is admitted—1st, *ptosis can appear from disease in almost any part of the brain, including even the cerebellum and the pons Varolii*; 2nd, *ptosis can occur in the eye on the side of the lesion, or on the opposite side, in cases of disease sparing the nucleus, trunk, or branches of the third pair of nerves.*

Clinical Lecture

ON

BLOODLETTING.

Delivered at University College Hospital on Oct. 3rd, 1878,

BY PROFESSOR T. WHARTON JONES.

GENTLEMEN,—We have lately had under treatment cases of iritis and catarrho-rheumatic ophthalmia in which venesection was prescribed with great advantage; and, besides these, numerous other inflammations of the eye in which blood was taken by leeches and by scarification of the palpebral conjunctiva. I, therefore, think that I may on this occasion advantageously occupy your attention with a few remarks on bloodletting.

At the present day medical practitioners seldom order abstraction of blood by venesection in cases of inflammation, and have even misgivings as to the propriety of applying leeches, the current doctrine being that it is not necessary for the cure, and that it involves a risk of impairing the strength needed to bear up against the disease. Formerly quite the contrary opinion prevailed, so that it would have been considered bad practice to abstain from the use of the lancet in any inflammatory complaint whatever. Bloodletting was, therefore, very commonly prescribed, but the extent to which it was sometimes pushed, especially by repetitions of the venesection, it must be admitted, was anything but reasonable, and, no doubt, reform was imperatively called for. Instead of simple reform of indiscriminate practice, however, complete reaction in the opposite direction has taken place, as is so common when extreme views on any subject come to be called in question. And now, as I before observed, doctors abstain from venesection, or even leeching, and that to the most moderate amount, in almost any case of inflammation, however severe.

Under these circumstances, in face of such a difference between past and present opinion, it may fairly be asked—and the question I consider one to which it is of the highest importance to obtain an answer, founded on the dictates of science and experience,—under these circumstances, I say, it may fairly be asked whether by abstinence from bloodletting altogether, as is the present fashion, inflammations of important organs are not often allowed to run a prolonged and disastrous course, which might be prevented by a timely abstraction of blood in such quantity that the loss of it could be in no wise injurious to the patient?

This question I will venture to answer as regards an important inflammation of the eye—namely, iritis. And first, I would observe that, in my experience, blood may be safely drawn, in any case in which we would think of letting blood at all, to the amount of ten to twenty ounces, while in many cases a repetition of the venesection to the same quantity need not be feared. You will have opportunities of observing in cases of iritis under my treatment here, that when bleeding has been had recourse to at the early stage of the disease, the pain around or over the orbit, or in the temple, ceases, or is soon greatly mitigated, the feeling of depression of the strength—for it is only a feeling, not real weakness—is relieved, the vascular congestion of the eye subsides, the pupil yields more completely to atropia, while mercury operating with more effect, less of it requires to be given. Convalescence is thus established within two or three weeks, sometimes even one week, with strength not only unimpaired but actually improved. *Apròpos* of this, let me relate a case. My friend the late Mr. Graham, formerly Professor of Chemistry in this College, and latterly Master of the Mint, was seized

with rheumatic iritis, for which I attended him in conjunction with the late Sir Robert Carswell, then also a professor in this College. Though Mr. Graham was not a strong man, I bled him, and, with the concurrence of Sir Robt. Carswell, repeated the venesection two or three days after; calomel with opium internally, and a belladonna application externally, were at the same time prescribed. Within a fortnight our patient was convalescent and back again to his lectures at the College, with strength not only unimpaired but actually improved. Though once before this he suffered from an iritis, for which he was successfully treated by the late Dr. Mackenzie, of Glasgow, he never had another attack. But mark you this to show how much Mr. Graham appreciated the benefit he had derived from the bloodletting: some years afterwards, finding himself rather out of health generally, he called on me one day and asked my opinion as to whether a bloodletting on this occasion was as likely to do him as much good as before. I was happy, however, to assure him that there was not now any necessity for the abstraction of blood; and to set his mind completely at rest I took him to the late Sir James Clark, who concurred in my opinion.

Without bloodletting, convalescence will not, in similar cases, take place in double the time, or even longer, and that only imperfectly; for, as a result of such a prolongation of the inflammatory action, serious organic damage of the eye is liable to accrue in the shape of synechia posterior, and implication perhaps of the ciliary body, choroid, and retina; whilst by the prolonged treatment the strength of the patient is pulled down, and a great tendency to relapse from slight causes remains.

