UNITED STATES
DEPARTMENT OF THE INTERIOR
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SUMMARY OF REFERENCES TO MINERAL OCCURRENCES (OTHER THAN MINERAL FUELS AND CONSTRUCTION MATERIALS) IN THE CRAIG QUADRANGLE, ALASKA

By

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Introduction

These summaries of references are designed to aid in library research on metallic and nonmetallic (other than mineral fuels and construction materials) mineral occurrences in the Craig quadrangle, Alaska. All references to reports of the Geological Survey, to most reports of the U.S. Bureau of Mines, and to most reports of the State of Alaska Division of Geological and Geophysical Surveys and its predecessor State and Territorial agencies released before May 1, 1978, are summarized. Certain, mainly statistical, reports such as the annual Minerals Yearbook of the U.S. Bureau of Mines and the biennial and annual reports of the State of Alaska Division of Geological and Geophysical Surveys and its predecessor State and Territorial agencies are not included.

This report is divided into three parts: a section made up of summaries of references arranged alphabetically by occurrence name; a section that lists synonyms for names in the first section, claim names, and the names of operators and owners of mines and prospects; and a section that lists, by author, all references summarized in the first section.

Index map

Summaries of References

For each mineral occurrence there is a page that gives the name of the occurrence; the mineral commodities present (listed alphabetically for metallic commodities and then for nonmetallic commodities); the mining district (Ransome and Kerns, 1954) in which the occurrence is located; the name of the 1:250,000-scale topographic quadrangle (Craig); coordinates (as described by Cobb and Kachadoorian, 1961, p. 3-4); the metallic mineral resources map number (MF-433) and the occurrence number on that map if the occurrence is shown; and the latitude and longitude of the occurrence. These data, presented at the top of the page, are followed by a short, general summary of the published information on the occurrence. This is followed (continued on additional pages, if necessary) by more detailed summaries, arranged chronologically, of all references to the occurrence. Material in brackets is interpretive or explanatory and is not in the summarized reference.

Proper names of mines, prospects, and other mineral occurrences are given if such names appear in the reports summarized. If a deposit does not have such a name, but is near a named geographic feature, the name of that feature is shown in parentheses in lieu of a proper name. If a part of a proper name is not always used in a reference, that part of the name is shown in parentheses. This is most common in company names and in place names with minor variations in spelling.

Citations are given in standard bibliographic format with the exception that references to reports and maps in numbered publication series also show, in parentheses, an abbreviation for the report or map series

and the report or map number. Abbreviations used are:

B	U.S. Geological Survey Bulletin
BMB	U.S. Bureau of Mines Bulletin
C	U.S. Geological Survey Circular
GC	Alaska Division of Geological and Geophysical Surveys (and predecessor State agencies) Geochemical Report
GR	Alaska Division of Geological and Geophysical Surveys (and predecessor State agencies) Geologic Report
IC	U.S. Bureau of Mines Information Circular
OF	U.S. Geological Survey Open-file Report (numbers are informal and used only within the Alaskan Geology Branch of the U.S. Geological Survey)
MF	U.S. Geological Survey Miscellaneous Field Studies Map
P	U.S. Geological Survey Professional Paper
RI	U.S. Bureau of Mines Report of Investigations
SR	Alaska Division of Geological and Geophysical Surveys Special Report

Summaries are as I made them while reading the cited reports. I made no attempt to use complete sentences and did not edit for grammatical consistency, although I have tried to edit out ambiguities.

References cited only in these introductory paragraphs are:

Cobb, E. H., and Kachadoorian, Reuben, 1961, Index of metallic and nonmetallic mineral deposits of Alaska compiled from published reports of Federal and State agencies through 1959: U.S. Geological Survey Bulletin 1139, 363 p.

Ransome, A. L., and Kerns, W. H., 1954, Names and definitions of regions, districts, and subdistricts in Alaska (used by the Bureau of Mines in statistical and economic studies covering the mineral industry of the Territory): U.S. Bureau of Mines Information Circular 7679, 91 p.

Alameda	Gold
Ketchikan district	Craig (25.4, 3.15) approx.
MF-433, loc. 92	55°10'N, 132°08'W approx.

Summary: Body of quartz about 4 ft. wide said to be low in gold values. Includes reference to Tomboy. See also Frisco (Kitkun Bay).

Brooks, 1902 (P 1), p. 85 -- Tomboy group staked on a series of quartz ledges that form topographic knolls and are reported by the owner to have been traced for about 3,000 ft. Walls not always determinable, but vein has minimum thickness of 20 ft. where exposed. Limestone on one side and chloritic schist on the other. Most of quartz appears to be barren; some is iron stained; contains some granular pyrite.

Wright and Wright, 1908 (B 347), p. 170 -- One of Tom Boy claims restaked as Alameda. Vein deposit about 4 ft. wide strikes due N and dips 50° E. Deposit is essentially quartz; said to be low in gold values. No development reported.

Alarm | Copper

Ketchikan district | Craig (21.8, 10.45)
MF-433, loc. 38 | 55°35'N, 132°28'W

Summary: A little chalcopyrite and magnetite in tactite in marble within a few hundred feet of diorite. About 200 ft. of adits, some open cuts, and 3 small stopes. Production (if any) was small. Includes reference to Eagle's Nest. See also It.

Wright and Paige, 1908 (B 345), p. 109 -- Same as Wright and Wright, 1908 (B 347), p. 118-119.

Wright and Wright, 1908 (B 347), p. 118-119 -- 70-ft. tunnel in garnet-epidote rock; a little [chalcopyrite] ore near face. Open cuts, shallow shafts, and outcrops expose contact rocks containing chalcopyrite and (in at least one place) magnetite. Country rock is limestone; diorite nearby.

Wright, 1909 (B 379), p. 79 -- Exploration, 1908.

Wright, 1915 (P 87), p. 94 -- Deposit at contact of diorite mass.

Warner and others, 1961 (B 1090), p. 5 -- Produced little or no ore.

p. 122 -- Ore in fractured tactite close to lenses of marble. Similar to It and Brown & Metzdorf.

p. 125 -- Development consisted of 2 adits (total length 200 ft.), a few open cuts and trenches, and a tram to the It mine. Little if any production. Country rock largely marble with NW-trending lenses of tactite. Diorite and gabbro exposed within a few hundred feet; several basic dikes in workings. Chief ore minerals are pyrite and chalcopyrite. 3 stopes in workings of one adit; copper content of remaining material estimated to be less than 0.5%. [If there were stopes and a tram to the It mine it seems logical that there was some production.]

Berg and Cobb, 1967 (B 1246), p. 167-168 -- Deposit similar to that at It mine.

Alexander	Gold(?)
Ketchikan district	Craig (20.1, 11.4) approx. 55°37'N, 132°02'W approx.

Summary: 45-ft. tunnel on quartz vein 6 in. to 3 ft. thick. No data on mineralogy or gold content, if any. Includes reference to Alexandria.

Wright and Wright, 1906 (B 284), p. 44-45 -- Prospect near Helm Bay.
Wright and Wright, 1908 (B 347), p. 155-156 -- Tunnel 45 ft. long exposes a [quartz] vein 6 in. to 3 ft. wide striking N. and dipping 45° W. across schistosity and folded greenstone and slate.

Alpha	Copper, Gold
Ketchikan district	Craig (26.3, 3.0) approx.
MF-433, loc. 97	55°09'N, 132°02'W approx.

Summary: Open cuts and a 35-ft. shaft explored a quartz vein as much as 5 ft. wide in contorted limestone; pyrite, chalcopyrite, and low gold values in vein.

Brooks, 1902 (P 1), p. 82 -- Quartz vein 18-24 in. wide cuts across white crystalline limestone.

Wright and Wright, 1908 (B 347), p. 175 -- Vein deposit 5 ft. wide has been traced for nearly 2,000 ft. Vein strikes due N, dips 45° W, cuts across banded limestone that in places is schistose and much folded. Vein contains pyrite and chalcopyrite and small values in gold. Developed by open cuts and a shaft 35 ft. deep.

Amazon	Gold
Ketchikan district	Craig (26.1, 3.0) approx.
MF-433, loc. 94	55°09'N, 132°03'W approx.

Summary: Breccia vein in calcareous schist is 5-10 ft. wide and parallel to bedding. Gold content reported to be about an ounce to the ton. About 185 ft. of underground workings. No record of production; no activity since 1915.

Wright and Wright, 1905 (B 259), p. 65 -- Quartz vein narrows from 10 ft. wide at surface to 1 ft. at bottom of 123-ft. shaft; in calcareous schist that in places is brecciated and cemented by quartz. Gold content reported to vary from $15 to $30 a ton.

Wright and Wright, 1906 (B 284), p. 43 -- Assessment work only, 1905.

Wright, 1907 (B 314), p. 62 -- Underground exploration, 1906.

Wright and Wright, 1908 (B 347), p. 174-175 -- Country rock is calc schist that strikes N 85° E and dips 50° NW. Deposit is a breccia vein 5-10 ft. wide and parallel to bedding. Ore relatively low grade [in gold]. Inclined shaft 125 ft. deep; 50 ft. below surface drift extends 30 ft. each side of shaft.

Wright, 1909 (B 379), p. 73 -- Only assessment work, 1908.

Chapin, 1916 (B 642), p. 81 -- Assessment work, 1915.

Anderson (Cholmondeley Sound)	Copper(?)
Ketchikan district	Craig (24.3, 5.0) approx. 55°16'N, 132°14'W approx.

Summary: Copper values reported.

Brooks, 1902 (P 1), p. 88 -- Claim near entrance of West Arm of Cholmondeley Sound said to carry copper values.

p. 95 -- Said to be on extension of vein exposed at Mammoth and Lakeview claims [Stumble-On prospect].

Anderson (McKenzie Inlet) — Copper

Ketchikan district — Craig (22.85, 6.2)
MF-433, loc. 72 — 55°20'N, 132°22'W

Summary: Chalcopyrite in zone 3 ft. wide in sheared chloritic schist.

Brooks, 1902 (P 1), p. 96 -- Chalcopyrite in a zone about 3 ft. wide in sheared chloritic schist. Mineralized zone strikes about east and is about vertical. Development is a tunnel [size not stated].

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(Baker I.) Gold(?), Molybdenum

Ketchikan district Craig (10.9, 5.7)
MF-433, loc. 8 55°19'N, 133°05'W

Summary: Devonian metasedimentary rocks intruded by Mesozoic quartz diorite. Silicified shear zones contain quartz veinlets carrying molybdenite, pyrite, arsenopyrite, pyrrhotite, and possibly a little gold; mainly in transverse fracture in veinlets and near borders of veinlets. Probably less than 0.05% molybdenite. Does not appear to be of economic interest.

Smith, 1933 (B 836), p. 81 -- Molybdenite in veins; some interest in 1930.

Smith, 1934 (B 857-A), p. 75 -- Exploration in 1932. Molybdenite mineralization near contact between a series of slates and limestones with a granite mass. Also contains several dollars a ton in gold.

Smith, 1934 (B 864-A), p. 79 -- Exploration, 1933. Gold present. All data from newspaper items.

Smith, 1936 (B 868-A), p. 82 -- Prospecting reported, 1934.

Smith, 1942 (B 926-C), p. 166-167 -- Data from private engineer's report prepared in 1931. Quartz, molybdenite, pyrite, and pyrrhotite in fissures in slate along contact between slate and granite; molybdenite occurs as thick incrustations along fissures and in both quartz and granite. Samples contained as much as 7.25% MoS_2; average 0.276% MoS_2; also considerable gold. Estimated 100,000 tons of such material.

Twenhofel and others, 1946 (B 947-B), p. 31-36 -- Discovered in 1931. Diamond drilling by private industry in 1932 and 1943. Bedrock is Devonian argillite and quartzite with minor marble that was intruded by now-silicified Mesozoic quartz diorite, which is cut by 4 sets of joints locally followed by quartz veinlets. Molybdenite in many places, particularly along margins of quartz veinlets and in fractures cutting veinlets. Locally forms sheets up to 1/4 in. thick, but characteristically in small, very thin patches. Grade probably less than 0.05% MoS_2. Small amounts of pyrite, arsenopyrite, and pyrrhotite associated with molybdenite. May be a little gold in quartz veinlets.

Wedow and others, 1952 (OF 51), p. 67 -- Molybdenite deposit.

Wedow and others, 1953 (C 248), p. 9, 11 -- Silicified Upper Jurassic or Lower Cretaceous quartz diorite cut by many narrow quartz veinlets carrying thin films and small grains of molybdenite; minerals present are molybdenite, pyrite, pyrrhotite, molybdite, and iron oxides in quartz gangue.

Houston and others, 1958 (B 1058-A), p. 24, 27 -- Grab sample of granite containing molybdenite-bearing quartz veinlets contained 0.001% eU.

Condon, 1961 (B 1108-B), p. B17 -- Molybdenite occurrence
p. B35-B36 -- References to Twenhofel and others, 1946 (B 947-B).

Berg and Cobb, 1967 (B 1246), p. 178 -- Intensely brecciated and silicified zones in quartz diorite contain many quartz veinlets carrying molybdenite and small amounts of pyrite, arsenopyrite, and pyrrhotite. Metallic minerals in transverse fractures in veinlets and near borders of veinlets. Molybdenite content estimated at less than 0.1% and probably less than 0.05%. Discovered in 1931. Diamond drilled in 1932 and 1943. Further development does not seem to be warranted.

(Baker Point) Iron

Ketchikan district Craig (22.3, 9.2)
MF-433, locs. 54, 55 55°31'N, 132°25'W

Summary: Small pods and lenses of magnetite in banded chert and argillite associated with an altered dike or flow and disseminated magnetite in volcanic graywacke.

Sainsbury, 1961 (B 1058-H), p. 352 -- Thin pods and lenses of magnetite in banded chert and argillite intercalated in an altered pyroxene-bearing rock that could have been a dike or flow. Nearby a prospect tunnel was driven at least 50 ft. along a joint in altered volcanic graywacke; pyritized greenstone on dump contains specks of magnetite and is cut by epidote veinlets. Little economic significance for either occurrence.

Berg and Cobb, 1967 (B 1246), p. 168 -- Small pods and lenses of magnetite in banded chert and argillite.

Beauty	Copper, Gold, Silver
Ketchikan district	Craig (26.2, 2.9) approx.
MF-433, loc. 96	55°09'N, 132°03'W approx.

Summary: Quartz vein in crystalline limestone carries tetrahedrite, chalcopyrite, pyrite, and secondary copper minerals; assays indicating $200 in silver and $20 in gold reported. Developments consisted of 3 shafts between 15 and 60 ft. deep and a drift connecting 2 of the shafts. Vein 12-18 inches wide (Brooks) or 4-6 feet wide (Wright and Wright). No record of production. Another vein on property exposed by an open cut.

Brooks, 1902 (P 1), p. 80 -- Mineralized quartz vein 12-18 in. thick in micaceous crystalline limestone contains pyrite, argentiferous tetrahedrite, and a little chalcopyrite; strikes N 20° E, dips 30° SE. Assays reported to have shown values of $200 in silver and $20 in gold; values said to continue in depth. Development is 2 shafts 45 ft. deep connected by a drift.

Wright and Wright, 1908 (B 347), p. 175 -- 2 claims. Quartz vein 4-6 ft. wide strikes N 20° E and dips 45° SE. Has been traced for nearly 1,000 ft. across a limestone belt that strikes N 30° W. Explored by inclined shafts 50 ft. and 60 ft. deep on one claim and by a 15-ft. shaft on the other. Another vein 2 ft. wide exposed in one open cut. Minerals contained are tetrahedrite, chalcopyrite, pyrite, malachite, and azurite.

Smith, 1914 (B 592), p. 81 -- Has been prospecting.

Beaver	Copper(?), Gold(?)
Ketchikan district MF-433, loc. 68	Craig (20.75, 5.55) approx. 55°18'N, 132°35'W approx.

Summary: Rather nebulous report of a claim with copper and gold values.

Brooks, 1902 (P 1), p. 107 -- Said to be about a mile from Hetta Inlet near Sulzer and to carry gold and copper values.

Bendigo	Gold(?)
Ketchikan district	Craig (19.75, 9.5) approx. 55°32'N, 132°41'W approx.

Summary: Claim on Granite Mtn. In area quartz fissure veins in a granitic pluton carry free gold and sulfides.

Wright and Wright, 1906 (B 284), p. 41-42 -- One of the claims on Granite Mtn., where quartz fissure veins in a granitic pluton contain free gold and various sulfides. Similar to Treasure [Flagstaff].

Bertha	Copper(?)
Ketchikan district MF-433, loc. 69	Craig (22.6, 5.4) approx. 55°17'N, 132°25'W approx.

Summary: Claim on which chalcopyrite and pyrrhotite were reported.

Brooks, 1902 (P 1), p. 95 -- One of 3 claims near Kiam [Khayyam] on which are reported 3 parallel veins with an aggregate thickness of 50 ft. of ore consisting of chalcopyrite and pyrrhotite.

Big Five — Copper, Iron

Ketchikan district — Craig (22.35, 11.6) approx.
MF-433, loc. 32 — 55°39'N, 132°25'W approx.

Summary: Small pods and stringers of pyrrhotite, magnetite, and chalcopyrite in tactite that replaced limestone near a diorite dike. Explored in early 1900's by a 40-ft. adit and a 15-ft. winze. No recorded production. See also Iron Cap.

Wright and Paige, 1908 (B 345), p. 112 -- Same as Wright and Wright, 1908 (B 347), p. 127.

Wright and Wright, 1908 (B 347), p. 127 -- Limestone replaced by scattered masses of chalcopyrite, pyrrhotite, and pyrite in gangue of garnet, epidote, and pyrite. Deposit 10 ft. wide. Faults marked by gouge seams in deposit and country rock. Explored by a 50-ft. tunnel and a shaft; mainly assessment work.

Wright, 1915 (P 87), p. 101-102 -- Same as Wright and Wright, 1908 (B 347), p. 127.

Warner and others, 1961 (B 1090), p. 110-111 -- Small pods and stringers of pyrrhotite with associated chalcopyrite and magnetite in tactite developed in impure limestone cut by diorite dike. Very small deposit that seems to trend northwestward and to dip steeply SW. Explored by a 40-ft. adit and a 15-ft. winze.

Berg and Cobb, 1967 (B 1246), p. 168 -- Small lode in limestone near a diorite dike consists of stringers and pods of pyrrhotite, magnetite, and chalcopyrite. One of the few deposits in area that was formed by replacement of limestone. Explored by adit and winze.

Big Harbor — Copper, Gold(?), Silver(?), Zinc(?)

Ketchikan district — Craig (16.9S, 6.7)
MF-433, loc. 57 — 55°22'N, 132°58'W

Summary: Lenses of pyrite, chalcopyrite, and possibly sphalerite (mentioned in only one report) along a gradational contact between greenschist and quartz-mica schist; some gold and silver probably present. Workings included at least 2 shafts, several levels, a few stopes, and an adit. Total recorded production was 136 tons of ore shipped in 1913-1916; contained 6%-7% copper. Includes references to Northland Development Co.

Knopf, 1911 (B 480), p. 102 -- Reported that 400 ft. of drifts and tunnels were driven, 1910. Ore body said to be 62 ft. wide; chalcopyrite, pyrite, and sphalerite in specimens.

Brooks, 1912 (B 520), p. 26 -- Development, 1911; some ore reported to have been blocked out.

Brooks, 1913 (B 542), p. 33 -- Underground work, 1912.

Brooks, 1914 (B 592), p. 60 -- Development, 1913.

Smith, 1914 (B 592), p. 84-85 -- 2 shafts, each about 50 ft. deep, 190 ft. of crosscuts, and 180 ft. of drifts. Some stopes blocked out. Some ore, valuable mainly for copper, but also with gold values, shipped in 1912. Quotation from Knopf, 1911 (B 480), p. 102.

Brooks, 1915 (B 622), p. 41-42 -- Underground workings at end of 1914 were shaft 117 ft. deep, 200 ft. of drifts, and 150 ft. of adit.

Chapin, 1916 (B 642), p. 91-93 -- Staked in 1907. Small shipments in 1912-13. 650 ft. of adits, crosscuts, and shaft; chalcopyrite lenses and stringer lodes in silicified greenstone; altered zone and individual lodes in it strike N 60° E and dip 60° NW. Hanging wall is greenstone schist; beyond footwall are deformed calcareous and arenaceous sedimentary rocks. Ore shoots of chalcopyrite are 2-6 ft. wide; one was stoped out for 40 ft. Quartz stringer lodes contain disseminated pyrite and chalcopyrite and some gold [see Twenhofel and others, 1949 (B 963-A)].

Chapin, 1918 (B 662), p. 69-70 -- Changed hands in 1916. Test shipment of ore. Geologic data summarized from Chapin, 1916 (B 642), p. 91-93. Details of current and planned development given.

Chapin, 1919 (B 692), p. 89 -- Development, but no production, 1917.

Brooks, 1921 (B 714), p. 18 -- Example of shear-zone deposit.

Twenhofel and others, 1949 (B 963-A), p. 15-17 -- Most of data summarized from above references to reports by Chapin. Deposit at main workings was made up of small, discontinuous ore bodies; mined out. Total recorded production was 136 tons of ore containing between 6% and 7% copper, 1913-16. Ore bodies of chalcopyrite and pyrite on footwall side of a gradational contact between greenstone schist and quartz-mica schist that strike N 65° E and dip 50°-60° NW; gradational zone has been altered, silicified, and mineralized with sulfides. Eastern deposit poorly exposed; flooded below 25 ft. below surface. Sample across 8-ft. sulfide band contained 1.9% copper. Presence of significant gold values doubtful.

Condon, 1961 (B 1108-B), p. B35 -- Copper deposit spatially related to photointerpreted fault or shear zone.

Big Harbor - Continued

Noel, 1966, p. 63 -- Reference to Twenhofel and others, 1949 (B 963-A).
Berg and Cobb, 1967 (B 1246), p. 170 -- In 1913 and 1916 a total of 136 tons of copper ore was shipped. Workings included a vertical shaft, several levels, and a few stopes (flooded to within 25 ft. of surface in 1944). Lenses of pyrite and chalcopyrite at contact of greenschist and quartz-mica schist contained 6%-7% copper and probably some gold and silver. Chip sample of mineralized rock in a 75-ft. adit on another part of the property contained 1.9% copper.

Big Six — Copper

Ketchikan district — Craig (24.4, 8.7) approx.
MF-433, loc. 49 — 55°29'N, 132°12'W approx.

Summary: Chalcopyrite and pyrite in altered limestone along fault contact with greenstone; native copper along joints. Deposit apparently formed by replacement of limestone.

Brooks, 1902 (P 1), p. 103 -- Mineralized zone exposed in open cuts follows an east-striking contact that dips 70° S between much altered limestone hanging wall and greenstone footwall. Footwall is a fault; chalcopyrite and pyrite and native copper (along joints) die out into limestone. A pit exposes a fault contact between an altered pegmatite and weathered feldspathic rock.

Berg and Cobb, 1967 (B 1246), p. 168 -- Lode apparently formed by replacement of limestone by chalcopyrite and other sulfides.

Blackbird	Copper(?)
Ketchikan district	Craig (22.1, 10.25) approx. 55°32'N, 132°36'W approx.

Summary: Claim north of Poorman. Probably staked as a copper prospect, but no data are available.

Chapin, 1916 (B 642), p. 86 -- Claim north of Poorman [no other data].

(Black Point) Gold(?)

Ketchikan district Craig (25.8, 1.25) approx
55°03'N, 132°06'W approx.

Summary: Shaft (flooded when Smith visited it) and short adit opened a (quartz?) lead. Fragmental volcanic country rock. No data on mineralized rock, if any.

Smith, 1914 (B 592), p. 82 -- Small prospect where the lead was opened by a vertical shaft (filled with water in 1913) and a short adit. "The country rock is an agglomeratic or pyroclastic igneous rock trending east and dipping south." Infaulted mass of black shale and slate nearby.

Blue Jay (Helm Bay)	Gold
Ketchikan district	Craig (26.35, 11.9)
MF-433, loc. 115	55°39'N, 132°00'W

Summary: Mining reported 1938-40. May also have been more recent mining. Practically no data on this mine. Geologic setting generally similar to that of Gold Standard.

Smith, 1939 (B 917-A), p. 22 -- A little mining, 1938.
Smith, 1941 (B 926-A), p. 20 -- Mining, 1939. 25-ton ball mill installed.
Smith, 1942 (B 933-A), p. 19 -- Mining, 1940.
Berg and Cobb, 1967 (B 1246), p. 179 -- Was a producing mine.

Brown & Metzdorf	Copper, Gold, Molybdenum, Silver
Ketchikan district	Craig (21.65, 10.5)
MF-433, loc. 37	55°25'N, 132°29'W

Summary: Tactite zone (probably formed by replacement of calcareous sedimentary rock) of garnet and epidote contains chalcopyrite, pyrite, and a little molybdenite in a 10-ft.-wide ore zone along footwall of a basic dike that also carries sulfides. Average assay of 3 samples taken in early 1940's(?) was 0.027 oz. gold and 0.59 oz. silver a ton, 3.8% copper, and 0.05% MoS_2. Developed by adit level with 225 ft. of workings, 2 shafts, and surface excavations. Was a little mining; in 1937 a 30-ton shipment of previously mined ore returned $40 a ton; may have been other mining earlier. Includes reference to Brown & Newell.

Wright and Paige, 1908 (B 345), p. 113 -- Same as Wright and Wright, 1908 (B 347), p. 120-121.

Wright and Wright, 1908 (B 347), p. 120-121 -- Mineralized mass of garnet rock carrying chalcopyrite and pyrite is exposed for a width of 10 ft.; evidently replaced quartzite and greenstone tuff country rock.

Wright, 1909 (B 379), p. 79 -- Assessment work, 1908.

Wright, 1915 (P 87), p. 73 -- Graywacke much epidotized. Deposit in contact rock at a contact between limestone and graywacke, both of which were replaced; intrusive rock (not exposed at surface) is near the deposit.

p. 97 -- Same as Wright and Wright, 1908 (B 347), p. 120-121.

[Note: country rock called limestone and graywacke on p. 73 and quartzite and greenstone tuff on p. 97.]

Warner and others, 1961 (B 1090), p. 5 -- Little if any production.

p. 122 -- Similar to Alarm and It.

p. 125-126 -- Small production has been reported. Developed by 2 shafts and an adit with 225 ft. of workings; also open cuts and trenches. Country rock greenstone and marble; some tactite, probably formed by replacement of a calcareous sedimentary rock by garnet and epidote; basalt and andesite dikes are only intrusive rocks near mine,. Sulfides (chalcopyrite, pyrite, and a little molybdenite) in tactite along footwall of a basic dike near a marble lens. Assays of 3 samples taken in early 1940's(?) showed average of 0.027 oz. gold and 0.59 oz. silver a ton, 3.8% copper, and 0.05% MoS_2. Dike as well as tactite mineralized. Disseminated sulfides in greenstone and tactite in surface cuts; copper content probably less than 1%. Possibility of finding commercial bodies of ore is small.

Berg and Cobb, 1967 (B 1246), p. 167-168 -- Similar to It mine; amount of ore produced undoubtedly small.

Bufvers, 1967 (SR 1), p. 2-3 -- Discovered in early 1900's. Ore is chalcopyrite with considerable values in gold. Ore body is a mineralized mass of garnet rock carrying chalcopyrite and pyrite; 10 ft. wide; practically all ore above level of short tunnel mined out. 30 tons of previously mined ore was sent to Tacoma smelter in 1937; returned $40 a ton. Also some historical and anecdotal data.

Bruce	Copper(?)
Ketchikan district	Craig (20.5, 4.3) approx. 55°14'N, 132°37'W approx.

Summary: Copper (?) prospect at Copper Mtn. on which some work was done in 1914.

Brooks, 1915 (B 622), p. 41 -- Prospect on which some work was done in 1914.

Buckhorn	Gold
Ketchikan district	Craig (19.75, 9.5) approx.
MF-433, loc. 23	55°32'N, 132°41'W approx.

Summary: Group of claims on Granite Mtn. Quartz fissure vein about 15 in. thick in a granitic pluton has been traced for several miles. Explored by several tunnels and open cuts. Said to carry good gold values. No known production.

Wright and Wright, 1906 (B 284), p. 41-42 -- Group of claims on Granite Mtn., where quartz fissure veins in a granitic pluton carry free gold and sulfides. Similar to Treasure [Flagstaff].

Wright and Wright, 1908 (B 347), p. 165 -- 9 claims near summit of Granite Mtn.; explored by open cuts and several tunnels. Quartz fissure vein with average width of about 15 in. has been traced several miles; strikes N 5° W, dips 45° NE; similar to Treasure vein and is said to carry good values in gold.

Herreid and Rose, 1966 (GR 17), p. 17 -- Claim on Granite Mtn. near Flagstaff.

