AN AIR-TIGHT TROCAR FOR THORACENTESIS.*

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For the evacuation of pleural fluid by aspiration or siphonage a trocar, with lateral outlet, presents certain advantages over an ordinary needle. The needle may become plugged during its introduction into the chest or during the withdrawal of fluid, and must then be removed to dislodge the obstruction if the danger of artificial pneumothorax and possible infection of the pleura are to be avoided. Its unprotected point, moreover, may wound the expanding lung or the diaphragm. A trocar so constructed that air can not enter the chest on the withdrawal of the stilet not only guards against artificial pneumothorax and possible infection of the pleura, but also prevents the exit of pleural fluid from the body of the instrument before a stopcock can be turned.

Of the different trocars now in use Fraentzel's¹ and Potain's² are the most satisfactory. Potain's instrument

is less cumbersome and more easily cleaned. In Fraentzel's trocar the lateral outlet is protected by a stopcock. In Potain's instrument the stilet passes through a conical tube and an airtight connection is maintained by contact. Such a joint is insecure and the conical tube may be disconnected accidentally during the withdrawal of the stilet or other manipulation of the instrument.

To combine the advantage of a stopcock on the lateral outlet, as in Fraentzel's trocar, and to obviate the insecurity of a joint by contact of the conical tube with the body of Potain's trocar I devised the trocar here shown.

Air-tight trocar for thoracentesis, one-half actual size.

The addition of a stopcock to the lateral outlet permits the introduction of the trocar into the chest before it is connected to rubber tubing for aspiration or siphonage. It also allows a change to be made from one apparatus to another during the evacuation, if this is desired.

A small cap C, through which the stilet S passes, can be securely screwed to the base B of the instrument. The accidental detachment of the stilet and its holder is thus avoided. Although the stilet and cap can be removed from the base after the puncture is made and the stopcock A turned it is an advantage to allow the stilet, withdrawn to its full extent, to remain. The stilet is then less likely to be misplaced or contaminated and can more readily be reinserted to dislodge fibrin or other material which may plug the cannula.

The entrance of air and the exit of fluid are prevented by a rubber washer W. This may be made by cutting a section from a piece of rubber tubing of an appropriate diameter to fit the compartment X and the lumen of which is of approx-

imately the same caliber as the stilet. Owing to the shape of the compartment, the degree of approximation of the washer can be varied at will by the tightening or release of the screw of the cap.

For the cannula an internal diameter of 2 millimeters and a length of 7 centimeters are most convenient. The cannula can be unscrewed (at y) from the body of the instrument and replaced by another of different size. If cannulas of different size are used, to each a separate stilet and cap must be fitted.

A COVER-SLIP HOLDER.

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This holder was devised and made to fill the want of a suitable piece of apparatus to hold a large number of cover-slips while staining. It consists of four upright brass posts rising from a flat, square base, each post being securely fastened in a corner of the base, and of some twenty or thirty square bands or hoops of brass fitting snugly around the four posts, part of one side of each band having been cut away. The base should project slightly beyond the four posts, so that the bands when placed over and around the posts will rest on it. Cover-slips, either singly or in pairs, with back to back, can be placed between each band, the corners of the cover-slips projecting between the posts. When in position the cover-slips are a sufficient distance apart to allow the stain to run in between them.

The various stains can be kept in glass cylinders just large enough to receive the apparatus and the loaded holder can be lowered into one of these glasses, tilting the glass as far as possible to one side to let the air bubbles run out through the openings in the bands; these opening should preferably be superimposed one above the other. Cover-slips can not fall out after being placed in position, and there is not the slightest tendency for them to get broken.

The holder shown in the cut is for use with $\frac{3}{4}$ inch square cover-slips; for larger sizes a larger apparatus would be necessary. It would, perhaps, be possible to construct a triangular holder with three posts for staining round cover-slips, but these are seldom used in blood work, the squares being much better for making spreads.

I have stained spreads in this holder with hematoxylin and eosin very successfully, and even Wright's stain can be used with good results and with a considerable saving of stain. I have put in one glass, pure undiluted Wright's stain, and in another glass the properly diluted stain, and then have transferred the holder from the first into the second. The stain in these two glasses can be used again several times, so that it is possible, with but very little stain, to prepare a great many cover-slips. With this apparatus 35 c.c. of solution is sufficient for staining fifty cover-slips simultaneously.

Cover-slip holder for staining a large number of cover-slips simultaneously.

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1. Fraentzel: Berl. Klin. Wochschr., 1874, No. xii.

2. The instrument generally known as Potain's trocar is figured and described by Fraenkel (Handb. d. phys. Therap., Part II, vol. i, 1902, p. 438).