In such a damaged condition of the eye, iridectomy often does good as a “no better do,” but odd it is that the surgeon who would not hesitate to put the patient under the influence of chloroform or ether, and forthwith perform this operation, would, perhaps, shrink from ordering the more simple one of venesection—nay, even from the application of a few leeches—at the beginning of the iritis, by the beneficial operation of which the damaged state of the eye, requiring iridectomy, might have been prevented.

I have thus instanced the advantage of bloodletting in iritis, because we can so well observe its effects from day to day, and because I can speak from experience on the subject, elucidated by scientific observation as to the pathology of the inflammatory process generally. The *process*, mark me; for the state you have to contend with at the beginning of a pure, uncomplicated, acute inflammation, is very different from that which has supervened in the order of things at a later stage. First in the series of changes which take place in the inflammatory process, of which a part of the body accessible to observation is the seat, there is the visible rubor or redness, and the invisible nervous and muscular action which led to the vascular congestion on which the redness depends; while in the later stages there are the visible manifestations of the exudation of lymph, the tumor or swelling, &c., which have supervened on the congestion by the invisible work of liquid diffusion and cell-multiplication. Abstraction of blood in the beginning of an inflammation relieves the congestion, and thereby prevents or limits exudation. By abstraction of blood in the later stage, after exudation has taken place, congestion will even then be relieved, though less quickly, and in proportion as re-establishment of the circulation in the inflamed part takes place, the exuded matters tend to be absorbed, and so the inflammatory process slowly comes to an end.

The doctrine that the inflammatory process consists merely in “proliferation” virtually ignores the vascular congestion and the symptoms depending on it, such as *rubor cum calore et dolore*. The doctrine thus refutes itself, by omitting cognisance of the condition on which depends the supply of material from the blood for the maintenance of the increased activity of cell-multiplication constituting “proliferation.” By disallowing vascular congestion as an all-important stage in the inflammatory process, the doctrine of proliferation supplies a plausible argument against the necessity of bloodletting, easily admitting, however, of being disproved by clinical observation and experience.

A peculiar incompressibility of the artery in feeling the pulse, hot skin, and white tongue are indications of the propriety of bleeding in general. They are so in iritis, in particular, and, I may add, catarrho-rheumatic ophthalmia also, in which the orbital or temporal pain and apparent depression of the strength are often much greater than in

iritis, whilst danger to the integrity of the eye is as great, though in a different way—viz., by rapid ulceration to penetration of the cornea with all its disastrous consequences, such as prolapsus iridis, &c.

Irrespective of the general indications I have mentioned, the local subjective and objective symptoms in each case of iritis or catarrho-rheumatic ophthalmia will, often of themselves, furnish sufficient indications for the abstraction of blood. Circumorbital or temporal pain, for example, is a good indication, for when an acute ophthalmia in an ordinarily strong person is attended by that subjective symptom, venesection, followed by calomel and opium, quickly gives relief. And the same may be said of the ear-ache in acute inflammation of the membrana tympani. The absence of such pain, however, would be no counter-indication in the face of well-marked objective symptoms.

In severe inflammations of important organs the system tolerates the loss of blood in greater quantity than when there is no inflammation present, or when the organ inflamed is of less vital importance in the economy. In illustration of this fact the late Dr. Marshall Hall, in his work "On the Morbid and Curative Effects of Loss of Blood," pointed out from his experience that if several patients affected with dissimilar complaints be bled, while sitting in the erect posture, it is found that one patient, perhaps, will faint on losing only a few ounces of blood, while another will stand the loss of ten times the quantity before syncope takes place.

The complaints in which the greatest quantity of blood may thus be drawn without the speedy induction of syncope are: inflammatory congestion of the brain, inflammation of serous membranes, such as pleuritis or peritonitis, and inflammation of the parenchymatous substance of organs, such as pneumonia, to which may be added, as before mentioned, iritis and catarrho-rheumatic ophthalmia. Now take notice that these are the very complaints in which abstraction of blood is of most benefit, and, therefore, most called for. Dr. Marshall Hall accordingly laid it down as an axiom that in the operation of venesection the quantity of blood lost before fainting comes on, whilst the patient is in the erect posture, is *never more than is requisite for the cure of the inflammation, and never so great as to prove hurtful to the patient.*

In regard to the propriety of repeating venesection, the late Mr. Wardrop remarked that of a number of persons bled for inflammatory diseases, those who have lost the *largest quantities of blood by the fewest repetitions* of the operation have made the most rapid recoveries.

