

OCCURRENCE, DESCRIPTION, AND ORIGIN OF "OREGONITE"

By

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Abstract

"Oregonite" is the trade name for an attractive variety of semi-precious gem-quality spherulitic jasper found in the Illinois River district, Josephine County, Oregon. It occurs as lenses in a weathered zone between flows of amygdaloidal metabasalt of the Upper Jurassic Rogue formation and probably formed as cavity fillings of silica gel. The silica spherulites have radiating, concentric structure and are colored by hematite, which occurs as dust-like inclusions in the fibrous quartz. Source of the hematite may have been from weathered basalt in the interflow zone. Relatively late deposition under a low temperature, near surface environment is suggested by the limited crystal growth and relatively unfractured condition of the rock.

The deposit has been worked occasionally since the early 1900's. A total of about 1½ tons has been mined and is being marketed as uncut gem stone and finished hand-made jewelry. Uncut material is selling for as much as \$5.00 per pound.

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Introduction: "Oregonite" is the trade name for an attractive variety of semi-precious gem-quality spherulitic chalcedony or jasper found in the Illinois River mining district, Josephine County, Oregon. The Oregonite mine is on the Riverview claim owned by Mrs. Margaret and A. Donley Barnes of Grants Pass. It is located at about 2,420 feet elevation on a steep southwest slope near the east edge of the NE $\frac{1}{4}$ sec. 33, T. 37 S., R. 9 W. The mine is reached by 1 $\frac{1}{2}$ miles of steep trail from a point on the Illinois River Road about 10 miles west of Selma, Oregon.

The occurrence was originally located by Nelson "Tapioca" Cole in the early 1900's. The claim was relocated by A. S. and A. D. Barnes in 1925 and since that time has been held and worked by the Barnes family, who are jewelers in Grants Pass.

Workings consist of a 30-foot SE-trending tunnel and a few shallow open cuts.

Description: This unique variety of reddish-brown and white jasper has a characteristic spherulitic structure. The spherulites or "eyes" vary in size from .3 mm to 8 mm in diameter. They show both radiating and concentric micro-structures. The cores of the eyes are usually very small dark brown to black spots surrounded by concentric reddish to yellowish-brown shells and a yellowish-white to white feathery outer fringe. The successive shells blend into each other due to the radiating fibrous structure. The area between the eyes is filled with a wavy or sinuous-textured dark reddish-brown to black chalcedony. Rare pyrite crystals occur in the inter-eye areas.

Under the petrographic microscope with crossed nicols the eyes give a wavy cross type of extinction resulting from the feathery, branching, and radiating fibrous structure. Some of the eyes coalesce and form composite groups or clusters. Banding or layering is present and some of the bands exhibit different sized "eyes" than others. Original fractures in the rock have been recemented with quartz and/or agate material.

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Sterrett (1910) described a jasper-like quartz with similar spherulitic texture from Marin, San Francisco, and other northwestern California counties. This material is called "kinradite". The principal difference is that ^{none of} the kinradite spherulites have the white outer fringe which is typical of "Oregonite".

The red-brown coloring in "Oregonite" is due to finely-divided inclusions of hematite. Where more concentrated in some of the inter-eye areas the hematite forms an opaque, dark-brown to black mass.

Geologic occurrence: The spherulitic jasper occurs as thin seams and lens-shaped bodies along what appears to be an interflow zone in a greenish-gray, amygdaloidal meta-basalt. This basalt has been included in the Upper Jurassic Rogue formation by Wells (1955). Most of the amygdules in the metabasalt are white crystalline quartz with some blotches of green ferrous iron staining. The jasper-bearing interflow zone strikes about N. 55° W. and dips 50° NE.

The main body of jasper was mined from a lens up to 12 inches thick occurring at the tunnel and overlying open cut. At the present time only a few very thin and discontinuous seams of the material are visible along the zone at a point about 60 feet southeast of the tunnel. The zone appears to be offset by crosscutting faults but these probable faults are obscured by surface debris.

Origin: Layering or banding of the spherulitic jasper parallel to the walls of the interflow zone may indicate a gradual cavity filling process. The jasper differs sufficiently in color, texture, and composition from the amygdules in the surrounding rock to indicate that they probably formed at different times. Lack of crystal development in the jasper points to a probable low temperature environment and relatively recent geologic origin.

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The siliceous material is believed to have been deposited out of solution or colloidal suspension from circulating ground waters. The presence of extremely fine-grained inclusions of hematite indicates an oxidizing environment and a probable near surface formation. The spherulitic texture has apparently formed as the material solidified from a saturated jell-like suspension of the silica. The source of hematite is possibly best explained as derived from iron oxides commonly present in interflow zones of basic lavas.

Production: Total production of Oregonite-bearing rock from the mine is reported to be about 1½ tons. Some of the gem-quality material has been sold uncut for from \$4.00 to \$5.00 per pound, and some has been made into jewelry and retailed by the owners. Much of the material mined is still on hand.

It is unlikely that any extensive body of this type of material will ever be developed at this location. Further exploration along the interflow zone may, however, locate other small lenses of gem-quality material.

References:

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- Sterrett, Douglas Bovard, Gems and Precious Stones: Mineral Resources of the U. S., 1910, Part 2, pp. 847-900.
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Pictures by Norm Peterson

OREGONITE

Paul Ramdohr and Margaret Schmitt. Oregonit, ein neues Nickel-Eisenarsenid mit metallartigen Eigenschaften. Neues Jahrb. Mineral., Monatsh 1959, No. 11-12, 239-247.

The mineral occurs as water-rolled pebbles in Josephine Creek, Oregon; the pebbles have a smooth brown crust. Under the microscope, the mineral is metallic white with high reflectivity, about 65%, in both air and oil. Anisotropism is weak, but visible in air along grain boundaries. Hardness about 5. Associated minerals are an unidentified mineral ("mineral y"), and small amounts of native copper, bornite, chalcopyrite, molybdenite, chromite, and perhaps niccolite. The gangue (about 40% by volume) consists of penninite and serpentine.

X-ray fluorescence analysis (data not given) corresponds to $\text{Ni}_{10}\text{Fe}_6\text{As}_9$ or Ni_2FeAs_2 ; the data indicate that the compound has intermetallic properties. A little Co is present, and traces of Cu. Attempts to synthesize the mineral melts in evacuated silica tubes failed.

From x-ray powder data and a Guinier photograph, oregonite is hexagonal, $a_0 6.083 \pm 0.003$, $c_0 7.130 \pm 0.005$ Å., $c/a 1.1732$, $Z = 3$ (Ni_2FeAs_2), G. calcd. 6.92. An indexed x-ray pattern is given; the strongest lines are 2.314 (vs), 2.1195 (vs), 1.991 (s), 1.7885 (s), 1.757 (s), 1.739 (s). There is some similarity to the pattern of heazlewoodite, but the latter is rhombohedral.

The name is for the state of Oregon.

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