Burke & Lang	Gold(?)
Ketchikan district	Craig (20.0, 8.8) 55°14'N, 132°39'W

Summary: Quartz vein about 20 ft. wide parallel to strike of enclosing greenstone tuff. A little stripping in about 1916. No data on metallic mineral content, if any.

Chapin, 1918 (B 662), p. 65 -- Lode is a quartz vein about 20 ft. wide trending N 70° W parallel to strike of enclosing greenstone tuff country rock. Only work was surface stripping in about 1916.

Herreid and Rose, 1966 (GR 17), p. 16 -- Reference to above.

Cachelot	Copper, Gold, Silver
Ketchikan district	Craig (24.95, 8.6)
MF-433, loc. 50	55°28'N, 132°08'W

Summary: Quartz vein in sheared diorite contains chalcopyrite, gold, and silver.

Brooks, 1902 (P 1), p. 103-104 -- Vein 1-3 ft. thick in sheared diorite with epidote along shear zones consists of chalcopyrite in quartz gangue. Random specimen contained 0.41 oz. silver and 0.14 oz. gold [a ton]. Vein strikes east and dips 70° N.

(Cape Addington) Copper

Ketchikan district Craig (8.5, 7.85)
MF-433, loc. 6 55°27'N, 133°49'W

Summary: Chalcopyrite in marble; copper-stained tactite nearby.

Clark and others, 1970 (OF 420), p. 3 -(sample 3) -- Marble with chalcopyrite; copper-stained tactite nearby.

Cascade — Copper, Gold, Lead, Silver, Zinc

Ketchikan district — Craig (19.5, 8.9)
MF-433, loc. 20 — 55°30'N, 132°42'W

Summary: Quartz veinlets and lenses in a fracture zone in an altered mafic intrusive rock contained free gold, pyrite, sphalerite, galena, and chalcopyrite. Assays of samples collected from a quartz lens in 1939 showed 0.24-0.50 oz. gold and 0.4-0.7 oz. silver per ton. An unknown, but probably small, amount of gold was mined in early 1900's and 1914-15. Work included open cuts and about 300 ft. of tunnels. Work in late 1930's was not productive.

Wright and Wright, 1905 (B 259), p. 67 -- Vein 2 ft. wide along fault in basic eruptive rock; visible gold. Tunnels 50 and 240 ft. long.

Wright and Wright, 1908 (B 347), p. 161-162 -- Tunnel follows a quartz vein for about 175 ft. Vein is about 2 ft. wide and occupies an old fracture in an altered basic intrusive; strikes N 53° W, dips 70° SW; contains pyrite, sphalerite, galena, and gold in quartz and calcite gangue. Values very unevenly distributed; average content probably not high, although some very rich ore has been found. A second tunnel driven 300 ft. to undercut vein did not find it.

Brooks, 1915 (B 622), p. 48 -- Some development, 1914. Ore treated in an arrastre and a small stamp mill..

Herreid and Rose, 1966 (GR 17), p. 11 -- Minor gold-quartz deposit.

p. 14-15 -- Discovered in 1900. 2 tunnels driven in 1901 and a large quartz boulder containing considerable gold was broken up and shipped. Minor amounts of gold produced in 1914-15. A little work also in 1932 and 1938 and for a few years thereafter. Herreid and Rose could not find workings in 1965. Quotation from Wright and Wright, 1908 (B 347). Described by Roehm (who visited mine in 1939) as mineralized shears, some filled with quartz veins up to a few inches wide and a quartz lens up to 2 ft. thick and 36 ft. long. Most of ore milled came from surface cuts and a small lens of sulfide (including chalcopyrite) ore that averaged $100 a ton. Samples of a quartz lens in a tunnel contained 0.24-0.50 oz. gold and 0.4-0.7 oz. silver per ton.

Berg and Cobb, 1967 (B 1246), p. 169 -- Gold- and sulfide-bearing quartz veins were worked on a small scale.

Bufvers, 1967 (SR 1), p. 10-11 -- Historical data and anecdotes and material from Wright and Wright, 1908 (B 347) [not cited].

Charles	Copper, Gold, Silver
Ketchikan district	Craig (21.65, 10.75)
MF-433, loc. 36	55°36'N, 132°29'W

Summary: Small open pit in tactite that replaced greenstone tuff or graywacke and conglomerate contains some chalcopyrite, pyrite, and magnetite. High values in gold and silver reported. No record of production.

Wright and Paige, 1908 (B 345), p. 113 -- Same as Wright and Wright, 1908 (B 347), p. 120.

Wright and Wright, 1908 (B 347), p. 120 -- Located in 1907; little work has been done. Mineralized body exposed in open cut consists of masses of chalcopyrite with some magnetite in garnet gangue; replaced greenstone tuff country rock. Cut by younger diabase dikes. Ore said to carry high values in gold and silver.

Wright, 1915 (P 87), p. 73 -- Graywacke and conglomerate grade into contact rock; masses of conglomerate surrounded by contact rock. Intrusive rock not exposed.

p. 100 -- Same as Wright and Wright, 1908 (B 347), p. 120. [Note: country rock called graywacke and conglomerate on p. 73; called greenstone tuff on p. 100].

Warner and others, 1961 (B 1090), p. 5 -- Little if any production.

p. 132 -- Small open pit in tactite that contains some chalcopyrite, pyrite, and magnetite.

Chicago Kid — Gold(?)

Ketchikan district — Craig (26.0, 3.0) approx.
55°09'N, 132°03'W approx.

Summary: Shallow opening made on 5-ft. vein of brecciated limestone cemented by quartz carrying pyrite and tetrahedrite. In area where most mines and prospects were for gold; this claim probably was staked as a gold prospect.

Chapin, 1916 (B 642), p. 81 -- Shallow opening on a 5-ft. vein of brecciated limestone cemented by veinlets and masses of quartz carrying pyrite and tetrahedrite [no data on possible gold content]. Vein strikes N 60° E, dips 70° SE. South of Golden Fleece on James Lake.

Clipper	Gold
Ketchikan district	Craig (19.75, 9.5) approx.
MF-433, loc. 23	55°32'N, 132°41'W approx.

Summary: Vein 8-18 in. wide in altered and decomposed diabase dike in granite. Developed by surface stripping and short tunnels. Similar to veins at Flagstaff (Treasure), which carry free gold and sulfides.

Wright and Wright, 1908 (B 347), p. 165 -- On east side of Granite Mtn. Developments are surface stripping and short test tunnels. Vein is 8-18 in. wide in an altered and decomposed diabase dike in granite. Similar to Treasure veins.

Herreid and Rose, 1966 (GR 17), p. 17 -- Claim on Granite Mtn. near Flagstaff.

Constitution	Copper, Gold, Lead, Zinc
Ketchikan district	Craig (18.5, 9.5) approx.
MF-433, loc. 15	55°32'N, 132°48'W approx.

Summary: Fissure vein in gabbro and amphibolite contains gold (average tenor probably about 1 oz. per ton), pyrite, chalcopyrite, galena, and sphalerite. Explored by a 130-ft. tunnel and surface stripping. No record of production.

Brooks, 1902 (P 1), p. 94 -- Vein 2-1/2 to 3 ft. wide in slate; gouge along both walls. Gold (some free) values reported to be $4 to $200 [a ton]. Galena reported in area.

Wright and Wright, 1908 (B 347), p. 163 -- Tunnel 130 ft. long on a quartz fissure vein 6 in. to 4 ft. wide in gabbro and amphibolite; gouge on north sides in places. Vein contains pyrite, chalcopyrite, galena, and sphalerite; much surface oxidation of sulfides. In face of tunnel vein appears to be faulted off.

Bufvers, 1967 (SR 1), p. 11 -- Tunnel driven 130 ft. on a vein that narrowed from 4 ft. to 5 in. at face, where it appears to have been cut off. In 1933 vein was uncovered for a distance of 200 ft.; average width 1-1/2 ft.; average value $20 [about an ounce] a ton in gold. Vein in tunnel strikes N 65° W and dips 60°-90° SW. Pyrite, chalcopyrite, galena, and sphalerite in shear zone in gabbro and amphibolite.

Cook	Gold(?)
Ketchikan district	Craig (26.1, 3.0) approx. 55°09'N, 132°03'W approx.

Summary: Claim near Valparaiso mine staked, presumably for gold, in about 1915. No other data available.

Chapin, 1916 (B 642), p. 81 -- Claim near Valparaiso mine.

Copper (Granite Mtn.)

Gold(?)

Ketchikan district

Craig (19.75, 9.5) approx.
55°32'N, 132°41°W approx.

Summary: Group of claims on Granite Mtn. In area quartz fissure veins in a granitic pluton carry free gold and sulfides.

Wright and Wright, 1906 (B 284), p. 41-42 -- Group of claims on Granite Mtn., where quartz fissure veins in a granitic pluton contain free gold and various sulfides. Similar to Treasure [Flagstaff].

Copper Center — Copper, Gold, Iron, Silver

Ketchikan district — Craig (21.45, 11.05)
MF-433, loc. 31 — 55°37'N, 132°30'W

Summary: Small, irregular pods and veins of mainly magnetite with some pyrite and chalcopyrite and a little gold and silver in greenstone. Minor exploration, mainly in 1908. No record of production.

Wright and Paige, 1908 (B 345), p. 112-113 -- Same as Wright and Wright, 1908 (B 347), p. 120.

Wright and Wright, 1908 (B 347), p. 120 -- Located by dip-needle survey in 1907. Several shafts 10-30 ft. deep and surface cuts expose magnetite and chalcopyrite in garnet-epidote-hornblende gangue. Deposit is apparently flat lying. Country rock largely greenstone tuff and conglomerate underlain by granodiorite.

Wright, 1909 (B 379), p. 79 -- Assessment work, 1908.

Brooks, 1912 (B 520), p. 26 -- New discovery of copper ore reported, 1911.

Wright, 1915 (P 87), p. 94 -- Deposit at contact between syenite porphyry dike and diorite.

p. 100 -- Same as Wright and Wright, 1908 (B 347), p. 120.

[Note: Country rock called diorite and a syenite porphyry dike on p. 94; called greenstone tuff and conglomerate underlain by granodiorite on p. 100.]

Wells and others, 1957 (RI 5312), p. 56 -- Ore used for beneficiation tests was mainly magnetite, with some quartz, chlorite, chalcopyrite, epidote, limonite, and small amounts of calcite, pyrite, malachite, amphibole, and azurite. Heads assayed 50.6% Fe, 1.85% Cu, 3.73% S, less than 0.01% P, 2.6% CaO, 0.9% MgO, 13.4% SiO2, and 0.05 oz. Au and 0.25 oz. Ag per ton.

Warner and others, 1961 (B 1090), p. 5 -- Little if any production.

p. 42-43 -- One of several prospects and mines on hypothermal veins of pyrrhotite, pyrite, and chalcopyrite in quartz gangue. [This general statement does not agree with detailed description on p. 120-122.]

p. 120-122 -- Country rock greenstone; one diorite and several basic dikes in vicinity. Ore bodies are several small, irregular pods and veins of magnetite, pyrite, and chalcopyrite; garnet and epidote not abundant; minor quartz and calcite as gangue. Largest ore body is a dominantly chalcopyrite vein 1-3 ft. wide, exposed for a length of 20 ft., and probably widening downward. Much of mineralized material mainly magnetite. Analyses of 2 samples of better than average material showed 0.030-0.345 oz. Au, and 0.35-2.00 oz. Ag a ton; 4.08%-4.72% Cu, and 41.05%-54.40% Fe. Development, mainly in 1908, consisted of 4 shallow shafts and some surface excavations; no production.

Bufvers, 1967 (SR 1), p. 2 -- No geologic data not in Warner and others, 1961 (B 1090), p. 120-122. Discovered, 1907. A little useless work in 1930's.

Copper City — Copper, Gold, Silver, Zinc

Ketchikan district — Craig (20.6, 2.6)
MF-433, loc. 81 — 55°08'N, 132°37'W

Summary: Vein of mstly massive sulfide ore 6 in. to 4 ft. thick parallel to bedding in country rock that varies from black slate to amphibolite schist and is cut by post-ore diabase dikes. Ore contains chalcopyrite pyrite, sphalerite, rare hematite, and $3-$6 a ton in gold, $1-$3 a ton in silver (1908 prices); runs 6%-9% zinc. Mined from inclined shaft 300 ft. deep and several levels from 1904 to 1910 when salt water entering on 100-ft. level flooded mine. Work in the next few years did not result in production. Includes references to Red Wing.

Wright and Wright, 1906 (B 254), p. 51, 53 -- Country rock is altered greenstone schist with interbedded slate; strikes N and dips 40° E. Vein parallels country-rock structure, averages 2-1/2 ft. thick, and consists of pyrite, chalcopyrite, and pyrrhotite with some magnetite; copper carbonates near surface. Post-ore diabase dikes cut across ore body. 1,600 tons of ore mined; smelter return was about $60,000 in copper and gold values.

Wright, 1907 (B 314), p. 70-71 -- Mining, 1906. Several ore shipments to Tacoma smelter.

Wright, 1908 (B 345), p. 95 -- Further work, 1907. Most ore above 100-ft. level has been mined.

Wright and Wright, 1908 (B 347), p. 106-107 -- Vein 6 in. to 4 ft. thick of nearly massive sulfide ore parallel to bedding in slate-greenstone country rock that varies from black slate to amphibolite schist with regional strike of N 20° E and dip of 60° NW. Post-ore diabase dikes cut across schists and vein. Ore is chalcopyrite, pyrite, sphalerite, and, rarely, hematite in a gangue of quartz, calcite, and epidote; secondary iron and copper minerals in places. In addition to copper, ore contains $3-$6 [a ton] in gold, $1-$3 in silver, and 6%-9% zinc. Workings include inclined shaft, levels at 50 ft. and 100 ft., a 60-ft. winze, and a sublevel. Most of ore above 100-ft. level has been mined and shipped to Tacoma smelter.

Wright, 1909 (B 379), p. 81-82 -- Vein deposit in greenstone schists and quartzites. Salt water entering workings on 100-ft. level along a diabase dike. Mining above 100-ft. level, 1908.

Knopf, 1911 (B 480), p. 102 -- New shaft being sunk on Red Wing, 1910.

Brooks, 1912 (B 520), p. 26 -- Development continued, 1911.

Brooks, 1913 (B 542), p. 33 -- Development continued, 1912.

Brooks, 1915 (B 622), p. 41 -- Some work, 1914.

Wright, 1915 (P 87), p. 46-47 -- Vein deposit in schist.
p. 55 -- Have been small shipments of copper ore.
p. 64 -- Same as Wright and Wright, 1908 (B 347), p. 106-107.

Brooks, 1921 (B 714), p. 18 -- Example of shear-zone deposit.

Buddington and Chapin, 1929 (B 800), p. 318 -- Example of shear-zone deposit.
p. 369-370 -- Example of shear-zone deposit.

Berg and Cobb, 1967 (B 1246), p. 172 -- Deposit similar to that at Corbin (fissure vein deposit, except that it carries 6-9% zinc and somewhat more gold and silver. Was mined in a small way for several years.

Copper City -- Continued

Bufvers, 1967 (SR 1), p. 21-22 -- Discovered in 1898; operations began in 1903; ore sent to Tacoma smelter. Ore body of nearly massive chalcopyrite, pyrite, sphalerite, and some hematite; in slate-greenstone country rock. Ore assayed $3-$6 in gold and silver and 6%-9% zinc. Mine operated intermittently until 1910, when a drill hole allowed salt water to enter and flood the mine. Shaft depth was 300 ft.

Copper Hill — Copper, Gold(?)

Ketchikan district — Craig (19.65, 8.85)
MF-433, loc. 19 — 55°30'N, 132°41'W

Summary: Network of chalcopyrite veinlets and chalcopyrite-impregnated rock fragments in shear zone in greenstone tuff; said to carry gold as well as copper. A little work in about 1900 and in 1916; no record of any production. Includes reference to Copperplate.

Brooks, 1902 (P 1), p. 90 -- Small vein in diorite porphyry traced for about 100 ft. in Copperplate claim. Carries chalcopyrite; is said to carry gold.

Chapin, 1918 (B 662), p. 65-66 -- Assessment work in 1916 consisted of surface stripping. Lode is in a shear zone and consists of a network of chalcopyrite veinlets enclosing sheared rock impregnated with particles of chalcopyrite; stained in places with copper carbonates. Greenstone tuff country rock and lode strike N 70° W; country rock dips steeply NE; lode appears to dip to SW.

Herreid and Rose, 1966 (GR 17), p. 16 -- References to above.

Copper King	Copper, Gold, Iron
Ketchikan district	Craig (22.15, 10.05) approx.
MF-433, loc. 39	55°34'N, 132°26'W approx.

Summary: Greenstone with disseminated "bunches" of pyrite, chalcopyrite, and magnetite. Gold assays of about 0.39 to about 0.48 oz. a ton reported. Developed by short tunnel, shallow shaft, and open cut. Later may have become part of Poorman property.

Brooks, 1902 (P 1), p. 99-100 -- Pyrite, magnetite, and chalcopyrite disseminated in "bunches" with calcite, epidote, and quartz gangue. Ore zone is about 6 ft. wide and dies out into country rock. Assays showed 12%-13% copper and $8-$10 gold [a ton]. Developments are a 20-ft. shaft, a 30-ft. tunnel, and a 35-ft. open cut.

Copper Mountain — Copper, Gold, Silver

Ketchikan district — Craig (20.5, 4.3)
MF-433, loc. 76 — 55°14'N, 132°37'W

Summary: Discovered in 1897; mining 1902, 1905-06; had own smelter. Ore mined was mainly secondary carbonate ores and bornite; primary chalcopyrite in contact zones between granodiorite body and limestone too lean to mine at a profit. Ore mined ran $1-$2 a ton in gold and silver. Several thousand feet of workings. Includes references to: Alaska (Consolidated) Copper Co., Coppermount, (Copper Mtn.), Indiana, New York.

Brooks, 1902 (P 1), p. 105-107 -- Contact-metamorphic deposits in limestone intruded by pyroxene syenite(?) body 600-700 ft. wide. Ore is chalcopyrite and bornite and copper carbonates. Mined from open cut on New York claim; ore runs 20% and higher copper, silver, and gold. Material on Indiana claim contains $8-$10 a ton in gold. [Amount of production not given.]

Wright and Wright, 1905 (B 259), p. 64 -- Considerable surface and underground workings on New York ledge. Little work on lower grade Oregon ledge. Smelter and 5,000-ft. cable tram built, 1904.

Wright and Wright, 1906 (B 284), p. 51-52 -- At New York claim the ore body is a band of garnet-epidote rock about 30 ft. thick along the contact of a granite outlier of the main Copper Mtn. stock and limestone. Much malachite and azurite in shattered limestone hanging wall. At least 3,000 ft. of workings. Similar deposit on Indiana claim explored by several hundred feet of workings.

Wright, 1907 (B 314), p. 70 -- More underground exploration, 1906.

Wright, 1908 (B 345), p. 94 -- Idle, 1907.

Wright and Wright, 1908 (B 347), p. 96-98 -- Discovered in about 1897; shipments in 1902. Development, including building a smelter, thereafter, with production resumed late in 1905. At close of 1906 workings included 4,200 ft. of tunnels, 500 ft. of shafts, and glory holes. Smelter closed in Oct., 1906. Contact metamorphic ore deposits on both sides of a body of granodiorite 800 ft. wide cutting limestone; ore in garnet-epidote contact rock and fractured limestone hanging wall. Some surface oxidation. Ore bodies irregular. Ore contains copper sulfide and carbonate minerals and $1-$2 [a ton] in gold and silver.

Brooks, 1913 (B 542), p. 33 -- Some underground work, 1912.

Smith, 1914 (B 592), p. 84 -- Prospecting only, 1913.

Brooks, 1915 (B 622), p. 41 -- Considerable work, 1914.

Wright, 1915 (P 87), p. 50 -- Chrysocolla and cuprite present.
p. 54-58 -- Essentially the same information as in Wright and Wright, 1908 (B 347), p. 96-98, with some added details on workings and distribution of oxidized ore.

Chapin, 1916 (B 642), p. 91 -- Work suspended, 1915. Patents on 5 claims applied for.

Brooks, 1921 (B 714), p. 17 -- Example of contact copper deposit.

Wright and Fosse, 1946 (RI 3952), p. 2 -- Half a mile SE of Jumbo.

Kaufman, 1958 (IC 7844), p. 11 -- Garnet reported.

Copper Mountain -- Continued

Berg and Cobb, 1967 (B 1246), p. 171-172 -- First operated in 1902; exploited rich secondary copper carbonate ores derived from contact-metamorphic chalcopyrite deposit (too lean to mine at a profit) between diorite and limestone. Mine and smelter closed in 1907.

Bufvers, 1967 (SR 1), p. 21 -- Historical data only. Deposit discovered in 1897.

Copper Queen — Copper

Ketchikan district — Craig (22.6, 9.65)
MF-433, loc. 40 — 55°32'N, 132°23'W

Summary: First staked in 1867 (probably first lode location in Alaska). Deposit is an irregular mass of chalcopyrite, pyrite, and magnetite in garnet-epidote gangue; country rock greenstone tuff intruded by a syenite intrusive body. Surface excavations and about 500 ft. of tunneling. No work since 1903. No production.

Brooks, 1902 (P 1), p. 100 -- Irregularly distributed pockets of chalcopyrite ore in greenstone. Developed by 200-300 ft. of tunnel, some small shafts, and surface excavation.

Wright and Wright, 1906 (B 284), p. 48 -- Ore bodies in altered limestone and intercalated greenstone; consist of chalcopyrite, pyrite, magnetite, chlorite, garnet, calcite, and epidote. Ore bodies irregular. No work for several years because of litigation, 1905.

Wright, 1907 (B 314), p. 68 -- Assessment work only, 1906.

Wright and Paige, 1908 (B 345), p. 108 -- Same as Wright and Wright, 1908 (B 347), p. 117-118.

Wright and Wright, 1908 (B 347), p. 117-118 -- First copper locations on Prince of Wales I., 1898. Surface excavations and 500 ft. of tunneling. Idle since 1903. Principal deposit is an irregular mass of chalcopyrite, pyrite, and magnetite in garnet-epidote gangue at contact between altered syanite intrusive and greenstone tuff. Crosscut driven 400 ft. in altered syenite did not reveal any ore.

Wright, 1915 (P 87), p. 94-95 -- Same as Wright and Wright, 1908 (B 347), p. 117-118.

Warner and others, 1961 (B 1090), p. 5 -- Little, if any, production.

Bufvers, 1967 (SR 1), p. 3-4 -- Staked in 1867; probably the first lode location in Alaska. Other historical and anecdotal material. Deposit is an irregular mass of chalcopyrite, pyrite, and magnetite.

Corbin — Copper, Gold, Silver

Ketchikan district — Craig (20.2, 4.25)
MF-433, loc. 74 — 55°14'N, 132°39'W

Summary: Fissure vein in greenstone is 1-3 ft. wide; contains mainly pyrite with minor chalcopyrite and a little quartz and calcite. A little ore shipped in 1905; contained about $3 a ton in gold and silver (1905 prices). Developed by 100-ft. shaft and some drifts and a 210-ft. tunnel. No activity after 1914. Includes references to Corwin.

Wright and Wright, 1906 (B 284), p. 51-53 -- Ore zone of massive sulfides with small values in gold and silver is 1-3 ft. wide and follows structure of greenstone schist country rock.

Wright, 1907 (B 314), p. 70-71 -- "The ore body is a narrow vein of massive sulphide ore, carrying but a slight percentage of copper and small values in gold and silver." Deposit appears to be a small shoot less than 100 ft. long and 3 ft. wide that pitches about 60° NW. Some development, 1906.

Wright, 1908 (B 345), p. 95 -- Operated part of 1907.

Wright and Wright, 1908 (B 347), p. 105-106 -- Located in 1905 and some ore shipped to smelter at Coppermount that year. Considerable exploration involving 100-ft. shaft, crosscutting, drifting, and driving a tunnel 210 ft. did not yield encouraging results and was suspended late in 1907. Deposit is a vein no more than 3 ft. thick that pinches in places to a gouge seam; strikes N 70° W and dips 70° SW; parallel to stratification of greenstone-schist country rock; both walls slickensided. Diabase dikes cut across vein deposit. Ore is principally pyrite with chalcopyrite and quartz and calcite gangue. Low percentage [not given] of copper and about $3 a ton in gold and silver.

Wright, 1909 (B 379), p. 81-82 -- Vein or shear-zone deposit. Idle in 1908.

Wright, 1915 (P 87), p. 43 -- Diabase dikes are younger than ore deposit.
p. 47 -- Vein deposit in schist.
p. 54-56 -- Located between 1900 and 1903. Has been production.
p. 63-64 -- About the same as Wright and Wright, 1908 (B 347), p. 105-106.

Brooks, 1921 (B 714), p. 18 -- Corwin is an example of a shear-zone deposit.

Buddington and Chapin, 1929 (B 800), p. 318, 389-370 -- Quotation from Brooks, 1914 (B 214).

Berg and Cobb, 1967 (B 1246), p. 172 -- Fissure vein in greenstone consists of pyrite, subordinate chalcopyrite, and minor quartz and calcite; in 1905 an unknown but probably small amount of ore averaging about $3 a ton in gold and silver was shipped to smelter at Coppermount.

Bufvers, 1967 (SR 1), p. 21 -- Discovered in 1905 and some ore shipped that summer. In the next few years a shaft was sunk more than 100 ft.; some drifts were run, and a tunnel was driven on the vein for about 210 ft. Vein is 1-3 ft. thick, strikes N 70° W, dips 70° SW, and carries a little copper and some gold and silver. In 1913 a shipment of ore on the dock was lost when a ship pulled the dock and ore into deep water. Last activity was a little prospecting in 1914.

(Coronation I.) Lead, Zinc

Kupreanof district Craig (3.2, 16.0)
MF-433, loc. 1 55°55'N, 134°21'W

Summary: Lenticular small masses of galena, sphalerite, tetrahedrite, and secondary iron, lead, and zinc minerals in clay-carbonate gangue in fault zones as much as 4 ft. wide in Paleozoic limestone or marble, locally cut by diorite, were mined from several hundred feet of workings in early 1900's; more than 100 tons of ore shipped. Apparently all ore was mined.

Wright, 1908 (B 345), p. 97 -- Narrow irregular veins of galena form small masses along slipping planes in limestone. Explored by short tunnels.

Wright and Wright, 1908 (B 347), p. 190-191 -- Paleozoic limestone and schist intruded by a granite mass. Galena found in 1900; later development included 3 tunnels (aggregate length 782 ft.). Over 100 tons of ore has been mined and shipped to smelter. Ore deposits are narrow, irregular masses of galena in limestone country rock; few more than 20 ft. in greatest dimension, except for one pockety vein 1-4 ft. wide that was followed for 100 ft. and was bounded on its hanging wall by a fault. Galena accompanied by tetrahedrite and sphalerite; limonite, cerussite, and smithsonite near surface.

Chapin, 1916 (B 642), p. 98-99 -- Has been small production, but was idle in 1915.

Twenhofel and others, 1949 (B 963-A), p. 38-40 -- Most of data from Wright and Wright, 1908 (B 347). All galena at workings was mined out; no sulfides visible in 1944. Apparent that ore bodies were small (maximum dimensions no more than 10-20 ft.) lenticular masses in fault zones as much as 4 ft. wide; some of zones contain brecciated limestone cemented by gouge and clay.

Wedow and others, 1952 (OF 51), p. 67 -- Silver-bearing galena-tetrahedrite ores. [Note: no mention of silver in more detailed description.]

Wedow and others, 1953 (C 248), p. 11 -- Very little evident mineralization in irregular replacement deposits along small fractures in Paleozoic limestone. Minerals present are galena, sphalerite, iron oxides, cerussite, smithsonite, and hydrozincite in gangue of carbonate and clay minerals.

Houston and others, 1958 (B 1058-A), p. 24 -- One of several deposits at which no radioactivity in excess of 0.004 eU was found.

Condon, 1961 (B 1108-B), p. B35-B36 -- Lead occurrence.

Berg and Cobb, 1967 (B 1246), p. 188-189 -- Lenticular masses of tetrahedrite, sphalerite, and galena in fault zones in Paleozoic limestone or marble locally cut by diorite. 3 masses mined in early 1900's and more than 100 tons of ore shipped. No visible ore when examined in 1944.

Cobb and others, 1968 (B 1260-K), p. K23 -- Reference to Twenhofel and others, 1949 (B 963-A), p. 38-40.

Crackerjack — Copper, Gold, Lead, Silver, Zinc

Ketchikan district — Craig (19.6, 8.6)
MF-433, loc. 18 — 55°29'N, 132°42'W

Summary: Quartz veins as much as 5 ft. thick follow one or more porphyry dikes parallel to bedding and banding in slate country rock. Veins contain pyrite, chalcopyrite, galena, sphalerite, tetrahedrite, gold, and silver. Mined in early 1900's; production not known, but probably less than that of Puyallup and Dawson. More than 2,500 ft. of underground workings. Includes references to Hollis.

