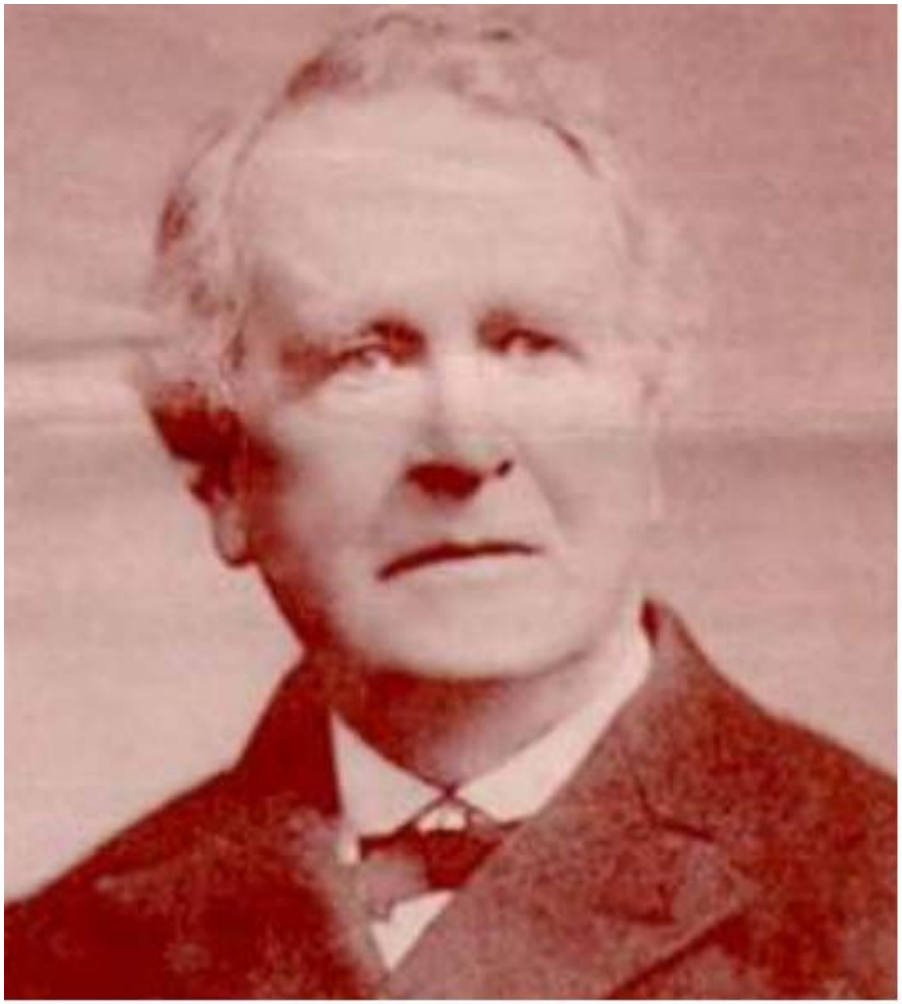


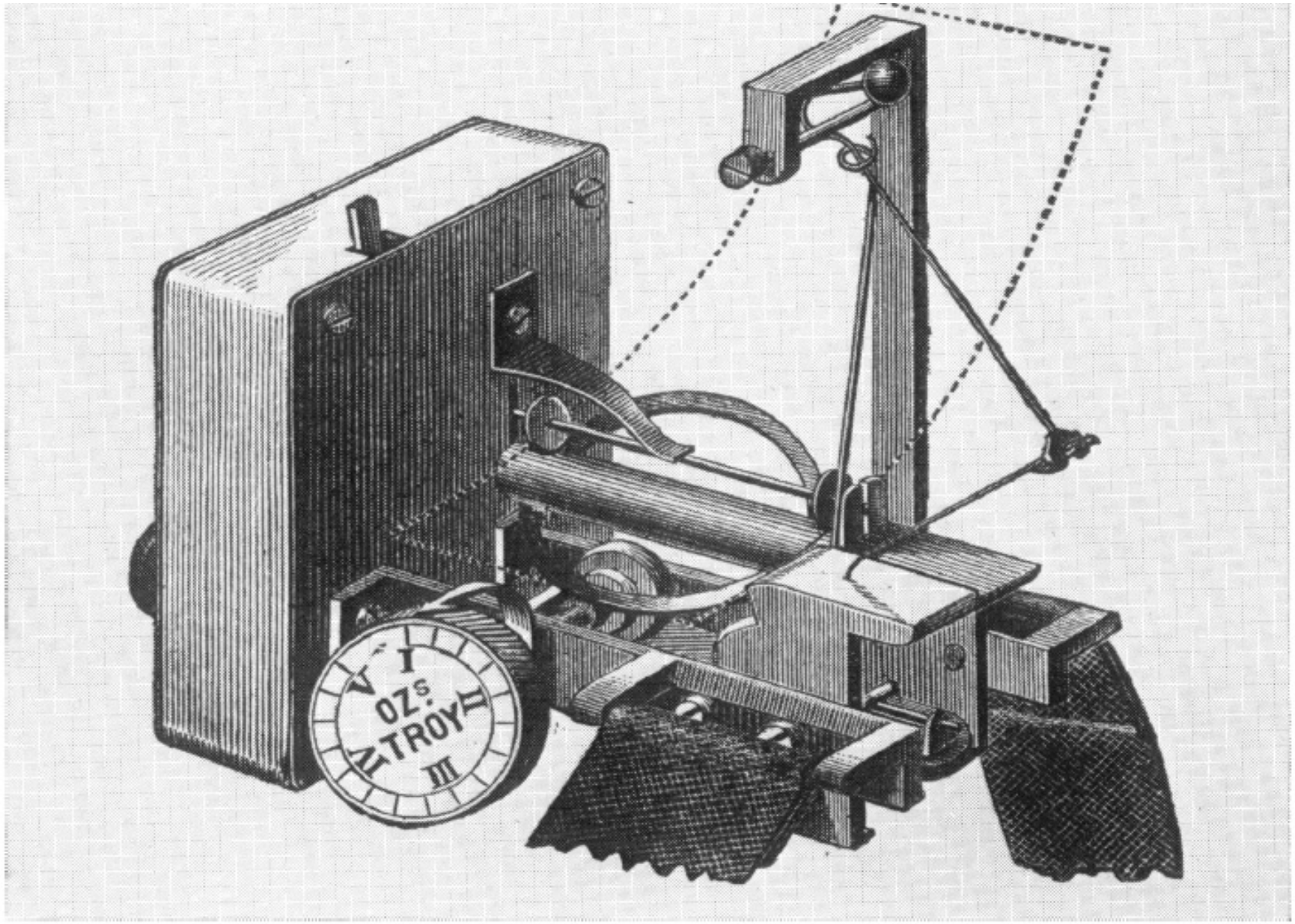


Figure 2.
A Dudgeon sphygmograph. From L. Landois, *A textbook of human physiology*, translated by William Stirling, 4th ed., London, Charles Griffin, 1885, vol. 1, p. 131. (*By courtesy of the Wellcome Trustees.*)

