

than 100,000 tons), is far from present markets, and would have to be mined so as not to interfere with the extraction of copper ore.

Clay formed by the hydrothermal alteration of early(?) Tertiary volcanic flow rocks to the east and west of Steamboat Springs (No. K-5), Washoe County, has been used by the Reno Press Brick Co. for the manufacture of building brick. Although the writer knows of no definitive mineralogical work having been done on the deposit, it is likely that these clays belong to the kaolin group.

West of Tonopah (No. K-6) in Esmeralda County kaolinite occurs as thin beds, generally less than 2 feet thick, in the Siebert lake beds of late Tertiary age. The clay apparently formed by the alteration of tuffaceous strata. The beds are too thin, areally limited, and too far from rail transportation to make their utilization likely in the near future.

At the old mining district of Cuprite (No. K-7) Esmeralda County clay derived from altered tuffs once was shipped to Los Angeles as china clay for the manufacture of sanitary porcelain. Although the clay has not been identified mineralogically the use to which it was put strongly indicates that it was kaolin clay.

The Bond and Marks clay deposit lies about 6 miles east of Beatty on the north slope of Bare Mountain (No. K-8) Nye County. This irregularly shaped pod of kaolinite clay and alunite probably was formed by the hydrothermal alteration of argillaceous beds in an Upper Silurian carbonate sequence. The clay is contaminated by intense staining of iron and manganese oxides, which undoubtedly led to its early abandonment.

Undoubtedly there are many other occurrences of kaolin clays in Nevada which are not yet known or have been misidentified in the past.

BENTONITE

The best known bentonite deposit in Nevada, and the one with greatest production, is the Ash Meadows deposit (No. B-1) Nye County, which actually includes many deposits within one large district. These clay deposits are calcium and magnesium montmorillonites derived from the alteration of tuffaceous lakebeds of probable Pleistocene age. Recorded past production has been almost \$3 million (Kral, 1951), but local residents who worked on these deposits over 30 years ago claim that the gross value of all production is many times this amount. The primary use of this clay was for filtering and clarifying mineral oils and as an absorbent. Some major oil companies still retain mineral rights in portions of the district, although production has been practically at a standstill since the 1930's. The K-B Mining Corp. recently built a plant in the northern portion of the district for the upgrading and beneficiation of bentonite clay.

The R. T. Vanderbilt Co., Inc., mines intermittently from three montmorillonite deposits in Nevada (Nos. B-2, Clark County, B-3, Nye County, B-4, Esmeralda County) for use in their line of Veegum products. This company has many other deposits in the Western United States from which they mine similar material. After careful testing, the various clays are blended into mixtures and processed at their plant in Connecticut for use in cosmetics, pharmaceuticals, and other such high-value uses.

Along the southwestern flank of the Muddy Mountains east of Las Vegas (No. B-2) Clark County a 3- to 4-foot thick tuffaceous bed of probable Cretaceous age is strip mined. Tonnages taken from this deposit are relatively small.

The Beatty area (No. B-3), Nye County, has many stony ash-flow tuff units in which pure montmorillonite clays with well-developed thixotropic properties have been formed, presumably by the combination of hydrothermal alteration and weathering. Although the crude ore may contain considerably less than 50 percent clay by volume, it is of such high value that underground mining commonly is employed. Lovelite Cosmetics, Inc., of Las Vegas uses Beatty clay in their products.

The clay deposit along the eastern flank of the Silver Peak Range (No. B-4), Esmeralda County, is megascopically similar to the Beatty clay deposits. It probably was formed by the hydrothermal alteration of ash-flow tuff of the Esmeralda Formation, possibly along a range front fault.

Large amounts of bentonite were mined from the Chiatovich clay deposit along the eastern shore of Walker Lake north of Hawthorne (No. B-5), Mineral County, but the property is now inactive.

The Jupiter bentonite deposit, presumably formed by hydrothermal alteration of volcanic flow rock, is located south of the Carson River near Fort Churchill (No. B-6), Lyon County. This clay is cut by abundant selenite seams and veinlets. It is intermittently mined and shipped to the San Francisco area, presumably without beneficiation of any sort.

Large amounts of clay, presumably bentonite, have been mined from a deposit high on the eastern wall of Rainbow Canyon north of Boyd siding on the Union Pacific Railroad (No. B-7), Lincoln County. The clay and abundant siliceous alunite have been formed by the hydrothermal alteration of what apparently was tuffaceous rhyolite (Moore, 1936). The deposit and its workings are extensive. A tramway was built to transport the ore to the bottom of the canyon, but operations ceased about 1930 and have not been resumed.

OTHER DEPOSITS

BOYD DISTRICT

Many clay deposits noted in the geologic literature are not described here. Vandenberg (1937) notes two bentonite deposits in Mineral County (Nos. 1 and 2). Schrader (1931) briefly describes a large clay deposit in Cave Valley (No. 3), Lincoln County. Overton (1947) notes a high alumina clay (No. 4) and a fuller's earth deposit (No. 5), both in Washoe County.

In summary, although Nevada has not been a large clay producer in the past, if large deposits of the right type of clay can be found, it is in an excellent position to serve Western United States market areas. The abundance of various types of known clay deposits in Nevada leads the writer to believe that additional specialty clays can be found in the State.