VII—*A Test of Specific Gravity.*

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IT often happens in mineralogical inquiries that from scarcity of materials, lack of time, or other causes, the important datum of specific gravity is not secured. Now, however, that Sonstadt has shown us how to prepare a nearly colourless and perfectly transparent liquid with a density three times as great as that of water, there will generally be no difficulty in ascertaining the specific gravity of very many rare minerals as to which our knowledge remains imperfect. More than this, two minerals if of different specific gravities (provided one is less than S.G. 3·0), may often be easily separated from one another if they are in fragments of appreciable size. Thus, pieces of quartz with a S.G. of 2.655 float, while fragments of beryl (S.G. 2·691) sink in a solution having S.G.=2·67. A very simple apparatus is required for the purpose. (See fig. 7, Plate. VIII.)

A small separating funnel A terminating in a glass stop-cock B, is mounted upon a glass bottle as a receiver. B. being closed, the mixed minerals, along with the solution, are put into A, agitated and freed from air bubbles (in the air-pump if necessary); then when, separation is complete, B is opened until the heavier mineral has been carried down into C. B is now closed so as to retain the floating mineral in A. A few repetitions of the process seldom fail in effecting such a separation in an hour as would have taken days, or been impossible by the ordinary method of mechanical selection. It is hardly necessary to say that the solution used, containing potassio-mercuric iodide, acts upon some minerals: it may be added that the washings from all specimens that have been wetted with the solution should be saved, as they need nothing but evaporation to reproduce the original liquid.

The usefulness to jewellers of Sonstadt's solution is obvious. One need possess but two strengths of this liquid (2·68 and 3·0), in order to be able to distinguish very many gems from one another. There should be at hand steel forceps, distilled water, and a few wide-mouthed squat bottles half full of the solution, into which the doubtful specimens are to be placed. Thus I have proved many

so-called white sapphires or white topazes to be beryl or quartz; once a parcel of "jacinths," for which a heavy price had been given, proved to be nothing better than burnt cairngorms. The densest solution I have yet obtained is one in which some transparent tourmalines (S.G. 3·01) neither floated nor sank. The preparation of this solution may be described in a single sentence. Mercuric iodide and potassium iodide are alternately dissolved in a saturated solution of the latter salt until no more of either compound is taken up. The resulting liquid may be diluted at will with water. If it were not for its honey-yellow colour, its high refraction and dispersive powers would tempt one to attempt its use, in lieu of carbon disulphide, for hollow prisms.