or encrustration on the lids in cataractous subjects, it is most important that a healthy tone should be restored before operating. Pagenstecher destroys the lacrymal sac when there is purulent discharge, and Haab also recommends the obliteration of the puncta by the galvanic cautery. I have, however, found myself that probing (without slitting up the caniculus) and the use of astringents and antiseptics, especially that most potent of all, nitrate of silver, are sufficient to enable us to extract with safety. When it is necessary to excise the iris for any reason during extraction without a general anæsthetic, it may be rendered insensible in from one to two minutes by merely dropping a solution of cocaine on to the surface of the wound. Mr. Critchett, to whom we are indebted for the suggestion, conducts the solution into the anterior chamber by means of a grooved curette; but I have not found this necessary, and have always deprecated the injection of fluids into the anterior chamber. When, in spite of all efforts to extrude cortex, the pupil remains obstructed, grey, and sombre, the hyaloid fossa may on occasion be punctured, in which case the patient is much in the position of one whose lens and capsule have both been removed at one *coup* with a spoon. Of course, the most serious drawback to simple extraction is the possible occurrence of prolapse of the iris; as Pagenstecher says: "The operation is completed beautifully, and just as beautifully next day you find that the iris is prolapsed." This accident is caused by abnormal tension of the eyeball, by sudden outgushes of the aqueous humour, by faulty placement of the incision, by swelling up of retained cortex, and by spasm of the lids. Kalt of Paris endeavours to prevent prolapse by suturing the cornea, Galezowski by sealing the wound with an antiseptic wafer, Snellen of Utrecht by closing it with a conjunctival flap, and Knapp of New York by subjecting his patients to a series of tests immediately after extraction, performing iridectomy in those cases in which the iris shows a tendency to protrude. For my own part, I am satisfied if the edges of the wound are accurately in apposition, if the flap fits like a watch-glass, and the pupil promptly contracts; in these cases the anterior chamber is reformed at once, there is no gushing of aqueous or prolapse of iris, and, barring accidents, there will be none. But accidents will happen: "Against stupidity the gods themselves are powerless"; hence we are compelled to reckon upon a certain percentage of cases in which prolapse will occur; and, of course, if prolapse were a very serious accident its possible occurrence would be a fatal objection to simple extraction, but it is not a very serious accident. The great majority of the subjects of prolapse are no worse off than if iridectomy had been performed in the first instance, while, if the operation succeeds, then, indeed, the surgeon has something like success—the success which leaves nothing to be desired, which has nothing to fear for the future, and which restores the patient to society, not only with excellent vision, but with eyes which show no trace of operative interference. I presented patients, the subjects of double extraction by this method, to the notice of members of the Clinical Society of London in 1875, to the Medical Society and to the staff at the Royal London Ophthalmic Hospital and again to the members of the Ophthalmological Section at the jubilee meeting of the British Medical Association. Such eyes, according to my experience, bear the wear and tear of life much better than eyes operated on by the combined method, and of course sight is better (one patient on whom I operated for senile cataract twenty-six years ago is still alive and has excellent sight), and, Helmholtz and Donders to the contrary notwithstanding, accommodation is not abolished.[1] I have had patients able to read small print without glasses after extraction, and many more who can do so by a slight change in the position of their distance glasses, and all trace of operative interference is so conspicuously absent that patients of mine who have afterwards consulted eminent ophthalmic surgeons have quite naturally escaped detection. Of course, in this operation there is only one wound; in extraction with iridectomy there are two; hence in the latter case the traumatism and liability to infection are greater. Otto Becker's researches (post mortem) have shown that when iridectomy is done there is always prolapse at the angles of the wound,[2] and the lens capsule, as Mr. Swanzy warns us, is very apt to be trapped in the wound with the combined operation, an accident which never happens with simple extraction. The central and movable pupil, too, of course fulfils its natural function of regulating and excluding rays of light much better than one that has been deprived of a portion of its sphincter, and, as in aphakial animals, compensates for the absence of the lens. If suppuration should threaten after extraction, internal antisepsis, after the method of Vopelius, should be at once adopted.

Nottingham.

[1] See Foerster's Researches.
[2] See his Pathological Anatomy of the Eye.

OBSERVATIONS ON COCAINE ANÆSTHESIA.

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LIKE many surgeons who have much out-patient work, I have for some years past made extensive use of cocaine anæsthesia, and I venture to give my experience of it, for two reasons. The first is because I am convinced that in many cases the solutions, whether used for superficial application or for hypodermic injection, are insufficiently diluted, and the second because, of late, improvements in the composition of solutions for hypodermic use have been suggested.

