

ENCAMPMENT KYANITE DEPOSITS

Location

The claims examined are near the head of Cottonwood Creek in sections 20 and 29, T. 14 N., R. 83 W., Carbon County, Wyoming.

They are from 5 to 6 miles east of the Union Pacific Railroad spur at Encampment, via a dirt road and paved highway.

Claims

The principal kyanite properties include four groups of patented claims, the Carleton, Big Chief, Pinyon, and Pardelco. The Carleton and Big Chief were visited in the company of Mr. Carleton H. Ashley. The four groups of claims were originally owned by Mr. C. H. Ashley and Mr. Frank Huston of Encampment and sold to the Prairie Oil Company. This company was later absorbed by the Sinclair Wyoming Oil Company. Geologic field and laboratory work was done by Dr. R. H. Beckwith of the University of Wyoming and Professor Hintze of the University of Utah. The U. S. Bureau of Mines made separation tests of kyanite and mica. These investigations are probably on file with the Sinclair Wyoming Oil Company.

Occurrence and Mineralogy

The kyanite occurs in pre-Cambrian muscovite-biotite schists and gneisses which, in the vicinity of the pits, strike generally northwest. The most abundant rock types are hornblende schist, amphibolite, and granitic rocks which vary from aplitic to pegmatitic phases. The granitic rocks are transgressive with respect to the darker metamorphics and appear to be genetically related to the kyanite. An alterna-

tive theory of origin is that the kyanite schists represent sediments rich in alumina, which were regionally metamorphosed with the development of kyanite.

Kyanite is associated with quartz, feldspar, biotite, and muscovite. Mica and kyanite appear to be altered and such hydrothermal alteration products as sericite, vermiculite, and chlorite form aggregates between the kyanite, quartz, and feldspar. Kyanite varies from light to dark blue and in places is white and gray. Crystals average approximately 1 inch by $\frac{1}{4}$ inch by $\frac{1}{16}$ inch, and form 10 percent of the rock by volume. No heavy minerals which might interfere with the separation of kyanite were observed in hand specimens.

Deposits

Carleton Group -- There are two Carleton claims on which several pits have been dug exposing kyanite on the slope of a hill. The kyanite is in a biotite-muscovite schist, is coarse textured, and varies from white to pale blue. The kyanite zone or lens varies in width from several feet to about 20 or 30 feet. Its length was not determined but is in the neighborhood of several hundred feet at the most. The zone appears to have little depth because the kyanite is surrounded by granitic rocks and pinches out rapidly down the slope of the hill.

Although much of the material seems to contain from 20 to 50 percent kyanite by volume, preliminary concentration tests made at the University of Wyoming indicate that it averages about 10 percent. The chief reason for this apparent discrepancy is the manner in which the resistant kyanite stands out on weathered surfaces; much of the softer mica having been eroded from between kyanite crystals.

Big Chief Group -- There are four patented claims in this group. Kyanite occurs as light and dark blue blades in a muscovite matrix. The crystals are about the same dimensions as those on the Carleton claims, although some are as much as six inches in length. The associated rocks and general geologic relations are similar to those at the Carleton claims. Muscovite appears to be of roofing grade.

Possibilities of the Area

There appears to be a moderate tonnage of kyanite on the Sinclair-controlled claims. No attempt was made in the two hour examination of the deposits to estimate tonnage. According to Mr. C. H. Ashley, work done by the oil firms indicated a reserve of 25,000 tons, using a conservative figure of 10 percent kyanite by volume. A report on separation of kyanite and mica by the Salt Lake office of the Bureau of Mines states that, "The results of the foregoing experiments indicate that both kyanite and mica in a high state of purity may be recovered from the ore by means of crushing, screening, and tabling."

Detailed mapping plus laboratory and petrographic studies would be necessary to establish the extent, origin, and mineralogy of the deposits. However, immediate production on a small scale seems possible judging by the tonnage in sight. There are other occurrences of kyanite near Encampment which could probably be drawn on if the area were exploited.

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Signed,

A. F. Hagner