

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
Geological Survey  
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THE IRON KING NO. 1 COPPER PROSPECT, KASAAN PENINSULA,  
PRINCE OF WALES ISLAND, SOUTHEASTERN ALASKA

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Introduction

The copper prospect on the Iron King No. 1 claim (see fig. 1) is 0.9 mile N. 63° W. of the village of Kasaan on Prince of Wales Island, southeastern Alaska. By Forest Service trail the distance from Kasaan is 1.5 miles. The prospect is at an altitude of 50 feet and is about 250 feet from the shore of Kasaan Bay. The claim is owned by James Coleman, who also owns the claim covering the nearby Poor Man iron deposit. Development at the copper prospect consists of a group of small pits, trenches, and stripped areas within an area 200 feet by 100 feet. The vicinity is almost completely covered by glacial deposits, alluvium and vegetation.

In September 1942 the Geological Survey made geologic, topographic, and magnetic surveys of the deposit and the adjacent country <sup>1/</sup>. The Bureau of Mines trenched and sampled the deposit in October 1942 and drilled it in February and March 1943, at which time the drill cores, pits, and trenches were examined by the Geological Survey. This report summarizes the results of the earlier Geological Survey examination and presents the geologic results of the exploration by the Bureau of Mines.

Geology

The principal country rock at the prospect is the Kasaan greenstone, which, as elsewhere on the Kasaan Peninsula, has been folded and metamorphosed <sup>2/</sup>. Northeast- and north-trending dikes (bostonite and lamprophyre) cut the greenstone. Minor faulting has taken place along northeast and northwest fractures. The rocks are shattered and break readily into small pieces. Close to the deposit both the greenstone and the dikes are epidotized.

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<sup>1/</sup> Walton, Matt, The Iron King No. 1 copper prospect, Kasaan Peninsula, Prince of Wales Island, southeastern Alaska, U. S. Geol. Survey report to war agencies, Dec. 1942.

<sup>2/</sup> Wright, C. W., Geology and ore deposits of Copper Mountain and Kasaan Peninsula, Alaska: U. S. Geol. Survey Prof. Paper 87, p. 68, 1915.

## Ore deposit

Exposures of ore are largely confined to a zone approximately 150 feet long and averaging between 10 and 15 feet wide (see fig. 2). The boundaries of this zone are irregular and poorly exposed. It trends about N. 15° E., but its dip is not definitely known. Trench no. 1 (see fig. 2) exposes a well-defined contact between magnetite and sulfide ore which strikes about N. 15° E. and dips 65° NW. This contact seems to indicate the approximate attitude of the deposit.

Originally the deposit was thought to comprise two small ore bodies formed by replacement of limestone and fractured greenstone along the axis of an anticline plunging about 40 degrees to the southwest <sup>3/</sup>. Subsequent work, however, indicates that the ore deposition was controlled mainly by faulting rather than by folding. The zone of exposed ore strikes nearly parallel to the principal dikes and to other faults and fissure deposits in the region.

A dip-needle survey of the covered area surrounding the deposit demonstrated that the magnetic attraction of the ore body diminishes rapidly away from its outcrop. Old prospect trenches around the present exposures have largely slumped in, but no ore was observed in the material thrown out. Thus it is inferred that the deposit on the surface does not extend much beyond the area of outcrop.

The principal ore minerals are magnetite, pyrite, and chalcopyrite. Of these magnetite is the earliest mineral and seems to have replaced the greenstone, whereas the sulfide minerals fill fractures which cut the greenstone and the magnetite. Magnetite is most abundant at the northern end of the body where some ore contains as much as 50 percent of iron. The magnetite content decreases to the south and the southern part of the body consists mostly of mineralized greenstone in which pyrite and chalcopyrite occur in a network of veinlets. Here magnetite is found locally as disseminated grains. Judging from the samples taken by the Bureau of Mines at intervals along the body, chalcopyrite, though not evenly distributed, is about as abundant in the northern as in the southern part of the deposit.

The trenches and drill holes of the Bureau of Mines are shown on the accompanying map and sections (see figs. 2 and 3). Trench no. 1 exposes a band of magnetite ore about 3 feet wide. East of the magnetite for 8 feet is mineralized greenstone containing pyrite and chalcopyrite. Although this material appears to be very low grade, the analyses indicate that it contains more than 1.5 per cent of copper. West of the magnetite is about 8 feet of sulfide ore. In trench no. 2 magnetite and sulfide ore are rather intimately associated and the ore extends farther east than in trench no. 1. About 5 feet of mineralized greenstone is exposed at the

<sup>3/</sup> Walton, Matt, op. cit.

east end of trench no. 4. The western part of trench no. 3 is now covered but mineralized greenstone was encountered here at the time the trench was excavated. Analyses of five-foot channel samples taken from trenches nos. 3 and 4 show that the material contains about 2 percent of copper.