The scope of the method.—As examples of the kind of operations to which my observations relate I may mention the removal of cutaneous tumours, such as rodent ulcer and sebaceous cysts of the scalp; circumcision; the excision of simple ganglia about the wrist and the ankle; the opening of deep abscesses, such as ischio-rectal and perineal abscesses, in cases where the skin is free from œdema and redness; tenotomies; the excision of tuberculous glands when free from deep adhesions; and also as a superficial application for the removal of tonsils and adenoids in adolescents and adults. The more serious operations are, in my opinion, unsuited to the method on account of unforeseen difficulties and complications which may arise and demand prompt and energetic measures, but in emergencies and exceptional cases—e.g., tracheotomy—cocaine may be used. As an example of the use of the drug in an emergency the case related by Mr. Hartley[1] is of interest; that surgeon successfully tied the external iliac artery after injecting a 2 per cent. solution. In parts to which the elastic band can be applied more latitude for the drug is obtained; thus Bryson,[2] using a 4 per cent. solution, performed double castration after surrounding the base of the scrotum with an elastic ligature.

Idiosyncrasy.—The smallest hypodermic dose which I have observed to produce faintness and nausea was one-tenth of a grain; this was in the case of a man aged sixty-five. I have found that old people are especially susceptible, and it is advisable in every case to have brandy and amyl nitrite at hand. Probably, as is the case with chloroform, degeneration of the heart is the condition most to be feared. The application of cocaine to mucous surfaces has given rise to fatal accidents. It must, however, be borne in mind that many cases attributed to idiosyncrasy have been due to the use of injudiciously strong solutions or to the injection of the drug directly into veins. With proper care, even in regions rich in veins, such as the lower part of the rectum, the method may be safely practised; thus Ricard[3] has operated for hæmorrhoids after producing anæsthesia by a 1 per cent. solution, the needle being plunged deeply into the tissues and gradually withdrawn as the injection was made.

Strength of solutions.—For some years I have employed a 1 per cent. solution for hypodermic injection and a 2 per cent. solution for mucous surfaces, but latterly, influenced by the experience of Schleich,[4] I have diminished the strength of the hypodermic injections. Schleich recommends a solution made up of cocaine hydrochlorate and sodium chloride, of each three grains; morphia hydrochloride, one-third of a grain; distilled water to three ounces—equivalent to a 0·25 per cent. solution. The sodium chloride was added, since it was found to diminish the pain caused by the

[1] THE LANCET, June 22nd, 1895.
[2] Journal of Cutaneous Genito-Urinary Diseases, July, 1895.
[3] Gazette des Hôpitaux, February, 1895.
[4] German Congress of Surgeons, July, 1894.

injection. Bransford Lewis[5] reports that, using this solution, he has found it possible to anæsthetise the corium, but in the deeper tissues the anæsthesia was not perfect. This has been my own experience, and latterly I have used a ½ per cent. solution in removing a rodent ulcer of the nose and in other minor operations with complete satisfaction. It is impossible to keep weak solutions for any length of time without fungi appearing in them; therefore it is preferable to make the solution fresh from the solid drug for each operation. For this purpose Messrs. Allen and Hanburys have kindly made for me pellets, each containing one grain of cocaine hydrochlorate and half a grain of common salt. One such pellet dissolved in three drachms of boiling water gives a sterile ½ per cent. solution, which is cooled by placing the vessel in cold water or on ice. Tested on myself, it produced in one minute complete anæsthesia, which lasted exactly a quarter of an hour. When the elastic band was used the anæsthesia was complete for twenty minutes, and after the band was removed at the end of this time the anæsthesia lasted ten minutes longer.

The method of making the injections.—When injections are made for the purpose of anæsthetising the skin, the corium should first be filled with the solution. This is accomplished by using a very fine needle and introducing it almost parallel to the surface of the skin. A few drops are injected, causing a slight wheal to appear, and after a pause of a few seconds the needle is pushed further, and the process is repeated until the whole of the corium is infiltrated. The subcutaneous and deeper tissues are to be treated in a similar way. This method has been described in detail by Schleich, but it has been used by many surgeons, including myself, for years. The merit of showing the anæsthetic effect of fluids injected into tissues so as to cause pressure on the nerves, and the suggestion of making the addition of common salt to solutions of cocaine, apparently belong to Schleich. There is, however, a limit to the desirable degree of infiltration. If the wheal produced by the entry of the fluid into the tissues is very tense the parts remain tender and the skin red for over twenty-four hours.

The elastic band.—As the result of a personal experiment I can say that for the first five minutes the band gives rise to but little discomfort, but after that the discomfort increases, until at the end of twenty minutes I was glad to get it off. In an operation which can be completed within fifteen minutes the band is not necessary, but in old people it is advisable to apply the band until after the chief incisions have been made, so that the tendency to absorption of the drug is diminished. In some cases the band is required in order to secure a wound unobscured by blood. If the band is used for more than a quarter of an hour tenderness and redness follow in the part which has been subjected to the action of cocaine.

