to his edition of Mr. Else's works. Justice to the gentleman, to whom the world is indebted for the method of curing the Hydrocele by means of Seton, obliges me to say, that during the many years I had the advantage of being assistant to him, I remember but one instance, among the great number cured, in which it was necessary to bleed. Of so little consequence were the inflammatory symptoms, in almost all the persons treated! And in this instance the necessity of doing it arose, not so much from the operation, as from the great inflammability of the patient's habit, which was irritated much more by drinking, than by the Seton.

Mr. Pott's general method of treatment was to direct a purge the day before the operation; to give an opiate immediately after the introduction of the Seton; to poul-

tice sometimes on the second, frequently not till the third day; to enjoin rest and an horizontal posture with a thin diet; and the occasional use of an opening medicine, and an opiate. If, under this kind of treatment, the symptoms were never but in one instance so high, as to require bleeding; nor so considerable as to be in the least alarming,—what may we not expect from a management more strictly conformable to an antiphlogistic plan?

A pulse more quick than natural, a white tongue, some degree of thirst, restlessness, some slight degree of pain in the part, and sometimes in the loins, for a very short time after the operation, were most frequently the general symptoms. These cannot be called dangerous; but yet they are sufficient to call forth attention on the side of the surgeon: to suppose them uniformly the same in every case would be absurd; a variety of circumstances will for ever make them more considerable in one person than
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in another. They were, however, frequently very mild, without any uneasiness in the loins, the pulse being scarcely quickened at all, and that, only for a few hours; and these slight as they are, I am convinced, are fully sufficient for the most perfect adhesion, and should be considered as the standard, to which we should endeavour to bring the symptoms, in every case. How far we are enabled to do this, in every kind of habit, must be left to the observation of others, and is not for me to determine. But if I may be allowed to hazard an opinion, I would say, that the present very improved state of physic inclines me to believe, that the thing is not only possible, but highly probable.

F I N I S.