

relieved, or where it does not exist, on having ascertained the time of access of paroxysm, we have given a full dose of quinine about three hours before its expected occurrence. I have, after some pains to ascertain it, come to the conclusion that the quinine acts better when given about three hours than at a longer or shorter period before the expected attack. I have also endeavoured to determine the minimum dose of quinine that is required, and this I have fixed at ten grains. Where the paroxysms are irregular in their character, I have found five grains of quinine, given every four hours, answer thoroughly. Out of 109 recent cases, 102 yielded at once either to ten grains or five grains every four hours, and in but 7 was a repetition or continuance of large doses required. Two or three cases complicated with severe gastric derangement proved more obstinate. For the removal of cachexia, and to guard against a relapse, quinine was generally given in two grains three times a day for a week or two, and the patients usually had a bottle of quinine mixture to take out with them. The quinine occasionally produced ringing in the ears and deafness, but in only one case did I observe any more serious effects. It was in a man who was admitted with tertian on Oct. 29th, who had had ague for a month, but had not any indications of head affection during the attacks. He was ordered ten grains of quinine before the expected paroxysm, and three grains three times a day. When seen on Nov. 1st, he had impaired motion of the right side of the face and right arm, with mouth somewhat drawn to left side, delirium, pupils contracted, pulse weak, surface moist; had passed his urine unconsciously, and stools twice in bed. Ordered a blister to nape of neck, and the omission of the quinine. He was much relieved on the following day, and by the end of a week all the cerebral symptoms had disappeared. Although these symptoms appeared during the administration of quinine, and disappeared on its discontinuance, yet it would not be quite logical to regard the quinine and the attack as cause and effect; for the cerebral affection occurred on the day on which the ague fit was due, and may have been a masked form of it.

I have fairly tried the liquor potassæ arsenitis against the quinine, in doses as full and frequently repeated as I dared to venture upon, and have continued it until irritation of the intestinal mucous coat rendered desistance imperative; but have not succeeded in checking the paroxysms as with quinine. Some physicians, admitting the greater efficacy of quinine in arresting the paroxysms, have claimed for arsenic, and also for strychnia, greater power in preventing a relapse. I believe, however, that quinine is quite effective for this purpose if continued in small doses for a considerable time, and also that it is the best prophylactic against the disease. A captain who consulted me a year or two back said that he was on the point of sailing for Jamaica, and that he had never been there without contracting severe ague. I recommended him to take quinine, in small doses, two or three times a day, all the way out. He did so; and on his return to England reported that for the first time he had enjoyed immunity from the disease.

(To be concluded.)

ON EXTRACTION OF SOFT CATARACT BY SUCTION.

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DURING the autumn of last year I was led to inquire whether the principle of suction might not be made use of in withdrawing from the eye through a small wound all such cataracts, whether traumatic or spontaneous, as have neither a hard nucleus from old age nor have undergone calcareous degeneration. This inquiry was suggested to me by the difficulty sometimes met with in certain cases of "linear extraction," in which the soft matter is removed either incompletely or only after prolonged and repeated introduction of the curette. I believed, moreover, that if the posterior capsule could be thoroughly cleansed from all opaque matter, without undue violence to the eye, there would be much less risk of inflammatory mischief after linear extraction, and that one of the chief sources of opacity of the posterior capsule would be removed. Having therefore satisfied myself by experiment that the softer portions of even a healthy lens could be sucked through a fine tube, I

requested Messrs. Weiss to make for me a suction instrument, which, being modelled upon the ordinary curette, I named a "suction-curette." This instrument is described and figured in the last number of the "Moorfields Ophthalmic Hospital Reports," vol. iv., p. 2.

As I have now had many opportunities of testing the value of extraction by suction, and as, since my introduction, or rather, as it proves, revival of the principle, it is being extensively adopted in ophthalmic practice, I venture to offer the following remarks on the mode of performing the operation, and on other points of interest connected with it.

Details of the Operation.

