A rubber pad used by chemists on evacuated filter flasks (Filtervac made by Alfred Bicknell Associates, Cambridge, Mass.) has a central hole of 3 cm. diameter lined on one side with a raised edge, forming a conically shaped rubber orifice, suitable for the support of the glass sphere on the microscope stage. The filled sphere converges the light from the concave mirror into the specimen held at the center, hence the sub-stage converging lens is not necessary. The objective needs to be of low power and preferably of long focal length. The polarizer, analyzer, and Bertrand lens are used in the normal manner.

The sphere can be rotated in many directions very quickly, and the interference figure can be followed very readily, and made to shift with change in crystal position. By holding the stopper firmly, the spherical part can be turned in the ground glass joint until the optical figure is located over the row of grid lines. The angle of tilt from the horizontal can be determined, and the corresponding line on the neck of the flask. By this means the location of the optical figure is oriented with respect to the position of the crystal in the sphere, and this location can be maintained after the stopper and specimen are removed from the sphere.

For beginners a very cheap combination can be made by using a boiling flask, with a metal holder held in a rubber or cork stopper. A clean capillary can be made by inserting a hypodermic needle in the stopper. The swelling of the rubber and the resulting discoloration of the liquids are draw-backs.

This spherical device should make a good learning tool for students before using the Universal Stage.

The help and interest of R. C. DeVries are gratefully appreciated.

After this idea was put into practice, it was learned that E. Leitz, Inc., has a "Waldermann Hollow glass sphere" for the examination of gem stones.

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A NEW MINERAL-PICKING APPARATUS

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Two types of mineral-picking apparatus have been described by Murthy (1957) and Kauranne (1957). The present authors have made a new model which we believe is easier to build, and in certain respects is more serviceable.

Making the Apparatus

Figure 1 represents the mineral-picking apparatus. It was constructed out of a Penfield tube that had been used in making water determinations. A capillary (B) was drawn from the broken-off end of the tube. The capillary was given a suitable diameter for the collecting of mineral particles. The tip of the capillary was cut off at a slant, to make it horizontal during operations. A hole (A) was blown into one of the globes in the Penfield tube. The diameter of the hole is large compared to

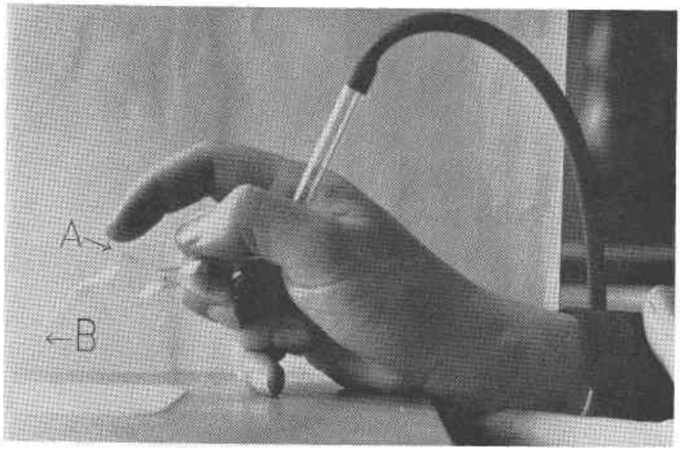

Fig. 1. Photograph of mineral-picking apparatus in use.

the diameter of the tip of the capillary. The intact end of the Penfield tube was bent upward so as to be easy to handle and to make sure the grains would halt in the globes. A rubber hose connects this end of the tube to a vacuum pump.

There are binocular microscopes with a stationary stage in which the binocular eyepiece may be moved mechanically in two directions at right angles to each other. In working with high magnifications, it is useful to attach the mineral-picking apparatus firmly to the stereoscopic tube so that the tip of the capillary of the apparatus (B) is at the focal point of the microscope. In such cases the hole (A) is not made in the globe, instead the rubber hose is cut in two and a length of glass tubing with a hole is placed in between.

Procedure for Using the Apparatus

The mineral grains are spread out on a slide under a stereoscopic binocular microscope. The vacuum pump is set going and the suction is regulated in such a way that the mineral grains will fly at a suitable speed into the globes and halt in them when the hole (A) is stopped by a finger. The suction is cut off immediately when the finger is lifted from the hole, whereupon it is possible to guide the mineral grains at will with the tip of the capillary. Only a slight motion of the finger is needed to start and to cut off the suction. It is easy to pour the mineral grains out of the apparatus through the hole (A).

If the mineral-picking apparatus is mounted on the stereoscopic tube, the tip of the capillary is guided to the mineral grain by means of the cross-stage.

Acknowledgments

The authors wish to express their appreciation to the Geological Institute of the University of Helsinki and to its head, Prof. Martti Saksela.

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METHOD OF MINIMIZING DAMAGE TO REFRACTOMETERS FROM THE USE OF ARSENIC TRIBROMIDE LIQUIDS[1]

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If there be other users of high-index liquids containing arsenic tribromide who have overlooked Meyrowitz's (1955, p. 400) reference to Alexander's (1934, p. 181) caution against their use with refractometers having lead-glass prisms, or who have used them in ignorance of the composition (commonly undisclosed) of the prism, the following note may be useful.

The refractometer I used (a Zeiss instrument having a prism marked S-3 with an index above 1.83) promptly showed the same white film described by Alexander, when used with Meyrowitz's liquid of index 1.79. Within a few minutes, the film became so dense that the boundary line could not be seen.

[1] Publication authorized by the Director, U. S. Geological Survey.