graduated side the substance to be weighed is suspended. This instrument has the advantage of not being so liable to get out of order as other contrivances.³⁹

Mechanical Analysis.-Much may be learned regarding the composition of a rock by reducing it to powder. In the case of many sandstones and clays this reduction may easily be effected by drying the stone and crumbling it between the fingers. But where the material is too compact for such treatment some fragments of it placed within folds of paper upon a surface of steel may be reduced to powder by a few smart blows of a hammer. The powder can be sifted through sieves of varying degrees of fineness and the separate fragments may be picked out with a fine brush and examined with a lens. If they are dark in color they may be placed on white paper, if light-colored they are more readily observed upon a black paper. Portions of this powder may be carefully washed and mounted with Canada balsam on glass, as in the way described below for microscopic slices. In this way the constituent minerals of many crystalline rocks may be isolated and studied with great facility. For purposes of comparison specimens of the rock-forming minerals should be procured and treated in a similar way. series of typical preparations of the powder or minute fragments of such minerals affords to the student an admirable basis from which to start in his study of the crystallographic and optical characters of the minerals which he will require to identify among the constituents of rocks.

Another method of isolating the several components of certain rocks is by washing the triturated materials in water and allowing the sediment to subside. The finer and lighter particles may be drawn off, while the coarser and heavier grains will sink according to their respective specific gravities, and may then be separated and collected. This may be done by means of a wide tube with a stop-cock at the bottom, or by gently washing the powder with water on an inclined surface, when, as in the analogous treatment of veinstones and ores in mining, the particles arrange themselves according to their respective gravities, the lightest being swept away by the current.

Magnetic particles may be extracted with a magnet, the end of which is preserved from contact with the powder by

³⁹ See Geol. Mag. 1883, p. 109, for a description and drawing of this instrument, and the manner of using it. It may be obtained of Lowden, optician, Dundee, and How & Co., Farringdon Street, London. Its price is 31s. 6d.