The operation by suction which I have adopted is founded upon, and is essentially a modification of, "linear extraction," the principles of which have been worked out by Mr. Bowman, and have been clearly and fully described by Mr. Critchett* and Mr. George Lawson.†

First stage: *The efficient rupture of the anterior capsule.*—The pupil having been dilated by atropine, and the eyelids fixed by the stop-wire speculum,‡ the anterior capsule of the lens should be very freely torn open by two needles passed through the cornea from opposite sides. In carrying out this step the surgeon should bear in mind that its object is not merely to liberate the cataract, but also to ensure such a tearing up of the anterior capsule that it may curl back from the area of the pupil and be lodged behind the iris. At the same time he ought by all means to avoid injuring the *posterior capsule*: a caution to be especially remembered in cases where the cataract is dwarfed and the anterior capsule tough, or where, in traumatic cataract, the lens has been much reduced in bulk by absorption. If the operator wishes to avoid the use of the two needles, he may rupture the capsule at a later stage by introducing through the corneal opening made for the curette the hook used in extraction of hard cataract. The two needles, however, give more perfect command over this important step in the operation.

Second stage: *The opening in the cornea.*—Having withdrawn one needle, and steadying the eye by means of the other, the operator should next make an opening in the cornea for the admission of the tubular curette of the suction instrument. For this purpose a broad needle has been made for me, by Messrs. Weiss, of such a breadth as to make an opening of the exact size required for the curette. The needle should enter the cornea opposite the margin of the pupil when fully dilated, and, passing somewhat obliquely through the lamina of the cornea, should make a valvular opening, in order, firstly, that it may not be too central and leave a scar in front of the pupil; secondly, that it may not be too near the attached margin of the iris, and thus favour its prolapse and adhesion to the wound; and thirdly, that the curette, when introduced, may not rest upon nor bruise the iris.

Third stage: *The removal of the cataract by suction.*—Having carefully introduced the curette (if it hitches in traversing the corneal wound, it may easily be disengaged by being turned edgewise), the surgeon should hold the open end of the tube steadily within the area of the pupil, gently burying it in the opaque material. The suction power may then be applied, and regulated in degree as the opaque matter runs off into the tube. As soon as the pupil is clear, the curette may be carefully depressed towards the posterior capsule in order to ascertain whether any opaque matter remains, but it should not on any account be swept before or behind the iris. If the suction be continued after the opaque matter has been removed, the cornea is drawn down over the open end of the curette, and blocks it up, thus preventing the iris from being sucked into the instrument and injured.

If the operation has been efficiently performed, it will be found that the cataract has been completely withdrawn from the eye, through an opening in the cornea no larger than would admit the common curette, without any injury to the iris, without rupture of the posterior capsule, and with such complete division of the anterior capsule that it has disappeared completely behind the iris. It will be also found, I think, in the majority of such cases, that recovery is most speedy, that the operation is followed by little or no irritation of the eye, that the patient on the eighth or tenth day can read No. 1 (Jäger), and that the conditions which usually produce opacity of the capsule have been provided against.

The foregoing rules apply to a simple case of complete soft

* Ophthalmic Hospital Reports, vol. ii., part ii., p. 141.

† British Medical Journal, July 9th and Sept. 3rd, 1864.

‡ Ophthalmic Hospital Reports, vol. iv., part ii., p. 141.

cataract. They are also applicable, with slight modification, to cases of traumatic cataract of recent occurrence. In these cases, however, it is necessary, in the first place, to be very careful to tear open completely the anterior capsule which may have been previously ruptured in the accident producing the cataract; and, in the second place, to bear in mind that the posterior capsule may also have been torn through. Should this have occurred, the suction operation will be complicated by the admission into the anterior parts of the eye of the vitreous humour, which would tend to pass through the tube more readily than the denser material of the cataract. When such a defect occurs, it is sometimes possible, by careful management of the curette, to withdraw the opaque lens without at the same time drawing off a serious amount of vitreous humour.

Another complication may arise—namely, partial cataract, in which the nuclear portions of the cataract are opaque, and the cortical portions are healthy, tenacious, and adherent to the capsule. This difficulty must be met in the same way as in “linear extraction”—by the preliminary operation of puncturing the anterior capsule, so as to admit the aqueous humour into the structure of the lens, and so to cause its disintegration. It may be possible to withdraw by suction even a partially sound lens without the preliminary disintegration; but I have not yet attempted to do so, not from any difficulty in drawing such healthy lens through the tubular curette, but because, when the peripheral parts of the lens are transparent and adhere to the capsule, it is hardly possible to ascertain when the capsule has been completely cleansed from lenticular matter.

Another class of cases presenting difficulties is that in which a soft cataract has become wasted and calcareous, or partly so. In such cases the solid portions will not pass along the tube of the curette.