Brooks, 1902 (P 1), p. 91-92 -- Quartz veins, mainly following porphyry dikes, in slate contain argentiferous galena, auriferous pyrite, free gold, and chalcopyrite. Veins are 1-1/2 to 2-1/2 ft. thick. Average gold content of 30 samples across surface of one vein was $14.57 [about 0.70 oz.] a ton. Has been considerable prospecting by tunneling and surface excavation, but no systematic mining.

Wright and Wright, 1905 (B 259), p. 66 -- Vein on and in porphyry dike cutting schist is 1-5 ft. thick and contains gold and pyrite; average value of $15 a ton. 800-ft. tunnel on main occurrence on Crackerjack claim. Similar veins on other claims opened by other tunnels 400 and 120 ft. long.

Wright and Wright, 1906 (B 284), p. 42 -- Fissure vein along hanging wall of a porphyry dike in argillite; contains galena, sphalerite, tetrahedrite, and pyrite. Assessment work only, 1905.

Wright, 1907 (B 314), p. 62 -- Investigations, spring of 1906; no development.

Wright, 1908 (B 345), p. 92 -- Some work, 1907.

Wright and Wright, 1908 (B 347), p. 160-161 -- On Crackerjack claims ore is in veins bordered by gouge along both sides of a porphyry dike parallel to bedding of black slate country rock (strike N 25° W, dip 35° SW); veins 5 ft. thick down to a mere seam. Metallic minerals are pyrite, galena, sphalerite and an unidentified sulfantimony or bismuth mineral in a quartz-calcite gangue. Dike is epidotized and pyritized. Gold values in shoots, two of which were stoped above tunnel level; some streaks give high silver values. About 1,300 ft. of underground workings. On Hollis claims a similar vein was followed by a tunnel for 400 ft.; branches into porphyry so there are 2 veins with well-defined walls. Production has not been large.

Brooks, 1911 (B 480), p. 70 -- Ore body adjacent to epidotized and pyritized porphyry dike cutting somewhat graphitic slate; ore carries pyrite, galena, sphalerite, and an undetermined black antimony or bismuth mineral in a quartz and calcite gangue.

Smith, 1914 (B 592), p. 79 -- Has been no work for several years, 1913.

Brooks, 1915 (B 622), p. 42 -- Development, 1914.

Chapin, 1916 (B 642), p. 80 -- Development, 1915. Recent work uncovered an 18-ft. lode along 2 porphyry dikes.

Chapin, 1918 (B 662), p. 65 -- Development, but no production, 1916.

Crackerjack -- Continued

Chapin, 1919 (B 692), p. 88 -- [Reference has Crackerjack, Ready Bullion [Puyallup] and Dutton [Dawson] all mixed up. This reference probably should be ignored.]

Mertie, 1921 (B 714), p. 127-128 -- On same mineralized zone as Dunton (Dawson).

Smith, 1936 (B 868-A), p. 17 -- Examined by engineers, 1934.

Herreid and Rose, 1966 (GR 17), p. 11-12 -- 10 claims patented in 1926. In 1938 workings were 8 tunnels (total length more than 2,560 ft.), numerous open cuts, and a tramway; most work apparently done before 1909. 2 banded quartz veins 1-5 ft. wide closely follow porphyry dikes; strike N 20°-30° W, dip 20°-48° SW, generally parallel to bedding and foliation in slate country rock. Metallic minerals are pyrite, chalcopyrite, galena, sphalerite, silver, and gold; tetrahedrite and "a sulf-antimony or bismuth mineral" reported. Gangue includes quartz, chlorite, epidote, calcite, graphite, and rock fragments.

Berg and Cobb, 1967 (B 1246), p. 169 -- Gold- and sulfide-bearing quartz veins.

Bufvers, 1967 (SR 1), p. 16-17 -- Historical and anecdotal material; geologic data mainly from old reports.

Croesus	Copper, Gold
Ketchikan district MF-433, loc. 90	Craig (24.9, 3.0) approx. 55°09'N, 132°11'W approx.

Summary: Quartz veins as much as 4 ft. thick contain a little gold and native copper. Country rock is greenstone schist and crystalline limestone, which contains hematite, epidote, and chalcopyrite; magnetite in the schist. Developed (between 1892 and 1902) by several tunnels. Samples collected in 1932 contained a little gold. Includes reference to San Juan.

Brooks, 1902 (P 1), p. 85-86 -- On San Juan claim chlorite schist next to a large barren quartz vein is mineralized with low-grade gold-bearing quartz veins and stringers. On Croesus claim fissure vein 4-8 in. thick in chloritic schist and limestone contains gold and some native copper. Nearby the schists contain considerable magnetite and crystalline limestone contains hematite, epidote, and chalcopyrite. Has been a little underground and surface exploration.

Wright and Wright, 1908 (B 347), p. 170-171 -- Operations suspended since 1902. On Croesus claim a tunnel 360 ft. long follows quartz vein that pinches from 4 ft. to 4 in.; higher tunnel on same vein is 135 ft. long; vein much thinner. Some rich ore reported to have been taken out, but ore streaks are small and, in places, faulted. On San Juan claim 2 tunnels failed to find ore. 6-ft.-wide vein exposed on surface has some rich ore, but average value is low. Country rock is interbedded greenstone schist and limestone.

Smith, 1914 (B 592), p. 80 -- Assessment work, 1913, said to have revealed some fairly good ore.

Berg and Cobb, 1967 (B 1246), p. 173-174 -- One of several prospects on quartz veins that carry sulfides and gold and that cut metamorphic rocks. May have been a little production.

Bufvers, 1967 (SR 1), p. 24 -- Discovered in 1892. Explored by tunnels 360 and 150 ft. long; no work since 1902. Vein is from a few inches to 4 ft. thick; strikes N and dips 85° E. Some rich ore was found (best values in a streak along footwall). Country rock is greenstone schist and limestone. Samples collected in 1932 assayed low in gold. On San Juan is a 3-ft. quartz vein; a sample collected in 1932 from a 4-in. mineralized seam assayed $5.00 [about 0.24 oz.] a ton in gold.

Cutter	Gold
Ketchikan district MF-433, loc. 23	Craig (10.75, 9.5) approx. 55°32'N, 132°41'W approx.

Summary: Claim on Granite Mtn. reported to have good values. Claims in area are on quartz fissure veins in a granitic pluton; veins carry free gold and various sulfides.

Wright and Wright, 1906 (B 284), p. 42 -- One of the claims on Granite Mtn., where quartz fissure veins in a granitic pluton contain free gold and various sulfides. Similar to Treasure [Flagstaff].

Cymru (Mining Co.) — Copper, Gold, Silver

Ketchikan district — Craig (24.75, 2.75)
MF-433, loc. 89 — 55°08'N, 132°12'W

Summary: 4 veins 1 to 5 ft. wide in Paleozoic marble contain pyrite and chalcopyrite in quartz and calcite gangue. Several hundred feet of underground workings; also open cuts. Discovered in 1899 and mined in 1906-07, 1915-16, and possibly some other years. Minimum production was 155,000 lbs. copper, 1,500 oz. silver, and a little gold. Includes references to: Cimru, Cymra, Excelsior, Vesta.

Brooks, 1902 (P 1), p. 79 -- Pyrite and chalcopyrite in veins in crystalline limestone and chloritic schist between limestone walls. Deposits opened by a short crosscut and a 30-ft. tunnel.

Wright, 1907 (B 314), p. 69 -- 4 veins 1 to 5 ft. thick strike N 35° W, dip 70° SE; in limestone and greenstone-schist country rock; contain chalcopyrite and pyrite. In quartz gangue. Mining, mainly from a surface trench 500 ft. long and 4-8 ft. wide, 1906. Shaft sunk 105 ft. and drift at 100-ft. level.

Wright, 1908 (B 345), p. 96 -- Development during first half of 1907. Veins are 1-10 ft. wide in limestone that is interbedded with quartzite and greenstone schist. Ore is pyrite and chalcopyrite in quartz-calcite gangue.

Wright and Wright, 1908 (B 347), p. 132-134 -- Occurrence known since 1900. Development and some production, 1906-1907. Workings consist of shaft 105 ft. deep, 2 levels from it, a tunnel 180 ft. long, and deep trenches. Vein deposits 1-10 ft. wide in limestone that strikes N 60° W and dips to 5° SW. Limestone interbedded with quartzite and greenstone schists; altered to marble in many places where there has been minor faulting and shearing. 4 veins parallel stratification of wall rocks. Ore is pyrite and chalcopyrite in quartz and calcite gangue. Some ore in transverse veinlets in wall rock, which in many places is impregnated with sulfides. Some surface oxidation.

Wright, 1909 (B 379), p. 83 -- Some work, 1908; suspended in July.

Brooks, 1915 (B 622), p. 42 -- Underground work, 1914. Workings now total 100 ft. of shaft and 500 ft. of drifts.

Chapin, 1916 (B 642), p. 83 -- Ore was shipped in 1915.

p. 89-90 -- Lode strikes N 60° W, dips about 60° SW; in limestone. Workings comprise about 685 ft. of inclined shaft and drifts on 2 levels; stopes from 30-ft. level to surface.

Brooks, 1921 (B 714), p. 18 -- Example of chalcopyrite-bearing quartz-vein deposit.

Buddington and Chapin, 1929 (B 800), p. 317 -- Example of fissure-vein deposit.

p. 370 -- Quotation from Brooks, 1921 (B 714).

Noel, 1966, p. 54 -- Small copper producer.

p. 62-63 -- 4 veins 1-5 ft. wide in Paleozoic limestone and schist consist of chalcopyrite, pyrite, and quartz.

Berg and Cobb, 1967 (B 1246), p. 175 -- Sulfide-bearing quartz veins in marble. Mine, consisting of shafts and several hundred feet of adits and drifts, operated in 1906-07, 1915-16, and possibly at other times. Minimum production was 155,000 lbs. copper, 1,500 oz. silver, and a little gold.

Cymru (Mining Co.) -- Continued

Bufvers, 1967 (SR 1), p. 27 -- First staked in 1899. 662 tons of ore shipped to smelter in 1906; returns totaled $9,370. In 1928 most of surface improvements other than the headframe over one of the two shafts were in very poor condition or had disappeared completely.

Dama — Copper, Gold

Ketchikan district — Craig (25.6, 1.3)
MF-433, loc. 106 — 55°03'N, 132°07'W

Summary: Lenticular sulfide bodies in a zone 125 ft. wide in greenstone schist are mainly pyrite; some chalcopyrite; gold reported. Explored, 1903-05, by a 40-ft. shaft and 450 ft. of other workings. Deposit similar to, but smaller and lower grade than, that at Niblack. No record of production. Includes reference to Trio.

Brooks, 1902 (P 1), p. 77 -- A little preliminary work in Trio group exposed an ore body about 10 ft. wide that carries both copper and gold.

Wright and Wright, 1908 (B 347), p. 131 -- Lenticular bodies of massive sulfide ore in greenstone schist; thin films of native copper along joint planes. Ore bodies smaller and contain less chalcopyrite than those at Niblack. Developments in 1903-05 included 450 ft. of tunnel, crosscuts, and drifts and a shaft 40 ft. deep. Property idle since 1905.

Twenhofel and others, 1949 (B 963-A), p. 7-9 -- Most of data from Wright and Wright, 1908 (B 347), p. 131 -- Pyritized schist in zones as much as 125 ft. thick; one at least 50% pyrite. Zones and schist strike N 45° W and dip about 70° SW. Chip sample across 125-ft. zone contained only 0.11% copper.

Herreid, 1964 (GR 5), p. 7 -- Reference to Twenhofel and others, 1949 (B 963-A), p. 7-9.

Berg and Cobb, 1967 (B 1246), p. 174 -- Similar to, but lower grade than, Niblack; several hundred feet of underground workings.

Dawson — Copper, Gold, Lead, Zinc

Ketchikan district — Craig (19.5, 8.5)
MF-433, loc. 17 — 55°28'N, 132°42'W

Summary: Deposit is quartz veins and stringers in black, graphitic slate in a zone from 2 to more than 6 ft. wide. Most values in free gold along contacts of quartz stringers and slate; sulfides are scattered in quartz and country rock. Sulfides include pyrite, sphalerite, chalcopyrite, and galena. Altered pyritized fine-grained dikes parallel and crosscut lode. Discovered in about 1900 and mined (not continuously) until 1948. Developed to a depth of at least 600 ft. Production was probably several thousand ounces each of gold and silver and a little lead. Includes references to: Alaska-Kassan Gold Mining Co., Dunton, Dutton, George, Harris Creek, Hendy, Humboldt, Julia, Kasaan Mines, Kasaan (Gold) Mining Co., Kassan (Gold) Mining Co., Keokuk, Last Chance, Rodgers, Rogers.

Brooks, 1902 (P 1), p. 92 -- Last Chance claim on extension of vein on Hollis claims [Crackerjack]. Small cut exposes a vein 3-5 ft. thick in slate country rock.

Wright, 1907 (B 314), p. 62 -- Inclined shaft (25°) sunk 100 ft. and drifts run at 2 levels. Quartz vein 1 ft. wide at surface becomes a stringer lead 4-1/2 ft. wide at 100-ft. depth; carries auriferous pyrite, galena, and sphalerite; strikes NNW and dips 25° SW. Country rock is black slate.

Wright, 1908 (B 345), p. 92 -- Inclined shaft 220 ft. deep and drifts. Property changed hands, 1907.

Wright and Wright, 1908 (B 347), p. 161 -- On continuation of rocks at Crackerjack; mineral deposits similar to those at Crackerjack. Veins exposed by surface excavations and short tunnels. Many associated with porphyry dikes; contain pyrite, galena, sphalerite, and occasional free gold in quartz and calcite gangue. On Julia claim inclined shaft is 200 ft. deep; drifts in 3 levels. Ore shoot reported to be about 60 ft. long, 2-5 ft. wide, and to carry high gold values (50% free milling).

Wright, 1909 (B 379), p. 74 -- A little development work, 1908.

Knopf, 1910 (B 442), p. 139 -- Mill installed; enough ore said to be blocked out to pay for it; 1909.

Knopf, 1911 (B 480), p. 98 -- Development, 1910. Mine shut down in September.

Brooks, 1914 (B 592), p. 60 -- Stamp mill operated, 1913.

Smith, 1914 (B 592), p. 78-79 -- Quartz stringers and veins in black schistose slate. Vein strikes N 35° E and dips NW at an average of less than 28°. Material mined varies in thickness from 2 to more than 6 ft. Values mainly in native gold concentrated along contacts of quartz stringers and country rock; sulfides (scattered in quartz and country rock) include pyrite, sphalerite, chalcopyrite, and galena. Developed by an inclined shaft 205 ft. long that bottoms 95 ft. below surface and some drifts. Some ore blocked out. Mill installed in 1913. Has been small production.

Dawson -- Continued

Brooks, 1915 (B 622), p. 42 -- Mining, 1914.
Chapin, 1916 (B 642), p. 80 -- Considerable underground prospecting, 1915; a little ore milled.
Smith, 1917 (BMB 142), p. 29 -- Ore in quartz stringers and veins; footwall slate; hanging wall in some places slate and in others a porphyritic rock. Mining and milling, 1915.
Chapin, 1918 (B 662), p. 65 -- No mining, 1916; some ore testing and prospecting.
Chapin, 1919 (B 692), p. 88 -- Mining, 1917. [Most of this reference has data on Crackerjack, Dutton [Dawson], and Ready Bullion [Puyallup] mixed up and probably should be ignored except for regional data.]
Martin, 1919 (B 692), p. 28 -- Mining, 1917.
Martin, 1920 (B 712), p. 28 -- Mining, 1918.
Mertie, 1921 (B 714), p. 127-128 -- Country rock is graphitic slate that strikes E to N 30° W (average about N 30° E) and dips 12°-35° SE [dip given as to NW in all other descriptions] sheared "parallel to rock structure." Fine-grained dike rocks (in places porphyritic) present; commonly parallel structure of slate. Mineralized zone extends 2 mi. to NE and there turns N or joins another northward-trending zone. Lode at Dunton [Dawson] mine is a zone (average thickness 7 ft.) of quartz stringers from a few inches to 1 or 2 ft. thick in sheared country rock; altered and pyritized dikes parallel and crosscut lode. Quartz contains auriferous pyrite, free gold, and a little galena; pyrite and a little gold in slate. Mineralized mass constitutes low-grade gold ore; only higher grade shoots being mined. Mine developed by adit 364 ft. long and 4 drifts. Mill has capacity of 12 tons a day.
Brooks, 1922 (B 722), p. 35 -- Mine changed hands; rehabilitation and some mining and milling, 1920.
Brooks, 1923 (B 739), p. 20 -- Mining, 1921.
Brooks and Capps, 1924 (B 755), p. 23 -- No report, 1922; apparently closed.
Brooks, 1925 (B 773), p. 15 -- Operated on a small scale, 1923.
Buddington, 1926 (B 783), p. 41 -- Mining, 1924.
Smith, 1926 (B 783), p. 7 -- Mining, 1924.
Moffit, 1927 (B 792), p. 10 -- Did not operate, 1925.
Buddington and Chapin, 1929 (B 800), p. 321 -- Gold is said to be most plentiful where pyrite is most abundant in quartz.
p. 371 -- "The Kassan Gold Mining Co. is now operating the Dunton mine, on Harris Creek."
Smith, 1929 (B 797), p. 10 -- Exploration and development work only, 1926.
Smith, 1930 (B 810), p. 13 -- Mining, 1927. Output limited by power to run mill; free gold recovered at mill; concentrates shipped outside.
p. 51 -- A little lead recovered from concentrates.
Smith, 1930 (B 813), p. 15-16 -- Mining, 1928. Mine developed to a depth of about 600 ft.; several levels. Graphite in the ore (which has rather low gold tenor) required change in milling practice.
Smith, 1932 (B 824), p. 18 -- Apparently no more than development or assessment work, 1929.

Dawson - Continued

Smith, 1933 (B 836), p. 15 -- Renewed activity reported, 1930.
Smith, 1933 (B 844-A), p. 16 -- Development work, 1931.
Smith, 1941 (B 926-A), p. 19-20 -- Mining, 1939. [From wording it seems that there was mining in several of the preceding years; had not been noted in annual reports.]
Smith, 1942 (B 933-A), p. 18-19 -- Probably was mining in 1940 [reference indefinite].
Herreid and Rose, 1966 (GR 17), p. 10-14 -- Veins on northern part of property reported to be cut off at shallow depth by a flat fault. Deposit is gold-quartz veins in black slate. Most of data from older reports. Mining through 1948. Total production was worth more than $180,000 [data not adequate to convert to amounts of gold, silver, and lead].
Berg and Cobb, 1967 (B 1246), p. 169 -- Discovered about 1900; operated (not continuously) until after World War II. Probably produced several thousand ounces each of gold and silver. Lode in black, graphitic slate; consists of a 2- to 6-ft. zone of quartz stringers and veins containing relatively sparse pyrite, sphalerite, chalcopyrite, galena, and gold. Developed to a depth of at least 600 ft.; ore milled on property.
Bufvers, 1967 (SR 1), p. 14-16 -- Mainly anecdotes and biographical data on men associated with the mine.

Dew Drop — Gold, Silver

Ketchikan district — Craig (18.4, 9.35)
MF-433, loc. 14 — 55°31'N, 132°49'W

Summary: Fissure vein along a fault in a basic intrusive reported to carry values in gold and silver. See also Rose.

Wright and Wright, 1905 (B 259), p. 66 -- Prospecting of auriferous quartz fissure vein(s) in a porphyry dike. Veins in area contain galena, pyrite, chalcopyrite, and gold.

Wright, 1906 (B 284), p. 42 -- Has been a little work [as of 1905].

Wright, 1907 (B 314), p. 62 -- No work, 1906.

Wright and Wright, 1908 (B 347), p. 163 -- On vein 6-14 in. thick that strikes N 60° W, and dips 85° SW. Vein is along a fault in a basic intrusive rock. Values reported to average well in gold and silver.

Herreid and Rose, 1966 (GR 17), p. 16 -- Same data as in Wright and Wright, 1908 (B 347), p. 163.

Dolly Varden — Copper, Gold, Silver

Ketchikan district — Craig (19.6, 6.35) approx.
MF-433, loc. 65 — 55°21'N, 132°42'W approx.

Summary: Discontinuous small quartz veins in marble interbedded with metamorphosed sedimentary and volcanic rocks contain tetrahedrite, much of which is altered to azurite and malachite, and some gold and as much as 8.64 oz. per ton silver. Discovered in about 1900. Not much work and no production.

Brooks, 1902 (P 1), p. 93 -- Country rock is white limestone. Ore is chalcopyrite and malachite with some gold values.

Wright and Wright, 1908 (B 347), p. 162 -- In marble. Veins follow bedding; strike N 15° E and are vertical or dip steeply SE. Main metallic mineral is tetrahedrite, altered in many places to azurite and malachite.

Wedow and others, 1952 (OF 51), p. 65 -- Tetrahedrite-bearing gold veins.

Herbert and Race, 1964 (GC 1), p. 26 -- Quotations from Brooks, 1902 (P 1) and Wright and Wright, 1908 (B 347).

Herreid and Rose, 1966 (GR 17), p. 29 -- At what is probably the old Dolly Varden prospect is a series of discontinuous quartz veins trending N 10° E and dipping 80° NW and containing small amounts of chalcopyrite and tetrahedrite-tennantite. Selected sample contained 0.06 oz. gold and 8.64 oz. silver a ton. Country rock is massive light-gray dolomite. Adit 110 ft. long and several pits.

Berg and Cobb, 1967 (B 1246), p. 170 -- Staked in about 1900 on quartz veins in marble interbedded with metamorphosed sedimentary and volcanic rocks. Veins contain tetrahedrite, largely altered to azurite and malachite. Only cursory prospecting.

Bufvers, 1967 (SR 1), p. 19 -- Stringers showing azurite and malachite in a zone 20 ft. wide and 30 ft. long contain fair values in gold and silver. Entire zone probably too low grade to mine; mining individual stringers not feasible. Sample taken in 1924 (location and type not known) reported to have assayed $80 a ton.

Earl No. 1 — Gold(?)

Ketchikan district — Craig (21.75, 5.0) approx. 55°16'N, 132°29'W approx.

Summary: Pyritiferous quartz blebs in quartzitic schist. No mention of possible gold content.

Brooks, 1902 (P 1), p. 88 -- Disseminated quartz blebs with pyrite in quartzitic schist associated with graphitic phyllite.

Edith M.

Copper, Gold(?)

Ketchikan district
MF-433, loc. 105

Craig (25.4, 1.45) approx.
55°04'N, 132°08'W approx.

Summary: Greenstone schist contains pyrite and chalcopyrite. Gold said to be present. Only development is a 20-ft. tunnel.

Brooks, 1902 (P 1), p. 77-78 -- 20-ft. tunnel driven in greenstone schist. Mineralized zone about a foot wide carries pyrite and chalcopyrite and is said to carry $5 in gold and copper values. Another mineralized zone about 8 ft. wide contains pyrite.

Elm City	Copper, Gold
Ketchikan district MF-433, loc. 42	Craig (22.9, 9.55) 55°32'N, 132°22'W

Summary: Pyrite and chalcopyrite that carry about half an ounce of gold per ton in dioritic country rock that has been partly replaced by epidote. Includes reference to Skookum.

Brooks, 1902 (P 1), p. 101 -- Elm City and Skookum claims on dioritic country rock that is partly replaced by epidote. Short tunnel exposes pyrite and chalcopyrite in a zone 3 ft. wide (including some country rock) bounded by faults; small calcite veins. Ore said to carry $10 [about 0.48 oz.] in gold per ton.

Equator	Copper, Gold
Ketchikan district MF-433, loc. 100	Craig (26.05, 4.4) approx. 55°13'N, 132°04'W approx.

Summary: Auriferous quartz vein 3 ft. thick contains inclusions of limestone country rock and chalcopyrite and pyrite. Tunnel 50 ft. long. Property located in 1902.

Wright and Wright, 1908 (B 347), p. 168 -- Property located in 1902. 50-ft. tunnel follows quartz vein 3 ft. thick with inclusions of limestone country rock, chalcopyrite, and pyrite; values essentially in gold.

Flagstaff (Mining Co.) — Copper, Gold, Lead, Silver, Zinc

Ketchikan district — Craig (19.8, 9.6)
MF-433, loc. 24 — 55°32'N, 132°40'W

Summary: Quartz fissure vein in diorite traced for more than a mile and through a vertical range of at least 1,300 ft.; in mine workings is about 18 in. thick; thicker in some surface exposures. Contains gold, galena, chalcopyrite, pyrite, sphalerite, covellite, chalcocite, and native copper. Mine consists of a main level 1,120 ft. long, a 55-ft. winze, and 5 small stopes. Staked before 1905; intermittent mining until 1941. Much of gold not recovered in mill. Ore milled in 1939 yielded 10.5 lbs. copper and 1.6 lbs. lead for each ounce of gold recovered; silver-gold ratio was 7 to 1. Total production not known. Includes references to: Last Chance, Treasure.

Wright and Wright, 1906 (B 284), p. 41-42 -- Quartz fissure vein 1-3 ft. (average 1-1/2 ft.) thick strikes N 55° W, dips steeply NE; gouge along walls; largely in hanging wall of an altered diabase dike in a granitic rock. Metallic minerals are free gold, pyrite, chalcopyrite, and galena. About 660 ft. of workings. A similar set of veins, but crosscutting the main vein, is leaner.

Wright, 1907 (B 314), p. 62 -- Not much work on Treasure, 1906.

Wright and Wright, 1908 (B 347), p. 164-165 -- About the same as in Wright and Wright, 1906 (B 284), p. 41-42.

Chapin, 1916 (B 642), p. 80-81 -- Quartz vein pinches and swells from a gouge seam to width of 3 ft.; average about 18 in.; strikes N 45° W and dips at various angles to NE. Vein is cavernous quartz with considerable free gold, pyrite, and a little chalcopyrite; country rock is granite. Other veins on property carry galena, chalcopyrite, silver, and gold; some have been mined, but were not being worked in 1915.

Chapin, 1918 (B 662), p. 65 -- Preparations for putting in a stamp mill, 1916.

Smith, 1939 (B 917-A), p. 917-A), p. 21-22 -- Considerable preparatory work, 1938.

Smith, 1941 (B 926-A), p. 19-20 -- Mining, 1939. New 25-ton mill and old 10-ton mill both used.

Smith, 1942 (B 933-A), p. 18-19 -- Mining, 1940. In 1940 mine consisted of main level 1,120 ft. long, 55-ft. winze, and 5 small stopes; 20-ton mill and 1,800-ft. aerial tram from mine to mill. Milling difficult; only a little of the gold seems to amalgamate.

Twenhofel and others, 1949 (B 963-A), p. 10-13 -- Staked before 1905; development for about 10 years. Reactivated sometime around 1935 and closed in 1941 (much of gold not recovered with milling methods in use). Workings consisted of a main level 1,120 ft. long, a 55-ft. winze, and 5 small stopes; mill and other surface facilities. Vein in workings averages about 18 in. thick, strikes about N 55° W, dips 60°-86° NE, and follows the footwall of a diabase dike (probably no more than 8 ft. thick, but not known for certain). Vein can be traced on surface for more than a mile through a vertical range of at least 1,300 ft.; in places is wider than in mine workings and is intersected by other quartz veins following cross faults. In places a thin dike follows the foot-

Flagstaff (Mining Co.) -- Continued

wall; in places the footwall is dioritic country rock. Richer ore seems to be limited by a cross fault that displaces the vein 18 in. Vein is mainly quartz with gold, galena, chalcopyrite, pyrite, sphalerite, covellite, sooty chalcocite, and native copper. Ore milled in 1939 yielded 10.5 lbs. copper and 1.6 lbs. lead for each ounce of gold; silver-gold ratio was 7 to 1; value [probably of mill heads] was reported to be $12 a ton.

Sainsbury, 1961 (B 1058-H), p. 356 -- Reference to Twenhofel and others, 1949 (B 963-A), p. 10-13.

Herreid and Rose, 1966 (GR 17), p. 17 -- Reference to Twenhofel and others, 1949 (B 963-A), p. 10-13.

Berg and Cobb, 1967 (B 1246), p. 169 -- Staked before 1905 and operated intermittently until 1941. Workings included a main level 1,120 ft. long, a 55-ft. winze, and 5 small stopes. Mill recovery was poor. Gold, silver, copper, and lead were recovered.

Bufvers, 1967 (SR 1), p. 8-9 -- Mainly historical data. Geologic data seem to be largely from Twenhofel and others, 1949 (B 963-A), p. 10-13 [not cited].

(Flat I.) Gold

Ketchikan district Craig (19.8, 1.8)
MF-433, loc. 111 55°05'N, 132°42'W

Summary: Old prospect (probably in 1880's) with some rich gold ore, much of which was blasted into the water by mistake. A few thousand dollars worth said to have been recovered.

