

### The Standardisation of Radium Ampoules for Therapeutic Use.

AN apparatus for the routine standardisation of ampoules containing radium compounds and emanation by the  $\gamma$ -ray ionisation method was installed recently at the Institut Curie. It consists, as

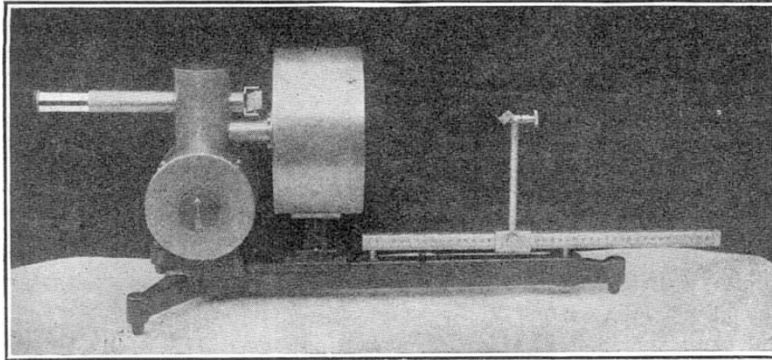


FIG. 1.—Apparatus for the standardisation of radium ampoules (one-tenth full size).

shown in Figs. 1 and 2, of a screened ionisation chamber A connected directly to a gold-leaf electroscopical B. The ampoule to be tested is placed in an aluminium tray on the support C, which can be slid along a graduated rule D. The intensity of the ionisation current is deduced from the rate of fall of the gold-leaf.

A novel feature of the apparatus is the method of charging the electroscopical by means of a variable multicellular condenser E, which obviates the need for a high-voltage battery.

The fixed plates of the condenser are connected to the frame, whilst the movable plates are mounted on a spindle actuated by an ebonite knob. When the condenser is in the position of maximum capacity a projecting finger F brings the movable plates momentarily into contact with the stem H, to which is connected a low-voltage battery (10–20 volts). On turning the movable plates through  $180^\circ$  the same finger comes into contact with another stem J connected to the electroscopical; at this instant the capacity

of the condenser is at its minimum and the potential proportionately increased (about thirty times).

The gold-leaf is observed by means of a microscope K the eyepiece of which is fitted with an angular scale; a small mirror L serves to illuminate the field of the microscope. The ionisation chamber consists of a cylindrical brass box containing a thin aluminium disc M, which is connected to the electroscopical rod N. The end of the box facing the ampoule is closed by a screen consisting of two lead plates each 5 mm. thick.

A modification of the apparatus is used for measuring the radio-activity of ores, earths, etc. The electroscopical, the charging condenser, and the substance to be tested occupy separate compartments of a cylindrical brass box. The radio-active substance is placed on a tray immediately underneath a rounded stem, the upper end of which forms the pillar of the electroscopical. The latter is charged by means of a variable condenser identical with the one previously described, but it can, if desired, be charged independently or connected to a separate ionisation chamber.

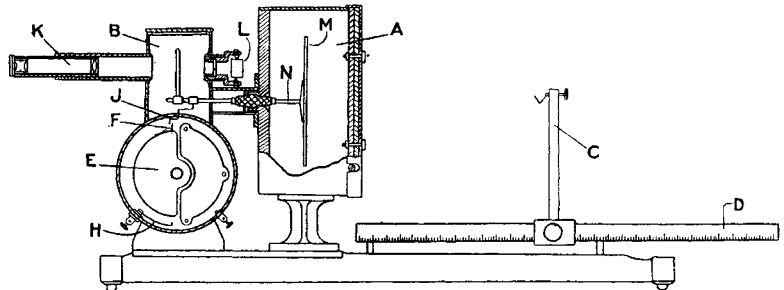


FIG. 2.—Sectional view.

The electroscopical is "earthed" by turning a milled head.

Both instruments were designed by M. Holweck, of the Institut Curie, in collaboration with the manufacturer, M. Beaudouin, Paris.

### Life-cycles of Bacteria.

IN a preliminary communication published in 1916 Dr. Löhnis expressed the view that all bacteria pass through a definite life-cycle, and the present publication<sup>1</sup> is an extensive review of the literature in support of that contention. The volume also includes a chapter on methods, an extensive bibliography, and more than 350 microphotographs of the forms observed.

Briefly, the life-cycle is as follows:—Under certain conditions the cells come together and fuse, forming an amorphous mass—the symplastic stage—in which the protoplasm undergoes a thorough mixing. The symplastic stage is formed not only in cultures in artificial media, but, in the case of the

pathogenic organisms, in the body of the host as well. It forms the connecting link between the various sub-cycles of which the life-cycle of the organism may be composed. All kinds of vegetative cells, as well as all the varieties of reproductive organs described by the author, can give rise to the symplastic stage. From the symplasm the so-called regenerative units always arise, and these either grow into new cells or several of them unite to form new cells directly.

Six distinct types of reproductive organs have been described by the author. These are:—(1) Gonidia, two to four or more in each cell. They are generally motile and slightly more resistant than vegetative cells. Many are filter passers. They grow into vegetative cells. (2) Regenerative bodies, distinct from regenerative units. They are spherical, oval,

<sup>1</sup> Part 1, Review of the Literature (1838–1918). By Dr. F. Löhnis. National Academy of Sciences, Washington, vol. 16, second Memoir. Pp. 252+41 plates.