On former attempts to extract Cataract by Suction, and their failure.

When I first devised the suction-curette, I was under the impression that I had hit upon a new idea, and that the proposal was original. By the kindness of several friends, however, I have been directed to accounts of various previous attempts to apply the same principle to the extraction of cataract.

The Persians, ages ago, are said by Avicenna* to have sucked out cataracts through a hollow needle. How far they succeeded I am not able to state.

In 1847, M. Laugier invented his “*aiguille à pompe*,” a hollow needle fixed in a syringe, apparently like that now in use for subcutaneous injection. Its use is discussed by M. Desmarres.† The needle having been thrust through the sclerótica, vitreous humour, and posterior capsule, and lodged in the centre of the lens, the suction was applied by means of the syringe in the handle of the instrument. If the cataract were fluid, it was drawn into the instrument; the pupil became clear, and sight was immediately restored. If the cataract were not fluid (“*et la cataracte liquide est fort rare*”), the vitreous humour was drawn out, the cataract was left *in situ*, and the eye collapsed. This misadventure was followed by internal inflammation of the eye, and in consequence the operation was condemned. “*En résumé, l'opération de la cataracte par succion est abandonnée.*” Failure in this operation was to be expected from using the needle of the syringe as the piercing instrument, and from traversing the sclerótica and rupturing the posterior capsule, which ought to have been preserved as the barrier between the cataract and vitreous humour.

Again, M. Blanchet‡ brought forward another method of extracting cataract by suction. Having dilated the pupil, he made an opening in the cornea with a broad needle, through which he introduced a small tube with a flageolet-like mouth attached to an Anell's syringe. With this blunt tube he pierced the capsule of the lens; and if the cataract proved soft, he pumped it out through the tube by working the piston of the syringe. The main defects of this plan of M. Blanchet were—first, the attempt to puncture the anterior capsule with a blunt instrument, thereby using unnecessary force in reaching the cataract; and secondly, the imperfect opening of the anterior capsule, whereby the capsule remained in the area of the pupil, and, becoming opaque, rendered a secondary operation necessary.

On Suction Instruments.

The original suction instrument which Messrs. Weiss made for me consisted simply of a tubular curette fixed in a handle, to

which a small india-rubber tube* with a mouthpiece is attached. The flexible tube is of such a length as to reach from the mouth of the operator to the curette when held in the eye.

Shortly afterwards Messrs. Weiss made, at the suggestion of Mr. Bowman, a modification of this instrument, in which the suction power is applied by an ingenious mechanism in the handle, so that the hand which holds the curette controls the suction. Mr. Bowman also inserted a piece of glass tube between the curette and the handle, to enable the operator to watch the result of the suction.

A third instrument has been suggested and made for me by Messrs. Weiss, which is simply a light glass tube with the tubular curette fixed at one end, and the flexible tube with a mouthpiece at the other end.

A fourth instrument has been made for Dr. Bader, of Guy's Hospital, by Khroné, of Whitechapel, and is thus described by Mr. Lawson:—“The suction-power is a small, hollow india-rubber ball, placed at the extremity of a tube which terminates in a glass tubular curette. Pressure is made on the ball with the hand to expel the air from the tube, and its readmission is regulated by a well-contrived stop apparatus placed close to the curette. After the air from the ball has been expelled and its readmission prevented by closing the stop, the curette is introduced into the eye, and the amount of suction is regulated by a little trigger connected with the stop apparatus within.”

Having used the first three forms of instrument I have found them to do their work perfectly; and I have no doubt that Dr. Bader's is at least equal to them. On the whole, perhaps from having used it more frequently, I prefer the original curette (with the addition of the glass tube), as the suction is more immediately at command when applied by the mouth, and the instrument can be guided with greater delicacy when the hand is not fettered by applying the suction power.

Cases of Extraction by Suction.

I have selected the following from several in which I have extracted cataract by suction:—

CASE 1.—G. C. D.—; cataract produced by grains of powder shot into the eye eighteen months previously.

Dec. 18th, 1863.—Extraction by suction.

21st (fourth day).—Reads No. 10 (Jäger).

24th (seventh day).—Reads No. 4.

Jan. 13th, 1864.—Reads No. 1.

CASE 2.—G. A.—, aged ten; cataract caused by a blow three weeks previously.