Bufvers, 1967 (SR 1), p. 31 -- Rich outcrop found on beach. Too much powder was used and most of the gold was blasted into the water. A few thousand dollars in gold is said to have been recovered. Prospect was found by W. D. McLeod, probably in the 1880's.

Florence	Copper(?)
Ketchikan district	Craig (20.45, 1.45) 55°04'N, 132°38'W

Summary: Claim a mile north of Claim Point located for copper in 1916. No other data available.

Chapin, 1918 (B 662), p. 69 -- Copper claim located in 1916; a mile north of Lime Point.

Fortune — Copper, Gold

Ketchikan district — Craig (26.2, 2.9) approx.
MF-433, loc. 96 — 55°09'N, 132°03'W approx.

Summary: Quartz veins in a shear zone in limestone and schist carry a little gold, chalcopyrite, pyrite, and tetrahedrite. Developed in a small way in early 1900's and 1922. Small production, mainly test shipments. Includes reference to Fortuna.

Brooks, 1902 (P 1), p. 80 -- 3 quartz veins in graphitic schist are 1-2 ft. wide and crossed by smaller veins; contain tetrahedrite and graphite.

Wright and Wright, 1908 (B 347), p. 175 -- Country rock is graphitic schist with bands of limestone. Lode is 10 or more ft. wide, is made up of quartz veins 1-2 ft. wide in a shear zone; strikes N 60° W, dips 25° SE. Principal metallic minerals are chalcopyrite and pyrite. Open cuts and shallow shafts amount to no more than assessment work.

Smith, 1914 (B 592), p. 81 -- Has been prospecting. Native gold in quartz veins in quartzite and in the quartzite itself near contact with limestone. Sulfides (mainly pyrite and tetrahedrite) in veins. A little gold has been recovered from Fortune, Moonshine, or both.

Chapin, 1916 (B 642), p. 81 -- Claim near James Lake located on breccia lode or vein that strikes N 60° W and dips NE. Country rock is banded blue limestone and schist with a network of quartz veins carrying disseminated chalcopyrite and pyrite.

Brooks and Capps, 1924 (B 755), p. 23 -- Some development at Fortuna, 1922; some test shipments of gold ore.

Berg and Cobb, 1967 (B 1246), p. 174 -- Developed in a small way, about 1900 and 1922; only test shipments were made.

Fowlkes	Copper
Ketchikan district	Craig (23.7, 5.1) approx. 55°16'N, 132°18'W approx.

Summary: Chalcopyrite in a 12-ft.-wide zone in a gneiss-schist belt. No work since about 1905.

Wright and Wright, 1906 (B 284), p. 50 -- Chalcopyrite in mineralized band 12 ft. wide in a gneiss-schist belt. Crosscut driven 95 ft. to footwall. Assay results said to be good enough to encourage further development. Some surface alteration of sulfide ore.

Friendship	Copper, Gold
Ketchikan district	Craig (23.45, 4.05) approx.
MF-433, loc. 86	55°13'N, 132°20'W approx.

Summary: Irregularly distributed bunches of chalcopyrite and bornite along faulted contact between greenstone schist and marble in a gangue of quartz and calcite reported to contain as much as 26% copper and about 0.05 oz. gold a ton. Little development.

Brooks, 1902 (P 1), p. 87 -- Mineralization followed a faulted contact between greenstone schist and limestone; vein is 2 to 3-1/2 ft. wide; contains irregularly distributed chalcopyrite and bornite in a gangue of quartz and calcite. Some of ore runs as high as $1 a ton in gold and 26% copper. Little development.

Wright and Wright, 1906 (B 284), p. 50 -- Has been little recent work, 1905.

Berg and Cobb, 1967 (B 1246), p. 173 -- Trenches and shallow shafts explored irregularly distributed bunches of chalcopyrite and bornite at contact between schist and marble. Samples said to have assayed as much as 26% copper and $1 a ton in gold.

Frisco (Kitkun Bay)	Gold
Ketchikan district	Craig (25.4, 3.15) approx.
MF-433, loc. 92	55°09'N, 132°08'W approx.

Summary: Low gold values in vein deposit 12 ft. wide that contains pyrite and fragments of limestone and schist country rock. Only reported development was a trench. Similar low-grade vein deposit 30 ft. wide is nearby. See also Alameda.

Brooks, 1902 (P 1), p. 85 -- For description of Tomboy group see Alameda sheet.

Wright and Wright, 1908 (B 347), p. 170 -- Part of Tom Boy group restaked as Frisco. Vein deposit 12 ft. wide strikes due N; opened by a trench. Vein contains pyrite and fragments of schist and limestone country rock. "The vein is said to carry but a few dollars in gold values." Another vein deposit 30 ft. wide and too lean to mine is nearby.

Gervis	Gold(?)
Ketchikan district	Craig (18.4, 9.15)(?)
MF-433, loc. 13(?)	55°31'N, 132°49'W(?)

Summary: Prospect near Lucky Nell; said to be an auriferous lode being developed in 1911. May be the same as Lucky Nell; one of owners or operators of Lucky Nell was Gervais. MF-433 considers Gervis to be at loc. 17, which is also possible.

Brooks, 1912 (B 520), p. 26 -- Auriferous lode; further developments reported in 1911.
Herreid and Rose, 1966 (GR 17), p. 16 -- Near Lucky Nell.

Gladstone	Copper, Gold, Silver
Ketchikan district	Craig (26.05, 4.4) approx.
MF-433, loc. 100	55°13'N, 132°04'W approx.

Summary: Quartz veins in limestone with at least one diabase dike contain pyrite, chalcopyrite, and a little gold and silver in a gangue of quartz, calcite, and a little graphite. Only work was in early 1900's.

Wright and Wright, 1906 (B 284), p. 50 -- Little recent work as of 1905.

Wright and Wright, 1908 (B 347), p. 166-167 -- Located in 1904; has been considerable prospecting, but no extensive development. 2 or more parallel quartz ledges with considerable included limestone country rock are generally parallel to bedding of limestone. Veins are 1-4 ft. wide; altered diabase dike forms hanging wall of one vein. Veins are pyrite and chalcopyrite in a gangue of quartz, calcite, and some graphite.

Bufvers, 1967 (SR 1), p. 27 -- Veins carry pyrite, chalcopyrite, and a little gold and silver. Practically no work since soon after discovery.

Go-by

Gold(?)

Ketchikan district
MF-433, loc. 23

Craig (19.1, 9.8) approx.
55°33'N, 132°41' W approx.

Summary: Claims on veins on north side of Granite Mtn. that are said to carry good gold values.

Wright and Wright, 1908 (B 347), p. 165 -- Group of claims on north side of Granite Mtn. Said to be similar to other veins in area [quartz fissure veins in granitic rock that carry gold and sulfides]. Said to carry good gold values.

Golden Fleece (Mining Co.) Gold, Silver

Ketchikan district Craig (26.0, 3.0) approx.
MF-433, loc. 94 55°09'N, 132°03'W approx.

Summary: Deposit is quartz vein made up of irregular lenses as much as 8 or more feet wide in limestone. Deposit and country rock cut by post-ore(?) diabase dikes. Caverns in limestone follow ore in places. Ore minerals are free gold, tetrahedrite, and pyrite. Ore specimens contained as much as 4.17 oz. gold and 9.96 oz. silver a ton. Ore ran $40-$60 a ton (prices as of about 1900). Mine developed by at least 600 ft. of adits and a raise reported to be 400 ft. long between tunnels. Considerable production in early 1900's and in 1920's and early 1930's. Includes references to: Beulah, Copper Lake.

Brooks, 1902 (P 1), p. 81-82 -- Veins that pinch and swell generally follow the contact between blue crystalline limestone and white crystalline limestone cut by unmetamorphosed diabase dikes, which also are mineralized in places. Ore is free gold, tetrahedrite, and pyrite. Mill recovery is $40-$60 a ton. Two specimens of ore contained 2.36 oz. silver and 0.05 oz. gold and 9.96 oz. silver and 4.17 oz. gold a ton. Deposit being mined from 2 tunnels and several shafts.

Wright and Wright, 1905 (B 259), p. 65-66 -- Description essentially a summary of above. Several limestone caverns apparently follow the mineral deposits. Mill being enlarged, 1904.

Wright and Wright, 1906 (B 284), p. 43 -- Assessment work only, 1905.

Wright, 1907 (B 314), p. 62 -- Properties sold at court auction, 1906. No work.

Wright, 1908 (B 345), p. 92 -- No work, 1907.

Wright and Wright, 1908 (B 347), p. 175-176 -- Irregular lenses slightly cutting bedding of enclosing limestone are from a fraction of a foot to 8 or more feet wide; strike NE and dip 40° SE. Post-ore diabase dikes cut ore bodies and limestone. In places caverns developed in limestone along ore bodies. Ore is free gold with tetrahedrite and pyrite; average grade is moderate [no figures on tenor given]. Several hundred feet of workings and a 5-stamp mill. No work since early 1905.

Noel, 1966, p. 54 -- Not a major gold producer.

p. 61 -- Gold has been mined. Reference to Brooks, 1901 (P 1).

Berg and Cobb, 1967 (B 1246), p. 174 -- Operated between 1901 and 1905; produced ore worth $40-$60 a ton in gold and silver.

Bufvers, 1967 (SR 1), p. 26 -- Discovered in 1899 and a small shipment of ore to Tacoma smelter netted $45 a ton. At least 600 feet of tunnels and a 400-ft. raise driven. In 1920's a considerable tonnage of ore was mined and treated in a 2-stamp mill; returned $12 a ton. About 1933 the vein (dips 40° SW) above the upper tunnel was mined to the surface and some ore taken out of the raise. Samples from a parallel vein exposed at the surface in 1899 assayed $13.95 and $56.69 a ton.

Herreid, 1967 (GR 27), p. 11 -- 2 most extensively developed deposits near Dolomi were Valparaiso and Golden Fleece; little left of Golden Fleece in 1966 except adit and ruins of mill.

p. 13-14 -- Quotation from Wright and Wright, 1908 (B 347). Data from Bufvers, 1967 (SR 1) summarized. [Herreid misquotes Bufvers on length of raise, giving it as 200 ft. whereas Bufvers gives it as 400 ft.]

Gold Standard | Bismuth, Gold, Lead

Ketchikan district | Craig (26.4, 11.8)
55°39'N, 132°00'W

Summary: Two sets of quartz veins of different ages striking parallel to foliation of greenstone schist country rock dip in opposite directions; older set follows foliation and contains most of ore, which is essentially auriferous quartz and pyrite; some tetradymite (bismuth mineral) and a little galena; quartz, calcite, and chlorite gangue. Deposit discovered in 1897; intermittent mining from 1898 to 1941. Gold recovered in mill on property or from concentrates sent to smelter; sources disagree on proportion of values in concentrates (may have been as much as half in some years). A little gold placer mined from near main vein outcrop in 1913. Extensive underground workings. See also Gold Standard, Ketchikan quad.

Brooks, 1902 (P 1), p. 59-60 -- Property located in 1898; about $20,000 recovered from a pocket of gold ore near surface. Workings consist of a shaft, which follows vein to a depth of 125 ft., a tunnel, and 2 levels. Has mill. Country rock is greenstone, some schistose, made up entirely of secondary minerals. Vein is from 7 in. to 5 ft. wide, strikes N 20° W, dips 85° NE, and has a seam of gouge along footwall. Ore is free gold, auriferous pyrite, and a little galena in a gangue of quartz with considerable calcite and some chlorite. Other veins on property cut schistose diorite and carry free gold and tellurides; values reported to be from $5 to $15 [a ton].

Wright and Wright, 1906 (B 284), p. 44-45 -- No significant production, 1905.

Wright, 1907 (B 314), p. 63 -- Exploration and 60 days of mill operation, 1906.

Wright, 1908 (B 345), p. 92 -- Development [and probably mining and milling], 1907. Seams and pockets of rich free-gold ore in quartz veins in a narrow belt of greenstone schist. About 815 ft. of underground workings.

Wright and Wright, 1908 (B 347), p. 153-155 -- Discovered, 1897. Mining 1898-1900, 1906 and thereafter. Developments include 150 ft. shaft, 2 drifts, other smaller workings, and a stamp mill. 2 sets of veins, the major one of which parallels schistosity of greenstone schist (with some argillaceous beds); strike N 25° W, dip 60° NE. The second (younger) set is gash veins that strike about N 25° W also, but dip 60°-70° SW; little if any values except at intersections with main set. Vein that is developed is 6 in. to 6 ft. wide and is exposed for more than 1,000 ft. along strike; walls slickensided; gouge along footwall and seam of calcite with free gold along hanging wall. Ore is essentially auriferous quartz and pyrite; small crystals of tetradymite in gash veins. Most gold is free milling; concentrates are about 3% of ore; reported to carry high values.

Smith, 1914 (B 592), p. 86 -- Mine has not operated for 6 years [as of 1913]. A little angular gold was recovered by placer methods from surface detritus near main shaft, 1913; probably derived from outcrop of vein and not transported very far. Gold said to be 920 fine.

Gold Standard -- Continued

Brooks, 1915 (B 622), p. 42 -- Some work, 1914.
Chapin, 1916 (B 642), p. 82 -- Several shipments of ore, 1915.
Brooks, 1922 (B 722), p. 35-36 -- Exploration, 1920.
Smith, 1930 (B 813), p. 16 -- Mining, 1928; mill concentrates shipped to Tacoma.
Smith, 1934 (B 857-A), p. 16 -- Some production, 1932.
Smith, 1934 (B 864-A), p. 16 -- Gold recovered at mill and from concentrates shipped outside, 1933.
Smith, 1936 (B 868-A), p. 16-17 -- Mining, 1934. One of largest producers in Ketchikan district.
Smith, 1937 (B 880-A), p. 17 -- Mining, 1935.
Smith, 1938 (B 897-A), p. 18 -- Mining, 1936. Company reorganized as Gold Helm Mining Co.
Smith, 1939 (B 917-A), p. 22 -- Mining, 1938. Half of gold free milling and half in concentrates, which are sent outside to smelter.
Smith, 1941 (B 926-A), p. 20 -- Mining, 1939.
Smith, 1942 (B 933-A), p. 19 -- Mining, 1940.
Berg and Cobb, 1967 (B 1246), p. 179 -- Mine operated intermittently from 1898 to as recently as 1940.
Bufvers, 1967 (SR 1), p. 6-8 -- Property discovered in 1897; last mined in 1941. Two deposits, one at beach [Ketchikan quad.] and the other half a mile inland [Craig quad.]. Production about $200,000 [ambiguous; may mean in early 1900's only]. Geologic data from Wright and Wright, 1908 (B 347), p. 153-155 [not cited].

Gould (Hetta Inlet)	Copper
Ketchikan district	Craig (20.75, 4.0)
MF-433, loc. 79	55°13'N, 132°36'W

Summary: Contact-metamorphic deposit at contact between granodiorite and quartzite. Small amounts of pyrite and chalcopyrite in garnet-epidote rock. Minor development in early 1900's; no record of production.

Wright and Wright, 1908 (B 347), p. 107 -- Contact-metamorphic deposit at contact between granodiorite and quartzite. Tunnel and shaft in garnet-epidote contact rock and granite, which also contains small amounts of chalcopyrite and pyrrhotite scattered near contact.

Wright, 1909 (B 379), p. 82 -- A little work, 1908.

Wright, 1915 (P 87), p. 65 -- Same as Wright and Wright, 1908 (B 347), p. 107.

Gould (Sukkwan I.) Copper

Ketchikan district Craig (19.4, 0.35)
MF-433, loc. 112 55°00'N, 132°44'W

Summary: Schist, in places pyritiferous, along contact with granitic rock is veined with stringers of chalcopyrite and pyrrhotite that follow and cut across schistosity. A little surface exploration in 1917.

Chapin, 1919 (B 692), p. 88-89 -- Prospects in schist (in places pyritiferous) along contact with granite. In places the schist is veined with stringers of chalcopyrite and pyrrhotite that follow schistosity and cut across it. Only surface work in 1917.

Berg and Cobb, 1967 (B 1246), p. 176 -- Showings of chalcopyrite, pyrrhotite, and pyrite at contact of quartz diorite and schist.

(Gould I.) Copper, Lead, Zinc

Ketchikan district Craig (20.5, 5.15)
MF-433, loc. 66 55°17'N, 132°32'W

Summary: Small veinlets and disseminations of galena, sphalerite, and chalcopyrite in a belt of siliceous limestone in a sequence of limestone, schist, and slate intruded by granodiorite. Gangue minerals include calcite, quartz, garnet, epidote, and wollastonite. A little exploration in early 1900's. Mineralized material is low grade and amount exposed is small.

Wright, 1908 (B 345), p. 95 -- Little or no development work, 1907.

Wright and Wright, 1908 (B 347), p. 107 -- Bedrock on island is limestone, siliceous schists, and slate intruded by granodiorite. Galena, sphalerite, and chalcopyrite in small veinlets and finely disseminated in a belt of siliceous limestone 30 ft. wide (strike E, dip steep to N); calcite, quartz, garnet, epidote, and wollastonite associated with ore. Developments include 70-ft. tunnel along footwall of mineralized belt, open cuts, and a shallow shaft. Amount of ore exposed is small and of low grade.

Wright, 1915 (P 87), p. 64-65 -- Same as Wright and Wright, 1908 (B 347), p. 107.

Berg and Cobb, 1967 (B 1246), p. 171 -- Veins of massive sulfides cut greenstone.

Green Monster — Copper, Gold(?), Iron, Lead, Molybdenum

Ketchikan district — Craig (21.3, 4.55)
MF-433, loc. 77 — 55°15'N, 132°32'W

Summary: Most of deposits are small masses of magnetite and sulfides (chalcopyrite, pyrite, pyrrhotite, molybdenite) along contact between lower Paleozoic limestone (with some interbedded green schist) and Upper Jurassic or Lower Cretaceous quartz diorite stock; some surface oxidation; gangue includes epidote, diopside, garnet, actinolite, tremolite, chlorite, calcite, quartz, spinel, and phlogopite. One early reference reported $8-$10 a ton in gold; gold not mentioned in more recent references. One deposit is a narrow vein on contact between limestone and a porphyry dike about 1,000 ft. from main granitic mass; contains galena, pyrite, and chalcopyrite. Most of development was in the early 1900's and consisted mainly of 2 tunnels, each 65 ft. long. Includes reference to (Green Monster Mtn.).

Brooks, 1902 (P 1), p. 107 -- Considerable development. Values reported to run $8-$10 in gold [per ton] and 20%-40% copper.

Wright and Wright, 1905 (B 259), p. 64 -- Deposits at or near contact between granite and limestone.

Wright and Wright, 1906 (B 284), p. 51-52 -- Contact-metamorphic deposit along contact between granite and limestone. Sulfides in small masses or pockets in garnet-epidote rock; some copper carbonates. 2 tunnels, each 65 ft. long.

Wright, 1907 (B 314), p. 71 -- No work, 1906.

Wright, 1908 (B 345), p. 95 -- Little or no work, 1907.

Wright and Wright, 1908 (B 347), p. 102-103 -- About the same as in Wright and Wright, 1906 (B 284), p. 51-52. Added information that a narrow vein along the contact between a porphyry dike and limestone about 1,000 ft. from main granite mass contains galena, pyrite, and chalcopyrite. Work on prospect was to fulfill assessment requirements.

Wright, 1915 (P 87_, p. 43 -- Diabase dikes younger than ore deposit.
p. 53 -- The spinel pleonast accompanies diopside.
p. 58 -- 14 claims in group.
p. 61-62 -- Same as Wright and Wright, 1908 (B 347), p. 102-103.

Wright and Fosse, 1946 (RI 3952), p. 4 -- Data on claim ownership.

Wedow and others, 1953 (C 248), p. 9, 11 -- Lower Paleozoic limestone (with some green schist) intruded by Upper Jurassic or Lower Cretaceous quartz diorite stock; ore in small, irregular masses and veins near contact. Minerals present are magnetite, chalcopyrite, pyrite, pyrrhotite, molybdenite, malachite, and iron oxides in gangue of epidote, diopside, garnet, actinolite, tremolite, chlorite, calcite, quartz, spinel, and phlogopite.

Houston and others, 1958 (B 1058-A), p. 24, 27 -- Grab sample of chalcopyrite-bearing contact-metamorphic ore contained less than 0.001% eU.

Berg and Cobb, 1967 (B 1246), p. 171-172 -- Group of claims on some of which are sulfide-bearing contact metamorphic deposits and on one of which is a massive-sulfide vein beyond the zone of contact metamorphism.

Haida (Copper Co.) — Copper, Gold, Iron, Molybdenum, Silver

Ketchikan district — Craig (21.55, 10.85)
MF-433, loc. 35 — 55°36'N, 132°30'W

Summary: Small, irregular magnetite-chalcopyrite deposit (garnet-epidote gangue) in greenstone with lenses of calcareous material; a little molybdenite, gold, and silver. Developed by a small glory hole and about 200 ft. of underground workings. Small shipment of copper ore in 1907; little work thereafter. Includes references to: Hyda, Mammoth.

Wright and Wright, 1906 (B 284), p. 48-49 -- Ore body on Mammoth group is magnetite and garnet with variable amounts of chalcopyrite and pyrite. Contact metamorphic deposit in limestone.

Wright, 1907 (B 314), p. 67-68 -- Tunnel to undercut ore body completed and surface improvements, 1906. Ore body is low-grade magnetite-chalcopyrite body with basic gangue minerals; less than 100 ft. in greatest dimensions.

Wright and Paige, 1908 (B 345), p. 109-110 -- Same as Wright and Wright, 1908 (B 347), p. 119-120.

Wright and Wright, 1908 (B 347), p. 119-120 -- Ore shipped to Hadley smelter early in 1907; operations suspended later in the year. Ore body is an irregular mass of magnetite carrying chalcopyrite in garnet-epidote gangue. Country rock is greenstone, tuff, and conglomerate, probably underlain by diorite; limited on NE by a fault. Developed by open pit 50 ft. in diameter and tunnel in which chalcopyrite is less abundant than in pit.

Brooks, 1912 (B 520), p. 26 -- New discoveries reported, 1911.

Wright, 1915 (P 87), p. 94 -- At contact of diorite mass.

p. 100 -- About the same as Wright and Wright, 1908 (B 347), p. 119-120.

Bain, 1946 (IC 7379), p. 31 -- Small amounts of molybdenite.

Warner and others, 1961 (B 1090), p. 5 -- Little, if any, production.

p. 119-120 -- Reference to Wright, 1915 (P 87), p. 100. Country rock is greenstone with a few intercalated calcareous lenses. Ore is mainly magnetite that replaced greenstone along NW trending fractures (possibly preferentially replacing calcareous lenses); pyrite, chalcopyrite, and minor molybdenite in veins and minute veinlets in magnetite and greenstone. Average of USGS samples analyzed was 33% Fe, 0.88% Cu, 0.03 oz. Au a ton, and 0.2 oz. Ag a ton. Most development (adit, winze, shaft, open cuts) in 1904-05. A little ore shipped in 1907.

Berg and Cobb, 1967 (B 1246), p. 168 -- Has been minor production.

Bufvers, 1967 (SR 1), p. 3 -- Mainly historical and anecdotal material. Workings consisted of tunnel 125 ft. long, 35-ft. raise, 30-ft. winze, and a small glory hole. Good ore said to have been found in winze.

Hatchet	Gold
Ketchikan district	Craig (22.2, 7.8S)
MF-433, loc. 56	55°26'N, 132°26'W

Summary: Mineralized zone along a narrow fissure vein in slate is about 4 ft. thick; contains pyrite and less than 0.048 oz. gold a ton.

Brooks, 1902 (P 1), p. 96 -- Fissure vein in carbonaceous, pyritiferous slate is about 4 in. wide with offshoots into country rock resulting in a mineralized zone about 4 ft. thick. Reverse faulting along fissure, which strikes N 60° W and dips 70° N. Chief ore mineral is pyrite; gold content less than $1 [about 0.048 oz.]

Berg and Cobb, 1967 (B 1246), p. 173 -- Occurrence probably not large enough to justify much exploratory work.

Hecla — Copper(?)

Ketchikan district — Craig (22.6, 5.4)

MF-433, loc. 69 — 55°17'N, 132°25'W

Summary: Claim on which chalcopyrite and pyrrhotite were reported.

Brooks, 1902 (P 1), p. 95 -- One of 3 claims near Kiam [Khayyam] on which are reported 3 parallel veins with an aggregate thickness of 50 ft. of ore consisting of chalcopyrite and pyrrhotite.

(Helm Bay) Gold

Ketchikan district Craig (26.05, 11.25) approx.
MF-433, loc. 114 55°37'N, 132°00'W approx.

Summary: Many small gold-bearing quartz stringers near contact between black slates and greenstone have been prospected. May have been a little actual mining. Includes references to: Free Gold, Quartzite Ledge. See also Blue Jay (Helm Bay), Gold Standard, (Helm Bay) Ketchikan quad., Helm Bay King.

Smith, 1914 (B 592), p. 87 -- Numerous small gold-bearing quartz stringers near contact between black slates and greenstone. Little exploration; most claims have lapsed.

Brooks and Capps, 1924 (B 755), p. 23 -- Some work on Alaska and Free Gold properties, 1922.

Brooks, 1925 (B 773), p. 10 -- Some systematic work, 1923.

Smith, 1930 (B 813), p. 16 -- Prospecting and sampling at properties other than Gold Standard.

Smith, 1932 (B 824), p. 18 -- A little development work and a little ore mined in 1929 from at least one property [may have been Gold Standard].

Smith, 1933 (B 844-A), p. 16 -- Some development on one or more properties near Helm Bay, 1931.

Smith, 1934 (B 864-A), p. 16 -- Work on several properties, 1933.

Smith, 1942 (B 933-A), p. 19 -- Some prospecting or development, 1940.

Helm Bay King (Mining Co.) — Copper, Gold, Lead

Ketchikan district — Craig (26.2, 12.1)(?)
MF-433, loc. 114 — 55°40'N, 132°01'W(?)

Summary: Quartz gash veins and lenses in a shear zone in greenstone carry free gold (about 0.68 oz. a ton) and rare chalcopyrite and galena; pyrite in wallrock. Shaft 45 ft. deep (one zone in bottom is 8 ft. thick) and crosscuts and trenches. Mill on property. Active only in 1923; probably was small production.

Brooks, 1925 (B 773), p. 15 -- Operated in a small way, 1923.

Buddington, 1923 (B 773), p. 72 -- Newly discovered gold lode being prospected, 1923.

p. 128 -- 2 veins; only one (Alaska vein) being developed. In a shear zone in greenstone; strikes NW and dips (average) 75° SE; consists of crosscutting quartz gash veinlets and quartz lenses parallel to foliation of schist in shear zone. Quartz milky and accompanied by a little calcite and locally chlorite; carries rare flakes of free gold and rare chalcopyrite and galena. Pyrite cubes in wallrock. Developed by a shaft 45 ft. deep, crosscuts, and trenches. Ore zone in bottom of shaft is 8 ft. wide and is reported to average $14 [about 0.68 oz.] gold a ton. Mill on property [no data on production].

Berg and Cobb, 1967 (B 1246), p. 179 -- Has been production.

(Hetta Mtn.) Copper

Ketchikan district Craig (20.9, 3.7)
MF-433, loc. 80 55°12'N, 132°32'W

Summary: Small masses of chalcopyrite and pyrrhotite in contact zone between granodiorite body and limestone and quartzite; some surface oxidation. No large deposits found. A little exploration, but no production, in early 1900's.

Wright, 1908 (B 345), p. 95 -- Little or no work, 1907.

Wright and Wright, 1908 (B 347), p. 108 -- Country rock is limestone and quartzite along margin of granodiorite intrusive body. Contact zone is made up of garnet-epidote rock containing small masses of chalcopyrite and pyrrhotite. Some secondary copper minerals at surface. Several prospects consist of short tunnels, open cuts, and stripped surfaces. No large deposits found.

Wright, 1915 (P 87), p. 56 -- Claims located between 1900 and 1903.
p. 65 -- Same as Wright and Wright, 1908 (B 347), p. 108.

Hoffman — Gold

Ketchikan district — Craig (26.0, 11.4) approx.
55°38'N, 132°02'W approx.

Summary: Irregular vein about 5 ft. thick in greenstone contains pyrite; fine gold reported. Tunnel driven 21 ft. in early 1900's.

Wright and Wright, 1908 (B 347), p. 155-156 -- Located in 1902 or 1903. Irregular vein with average width of 5 ft. strikes N 5° W and dips steeply SW; in greenstone schist cut by many faults of small displacement. Pyrite in both vein and wallrock. Tunnel driven 21 ft. on vein. Fine gold said to be present; average values low.

(Hole in the Wall) Copper

Ketchikan district Craig (23.4-23.5, 9.55-9.7)
MF-433, locs. 45, 46 55°32'N, 132°18'W

Summary: Many claims staked in early 1900's in an area of contact-metamorphosed limestone adjacent to a diorite intrusive body. Chalcopyrite and a little magnetite. Little fruitful development. Includes references to: Eureka, Pelaska, Pennsylvania, Plumley, Sunrise.