Drill holes were inclined southeasterly from two places on the west side of the deposit. Two holes, nos. 17 and 17A, were put down from the southern location and one, no. 15, from the northern. A fourth hole, no. 18, was inclined northwesterly from a point on the east side of the ore body. None of the cores contain any ore minerals other than occasional grains of pyrite and chalcopyrite. Holes nos. 15, 17, and 17A encountered a dike at the previously inferred position of the ore body. Hole no. 18, if it had been continued about 20 feet farther, would probably have entered the dike below the footwall boundary of the deposit (see fig. 3). The dike is exposed only near the west end of trench no. 4. From the drill-hole data it appears to be about 20 feet thick, to strike approximately N. 15° E., and to dip about 65° SE. Whether or not the deposit extends to or beneath the dike has not been shown by the drilling.

#### Reserves

Twenty-nine channel samples were cut by the Bureau of Mines from the trenches and outcrops. The analytical data from these samples were made available by the Bureau of Mines and indicate that the deposit contains an average of about 2 percent of copper and minor amounts of gold and silver. On the basis of the surface outcrops the body appears to be about 150 feet long and to average between 10 and 15 feet wide. No data are available on the depth to which the deposit extends. Assuming that the deposit extends, without change in length or width, to the large dike at an average depth of 30 feet, it contains about 5,500 tons of ore.

