

centage of pepsin inhibition may be obtained. Resting peptic power cannot be determined with the alternative method.

Summary and Conclusions. Simple procedures have been described whereby the amount of active pepsin, the percentage of

pepsin inhibition and the resting peptic power can be obtained when used in combination with the test for total pepsin. The test employs a nephelometric method to determine the diminution of an albumen substrate after digestion.

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An Electro-Magnetic Sphygmograph* of New and Simple Design.

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While there are several more or less satisfactory mechanical devices adapted for the transcription of pulse pressure waves from superficial arteries (carotid,[†] radial,[‡] digital[§]), excellent results are not always easily attained. The adaptation of the electro-magnetic principle here described, while simple, seems to present a sturdy as well as a foolproof device. The chief assemblage includes a 200 ohm, single Button Model W carbon granule microphone[¶] of excellent sensitivity which, by the adaptation of a short rod fixed upon its diaphragm, is held or strapped over a suitable throbbing artery serving in place of a dispatching tambour. It is to be noted here that its

function is the reception *not* of sounds but of the pulse pressure waves as such, and it acts as a variable resistance to the passage of an electric current. Thus the resistance is caused to vary inversely with the differential pressure throbs of the artery. At the recording end of the electrical circuit in this assemblage, a permanent cylindrical alnico magnet, $\frac{3}{8}$ " in diameter and 5" long is fixed in an upright position, supported upon an adjustable iron stand. About the magnet is placed an ordinary 6" test tube with bottom removed, upon which is wound about 200 turns of 28 gauge cotton covered magnet wire of approximately 1.7 ohm total resistance; each end of

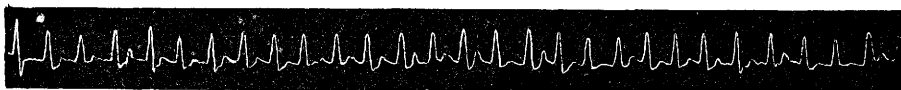
Normal radial



Slow closure
of carotid



From femoral



* Acknowledgment is here made to Dr. R. E. Vollrath of the Physics Department for his interest and helpful suggestions.

[†] Usual assemblage of two Tambours in series.

[‡] The Dudgeon Sphygmograph.

[§] See A Simplified Digital Sphygmograph, Baldwin, F. M., *Science*, N. S. **69**, No. 1792, May, 1929.

[¶] Manufactured by Universal Microphone Co., Inglewood, Calif.

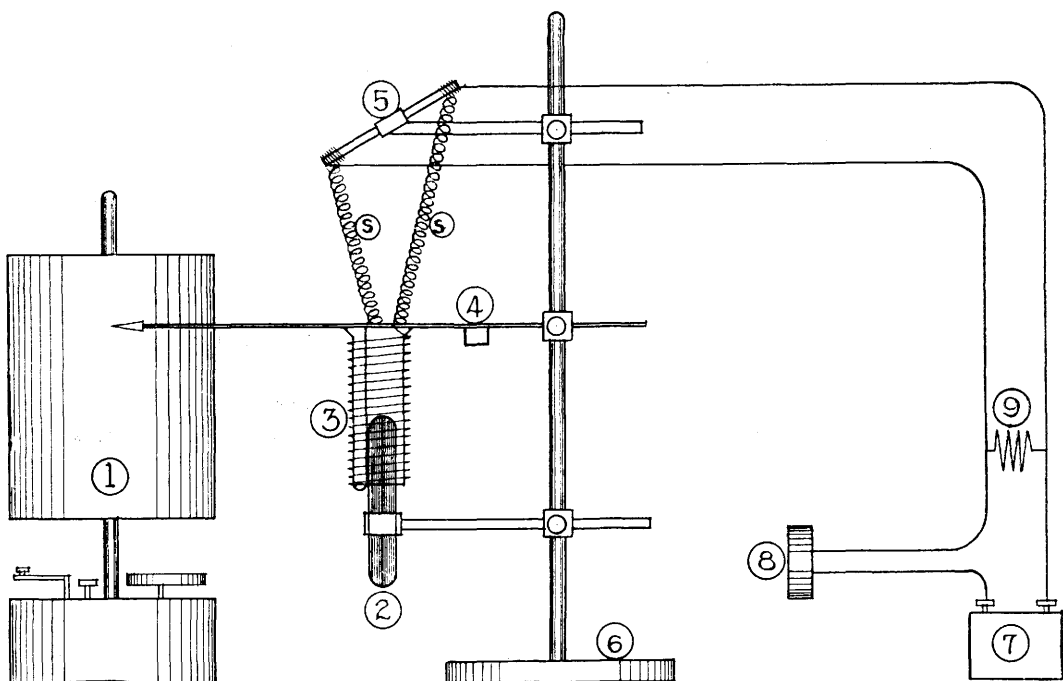


FIG. 1.

The Electro-Magnetic Sphygmograph. 1. Drum. 2. Permanent magnet. 3. Coil on bisected test tube. 4. Writing lever. 5. Horizontal bracket. 6. Stand. 7. D.C. battery. 8. Microphone. 9. Resistance. S. Suspension springs.

the wire being coiled somewhat tightly to serve as an elastic mounting of the tube and its coil. The ends of the wire constituting the coil then serve as supports as well as terminals through which the current passes. One pole of the D.C. battery is connected to one end of the wire mounting; the other battery pole is connected through the microphone to the other terminal. A 5 ohm resistance is placed in parallel to act as a damping device. A light heart lever is mounted upon the iron stand and its writing point is brought against the Kymograph beyond the coil upon which it rests. The actual transcription results from the following considerations:

With increasing pressure of the artery, the

decreasing resistance of the microphone permits a proportionally greater current ($I = E/R$) to be delivered to the coil. This greater current causes a proportionally increased magnetic flux through the recording coil but in the opposite direction to the field of the permanent magnet. This opposition literally lifts the coil and gives an upswing to the writing point and produces on the actual sphygmogram and anacrotic limb. Since the drop off of the throb creates differential currents through the microphone, also the catacrotic limb with its most minute variable phases are faithfully transcribed. The essential details of the assemblage is shown here in Fig. 1.