We can only compare the effects on the same individual at different times, and therefore probably under widely differing circumstances; or in apparently similar pathological conditions occurring in different individuals, each with his own idiosyncrasy, habits, and external circumstances to disturb the calculation. I do not say that a satisfactory result is impossible; far from it: but I do say that it will never be attained by any mind that does not fully comprehend that there exist difficulties enough to make it nearly so. And if this be true when doses are administered of which the action is so great as to produce obvious and undoubted disturbing effects on the animal economy, what shall we say of the confident assertions which we hear made respecting the influence of doses of the same drugs, but so minute as to effect no obvious disturbance under any circumstances—so infinitesimal as to be inappreciable by any sense we possess—so attenuated as sometimes not to be identified by any chemical test we can apply to detect their presence?

I refer to these things to exemplify the difficulties which the search after truth involves in one only of the many fields in which our profession requires us to labour. Yet if the difficulties are great—if the responsibilities of our position, when rightly estimated, are grave, there is much encouragement for the labourer. The steady pursuit of truth is rarely unsuccessful for him, and it will always be triumphantly repaid in the end. We may meet with severe disappointment when engaged in the honourable exercise of our profession, in witnessing the flattering reception which society often accords to the self-confident charlatan, who exhibits an assurance inconceivable except as the result of profound ignorance or of brutal indifference to the weighty responsibilities attaching to the practice of medicine. We witness the persevering attempts to disinter and revive that mighty power of the past—ancient magic—buried here, it was thought, past all hope of resurrection; but man's innate love of the marvellous, uncurbed or misguided where ignorance of natural science exists, still demands its meed of excitement; and mysterious rites, savouring much of a superstitious character, and altogether of the ridiculous, are again performed for the *soi-disant* "spiritual" circles of modern society. But the true philosopher can witness all this, and not be greatly moved. He pities the victims of the delusion; but his equanimity is not disturbed. He looks for the cure of all this unhappy evil, not to any special crusade to be carried on against the errors of the day, but to the slow and steady march of education in natural science amongst the people. These changing forms of error, which in turn dominate the minds of the unthinking masses, do but indicate the ebbing and flowing of a tidal sea, which on the whole slowly recedes from the steadily rising shore. He regards humanity as it is; deplors its weakness, ignorance, and folly; but he trusts to the gradual, silent advance of the race through the teachings of the most enlightened amongst it. He has seen its progress, century by century, oscillating it is true, but still upward and onward, as the total result; and he even finds evidence of this in certain characters which mark the delusions of his time, since, degrading as they are, they are adapted to minds better informed than those which were subject to the delusions of three centuries ago.

In fine, then, we look to the general diffusion of a sound and comprehensive education as the great remedy for these evils—an education which shall not be mainly confined to the acquirement of classical lore, or even of mathematical science, but which shall impart a knowledge of the laws which govern man's life and health, physical and mental, and the phenomena around him—laws which, springing from the same source as the moral law, it behoves him equally to know and to keep. It is *our* function to press home this great duty on society. It is *our* function to teach the vast importance of these eternal truths. No other class of men can so well do this; *no others will, until we have demonstrated it beyond the possibility of dispute.*

Let us, then, remember, that while it is our honourable office to relieve pain, to avert disease, and to minister to the distressed around us, we have also duties to perform, not for our fellows and contemporaries only, but for posterity, since posterity must and will take much of its character from us. Let us, faithful to our high trust as depositories of natural truth,—as the high priests of natural religion,—cherish an unswerving confidence in the ultimate triumph of our mission, whatever our difficulties and disappointments—whatever the temporary successes of chicanery and error. Let the attainment of Truth be the end of all our scientific labours, and the promotion of truth be the aim of our lives, whether public or social; and although we may not perform the achievements or win the

fame of a Hunter, a Newton, or a Harvey, we shall no less certainly add a worthy contribution to the onward progress of the world; and place, as the result of our labours, an imperishable stone in that great edifice which shall eternally endure, a glorious witness to the immortality of its founders—the Wise and Good of every age, and clime, and race.

ON THE SURGICAL TREATMENT OF GLAUCOMA.

By J. W. HULKE, F.R.C.S.,

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KING'S COLLEGE HOSPITALS.

IN some prefatory remarks to two cases illustrating the successful treatment of glaucoma by Von Graefe's operation of iridectomy, published in the *Medical Times and Gazette*, September 1st, 1860, I stated my belief that this was "the only known successful treatment of this previously incurable disease." This has elicited from Mr. Hancock a comparison between the treatment of glaucoma by division of the ciliary muscle, of which he is the author, and that by iridectomy, which he discredits, maintaining the former to be "the best operation." Attempting to disprove the supposition that all the prominent symptoms—"the hardness of the eyeball, the peculiar progressive contraction of the field of vision, the paralysed dilated pupil, the intense throbbing pain, the excavation of the optic nerve entrance, and the pulsation of the retinal vessels"—are consequences of excessive tension of the eyeball, produced by a superabundance of fluid within it, which is probably exuded from the choroidal vessels and distends the vitreous humour, Mr. Hancock advocates an ingenious theory, according to which various pathological appearances, enumerated by him as characteristic of glaucoma, are supposed to be produced by a constriction exerted upon the bloodvessels by a spasmodic or extreme contraction of the ciliary muscle.

