A New Mercury Manometer for Student Use

R. E. Ranney

Department of Physiology,
University of Colorado, School of Medicine, Denver

A new approach to the design of a mercury manometer system for direct blood pressure recording to replace the time-honored, but often erratic, glass U-tube manometer has resulted in a much more student-proof apparatus in which the unique physical properties of plastics have been utilized.

Construction. Figure 1 shows the complete manometer-pressure bottle system.[1] The manometer is made of a single block of lucite, in which is bored a right-angular version of the traditional U. The float is accurately machined of hard rubber to fit one manometer bore, so that mercury creepage is minimized. A lucite float shaft guide is turned to fit snugly into the top of the vertical bore. Nipples, cemented into the other vertical bore and into a connecting hole drilled on the side of the manometer, furnish connections through vinyl tubing to the pressure bottle and to the arterial cannula. A mounting bracket is fashioned by hard soldering a triangular plate to a length of brass rod.

The pressure bottle unit consists of a bottle holder, a valve-and-pressure-tube assembly, and a 16-oz polyethylene bottle. The bottle support is made by bending a piece of stainless steel into a U-shape, which is welded to a stainless steel base. A brass bar, tapped to provide threads for a screw, is attached to the open end of the support. A round pressure plate is fitted to one end of the screw. A knurled knob is attached to the other end.

The valve-and-tube assembly consists of a rubber stopper through which are passed two lucite tubes, 2 and 12 in. in length, respectively. The longer tube is connected to the manometer. Over the upper end of the shorter tube is placed a simple "squeeze" valve consisting of a short length of rubber tubing in which a glass bead has been placed. The valve-and-tube assembly is clamped in the top of the pressure bottle by the bottle cap through which the tubes extend.

Application. After a base line has been established, the arterial blood pressure of an experimental animal may be approximated by screwing in the pressure plate, which consequently increases the pressure in the system. To flush the system, the pressure plate is advanced as far as possible, the tube between manometer and bottle is clamped, and additional air is introduced into the bottle by withdrawing the pressure plate and simultaneously squeezing the ball valve.

The manometer may be modified for electrosensitive paper recording by placing a binding post, which contacts the mercury, in the manometer near the base of the U and by extending the wire shaft completely through the float. These modifications provide a low-resistance path for the current from power source to recording paper.

[1] The author will furnish a more detailed description of this apparatus to anyone interested in duplicating it.

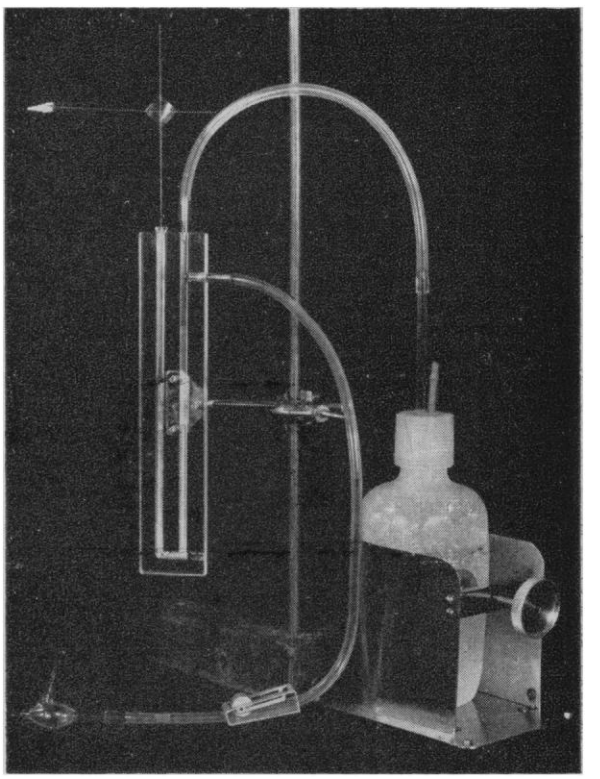

FIG. 1. Plastic mercury manometer and pressure bottle system.

Characteristics. One of the outstanding advantages of this manometer is the complete interchangeability of parts. Floats, float guides, and manometers are all machined to the same specification and need not be matched to fit. In addition, the one-piece design and absence of fragile extensions have resulted in a long estimated useful life for each manometer. Finally, the few working parts of the entire system decrease the chance of failure.

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Further Investigations into the Modification of Radiation Sensitivity Afforded by Cobalt

W. Parr, T. O'Neill, S. Bush, and A. Krebs

U.S. Army Medical Research Laboratory,
Fort Knox, Kentucky

In light of recent developments in the clinical usage of cobalt (*1*) and its ability to modify radiation sensitivity (*2, 3*), it appeared desirable to investigate the possible effects resulting from the utilization of cobalt under various conditions of administration.

Four hundred female Swiss-Wabster albino mice (25 ± 1 g) were divided into four groups: group A,