Gulstonian Lectures

ON

THE USES OF BLOOD-LETTING IN DISEASE.

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BY

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I HAVE lingered long on this theory of a change of type in diseases, and have been led on to discuss it freely, not only because I believe it to be an incorrect theory, but chiefly because it is certain that its rejection would remove the greatest obstacle which now interferes with our taking a fair measure of the value of blood-letting at the present time. If it could be satisfactorily shown that the theory was erroneous, then the profession would be bound to reconsider the whole matter, and would, I am satisfied, once again take the lancet in hand and bleed their patients, not certainly as our forefathers did, without rhyme or reason, and under the blinding influence of false theories, but rationally—to the benefit of the sick, and in accordance with the teachings of modern medical knowledge.

I will now, sir, turn to the second part of my thesis, and endeavour to show that another obstacle to our employment of venesection in diseases is to be ascribed to the fact that we have, generally speaking, adopted erroneous notions concerning the uses and actions of the remedy; that we have ascribed to it virtues which it does not possess; and have, in consequence of this untrue estimate of it, and of its failing to effect what our false expectations had awaited from its use, allowed it to lapse into neglect.

I have, therefore, now to ask you to consider with me whether we may not arrive at a truer estimate of the uses and value of bleeding from a basis of considerations other than those which have hitherto been taken into account, and are founded on the unstable bases of uncontrolled personal experience and of medical statistics. It seems to me that there is a safe and firm ground, whereon we all stand much together in agreement, and from which the matter may be usefully discussed; that there are, in truth, a series of facts fitted to serve our purpose in explaining the uses of venesection in disease, so clear and simple and positive as, when clearly expressed, to press themselves home upon the conviction of all of us. It is from the consideration of plain-speaking facts of this kind that the conclusions here suggested, concerning the influence exercised by venesection over diseases, are derived.

In considering the effects of blood-letting in diseases, it is necessary to bear in mind that a marked line of distinction is to be drawn between the effects produced by the local—*i. e.*, the direct—abstraction of blood from an inflamed part, and the effects produced over such inflamed part by venesection. Systematic writers, as a rule, pay little attention to this

very important fact—the mode of abstraction of blood, in respect of its influence over the inflammation, being usually regarded as much a matter of indifference; the main item of consideration with authors being the quantity of blood extracted. Thus, for example, we are told, in pneumonia, that the condition of the patient must decide us as to how the blood should be removed; if the patient be feeble, let the blood be taken by leeches or cupping from the skin in the neighbourhood of the inflamed lung; but if the patient be strong and vigorous, then let the blood be taken from the arm; it being assumed that the effects produced here by the abstraction of blood are alike in both cases, and in both cases have a similar control over the inflammatory process.

But a nearer consideration of the subject infallibly shows us that there is a marked distinction to be drawn between the effects of the direct abstraction of blood from an inflamed part, and the effects exercised over that part by venesection—*i. e.*, by the indirect abstraction of blood. *A priori* reasoning suggests that such should be the case, and experience proves that it is so.

In the one case—the direct abstraction of blood—the blood is drawn directly from the inflamed part, from blood-vessels which are directly in communication with the inflamed part. The abstraction of blood has consequently a direct and immediate influence over the seat of inflammation. It not only draws blood, but it draws inflamed blood—*i. e.*, blood deteriorated under the action of the inflammatory process, altered in quantity and altered in quality, and therefore no longer duly fitted for its purposes—from the part affected. It may, indeed, abstract blood which, in its altered state, acts poisonously, both locally on the inflamed tissues, and generally on the system at large, as it passes into the circulation. The local action of the leeches or the cupping, moreover, may have, and I believe actually exerts by irritation, an influence over the vaso-motor nerves which are distributed to the vessels of the inflamed part. But venesection manifestly exercises no such influence over the inflamed part.

Moreover, the distinction here maintained is confirmed in the most marked manner by the teaching of experience. Experience demonstrates to us, in the case of external, visible inflammations, that the direct abstraction of blood from an inflamed part, during at least the congestive period of the inflammatory process, exercises a benign influence over the progress of the inflammation. Thus, for example, the application of a few leeches around an inflamed ankle-joint or an inflamed conjunctiva almost infallibly reduces the main characteristics of the inflammation—the pain, the heat, the redness, and the swelling; and it does this more effectually and certainly than the abstraction of a pint of blood from the arm would do.

Venesection, on the other hand, exercises no direct and immediate influence over the local inflammatory process. It removes no inflamed or locally altered blood from the body. It can have no direct derivative action; it can exert no nervous influence of that kind referred to by Hunter under the term of contiguous or continuous sympathy, such as may be effected by the local taking of blood. Its influence is transmitted indirectly through the general circulation, and therefore it operates only in a secondary way. Venesection affects the local inflammation just as it affects all other parts of the body, and only as

—i. e., not more powerfully or otherwise than—it affects them; the main influence being the reduced action of the heart's force. The influence resulting from the altered action of the heart, however, is only a part of that same general influence which, through the loss of blood, has been divided and distributed over the whole of the body. By the venesection, the heart's power is diminished; diminished, therefore, is the stream of blood which is forced through all the channels of the circulation into every part of the body. The amount of blood abstracted by venesection is deducted equally from all parts of the body—not more, surely, from the inflamed than from every other part; so that, even when the venesection is very large, the amount of blood withdrawn from the seat of inflammation must be small, not nearly so much as would be drawn by a single leech directly applied to it.

