irregularities recorded at the higher dilutions are not infrequent, especially after the virus has been standing.

For the present the proximate purification here proposed has found wide use in our work. This in no way minimizes the pressing importance of a highly purified virus product, if obtainable, with its attending biochemical possibilities; yet it is always possible that purification beyond a certain point may lead to inactivation.

6811

A Modification in the Thermostromuhr Method of Measuring Flow of Blood.

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The proper construction of the unit applied to the blood vessel is fundamental to the success of the thermostromuhr method of measuring flow of blood. Rein[1] developed the thermostromuhr and named the unit the diathermy thermo-element. This diathermy thermo-element is U-shaped and requires the use of collodion to hold it firmly on the blood vessel during an experiment. It is very satisfactory for short-time observations, but is less so for experiments in which the unit is to be kept on the blood vessel for several days.

Since it was obvious that a drop of collodion could not be expected to hold the unit to the blood vessel firmly enough to insure good electrical contact when the animal was allowed to run about, it was necessary to construct a unit better suited to such conditions. Consequently the unit described here was developed.

The dimensions of each particular unit depend on the size of the blood vessel to which it will be applied. Several units of varying sizes must be at one's disposal in order to permit the selection of the one which best fits the particular blood vessel. For a vessel the diameter of which is somewhat larger than 5 mm., the specifications for the transparent bakelite block are: length 19 mm., width

[1] Rein, Hermann, *Die Thermo-Stromuhr. Ztschr. f. Biol.*, 1928, **87**, 394. In: Abderhalden, Emil, *Handbuch der biologischen Arbeitsmethoden.* Berlin, Urban and Schwargenberg, 1929, **5**, **8**, 692.

8 mm. and height 7 mm. The length of the block is determined by: (1) the distance from platinum electrode to thermojunction, which must be at least 1.2 times the diameter, that is, 6 mm. in this case; (2) platinum electrodes, which for this particular vessel are 4 by 4 mm., and (3) allowing 1.5 mm., at each end for suture holes.

The width and height are determined by the diameter of the hole into which the blood vessel is inserted (in this particular case 5 mm.), and by the thickness of wall necessary for sufficient rigidity and for countersinking the 4 leads.

After the bakelite block is cut, a hole 5 mm. in diameter is drilled lengthwise somewhat eccentrically so as to allow sufficient space on one side for countersinking the rubber tubing which insulates the lead wires (Fig. 1). Before cutting the slit at the top

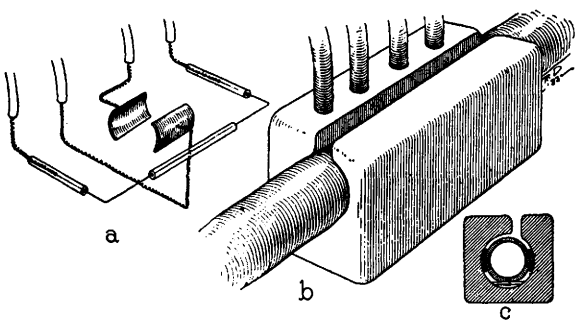

FIG. 1.

The modified diathermy thermo-element. *A* shows the wiring only. The constantin wire is represented by straight lines and the copper by coiled; *B* shows its application on a blood vessel; *C* shows a cross section of the blood vessel as it fits against the electrodes (platinum plates) and on a thermojunction.

of the unit through which the blood vessel is slipped, the various grooves necessary for inserting the differential thermocouple circuit and the wires leading to the heating plates are made. A detailed description of the latter process may be found in a previous paper[2]; the only change in technic is the curving of the heating plates to fit the curvature of the unit before inserting them. The electrical wires may be sealed in the bakelite block with resin or bakelite cement. The latter was used with the hope that it would permit sterilization of the unit by boiling. However, the problem of sterilization of the unit has not thus far been solved satisfactorily.

The most satisfactory method of sterilization was accomplished by enclosing the wire leads from the unit in a piece of rubber tubing

[2] Herrick, J. F., and Baldes, E. J., *Physics*, 1931, **1**, 407.

1 cm. in diameter. This was boiled for 15 minutes while the diathermy thermo-element was held outside of the sterilizer. Subsequently the unit was washed with water and green soap, after which it was submerged in a 1:400 solution of merthiolate for 15 minutes.

The new design does away with the use of any material for holding the unit on the blood vessel (Fig. 1). After the blood vessel is carefully isolated, it is momentarily collapsed and slipped through the slit in the top of the diathermy thermo-element. This modified diathermy thermo-element rides on the vessel, maintaining electrical contacts in spite of any movements of the animal. Holes may be drilled in the corners or sides of the unit for suturing it firmly so as to keep it from slipping along the blood vessel.

This modified diathermy thermo-element is much easier to manipulate and can be applied in considerably less time than the original unit. It has been found particularly convenient for measuring flow of blood in the thoracic portion of the inferior vena cava where movements with large amplitude occur. These units are applied, employing the usual sterile surgical technic and ether anesthesia. After the effects of the anesthesia have worn off, the flow of blood returns to normal and measurements of the flow may be carried on for several days. Undoubtedly the measurements under these conditions may be said to be more nearly normal than those made by any method thus far developed.

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Development of Transplanted Rat Eggs.

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The first experiments employing transplantation of mammalian eggs were reported by Heape[1] more than 40 years ago. He transferred the eggs of an Angora rabbit into the uterus of the Belgian hare. Similar work is reported by Hammond[2]. As a part of the program of work on the development of the rat, this experiment has been repeated as a test for egg viability and its capacity for continued development. The transplantations were performed between

[1] Heape, *Proc. Roy. Soc.*, 1890, **58**.

[2] Hammond, *Verh. d. 1er Internat. Kaninschenzüchten-Kongr.*, 1930.