One moderate bleeding at first—say, to sixteen ounces—is usually sufficient for the speedy cure of an iritis or catarrho-rheumatic ophthalmia; but in some cases it may be necessary to repeat the venesection. The continuance of great pain in and around the eye, much vascular congestion, and the formation of a buffy coat on the blood previously let, will generally, taken in conjunction with other circumstances, indicate the propriety of a repetition of the venesection. If the first bleeding was well borne, a second may safely enough be had recourse to; but it is to be remembered that fainting comes on from the loss of smaller and smaller quantities of blood in the subsequent operations; showing that repetitions of the venesection are less and less necessary.

When it is not considered proper to repeat venesection, the application of leeches to the affected organ may still be necessary and prove advantageous. Leeches alone, applied near the corners of the eye, without any preceding venesection, you will often find sufficient for the speedy cure of moderate degrees of iritis and catarrho-rheumatic ophthalmia. It being always, of course, understood that the appropriate medicinal treatment is employed.

In acute inflammation of the membrana tympani attended by ear-ache in children, a leech or two behind the ear and a few doses of gray powder give speedy relief, and, by arresting the inflammation, prevent damage to the structure and function of the ear. In grown-up persons, if the pain in the ear be very great, venesection may be required, followed up with blue-pill or calomel, colchicum, and Dover's powder.

The inflammatory complaints not admitting of substantial benefit from the abstraction of blood, or in which abstraction of blood is not called for, such as bronchitis, conjunctivitis, and other inflammations of mucous membranes, are those in which, if venesection be performed, the patient is liable to faint before much blood has flowed, it being understood that the patient was sitting in the erect posture during the

operation. A patient, it is to be particularly remembered, ought never to be let blood while in the recumbent position, as syncope less readily takes place, so that more blood might be drawn than is required or safe. Of course, if any tendency to syncope manifests itself when the patient sits up, that alone would be a counter-indication to the abstraction of any blood at all. When syncope does occur while the patient is sitting erect, he should be placed in the horizontal position, with his head low, and his feet raised, in order to favour the gravitation of blood to the brain.

Syncope, I may observe, is owing to diminished access of arterial blood to the brain, in consequence of the sudden constriction of the small arteries which takes place. The paleness and coldness of the surface of the body, and collapse of the face, indicate a similar impediment to the circulation in the skin. Relaxation of the muscular walls of the arteries, and dilatation of their calibre (which soon succeed to the contracted and constricted state of those vessels), taking place, free access of blood to the brain and surface of the body is restored, with corresponding relief of the depression of the vital powers, which had been occasioned by the impeded circulation in the extreme vessels on the one hand, and the overloading of the heart and lungs by the consequent reflux of blood to those organs on the other.

Bloodletting by arteriotomy, or puncture of an artery, has been practised, but it often happens that the requisite quantity of blood cannot be drawn. The artery being opened with the lancet, contraction of its muscular walls is excited by the irritation of the incision, so that the calibre of the vessel becomes constricted, and the blood at first merely trickles out, instead of issuing in a stream or jet. After a time, however, the walls of the artery relax, and its calibre then becoming dilated, the blood jerks out. Suppose a sufficient quantity of blood has been obtained, now comes the difficulty and trouble—namely, the arrestment of the bleeding. To effect this, it is necessary to apply pressure over the vessel on either side of the puncture, by means of graduated compresses and a tight bandage, so as to intercept the stream of blood in it, whether direct or retrograde. The artery which admits best of this pressure is the temporal artery, the subjacent bone offering the means of counter resistance. Notwithstanding the pressure which may thus be advantageously applied, however, hæmorrhage sometimes bursts out from the punctured artery owing to the now relaxed state of its walls permitting, to the fullest extent, the impulse of the heart's action on the stream of blood. Under such circumstances, the practice is to divide the artery completely across, in order that the ends may retract within the sheath, and become closed, first by an external clot, to be followed by the formation of an internal clot, and the eventual obliteration of the artery at the place. Neglect of this precaution has sometimes permitted the formation of an aneurism.

