

State Department of Geology and Mineral Industries

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Portland 1, Oregon

SIPPLE "BAUXITE" INVESTIGATION

Washington County

Location: The area visited is on the N. W. Sipple farm, located in the SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 11, T. 3 S., R. 2 W., approximately 4 miles west of Six corners and 1/2 mile north of U. S. Highway 99 W. Most of the property lies on the south slope of a fairly broad ridge at an elevation ranging between 400-500 feet above sea level. This main ridge rises gradually to a maximum elevation of 818 feet approximately 1/2 mile northwest of the northwest corner of the Sipple property, and is near the southeastern edge of the Chehalem Mountains fault block.

It was reported by Mr. Sipple that "ferruginous bauxite" had been encountered just below the surface in a well drilled for water on his property at an elevation of approximately 410 feet. The total thickness of the "bauxite" zone was ^{reported to be} about 50 feet lying directly on fresh basalt. The color of the material as described by Mr. Sipple, was yellowish-brown, typical of ferruginous bauxite in this area.

Geology: The Chehalem Mountains is a fairly large fault block approximately 12 miles long, trending northwest in the southern portion, to north at the northern end. The steep face of the scarp is on the southwest flank, with the opposite slope dipping gently to the northeast. Oligo-Miocene marine sediments are exposed along the base of the scarp and are overlaid unconformably by a thick series of lavas equivalent to the Miocene Columbia River basalt series. Lying on top of these lavas, particularly along the crests of the ridges that make up the lower slopes, is a blanket of reddish-brown silty clay of probable Plio-Pleistocene age tentatively correlated with the Portland Hills silt,

based on its similar appearance and stratigraphic position (Libbey, Lowry and Mason, 1945).

Surface weathering of the lavas prior to deposition of the silty clay has produced a low-grade ferruginous bauxite in the Portland Hills, and small lenticular deposits are known to occur on the crests of some of the ridges in the Chehalem Mountains (Libbey, Lowry and Mason, 1945). Bauxite nodules are fairly common in the soil in the south half of T. 2 S., R. 2 W., about 2 miles northwest of the Sipple property.

Procedure: Material brought up by the churn drill was examined as well as a pile of weathered rock from a recently dug cesspool back of the house. All of the samples examined were weathered or fresh basalt, but as the house and well were at least 100 feet below the top of the ridge, a 6-foot auger hole was drilled nearer the crest at the north edge of the property. Unfortunately the silty clay overburden is more than 6 feet thick on the upper portions of the ridge, and I was unable at this time to find what lay beneath. Another hour was spent walking over the ridge area in order to see whether any bauxite nodules or pebbles were present in the surface soil. At least 10 or 12 nodules were picked up for later checking. The largest piece found was approximately 1½ inches long.

Test results: All of the nodules collected in the field were broken open in the laboratory in order to test on the D.T.A. any that appeared to be bauxitic. Most of the nodules were composed of brownish earthy clay, apparently formed during the development of the soil horizon at or near the surface. Many of the soils in this area have a pisolitic character, which may be due to local composition of the underlying clay or peculiar surface weathering conditions. All of the rest of the nodules were found to be weathered basalt with one

exception. This piece was tested on the D.T.A. and gave a very good gibbsite reaction. One of the earthy clay nodules as well as a sample taken from the bottom of the hand auger hole were tested on the D.T.A., but both gave negative results.

Recommendations: Although the tests made in this particular area were negative or inconclusive, the presence here of weathered Miocene lavas is an indication that sizable deposits of bauxitic clay may yet be found. The silty clay overburden tends to hide exposures of the underlying lavas, except in some of the deeper roadcuts, and any attempt to locate buried laterite horizons must be based on such indirect evidence as topographic "highs" away from the main scarp, or the presence of large quantities of bauxite nodules in the surface soil. Even the validity of surface indications of bauxite in the soil as a criterion for possible buried horizons nearby is fairly questionable as shown by the explorational work in the Salem Hills to the south.

The silty clay overburden has, in many areas of the nearby Portland Hills, tended to preserve the underlying laterite zone. This clay is prevalent in the northeast slopes of the Chehalem Mountains, and the chances for finding a fairly widespread bauxite zone may be good.

Because of the similarity in geology, topography, and weathering history between the Portland Hills and Chehalem Mountains, it is recommended that some hand auger holes be put down in favorable-appearing localities in the Chehalem Mountains - Parrett Mountain area. The thickness of the silty clay overburden is unknown at the present time, but these holes will probably need to be deeper than the average of those drilled in the Salem Hills. The actual number and location of these exploratory holes will have to be based on more detailed examination of this entire area, and also on the day-by-day information obtained on the drilling progress.

Reference: Libbey, F. W., Lowry, W. D., and Mason, R. S, Ferruginous bauxite
in northwestern Oregon, 1945; State of Oregon Dept. of
Geology and Mineral Ind. Bull. 29.

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Report by: R. E. Corcoran, 1-17-61