State Department of Geology and Mineral Industries

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Portland, Oregon

RECONNAISSANCE GEOLOGY OF THE TABLE MOUNTAIN INTRUSIVE
Lincoln County, Oregon

Purpose of Investigation: The desirability of investigating all possible sources of aluminum ore for Northwest aluminum reduction plants led to the examination of a reported occurrence of nepheline syenite in the Coast Range of Oregon, since syenite is a rock from which bauxite, the ore of aluminum, may be derived. Also nepheline has an expanding use in glass manufacture as well as in general ceramic use. At present the only commercial production of nepheline syenite in the western hemisphere is in eastern Canada.

Location and topography: Table Mountain is located at the joint corner of Ts. 12 and 13 S., and Rs. 9 and 10 W. in the southwest portion of Lincoln County, Oregon. The Coast Range here consists of a series of relatively level-topped ridges, separated by steep-walled youthful valleys with a relief of 1600 to 1700 feet. Only the major streams have developed level valley floors. Table Mountain as its name implies, appears flat-topped at a distance. There are actually two main summits about half a mile apart on a north-northeasterly line. These summits rise about 50 feet above the more gently sloping ellipsoidal-shaped crest of the mountain and lie about 500 feet above the surrounding ridge-tops. Light gray outcrops and pinnacles appear on the southern and western flanks of the mountain where timber is scanty.

Accessibility: The area lies 12 miles from the coast slightly north of east of the town of Waldport, and about 15 miles southeast of Newport. It is most easily reached from the Alsea River Highway east of Tidewater (11 miles east of Waldport) by 11 miles of forest trail. A poor road, passable only in the summer, ascends Drift Creek from the Big Elk Creek road to a point two miles airline northeast of the mountain. The Yaquina branch of the Southern Pacific Railroad extends to within a few miles of Newport northwest of the mountain.

Geology: Table Mountain stands as an isolated mass rising several hundred feet above adjoining ridge-tops, which have a more or less uniform elevation. Evidence based upon physiographic relationships supplemented by a few observed contacts, around the southern periphery and on the summit, suggest that the entire mountain, with the exception of a capping of sandstone on its southern peak, consists of syenite, surrounded by sandstone. The outline of the intrusive (no evidence of contact alteration in the sandstones adjacent to the observed contacts was observed) is probably roughly ellipsoidal, corresponding to the outline of the mountain, with the major axis, about 1 mile in length, trending northeast southwest.

It was impossible to finally determine the type of intrusion due to time limitations and the dense forest cover. The rock mass may be either a laccolith or a small boss. The physiographic expression of the mass, the flat contact of the overlying sandstone, and the absence of syenite on adjoining ridges indicate that it is not a sill.

The regional rock is a massive to coarsely laminated medium-fine grained micaceous and arkosic sandstone, probably correlative of the Tyee formation of Eocene age. Table Mountain consists of a light greenish gray medium-grained porphyritic or granitoid rock, broken by well-defined joint systems with a spacing of 2 to 3 feet. The major joint system on the south side of the mountain strikes north-south and is vertical; a second subordinate system lies nearly horizontal. The rock also exhibits strong flow banding, the layers being from 1 to 3 inches thick. The layers weather out and split off easily, trend from N. 75 E. to E-W, and dip from 65 to 80° N. The intersecting jointing and flow-banding often form pinnacles 1 foot to 3 feet across and tens of feet high.

In the hand specimen the rock is holocrystalline phanerocrystalline, varying from hypidiomorphic to porphyritic granular. Anhedral phenocrysts of gray analcime from .5 to 3 mm. in diameter are almost always surrounded by a rim of small (.1 to .5 mm.) soda-amphibole crystals, which also appear within the phenocrysts. The groundmass consists of fine-grained trachytoid albite, some nepheline, and small (less than 1 mm.) aggregates and rosettes of amphibole. Albite may constitute 75% and amphibole 15% of the rock. Small (up to 2 mm.) vugs are lined with clusters of glassy euhedral crystals of nepheline. Infrequent anhedral spots of pale reddish yellow mineral suggest cancrinite. On weathered surfaces the analcime has weathered out, leaving cavities into which the euhedral amphibole crystals project. Although the mass is remarkably uniform in mineral content, fine-grained phonolitic phases were observed both on the south side of the main mass and half a mile from the south border, where it outcrops along the top of the ridge above the trail. Here it is porphyritic, with up to 15 percent tabular phenocrysts of pink twinned feldspar from 1 to 4 mm. in length in a fine-grained trachytoid groundmass.

Soil mantle is shallow or absent on the syenite, deeper on the sandstone. When present, the soil is granular and stony. The heavy rainfall of the area has apparently removed the soil cover nearly as fast as it is produced.

No mineralization or contact effects whatever were observed.

Conclusions: No evidence of bauxite formation was seen, and conditions do not appear favorable for its formation. The percentage of nepheline is low, and the mineral is rather intimately mixed with other minerals in such a way that its separation would probably not be economically feasible.

Report by: John Eliot Allen

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