Wright and Paige, 1908 (B 345), p. 114 -- Same as Wright and Wright, 1908 (B 347), p. 121-122.

Wright and Wright, 1908 (B 347), p. 121-122 --Many claims staked in an area of contact-metamorphosed limestone adjacent to a diorite intrusive and felsic and diabase dikes. Deposits are chalcopyrite in garnet-epidote-calcite rock; magnetite in at least one deposit. Little development.

Wright, 1909 (B 379), p. 79 -- Assessment work, 1908.

Wright, 1915 (P 87), p. 97 -- Same as Wright and Wright, 1908 (B 347), p. 121-122.

Bufvers, 1967 (SR 1), p. 4-5 -- Exploration on Pelaska prospect failed to find any large ore body. About 50 tons of material mined from surface was left in a dump.

Home	Gold(?), Silver(?)
Ketchikan district	Craig (26.0, 3.0) approx. 55°09'N, 132°03'W approx.

Summary: Quartz vein in sheared limestone contains pyrite and tetrahedrite. No data on metal content.

Brooks, 1902 (P 1), p. 82 -- Quartz vein as much as 2 ft. thick cuts sheared limestone beds and contains pyrite and tetrahedrite. Only development is a pit 8 ft. deep.

Hope (Cholmondeley Sound) — Lead, Silver, Zinc

Ketchikan district — Craig (23.0, 3.2) approx.
MF-433, loc. 83 — 55°10'N, 132°32'W approx.

Summary: Marble and calcite lenses in schist replaced by sphalerite, galena, epidote, and garnet; low silver values. Explored by shallow shaft and open cuts. No reported production and no reported activity after 1915.

Wright and Wright, 1906 (B 284), p. 53-54 -- Veins 1-10 ft. wide formed by replacement of crystalline limestone strike about N 65° E; variable dip. Opened by inclined shaft 20 ft. deep. Metallic minerals are chiefly sphalerite and galena, with low silver values; some cerussite.

Chapin, 1916 (B 642), p. 82 -- Some work, 1915.

Buddington and Chapin, 1929 (B 800), p. 367-368 -- Silver-lead deposit. Lode cuts quartzite, schist, and limestone; appears to be continuous, but to widen where it crosses calcareous rocks. Ore bodies due to replacement of limestone and calcite lenses in schist by epidote, garnet, and galena.

Berg and Cobb, 1967 (B 1246), p. 173 -- Vein in marble and schist; metallic minerals are sphalerite and galena carrying a small amount of silver. Explored by a shallow shaft and open cuts.

Houghton	Copper, Iron
Ketchikan district	Craig (20.2, 4.9)
MF-433, loc. 73	55°15'N, 132°38'W

Summary: Contact-metamorphic deposit along contact between granodiorite and limestone contains massive chalcopyrite with magnetite, pyrite, and pyrrhotite in a body 5 ft. wide. Some native copper at outcrop. Explored by surface excavations and 2 tunnels. No record of production. Includes references to Cuprite Copper Co.

Wright, 1907 (B 314), p. 71 -- North of and similar to Jumbo (Hetta Inlet) deposits. Chalcopyrite-magnetite deposits along contact of granodiorite body. Development in 1906.

Wright, 1908 (B 345), p. 94-95 -- Work, 1907. Ore in contact zone between granite and limestone.

Wright and Wright, 1908 (B 347), p. 103-104 -- Deposit in a contact zone 25-75 ft. wide made up of garnet-epidote rock between granodiorite and limestone; massive chalcopyrite ore with associated magnetite, pyrite, and pyrrhotite form a body 5 ft. wide. Developments, mainly in 1906-07, include surface excavations and a tunnel being driven to undercut the ore body.

Wright, 1909 (B 379), p. 82 -- Development, 1908, was not encouraging; work stopped in spring, 1908.

Wright, 1915 (P 87), p. 50 -- Native copper in cracks or gouge seams at outcrops.

p. 56 -- Staked between 1900 and 1903.

p. 62-63 -- About the same as Wright and Wright, 1908 (B 347), p. 103-104; another 100-ft. tunnel was driven.

Berg and Cobb, 1967 (B 1246), p. 172 -- Contact-metamorphic lodes contain chalcopyrite, magnetite, pyrite, and pyrrhotite.

House

Copper

Ketchikan district
MF-433, loc. 94

Craig (26.0, 3.0) approx.
55°09'N, 132°03'W approx.

Summary: Quartz vein 1-2 ft. thick in crystalline limestone contains pyrite, chalcopyrite, and tetrahedrite.

Brooks, 1902 (P 1), p. 82 -- Quartz vein in white crystalline limestone strikes N 15° E, dips 30° NW, is 1-2 ft. thick, and contains pyrite, chalcopyrite, and tetrahedrite. Exposed in a small pit.

Hula Hula	Gold(?)
Ketchikan district	Craig (25.3, 3.4) approx. 55°10'N, 132°09'W approx.

Summary: Wide vein of possibly auriferous quartz staked in 1899. Probably the same prospect as Kid, Oregon, or Washington.

Bufvers, 1967 (SR 1), p. 23 -- Wide quartz vein, slightly mineralized along footwall, is too low grade to mine. Staked in 1899.

Independent	Gold, Lead, Zinc
Ketchikan quadrangle MF-433, loc. 14	Craig (18.4, 9.35) approx. 55°31'N, 132°49'W approx.

Summary: Thin vein in shear in andesite porphyry contains galena, pyrite, and sphalerite in quartz and calcite gangue. High assay values in free gold reported. All work in early 1900's.

Wright and Wright, 1908 (B 347), p. 163-164 -- 2 claims. On lower claim a vein 1 ft. wide follows a shear plane in andesite porphyry. Vein strikes N 75° W, dips 75° SW. Contains galena, pyrite, and sphalerite in quartz and calcite gangue; very high assay values in free gold reported. On upper claim vein 1-2 ft. wide (including gouge) strikes N 78° W, dips 75° SW. Country rock is altered slate and graywacke cut by porphyry dikes. A little development in early 1900's.

Bufvers, 1967 (SR 1), p. 11-12 -- Most of data seem to have been taken from above reference. Prospect restaked in 1945. Some gold may have been produced, but it is doubtful.

Iron Cap — Copper, Gold, Iron, Silver

Ketchikan district — Craig (22.5, 11.6)
MF-433, loc. 33 — 55°39'N, 132°24'W

Summary: Contact-metamorphic iron-copper deposits on Tolstoi Mtn. prospected between 1900 and 1908. Most work on Iron Cap; lenses of magnetite and subordinate chalcopyrite in greenstone and metamorphosed clastic rocks explored by adit, trenches, pits, and several hundred feet of diamond drilling. A little bornite, traces of gold, and as much as 0.6 oz. silver a ton. Between a granodiorite stock and a large fault zone 1/2 mi. to SW. Resource estimated at 100,000 long tons of material containing no more than 40% iron and 0.25% copper. No production. Includes references to (Tolstoi Mtn.). See also Big Five.

Brooks, 1902 (P 1), p. 104 -- Country rock is mainly greenstone; some limestone. Epidote along joint planes. Explored by diamond drilling. Deposit includes chalcopyrite, magnetite, and bornite and considerable epidote gangue. Appears to be similar to Mount Andrew.

Wright and Paige, 1908 (B 345), p. 111 -- Same as Wright and Wright, 1908 (B 347), p. 126-127.

Wright and Wright, 1908 (B 347), p. 126-127 -- In 1901 was prospected by open cuts and several hundred feet of diamond drill holes; idle since then. Country rock is mainly tuffaceous greenstone intruded by wide syenitic dikes. 3 ore bodies have been found; one is 20 ft. wide and traceable for 50 ft.; another (separated from the first by a 30-ft.-wide altered syenite dike) is 12 ft. wide and limited on side away from dike by a fault with considerable gouge; the third appears to be a flat-lying magnetite body only a few feet thick. [No data on ore mineralogy.]

Wright, 1915 (P 87), p. 101 -- Same as Wright and Wright, 1908 (B 347), p. 126-127.

Erickson, 1948 (RI 4373) -- Some data summarized from Wright, 1915 (P 87), p. 101. Deposits in contact zone between Jurassic(?) intrusive diorite and Devonian sedimentary and volcanic rocks. Deposits are small bodies of magnetite in a zone 2,000 ft. long, 200-500 ft. wide, and striking N 60° W. Magnetite is accompanied by small amounts of chalcopyrite and pyrite; gangue is garnet, epidote, calcite, and quartz. Details of USBM trenching, dip-needle surveying, and sampling program. Analyses of samples showed 0.24%-1.88% Cu, 39.9%-63.9% Fe, traces of Au, and 0.4-0.6 oz. silver per ton.

Carr and Dutton, 1959 (B 1082-C), p. 102 -- Small reserves of magnetite with 30%-50% iron.

Warner and others, 1961 (B 1090), p. 5 -- Little or no production.

p. 31-32 -- Magnetite bodies related to stocklike bodies of late granodiorite and related rocks; of replacement origin. Some magnetite shows bladed or tabular structure; may be pseudomorphous after specular hematite.

p. 37,43 -- Small vein composed essentially of pyrite and arsenopyrite in broken quartz.

Iron Cap -- Continued

p. 45 -- Virtually all of ore associated with lenses of metamorphosed clastic material in greenstone.

p. 106-112 -- Explored by adit 100 ft. long, several hundred ft. of diamond-drill holes, and pits and trenches. No large bodies of magnetite ore found. Country rock is greenstone with included metamorphosed clastic sediments and limestone cut by many granitic and mafic dikes, all intruded by a granodiorite stock; large fault zone parallel to and about a half mile SW of granodiorite contact. Ore bodies all between stock and fault; mainly magnetite with minor pyrite and chalcopyrite; some pyrrhotite; gangue is typical contact-metamorphic minerals. Total estimated reserves of Tolstoi Mtn. area are 100,000 long tons of inferred ore with an average grade of about 40% Fe and 0.25% Cu. Ore bodies are irregular replacement pods and lenses as much as 200 ft. long and 20-30 ft. thick. Most of magnetite ore probably within 50 ft. of surface. Sulfide veins on Tolstoi Mtn. in fault zone and granodiorite stock contain pyrite, chalcopyrite, arsenopyrite, and a little magnetite. Magnetic survey generally indicated that magnetite deposits are not much larger than as exposed at surface and are shallow.

Berg and Cobb, 1967 (B 1246), p. 168 -- Data from Warner and others, 1961 (B 1090) [not specifically cited].

Iron Crown (Hetta Inlet)

Cobalt, Nickel

Ketchikan district
MF-433, loc. 79

Craig (20.75, 4.0)
55°13'N, 132°36'W

Summary: Sample of pyrrhotite contained 0.1-0.2% nickel and a trace of cobalt.

Wright and Wright, 1908 (B 347), p. 87 -- Analysis of sample of pyrrhotite ore showed 0.1-0.2% Ni, tr. Co, and no Pt or Au.

Wright, 1915 (P 87), p. 49 -- Same as above.

Berg and Cobb, 1967 (B 1246), p. 171 -- Samples of pyrrhotite from Iron Crown and Sultana contained 0.1-0.2% Ni and traces of Co.

Iron King No. 1 — Copper, Gold, Iron, Silver

Ketchikan district — Craig (22.3, 9.9)
55°33'N, 132°25'W

Summary: Isolated magnetite-chalcopyrite-pyrite deposit in greenstone and associated rocks cut by syenite, andesite, and basalt dikes is about 150 ft. long and 10-15 ft. wide. Exposed by trenches and stripped surfaces. Chalcopyrite and pyrite in fractures in magnetite and in greenstone. Magnetite in small bodies containing 50% iron and as disseminated grains. Channel samples (by UBSM) indicated about 2% copper and minor gold and silver. See also Poorman; on same group of claims.

Warner and others, 1961 (B 1090), p. 102-106 -- Country rock greenstone and associated rocks as at other deposits on Kasaan Peninsula. Deposit exposed by trenches and stripped surfaces in an area about 200 ft. by 100 ft. Basalt, andesite, and alkalic dacite dikes cut greenstone. Ore exposed in zone about 150 ft. long and 10-15 ft. wide that trends about N 15° E. Magnetite and sulfide ore separated by a sharp contact that strikes about N 15° E and dips 65° NW. Ore deposition probably controlled by faulting. In places magnetite makes up most of ore (50% Fe); in others only locally disseminated with chalcopyrite and pyrite in greenstone. Sulfides later than magnetite; in fractures in both magnetite and greenstone. 4 diamond-drill holes did not encounter any ore. Magnetic survey indicated no ore not exposed in trenches. Analytical data from 29 channel samples by USBM indicated average of about 2% Cu and minor gold and silver in a body about 150 ft. long and 10-15 ft. wide; no data on depth.

It (Mining Co.) — Copper, Gold, Molybdenum, Silver

Ketchikan district — Craig (21.8, 10.45)
MF-433, loc. 38 — 55°35'N, 132°28'W

Summary: Mine operated from 1908 to 1912 and from 1915 to 1918. Produced copper ore worth more than $1,000,000 and some gold and silver. Mined from glory holes and extensive underground workings. Ore mainly chalcopyrite and pyrite with minor molybdenite and a little magnetite and hematite. Ore in tactite adjoining marble lenses. Country rock interlayered marble and greenstone cut by dikes of diorite, gabbro, and finer grained mafic rocks. Two small magnetite deposits, one with small pods of sulfides in it, were not mined. Ore mined contained an average of 3.99% copper and 0.0685 oz. gold and 0.478 oz. silver per ton. Mine worked out in 1918. Includes references to: Dean, Taylor. See also Alarm.

Wright and Paige, 1908 (B 345), p. 109 -- Same as Wright and Wright, 1908 (B 347), p. 119.

Wright and Wright, 1908 (B 347), p. 119 -- Located in 1907. Chalcopyrite in gangue of garnet and epidote exposed by surface cuts over an area 20 to 40 ft. Diorite to SW and limestone to NE.

Wright, 1909 (B 379), p. 78-79 -- Contact deposit; diorite footwall and limestone hanging wall. Chalcopyrite, pyrrhotite, and pyrite in gangue of garnet, epidote, and calcite; no magnetite. In 1908 considerable development and ore shipments to Hadley and Ladysmith, B.C.

Brooks, 1910 (B 442), p. 38 -- Mining, 1909.

Knopf, 1910 (B 442), p. 141 -- Ore, high in copper and gold, is mined at the rate of 50 tons a day, sorted, and sent to smelter at Ladysmith, B.C., 1909.

Knopf, 1911 (B 480), p. 101 -- Operations continued, 1910. Development on Dean prospect also; 100-ft. tunnel and shallow winze; another 75-ft. tunnel.

Brooks, 1912 (B 520), p. 26 -- Mining, 1911. Tunnel driven to undercut ore body said to have encountered ore.

Brooks, 1913 (B 542), p. 33 -- Mining, 1912.

Brooks, 1915 (B 622), p. 42 -- Development, 1914.

Wright, 1915 (P 87), p. 94-95 -- Ore shipments began in 1908. Developments, 1908, 1911, include a shaft and 3 levels, the beginning of a long tunnel designed to undercut the ore deposits at a depth of 500 ft.; and surface improvements. Ore bodies are contact deposits on both sides of a diorite mass that intruded limestone and graywacke. Ore bodies consist of chalcopyrite, pyrite, garnet, epidote, and some hematite; are from a few to many feet in dimensions.

Chapin, 1916 (B 642), p. 83-85 -- Considerable mining, 1915. Ore carries both copper and gold.

Smith, 1917 (BMB 142), p. 30 -- Development, 1915.

Smith, 1917 (BMB 153), p. 25-26 -- Chalcopyrite in lenses between granodiorite and limestone. Much of activity in 1916 was diamond drilling.

It (Mining Co.) -- Continued

Chapin, 1918 (B 662), p. 64 -- Mining and diamond-drill prospecting, 1916.
Chapin, 1919 (B 692), p. 85-86 -- Mining, 1917.
Martin, 1919 (B 692), p. 28 -- Mining, 1917.
Martin, 1920 (B 712), p. 28 -- Ore shipments and development; mining suspended before end of 1918.
Brooks, 1921 (B 714), p. 17 -- Example of contact copper deposit.
p. 19 -- Cost (including that of diamond drilling) per ton of ore mined in 1916-17 was $5.54. Production was 14,881 tons of ore.
Buddington and Chapin, 1929 (B 800), p. 316 -- Example of a contact deposit.
p. 369 -- Quotation from Brooks, 1921 (B 714).
Warner and others, 1961 (B 1090), p. 5 -- Produced more than $1,000,000 in copper ore.
p. 32 -- Replacement body that contains only accessory magnetite; mainly chalcopyrite and pyrite; minor molybdenite.
p. 50 -- Sulfide minerals confined mainly to network of minute fractures.
p. 122-125 -- Mined from glory holes and extensive underground workings, 1908-12, 1915-18; probably mined out, as extensive diamond drilling failed to find more ore. Ore mainly chalcopyrite and pyrite with a little magnetite, hematite, and minor molybdenite. Average metal content of ore mined was 3.99% copper, 0.0685 oz. gold, and 0.478 oz. silver a ton. Country rock is mainly interlayered marble, greenstone and irregular zones of tactite; irregular dikes of diorite, gabbro, and finer grained mafic rocks. Much of ore along contacts between lenses of marble and tactite. 2 small deposits consist of magnetite, one with small pods of sulfides, in tactite.
Noel, 1966, p. 54 -- One of 3 major producers on Kasaan Peninsula.
p. 62 -- Reference to Warner and others, 1961 (B 1090).
Berg and Cobb, 1967 (B 1246), p. 165-167 -- Data in Warner and others, 1961 (B 1090), p. 5, 122-125, summarized [not specifically cited].
Bufvers, 1967 (SR 1), p. 3 -- Historical data.

Jumbo (Dolomi)	Gold, Silver
Ketchikan district	Craig (26.1, 3.0) approx.
MF-433, loc. 94	55°09'N, 132°03'W approx.

Summary: Vein 2-3 ft. thick in graphitic phyllite contains 2 generations of quartz, gold, and tetrahedrite. No record of production. Last reported activity was assessment work in 1915.

Brooks, 1902 (P 1), p. 80 -- Shaft sunk about 40 ft. on a vein 2-3 ft. thick in graphitic phyllite. Vein contains 2 generations of quartz, gold, and tetrahedrite.

Chapin, 1916 (B 642), p. 81 -- Assessment work, 1915.

Jumbo (Hetta Inlet)	Copper, Gold, Iron, Molybdenum, Silver, Zinc
Ketchikan district	Craig (20.45, 4.5)
MF-433, loc. 75	55°15'N, 132°37'W

Summary: Contact-metamorphic deposits, mainly in limestone at contacts with a mainly granodiorite stock and in limestone inclusions in the stock. Two deposits; one of sulfide ore that was pretty well mined out; the other mainly of magnetite with some chalcopyrite. Sulfide ore was mainly chalcopyrite; smaller amounts of specularite, sphalerite, and molybdenite; values in gold and silver. Developed by 2 miles or more of workings; production, 1907-23, was 122,937 tons of ore which yielded 10,194,264 lbs. copper, 7,076.36 oz. gold, and 87,778 oz. silver; worth $1,768,342 in current dollars. The 3 principal magnetite bodies contain about 370,000 long tons of indicated and inferred material containing about 45% iron and 0.73% copper. Property consists of 29 claims. Coordinates above are for main mine workings.

Brooks, 1902 (P 1),p. 107 -- Believed to be an extension of Copper Mountain ore body.

Wright and Wright, 1905 (B 259), p. 64 -- Copper-bearing ledges in diabase and limestone.

Wright and Wright, 1906 (B 284), p. 51-52 -- Contact-metamorphic deposits of magnetite and chalcopyrite in limestone or between limestone and granite. Considerable development; production seems imminent, 1905.

Wright, 1907 (B 314), p. 70-71 -- Considerable development; 3 tunnels connected by raises, surface cuts, and other improvements.

Wright, 1908 (B 345), p. 94 -- Ore mined and shipped to Tyee smelter, 1907.

Wright and Wright, 1908 (B 347), p. 99-102 -- Contact-metamorphic deposit in garnet-epidote rock with small amounts of scapolite, wollastonite, specularite, and molybdenite between a fractured limestone hanging wall and an indefinite granodiorite footwall. The ore being mined is an irregular chalcopyrite body 30-40 ft. by 120 ft. by 140 ft. Workings consist of 4 tunnels, raises, drifts, stopes, and open cuts. A large body of magnetite is on another claim of the group, and several other chalcopyrite and magnetite bodies have been explored by tunnels and surface excavations; some material contains values in gold and silver.

Wright, 1909 (B 379), p. 81-82 -- Considerable development and production, 1908. More ore bodies discovered.

Brooks, 1910 (B 442), p. 38 -- Mining, 1909.

Knopf, 1910 (B 442), p. 142 -- Contact-metamorphic deposit made up of chalcopyrite, garnet, calcite, pyrrhotite, pyrite, molybdenite, hematite, epidote, and other silicates. Ore shipments in 1909.

Knopf, 1911 (B 480), p. 99 -- Ore bodies occur through a vertical range of 700 ft.

Jumbo (Hetta Inlet) -- Continued

p. 101-102 -- Mining and diamond drilling, 1910.
Brooks, 1912 (B 520), p. 26 -- Mining, 1911.
Brooks, 1913 (B 542), p. 33 -- Mining, 1912.
Brooks, 1914 (B 592), p. 60 -- Mining, 1913.
Smith, 1914 (B 592), p. 83 -- Mining, 1913. Ore shipped to Tacoma smelter.
Brooks, 1915 (B 622), p. 41 -- Mining, 1914. Closed end of August.
Wright, 1915 (P 87), p. 49 -- Molybdenite associated with garnet, calcite, diopside, and chalcopyrite on one claim.

p. 58-61 -- Data on ore deposits essentially as in Wright and Wright, 1908 (B 347), p. 99-102, with more detailed descriptions of some of workings and of some individual ore bodies. Granitic rock is called diorite rather than granodiorite, as in earlier report.

p. 106-107 -- Chemical analyses and descriptions of rock types on property. Speculation on mineral changes during metamorphism.

Chapin, 1916 (B 642), p. 83 -- Mining, 1915.

p. 90 -- Mining, 1915. Total length of underground workings is about 10,000 ft.

Smith, 1917 (BMB 142), p. 29 -- Chalcopyrite ore in discontinuous irregular lenses in altered zone between granite and limestone or in schist. Mining, 1915.
Smith, 1917 (BMB 153), p. 26 -- Mining, 1916.
Chapin, 1918 (B 662), p. 68 -- Mining, 1916.
Chapin, 1919 (B 692), p. 88 -- Mining, 1917. Problem getting shipping facilities for ore.
Martin, 1919 (B 692), p. 28 -- Mining, 1917.
Martin, 1920 (B 712), p. 28 -- Mining, 1918.
Brooks, 1921 (B 714), p. 17 -- Example of contact copper deposit.
Brooks and Martin, 1921 (B 714), p. 69 -- Copper ore shipped, 1919.
Brooks and Capps, 1924 (B 755), p. 23 -- Some work preparatory to reopening, 1922.
Brooks, 1925 (B 773), p. 36 -- Some copper ore shipped, 1923.
Buddington and Chapin, 1929 (B 800), p. 316 -- Example of a contact deposit.

p. 369 -- Quotation from Brooks, 1921 (B 714).

Smith, 1942 (B 926-C), p. 165-166 -- Data from Wright, 1915 (P 87), p. 49, 107 [authorship incorrectly cited].
Wright and Fosse, 1946 (RI 3952) -- Discovered in 1897. Copper ore mined and shipped from 1907 intermittently until 1919. Total production not known, but value of gold and copper reported to have been more than $1,000,000. 55 patented claims cover 860 acres. Country rock is a series of limestones and greenstone schists intruded by a dioritic body with apophyses and outliers and with inclusions of the older rocks in it. Deposits are contact metamorphic in origin. 2 groups of deposits: (1) chalcopyrite group (mined out), and (2) magnetite-chalcopyrite group, on which all USBM work was done. Details of USBM dip-needle survey and channel-sampling programs. Weighted averages of samples showed 0.67% Cu, 4.4% Fe, tr. P, tr. TiO_2, 21.6% insol., 3.74% CaO, 1.67% P, and 0.012 oz. Au and 0.90 oz. Ag per long ton. Descriptions of beneficiation tests.

Jumbo (Hetta Inlet) -- Continued

Kennedy, 1953 (P 251) -- Country rock is a sequence of intensely folded limestone and calcareous schist conformably overlain by quartz-mica schist; both are overlain (probably unconformably) by massive greenstone flows. A large stock, predominantly granodiorite, but varying widely in composition, and many andesite dikes and sills intruded the metamorphic rocks. Ore deposits and associated skarn bodies were formed by replacement of limestone and calcareous schist where tongues of intrusive rock invaded limestone and in limestone inclusions; probably formed by late emanations from magma rather than by emanations coming directly from adjacent parts of the stock. Predominant contact minerals associated with magnetite bodies are diopside and garnet; some chalcopyrite. Lenses of magnetite are from a few to as much as 60 ft. thick and as much as 450 ft. in outcrop length. The principal bodies contain a total of about 370,000 long tons of indicated and inferred ore containing about 45% iron and 0.73% copper. The richer contact chalcopyrite ore bodies were mined out between 1907 and 1923; total production was 122,937 tons of ore which yielded 10,194,264 lbs. copper, 7,076.36 oz. gold, and 87,778 oz. silver worth a total of $1,768,342 (in current dollars). Minerals reported from chalcopyrite bodies include chalcopyrite, specularite, sphalerite, and molybdenite. [most of this report is detailed petrography and petrology.]

Carr and Dutton, 1959 (B 1082-C), p. 80 -- Lenses of magnetite (largest 300 ft. long, as much as 60 ft. thick, extending for more than 400 ft. at inclination of 60°) believed to be replacements of marble.

p. 102 -- Indicated and inferred reserves are 0.37 million tons of magnetite ore containing 45% iron.

Noel, 1966, p. 54 -- Principal mine in Hetta Inlet area, from which production was about 10,000,000 lbs. of copper from 125,000 tons of ore mined between 1907 and 1923.

Berg and Cobb, 1967 (B 1246), p. 171 -- Data from Kennedy, 1953 (P 251) summarized [not specifically cited].

Bufvers, 1967 (SR 1), p. 19-20 -- Mainly historical and anecdotal material and data from old reports. A miner who was working there when the mine closed in about 1920 told Bufvers that a winze sunk about 60 ft. below the main tunnel was in high-grade ore, but that the pump could not keep the winze dry.

Juneau	Gold(?)
Ketchikan district	Craig (19.1, 9.8) approx.
MF-433, loc. 23	52°33'N, 132°41'W approx.

Summary: Claims on veins on north side of Granite Mtn. that are said to carry good gold values.

Wright and Wright, 1908 (B 347), p. 165 -- Claims on north side of Granite Mtn. Said to be similar to other veins in area [quartz fissure veins in granitic rock that carry gold and sulfides]. Said to carry good gold values.

Kansas	Copper(?)
Ketchikan district	Craig (22.1, 10.25) approx. 55°32'N, 132°36'W approx.

Summary: Claim north of Poorman. Probably staked as a copper prospect, but no data are available.

Chapin, 1916 (B 642), p. 86 -- Claim north of Poorman [no other data].

(Keete Inlet) Copper

Ketchikan district Craig (22.0, 1.8) approx.
MF-433, loc. 87 55°05'N, 132°29'W approx.

Summary: Shear zone in siliceous beds in greenstone schist contains chalcopyrite, pyrite, and possibly bornite. Little development and no reported production.

Chapin, 1916 (B 642), p. 90 -- Shear-zone deposit in siliceous beds in greenstone schist contains disseminated particles and lenses of chalcopyrite and pyrite; pieces of quartz veins containing bornite and chalcopyrite on dump. Lode strikes N 20° W and dips 60° NE. Opened by an incline flooded below 10-ft. level in 1915.

Berg and Cobb, 1967 (B 1246), p. 172 -- Shear zone contains lenses and disseminated particles of chalcopyrite, pyrite, and possibly bornite.

Ketchikan Copper Co.	Copper, Gold, Silver
Ketchikan district	Craig (22.9, 3.4) approx.
MF-433, loc. 84	55°12'N, 132°21'W approx.

Summary: Mineralized zones in schist contain pyrite, chalcopyrite, and their oxidation products. Owners reported combined copper, gold, silver, and lead values of from $2.50 to $25 a ton; no mention of any lead mineral. 300-ft. tunnel.

Brooks, 1902 (P 1), p. 87-88 -- Mineralized zones in pyritiferous quartz-sericite schist that may be an altered rhyolite contain pyrite and chalcopyrite and their oxidation products. Owners report that values in copper, gold, silver, and lead run from $2.50 to $25 and average $4-$5 a ton. [No lead mineral reported.] Tunnel has been driven 300 ft. Property consists of 12 claims.

