THE ESTIMATION OF BLOOD PRESSURE BY MEANS OF THE SPHYGMO-OSCILLOMETER.

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So much has been done of late on blood pressure, and so many advances have been made in methods for the estimation thereof, that it may be useful to describe an instrument which presents several interesting features.

The sphygmo-oscillometer is an instrument which recently has been devised by Dr. V. Pachon, Chef du Laboratoire de Physiologie in the Faculty of Medicine of Paris for the clinical estimation of blood pressure, and the study of the variations which occur in the cardiac cycle as manifested by the pulse wave.

The instrument is shown in Fig. 1, and its mechanism is explained in Fig. 2.

It consists of a rigid and air-tight metallic box *E*, which contains an aneroid chamber *c*. At the beginning of an experiment the box *E*, the aneroid chamber *c*, and the armlet *B* are in direct communication with one another by means of the three-way passage *f*, *b*, *a*.

The pump *P* is used for establishing a given pressure throughout the combined system; the reading of the pressure at a given moment being indicated by the manometer *M*, the graduations of which correspond to centimetres of Hg; an escape valve *v* allows the pressure to be reduced at will; *s* is a separator or key which on being depressed closes the india-rubber tube between the box *E* and the aneroid system, thus allowing pulsations set up in the armlet *B* to be transmitted direct to the registering needle *l*. In order to determine the blood pressure of an individual the armlet is applied most conveniently to the forearm just above the wrist, and the atmospheric pressure in the entire system is raised to a point likely to be above the maximal or systolic blood pressure. The separator is then pressed down and the needle *l* watched. If no deflection occurs, the atmospheric pressure is too high, and it is lowered about 1 cm. at a time by opening the screw-valve *v*. On no account must the separator be touched whilst the valve is open.

The maximal or systolic pressure is indicated by the pressure at which the needle first shows definitely increasing oscillations.

Having read off this number, which is registered in centimetres of Hg on the manometer scale, we next proceed gradually to lower the pressure.

The oscillations will be seen to increase in vigour until a point is reached at which they are of maximal intensity.

The number of divisions of the scale over which the needle *l* swings gives the amplitude of the pulse.

It is at this moment that the separator should be kept pressed down for a short time, and the character of the pulse as shown by the behaviour of the needle studied.

Irregularity, dicrotism, missed beats, and the effects of respiration, etc., may be demonstrated with great facility.

Finally, the pressure is gradually lowered until a sudden diminution in the size of the oscillations is observed; this is the diastolic pressure.

What advantage has such an instrument over those already in use? One great advantage is the absence of the personal equation. Those who have worked with instruments of the Riva-Rocci type must have been struck with the difficulty that is sometimes experienced in determining the exact moment at which the registering finger can no longer distinguish the pulse. This difficulty may be made still more marked if two observers perform the experiment, one of whom is engaged in watching the sphygmomanometer whilst the other is occupied solely with feeling the pulse.

With the oscillometer there is no such difficulty, as the disappearance or reappearance of the pulse is indicated by the needle. The following experiment would seem to suggest that the finger is not to be entirely relied upon to indicate the pulse.

The oscillometer should be used exactly as a Riva-Rocci instrument—that is to say, the armlet should be applied over the brachial artery and the finger on the radial pulse.

The separator and registering needle are to be ignored. The pressure is raised gradually until the pulse is no longer felt. If the separator be now depressed, the registering needle will be seen to oscillate freely, and an increase of pressure equal to a varying number of centimetres of Hg will be required to abolish the oscillations.

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It may be noted that, whereas with the Riva-Rocci instrument the pressure is applied over the brachial artery and the pulse felt at the wrist, with the oscillometer the pressure and the indication of the pulse wave take place at the same point.

In this preliminary communication I do not propose to enter into further details, but I hope to publish a longer paper as soon as I have been able to work out more fully the clinical results to be obtained by the use of this instrument.

I desire to express my thanks to Dr. Pachon for his courtesy in personally explaining to me various points in connexion with this work, and to Mr. Boulitte, the constructor, for the loan of the blocks illustrating the oscillometer.

AN International Congress of Pathology is to be held in Turin in 1911. The date will probably be the last week in September.

Fig. 1.

Fig. 2.