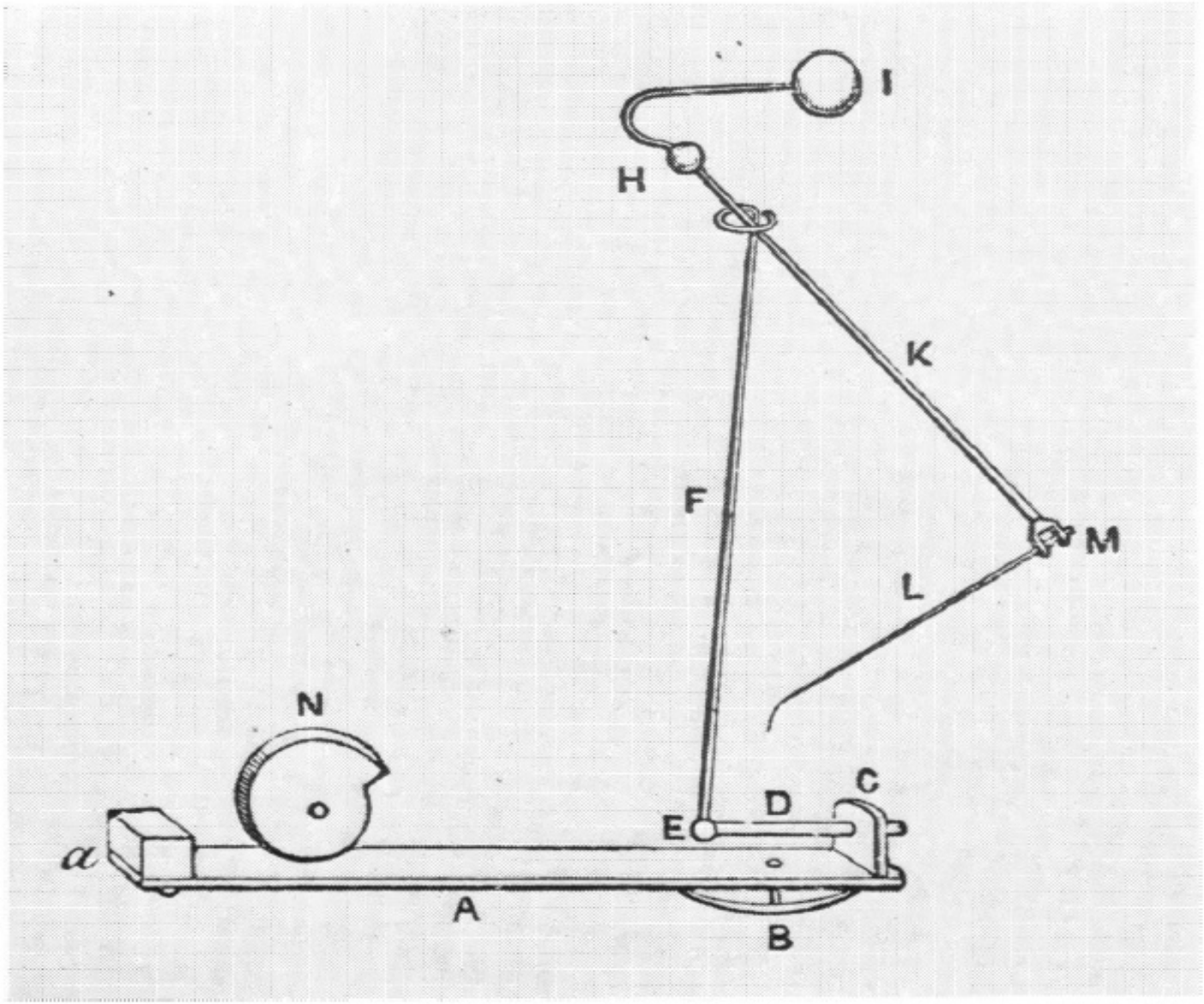


Figure 3.
Schematic representation of the mechanism of a Dudgeon sphygmograph. From R. E. Dudgeon, *The sphygmograph,* London, Bailliere, Tindall & Cox, 1882, fig. 2. (*By courtesy of the Wellcome Trustees.*)