Berg and Cobb, 1967 (B 1246), p. 173 -- 300-ft. tunnel explored veins and disseminated grains of pyrite, chalcopyrite, and galena(?) in schist. Grade data same as above.

Keystone	Gold, Silver
Ketchikan district	Craig (26.25, 11.25) approx. 55°37'N, 132°01'W approx.

Summary: Stockwork in intensely sheared chlorite schist. Much pyrite and some gold and silver. Average gold content is about 0.39 oz. per ton. About 700 ft. of underground workings. All work in early 1900's. No record of production.

Brooks, 1902 (P 1), p. 57-58 -- Pyrite and gold in mineralized zone 20-40 ft. wide in a green schist. Mineralized zone contains many irregular quartz veins and blebs. Values run from $3.20 to $20 in gold and average about $8 , of which 5% is in concentrates, which are valued at $140 a ton. Developed by 120-ft. shaft, drifts, and crosscuts.

Wright and Wright, 1908 (B 347), p. 157 -- Keystone workings consist of a shaft 65 ft. deep and nearly 700 ft. of crosscuts and drifts. Has been idle for several years. Deposit is a stockwork of stringer veins in intensely sheared chloritic schist. Belt is mineralized with pyrite and carries low values in gold and silver.

Smith, 1914 (B 592), p. 86 -- 375 ft. of drifts and crosscut and a raise to surface. Vein is split into numerous quartz stringers; much slickensiding. Main value reported to be in free gold.

Bufvers, 1967 (SR 1), p. 8 -- Under development in 1902. Wide stockworks of stringers in schist; much pyrite and some gold and silver. About 700 ft. of workings plus a 65-ft. tunnel. Has been idle for half a century.

Khayyam	Copper, Gold, Silver, Zinc
Ketchikan district	Craig (22.75, 5.55)
MF-433, loc. 70	55°18'N, 132°23'W

Summary: Ore bodies are irregular, elongate, nearly vertical lenses of sulfide ore parallel to layering of enclosing altered and banded diorite(?). Sulfides are chiefly pyrite with smaller amounts of chalcopyrite, pyrrhotite, and sphalerite; a little magnetite; some secondary native copper; gangue is quartz, calcite, epidote, and chlorite; carries gold and silver. Several hundred feet of underground workings and pits and trenches. Little work and no mining since 1907. Investigated by USBM during World War II. 31 channel samples contained 0%-5.25% copper, trace to 0.20 oz. gold a ton, and 0-8.1 oz. silver a ton. 7 samples contained 6.8%-52.3% sulfur. Indicated and inferred resources of 84,000 tons containing 1.71% copper, 0.93% zinc, 38% sulfur, 0.06 oz. gold a ton, and 0.30 oz. silver a ton. Includes references to Kiam.

Brooks, 1902 (P 1), p. 94-95 -- Body of chalcopyrite and pyrrhotite about 20 ft. wide exposed on top of mountain; some inclusions of altered dioritic or andesitic rock. Ore contains some sphalerite and pyrite and a little gold; owners report nickel values of $35 a ton and 5% to 30% copper. Tunnel in ore and another being driven to undercut lode.

Wright and Wright, 1906 (B 284), p. 49 -- Mineralized bands in a series of quartz-sericite schists interbedded in chloritic and actinolitic schists, all cut by 3 sets of fracture systems, contain irregular masses of pyrite, pyrrhotite, and chalcopyrite with minor magnetite and some secondary native copper; gangue is quartz, calcite, epidote, and chlorite. Low-grade smelting ore. Tunnel driven 700 ft. to undercut ore zone did not reach it. At least 260 ft. of new workings. Considerable surface improvements made in 1905.

Wright, 1907 (B 314), p. 69 -- Idle, 1906. Ore did not smelt well.

Wright, 1908 (B 345), p. 96 -- Mining, 1907. Some ore shipped to Tyee smelter in B.C. Ore bodies are elongate lenses of sulfide ore parallel to schistosity of gneissoid diorite country rock. Ore is mainly pyrite with chalcopyrite, pyrrhotite, sphalerite, and magnetite. Several hundred feet of underground workings and pits and trenches.

Wright and Wright, 1908 (B 347), p. 135-137 --Ore bodies are irregular, elongate, nearly vertical lenses of sulfide ore parallel to the schistosity (strike N 85° W, dip 80°-90° N) of the enclosing rocks, which comprise a variety of which the chief one is banded basic hornblende gneiss (probably an altered diorite). Sulfides are chiefly pyrite with smaller amounts of chalcopyrite, pyrrhotite, and sphalerite; gold and silver present, particularly in chalcopyrite; some magnetite; no nickel in assays. 4 ore bodies 6-20 ft. wide exposed on surface and in a tunnel 220 ft. long; limited on west by a vertical fault; not encountered in a lower tunnel 680 ft. long. Property first located in 1899; developed, 1901-05 and 1907. Production in 1907.

Buddington and Chapin, 1929 (B 800), p. 325 -- Very large masses of pyrite.

Khayyam -- Continued

Fosse, 1946 (RI 3942) -- First located in 1899. Nearly all work was between 1901 and 1907; a little development in 1916; relocated in 1937, but soon abandoned. No data on amount of early production; none since 1907. Ore follows shear planes parallel to schistosity of hornblende gneiss (derived from diorite) country rock. Lenses of massive iron and copper sulfides as much as 27 ft. wide are in a zone 10 to 260 ft. wide and 1,100 ft. long; western limit defined by a nearly vertical fault. Ore lenses are mainly pyrite with chalcopyrite, pyrrhotite, sphalerite, and magnetite; minor amounts of gold and silver. Detailed descriptions of workings (8 adits with a total length of 1,263 ft., several stopes, and several pits) and USBM sampling program. 31 channel samples contained from 0 to 5.25% Cu, from a trace to 0.20 oz. Au a ton, and 0 to 8.1 oz. Ag a ton; 7 samples analyzed for S ranged from 6.8% to 52.3%.

Condon, 1961 (B 1108-B), p. B36 -- Large pyrite deposit.

Noel, 1966, p. 54 -- Has produced copper.

p. 63 -- Reference to Brooks, 1902 (P 1).

Berg and Cobb, 1967 (B 1246), p. 172 -- Elongate lenses parallel to schistosity in enclosing metamorphosed sedimentary and volcanic rocks consist of pyrite, disseminated chalcopyrite, and a little pyrrhotite, sphalerite, and magnetite. Sample data from Fosse, 1946 (RI 3942) [not cited].

Bufvers, 1967 (SR 1), p. 22-23 -- Mainly historical and anecdotal material. USBM investigation shows indicated and inferred reserves of 84,000 short tons of material containing 1.71% Cu, 0.93% Zn, 38% S, 0.06 oz. gold, and 0.30 oz. Ag a ton. Grab sample from one ore bucket assayed 0.05 oz. gold and 1.30 oz. Ag a ton and 2.26% Cu.

Kid	Copper, Gold, Lead, Zinc
Ketchikan district	Craig (25.3, 3.4) approx.
MF-433, loc. 91	55°10'N, 132°08'W

Summary: Veins in schist with intercalated limestone contain small amounts of pyrite, chalcopyrite, galena, sphalerite, and gold. Little if any work since 1901. Includes reference to Fawn.

Brooks, 1902 (P 1), p. 85 -- Vertical quartz vein strikes N 40° W, is 6 ft. thick, and cuts chloritic schist. Offshoot 18 in. long and many small veins in wall rock. Best-looking ore is 2 ft. thick near one wall; carries pyrite and galena; assay (probably of picked sample) showed $26 a ton in gold. A similar, but apparently less mineralized, vein is 4-5 ft. wide. Called Fawn in this reference.

Wright and Wright, 1908 (B 347), p. 169-170 -- 3 claims. 3 parallel vertical quartz veins strike N 30° E; in greenstone schists with intercalated limestone beds. Veins contain pyrite, chalcopyrite, galena, and sphalerite in quartz and quartz-calcite gangue. Metal content worth only a few dollars a ton. Veins where exposed in outcrops, open cuts, and a 30-ft. tunnel are 4-8 ft. wide; one contains fragments of mineralized schist.

(Kina Cove) Copper

Ketchikan district Craig (21.25, 8.75-9.2)
MF-433, locs. 52, 53 55°29'-55°31'N, 132°31'-132°32'W

Summary: Chalcopyrite in recrystallized limestone and in a quartz vein in skarn bordering a quartz diorite pluton. Also pyrite, pyrrhotite, and chalcopyrite in small quartz veins and veinlets and pyrrhotite in schist. Occurrences only; no development.

Sainsbury, 1961 (B 1058-H), p. 352-353 -- Chalcopyrite makes up about 2% of a recrystallized limestone bed 4-6 ft. thick exposed in a creek bottom. Selected specimens of a knob of recrystallized limestone near the beach contain as much as 5% chalcopyrite. On west side of peninsula between Kina Cove and Twelvemile Arm skarn at contact between quartz diorite and quartz-mica schist is cut by a 6-in. quartz vein containing disseminated chalcopyrite. Other small quartz veins and veinlets contain pyrite, pyrrhotite, and a little chalcopyrite; locally the schist contains as much as 5% pyrrhotite.

Berg and Cobb, 1967 (B 1246), p. 168 -- Chalcopyrite in recrystallized limestone and chalcopyrite, pyrite, and pyrrhotite in tactite(?) bordering a quartz diorite pluton.

Leibrant — Copper

Ketchikan district — Craig (20.85, 11.3)
MF-433, loc. 29 — 55°38'N, 132°34'W

Summary: Disseminated bornite and chalcopyrite in quartz in a vertical fault in altered gabbro. Adit (said to be 100 ft. long) and an 18-ft. winze(?); all work before 1915.

Chapin, 1916 (B 642), p. 85 -- Adit (said to be 100 ft. long with an 18-ft. shaft [winze?]) driven on a vertical fault that strikes N 36° E. Country rock is gabbro with chlorite and epidote. Similar rock on dump contains considerable quartz with disseminated bornite and chalcopyrite.

(Lime Point) Barite

Ketchikan district Craig (20.4, 1.2)
55°03'N, 132°08'W

Summary: Barite replaced limestone (interbedded with talc schist) in an irregular mass about 100 ft. long and 11-40 (average 21) ft. wide. Estimated to contain about 5,000 short tons of barite. Barite is about 91% $BaSO_4$; only impurity is calcite. Deposit has been known since about 1914. Test shipment in 1915; other shipments reported in 1915-16. Includes reference to barite on west coast of Prince of Wales I.

Brooks, 1915 (B 622), p. 43 -- Some work done on barite deposit near Hetta Inlet, 1914.

Chapin, 1916 (B 642), p. 104 -- Limestone interbedded with talc schist strikes generally north and dips about 80° W. Body of barite about 30 ft. wide apparently is conformable with limestone, which it seems to have replaced. No visible impurities in the barite. Some was shipped to San Francisco and tested with satisfactory results, 1915.

Smith, 1917 (BMB 153), p. 26 -- Barite deposit opened; grinding plant to be installed in 1917.

Brooks, 1918 (B 662), p. 40 -- Work on barite deposit, 1916. Reduction plant being built at Salzer.

Chapin, 1918 (B 662), p. 63, 67 -- Work in 1916. Crushing plant being built near Jumbo (Hetta Inlet) wharf.

Brooks, 1921 (B 714), p. 54 -- Reference to Chapin, 1916 (B 642), p. 104. Some shipments made in 1915-16.

Buddington, 1925 (B 773), p. 138 -- Reference to Chapin, 1916 (B 642), p. 104.

Buddington and Chapin, 1929 (B 800), p. 333 -- Data from Chapin, 1916 (B 642), p. 104 [not cited].

Smith, 1933 (B 844-A), p. 81 -- Report that a company was formed to mine a barite deposit on west coast of Prince of Wales I., 1931.

Twenhofel and others, 1949 (B 963-A), p. 17-19 -- Barite replaced limestone in an irregular mass about 100 ft. long and 11-40 (average 21) ft. wide. Estimated to contain about 5,000 short tons above low-tide level. Barite contains 53.72% barium (about 91% $BaSO_4$), only impurity is calcite.

Kaufman, 1958 (IC 7844), p. 9 -- Tabular, nearly vertical barite body 30 ft. wide in limestone with interbedded schist; full extent of body not known.

Condon, 1961 (B 1108-B), p. B8, B37 -- Barite in replacement deposit in limestone.

Lookout	Copper, Gold, Silver
Ketchikan district	Craig (25.4, 1.45) approx.
MF-433, loc. 105	55°04'N, 132°08'W approx.

Summary: Zones of mineralized schist contain quartz veins and small masses of sulfides (covellite, chalcopyrite, pyrite) and gold. Samples assayed as much as 5.2% copper, 0.20 oz. gold a ton, and 2.31 oz. silver a ton. Only assessment work after 1901.

Brooks, 1902 (P 1), p. 75-77 -- Group of 6 claims; country rock is quartz-sericite schist; zones of bands or veins of covellite, chalcopyrite, pyrite, and auriferous quartz veins. Samples taken across mineralized zones (one 15 ft. wide and one 6 ft. wide) contained, respectively, 5.2% Cu, 0.20 oz. Au a ton, 2.31 oz. Ag a ton and 2.69% Cu, 0.12 oz. Au a ton, 1.3 oz. Ag a ton. At least one ore zone can be traced for several hundred feet. Development is a 30-ft. tunnel and surface excavations.

Wright and Wright, 1905 (B 259), p. 62 -- Assessment work only, 1964.

Wright and Wright, 1908 (B 347), p. 131 -- Only assessment work since 1901. Deposit on Conundrum claims is mineralized schist striking N 65° W and dipping 70° SW beneath a hanging wall of schistose greenstone with stringers of mineral-bearing quartz; 2 tunnels with total length of 220 ft. Elsewhere on property is a belt of brecciated schist with quartz and small masses of sulfides; too low grade to mine at a profit.

Berg and Cobb, 1967 (B 1246), p. 174 -- Similar to, but lower grade than, Niblack.

Lucky Boy — Copper, Gold, Lead, Silver, Zinc

Ketchikan district — Craig (24.3, 3.0)
MF-433, loc. 88 — 55°09'N, 132°14'W

Summary: At least 4 quartz-calcite breccia veins 3-8 ft. thick transect foliation in schist and minor limestone. Contain sphalerite, galena, chalcopyrite, pyrite, and small amounts of gold and silver. Exposed in outcrops, pits, and several hundred feet of workings; no known production. Development began about 1900; activity in 1917 is last that was reported. Resources of 2 best exposed veins are estimated to be about 8,500 tons of material containing as much as 5.23% zinc and 2.05% lead with very small amounts of copper, gold, and silver (averages much lower). Includes references to: Complex, Frisco (Dora Lake), Idaho, Lady of the Lake, Minnetonka, Oregon (Dora Lake), Portland, Seattle.

Brooks, 1902 (P 1), p. 79 -- Mineralized zone on Frisco claim is 8 ft. wide, carries sphalerite, pyrite, chalcopyrite, and galena; has been stripped in several places.

Wright and Wright, 1906 (B 284), p. 54 -- Oregon and Idaho claims on a well-defined vein about 3 ft. thick and exposed for a length of more than 300 ft.; in schist; carries good values in silver, gold, and zinc.

Wright and Wright, 1908 (B 347), p. 171-172 -- Country rock is schist and limestone; granite intrusive to west. Mineral deposits are veins in limestone and schist that contain galena, sphalerite, pyrite, and chalcopyrite; values principally in silver and lead; gold values low. Veins are 3-8 ft. wide; one strikes N 10° W and dips 50° SW; another strikes N 20° E and dips 70° SW. Claims originally located in 1899. Developments are a 68-ft. tunnel and open cuts.

Smith, 1914 (B 592), p. 79-80 -- Ore consists of copper sulfides, sphalerite, galena, and gold. Early quartz veins probably were fractured and the gold and sulfides introduced later. Prospecting, but no productive mining, 1913.

Chapin, 1916 (B 642), p. 81-82 -- Assessment work, 1915. Fissure vein as much as 9 ft. wide in limestone and schist is made up of banded quartz with considerable galena, sphalerite, chalcopyrite, and pyrite carrying gold and silver. Exposed by surface excavations and 295 ft. of adit, drift, and raise.

Martin, 1919 (B 692), p. 28 -- Small ore-treating plant reported to be under construction at Complex, 1917.

Buddington and Chapin, 1929 (B 800), p. 368 -- Fissure vein in limestone and schist is banded quartz with considerable galena, sphalerite, chalcopyrite, and pyrite carrying gold and silver; some of the ore is essentially sphalerite with little gold, silver, or other sulfides.

Robinson and Twenhofel, 1953 (B 998-C), p. 73-78 -- 2 deposits. South deposit is a quartz-calcite vein that strikes N 22° E, dips about 35° E, and was traced by surface cuts for a strike length of about 380 ft.; in schist. About 300 ft. of underground workings; the

Lucky Boy -- Continued

sphalerite content increases toward the surface. Analyses of samples indicate 5.84%-8.82% Zn, 0.07%-0.15% Pb, 0.11%-0.2% Cu and 0.01-0.07 oz. Au and 0.27-0.31 oz. Ag a ton. Indicated reserve estimated to be about 1,500 tons containing 3% zinc. North deposit composed of at least 3 quartz-calcite breccia veins slightly mineralized with sphalerite, galena, pyrite, and chalcopyrite; exposed in outcrops, pits, and a 65-ft. adit; schist wallrock. Assays show 0.31%-5.23% Zn, 0.36%-2.05% Pb, 0.05%-0.08% Cu and (one sample only) 0.09 oz. Au and 0.15 oz. Ag per ton. In vein exposed by adit it is estimated that there are about 7,000 tons of material containing about 0.33% Zn, 1% Pb, and minor Au and Ag. [Map shows small stopes in south working, but text does not mention production.]

Berg and Cobb, 1967 (B 1246), p. 173 -- Never mined commercially. 4 quartz-calcite breccia veins transect foliation of schist; contain sphalerite, galena, chalcopyrite, pyrite, and small amounts of gold and silver. Resource data summarized from Robinson and Twenhofel, 1958 (B 998-A), p. 73-78 [not specifically cited].

Lucky Find — Copper, Gold(?)

Ketchikan district — Craig (19.75, 9.5) approx.
MF-433, loc. 23 — 55°32'N, 132°42'W approx.

Summary: 4 claims on a 1-ft. vein between a diabase dike and granite. Gouge on both sides of vein. Vein carries pyrite, chalcopyrite, and possibly gold; gangue is quartz, calcite, and siderite(?). Explored in early 1900's by 50-ft. tunnel.

Wright and Wright, 1908 (B 347), p. 165 -- 4 claims located on a 1-ft.-thick vein between a diabase dike and granite; strikes N 45° W, dips 60° NE; gouge on both sides; contains pyrite and chalcopyrite in a quartz, calcite, and siderite(?) gangue. Explored by a 50-ft. tunnel.

Herreid and Rose, 1966 (GR 17), p. 17 -- On Granite Mtn. near Flagstaff.

Lucky Jim	Copper, Gold(?), Lead
Ketchikan	Craig (19.75, 9.5) approx.
MF-433, loc. 23	55°32'N, 132°42'W approx.

Summary: Quartz vein, probably in granite, contains pyrite, galena, malachite, azurite, and possibly gold. Little if any development.

Wright and Wright, 1908 (B 347), p. 165 -- Near summit of Granite Mtn. Quartz vein strikes N 25° W; dips 40° NE. Similar to other veins in area [which are auriferous quartz fissure veins in granite). Metallic minerals are pyrite, galena, malachite, and azurite.

Herreid and Rose, 1966 (GR 17), p. 17 -- On Granite Mtn. near Flagstaff.

Bufvers, 1967 (SR 1), p. 18 -- Has shown good values [in gold?]; ore minerals are pyrite, galena, malachite, and azurite. Discovered before 1905.

Lucky Nell (Mining Co.) — Copper, Gold, Lead, Silver, Zinc

Ketchikan district — Craig (18.4, 9.15)
MF-433, loc. 13 — 55°31'N, 132°49'W

Summary: Discovered in 1900, a little production in 1905, 1913-14, and probably a few other years. Nonproductive activity as recently as 1940's. Developed by nearly 1,000 ft. of adit levels, a raise and a winze. Quartz fissure vein about 4 ft. thick in diorite porphyry contains pyrite, chalcopyrite, galena, sphalerite, and values in gold and silver. A small shipment to smelter in 1914 returned $33 a ton after deducting shipping and smelter charges. Similar veins elsewhere on property not developed. Includes references to: Commander, Flora (& Nellie), Nellie, President, Red Jacket.

Brooks, 1902 (P 1); p. 92-93 -- Shear zones in diorite porphyry contain quartz and calcite veins carrying pyrite, chalcopyrite, and galena. Assays show gold values of $20-$50 a ton in gold. Developments are 2 tunnels 50 ft. and 30 ft. long.

Wright and Wright, 1905 (B 259), p. 66 -- Development in prospecting stage, 1904. In general area quartz fissure veins in a porphyry dike contain galena, pyrite, chalcopyrite, and gold.

Wright and Wright, 1906 (B 284), p. 42 -- Vein is 6 in. to 4 ft. wide; in altered porphyry dike. Followed for 500 ft. by 2 tunnels.

Wright, 1907 (B 314), p. 62 -- Idle, 1906.

Wright and Wright, 1908 (B 347), p. 162-163 -- Main ore body is a quartz vein and gouge along a shear plane in diorite porphyry; average thickness of 4 ft.; strikes N 70° E and dips 60° SE. Contains pyrite, chalcopyrite, galena, and sphalerite; high gold and silver values reported. Developments include 2 tunnels (total length 480 ft.), a shaft, and a winze. Extensions of vein on Red Jacket and Commander claims have been explored less extensively; assays show high gold content and a little silver.

Smith, 1914 (B 592), p. 79 -- A small lot of ore was shipped, 1913.

Chapin, 1919 (B 692), p. 88 -- Quartz fissure vein in porphyry strikes N 70° E and dips 65°-80° SE; carries pyrite, chalcopyrite, galena, sphalerite, and high values in gold and silver; averages about 4 ft. in width. Development, 1917.

Herbert and Race, 1964 (GC 1), p. 24 -- Pyrite, galena, sphalerite, and chalcopyrite in quartz lenses; sulfide-quartz ratio of 4 to 1. Gold in sulfides.

Herreid and Rose, 1966 (GR 17), p. 11 -- Precious metal-sulfide-quartz vein.
p. 16 -- Original claims staked in about 1900. Development reported, 1904, 1905, 1912, and 1913. 38 tons of ore shipped in 1905 and 1912. 5 tunnels with total length of 740 ft. driven on vein. Vein strikes N 68° E, dips 60° SE, is 1-4 ft. thick; sheared and slickensided, some gouge. Vein contains pyrite, galena, sphalerite, chalcopyrite, and gold in gangue of quartz with minor chlorite and calcite; sulfides form more than half of vein in places. Assays and shipment returns indicate values of $20-$50 a ton; may include values

Lucky Nell (Mining Co.) -- Continued

in copper, lead, and/or zinc [metal prices probably as of 1905 and 1913].

Berg and Cobb, 1967 (B 1246), p. 169-170 -- Several hundred feet of tunnels, a shaft, and a winze on a quartz vein said to be rich in sulfides and to contain considerable gold and silver. A little ore shipped in 1913 and possibly a few other years.

Bufvers, 1967 (SR 1), p. 12-14 -- Many historical and anecdotal data. Discovered in 1900. Shipment of 30 tons of ore in 1914 contained $46 per ton and netted $33 per ton after shipping and smelting charges. Almost 1,000 ft. of drifting on various levels, a raise, and a winze. Vein from 6 in. to 4 ft. wide. Samples taken in 1934 ran from $1.33 to $44.92 a ton. Sampling in 1935 gave encouraging results, but there was no mining. Another attempt to reopen the mine in 1940's was unsuccessful, probably because of access problems.

Mamie	Copper, Gold, Iron, Silver
Ketchikan district	Craig (23.65, 9.4)
MF-433, loc. 48	55°31'N, 132°17'W

Summary: Produced more than $1,000,000 worth of copper ore between 1905 and 1918. Mamie, Mount Andrew, and Stevenstown collectively produced more than 270,000 tons of copper ore that yielded more than 12,817,000 lbs. copper, 6,939 oz. gold, and 55,930 oz. silver; no iron was produced. In the area the lodes are mainly contorted tabular bodies of magnetite, chalcopyrite, pyrite, and calcite and siliceous gangue minerals formed by replacement of metamorphosed sedimentary layers intercalated in greenstone that was intruded by dioritic and more alkalic granitic rocks and mafic dikes; locally magnetite also replaced brecciated greenstone. Ore mined was in several large, irregular masses of chalcopyrite (now virtually mined out) along fringes of predominantly magnetite bodies. Area estimated to contain about 2,684,000 long tons of material containing about 50% iron; 80% is on Mount Andrew property and most of the rest at Mamie. All ore bodies within a few hundred feet of surface. Magnetic survey, diamond drilling, and other exploration indicates that there are no large undiscovered ore bodies in the area. Mamie mine consisted of 3 glory holes, 3 adits, and other interconnected underground workings. Includes references to Brown-Alaska Co. unless specifically to another property.

Wright and Wright, 1905 (B 259), p. 63 -- Property of Brown Alaska Co. developed by several hundred feet of underground workings; smelter has been built,1904. Country rock is Kasaan greenstone with interbedded marble, in some of which are beds of magnetite with some chalcopyrite. Chalcopyrite ore forms at least 7 irregular lenses as much as 150 ft. long and 40 ft. wide; 3.5%-4.5% copper with $1-$2 [a ton] in gold.

Wright and Wright, 1906 (B 284), p. 46-47 -- Considerable diamond drilling and underground work, 1905. Flat-lying lenticular masses 100-200 ft. long in bands of limestone and greenstone cut by felsite, andesite, and diabase dikes. Contact-metamorphic [term not used] deposits. Metallic minerals mainly magnetite and chalcopyrite; some pyrite.

Wright, 1907 (B 314), p. 67 -- Mining, 1906. Smelter at Hadley handled 90,000 tons of ore, mainly from Mamie and Stevenstown.

Wright and Paige, 1908 (B 345), p. 103-104 -- Same as Wright and Wright, 1908 (B 347), p. 112-114.

Wright and Wright, 1908 (B 347), p. 112-114 -- Developments, 1904 to October, 1907 (when they were suspended), include 5,000 ft. of underground workings and about the same amount of diamond drilling. Mining, 1905-07; ore went to Hadley smelter. Ore bodies are contact-metamorphic deposits in a zone 400 ft. wide between a syenite intrusive and limestone; bodies are limited by faults or assay limits; consist of chalcopyrite in magnetite-garnet-epidote rock. 9 ore bodies are 50-100 ft. long and 10-40 ft. wide.

