

ulexite and one of borax to a temperature of 60°C. or higher. It is doubtful, however, if any temperatures even approximating this was attained in the boron beds. From the relationship of the mineral to the marl fragments it is quite evident that the mineral has undergone some rearrangement or recrystallization. Its general similarity to the ulexite of similar deposits suggest that probertite is a recrystallization of ulexite, the formation of the lower hydrate being favored by the pressure of the superincumbent load of sediments and lavas or by the pressure induced by earth movements. The appreciable difference of volume (ulexite: Sp. Gr. = 1.963; probertite: 2.141) would favor this change with increasing pressures.

NOTES AND NEWS

A NEW OCCURRENCE OF VIVIANITE IN VIRGINIA.

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During the latter part of June, 1930, while making a study of the Eocene formations in the vicinity of Fredericksburg, Virginia, fragmentary specimens of indurated greensands were collected from the Nanjemoy beds at Woodstock which contain radiating crystal aggregates of vivianite. Woodstock is an old homestead on the south bank of the Potomac River, 31 miles east of Fredericksburg, now known as Mathias Point, in King George County. At the time the collections were made nothing was known as to the nature of the mineral in question. The writer is indebted to Dr. C. S. Ross of the United States Geological Survey for its identification. No reference in the literature to such an occurrence in Virginia has been made so far as is known. Dana in his *System of Mineralogy* reports its occurrence in bog ore in Stafford County, and also as occurring 8 or 10 miles from Falmouth with gold and galena. He does not give any references so that apparently the occurrences which he cites have not been described.

The crystals of vivianite occur as acicular, radiating aggregates on the outer surfaces of the indurated greensand fragments. The individual crystals average 4 mm. in length, the maximum being 7 mm. Cleavage is well developed in the direction (010). In color the crystals vary from dark blue to bluish-green. Owing to the extreme scarcity of the crystals occurring at this locality, blow pipe tests have not been made of the specimens collected.

Vivianite is essentially a hydrous ferrous phosphate, $\text{Fe}_3(\text{PO}_4)_2 \cdot 8\text{H}_2\text{O}$; ($\text{H}_2\text{O} = 28.7$ per cent). Its composition suggests an association with glauconite which is a hydrous silicate of aluminum, iron, and potash.

Vivianite is mentioned as occurring in clays and marls in New Jersey and elsewhere, but its occurrence in indurated greensands in Virginia has not heretofore been described in the literature so far as is known.

A Correction

The foot-note reference on page 134, volume 16, No. 4, should read: H. W. Foote instead of A. W. Foote and *Jour. Am. Chem. Soc.*, instead of *Am. Jour. Sci.*

BOOK REVIEW

HANDBOOK FOR PROSPECTORS, M. W. VON BERNEWITZ. Second edition. McGraw-Hill Book Company, Inc., *New York*, 1931. XI+359 pages, 89 illustrations. Price, \$3.00.

This book is written as a handy guide for prospectors and other men who, from time to time, may wish to undertake some kind of prospecting work. The author assumes that these readers have not had a basic training in mineralogy and geology and therefore attempts to present the subject matter in such terminology and simplified classification that the layman may readily understand it. In undertaking such a difficult task, however, he occasionally throws himself open to criticism by his professional associates, which in such an endeavor is almost an inevitable result.

One-half of the book is devoted to a discussion of the most common non-metallic and metallic minerals in reference to their occurrence, description, detection, use, value, etc. They are listed alphabetically for ready reference. Each mineral or metal is treated with special regard to its particular attributes and considerable supplementary material is added where appropriate, such as methods of prospecting, mechanical concentration, types of deposits, minerals which might be mistaken for the one in question, etc.

A short but good "glossary of terms used in mining" is included which contains many words not used in the simple discussions in the book but are intended, apparently, to aid the prospector in reading governmental, and other publications, so often referred to.

Because of the growing importance of geophysical methods of prospecting, a chapter in keeping with the general simplicity of the book has been included on this subject. It has as its object merely the familiarizing of the prospector with the various methods of geophysical prospecting and the opinions of experts regarding their utility.

The first third of the book is devoted to a series of twenty-six very short chapters which deal with the following subjects: financial aid to prospectors, equipment, food, water, transportation, mining laws, first aid, introduction to mineralogy and geology, occurrence of ores, outcrops, sampling, field tests, development of prospects, and markets and prices.