or geologic earthquakes, and (II) external dynamics earthquakes, which include volcanic and landslide earthquakes, both relatively unimportant. Under (I) are to be found practically all the great earthquakes of history, and these de Montessus subdivides into (1) epeirogenic, (2) tectonic or orogenic earthquakes and (3) epeirogenic and tectonic earthquakes.

The reviewer believes that neither in its plan nor in the allocation of individual earthquakes is the Count's classification satisfactory. The fact that the earthquake of Casamicciola (Ischia) in 1883 was centered on the flanks of the volcano of Epomeo does not show that it was volcanic in origin, for Cassamicciola is well known to lie at the intersection of dislocation lines. It is also difficult to understand why the earthquake of Assam in 1897 or various Chilian earthquakes should be placed in the epeirogenic class, since they occurred either within or close to the zones of mountain growth. The reviewer believes, moreover, that it will in most cases be found impossible to determine in how far epeirogenic movements in the sense employed by de Montessus may or may not be combined with orogenic ones; and that it would have been both simpler and more nearly correct to make of the glyptogenic (better, tectonic) class two subdivisions only, one called orogenic and connected with mountain growth, and the other epeirogenic and not so connected but related to block faulting *per se*.

The Count's isolation, because of his residence in Chili during the last eighteen years of his life when he was preparing the "Seismic Geology," imposed a handicap which was to a large extent overcome by his wide correspondence, by his large personal library and by his intimate familiarity with many European languages.

WILLIAM HERBERT HOBBS
UNIVERSITY OF MICHIGAN

LABORATORY APPARATUS AND METHODS

A CULTURE TUBE FOR USE WITH COLLODION SACS

IN the course of recent studies of bacteria, the associated growth of gas formers and non-gas formers was under observation. It was desirable to cultivate the organisms in the same medium separated by a collodion membrane. After several tests, the method of preparing permeable membranes, as described by Gates,[1] was followed. This method, if carefully followed, gives excellent results.

For anaerobic non-gas formers the V-shaped glass tubes as designed by Gates[2] were used. This apparatus, however, is unsuitable for cultures of gas formers. To meet the conditions of these gas producers it was found desirable to develop an apparatus as shown in Fig. I.

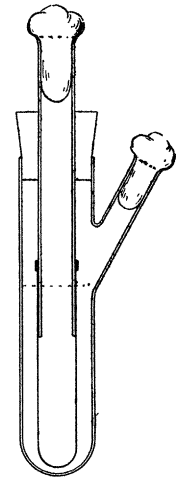

FIG. 1

The illustration shows a simple arrangement for the culture of bacteria and other micro-organisms on opposite sides of a collodion sac. These tubes have also been found convenient in experiments where a membrane is interposed between solid bodies and bacterial cultures as in the Noguchi method. They are convenient to handle and may be inserted into the common type of test tube stand. The side arm of the tube affords an easy means of inoculating culture media or withdrawing solutions from outside the sac, while material inside the sac may be reached through the glass supporting tube to which the sac is attached. These tubes may be used with either a rubber stopper or a cotton plug carefully fitted to the supporting tube and pressed into the larger tube.

MAURICE MULVANIA
DEPARTMENT OF AGRICULTURAL BACTERIOLOGY,
UNIVERSITY OF WISCONSIN,
MADISON, WISCONSIN

CADAVERA WITH FLEXIBLE JOINTS

THE rigidity of the joints of the cadaver as ordinarily prepared impedes the progress of the dissection. In the study of muscle action it is especially desirable to have a flexible specimen. In such a specimen the orifices of the body may be approached naturally. Any method resulting in flexibility should be of ready application and preferably should call for no great alteration in the preserving fluids used.

For the past thirty months the following simple method has given us satisfactory results. Upon bringing the cadaver into the embalming room the joints are manipulated so as to secure free and complete mobility. By steady traction each joint is once com-

[1] Gates, F. L., *Jour. Exp. Med.*, XXXIII, 25 (1921).
[2] Gates, F. L., *Jour. Exp. Med.*, XXXV, 635 (1922).