nor has the source been discovered. At Troutbeck we take the train back to Keswick, and going southwest near the Causey Pike a mine is passed from which smaltite and erythrite have been obtained. On the west of the Skiddaw is a vein of barite and further along are found chiastolite, and, in the igneous rocks about Derwentwater Lake, apatite, beryl, jasper, carnelian chlorite, enstatite, epidote, garnet, labradorite, olivine, oligoclase, orthoclase, serpentine and talc.

Lastly we come to the west coast of Cumberland. In the north are the coal mines of Maryport and Whitehaven, and south and east of Whitehaven are the Cleatormoor iron mines where are found the hematite kidney ore and specular iron. Also, over the whole distance from Frizington to Egremont, the beautiful calcite crystals. This is also the district where the well-known colorless, green, yellow and brown barite crystals come from. Very often the hematite is covered with fine crystals of smoky quartz and thin hexagonal plates of specular iron which sometimes are over a centimeter in diameter. Altogether about one hundred and ten different mineral species are to be found in the county of Cumberland.

ETCHING IRON METEORITES

OLIVER C. FARRINGTON
Field Museum of Natural History

Recent experiences of the writer have led him to adopt some modifications in the method of etching iron meteorites which was originally furnished him by Foote Mineral Company, and quoted in this magazine.[1]

The principal change in this method which the writer's experience has indicated as desirable is the use of a large magnet for holding the meteorite section during etching. Magnets of a size capable of sustaining the weight of any ordinary section can be obtained from many dealers in physical apparatus. That which the writer uses is able to sustain a weight of 12½ kilograms. Holding the section with such a magnet, the polished surface which it is desired to etch can be dipped into the etching fluid without the necessity of exposing the entire section to the action of the fluid. Lacquering of the back of the section is thus made unnecessary. The building up a wall of wax or clay about the border of the section to contain the etching fluid,

[1] *Am. Min.*, **2**, 39, 1917.

as has often been done, is also avoided. This latter practice is especially objectionable because it leaves an unetched border which is invariably taken by the general public to represent a a crust formed on the meteorite by atmospheric heating. The excess of fluid can also be more readily and thoroly removed after such a dipping than if the section were all exposed to its action. Moreover, pouring of the fluid (usually acid) on the section, after the common method, causes the fluid to penetrate deeply into cracks and pores where traces of it are pretty sure to remain and cause subsequent decomposition.

A second modification of the previously published method consists, if an acid etching fluid has been used, in immersing the section in lime water after etching and washing. This is for the purpose of neutralizing any traces of acid that washing might not have removed. The more elaborate methods which have been recommended by some authors for removing such traces of the etching fluids, such as washing with ammonium carbonate, water, alcohol and ether in succession, the writer has not found in practice to be necessary.

The method of etching at present recommended by the writer is, then, as follows:

1. Provide two photographer's trays of glass, porcelain or other acid-resisting substance of a sufficient size to receive the section to be etched. Partially fill one tray with a 10 per cent. solution of C. P. nitric acid, the other with lime water. Provide also a small bottle of "steel gloss"[1] preferably diluted about one-half with benzine, one small camel's hair brush, one large camel's hair brush, a good sponge and several dry cloths.

2. Wash the surface of the section that is to be etched thoroly with benzine, for the purpose of removing all traces of grease or oil from it.

3. Lacquer with "steel gloss" any nodules of accessory minerals. They should be completely covered, so that they cannot be reached by the etching fluid, or they will stain the etched surface. On the other hand, the lacquer should not extend any farther over the border of the nodule than is necessary for its protection, as any portion of the section covered by the lacquer will not be etched.

[1] "Steel gloss" can be obtained of E. F. Houghton and Company, Philadelphia and other large cities. This firm specializes in rust-preventing liquids and their "steel gloss" is the most efficient protection for meteorites that the writer has found.

4. After the protective lacquer has dried sufficiently, which will be in a few minutes, especially if the drying is assisted by a little heat, take up the section by means of the magnet, with the surface to be etched outward. Holding the section with the magnet, immerse the section in the etching fluid to a depth not greater than is necessary to cover the entire surface to be etched, and accompany the immersion with a slight rocking motion in order to release bubbles of air that usually form on the immersed surface and interfere with the etching. At intervals of a few seconds, turn up the etching surface for examination, occasionally washing or rubbing off the surface in order to observe the progress of the etching. Usually in less than two minutes the etching figures will be seen to have reached their maximum brilliancy, and the etching should be discontinued. If etched too long, the iron will darken.

5. Sponge and wash thoroly the etched surface and immerse the section for a few seconds in the lime water previously provided.

6. Again wash the section and dry it as thoroly as possible with the dry cloths.

7. Lacquer the etched surface, and give the section a final thoro drying by gentle heat.

PROCEEDINGS OF SOCIETIES

THE PHILADELPHIA MINERALOGICAL SOCIETY

Wagner Free Institute of Science, January 8, 1920

A stated meeting of The Philadelphia Mineralogical Society was held on the above date with the president, Dr. Burgin, in the chair. Sixteen members and four visitors were present. Dr. Alfred C. Hawkins, Wilmington, Delaware, was elected to active membership.

Dr. Hawkins addressed the society on "Mineralogical Experiences" at a number of localities in Rhode Island, New York, New Jersey, Oklahoma Texas and Missouri, illustrated with lantern slides and specimens.

Mr. Trudell announced the formation of The Mineralogical Society of America, and the taking over of THE AMERICAN MINERALOGIST by the new society.

SAMUEL G. GORDON, *Secretary.*

NEW YORK MINERALOGICAL CLUB

January 14, 1920

The Regular Monthly Meeting of the New York Mineralogical Club was held in the American Museum of Natural History on the evening of Wednesday, January 14, at 8.15 P.M. The President, Dr. George F. Kunz, presided and there was an attendance of 28 members. Mr. William Maurer, of 630 84th St., Brooklyn, was elected to membership.