Quoting a paper on the "Surgical Treatment of Glaucoma," communicated by me to the Royal Medico-Chirurgical Society, June, 1860,* Mr. Hancock infers the recognition of "three stages" of this disease—"the premonitory, the acute, and the chronic;" and "that the success of the operation (iridectomy) is greater the earlier it is performed." It is this "great practical fact," as he terms it, taken in connexion with my description of a peculiarly firm state of the vitreous humour in glaucoma, which appears to him to be fatal to what he designates my "theory of glaucoma being due to a superabundance of serum in the vitreous humour." Mr. Hancock will find that acute and chronic glaucoma are described as two *forms*, not as two *stages*, of the disease. But it is the great firmness of the vitreous humour which seems to him to be incompatible with its distension by serum. This would be really the case were the organ simply a structureless mass of fluid contained in a hyaloid capsule, on the rupture of which the contents would immediately flow off; but, being an organized living tissue, having a locular or cellular arrangement, the distension of its loculi with a dense fluid, as serum, would give the whole tissue an unnatural turgidity and stiffness. The fluidity of the organ which occurs later in the disease depends upon the breaking up of its dissepiments, when it shares the atrophy which finally involves all the ocular structures. At this time, if the sclerotic be punctured, as in Mr. Hancock's operation, the dissolved or fluid vitreous humour will trickle out by the side of the knife; whilst at an earlier period no gush of fluid would be visible, notwithstanding an excess of fluid in the organ. There is a distinction between the distension of an organ with fluid, and its reduction to a fluid state. The absence of the escape of a visible quantity of fluid, at the moment of puncture, in some of Mr. Hancock's cases, is brought forward by him as evidence in favour of the non-existence of an excess of extravascular fluid in the eyeball, and in support of his theory of spasm of the ciliary muscles; but it does not warrant this inference.

I propose to examine the bases on which Mr. Hancock founds his spasmodic theory. They were published in a clinical lecture, (*THE LANCET*, Feb. 11th and 25th, 1860,) where he says: "I have observed that in acute glaucoma the eyeball is constricted and marked by a circular depression at the point cor-

* *THE LANCET*, July 21st. An Abstract.

responding to the ciliary muscle. The eyeball is elongated in the antero-posterior diameter, the cornea lessened in all its diameters, and rendered more conical than natural;.....whilst, when the patient turns his head sideways, irregular bulging of the sclerotic is exposed to view."

We are told that this annular constriction of the eyeball by the ciliary muscle was "not found noticed by any previous writer." This is not surprising, for on turning to the fifteen reported cases for an example, and selecting No. 3, where this sign was strongly marked, we find an instance of cyclitis or irido-choroiditis, with the usual thinning of the ciliary sclerotic, rather than of glaucoma. Again, not a single measurement is given, or dissection of a glaucomatous eyeball referred to, in proof of the *elongation of the antero-posterior axis* of the globe; neither is any proof of the *conicity of the cornea* in this disease given. Whilst, on the other hand, *flattening of the cornea*, the opposite of conicity, may be easily demonstrated, as Von Graefe showed long ago, by comparing the size of the image which the flame of a candle forms upon the glaucomatous cornea with that which it forms upon the healthy cornea of the other eye, when it will be apparent that the glaucomatous cornea furnishes the larger image, proving that its outline has a larger (flatter) curve.

Mr. Hancock, unable to understand how an excessive intra-ocular fluid-pressure can of itself produce excavation of the optic nerve entrance, pulsation of the arteria centralis retinae, and the other phenomena of a disordered circulation which occur in glaucoma, says—"Equable pressure from confined and compressed fluid, exerted in all directions from within outwards, would, if uninfluenced by extraneous circumstances, tend to stretch the retina and choroid, and thus prevent the cupping of the optic pupilla and bulging of the choroid." Mr. Hancock will find a full explanation of these phenomena in the "Archiv für Ophthalmologie," and in the MSS. of the Jacksonian Prize Essay on "Diseases of the Retina," for Christmas last, deposited in the library of the Royal College of Surgeons: it would occupy too much space to give it here; but I would call his attention to the important fact, that the optic nerve entrance constitutes the weakest, the most yielding point in the fundus, where the first visible effects of excessive pressure would naturally be expected.

Mr. Hancock says—"We can, however, readily understand that the *lateral expansion* of the eyeball being, in great degree, prevented by the constriction of the ciliary muscle (*lateral bulging* of the sclerotic having been just before given as one of the signs), the force of the compressed fluid acts powerfully in the antero-posterior direction; hence the *puckering and cupping of the retina*, the irregular bulging of the choroid, the alteration in shape of the cornea, and the elongation of the eyeball." It is to be regretted that such striking characters as *puckering and cupping of the retina* are merely enumerated without description, as they seem to be unknown to other ophthalmologists.