Other details.—It need hardly be mentioned that perfect antiseptic precautions should be observed, yet some cases have come to my notice in which subcutaneous abscesses &c. have followed hypodermic injections of cocaine. These have been due to the lack of simple precautions. An ideal syringe should be capable of being placed in boiling water with the other instruments, and at the same time should be perfect as a hydraulic machine. The syringe I have used for some years without any mishap answers the second, but not the first, of these requirements. By using it solely for the one purpose, and by cleansing it with a 5 per cent. carbolic solution before and after each operation, it has been kept aseptic. It is also kept in an air-tight metal case, which keeps the piston moist. The instrument was made for me by Mr. T. Hawksley, who has also brought to my notice two other instruments—one with a solid steel piston fitted with cork; this can be placed in boiling water without detriment, but the cork fittings would, in my opinion, be liable to wear and become defective; the other is the instrument used for mercurial injections in syphilis—it has platino-iridium needles and an ingenious rubber piston (the latter would prevent its being sterilised by heat). A perfect syringe has, I think, yet to be found.

Substitutes for cocaine.—Lucas Championnière has recently suggested guaiacol dissolved in olive oil as a substitute for cocaine. I have tried on myself a solution of thirty grains in one ounce of olive oil, and find it produces anæsthesia, but causes considerable swelling; and, whilst in the central part of the swelling there is anæsthesia, there is much smarting at the peripheral part of the area into which the fluid has been injected. The smarting lasts much longer than the anæsthesia. I am not, therefore, inclined to try this drug on patients.

Old Cavendish-street, W.

[5] Journal of Cutaneous and Genito-Urinary Diseases, July, 1895.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

TWO CASES OF REVOLVER ACCIDENT.

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A LAD aged seventeen years was admitted into the Roya Infirmary, Newcastle-on-Tyne, on Feb. 6th, 1895, in a very critical condition, his left chest being full of pus, the result of a pistol accident fourteen days previously. Over the apex of the heart there was a small entrance wound; the ball was lodged in his chest. The apex-beat was felt under the right nipple. Thirty ounces of pus were at once drawn off by aspiration, and three pints were drawn off the next day by the same means. On the following day, the lad being much improved, the chest was incised and drained without chloroform; thirty ounces of pus escaped. On May 10th a portion of the seventh rib was removed to permit of better drainage. On June 6th the lad left the hospital in a fairly satisfactory condition, gaining strength, in good spirits, and with about one drachm of discharge daily escaping through the tube.

Remarks.—One interesting point in the case is, Where is the ball lodged? The lad never spat any blood; fluid quickly accumulated in the chest after the accident, but without marked symptoms, apparently, till the quantity was very large, and on admission he was too ill to have his chest incised or to take chloroform. Two weeks after leaving the infirmary he had a troublesome attack of hysteria, during which he refused food and had to be fed by the stomach-pump, resisted being dressed, had retention of urine, bit and scratched and kicked, and altogether behaved like a maniac. The attack lasted some four or five days. Since then his progress towards recovery has been satisfactory, and he is now strong and well.

Since writing the above I have had a second patient under my care suffering in a similar manner. A lad aged seventeen years was admitted into the Royal Infirmary on Dec. 22nd, 1895, suffering from internal hæmorrhage, the result of a bullet wound received two hours previously. While the patient's father was explaining to him the action of a revolver the weapon exploded and the ball entered his abdomen a little above the pubes; it could be felt lying under the skin of the left buttock. On opening the abdomen it was found to contain a large quantity of blood. The bladder was full of clot, and there were four perforations of the small intestine. The ball had passed out of the pelvis through the left sacro-sciatic notch, injuring an artery in its neighbourhood, probably the gluteal or a branch of that vessel. The bladder and abdomen were freed from blood, and an attempt was made to find the wounded artery, but this was unsuccessful, and at last the common iliac artery was ligatured. The injured gut was resected and the ends sutured, Allingham's bobbin being used. The ball was then extracted and a large drainage-tube introduced into the pelvis from the buttock wound alongside the bladder. The peritoneal cavity was carefully sutured so as to shut it off as completely as possible from the bladder, and the wound closed. Transfusion of hot saline fluid was performed during the operation. The lad rallied and was able to give a full account of the accident. At 4 A.M. on Monday, Dec. 23rd, however, he began to sink, and died during the morning. This is the second serious revolver accident which has been treated at the Royal Infirmary during the last few months. In the other case, reported above, a youth aged seventeen accidentally shot himself with a toy revolver, the ball entering his chest over the apex of the heart; empyema followed, from which he has only just now recovered.

Newcastle-on-Tyne.