February, 1944

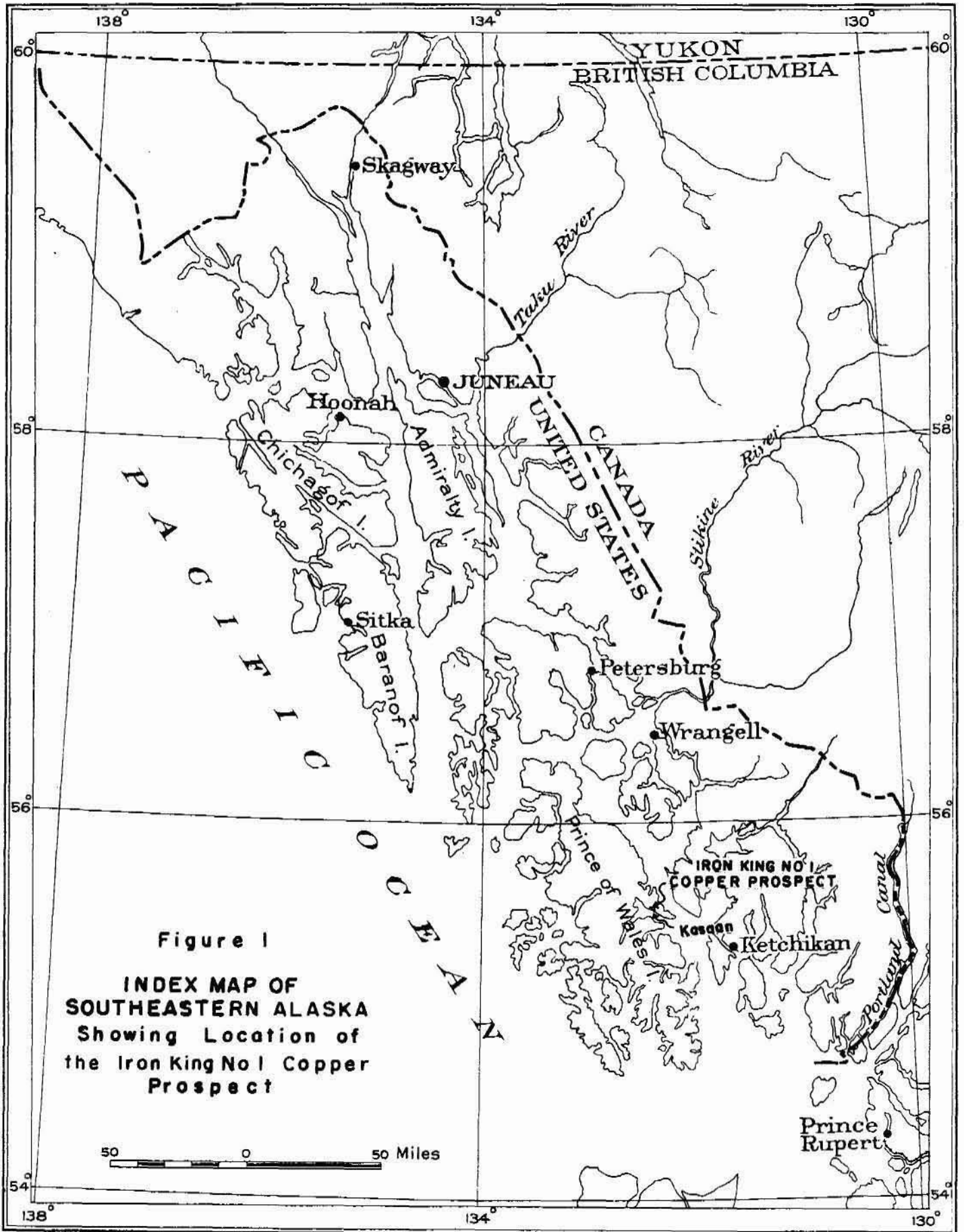









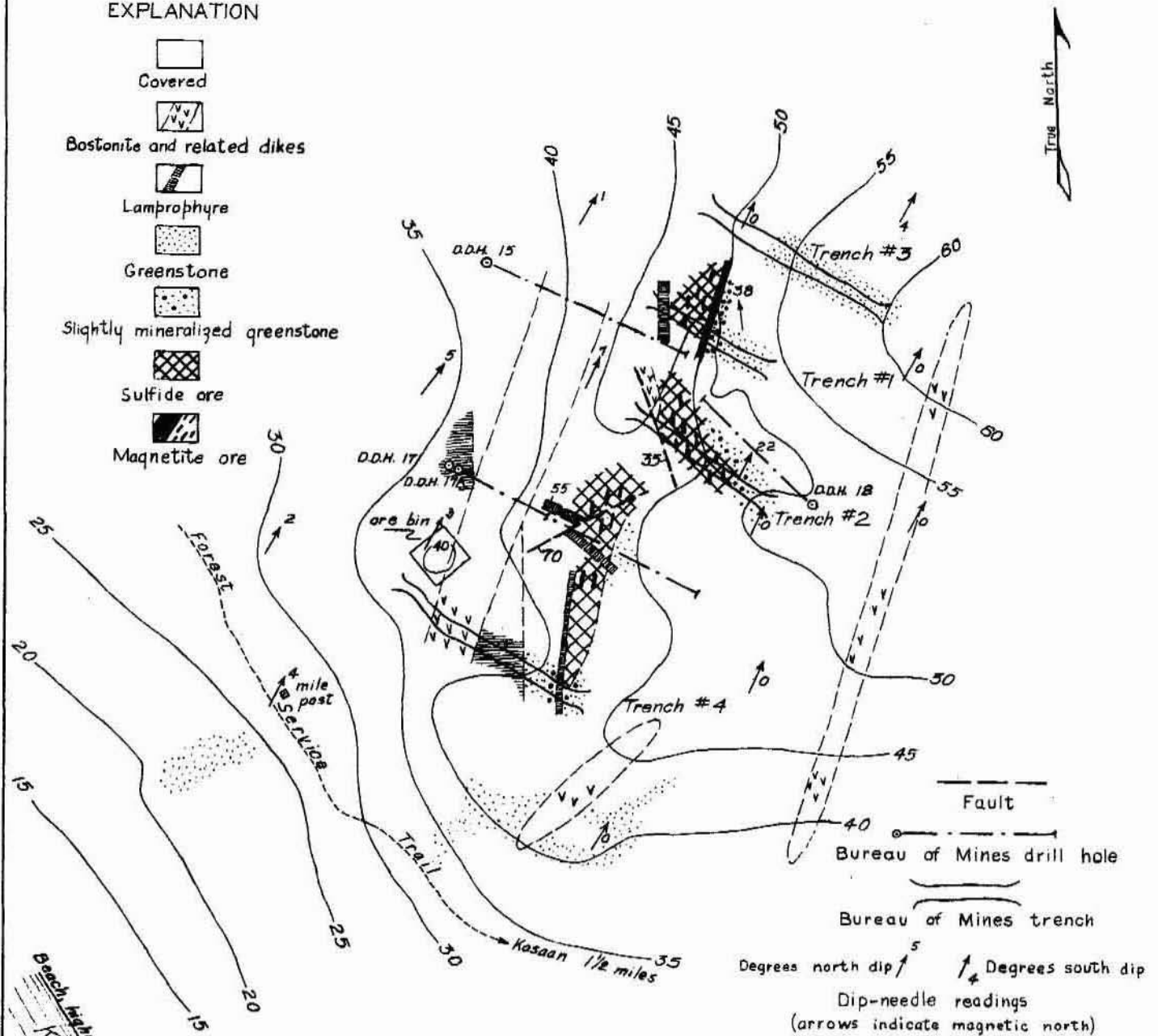
Figure 1  
**INDEX MAP OF  
 SOUTHEASTERN ALASKA**  
 Showing Location of  
 the Iron King No 1 Copper  
 Prospect

