HOW TO PREPARE A SPECIMEN FOR MINERALOGRAPHIC STUDY

THE EDITORS

A FLAT surface a centimeter or two square must first be cut, for which purpose a carborundum wheel run at 1,000 revolutions or so per minute gives the most rapid results, altho the work may be done by hand, using a slab of carborundum or even loose powder—60 or 80 mesh—on a wet iron plate. The edge of the ground face should be beveled off all the way around. The specimen and the hands of the operator must then be carefully rinsed to remove *all* grit. This surface is ground smooth with moistened carborundum or emery flour—200 or 220 mesh—on stretched canvas, or on a smooth plane surface like that of a sheet of glass. After another rinsing the surface is polished with rouge or "putty-powder" on stretched cloth or chamois skin, and if necessary a final polishing is given with specially floated rouge on fine textured linen. Specimens too small to be held in the hand while grinding may be embedded in sealing wax. To obtain a really good reflecting surface requires considerable care and skill, which comes only as a result of long practice, but the amateur can readily polish a piece of a mineral like ordinary bornite to such a degree that its lack of homogeneity is easily seen.

The specimen must then be mounted so that its polished surface may readily be made perpendicular to the axis of the microscope; this is best accomplished by attaching it by means of a lump of modeling wax or clay to a large microscope slide (or a metal strip of like dimensions) and pressing it down by a sheet of glass kept strictly parallel to the surface of the slide; Murdoch advises the use of a metal ring of uniform height within which the specimen is placed, and down to which the glass sheet is pressed, forcing the specimen beneath it into the wax.[1]

Any ordinary microscope in which the tube can be well drawn up may be used for the examination. A vertical illuminator is inserted above the objective; this is a device which reflects a ray of light projected into it laterally down thru the objective on to the surface of the specimen. The light may be clear sky light, or may be obtained from an electric arc shielded by a ground glass screen, or from a gas-filled tungsten incandescent light provided with a light-filter to render its rays white. Oblique light should

[1] See also Brokaw, *J. Geol.*, **24**, 718, 1916.

be excluded except where definitely needed for the study of non-opaque minerals in the specimens. A magnification of about 50 diameters is usually most convenient.

In addition to the features of the minerals brought out by polishing, microchemical tests on the polished surfaces often yield valuable information. Reagents may be applied by glass tubes drawn out to fine points, or by strips of filter paper. Murdoch has found the following most useful: HNO_3 1:1, HNO_3 concd., KCN (20% soln.), HCl 1:1, HCl concd., aqua regia, $FeCl_3$ (20% soln.) and KOH in concd. soln. Details of the results thus obtained are tabulated in Murdoch's book.

A number of the rarer opaque minerals have never been studied mineralographically, and indeed, the compositions of many that have been thus studied are by no means established, so it is evident that a considerable field for investigation lies open to anyone who cares to take up mineralographic work.

PROCEEDINGS OF SOCIETIES

New York Mineralogical Club

At the regular meeting held at the American Museum of Natural History on December 13, 1916, there were forty-four persons present, Mr. James G. Manchester presiding.

After the usual routine business the secretary gave notice that on Pavilion Hill, Staten Island, in the Borough of Richmond, New York City, excavations were in progress which afforded a long sought opportunity for the collection of excellent specimens of the Staten Island serpentine and associated minerals.

Dr. Waldemar T. Schaller, of the U. S. Geological Survey, then presented the announced paper of the evening on "The so-called pseudomorphs of the New Jersey zeolite region." He objected to the customary application of the term pseudomorph to the cavities, which should be called molds. The term pseudomorph should be limited to solid replacements of fillings, such as the cores which occur in and fit certain of the molds at McKiernan & Bergin's Quarry in West Paterson. He approved the theories of Allen & Wherry that the rectangular and lozenge-shaped cavities were originally crystals of anhydrite and glauberite respectively, and disapproved of the theory which attributed them to babingtonite. He then reviewed and favored a hydrothermal theory as to the origin of the anhydrite and glauberite. Upon its conclusion questions were asked and the paper was discussed by Messrs. Cahn, Allen, Kunz, Levison and others, and from the tenor of the remarks made it seemed that the theory of the origin of the anhydrite and glauberite proposed was not convincing to everyone. The paper was liberally illustrated with lantern slides and specimens.

Mr. James G. Manchester jointly with Mr. Gilman S. Stanton then presented the second announced feature of the evening, an exhibit of a series of small spessartite garnets cut from a fragment of a transparent crystal they found at Haven Avenue, between 178th and 179th Streets, in the Borough of Manhattan, as the first gem garnet found in New York City.

Wallace Goold Levison, *Secretary.*