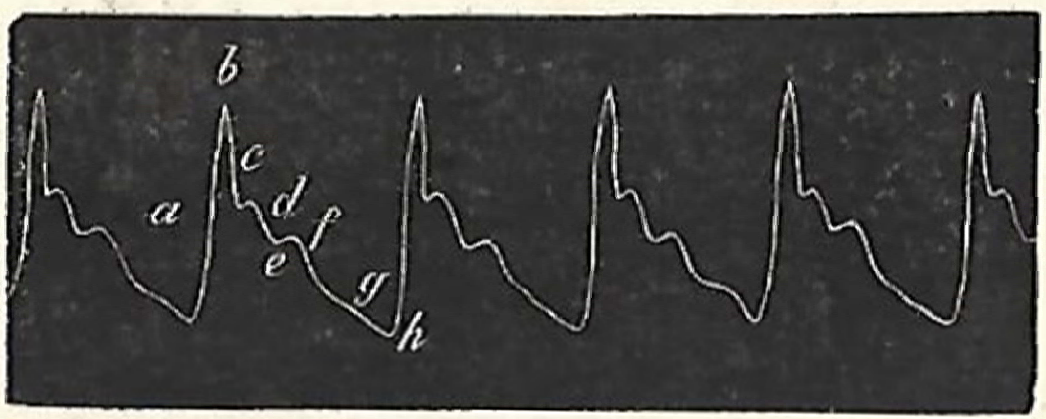
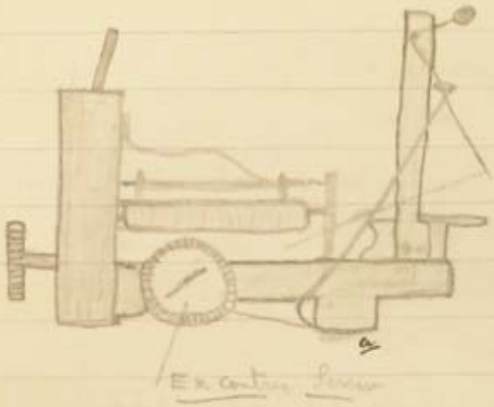
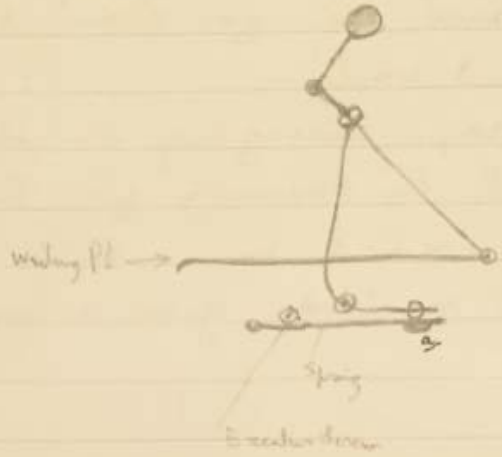


FIG. 3.—Pressure 2 oz.

Dudgeon's Sphygmograph.





Dudgeon's Sphygmograph.

This is an apparatus for making a pulse tracing. A strip of blackened paper is carried under the writing lever by two revolving rollers.

The arrangement of the levers ~~this~~ working the writing pt are shewn in fig.

Spring a is placed over radial artery the pulsations of which cause the levers to move.

Make a tracing from both the right & left radial arteries.

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NEWCASTLE, N.S.W.

Dudgeon's Sphygmograph.

Sphygmogram.

Radial arteriogram

(a) Percussion wave.

Presystolic or pretidal waves

(b) Tidal wave.
(Predicrotic wave.)

Systolic decline.

(c) Aortic notch (Dicrotic notch)
[closure of aortic valve.

(d) Dicrotic wave.
Rebound of pulse wave following closure of aortic valves.

Anacrotic limb.
catacrotic limb.

Ohm's Law

$E = i.R$

or, better: $\Delta E = i.R$.

In the human circulation (since, at rest in the horizontal position, the mean right atrial pressure is approximately 0mmHg) this can be written as:

$BP = Q.TPR$ where

BP is mean systemic arterial pressure

Q is cardiac output (or regional flow)

TPR is total peripheral resistance (or resistance of a regional vascular bed)

Alternatively, since *flow* is the critical variable, it can be recast:

$Q = BP.G$ where

G is the conductance of the relevant vasculature

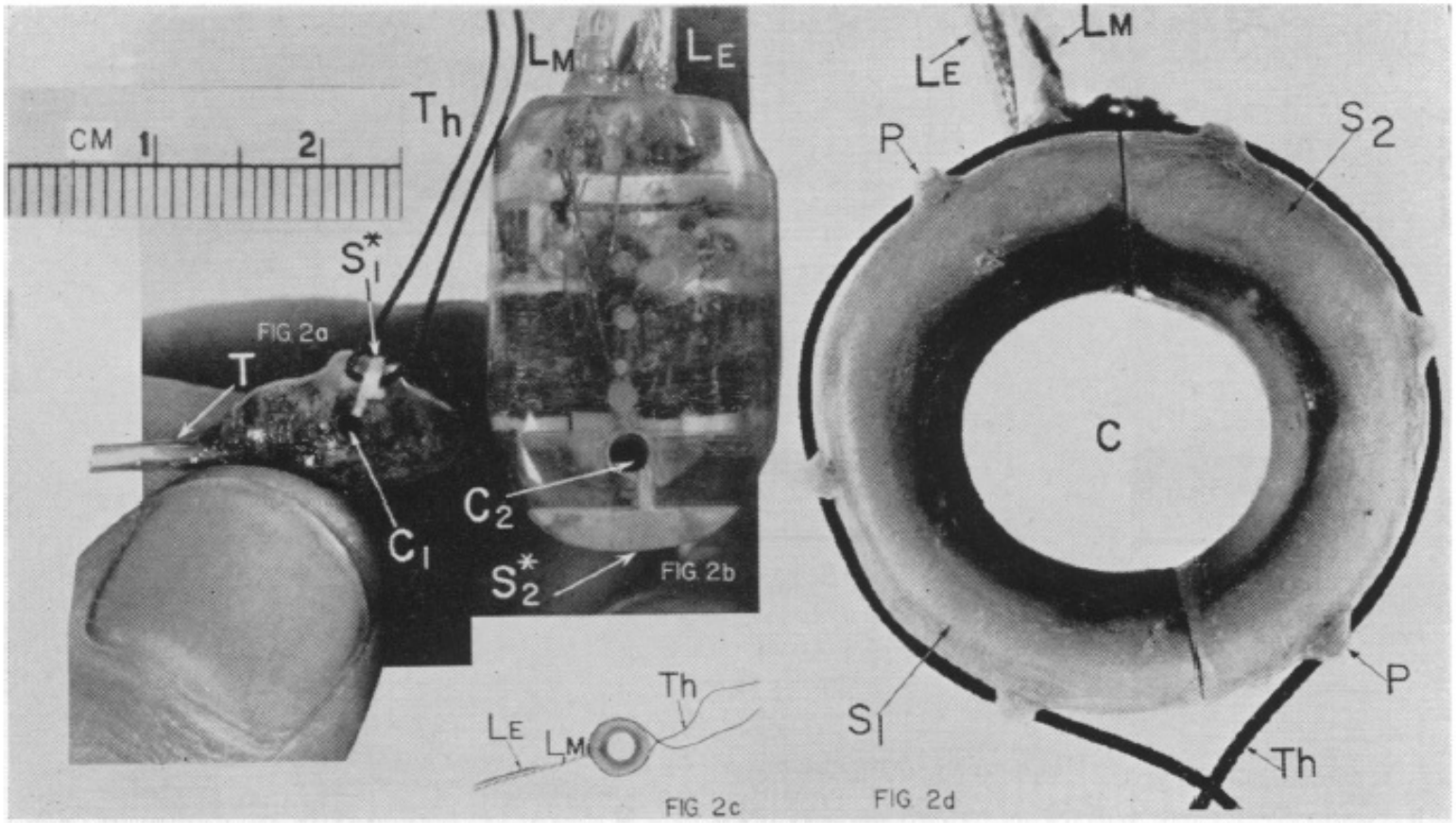


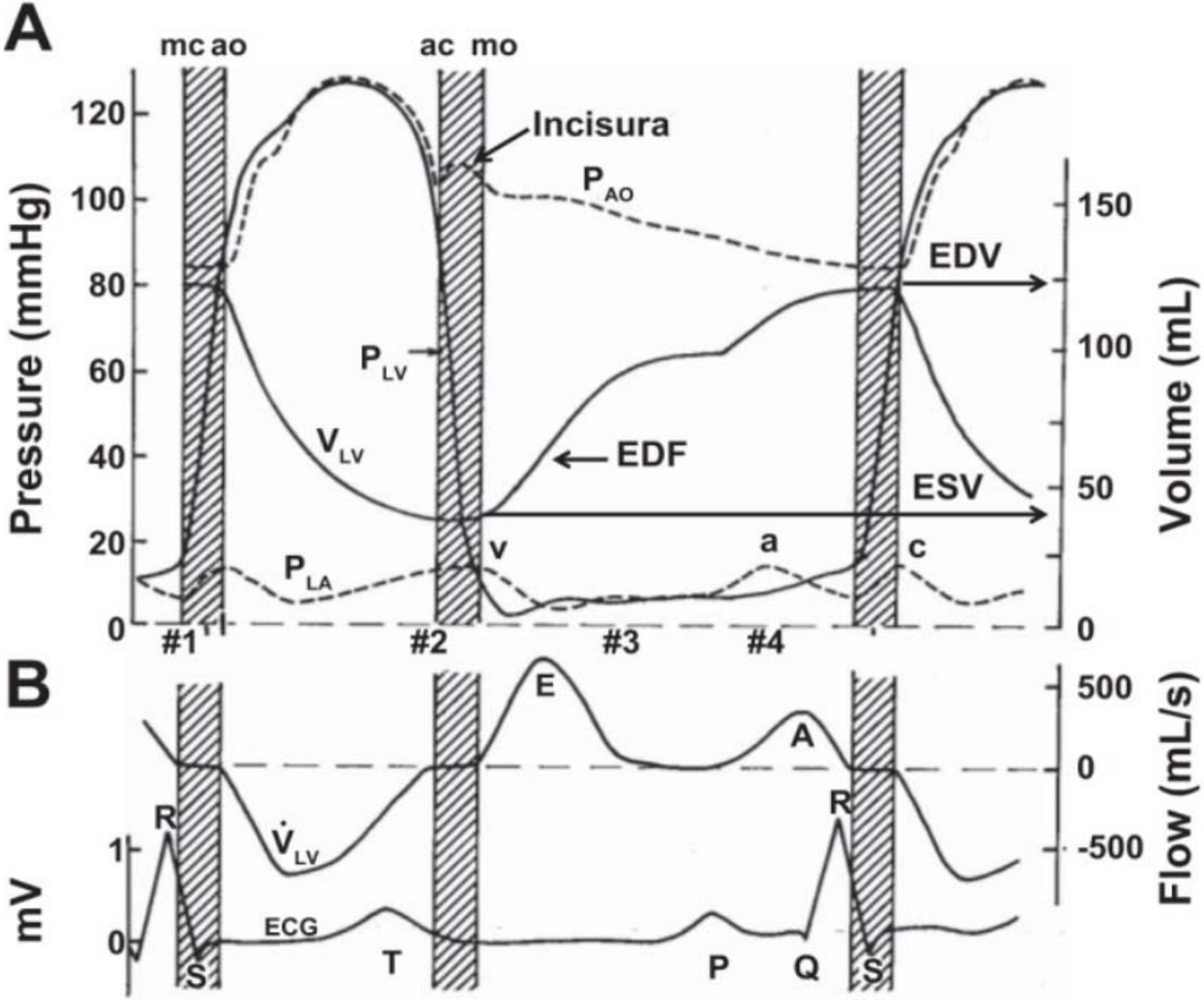
FIG. 2.—Comparison between different designs of implantable blood flow meters.