Direct abstraction of blood acts immediately upon the seat of inflammation; its benefits are sure and immediate also; and, as usually practised, its influence over the system generally is scarcely perceptible. Venesection, on the other hand, has no such influence over the local inflammation; but a very powerful influence over the system at large. It acts only through the influence which it exercises indirectly over the inflammation. The good effects of direct abstraction of blood are positive and manifest, and admitted by all; and they are obtained at a small cost to the system at large. The good effects of venesection over the inflamed part are not easily demonstrated; they are disputed, and are more or less costly.

I have insisted on this distinction between the effects of direct abstraction of blood and of venesection, because it is for the most part overlooked in practice, and because it seems to me to afford a clue to an explanation of the good effects actually produced by venesection in inflammations; and I have also attempted to remove the idea, so generally entertained, that venesection is felt and resented in some especial manner by the part inflamed; that it affects that part differently from what it does the other parts of the body. And the conclusions at which I have here arrived are, I believe, the plain every-day lessons demonstrated to us by direct observation—I mean, from what has been observed of the effects of venesection, and of the direct abstraction of blood, in the case of *external* inflammations. It is a fact well worthy of note here, that venesection has long since been, both by physicians and surgeons, completely discarded, not only practically, but theoretically, in the treatment of all external inflammations—i. e., in all those inflammations of whose course and progress the eye can take cognisance. And equally is it a fact that we have never either abandoned in practice or denounced in theory the direct abstraction of blood from external inflammations. I think we may accept it as certain, that surgeons abandoned venesection in external inflammations because, under the enlightenment of modern medicine, they failed to see its utility. I am not aware that any surgical authority—and I need not say that surgeons were once as free bleeders as physicians—has ever called in the change-of-type theory to account for his change of practice in the matter of external inflammations. Physicians also have renounced all pretension to venesection in a cure of *external* inflammations; and I do not recollect that any physician has put on record that he abandoned the practice because he found his patients

would not bear the loss of blood as they once did, or were said to have done. I think you will rather admit that, under the lessons of modern pathology, we have learnt that venesection never could have been a proper remedy for the inflammations which we meet with on the surface of the body; and that we, therefore, abandoned the practice, and because, so instructed, we were no longer able to note the utility of the practice. Venesection in external inflammations, be it noted, was given up before bleeding in internal inflammations. And is it not obvious that we could far better note the results of the operation in the one case than in the other? The change-of-type theory of disease has only been called in by physicians, and by them only, as explanatory of the abandonment of bleeding in internal inflammations.

From a consideration of the foregoing particulars, I am led to inquire, What, then, are the real uses of venesection in diseases? What good ends does it effect? And surely a remedy which, through evil report and through good report, has steadily held its own in the catalogue of curative agencies from the days of Hippocrates to our own, can hardly all at once have ceased to be of service to humanity. Is it possible for us to believe that all the great minds who, through the long ages of past medicine, have resorted to this remedy, have been using it under a complete delusion? The very fact of the antiquity of the remedy, of its universality, and of its persistence during all times as a cure, is strong *à priori* evidence of its possessing some value and excellence as such.

But, in truth, no living physician, I believe, denies its value as a remedy. Leading physicians of the highest authority amongst us in modern days have said of it, “that of all remedies in acute inflammation, the only one on which absolute reliance can be placed is blood-letting;” and again: “The great remedy in acute and dangerous inflammation is blood-letting.” This, then, admittedly most excellent of remedies, if rejected, is rejected not through any recently discovered fault in the remedy itself, but on other grounds. It is an excellent remedy, says one party; but you cannot now make use of it, because the human constitution is at the moment in one of its periodical phases of asthenia. Wait a little till the sthenic tide again rolls in, and then your remedy will once more do great service in the cure of diseases. Others say venesection is an excellent remedy, *hic et ubique*, at this moment; that it ever has been and ever will be an excellent remedy, only men have abused instead of using it, and therefore has it fallen into so great discredit. Define its true uses, and indicate the limits of its right application, and then again will venesection find its position, and this time its rightful position, in therapeutics. Such is my own view; and the attempt I am now making is to point out, as I conceive, the way by which we may attain to a distinct or better understanding of its real use and of its right application.

Let me, therefore, with this intention, ask you now to apply the remarks which I made concerning the effects of venesection, and of the direct abstraction of blood, over external inflammations, to the case of internal inflammations; and then to consider the conclusions which result from such comparison.

You must, I think, admit that whatever be true of the effects of venesection, and of the direct abstraction of blood, upon an external inflamed part, must be

equally true of its effects over internal inflammations; and for the reason, that the essential characteristics of inflammation are everywhere alike in all parts of the body. If, for example, venesection have no directly beneficial influence in the cure of an inflamed ankle-joint, neither, we may fairly argue, can it have any directly beneficial influence over an inflamed lung. And so, again, if the *direct* abstraction of blood is beneficial in the case of external inflammations, equally beneficial should it be in the case of internal inflammations—that is, whenever it can be practised.

