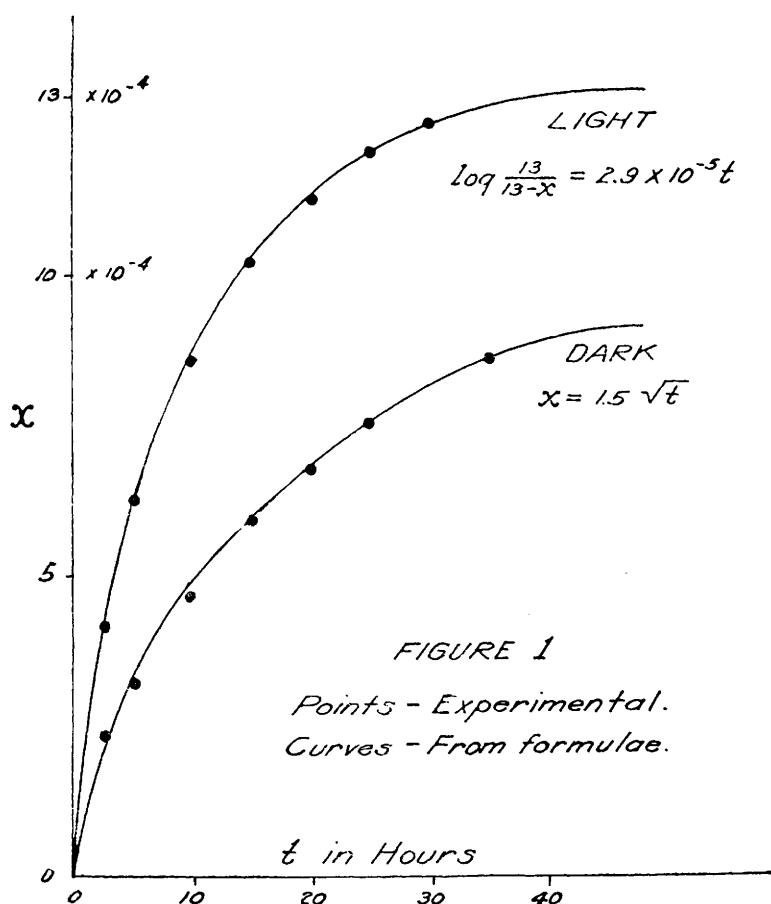




81 (2604)

A method for recording continuous blood pressure.

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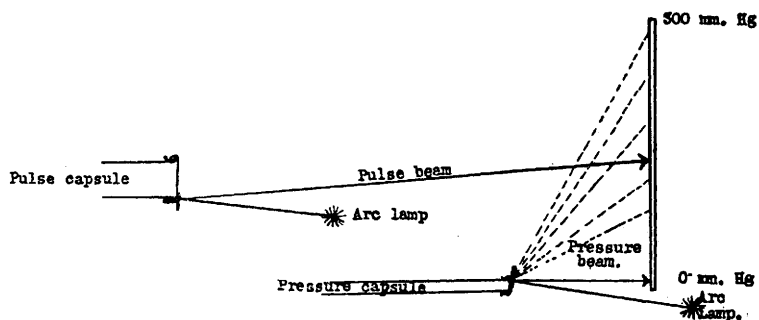
With the usual apparatus used in clinical study, such as the blood pressure manometer or the Erlanger capsule recording on a smoked drum, the pressure changes in the cardio-vascular system

can not be followed accurately. The inertia of the apparatus and the variation in the elasticity and responsiveness of the different instruments give inaccurate or asynchronous data.<sup>1</sup>

The application of the Frank capsule method to the study of pressure has been to record pressure curves or pressure gradients by means of an optical system consisting of a mirror on the rubber capsule, reflecting a beam of light.<sup>2</sup> Its immediate responsiveness and accuracy are extremely efficient.

By a simple means of adaptation, it can be made to record with extreme sensitiveness the amount of blood pressure over a continuous period of time. The rubber dam stretched over the end of a piece of metal or glass tubing is made so tight as to resist pressure up to 300 mm. of mercury. The band of light reflected from the mirror on the capsule is so arranged, directed over the slit of a camera, that its excursion from 0 to 300 mm. of mercury pressure should range from one end to the other end of the slit in the camera. The position of the band of light at any point across the moving film represents a known, previously standardized, amount of pressure (Figure I).

FIG. 1.



This system is connected with a blood pressure cuff and with a mercury manometer. When the blood pressure cuff is inflated and deflated alternately, it records a zig-zag line on the moving film of the camera.

At the same time, another Frank capsule is connected with

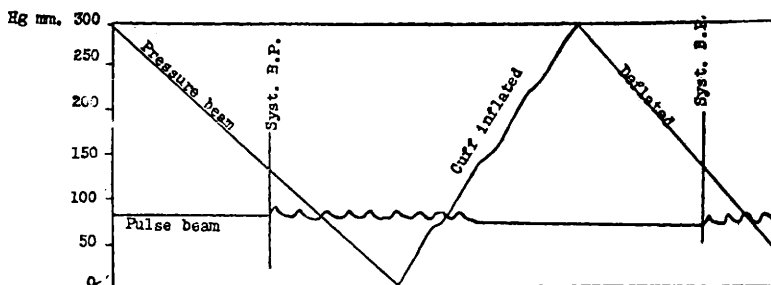
<sup>1</sup> Frank: *Ztschr. f. Biol.*, 1903, xxvi, 445; 1908, xxxii, 309; 1910, xxxv, 429, 545; 1911, xxxvii, 547.

<sup>2</sup> Wiggers, C. J.: *Arch. Int. Med.*, 1915, xv, 77; *Jour. A. M. A.*, 1915, lxiv, 1485.

the radial or brachial pulse below the cuff by means of a glycerin capsule. The pulse wave appears as another beam of light on the film. It is recorded as a wave when the pressure in the arm cuff is below the systolic point, and as a straight line when the pressure rises above the systolic point. Each time the pulse reappears, the systolic pressure is known from the position of the pressure beam on the film.

A series of these observations is made in sequence, and the point of appearance of the pulse curve can be plotted. This will show the blood pressure variation every few seconds. Diagrammatically, this is represented in Figure II.

FIG. 2.



This apparatus can be utilized to note the changes of blood pressure during and immediately following exercise. The patient's arm must, of course, be at rest as in working a bicycle ergometer. The correctness of the clinical tests based on pulse rate and pressure changes during and following exercise can be analyzed with absolute precision by this method. The controversies in this field are abundant. The physiological basis for the findings has not yet been definitely determined.