Besides the disadvantages of arteriotomy which I have pointed out, opening an artery is not so simple an operation as venesection. To get at the temporal artery in order to puncture it conveniently, it is necessary first to cut through not only the skin and subjacent cellular tissue, but also a thin fascia over the vessel. We thus see that *arteriotomy*, even if it had any advantage over *phlebotomy*, which it has not, is too troublesome an operation to merit being much recommended for the abstraction of blood. What led to the employment of arteriotomy in preference to phlebotomy appears to have been the loose unmeaning hypothesis that inflammation is owing to an "increased action of the heart and arteries," and that, therefore, abstraction of blood from an artery would be going more directly to the root of the disease than abstraction of blood from a vein.

The excessive bleedings formerly in vogue appear to have been prescribed under the erroneous idea that it was by the mere diminution of the quantity of blood in the body that the cure of an inflammation was to be effected; and that, therefore, if the inflammation did not yield to one venesection, it ought to yield to a second, a third, or even a fourth—a "Sangrado" practice by which the patient was actually drained of his life's blood, instead of being cured of his inflammatory attack. But that this idea was not well-founded is shown by the fact that it is not in the full-blooded that the severest inflammations always occur. The truth is that the mode in which the abstraction of blood operates beneficially in subduing inflammation consists, when practised in the early stage of the attack, as I before hinted, in the impression

made on the vaso-motor system of nerves and in the changes produced in the composition of the blood whereby re-establishment of the activity of the circulation in the congested part is promoted. The arteries, from being at first constricted, become dilated, and the blood is rendered thinner by the increased absorption into it of serous fluid from the interstices of the tissues which, in the dilated condition of the arteries, more freely takes place.

In many low states of the system very stubborn inflammations occur, and though, in most such cases, it would be improper to take away blood by venesection, leeches are, nevertheless, often of the greatest service. Though it is evident also that the powers of the system require to be raised by nutritious diet and strengthening medicines, it is bad practice to have recourse at once to the indiscriminate and premature employment of this treatment. The nutritious diet, even if swallowed, fails to nourish, and the tonic medicines make matters worse. In a case of scrofulous ophthalmia, for example, it is a common thing to see port wine, quinine and iron, and the like forthwith prescribed, instead of first trying to check the inflammation in the only way in which that can be most easily and safely done—viz., by the application of a leech or two to relieve the congested vessels, and the exhibition of a few doses of grey powder to correct the morbid state of liver and stomach. When by such medication the inflammation with the intolerance of light is abating, then, but not sooner, tonics may be advantageously given, with liberty to the patient to eat as much as he has appetite for. Counter-irritation, if had recourse to at all, ought never to be ordered until this convalescent stage of the disease has set in. Blistering at first only tortures the patient, and does no good, if it does not aggravate the inflammatory symptoms.

Scarification of the palpebral conjunctiva we frequently practise in cases of purulent ophthalmia and chronic conjunctivitis. The vessels of the part being in such cases much engorged, a few superficial scratches with the lancet are sufficient to give issue to a very considerable quantity of blood, and the propriety of the operation may be estimated by the freedom with which the blood is evacuated. After the bleeding has ceased we apply to the scarified surface the nitrate of silver in substance or solution, the red precipitate ointment or the like according to circumstances. It is, however, to be remembered that it is not the mere quantity of blood abstracted by scarification that does good. By first emptying the engorged bloodvessels, the subsidence of the inflammatory congestion admits of being more effectually promoted by the action of the irritating applications which I have said we make to the conjunctiva for that purpose immediately after the scarification. Without previous scarification the irritating applications make little beneficial impression. Often they do ill. As to the *modus operandi* of irritating applications in curing conjunctivitis, you will find it explained in my *Ophthalmic Medicine and Surgery*.

LITHOLAPAXY.

By HENRY J. BIGELOW,

PROFESSOR OF SURGERY IN HARVARD UNIVERSITY, SURGEON OF THE MASSACHUSETTS GENERAL HOSPITAL.

