

NITER AND SODA NITER  
FROM BREWSTER COUNTY, TEXAS\*JOHN T. LONSDALE, *University of Texas*

Recently the occurrence of niter and soda niter in Brewster County, Texas, has been called to the attention of the Bureau of Economic Geology. The writer together with Dr. E. H. Sellards made a hasty examination of the nitrate deposit in August, 1925. It is thought that a brief note recording the occurrence is warranted.

The locality is the west side of Agua Fria Mountain on the Worthen Ranch, 55 miles south of Marathon and 10 miles west of the Marathon-Terlingua road. The name Agua Fria refers to a large spring of fresh water which issues from the base of the mountain and which is known throughout the region. The nitrate minerals are found a few yards distant from the spring, along the base of the mountain.

Agua Fria Mountain is composed essentially of a large mass of trachytic igneous rock, intrusive into sedimentary rocks of Cretaceous age. The west flank of the mountain is terminated by a sheer cliff several hundred feet high and approximately 400 feet in width at the base. The flanks of the cliff are masked by talus heaps but in the center of the cliff a great surface of igneous rock is exposed.

The cliff of igneous rock contains numerous vertical joints spaced about four feet apart. These range from mere threads to open cracks several inches in width. The nitrate minerals are found filling the joints as vein material. The veins are not continuous but consist of occasional masses and crusts varying from a fraction of an inch in thickness to slightly more than one inch. The length of individual vein fillings seen did not exceed two feet. Near the veins of nitrate minerals in some instances the rock is highly kaolinized. In some cases, also, the rock has been silicified for a distance of four inches from the vein or joint.

The vein material in some cases is snow white in color but in the majority of cases is stained brownish or grayish. It is possible to secure apparently pure specimens but these are limited to small samples. Blowpipe tests made on the material indicate nitrate minerals and the characteristic cooling taste is also noticed. An incomplete analysis, of a sample of the vein material, made in

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the Industrial Chemistry Experiment Station, University of Texas, is given below.

|                                |       |
|--------------------------------|-------|
| KNO <sub>3</sub>               | 36.29 |
| NaNO <sub>3</sub>              | 36.35 |
| NaCl                           | trace |
| CaCl <sub>2</sub>              | trace |
| N <sub>2</sub> SO <sub>4</sub> | trace |
| CaSO <sub>4</sub>              | trace |

An undetermined insoluble residue was left.

The material is seen to be a mixture of sodium and potassium nitrates. This is verified by microscopic study which shows two minerals, one orthorhombic and the other rhombohedral. Due to the difficulty of manipulating these highly soluble materials and the lack of a liquid sufficiently low in refractive index the optical constants were not completely determined.

The soda niter exhibited perfect rhombohedral cleavage, was optically negative and showed  $\omega = 1.585 \pm .005$ . The niter was negative, showed  $\gamma = 1.500 \pm .005$  and was typically orthorhombic. Birefringence in both cases was extremely high. The values for  $\epsilon$  and  $a$ , respectively, were not determined but the extremely high birefringence indicates values close to those quoted in Larsen's tables. It is believed that the data available are sufficient to establish the minerals as niter and soda niter.

The origin of these nitrates is not plain and no attempt is made here to explain their occurrence. The igneous rocks in which the nitrate veins are found were once covered by sedimentary rocks in which cave deposits might have occurred. At the present time there is no evidence of guano or similar deposits. There is some indication that hot solutions have travelled along the joints and crevices in the igneous rock but the relation of such solutions to the nitrates is not known. Somewhat similar deposits have been reported from Presidio County, Texas, and it is hoped that these along with the deposits of Agua Fria may be described in greater detail in a later paper.

#### BOOK REVIEWS

UEBER DIE SYSTEMATIK DER ERZLAGERSTÄTTEN. W. A. OBRUTSCHEW, *Abhandlungen zur praktischen Geologie und Bergwirtschaftslehre*, Vol. 4. Berlin, 21 pages (1926). Published by WILHELM KNAPP, HALLE (SAALE).

The question of classification is in every science almost as old as the science itself. As our knowledge increases new problems are encountered and the old schemes are no longer sufficient. The classification of ore deposits has always