Now, this *à priori* reasoning of what should happen in the case of internal inflammations is, I believe, thoroughly corroborated by what we learn as the results of our practical experience in the matter. This I will now endeavour to show you. And, perhaps, I may make the matter clearer if I at once state the conclusion to which, as I see the thing, both reason and practical experience inevitably lead us. It is this: that venesection has no directly beneficial influence over inflammations, either external or internal; that venesection is useless in the cure of all external inflammations; and that its beneficial effects are distinctly marked in those cases of internal inflammation only in which the play of the organs of respiration or circulation is seriously impeded; and that, in such cases, its beneficial effects are not to be ascribed to any direct influence exercised by it over the local inflammatory process, but to its power in relieving obstructions to the play of the respiratory and circulatory organs. In other words, the bleeding operates, not primarily and directly on the inflammation, but secondarily—*i. e.*, upon the consequences which arise out of, are incidental to, and, in fact, the results of, the inflammation.

I arrive at this conclusion for the following reasons. In the first place, we *see* that venesection has no marked beneficial effect over external inflammations; and we know also that venesection can neither remove the cause of a local inflammation, nor remove any of the products of the inflammation. And it is a significant fact, that to this day no one has ever been able to tell us in clear and satisfactory language what that local beneficial effect is which is said to be produced by the bleeding, or in what way the hypothetical good is effected by the bleeding.

Moreover, it has ever been admitted that the beneficial effects predicated of bleeding are most marked in those diseases in which there is obstruction to the free play of the heart or lungs, and in proportion to the degree of the obstruction; and it is a fact that, at the present day, bleeding is never resorted to, except in those cases in which such obstructions exist. Bleeding also has ever been most highly lauded in that inflammation—*viz.*, pneumonia—in which the obstruction and its consequences come on most rapidly and are most marked. And, again, when bleeding gives relief, the relief is immediate, comes while the blood is still flowing, and is just of that character which results from removal of obstruction to the pulmonary or cardiac functions. The relief is just that which is given by bleeding in cases of chronic valvular disease of the heart, or in local injuries of the chest, where no inflammation is present. And the relief is given in pneumonia, even though the state of the inflamed portion of the lung remain absolutely unchanged; as, for instance, when it may be in a state of consolidation. And it may be added, that no one has ever

proposed to resort to bleeding in pneumonia in cases where the respiration and circulation are not obstructed. Such cases, it is said, do not require bleeding; though it is hard to understand why they do not, if the hypothesis, that bleeding has a direct influence over the progress of the inflammatory process, be true; for the destruction of a small portion of a lung may be as fatal as the destruction of a whole lung. And it may, I think, be very fairly suggested, that the relief given is just the very same as probably would be given by bleeding in that state which is apt to come on in some persons after violent running, and from which probably all of us have one day or other suffered acutely; I mean what is called “stitch in the side”. I think it is more than probable that the pain we often ascribe to pleuritic inflammation in cases of pneumonia is rather the local nervous expression of the obstructed play of heart and lungs, of the character of the stitch alluded to, of the pain of angina; for it is a fact, that wherever be situated or discovered the signs of the pleurisy, the pain referred to is almost invariably localised at the lower part of the side of the chest.

These are the reasons which force us, I think, to the conclusion that, in those cases of pneumonia in which bleeding is found of so much service, the good results mainly from the freedom thereby given to the play of the obstructed thoracic organs. There is no single argument, of a clear and satisfactory kind, which can be adduced in favour of the idea that the relief has come from any directly beneficial influence exerted over the inflammatory process.

And it is, I think, a very suggestive fact, that at this time of day, at all events, in this age of scientific medicine, there is neither thought nor question of bleeding, except in those cases in which the play of the lungs or the heart is impeded. Thus, for example, we are recommended to bleed in pneumonia—supposing, of course, that the phase of disease is favourable and sthenic; and in heart-affections, and peritonitis, and certain head-affections; and here, I think, ends the catalogue of disorders in which we are advised that bleeding may be practised. But, in all these affections, the respiratory and cardiac functions are more or less hindered; and it is just in proportion to the degree of their hindrance that we measure the need of, and mark the benefits derived from, the bleeding. And it is in pneumonia, above all other diseases, in which the benefits of bleeding have been preeminently noted; and it is in this inflammation, in a preeminent manner, that we find the play of the cardiac and respiratory organs impeded.

Let me not be misunderstood, however. I am not affirming that bleeding is of no service except in the class of cases referred to. You will remember that I am here engaged with the consideration of the effects of bleeding over inflammations, and am showing that it is only of service in those inflammations in which the action of the heart or the lungs is compromised. I am not denying that bleeding may, in some exceeding rare cases, be of service under other conditions.

[To be continued.]

SOLAR RADIATION. Father A. Secchi has made a series of experiments on the intensity of the solar radiation in different seasons. They fully bear out the observations of Professor Tyndall as to the power of the vapour of water to intercept the sun's rays.