Jan. 1, 1864.—Extraction by suction; some opaque capsule remaining in the area of the pupil.

18th.—Reads No. 20.

28th.—Reads No. 4. The opaque capsule has spontaneously opened out, but there is still a slight film, preventing perfect vision.

CASE 3.—Feb. 1864: M. E. T.—, aged seven; an unhealthy child. Extraction by suction, followed by iritis and partially closed pupil. This is the only case of suction in which I have seen serious inflammation.

CASE 4.—Mrs. A.—; partial cataract, probably caused by a blow three years previously.

May 17th, 1864.—Capsule freely punctured.

30th.—Extraction by suction. Reads No. 20.

June 6th (eighth day).—With +2½ reads No. 2.

8th (tenth day).—With +2 reads No. 1.

CASE 5.—E. S.—, aged seven months; complete spontaneous cataract in both eyes.

May 17th, 1864.—Extraction of both cataracts by suction.

22nd (sixth day).—Returned home into the country, with pupils clear, central, and active, and with the eyes free from irritation.

The following cases were operated on by Mr. Samuel Hey in the Leeds General Infirmary, who has kindly allowed me to relate them.

CASE 6.—M. S.—, aged twenty-eight.

Right eye—complete spontaneous cataract of four years' duration:

June 2nd, 1864.—Extraction by suction.

6th (fifth day).—Reads No. 16.

9th (eighth day).—Reads No. 1.

Left eye—spontaneous cataract of two years' duration:

June 16th.—Extraction by suction. In this eye the capsule

* Arit. Krankheiten, vol. ii., p. 352.

† Desmarres. *Maladies des Yeux*, vol. iii., p. 325.

‡ Dublin Quarterly Journal, May, 1843.

* The idea of the flexible tube was probably suggested to me by reading an article by Mr. Greenway, of Plymouth, in which he describes a suction instrument for making artificial pupil.

was tough, and the lens not completely opaque, so that some transparent portions were left behind.

19th.—Pupil filled with opaque material. The eye painful and congested.

July 14th.—Left the hospital. Pupil clear; no inflammation.

Aug. 17th.—With + 2½ reads No. 4.

CASE 7.—B. F.—, aged sixteen; suffering from diabetes. Complete spontaneous cataract in both eyes, of two months' duration.

Right eye:

June 2nd.—Extraction by suction.

9th.—Pupil perfect; free from opaque matter. No congestion of the eye.

Left eye:

June 16th.—Extraction by suction.

23rd.—Pupil perfect; free from opaque matter. No congestion of the eye.

As she was not very intelligent, and could not read, we were unable to test her vision by type; the vision, however, of both eyes was excellent.

Leeds, Sept. 1864.

ON THE INSPIRATION OF VAPOUR IN CERTAIN LESIONS OF THE BREATHING APPARATUS.

By JOHN HUNTER, M.A.

WITHOUT laying claim to any great originality, I trust that the few observations I have to make upon this important subject, to which I have directed considerable attention, may be worthy of notice by the profession.

I suppose no one will deny that, as a general principle, the use of moisture in combination with air is of service in chest-diseases. This we see daily evidenced by the beneficial effect of sea-air—which contains vapour in excess of the amount held by the air generally—in the different forms of bronchitis, &c. But it is to insist on the powerful remedial agent which we possess in vapour when judiciously used at the bedside of the patient that is the object of the present paper. On the first appearance of an attack of, say, simple bronchitis, the earliest symptom observed by the patient is a feeling of oppression in breathing, "a tight feeling across the chest." This is caused by the proper secretion of the lining mucous membrane of the lungs being partially arrested. The air-cells are in an equal degree incapable of performing their proper functions—namely, the reception of oxygen from the inspired air, and the giving out of carbonic acid gas; the result of which is that the patient has a diminished area of breathing-surface, in proportion to the intensity of the attack. And here I may remark, in passing, that there is an evident necessity in such a case that the patient should have the purest air procurable, to make some amends for the deficient quantity. Now in this stage of the bronchitis I believe we have no such powerful remedial agent as steam, properly applied. The precise mode of application may be varied to suit different attacks in patients of different ages, and other peculiarities; the great principle being that the steam should be carried with the inspired air into the air-cells, where it not only acts as a substitute for the natural mucous secretion, but by its soothing action disposes the membrane to resume its normal functions. I have seen an attack of acute bronchitis cut short by these means, almost without any other; while in the different forms of asthma it is found of the greatest service. I put the acute bronchitis first in the list, as I think that it yields to the power of steam more easily than any other form of chest-disease; but it is good in all. And even in chronic bronchitis it is of the greatest service in softening the glutinous sputa, and rendering it much more easy to be got up by the patient, thereby saving time and many coughs, the patient being enabled to get up all his expectoration at the beginning of the night, and thus start, as it were, with a fresh account, instead of being tormented by the small instalments frequently due. In phthisis also I have found the breathing-in of steam to be of the greatest service in the frequent though often slight attacks of localized congestion, which denote that the disease is placing its grasp upon another portion of the lung; such attacks, if not altogether warded off, being certainly modified in their intensity. I could now give details of many cases in which phthisis appeared to be kept in