THE object of this operation is to remove at once, by the urethra, the débris created by the lithotrite. It is based on the belief of a tolerance by the bladder of protracted manipulation, which has not been hitherto recognised. It is also based on a theory that a brief manipulation, in the bladder, of polished and blunted instruments is less irritating to that organ than is the protracted presence of fragments, especially in view of the fact that the bladder hugs the latter more or less sharply at each micturition. When lithotripsy is properly done, the process of crushing is easy and safe. The real question relates to the subsequent disposal of the fragments. If the purpose of the surgeon is to get rid of them, and if their evacuation has hitherto been, for the want of instruments, slow and injurious to the bladder, it is fair to consider whether this object cannot be better attained with the aid of an instrument devised to evacuate the bladder more quickly, through the urethra,

while its walls are held apart at their full normal dimensions, such, for example, as this canal attains when the meatus is compressed during the passage of urine.

It is quite safe to leave this question to be settled by such further experiments as shall be deemed wholly satisfactory. In the meantime, in order that the operation of evacuation may be accomplished in the readiest and safest way, it may be well to offer a few explanatory suggestions in respect to it.

One difficulty at the outset may be illustrated by a simple experiment. If a small catheter, surmounted by a funnel, be tied in an ox's bladder and held vertically, water introduced by the funnel will distend the bladder very forcibly. Similarly, the hydrostatic pressure of a column of water but a few inches higher than the pubes will distend the human bladder beyond its safe capacity. So that it may be assumed that any catheter surmounted by a bulb is more liable to injure the bladder by over-distending it than when the bulb is lowered to the level of the bladder or below it. The weight of a full bulb in the former position also prevents accurate manipulation of the catheter. It is more easily handled in a stand.

The instrument now employed is a syphon, at one of whose extremities is a large metal tube that takes advantage of the full normal capacity of the urethra, while the other terminates in an elastic bulb and glass receptacle. The tube extremity is shaped to facilitate its introduction, and also so that its orifice may be placed, if necessary, at the lowest point in the bladder, at the apex of an inverted funnel, among the fragments, without being occluded by the usual valve-like action of the bladder-wall. A straight tube has advantages over a curved one; the surgeon can more readily direct it and regulate its pressure; it is less liable to obstruction, and better cleared by a rod. Again, a straight instrument, when of the size 29, 30, or 31 of Charrière, is more easy to introduce than a curved one. In order to carry it into the bladder with least resistance, it should be passed as far as possible in a nearly vertical direction towards the anus, before the handle is depressed; its extremity then lies not only in front of the aperture in the triangular ligament, but, what is of more importance, below it; and is afterwards tilted up to this orifice by depressing the handle of the instrument to the axis of the body. The tube should be next rotated through this aperture like a corkscrew; and during this process, its point, which is made a little excentric for this purpose, revolves in a small circle until it discovers the orifice. A common difficulty in introducing a catheter or lithotrite results from depressing the handle prematurely, by which the beak is arrested above the aperture in the ligament, instead of below it. This error should be carefully avoided in introducing the large straight tube, and which so fills the urethra that it needs every advantage in traversing its less yielding parts. Indeed it is not superfluous to say that even a free use of oil injected with a syringe both into the urethra and into the tube may sometimes determine the question of the passage of the larger sizes. And yet, with these precautions, the whole manœuvre is a very easy one. Before introducing the tube the calibre of the urethra is ascertained by a common olive-pointed elastic bougie, or a sound. I have not found much advantage in trying to dilate it, unless at the moment of the operation, by incising the meatus, which is the narrowest part, or "divulsing" a stricture when it exists. Such preliminary enlargement of the contracted canal, unless especially contra-indicated, suggests itself.

But there is another important measure that does not suggest itself, and yet deserves careful attention. In order to protect the bladder from over-distension the first movement of the aspirator should be to withdraw water from it, and not to inject water into it. This cannot be too strongly emphasised. As preliminary to this precaution the surgeon ascertains exactly the capacity of the bladder. For this purpose it should be emptied by a catheter, and tepid water slowly injected, until the fluid is forcibly expelled between the catheter and the loosely grasped urethral walls. This reaction of the organ, which anaesthesia does not prevent, may be relied on to furnish a sufficiently accurate indication of the size of its cavity. If the fluid be now drawn off and measured, the same amount may be safely reinjected through the large tube, which is next to be introduced, the injected fluid being retained in the bladder by a tape tied round the penis, with the thumb, or a cork, at the extremity of the tube. Here is, I think, a critical moment of the operation, because if the contents of the bulb are added to those