(2*a*) Subminiature unit for an artery 1.5 mm in diameter. T, polyvinyl chloride tubing containing the leads; C_1, channel for insertion of the blood vessel; S^*_1, shutter closing the slit through which the blood vessel is inserted into the channel C_1; Th, thread which facilitates handling the shutter S^*_1.

(2*b*) The original design (ref. 7) for a 2-mm blood vessel. L_M, magnet leads; L_E, electrode leads; C_2, channel for blood vessel; S^*_2, shutter.

(2*c*) The coreless flow meter, shown in Figure 2*d* in proper proportion in relation to the units depicted in Figures 2*a* and 2*b*, is shown reduced in size to match the diameter of channel C_1. L_E, electrode leads; L_M, magnet leads; Th, thread.

(2*d*) Flow meter for a blood vessel of 1.5-cm. diameter (shown reduced $^1/_{10}$ in Fig. 2*c*) utilizing no iron core. The bent coreless coils are sealed in plastic material in the two sections S_1 and S_2 which can be separated; the section S_1 contains both electrodes; C is the channel for the blood vessel formed by uniting the sections S_1 and S_2; L_E, electrode leads; L_M, magnet leads; Th, thread which is tied to prevent the sections S_1 and S_2 from coming apart after insertion of the blood vessel; P, plastic protrusions with perforations through which the thread Th is passed.


A
mc ao
ac mo
Incisura
P_{AO}
P_{LV}
V_{LV}
EDF
EDV
ESV
P_{LA}
v
a
c
Pressure (mmHg)
Volume (mL)
120
100
80
60
40
20
0
150
100
50
0
#1
#2
#3
#4
B
E
A
R
R
$\dot{V}_{LV}$
ECG
T
P
Q
S
S
mV
1
0
500
0
-500
Flow (mL/s)

