change in capacity of the electrometer due to the changed position of the meniscus.

If the original potential of the standard condenser of capacity C_1 is V_1 and after mixture is V, we have for the total charge

$$Q_1 = C_1V_1 = (C_1 + C)\ V = C_1V + Q$$

where C is the capacity of the electrometer in the final position. Q is the charge in the electrometer after mixture. From these equations

$$C = C_1 \frac{V_1 - V}{V}$$

or $$Q = C_1 (V_1 - V).$$

Using the first we may get the value of C, but for comparison of results, we may plot Q against V, *i.e.*, the charge in the electrometer against the potential. Then, if the capacity is constant the graph will be straight, if variable it will be curved.

If the capacity is not constant it should be defined as $\frac{dQ}{dV}$, or as the slope of the Q-V curve. The ordinary definition of capacity at any given potential difference gives the average value over the interval of potential from zero to the final value.

Figure 1 shows the general character of the results of capacity measurement. In most cases for direct charging, with mercury as the cathode, the capacity decreases as the potential difference increases and becomes nearly constant. For reverse charging the capacity always increases and for the larger potentials becomes very large. The slope of the curve is continuous through the origin. In a few cases, the curve for direct charging was concave upward and the capacity increased a little and became constant. In either case the capacity seems to approach a steady value. In all cases where the curve for direct charge is concave upward, the capacity is very high. This form of curve is easily interpreted.

We may regard the electrometer as a system composed of two condensers in series, one at the surface of the mercury in the capillary tube, the other at the surface in the larger vessel. If we call the capacity of the first C_1 and that of the second C_2, the combined capacity is given by

$$\frac{1}{C} = \frac{1}{C_1} + \frac{1}{C_2} \quad \text{or}$$

$$C = \frac{C_1C_2}{C_1 + C_2}$$