Mamie -- Continued

Wright, 1909 (B 379), p. 78 -- Ownership consolidated with that of Stevenstown, 1908. Some development and probably production.
Knopf, 1910 (B 442), p. 142 -- Idle, 1909.
Brooks, 1915 (B 622), p. 42 -- Large-scale operations, 1914.
Wright, 1915 (P 87), p. 86 -- Contact-metamorphic deposit.
p. 88-89, 92 -- Data through 1907 same as in Wright and Wright, 1908 (B 347), p. 112-114. In 1908 Mamie, Stevenstown, and Hadley smelter were consolidated under one management, Mamie mine was pumped out, and for a few weeks operated; about 360 tons a day went through smelter. Closed since early November 1908 (to 1913).
Chapin, 1916 (B 642), p. 83-84 -- Considerable underground work and surface improvements, 1913-15. 30,000 tons of chalcopyrite-magnetite ore shipped to smelter at Anyox, B.C., 1914-15. Magnetite ore was low grade and sweetened with 4% copper ore from a porphyry dike.
Smith, 1917 (BMB 142), p. 30 -- Contact-metamorphic deposits between diorite and limestone; ore is chalcopyrite in gangue of magnetite, garnet, epidote, pyroxene, and hornblende. Development, 1915.
Smith, 1917 (BMB 153), p. 25-26 -- Mining, 1916.
Chapin, 1918 (B 662), p. 64 -- Fairly large-scale mining, 1916. Magnetic survey and diamond-drilling program also.
Chapin, 1919 (B 692), p. 85 -- Closed down in spring of 1917.
Martin, 1919 (B 692), p. 28 -- Closed down in spring of 1917.
Martin, 1920 (B 712), p. 28 -- Some ore shipped, 1918. Closed down before end of year.
Brooks, 1921 (B 714), p. 17 -- Example of contact copper deposit.
p. 19 -- Cost (including that of diamond drilling) per ton of ore mined in 1916-17 (20,115 tons) was $3.733.
Buddington and Chapin, 1929 (B 800), p. 316 -- Example of a contact deposit.
p. 369 -- Quotation from Brooks, 1921 (B 714).
Bain, 1946 (IC 7379), p. 32 -- Siliceous ore has been shipped.
Wright and Tolonen 1947 (RI 4129), p. 5 -- Production from Mount Andrew-Mamie area was about 270,000 tons of copper ore which yielded more than $124,000 in gold and $32,500 in silver.
Twenhofel, 1953 (C 252), p. 10 -- Mount Andrew-Mamie pyrometasomatic magnetite deposit estimated to contain about 3,500,000 tons of ore.
Carr and Dutton, 1959 (B 1082-C), p. 80 -- Magnetite-chalcopyrite replacement body at least 400 ft. long, 15-50 ft. thick, and known to a depth of 400 ft.; probably does not extend much deeper.
p. 102 -- Mount Andrew-Mamie contains 2.3 million tons of indicated and 0.91 million tons of inferred magnetite ore containing 50% iron.
Warner and others, 1961 (B 1090), p. 5 -- Produced over $1,000,000 in copper ore.
p. 32 -- Enough chalcopyrite in magnetite to form fairly high-grade copper ore.
p. 37 -- Coarse, bladed variety of hornblende forms large masses in and around ore bodies.
p. 54-80 -- Historical data from older reports summarized. Production from Mount Andrew-Mamie area, 1905-18 (not including that in 1914) was 270,726 tons of ore from which were recovered 12,817,375 lbs.

copper, 6,939.54 oz. gold, and 55,933 oz. silver; total value $2,593,480; more than half from Mamie. Rocks in Mount Andrew-Mamie area are chiefly greenstone and associated sedimentary rocks (including limestone and dolomite) on the NE border of a large stock of granodiorite and related rocks; cut by porphyry dikes ranging in composition from gabbro to alkalic dacite and by younger diabase dikes. Tactite developed, particularly near ore deposits. Magnetite makes up as much as 10% of some altered greenstone. Two systems of folds; one trends N 10° W and the other N 80° E. Four sets of faults, most of which dip steeply; on only one fault (strike about N 80° E) is any major (several hundred feet) displacement; displacements on others appear to be small. Some fault movement was pre-ore, some during ore deposition, and some post-ore. Rocks intensely fractured; joints seem to have random orientations. Ore deposits are pyrometasomatic magnetite bodies that replaced metasedimentary calcareous rocks and adjoining tactite; locally large chalcopyrite masses are along fringes of magnetite bodies (nearly all mined out). Pyrite and chalcopyrite in these bodies and disseminated in magnetite are the only metallic minerals in the deposits except for minor amounts of limonite and malachite at and very near surface. Gangue is tactite minerals; epidote commonest. Data on dip-needle survey. 3 iron-ore samples contained 53.40%-59.18% Fe, 0.26%-0.90% Cu, 1.69%-3.88% S, and 0.03%-0.07% Ti. Grade of copper ore mined from Mount Andrew-Mamie area ranged from 1.31% to 4.30%; average 2.37%. Iron reserves of area calculated at 2,684,000 long tons of indicated and inferred ore; 80% at Mount Andrew and most of the rest at Mamie.

p. 80-84 -- Historical data from Wright, 1915 (P 87), p. 89. Most of ore appears to be in a single contorted layer 15-50 (average 30) ft. thick and at least 500 ft. long; 4 other smaller lenticular masses. Remaining ore is nearly all high-grade massive magnetite containing finely disseminated pyrite and chalcopyrite which are also in bordering tactite. Average grade of ore mined was 1.81% Cu, 0.0204 oz. Au a ton, and 0.126 oz. Ag a ton. No indication of new, unexposed ore bodies from magnetic or other work.

Noel, 1966, p. 54 -- One of major copper producers of Kasaan Peninsula area.

p. 61-62 -- Data mainly from Warner and others, 1961 (B 1090).

Berg and Cobb, 1967 (B 1246), p. 165-167 -- Produced more than $1,000,000 worth of copper ore between 1905 and 1918. Mamie, Mount Andrew, and Stevenstown collectively produced more than 270,000 tons of copper ore containing minor amounts of gold and silver. At all those the lodes, mainly contorted tabular masses, are of contact-metamorphic origin and consist of magnetite, chalcopyrite, and pyrite that, with calcite and calc-silicate gangue minerals, replaced sedimentary layers in greenstone; locally magnetite also replaced brecciated greenstone. Ore bodies were several large, irregular masses of chalcopyrite (now almost entirely mined out) along the fringes of predominantly magnetite bodies. Mamie mine consisted of 3 glory holes, 3 adits, and other interconnected underground workings. Remaining mineralized material is chiefly massive

Mamie -- Continued

magnetite containing finely disseminated chalcopyrite and pyrite; material contains 53-59 percent iron, 0.26-0.90 percent copper, and 1.69-3.88 percent sulfur. Iron resources of Mount Andrew-Mamie area estimated to be about 2,684,000 long tons; about 80% at Mount Andrew and most of the rest at Mamie.

Bufvers, 1967 (SR 1), p. 6 -- Historical and anecdotal material.

Marble Heart — Lead

Ketchikan district — Craig (19.0, 6.0) approx.
MF-433, loc. 62 — 55°20'N, 132°41'W approx.

Summary: Small vein of galena in deformed crystalline limestone explored in about 1900 by a shallow shaft and a short tunnel. No data on possible precious metal content.

Brooks, 1902 (P 1), p. 93 -- Country rock is crystalline and semicrystalline limestone with some argillaceous layers. Shaft about 20 ft. deep and a short tunnel following a small vein of galena in intensively squeezed and metamorphosed limestone. [No data on possible silver content].

Condon, 1961 (B 1108-B), p. B8 -- Reference to above.

Berg and Cobb, 1967 (B 1246), p. 170 -- Galena vein in crystalline limestone explored by shallow shaft and short tunnel.

Marion	Copper, Lead
Ketchikan district	Craig (21.9, 2.8)
MF-433, loc. 82	55°09'N, 132°29'W

Summary: Quartz-calcite vein along a fault in schist contains small quantities of pyrite, chalcopyrite, and galena; no data on gold or silver content, if any. Opened by an adit 400 ft. long and a 50-ft. winze. No record of production. Includes references to: (Nutkwa Lagoon), Nutqua Gold Mining Co.

Chapin, 1916 (B 642), p. 90-91 -- Quartz vein trends N 25° W and dips 85° or more steeply SW; is about 6 ft. wide; carries chalcopyrite and a little galena. Followed for 400 ft. by an adit from which a winze was sunk 50 ft.; schist horse fills half of vein at mouth of adit.

Smith, 1933 (B 844-A), p. 16 -- Some development by Nutqua Gold Mining Co. reported, 1931; no details.

Twenhofel and others, 1949 (B 963-A), p. 19-21 -- Restaked in 1944. Adit driven about 400 ft. along a quartz vein that pinches and swells from nothing to 5 ft. thick (in general 1-2 ft. thick) along a fault in graywacke schist; in places the vein is made up of several quartz stringers separated by bands of schist. Contains as much as 15% calcite and a small percentage of sulfides (pyrite, chalcopyrite, and galena). No data on gold and silver content, if any. Vein strikes N 30° W and dips from 85° SW to nearly vertical.

Berg and Cobb, 1967 (B 1246), p. 172 -- Quartz-calcite vein with small quantities of pyrite, chalcopyrite, and galena was prospected by a 400-ft. adit and a 50-ft. winze.

Matilda	Gold(?)
Ketchikan district	Craig (26.0, 3.0) approx.
MF-433, loc. 94	55°09'N, 132°03'W approx.

Summary: Quartz vein in sheared mica schist contains pyrite and possibly gold.

Brooks, 1902 (P 1), p. 81 -- Quartz vein 3 ft. wide strikes about E and dips 60° S; in decomposed sheared mica schist. Quartz contains pyrite and is said to carry gold.

McCullough — Copper, Zinc

Ketchikan district — Craig (16.4, 17.25)
MF-433, loc. 3 — 55°59'N, 133°00'W

Summary: Breccia vein with average width of 10 ft. and probably at least half a mile long contains chalcopyrite and smaller amounts of pyrite, sphalerite, and secondary copper minerals in quartz-calcite gangue; many fragments of graywacke and argillite country rock. Developed by 61-ft. shaft and open cuts. 4-ton test shipment in early 1900's(?). Sporadic work from about 1905 to as recently as 1930, but no productive mining. Gold reported in one early reference, but not in more complete descriptions. Samples of vein contained 0.7%-3.3% copper. Includes references to Lake Bay.

Brooks, 1915 (B 622), p. 42 -- Small test shipments of copper ore, 1914; considerable underground work.

Chapin, 1916 (B 642), p. 88-89 -- Breccia lode of quartz surrounding angular pieces of black slate and argillite contains considerable chalcopyrite and pyrite. Country rock is black slate, argillite, and banded graywacke. Claims located in about 1905; 4-ton test shipment about then. In 1915 workings were not accessible. Some work during part of 1915 season.

Brooks and Capps, 1924 (B 755), p. 23 -- Development, 1922.

Buddington, 1926 (B 783), p. 41 -- Development in excess of assessment work, 1924.

Smith, 1926 (B 783), p. 22 -- Work continued, 1924.

Smith, 1930 (B 836), p. 16 -- 10-12 men doing underground development, 1930. Valuable mainly for copper, but also "subsidiary quantities" of gold.

Twenhofel and others, 1949 (B 963-A), p. 13-15 -- Quartz-breccia vein as much as 10 ft. thick strikes about N 45° W and is vertical. Contains pyrite and more abundant chalcopyrite. Country rock is banded argillite and graywacke, blocks of which are in vein and appear to have influenced deposition of ore minerals. Samples contained from 0.7% to 3.3% copper. Explored by a 21-ft. shaft and numerous open cuts.

Wedow and others, 1953 (C 252), p. 9, 11 -- Breccia vein 5-15 ft. wide and probably at least 1/2 mi. long cuts Ordovician graywacke and argillite. Minerals present are pyrite, chalcopyrite, sphalerite, secondary copper minerals, and iron oxides in quartz-carbonate gangue.

Houston and others, 1958 (B 1058-A), p. 24, 27 -- Copper deposit contains no more than 0.001% eU.

Herbert and Race, 1965 (GC 6), p. 62 -- Reference to several of above reports. Quartz-breccia vein contains pyrite and chalcopyrite, is about vertical, is about 10 ft. wide, and crops out over a distance of 350 ft. Explored by 60-ft. shaft and open cuts. Samples contained 0.7%-3.3% copper.

Berg and Cobb, 1967 (B 1246), p. 177 -- Staked in early 1900's on quartz-breccia vein that cuts graywacke and argillite and contains chalcopyrite and smaller amounts of pyrite, sphalerite, and secondary copper minerals. Explored by a shaft and several open cuts. Assays of 3 samples showed 0.7, 0.9, and 3.3 percent copper.

Melville	Gold(?)
Ketchikan district	Craig (26.0, 11.3) approx.
MF-433, loc. 116	55°37'N, 132°02'W approx.

Summary: A little gold was produced from a quartz vein that also carried some arsenopyrite. Vein in a fault that crossed slate and greenstone. All work in early 1900's.

Wright and Wright, 1908 (B 347), p. 155-156 -- [Quartz] vein in fault that crosses foliation of slate and greenstone country rock; strikes N 40° W [dip not given]. Arsenopyrite in vein and in slate wallrock, but practically absent in greenstone wallrock. A little ore was mined from a short tunnel and surface stripping and treated in an arrastre. [On basis of statement on mining, gold is assumed to be present.]

Berg and Cobb, 1967 (B 1246), p. 179 -- Was a little gold production.

Midnight Sun	Gold
Ketchikan district	Craig (26.25, 11.85) approx. 55°39'N, 132°01'W approx.

Summary: Free gold in pyrite in sheared quartz vein in greenstone schist. 15-ft. open cut excavated in early 1900's.

Wright and Wright, 1908 (B 347), p. 155 -- [Quartz] vein from 6 in. to 2 ft. thick in greenstone schist strikes N 80° W, dips 30° NE, and was sheared after being deposited. Vein contains fragments of schist and pyrite with particles of free gold. Exposed in 15-ft. open cut.

Miller	Copper
Ketchikan district	Craig (15.65, 1.1) approx.
MF-433, loc. 109	55°03'N, 133°06'W approx.

Summary: Open cuts exposed quartz-calcite veins that carry chalcopyrite and pyrrhotite. Country rock is limestone and siliceous schist.

Wright, 1909 (B 379), p. 83 -- Similar to Shellhouse claims, where there are several bodies of chalcopyrite-pyrrhotite ore in a quartz-calcite gangue in limestone and siliceous schist. Mineralized bodies exposed by surface cuts.

Berg and Cobb, 1967 (B 1246), p. 177 -- Quartz-calcite veins carry chalcopyrite and pyrrhotite.

Miller Bros.	Copper(?), Gold(?)
Ketchikan district	Craig (20.5, 4.3) approx.
MF-433, loc. 76	55°14'N, 132°37'W approx.

Summary: Low-grade copper and gold ore reported.

Brooks, 1902 (P 1), p. 107 -- Claim said to be north of Copper Bay. Rather large body of low-grade copper and gold ore reported.

Monday	Gold, Lead, Silver
Ketchikan district	Craig (20.25, 8.9)
MF-433, loc. 21	55°30'N, 132°35'W

Summary: Quartz vein in shear zone in slate contains galena, pyrite, and (reportedly) $5-$8 in gold and 15-40 oz. silver a ton. Exposed by open cuts; in one a sheared andesite dike forms one wall of vein. No work since 1901 has been reported. See also Stella.

Brooks, 1902 (P 1), p. 93 -- Open cuts expose quartz vein 4-14 in. thick in shear zone in slate; in one cut sheared andesite dike forms one wall of vein. Vein of vesuvianite is apparently younger than quartz vein, which contains galena and pyrite and, reportedly, $5-$8 in gold and 15-40 oz. silver a ton.

Herreid and Rose, 1966 (OR 17), p. 16 -- Reference to above.

Moonshine (Cholmondeley Sound) — Copper, Lead, Silver, Zinc

Ketchikan district — Craig (23.1, 3.8) approx.
MF-433, loc. 85 — 55°11'N, 132°23'W approx.

Summary: Replacement deposit in limestone and schist; vein varies from a gouge seam in schist to a body several feet wide in limestone; made up mainly of massive galena in a quartz-carbonate gangue; some pyrite, chalcopyrite, and sphalerite; high silver values reported. Staked in 1900 and developed intermittently until 1922; several tunnels, a shaft, and a raise that did not find ore. A little ore mined in 1907 and probably some other years. Includes references to: (Chomley), Knapp.

Brooks, 1902 (P 1), p. 88 -- E. A. Knapp reports galena-bearing veins in white crystalline limestone.

Wright, 1907 (B 314), p. 72 -- Claims located, 1906. Nearly vertical vein on shear zone obliquely crosses limestone-schist country rock in a northeasterly direction; 2-4 ft. thick. Ore is massive galena with pyrite, chalcopyrite, and sphalerite in a quartz and calcite gangue; fragments of brecciated country rock included in places. 2 tunnels being driven and a shaft sunk.

Wright, 1908 (B 345), p. 96-97 -- Galena being mined in small quantities, 1907. Fissure vein in limestone and schist; from a few inches to several feet wide where it has replaced limestone; in many places in schist is only a gouge seam. Ore in scattered masses. Developed by a 100-ft. shaft and a tunnel 200 ft. long being driven to connect with shaft.

Wright and Wright, 1908 (B 347), p. 187-188 -- Vein strikes N 65° W and is vertical. Many ounces of silver per ton of ore. Rest of data essentially the same as in above references.

Wright, 1909 (B 379), p. 83-84 -- Assessment work, 1908. Another body of galena ore found in tunnel extension.

Knopf, 1911 (B 480), p. 102 -- Some work, 1910.

Brooks, 1912 (B 520), p. 26 -- Assessment work, 1911.

Brooks, 1913 (B 542), p. 33-34 -- Development said to have been resumed, 1912.

Chapin, 1916 (B 642), p. 82 -- Some work in 1915.

Brooks, 1923 (B 739), p. 20 -- Some underground work, 1921.

Brooks and Capps, 1924 (B 755), p. 16 -- Reopened, 1922.

Moffit, 1927 (B 792), p. 30 -- Silver-lead prospect has attracted attention.

Buddington and Chapin, 1929 (B 800), p. 327 -- Galena is principal ore mineral in a replacement deposit.

p. 367-368 -- Silver-lead deposit. Reference to Wright and Wright, 1908 (B 347), p. 187.

Noel, 1966, p. 54 -- Minor quantities of silver, lead, and gold produced between 1900 and 1910. [Only mention of gold; may be in error, as other references are much more detailed.]

Berg and Cobb, 1967 (B 1246), p. 173 -- In marble and schist. 100-ft. shaft and 200-ft. tunnel explored a lode said to contain chalcopyrite, galena, and sphalerite and to carry considerable silver.

Moonshine (Cholmondeley Sound) -- Continued

Bufvers, 1967 (SR 1), p. 23 -- Staked around 1900. Development begun in 1906; mine closed in about 1922. Well-defined fissure vein in limestone and schist is from a few inches to several feet wide; contains mainly galena, siderite, and calcite with a little sphalerite and chalcopyrite. Vein is vertical and strikes N 65° W. Workings consist of several tunnels, a shaft, and a long raise that did not hit ore.

Moonshine (Dall I.)	Lead(?), Silver(?)
Ketchikan district	Craig (15.5, 1.85) approx.
MF-433, loc. 108	55°06'N, 133°07'W approx.

Summary: Prospecting reported to have found argentiferous galena. Not enough work done to determine size or grade.

Smith, 1914 (B 592), p. 92 -- Galena ore said to carry considerable silver. Has been little work, 1913.

Berg and Cobb, 1967 (B 1246), p. 177 -- Prospecting said to have disclosed argentiferous galena; has been too little work to determine size or grade.

Moonshine (Dolomi)	Copper, Gold(?)
Ketchikan district	Craig (26.0, 3.0) approx.
MF-433, loc. 94	55°09'N, 132°03'W approx.

Summary: Breccia vein of limestone and schist with quartz veins with disseminated chalcopyrite, tetrahedrite, and pyrite. A little gold has been recovered from Fortune, Moonshine, or both. See also Fortune.

Smith, 1914 (B 592), p. 81 -- Has been prospecting. Native gold in quartz veins in quartzite and in the quartzite itself near contact with limestone. Sulfides (mainly pyrite and tetrahedrite) in veins. A little gold has been recovered from Fortune, Moonshine, or both.

Chapin, 1916 (B 642), p. 81 -- Claim located on breccia lode or vein that strikes N 60° W and dips NE; blocks of limestone and schist country rock with a network of quartz veins carrying disseminated chalcopyrite and pyrite.

Morning Star — Copper, Gold(?), Iron

Ketchikan district — Craig (22.15, 10.05) approx.
MF-433, loc. 39 — 55°34'N, 132°26'W approx.

Summary: Mass of magnetite, pyrite, and chalcopyrite said to carry gold values. Shaft was sunk 20 ft. May have become part of Poorman property.

Brooks, 1902 (P 1), p. 100 -- Mass of magnetite with pyrite and chalcopyrite exposed at surface appears to be 30 or 40 ft. wide. Said to carry gold values. Explored by shaft 20 ft. deep.

Mountain Bell	Gold
Ketchikan district	Craig (19.0, 6.0)
MF-433, loc. 18	55°20'N, 132°41'W

Summary: Narrow quartz vein reported to carry good values in free gold.

Wright and Wright, 1908 (B 347), p. 162 -- Near Cascade. 3 claims were located on a narrow quartz vein reported to carry good values in free gold.

Mount Andrew — Cobalt, Copper, Gold, Iron, Silver

Ketchikan district — Craig (23.5, 9.35)
MF-433, loc. 47 — 55°31'N, 132°18'W

Summary: Regional data and material also applicable to Mamie summarized on Mamie sheets. Copper ore mined from chalcopyrite replacement bodies, 1906-17, with several interruptions. Principal unmined deposit is a contorted tabular mass of magnetite diluted by about 50% waste (dikes and tactite); within about 200 ft. of the surface. Weighted average of USBM analyses of samples from property showed 47.8% iron, 0.32% copper, and 0.011 oz. gold and 0.55 oz. silver per long ton; also as much as 0.05% cobalt and small amounts of zinc, nickel, chromium, and vanadium in some samples. Average return of ore mined was 3.09% copper and 0.0265 oz. gold and 0.363 oz. silver per ton. Mine consisted of 4 glory holes, 3 adits, and other underground working; aggregate length about 3,000 ft. Copper ore practically mined out. Iron resource estimated at about 2,147,000 tons of material containing 50% iron. Includes references to: Jim, North Star. See also Mamie.

Brooks, 1902 (P 1), p. 102-103 -- Country rock is Kasaan greenstone; one small belt of limestone. Ore bodies are magnetite (containing 0.02% P) and chalcopyrite and carry as much as $6 [about 0.3 oz.] gold a ton. Some boundaries of ore are sharp and along joints; others are gradational into country rock. Much epidote. Explored by several hundred feet of underground workings.

Wright and Wright, 1905 (B 259), p. 63 -- Deposits similar to those at Mamie. Tunnel has been driven 800 ft., but no work in 1904. Ore is mainly chalcopyrite and magnetite; 4-1/2% copper and $1-$3 [a ton] in gold.

Wright and Wright, 1906 (B 284), p. 47 -- 4 flat-lying magnetite masses with some copper and gold. Country rock limestone with greenstone and felsite. Developments were 2 long tunnels with raises to the surface, test pits, and open cuts.

Wright, 1907 (B 314), p. 67 -- Ore shipped to smelter at Crofton, B.C., 1906.

Wright and Paige, 1908 (B 345), p. 105-106 -- Preliminary to Wright and Wright, 1908 (B 347), p. 115-117.

Wright and Wright, 1908 (B 347), p. 115-117 -- 2,200 ft. of underground workings and glory holes. Ore shipments, Oct. 1906 to Oct. 1907, when operations were suspended. Six irregular chalcopyrite-magnetite ore bodies in garnet-epidote contact rock separated by barren contact rock and altered syenite porphyry dikes are 10-50 ft. wide, 40-80 ft. long, and 100 or more ft. deep. Post-ore faulting and introduction of felsite and diabase dikes. Elsewhere on property are large masses of magnetite with low copper contents; may have potential as iron ore.

Wright, 1909 (B 379), p. 78 -- Did not operate, 1908.

Brooks, 1910 (B 442), p. 38 -- Mining, 1909.

Mount Andrew -- Continued

Knopf, 1910 (B 442), p. 141-142 -- 50 tons a day mined, 1909. Much 2-1/2% Cu ore blocked out but only 4% Cu ore is mined
Brooks, 1911 (B 480), p. 76 -- Reference to Wright and Wright, 1908 (B 347), p. 115-117.
Knopf, 1911 (B 480), p. 100 -- Mining, 1910.
Brooks, 1912 (B 520), p. 26 -- Mining, 1911.
Brooks, 1913 (B 542), p. 33 -- Idle, 1912.
Brooks, 1915 (B 622), p. 42 -- Some work, 1914.
Wright, 1915 (P 87), p. 86 -- Contact deposit.
p. 88-89 -- Copper deposits associated with large masses of magnetite; in contact zone between a diorite intrusive mass and a narrow belt of limestone. Low-grade copper ore with $1 to $2 a ton in gold.
p. 92-94 -- Same data as in Wright and Wright, 1908 (B 347), p. 115-117, with added report on development from 1909 to 1911; production, 1910-11.
Chapin, 1916 (B 642), p. 85 -- Mining and prospecting, 1915.
Smith, 1917 (BMB 142), p. 30 -- Chalcopyrite associated with magnetite in altered limestone. Data on workings as of 1915.
Smith, 1917 (BMB 153), p. 26-27 -- Chalcopyrite-magnetite lenses in altered zone between limestone and granodiorite. Data on workings and surface improvements.
Chapin, 1918 (B 662), p. 64-65 -- Mining, 1916.
Martin, 1919 (B 692), p. 28 -- Mining, 1917.
Brooks, 1921 (B 714), p. 17 -- Example of contact copper deposit.
p. 41 -- Reference to Brooks, 1902 (P 1), p. 102.
Buddington and Chapin, 1929 (B 800), p. 316 -- Example of a contact deposit.
p. 326, 369 -- Quotations from Brooks, 1921 (B 714).
Smith, 1934 (B 864-A), p. 16-17 -- Short exploratory raise driven, 1933.
Bain, 1946 (IC 7379), p. 32 -- Siliceous copper ore has been shipped.
p. 44-46 -- Beneficiation of magnetite-chalcopyrite ore is technically feasible, but probably not economic. Estimated reserve is 2,009,000 tons of material containing 44% Fe and 0.35% Cu.
Wright and Tolonen, 1947 (RI 4129) -- Intermittent production from 1905 to right after end of World War I; accessible high-grade copper deposits exhausted and copper market collapsed. Production from Mount Andrew-Mamie area amounted to about 270,000 tons of copper ore which yielded more than $124,000 in gold and $32,500 in silver. Property consists of 13 patented claims. Country rock is greenstone with interbedded recrystallized limestone and metamorphosed sedimentary rocks intruded by granitic rocks. Ore bodies are contact metamorphic in origin; consist of irregular lenses. Magnetite in concentrations from sparsely disseminated particles to massive bodies, usually accompanied by chalcopyrite and pyrite. In places enough chalcopyrite to constitute copper ore, most of which was mined. Ore zone covers area roughly 1,000 ft. by 550 ft.; individual lenses are 3-100 ft. wide and 50-400 ft. long. Details of USBM trenching, diamond drilling, and sampling program. Weighted average of analyses indicate 47.8% Fe, 0.32% Cu, and 0.011 oz. Au and 0.55 oz. Ag per long ton. As much as 0.05% Cu and small amounts of Zn, Ni, Cr, and U in some samples. Mine developed by about 4,000 ft. of workings. Beneficiation tests show that a high-grade iron concentrate can be obtained.

Mount Andrew -- Continued

Twenhofel, 1953 (C 252), p. 10 -- Mount Andrew-Mamie pyrometasomatic magnetite deposit estimated to contain about 3,500,000 tons of ore.

Carr and Dutton, 1959 (B 1082-C), p. 80 -- Magnetite replacement ore body (about half interlayered rock) is 600 ft. long, 550 ft. wide, and extends to a depth of 100-150 ft.

p. 102 -- Mount Andrew-Mamie contains 2.3 million tons of indicated and 0.91 million tons of inferred magnetite ore containing 50% iron.

Warner and others, 1961 (B 1090), p. 31-32 -- Magnetite body adjacent to stocklike body of late granodiorite and related rocks. Chalcopyrite in sufficient quantities to form fairly high-grade copper ore in some places.

p. 37 -- Coarse, bladed variety of hornblende forms large masses in and around ore bodies.

p. 51 -- More than 85% of the 4 million tons of high-grade iron ore on Kasaan Peninsula are at Mount Andrew and Poorman.

p. 54-80 -- Most data summarized on Mamie sheets. 7 iron-ore samples contained 41.92%-62.00% Fe, 0.04%-0.98% Cu, 0.01%-1.50% S, and 0.04%-0.11% Ti.

p. 84-93 -- First prospecting, 1898. Intermittent mining of copper ore, 1906-18; significant production. 4 glory holes, 3 adits, several winzes, and a sublevel; aggregate length about 3,000 ft. Most magnetite in "compound ore body," a contorted body about 125 ft. thick in a syncline 600 ft. long and 550 ft. wide; bottom of syncline about 200 ft. below surface; tongues of magnetite extend beyond syncline. Similar layers as much as 35 ft. thick. Ore bodies interfinger with tactite and are cut by dikes; about half of bodies are waste; very little copper ore. Also are several small magnetite bodies (mostly not mined) exposed in workings of copper mine. Explored by glory hole, short adit, trenches, diamond-drill holes, and magnetic survey. 6 claims in eastern part of property contain smaller magnetite bodies, some with chalcopyrite, small tonnages of which have been mined. Average returns on ore mined from property between 1906 and 1917 were 3.09% Cu and 0.0265 oz. Au and 0.363 oz. Ag per ton; remaining magnetite ore undoubtedly much leaner in Cu, Au, and Ag.

Noel, 1966, p. 54 -- One of major producing mines of Kasaan Peninsula area.

p. 61-62 -- Data mainly from Warner and others, 1961 (B 1090).

Berg and Cobb, 1967 (B 1246), p. 166-167 -- Data also applicable to Mamie summarized on Mamie sheets. Production much less than that from Mamie. Mineralized rock remaining on property of interest for iron content; USBM samples averaged 47.8%; analyses also indicated 0.32% copper and 0.71% sulfur, 80% of iron ore resources of Mount Andrew-Mamie area (2,684,000 long tons) on Mt. Andrew property, mainly in a body south of mine workings.

Bufvers, 1967 (SR 1), p. 5-6 -- Mainly historical and anecdotal material. [Dates of mining do not agree with those from other sources.]