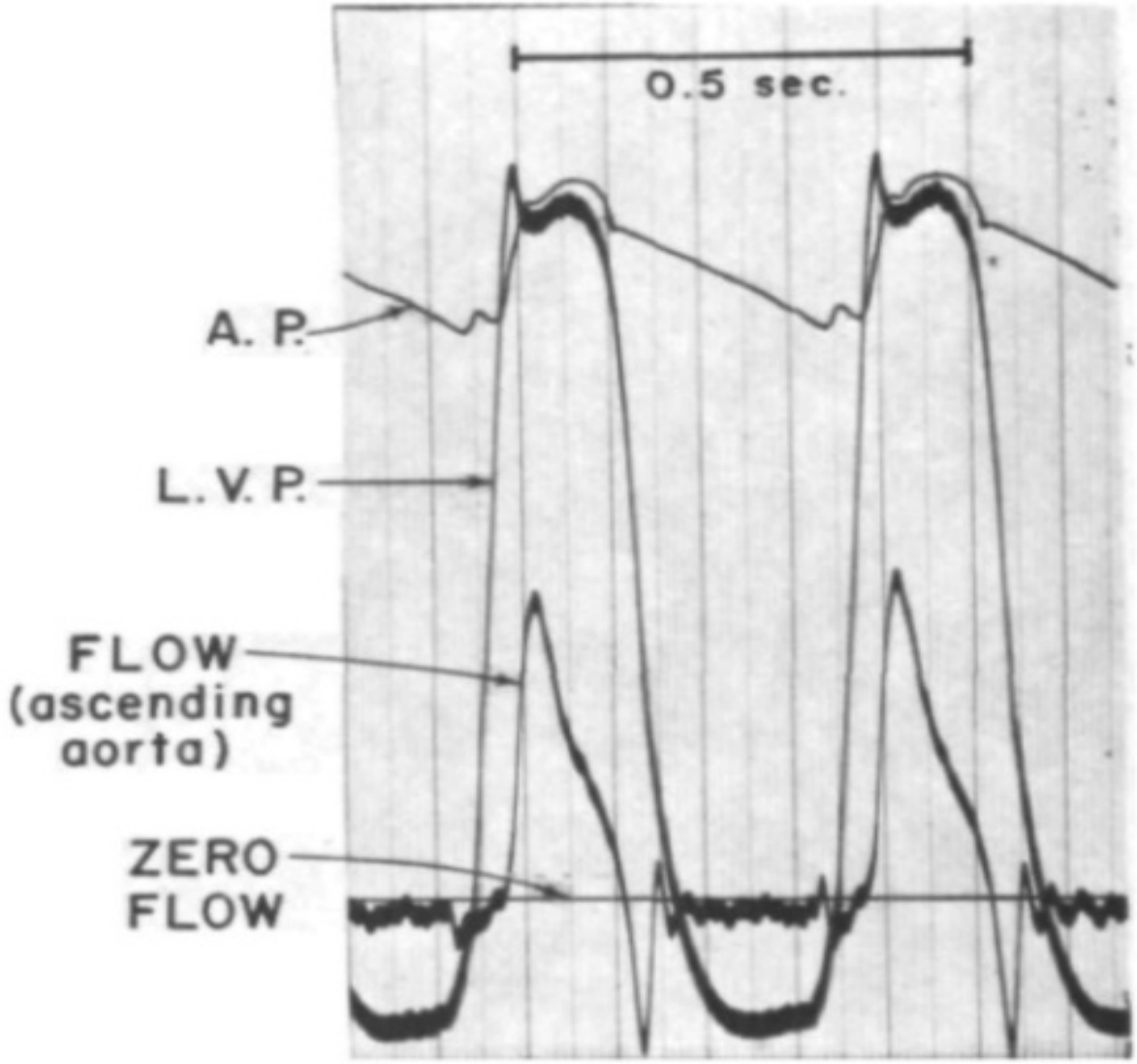


FIGURE 2

Contours and time relationships of aortic pressure (A.P.) and left ventricular pressure (L.V.P.), and the ascending aorta flow. (Superimposed tracings.)

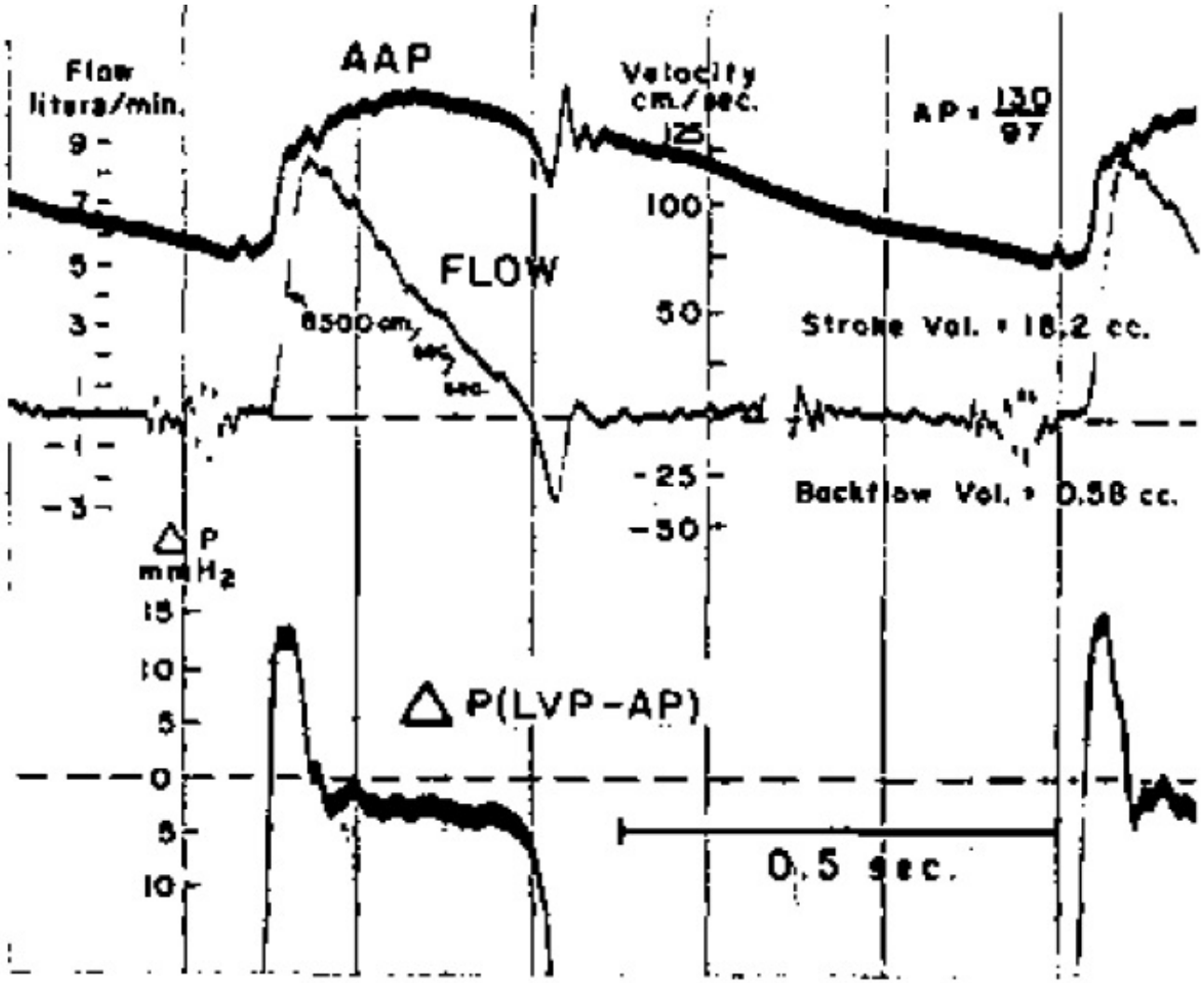
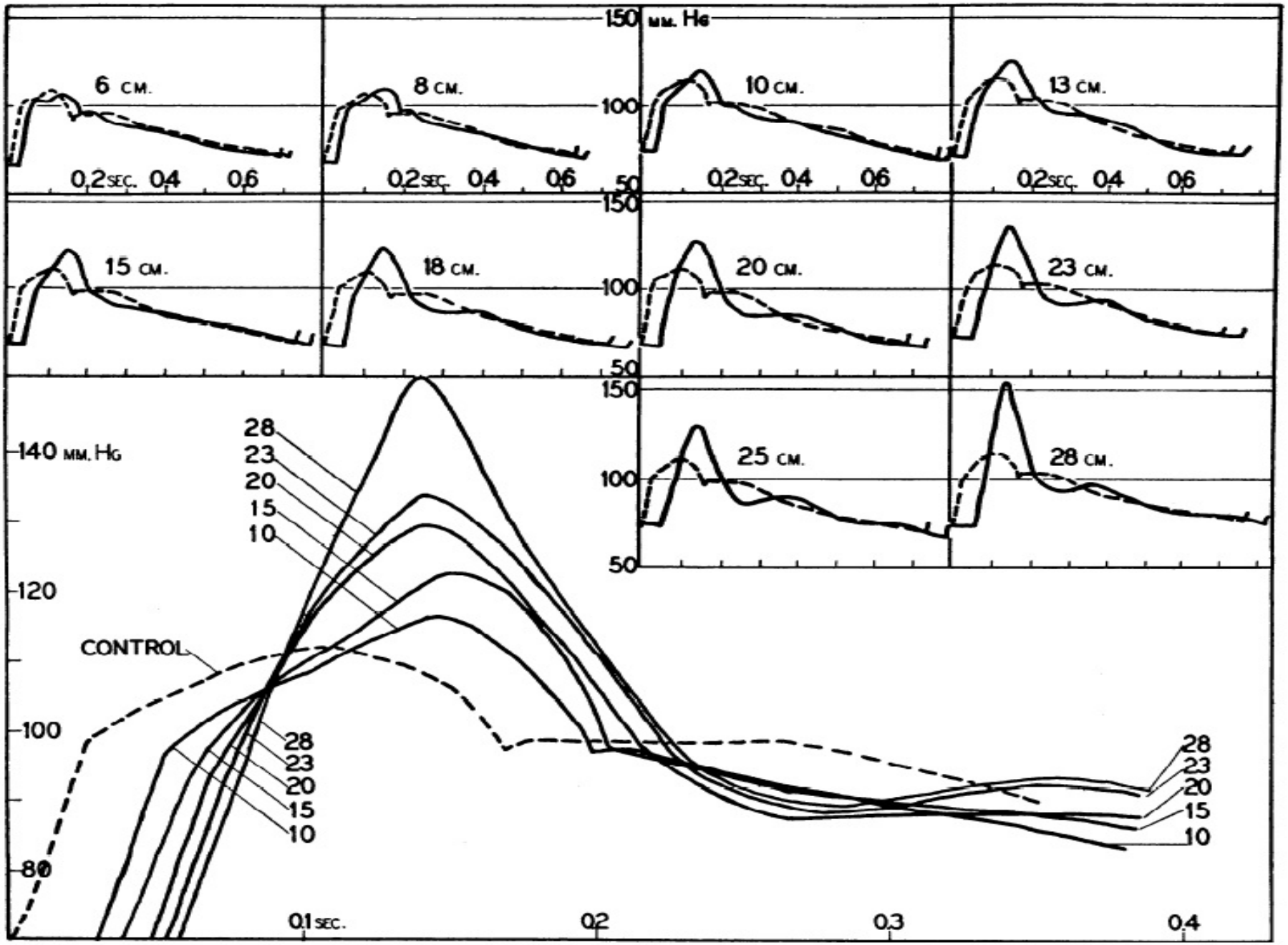