I have endeavoured to show the invalidity of Mr. Hancock's objections to what he incorrectly designates *my* theory, and to prove the inconclusiveness of *his*, in consequence of the inexact data on which it is founded. With respect to the ciliary muscle itself, I have found in several instances, by microscopical examination of glaucomatous eyeballs shortly after their extirpation during life, advanced fatty atrophy of this organ, so as to leave no doubt that its function must have been in abeyance. I am aware, from other dissections which I have made, that this is not a constant condition; doubtless it depends on the period of the disease at which the examination is made; but if a single incontestable example of structural and functional destruction of this muscle is found coexistent with unmistakable glaucoma, it legitimately follows that spasm of this muscle is not an essential condition.

Passing to a consideration of the operation, Mr. Hancock complains that I gave an incorrect version of it in describing him as "striking a knife through the ciliary region towards the axis of the globe." This description was not wholly taken from his published account, but from a personal inspection of the operation performed by his own hand. The incision which traversed the ciliary region "obliquely downwards and backwards" was made by puncturing this part with an extraction knife in such a manner that, whilst the wound in the cornea and sclerotica had the above direction, the point of the instrument seemed to pass deeply behind the edge of the lens. If this was not the case, I regret my mistake. My reasons for classing Mr. Hancock's puncture with other modes of paracentesis, to which he takes objection, were mainly furnished by his own clinical lecture, in which he enumerates amongst its advantages that "*by it the accumulated fluid is evacuated.*"

"By the situation and oblique direction of the incision, a *free drainage* of fluid is provided for." Do not these passages imply that the evacuation of fluid is a very important object of the operation? It is difficult to reconcile them with his recent statement—"Neither can I admit that the success of my operation in any way depends upon, much less is solely due to, the drawing away of some of the superabundant fluid."

As regards Mr. Hancock's comparison of the results contained in the tabular reports of iridectomy in glaucoma, published in the "Ophthalmic Hospital Reports," with those of his own operation, I disclaim any liability for anything these tables contain. My practice has hitherto been exempt from the serious complications and accidents he mentions. Of his own operation, Mr. Hancock says—"The iris not being injured, *hæmorrhage* from its lacerated edges cannot occur." If this be so, from what source does the anterior chamber sometimes become filled with blood, as I have been told by a credible witness that it does? Has the eyeball never suppurated after this ciliary wound?

The fifteen reported cases, by which the superiority of Mr. Hancock's operation over iridectomy is attempted to be shown, lose much of their value in consequence of the want of precise information respecting the amount of sight, as ascertained by a definite test instead of the "*says of the patient*;" the state of the field of vision, contracted or not, and, if so, in what manner; the state of the accommodation; and the ophthalmoscopic signs, which are only given in one case. Hence much uncertainty respecting the nature of several of these cases; indeed in some the diagnosis of glaucoma appears to me to be untenable. One very singular circumstance is frequently reported—I mean the recovery of transparency by opaque lenses! Does the ciliary incision cure *cataract* also? I think it must be granted that Mr. Hancock has yet to submit to the profession a conclusive proof, based on exact data, that his is "the *best* operation for the treatment of glaucoma."

Old Burlington-street, Nov. 1860.

REPORT OF ELEVEN CASES OF VESICO-VAGINAL FISTULA.

By I. BAKER BROWN, Esq., F.R.C.S. (EXAM.)

(Concluded from p. 508.)

CASE 8.—*Vesico-Vaginal Fistula; obliterated urethra of eight years' duration; one operation; cure.*—Mrs. B—, aged forty-two. This lady was sent to me by Mr. Ludlow, of Hinckley, Leicestershire; but that gentleman did not attend her in her confinement.

History.—Eight years ago she was taken in labour with her first child, and after twenty-four hours of severe pains she became insensible. She believes that instruments were applied, but is unconscious of their nature; by their aid she was delivered of a still-born female child. She had fits for some time after the labour, and when she became conscious she found that her urine came away involuntarily, and it has continued to do so ever since. She has never menstruated since the accident.

Aug. 11th, 1860.—On examination, I found a fistulous opening which would admit three fingers, situated about two inches up the vagina. The urethra was entirely occluded. There was a slight corrugation at the point where the meatus should have been. The vagina was large and roomy.

13th.—Chloroform having been administered by Mr. Wratishaw, I proceeded to operate in the presence of Messrs. George Brown, Philip Harper, Spencer, and my son, Mr. I. Baker Brown. I first freely pared the edges of the fistula, which were very hard and cartilaginous, and passed through them five silver sutures. Having done this, I introduced a long sharp-pointed knife into the centre of the corrugated part which pointed out the situation of the meatus, and gently pushed it into the bladder, keeping as nearly as possible in the track of the urethra. Through the opening thus made, which was nearly two inches deep, a metallic catheter with bag attached was passed. The sutures were then closed, one being simply twisted, but the other four were secured by my bar clamps. In the evening the catheter became closed up with coagula, and it was found necessary to withdraw and cleanse it.