LXXX. A SHAKER FOR QUANTITATIVE ADSORPTION EXPERIMENTS

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THE essential details of a simple effective shaker for quantitative adsorptions from aqueous solutions, which can be built almost entirely of Meccano parts, are illustrated in the accompanying diagram. A double crank (D), driven by a sprocket and chain with appropriate reduction from an electric motor, is coupled to a chain (C) which passes round a sprocket (S) fixed to a shaft bearing gears (G) supported above and below. These gears interlock with other paired gears (G_1, G_2) in train. When the crank revolves, the chain turns the sprocket first one

Fig. 1. Semi-diagrammatic representation of shaking mechanism.

way, then the other, and the train of gears is thus set in rapid alternating motion through an arc of a circle. Each upper gear serves as a table to support the adsorption vessel. An upright (U) is fixed near the periphery of the gear, and a 25 or 15 ml. centrifuge tube (X) is held firmly to it by a broad rubber band.

A machine embodying this principle was devised and used extensively in the development of methods for the estimation of creatinine and glycochamine [Fisher & Wilhelmi, 1937; Davenport & Fisher, 1938], and it has given satisfactory service, with minimum attention, for over 2 years. It has the advantages that unstoppered vessels can be shaken without loss of their contents and that a large number of vessels can be shaken simultaneously for any length of time. With a shaking radius of about an inch and proper regulation of the speed of shaking, a heavy adsorbent such as fuller's earth can be kept effectively in

suspension in a maximum of 7 ml. of solution in a 15 ml. centrifuge tube, or of 15 ml. of solution in a 25 ml. centrifuge tube, without stoppering the tubes and without loss of their contents by splashing. The ease of operation of the shaker is illustrated by the fact that our machine, with 16 pairs of gears in train, and powered by a 1/30th horse-power electric motor, runs smoothly and efficiently at a maximum crank speed of over 180 r.p.m.

REFERENCES

- Davenport & Fisher (1938). *Biochem. J.* **32**, 602.
Fisher & Wilhelmi (1937). *Biochem. J.* **31**, 1131.