FIGURE 3

Relationship between pressure gradient (ΔP) and flow through the aortic valve. Simultaneous tracings from dog S. Ordinates refer to the tops of the tracing lines.


6 см.
8 см.
10 см.
13 см.
15 см.
18 см.
20 см.
23 см.
25 см.
28 см.
150
100
50
мм. Hg
0,2 sec. 0,4 0,6
140 мм. Hg
120
100
80
CONTROL
28
23
20
15
10
0,1 sec.
0,2
0,3
0,4

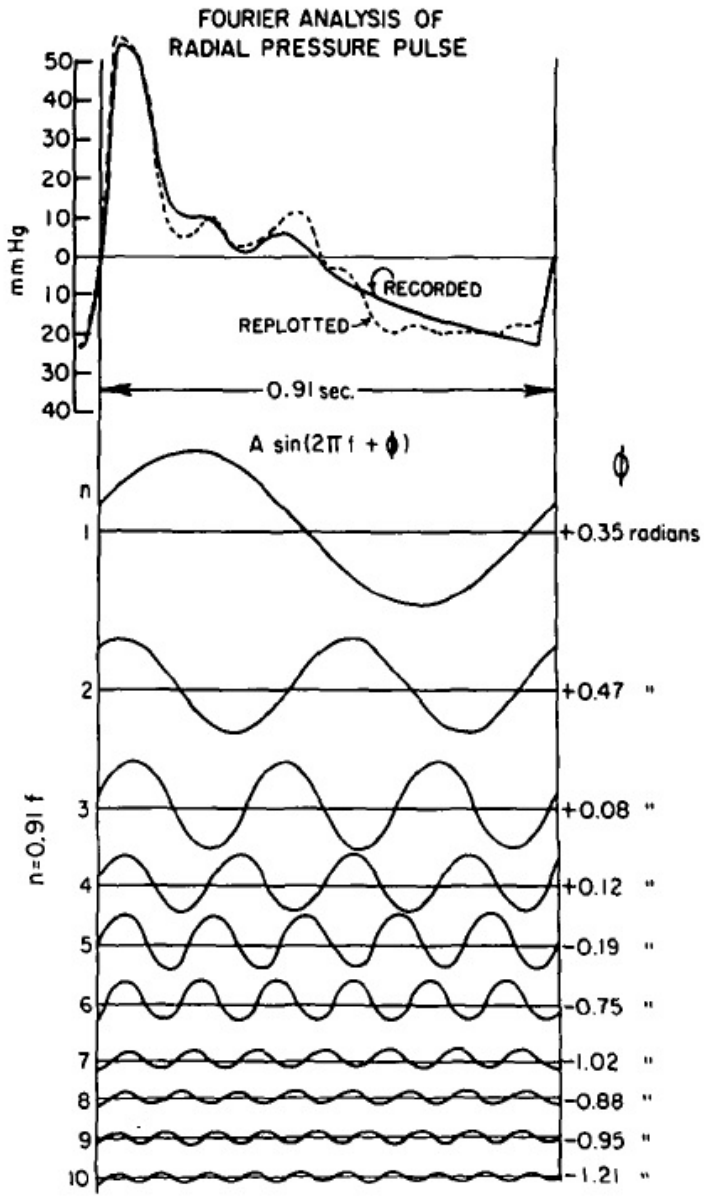


FIG. 2. Recorded radial artery pressure wave with first 10 frequency components drawn to scale. f, Frequency in cycles per second; ϕ, phase angle in radians.

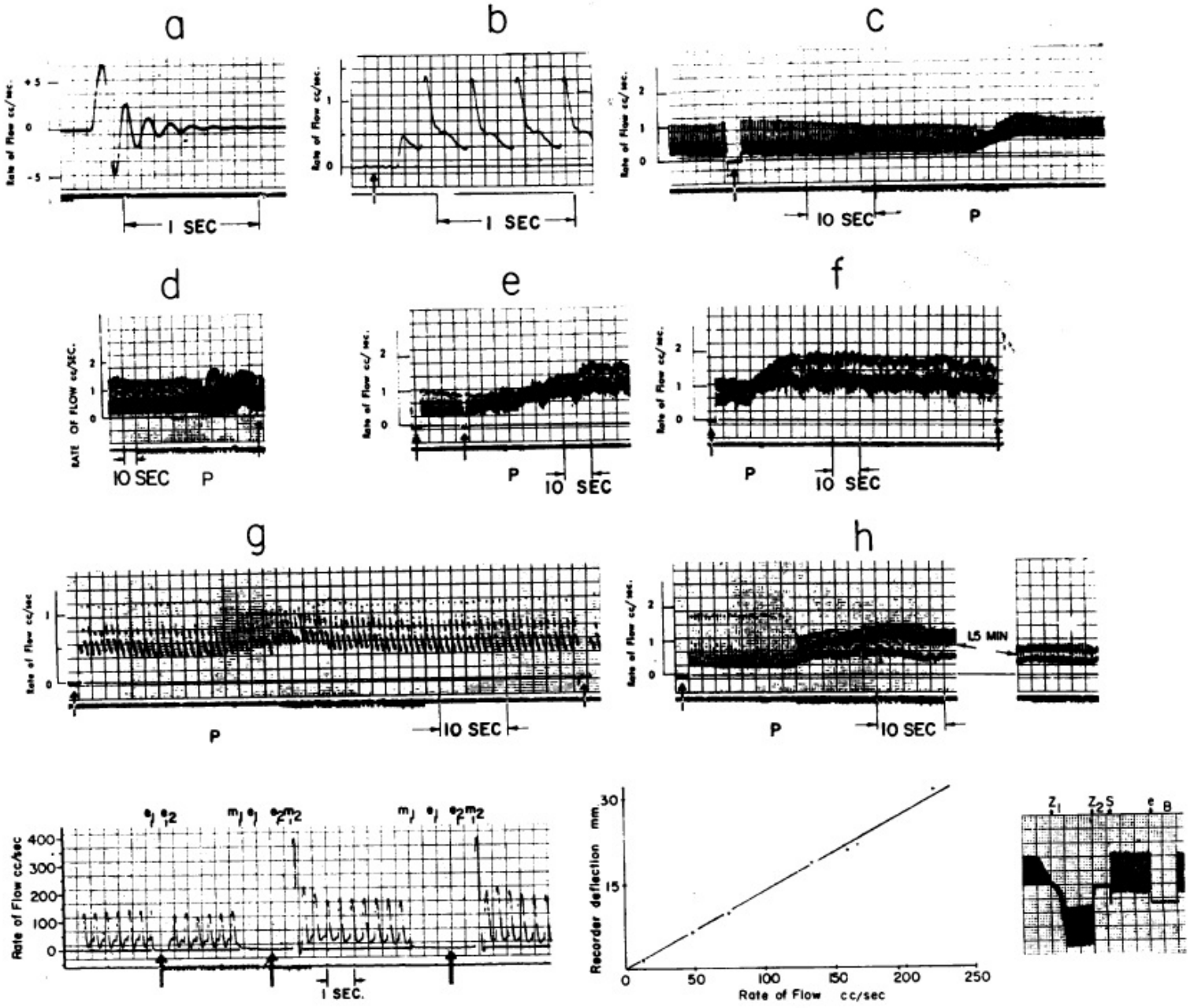


FIG. 3.—Examples of flow records.

(3*a*) Illustration of the ability of the flow meter to record rapidly varying flow in magnitude as well as in direction. This record depicts a damped oscillation of a liquid column in a conduit.

Dudgeon's and Richardson's Shpigmographes

Directions for use

The apparatus is fixed upon the arm as illustrated, the movable button lying under the spring upon the pulse. It is fastened with the two ribbons, so that the deflection of the needle is about 10 mm. Besides, the deflection can be regulated with the excenter on the side — or at the Richardson's apparatus with the adjustable weight, — as, by thick or thin hands, a deflection of 10 to 15 mm will be obtained. The attached paperstrips are smuted, by a gas-flame, for instance, and after having detached the lever on the apparatus, let through between the two rollers, the pulse may be read off the scale, as illustrated above.