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LOCAL SCIENTIFIC SOCIETIES AND THE COMMUNITY[1]

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THROUGH the whole range of nature, classification shows an underlying simplicity of principle expressed through various materials and in diverse grades. Gravitation controls galaxies and sand-grains, and evolution is the common destiny of genera and of individuals. Both of these fundamental principles tend inevitably to pile up aggregates of ever-increasing size and complexity. But such aggregates are collections of units, and, while appearing to acquire new properties, remain subject to the laws that govern units and dependent on the reaction of their components to those laws.

Human nature, despite the bombastic claims often urged by its exponents, illustrates the operation of the principle of evolution with painful fidelity, especially in its social reactions. From the lone hunter through the clan to the totalitarian state the process of aggregation goes on, with increasing complexity and decreasing flexibility, until Nemesis clears the stage for the next performance. Within the frame of natural or imperial unification are innumerable smaller aggregates, each so similar in type to the whole that one is reminded of a crystalline fabric, where each molecule has a shape consistent with that of the complete crystal.

A scientific society is but one example of this tendency towards congregation of kindred types. Whatever may be its peculiarities, its success or failure, each society has originated in much the same way as all the others. In most cases, its history can be traced back to the enthusiasm of an individual, who has attracted

[1] Address of the president of the Conference of Delegates of Corresponding Societies at the British Association for the Advancement of Science, Dundee, 1939.

for identifying and determining the concentrations of substances having characteristic absorption bands, such as bilirubin, hematoporphyrin and methemoglobin.

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PERIODIC DISCHARGING OF LIQUIDS AND INTERMITTENT WASHING OF SOLIDS

A VERY efficient method of washing solids is an intermittent addition and draining of the solution. Also it is desirable in certain cases to add solution quickly for agitation but to drain slowly because of diffusion limitations from the surface or interior of the material being washed. Further, many substances such as shredded gels, being fragile, are partially lost in washing if agitation is done mechanically or by forcing gases through the bulk material.

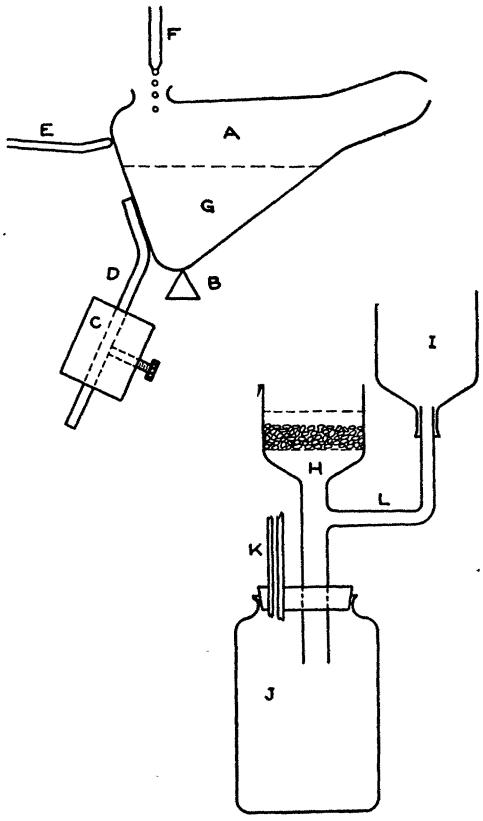

FIG. 1. Intermittent washing of solids.

We have devised a handy apparatus that can be set up in the laboratory. It is schematically shown in Fig. 1. A is merely an Erlenmeyer flask of appropriate dimensions with the mouth drawn down somewhat and a hole blown near the bottom. The flask rests on a fulcrum, B, and an adjustable weight, C, is attached to the flask by a rod D. B can include the holder for A, not shown in the diagram.

The sensitivity of the device depends on the unstable equilibrium, which in turn is influenced by the distance of the point of contact of the fulcrum from the center of gravity of the tilting flask containing liquid. With the appropriate dimensions the balance is maintained by moving C to the right position.

A stop bar, E, places the flask in the correct position for filling from a tube, F, and a slight adjustment of E also controls the amount of solution that will just dump. Obviously, the shape of the container is the cause of the mechanism shifting its center of gravity so that it functions on reaching a desired volume of wash solution. With a 500 cc flask the solution is delivered in 5 seconds.

The remainder of the figure is self-explanatory, H being a Buchner funnel and K a capillary that is adjustable. We have arranged that 500 cc drains in 3 minutes, while A fills in 5 minutes. The 111 mm inside diameter funnel will hold about 200 cc of material to be used. J is large enough to collect any sediment from the solid material so that K is not in danger of clogging.

The device is especially adaptable for washing such fragile material as shredded gelatin gels. The thinner the layer of material in the funnel the more uniform should be the washing. Funnels of larger diameter for the same weight of solid can be used for this purpose. No apparent difficulties are foreseen for making A any size desired.

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