

clavian. The orifice of the carotid is occluded, not by the clot, which is very thin at that point, but by adhesion of its sides due apparently to the pressure of the mass.

Vessels.—The subclavian artery is completely divided at the site of the ligature, which was applied about one-eighth of an inch on the distal side of the superior intercostal artery. It terminates abruptly, preserving its calibre to the end, and its wall at this point is but little thicker than elsewhere. All its branches, except the internal mammary which was not found, are pervious and not noticeably enlarged. There is no clot on the proximal side of the ligature. The distal portion is adherent at its end to the anterior surface of the first rib.

The carotid is narrowed and occluded, but not divided at the seat of the ligature, being represented at that point by a short fibrous cord smaller than the vessel. It is slightly dilated for an inch above its origin, and somewhat contracted in the half inch adjoining the ligature on each side. The seat of the ligature is about an inch below the angle of the bifurcation. Within the proximal portion is a red, firm clot, a little thicker than a match, extending from the origin of the artery to the ligature, and adherent at those two points, but not adherent elsewhere. This clot is apparently formed of blood that had been imprisoned in the vessel, either by the ligature, if the origin of the vessel was closed at the time of the operation, or by the closure of the orifice at some time subsequent to the operation. No collateral branch could be found on the proximal side of the ligature. An adherent clot occupies the distal portion, extends a short distance into and occludes the internal carotid. The external carotid is patent.

The internal jugular vein is occluded by adhesion of its walls where it crosses the front of the aneurism; and at its junction with the subclavian is an adhesion in the centre of the vessel, one-eighth of an inch in diameter, uniting the anterior and posterior walls. The subclavian vein is pervious.

Brain.—There is a spot of softening at the posterior third of the internal capsule on the right side.

Lungs.—Phtisical cavities were reported in both apices.

ARTICLE XVIII.

THE "PATHFINDER," A NEW INSTRUMENT FOR FACILITATING THE DIAGNOSIS AND TREATMENT OF STRICTURES OF SMALL CALIBRE. By STUART ELDRIDGE, M.D., Surgeon to the General Hospital of Yokohama, Japan; late Lecturer on Anatomy, Medical Department, University of Georgetown, Washington, D. C.

In operating upon or examining tight, eccentric, or tortuous strictures, or those complicated by false passages, or sacculated urethra, the primary object of the surgeon is, or should be, the passage of a whalebone guide, for, when this is once in position, any other instrument required may be safely passed upon it. An experience in the management of urethral strictures, so considerable as to include nearly two hundred operations of internal urethrotomy, has taught me, however, that the insertion of a

guide is by no means invariably an easy matter; the very elasticity and flexibility, which constitute its chief merits, prevent us from intelligently varying the position of its point as regards the face of the stricture, so that seeking in this manner for the opening of the canal is but a blind process at best. At one sitting we may be fortunate enough to enter at the first trial, while at the next, hours may be spent in vain efforts to detect an opening.

Various expedients have been suggested from time to time, as assisting in the operation, such as filling the urethra with guides, or passing a large open tube to the stricture so as to distend the face of the contraction, and allow free movement to the guide. These, and other measures, are often of much use, but something more is needed. The desideratum is an instrument which will enable us to explore, systematically and in succession, each individual point of the face of the stricture, and, when an opening has been detected, to record its position, in reference to the urethral axis, so that it may be found again with little delay or trouble. The instrument shown in the figure enables us, at least approximately, to fulfil these indications.

The instrument (Fig. 1) consists essentially of three tubes, the outer (A) including an enlarged and squared portion, serving as a handle, being nine inches long, and of a calibre which will fairly distend the average healthy urethra, viz., twenty-five millimetres circumference. This outer shell rotates freely upon a second concentric tube within, save for one centimetre of its length, at the point (B), which is fixed to the inner tube. A third tube, of diameter just sufficient to allow of the easy motion within it of an ordinary whalebone guide, is adjusted in the second tube in such manner that while its upper extremity is fixed and projects above the top of the instrument (C), its lower opening, which is nearly flush with the end of the lower tubes, is movable from the axis of the instrument outward to its circumference, or *vice versa*. The lower end of the outer tube is closed by a slightly convex diaphragm (D D), a slot in which (E), allows of the reciprocating motion of the small tube. A dial with milled edges (F), divided into twenty-four degrees, is fixed to the top of the inner large

FIG. 1.



tube, which it serves to rotate and by means of an index rising from the outer tube (G), serves to point out the position of the slot which moves with it. A thumbserew (H) above the dial controls the reciprocating motion of the small tube, one turn of the thumbserew moving the lower end of this tube one-half a millimetre outward or inward as may be desired. The small dotted circles in slot E of the figure show some of the innumerable possible positions of the part. The result of these arrangements is that the lower end of the small tube may be made to describe a series of concentric circles against the face of the striature, varying in diameter by one millimetre or less, and that each point in the circumference of any and every circle may be successively tested for an opening by the whalebone guide (shown in three positions in the figure as the dotted outlines 1 1). An opening once found, the position of the dial, and the number of turns made by the thumbserew may be noted, when at any future time it will be possible to place the guide tube in a corresponding position, and to again pass the whalebone with but little loss of time.

I have found the instrument in practice to perform all that I expected from it; false passages are avoided with ease and certainty, while contracted and ordinarily inaccessible channels are found quickly and repeatedly; the only departure from mathematical exactness in the action of the instrument, and the records of position taken from it being due to the necessary slight play allowed to the whalebone guide within its tube, and to the movable and elastic nature of animal tissues. It may occasionally be found necessary slightly to incise the meatus, in order to pass the instrument, but this fact can hardly be considered as an objection to its use, in view of the many advantages gained. An accomplished maker, however, will, I think, be able to construct the instrument in such a manner that the shaft shall be of smaller calibre than as shown, while the tip (B) can be changed for smaller or larger sizes as may be required, the rest of the instrument, and its mode of action, remaining as now. In the vast majority of cases, however, the present form will be found suitable.

I call the apparatus a "Pathfinder," but should it be deemed worthy of a higher-sounding title I would suggest the name *Eisodozete* (*εἰσοδος*, an entrance, *ζητεω*, I seek), as sufficiently pedantic. As I have necessarily been my own constructor as well as designer, I have sent working drawings of the instrument to Messrs. Tiemann, of New York, who will no doubt be able to furnish it on demand.