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A PRELIMINARY REPORT ON SOME MAGNETITE-BEARING ROCKS NEAR FRYING
PAN LAKE, ILIAMNA D-7 QUADRANGLE, ALASKA

By

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The following is a brief description of some magnetite-bearing rocks located during geologic mapping of the Iliamna Quadrangle. The location of the occurrence and sample localities are shown on figures 1 and 2.

The magnetite-bearing rocks are dark angular pyroxenite fragments in a plutonic breccia. The brecciation is related to the intrusion of a granodioritic body thought to be of Jurassic age and related to the Aleutian Range Batholith which lies 40 miles to the east. The northeast and southwest extensions of the breccia are covered by Quaternary deposits.

The pyroxenite blocks make up about 50 to 90 percent of the breccia. They are black, and megascopically consist mainly of pyroxene and magnetite with small amounts of biotite, plagioclase and possibly epidote. Some hand specimens of the pyroxenite are very magnetic, and in coarse specimens the magnetite forms conspicuous crystal aggregates up to 1 inch across.

Sixteen selected samples of the pyroxenite were collected for analyses (locations indicated in fig. 2), and the results are tabulated on table 1.

Each sample was crushed to -80 mesh, split, and a magnetic separation made of one of the splits. On table 1, the untreated split is shown as whole rock, the magnetically separated split as magnetic fraction and

nonmagnetic fraction. The three portions of each sample were analyzed chemically for total Fe (reported as FeO), TiO₂, and P₂O₅, and by semiquantitative spectrography for 52 elements. Remanent magnetization and magnetic susceptibility were measured on 1 inch cores taken from six of the analyzed samples.

Briefly summarized, the geologic and analytical data indicate that the magnetite-bearing pyroxenite is igneous and predates the granodiorite that intrudes it. Its iron content, expressed as FeO, is 16 to 24 percent; its TiO₂ content about 1.3 percent; and its P₂O₅ content 0.1 to 3.2 percent. Ground to -80 mesh, 13 to 30 percent of the rock separates into a magnetic fraction containing 56 to 80 percent FeO, about 3.1 percent TiO₂, and generally less than 0.4 percent P₂O₅. The increase in TiO₂ in the magnetic fraction indicates probably that the magnetite is titaniferous. The decrease in P₂O₅ in the magnetic fraction indicates that it is probably contained in apatite which might be nearly eliminated from the magnetic fraction by finer grinding.

The magnetite-bearing pyroxenite blocks at Frying Pan Lake are similar to the magnetic hornblendite body on the south shore of Pile Bay, Iliamna C₃-D₃ quadrangles. At Pile Bay the hornblendite body is intruded by granodiorite of Jurassic age.