tion pattern or vice versa. Reflections from known substances may be checked off rapidly, weak and doubtful reflections may be identified rapidly, and the necessity for much tabulation of interplanar spacings and relative intensities disappears because the data can be written directly on the diffraction chart which serves as a most satisfactory record of the experiment.

VIVIANITE CONCRETIONS IN AQUIA FORMATION (MIDDLE EOCENE), ANNE ARUNDEL COUNTY, MARYLAND

Authur R. Barwick*

Recently, in conjunction with geological field work done for a project sponsored by the Office of Naval Research, the author found some rather large concretionary masses in the Aquia Formation (Middle Eocene) exposed in a roadcut along Tarnan's Branch of the South River, Anne Arundel County, Maryland. More precisely located, the concretions were found on the south bluff of Tarnan's Branch where the Rutland School Road underpasses the new Expressway, now under construction (long. 76° 38′ 2″ W., lat. 38° 57′ 58″ N.).

The concretions vary in size from about 4 to 8 inches in diameter. They are deep blue in color and are often surrounded by a rusty shell of limonitic material. Under the microscope they are found to consist of deep blue needles of vivianite, $Fe_3(PO_4)_2 \cdot 8H_2O$.[1] The largeness of the concretions and their relative abundance seemed to be a matter of sufficient mineralogical interest to deserve mention.

The strata in which the vivianite concretions occur consist of Middle Eocene greensand of Aquia age. In the South River area of Maryland, the Aquia formation consists of a greenish-gray, glauconitic sand, practically free of clay, that is occasionally indurated by limonitic bands that have resulted from the weathering of the contained glauconite partly through exposure during burial but mostly by the subsequent downward percolation of oxygenated meteoric waters. On the surface the soil derived from this formation consists of a light-brown to greenish sandy loam that is known locally as the Collington fine sandy loam. Although the limonitic bands are fairly common and, at times, may contain casts of Eocene molluscan shells such as *Venericardia planicosta*, *Dosiniopsis lenticularis* and *Turritella mortoni*, the above locality is the only one in which the author has found, or has read accounts of others finding, extensive concretions of vivianite. Specimens of these concretions are

* Professor of Geology, Howard University, Washington, D. C.

[1] Identification checked by Division of Mineralogy, U. S. National Museum.

being retained for the Museum of Geology, Howard University, Washington, D. C., and the United States National Museum.

THE GREENOCKITE LOCALITY AT BISHOPTON, SCOTLAND

H. F. HARWOOD, *Deganwy, North Wales, England.*

In view of the announcement in the January-February issue of *The American Mineralogist*, Vol. **36,** 1950, page 165, that crystallized greenockite had been discovered at two new localities in Bolivia, a note of a visit paid last year by the writer and some mineralogist friends to the original Scottish source of this mineral may not be without interest.

The exact locality is a large pasture field near the village of Bishopton. Beneath the field runs the railway to Greenock, in a tunnel about 60 feet below the surface; this tunnel was excavated well over a century ago. At about the center of the tunnel is a large "eye" through which a considerable portion of the excavated debris was hoisted to the surface and dumped on the nearby grass field. The tunnel traverses a series of inclined lava beds. It is in one of these that the greenockite occurs. The rock in question is an amygdaloidal labradorite porphyry, containing mammillary prehnite. The greenockite crystals occur invariably in crevices of the prehnite. The mineral appears to be confined solely to the one band of rock, and nothing is known about either the thickness of this, or its exact situation in the tunnel.

An intensive search of the excavated material in the field produced one fair-sized block of this rock, and on carefully breaking this up, four crystals of greenockite were obtained from it. The largest one measured 6×4 mm. but was unfortunately incomplete. The remaining three were smaller, but showed well the hemihedral character of the crystals.

A prolonged search failed to bring to light any more of the prehnite-bearing rock, and as comparatively little of the original spoil heap now remains, most of it was carted away thirty years ago for road material, it seems unlikely that the locality will yield any further specimens of these rare crystals of greenockite.

TEN YEARS OF NEW MINERAL NAMES

MICHAEL FLEISCHER*

The completion of a ten year period of abstracting new mineral names for the *American Mineralogist* caused me to review the results for that period. The following table summarizes my present opinion of the new names that have been abstracted in Volumes 26 through 35

* Publication authorized by the Director, U. S. Geological Survey.