50 0 50 Miles

FIGURE 2

EXPLANATION

-  Covered
-  Bostonite and related dikes
-  Lamprophyre
-  Greenstone
-  Slightly mineralized greenstone
-  Sulfide ore
-  Magnetite ore



GEOLOGIC MAP OF THE IRON KING NO. 1 COPPER PROSPECT,  
KASAAN PENINSULA, PRINCE OF WALES ISLAND,  
SOUTHEASTERN ALASKA

SCALE IN FEET  
0 50 100

Contour interval 5 feet

Datum mean sea level

L.A. Warner, 1943



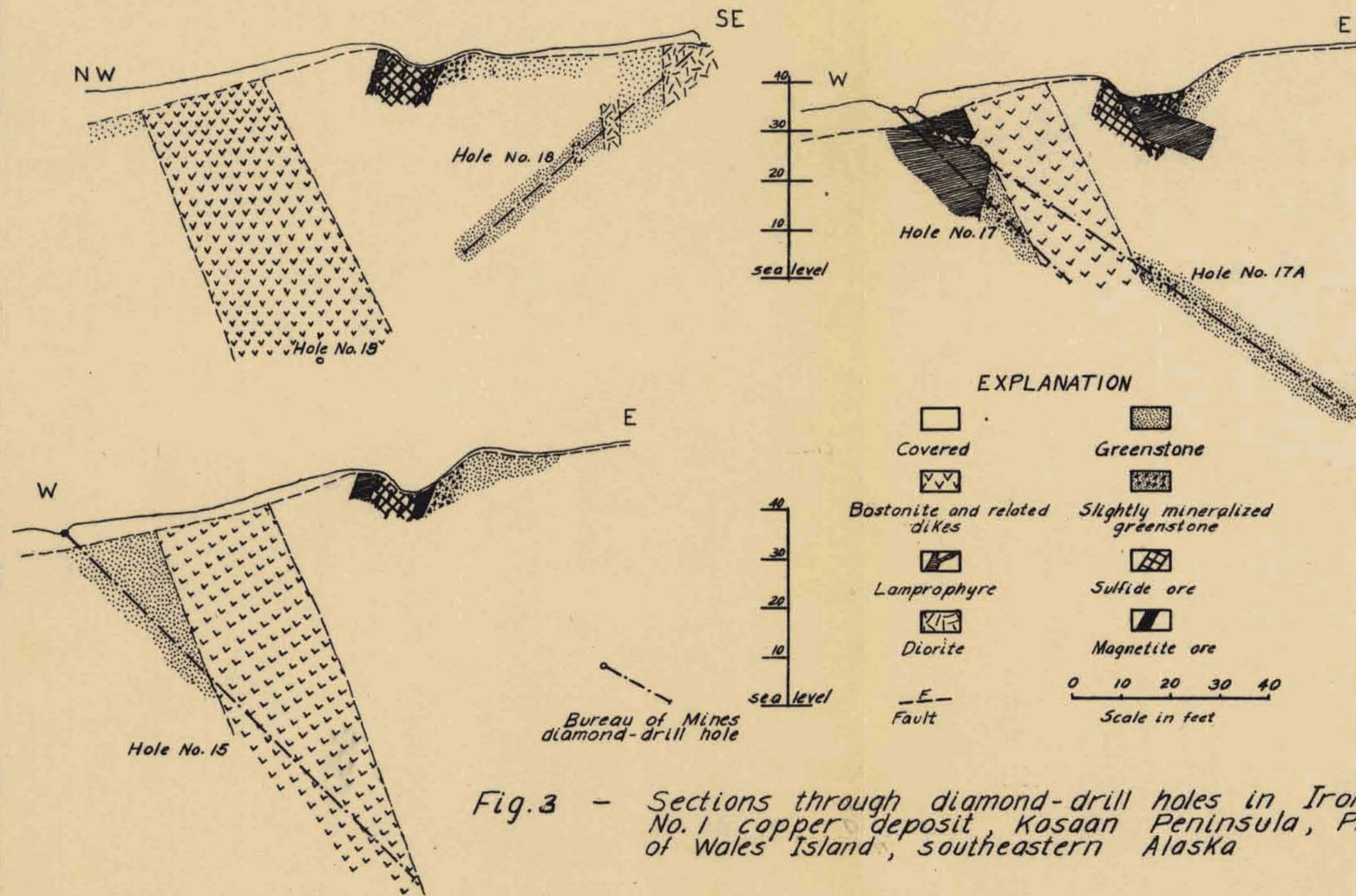


Fig. 3 - Sections through diamond-drill holes in Iron King No. 1 copper deposit, Kasaan Peninsula, Prince of Wales Island, southeastern Alaska

L.A. Warner, 1943