subjection, each exacerbation of the disease being speedily met and apparently crushed; but I must proceed to give details of the mode of application of the steam. This varies in different patients.

In the case of infants, where the simplest means must be used, I have found nothing to succeed so well as placing a flat and broad vessel at each side of the cot in which the little patient is; these should be kept filled by the nurse with hot water, and the steam from them is caused to ascend and float round the little sufferer, who unconsciously inspires the beneficial vapour. In patients of more mature age the steam may be applied by an ordinary teapot, which being *half* filled with boiling water, and the mouth applied to the spout, the patient may be taught to draw in the steam with his inspirations. At first it may give rise to a little irritation of the mucous membrane, but the patient quickly feels the beneficial effect, and generally perseveres in its use. It is a good plan to put some tea, cinnamon, &c., at the bottom of the teapot, which prevents the insipid taste of the steam from being disagreeable to the patient. I lately had a patient, an overlooker in a cotton factory, who was suffering from chronic irritation of the lungs, evidently arising from the small particles of cotton floating with the inspired air into his air-cells, and there giving rise to his sufferings. I explained to him the action of steam in his case, and he, being of an ingenious turn, put a piece of elastic tubing, about four feet long, to the spout of the kettle, and after his day's work, regularly sat by his fire inhaling the steam, and in about half an hour was able to get up all the cotton taken in during the day, thereby ensuring a comfortable night's rest, which had been before impossible from cough. Steam may also be applied in this way: a small perforation is made in the lid of a common kettle, into which may be soldered a short tin tube bent up at a right angle; attached to this may be a tube of vulcanized india-rubber, of any reasonable length, which may reach over to the bedside of the patient, and, opening out near to the patient's mouth, may during the night keep the air inspired hot and moist. The whole expense of this apparatus is only a few shillings. This plan is adapted for nightwork, as the kettle, if filled at bedtime, will furnish steam sufficiently during the whole night. Many other plans may be adopted, and no doubt will occur to the ready mind, but the great object to be attained is to keep the air inspired warm and moist as a powerful curative agent, being one particularly useful in this climate, where diseases of the chest are so common.

City-road, Manchester, August, 1864.

RECOVERY IN TWO CASES OF ACUTE TRAUMATIC TETANUS.

By O. FOSTER, Esq., M.R.C.S.

In looking over my case-book I am reminded of the great interest I took in two severe cases of acute traumatic tetanus under my care within the last two or three years. I do not lay claim to any originality in the treatment of them, but as it was successful I forward them for insertion in *THE LANCET*. If perchance by my remarks anyone should be happier in the saving of life or mitigation of suffering in that formidable malady I shall be compensated fiftyfold.

It having fallen to my lot during a career of thirty years' country practice and surgery to a small provincial hospital to meet with several cases of acute traumatic tetanus which were unsuccessfully treated with morphine, belladonna, aconite, tobacco, warm baths, counter-irritation, &c., singly and combined, and in some of which, I fear, the remedies increased the sufferings rather than relieved the sufferer, if they did not even hasten a fatal termination, I determined, if ever another case fell under my charge, I would act more upon the expectant principle than I had hitherto done, attending only to the usual routine of keeping the bowels well open, at the same time supporting the patient to the best of my power, and leaving the prominent features of the malady almost entirely uncarved for. Singularly enough, it was not very long before the two following severe cases occurred in our little hospital of thirty beds. Both of them being my patients, I had the opportunity of carrying out my intention, and was rewarded by coaching them both through a severe and dangerous illness to a state of convalescence and health.