Nancy	Copper
Ketchikan district	Craig (18.5, 6.25)
MF-433, loc. 60	55°21'N, 132°48'W

Summary: Quartz stringers in silicified shear zone 25 ft. wide in greenstone carry chalcopyrite and pyrite. Little development.

Chapin, 1916 (B 642), p. 93 -- Country rock is greenstone with interbedded argillite and conglomerate. Shear zone 25 ft. wide is composed of silicified greenstone with pyrite and chalcopyrite; ore zones separated by horses and barren places. Some quartz stringers carry chalcopyrite and pyrite. Exposed by shallow surface workings. At one place a quartzose lode 6 ft. thick strikes N 70° E and dips 45° NW.

Condon, 1961 (B 1108-B), p. B35 -- Copper deposit.

Berg and Cobb, 1967 (B 1246), p. 170 -- 25-ft. silicified shear zone in greenstone contains pyrite and chalcopyrite; size and grade of deposit not known.

Navaho — Copper, Gold

Ketchikan district — Craig (25.2, 2.4) approx.
MF-433, loc. 101 — 55°07'N, 132°10'W approx.

Summary: Quartz vein in silicified porphyritic diorite (Brooks) or chlorite schist (Wright and Wright) is irregular in width and direction; contains free gold, pyrite, and a little chalcopyrite. Samples said to have assayed as much as $40 [about 1.94 oz.] gold a ton. Tunnel driven about 80 ft. in about 1900. Includes reference to Hope (Moira Sound).

Brooks, 1902 (P 1), p. 78 -- At Hope claim country rock is silicified porphyritic diorite. Tunnel driven 20 ft. on quartz vein that pinches and swells to width of 2 ft. Vein contains free gold, pyrite, and a little chalcopyrite. Assay of a sample from near the surface showed $40 a ton in gold. Small exposure of granite 12 ft. or more wide is 200 ft. above tunnel; said to carry as much as $38 a ton in gold.

Wright and Wright, 1908 (B 347), p. 176-177 -- Pyritiferous quartz vein on Hope claim follows "slipping planes" in chlorite schist; irregular in width and direction. Tunnel about 80 ft. long. Nearby a large granite mass intruded chlorite schist. Little work since 1901.

Smith, 1914 (B 592), p. 82 -- Prospecting, but no important new discoveries, 1913.

Berg and Cobb, 1967 (B 1246), p. 175 -- Navaho and Westlake claims staked in about 1900 on quartz veins said to contain as much as $60 a ton in gold and various sulfides.

New Era	Gold(?)
Ketchikan district	Craig (26.2, 2.9) approx. 55°09'N, 132°03'W approx.

Summary: Pyrite-bearing quartz vein 30 ft. wide is crossed by an adit. No data on possible gold content.

Chapin, 1916 (B 642), p. 81 -- 30-ft. quartz vein carrying disseminated pyrite strikes N 30° W and is about vertical. An adit extends across the vein. On SW shore of James Lake.

Niblack (Copper Co.)	Copper, Gold, Lead, Silver, Zinc
Ketchikan district	Craig (25.3, 1.6)
MF-433, loc. 104	55°04'N, 132°09'W

Summary: Operated 1902-09. Production (based on incomplete records) was at least 1,400,000 lbs. copper, 1,100 oz. gold, and 15,000 oz. silver. Mine consisted of a 300-ft. shaft and about a mile of underground workings. Ore bodies were lenticular replacement masses of chalcopyrite and pyrite with smaller amounts of sphalerite, galena, and hematite and $1.50-$2.50 a ton in gold and silver. Country rock is schistose greenstone and some quartz-sericite rock. Ore bodies fault- and fold-controlled. Includes references to: Copper Chief, Judge.

Brooks, 1902 (P 1), p. 77 -- Greenstone schist mineralized with chalcopyrite for a width of 20 or more feet. Assays said to run as high as $42 in copper and gold ($7 or $8 in gold). Shaft 60 ft. deep near beach and crosscut nearby.

Wright and Wright, 1905 (B 259), p. 62-63 -- Massive chalcopyrite and pyrite in lenticular bodies as much as 100 ft. wide and several hundred feet long and deep in a matrix of altered greenstone appear to fill shear zones. Ore is said to contain 5% copper and $1.50-$2.00 [a ton] in gold. Development in 1904 is inclined shaft 180 ft. deep and 660 ft. of drifts and crosscuts on 3 levels.

Wright and Wright, 1906 (B 284), p. 50 -- Major copper producer in district in 1905 [amount of production not stated]. Ore bodies are fold- and fault-controlled irregular masses of chalcopyrite with much pyrite and small values in gold and silver. Nearly 1,000 ft. of underground workings and extensive surface improvements.

Wright, 1907 (B 314), p. 70 -- Considerable production, 1906. Ore is mainly chalcopyrite with considerable pyrite and small values in gold and silver; in mineralized parts of schist bands. Some ore bodies outlined by intersecting fault planes; one follows a diabase dike.

Wright, 1908 (B 345), p. 95-96 -- Mine operated, 1907. Underground workings about 5,500 ft. 3 large ore bodies and smaller veins and masses have been opened. One body is 200 ft. long, 20 ft. wide, and 100 ft. deep; developed by 3 levels at depths of 50 and 100 ft. A similar but smaller body is exposed on 150-ft. level. The third is 15 ft. wide and exposed for 90 ft. on 225-ft. level. More discoveries reported on 300-ft. level.

Wright and Wright, 1908 (B 347), p. 129-131 -- Ore minerals are chalcopyrite and pyrite with small amounts of sphalerite and hematite and some galena; quartz and calcite gangue. Ore contains $1.50-$2.50 a ton in gold and silver and 1%-2% zinc. Other data essentially as in above references.

Wright, 1909 (B 379), p. 82 -- Mining, 1908. Several shipments to Tacoma smelter.

Knopf, 1910 (B 442), p. 143 -- Idle because of litigation, 1909. Machinery sold and removed.

Niblack (Copper Co.) -- Continued

Smith, 1914 (B 592), p. 82 -- Idle, 1913; rumors that mine would be reopened.
Chapin, 1916 (B 642), p. 90 -- No mining, 1915.
Twenhofel and others, 1949 (B 963-A), p. 8 -- Ore bodies similar to pyritized zones at Dama, only smaller and considerably richer in copper.
Kaufman, 1958 (IC 7844), p. 11 -- Copper-bearing deposit.
Herreid, 1964 (GR 5), p. 1 -- One of many small copper mines that operated early in century.

p. 6-9 -- Only mineralized material visible in 1963 was a small limonite-stained outcrop, a chip sample across 7 feet of which contained 0.02 oz. Au and 0.3 oz. Ag a ton, 1.97% Cu, no Pb, and 1.5% Zn. Replacement of greenstone schist on nose of a plunging fold. On dump magnetite, some cut by chalcopyrite-calcite veinlets, is common. Country rock on dump is mainly greenstone; some quartz-sericite rock. Deposit similar to description of stratabound [term not used] copper deposits of Huelva district, Spain.

Noel, 1966, p. 63 -- Data from Herreid, 1964 (GR 5).
Berg and Cobb, 1967 (B 1246), p. 174 -- Operated 1902-09. Production (estimated on the basis of incomplete records) was at least 1,400,000 lbs. copper, 1,100 oz. gold, and 15,000 oz. silver. Mine consisted of a 300-ft. shaft and about a mile of underground workings. Ore bodies were replacement deposits in schistose greenstone and consisted of masses of chalcopyrite and pyrite containing small amounts of sphalerite, galena, and hematite and $1.50-$2.50 a ton in gold and silver.

(North Pole Hill) Copper, Gold

Ketchikan district
MF-433, loc. 27

Craig (20.5, 11.45)
55°38'N, 132°36'W

Summary: Bornite in pyroxenite or gabbro of same body as at Salt Chuck mine. Also pyritiferous quartz veins carrying about 0.2 oz. gold a ton. Surface excavations only.

Sainsbury, 1961 (B 1058-H), p. 354-355 -- As a result of magnetic and geochemical prospecting a prospector dug pits and trenches and found bornite in pyroxenite or gabbro of the pluton that is host to the Salt Chuck ore body. Pyritiferous quartz veins 6-18 in. wide contain about $7 [about 0.2 oz.] gold a ton.

(Noyes I.) Copper, Molybdenum, Nickel

Ketchikan district Craig (10.15, 9.3)
MF-433, loc. 4 55°32'N, 133°39'W

Summary: Quartz veins, probably at contact between a granitic pluton and bedded rocks, contain chalcopyrite and pyrrhotite. Analysis of pyrrhotite showed 0.1%-0.2% nickel, a trace of cobalt, and no gold or platinum metals. Molybdenite in schist on island; no other data on occurrence. Includes reference to Brown & Metz.

Wright and Wright, 1908 (B 347), p. 80 -- Chalcopyrite and pyrrhotite at granite contact [with what not stated] on north end of island; not developed.

p. 87 -- Analysis of sample of pyrrhotite ore showed 0.1%-0.2% Ni, trace of Co, and no Pt or Au.

Buddington and Chapin, 1929 (B 800), p. 329 -- Molybdenite in schist.

Smith, 1942 (B 926-C), p. 167-168 -- Data from above reports.

Condon, 1961 (B 1108-B), p. B35-B36 -- Minor molybdenite occurrence.

Berg and Cobb, 1967 (B 1246), p. 178 -- Quartz veins, probably at contact between a pluton and bedded rocks, contain pyrite and chalcopyrite and assay 0.1%-0.2% nickel. Molybdenite also reported on island; nothing known about mode of occurrence.

O.K.

Copper, Gold(?), Lead, Zinc

Ketchikan district
MF-433, loc. 99

Craig (26.1, 3.95) approx.
55°12'N, 132°04'W approx.

Summary: Quartz vein 3-4 ft. thick along contact between schist and limestone contains chalcopyrite, pyrite, sphalerite, galena, and gold(?).

Wright and Wright, 1908 (B 347), p. 168 -- Quartz vein 3-4 ft. thick and exposed for a length of 100 ft. strikes N 75° W [dip not given]; follows contact between schist and limestone. Vein contains chalcopyrite, pyrite, sphalerite, and small amounts of galena; reported to carry gold. Practically no work has been done.

Oregon (Kitkun Bay)	Copper, Gold, Silver, Zinc
Ketchikan district	Craig (25.3, 3.4) approx.
MP-433, loc. 91	55°10'N, 132°09'W approx.

Summary: Quartz vein that crosscuts chlorite schist contains pyrite, chalcopyrite, sphalerite, and small amounts of gold and silver. See also Washington.

Brooks, 1902 (P 1), p. 85 -- Maggie May claim [later restaked as Oregon and Washington] is on a vein of pyritiferous vitreous quartz that strikes N 30° E and dips 75° NW along contact between crystalline limestone footwall and chloritic schist hanging wall. Assay said to have given $4.80 a ton [in gold?]. [Probably on Washington claim.].

Wright and Wright, 1908 (B 347), p. 168-169. Vertical vein 3 ft. wide strikes N 30° E and crosscuts chlorite schist country rock. Contains pyrite, chalcopyrite, sphalerite, and small values in gold and silver.

(Palmer Cove)	Copper, Gold
Ketchikan district	Craig (22.7, 11.25) approx. 55°38'N, 132°22'W approx.

Summary: Small shipments of hand-picked copper ore with good gold values said to have been made in early 1900's. Vein 3 ft. wide; cut off at one end by a fault. May be the same as Tolstoi or Wallace.

Bufvers, 1967 (SR 1), p. 2 -- Vein 3 ft. wide found in a gulch and stripped, probably soon after 1900; vein cut off on one end by a fault. Vein said to carry good gold values as well as copper. One or two small shipments of hand-sorted ore.

p. 9 -- Discovered by de Nomie and(?) Bradford.

Paris	Copper, Gold.
Ketchikan district	Craig (20.75, 4.0)
MF-433, loc. 79	55°13'N, 132°36'W

Summary: Tunnel driven 115 ft. on foot-wide quartz vein in quartzite. Vein contains low values in copper and gold.

Wright and Wright, 1908 (B 347), p. 107 -- Tunnel driven 115 ft. on a NE-striking quartz vein a foot wide in banded quartzite. Vein contains low values in copper and gold.

Wright, 1915 (P 87), p. 65 -- Same as above.

Park View	Copper, Gold(?)
Ketchikan district MF-433, loc. 98	Craig (25.95, 4.0) approx. 55°12'N, 132°05'W

Summary: 5-ft. mineralized zone in schist contains quartz and calcite and disseminated chalcopyrite and pyrite; gold probably present. Average values low. Little development.

Wright and Wright, 1908 (B 347), p. 168 -- Mineralized belt 5 ft. thick is parallel to enclosing schist and strikes N 75° W; includes kidneys and stringers of quartz and calcite. Chalcopyrite and pyrite are finely disseminated in the veinlets and schist; average [gold?] values are low. [As this claim is described in a section on gold mines, gold is probably present.] Open cut and pit 8 ft. deep are only development.

(Paul Young Cr.) Copper

Ketchikan district Craig (20.5, 10.95)
MF-433, loc. 26 55°37'N, 132°36'W

Summary: Pyrite and chalcopyrite in quartz, calcite, and sulfide veins and disseminated in faulted and jointed argillite. Little exploration.

Sainsbury, 1961 (B 1058-H), p. 354 -- Pyrite and chalcopyrite in quartz and calcite veins, sulfide veinlets, and disseminated in faulted and jointed argillite. Near old Venus prospect, but not geologically similar to it. Development consists of a few old pits.

Peacock (W. of Mt. Andrew) — Copper, Molybdenum(?)

Ketchikan district — Craig (23.3, 9.4) approx.
MF-433, loc. 44 — 55°31'N, 132°30'W approx.

Summary: Garnet-epidote rock contains magnetite and a little chalcopyrite. Opened by 2 short tunnels driven in early 1900's. Molybdenite reported in an early report, but not in later ones.

Wright and Wright, 1906 (B 284), p. 47 -- Peacock and Tacoma claims are on irregular and sporadic contact deposits; chalcopyrite, magnetite, and small amounts of molybdenite in gangue of garnet and epidote. On Peacock claim 2 short prospect tunnels were driven near shore. In 1905 considerable ore had been mined from Peacock or Tacoma or both and was awaiting shipment.

Wright and Paige, 1908 (B 345), p. 113-114 -- Same as Wright and Wright, 1908 (B 347), p. 121.

Wright and Wright, 1908 (B 347), p. 121 -- Peacock claims adjoin Tacoma claim. 2 tunnels (45 ft. long and 30 ft. long) expose garnet-epidote rock containing magnetite and a little chalcopyrite. Felsite and basalt dikes; mineralized rock faulted. Development not sufficient to disclose minable ore bodies.

Wright, 1915 (P 87), p. 97 -- Same as Wright and Wright, 1908 (B 347), p. 121.

Poorman — Copper, Gold, Iron, Silver

Ketchikan district — Craig (22.15, 10.05)
MF-433, loc. 39 — 55°34'N, 132°26'W

Summary: Deposit is a mass of magnetite that replaced and cemented greenstone breccia in a fault zone; 1,500 ft. long, 85 ft. wide (average), and probably about 200 ft. deep (may be more). Resource estimated to be 900,000 tons of measured and indicated ore and 450,000 tons of inferred ore. About 10% of body is waste (dikes and unreplaced greenstone); less than 10% pyrite and chalcopyrite. Average content of ore is 52.4% iron, 0.25% copper, 3.72% sulfur, 0.032 oz. gold and 0.071 oz. silver a long ton, and small amounts of titanium and phosphorus. Some of material along margins contains less magnetite than the rest of the body; might be minable as copper ore if the main body were being mined. In early 1900's was explored as a copper deposit. More recent interest has been for iron content. Exploration has been by several shafts and adits, trenches, diamond-drill holes, and a magnetic survey.

Brooks, 1902 (P 1), p. 100-101 -- Jointed greenstone cut by diabase dike which forms footwall of ore body. Deposit is mass of mineralized greenstone carrying copper, gold, calcite, fluorite, and quartz. Considerable gold values. Developments are 15-ft. tunnel and some open cuts.

Wright and Wright, 1906 (B 284), p. 48 -- Extensive magnetite body with isolated pockets of chalcopyrite. Explored by 84-ft. shaft and several tunnels.

Wright, 1907 (B 314), p. 68 -- Assessment work only, 1906. Tied up in litigation.

Wright and Paige, 1908 (B 345), p. 108-109 -- Same as Wright and Wright, 1908 (B 347), p. 118.

Wright and Wright, 1908 (B 347), p. 118 -- Masses of magnetite (possible iron ore) contain pockets and narrow veinlets of chalcopyrite and pyrite; calcite and hornblende associated with the magnetite; in garnet-epidote contact rock. Minor faults and crosscutting diabase and felsite dikes. Developed by a 90-ft. tunnel, a 30-ft. shaft, a 60-ft. winze, and several short shafts and tunnels and open cuts. Last 20 ft. of 90-ft. tunnel in red syenite.

Wright, 1909 (B 379), p. 79 -- Assessment work, 1908.

Wright, 1915 (P 87), p. 95-97 -- Same as Wright and Wright, 1908 (B 347), p. 118.

Chapin, 1916 (B 642), p. 86 -- Of interest as possible iron ore. Magnetite bodies (with a small copper content); several adits and trenches are in magnetite for distances of 40-150 ft.

Smith, 1917 (BMB 153), p. 29 -- B. L. Thane Exploration Co. had option on property, 1916, and did a little development

Brooks, 1921 (B 714), p. 17 -- Example of contact copper deposit.

Buddington and Chapin, 1929 (B 800), p. 316 -- Example of a contact deposit. p. 319 -- Quotation from Brooks, 1921 (B 714).

Poorman -- Continued

Bain, 1946 (IC 7379), p. 44-46 -- Beneficiation of magnetite ore is technically feasible, but probably not economic. Reserve is estimated at 1,394,000 tons of material containing 52.4% Fe, 0.25% Cu, 3.72% S, and 0.03% phos. [P_2O_5?].

Holt and Sanford, 1946 (RI 3956) -- Property located in 1903. Considerable generally fruitless development trying to make a copper mine in early 1900's. In 1946 property consisted of 3 unpatented claims. Deposit has been traced for 1,520 ft. along strike; dip-needle surveys suggest that it continues 50-100 ft. along strike; dip-needle surveys suggest that it continues 50-100 ft. farther south and 10-15 ft. farther north beneath alluvium; maximum surface width of 150 ft. Country rock is greenstone with lenses of marble. Magnetite deposit in breccia zone; footwall dips average of 60° W; hanging wall dips average of 80° W. Deposit mainly magnetite; chalcopyrite, particularly near margins of body, along cracks and seams; pyrite disseminated throughout; sulfides make up about 7% of body. Waste (mainly syenite, andesite, and diabase dikes) make up about 3.1% (by weight) or 4.5% (by volume) of deposit. Details of USBM diamond-drilling and sampling programs. Adjusted weighted average of samples is 52.4% Fe, 0.25% Cu, 12.10% insoluble and 0.032 oz. gold and 0.071 oz. silver per long ton. Development consists of 19 trenches, 3 adits (total length 225 ft.), and 4 shafts (total length 105 ft.). Beneficiation tests produced a magnetic concentrate containing 66.8% Fe; 95.3% of Fe in feed.

Wells and others, 1957 (RI 5312), p. 5-6 -- Sample for testing consisted of magnetite and small amounts of pyrite, chalcopyrite, calcite, altered amphibole and clinopyroxene, chlorite, quartz, altered feldspar, epidote, and limonite; traces of malachite and apatite. Assay of heads was 55.2% Fe, 0.32% Cu, 3.86% S, 0.03% P, 3.2% CaO, 1.3% MgO, 9.6% SiO_2, and 0.02 oz. Au and 0.03 oz. Ag per ton.

Carr and Dutton, 1959 (B 1082-C), p. 80 -- Replacement mass along fracture zone is 1,500 ft. long, 10-150 ft. wide, and estimated to extend to a depth of at least 200 ft.

p. 102 -- Reserves are 0.9 million tons of measured and indicated ore and 0.45 million tons of inferred ore containing 52% iron.

Warner and others, 1961 (B 1090), p. 5 -- Little, if any, production.

p. 31-32 -- Magnetite ore contains laths and needles of pyrite that partly replaced gangue material. Some magnetite may be pseudomorphous after specular hematite.

p. 45 -- Iron deposit is in fault zone that cuts a layer of greenstone between 2 layers of limestone.

p. 48 -- Altered garnet inclusions; other minerals in tactite probably were replaced.

p. 50-51 -- Magnetite replaced finely brecciated greenstone in a large fault zone. Iron-ore reserves exceed a million tons.

p. 96-102 -- Body of magnetite that replaced and cemented finely brecciated greenstone is about 1,500 ft. long, an average of 85 ft. wide at the surface, and appears to taper downward; if attitudes of walls were constant, deposit would taper out at a depth of about 200 feet. About 10% of body is waste (dikes and unreplaced greenstone); ore contains averages of 52.4% iron, 0.25% copper, and 0.032 oz. gold

Poorman -- Continued

and 0.071 oz. silver a long ton; also 0.04% titanium, 0.03% phosphorus, and 3.72% sulfur. Pyrite and chalcopyrite make up less than 10% of the ore; precious metals are with sulfides, most of which were deposited after magnetite. Some marginal material is low in magnetite; sulfide content the same or slightly more than in magnetite ore; some might be minable as copper ore if the magnetite were mined. Explored by 4 shafts from 10 to 60 ft. deep, 3 adits, and many trenches and 13 diamond-drill holes, and a magnetic survey. Has been no production.

Noel, 1966, p. 62 -- Data mainly from Warner and others, 1961 (B 1090).

Berg and Cobb, 1967 (B 1246), p. 166-167 -- Explored in early 1900's by several shafts and adits,by USGS and USBM during World War II, and most recently by private interests. Originally prospected for copper; of current interest because of magnetite-rich lode 1,500 ft. long, 85 ft. wide, and 200 ft. deep. Pyrite and subordinate chalcopyrite make up less than 10% of lode. Data on composition of ore same as in Warner and others, 1961 (B 1090), p. 102.

Bufvers, 1967 (SR 1), p. 3, 10 -- Historical and anecdotal material.

(Port San Antonio) — Gold(?), Lead, Zinc

Ketchikan district — Craig (10.6, 6.25)
MF-433, loc. 7 — 55°21'N, 133°35'W

Summary: Stockwork of quartz veinlets in argillite exposed by open cuts. Veinlets contain sphalerite, galena, and pyrite. High gold values reported.

Wright and Wright, 1908 (B 347), p. 182 -- Quartz veinlets in argillaceous schist carry galena, sphalerite, and pyrite; exposed by open cuts; said to carry high values [in gold?]. [In section on gold mines, so gold probably is present.]

Twenhofel and others, 1946 (B 947-B), p. 35 -- Sphalerite-bearing quartz vein.

Berg and Cobb, 1967 (B 1246), p. 178 -- Stockwork of metalliferous quartz veinlets in argillite explored by open cuts; contains sphalerite, galena, pyrite, and (reportedly) considerable gold.

Puyallup — Copper, Gold, Lead, Silver, Zinc

Ketchikan district — Craig (19.5, 8.9)
MF-433, loc. 20 — 55°30'N, 132°42'W

Summary: Country rock variously reported as greenstone, diorite porphyry, altered slate, and other metasedimentary rocks. Quartz vein from a few inches to several feet (average probably less than a foot) thick follows hanging wall of a thin porphyritic dike; contains free gold, pyrite, galena, sphalerite, chalcopyrite, bornite, and (reportedly) tellurides; gold assays as high as about 53.2 oz. per ton reported. Mine consisted of several adits and drifts, at least one shaft, open cuts, and stopes over a vertical distance of at least 150 or 200 ft. Intermittent mining from 1901 to at least as recently as 1940. Unknown, but considerable, production; less than from Dawson mine. Includes references to Ready Bullion.

Brooks, 1902 (P 1), p. 90 -- Fissure vein 4 in. to 2 ft. thick has been traced along strike (N 30° W, dip 20°-40° NW) for 1,000 to 1,500 ft. in greenstone; 2 generations of quartz. Some of greenstone wallrock is mineralized. Ore is pyrite, free gold, telluride, chalcopyrite, and bornite in quartz and minor calcite gangue. Vein very rich; best assays show 3 oz. silver and $1,100 [about 53.2 oz.] gold per ton; poorest assays show $30-$50 [about 1.45-2.42 oz.] gold per ton. Little free gold except in oxidized zone. Developed by 2 shafts, a tunnel, short crosscuts, and open cuts. 14 tons of ore shipped; returned $159 a ton.

Wright and Wright, 1905 (B 259), p. 66 -- Quartz-filled fissure 4 in. to 2 ft. wide cutting diorite porphyry. Developed by tunnels 1,135 and 220 ft. long. Mill on property; 85% of gold is free milling.

Wright and Wright, 1906 (B 284), p. 42 -- Free-milling gold quartz. Mining, 1905.

Wright and Wright, 1908 (B 347), p. 159-160 -- Fissure veins along walls of a porphyry dike in altered slate. Mining complicated by faulting. Principal vein about 6 in. thick. Ore is free milling; 85% of total value in free gold. Extensive workings, but production has been small.

Smith, 1914 (B 592), p. 79 -- No work for several years, 1913.

Brooks, 1915 (B 622), p. 42 -- Some development on Ready Bullion, 1914.

Chapin, 1916 (B 642), p. 79-80 -- Quartz fissure vein bordered by gouge in altered tuffs, slate, and quartzite; average width 6-7 in.; said to be 3 ft. wide in places. Mining, 1915. Workings include 1,684 ft. of adit, above which stopes have been taken out for vertical distances of from 150 to 200 ft.

Smith, 1917 (BMB 142), p. 30 -- Gold-bearing quartz vein strikes N 25° W, dips 50° NE; richest part is 6-14 in. thick. Mining, 1915.

Smith, 1917 (BMB 153), p. 28 -- Data about the same as in Chapin, 1916 (B 642), p. 79-80 -- Vein strikes N 25°-35° W and dips 35°-50° NE. Data on mining methods used in 1916.

Chapin, 1918 (B 662), p. 65 -- Mining and milling, 1916.

Chapin, 1919 (B 692), p. 88 -- [This reference has data on Crackerjack, Dutton [Dawson], and Ready Bullion [Puyallup] mixed up and probably should be ignored.]

Puyallup -- Continued

Smith, 1936 (B 868-A), p. 17 -- Examined by engineers, 1934.

Herreid and Rose, 1966 (GR 17), p. 11 -- One of the mines on gold-quartz veins in or near black slate band extending from Harris R. to Maybeso Cr.

p. 14 -- Country rock is graywacke and conglomerate with local black slate units; strikes NW and dips 20°-40° SW. Main vein strikes N 25° W, dips about 35° NE; from a few inches to 3 ft. wide; follows hanging wall of porphyritic dacite(?) dike 1-2 ft. thick. Vein is of banded quartz; carries free gold, pyrite, galena, and a little sphalerite; chalcopyrite, bornite, and tellurides and assays of $20 to $1,100 in gold [at $20.67 an oz.] and up to 3 oz. silver a ton reported. Sample collected in 1965 contained 0.1% Cu, 0.2% Pb, 0.5% Zn, and 0.58 oz. Au and 2.04 oz. Ag a ton. Mine consisted of 5 tunnels, a short shaft, several open cuts, and considerable stopes. Intermittent mining from 1901 to 1938; most was before 1916.

Berg and Cobb, 1967 (B 1246), p. 169 -- 3 adits and several stopes on a thin quartz vein, Operated intermittently until as recently as 1946. Production not made public, but less than that from Dawson mine. 85% of gold was free milling.

Bufvers, 1966 (SR 1), p. 18 -- Mainly historical data. 3 men "made good wages" in 1939-40.

Puzzler	Gold(?)
Ketchikan district	Craig (26.1, 11.65) approx. 55°39'N, 132° 02' W approx.

Summary: Mineralized zone in graphitic schist contains 2 systems of quartz veins that probably are auriferous. Explored by tunnel and open cut. No data on tenor.

Wright and Wright, 1908 (B 347), p. 155 -- 2 systems of quartz veins similar to those at Gold Standard, but less well developed and with smaller ore shoots; in graphitic schist in a greenstone-schist country rock. Lode is parallel to schistosity, strikes N 50° E, and dips 60° SE. Opened by tunnel 180 ft. long that cuts lode at 60 ft. from portal and by open cut. [Gold probably present, though not definitely so stated.]

Red Rose	Copper(?)
Ketchikan district	Craig (22.6, 5.4) approx.
MF-433, loc. 69	55°17'N, 132°25'W approx.

Summary: Claim on which chalcopyrite and pyrrhotite were reported.

Brooks, 1902 (P 1), p. 95 -- One of 3 claims near Kiam (Khayyam] on which are reported 3 parallel veins with an aggregate thickness of 50 ft. of ore consisting of chalcopyrite and pyrrhotite.

Reed	Copper
Ketchikan district	Craig (21.8, 10.45) approx.
MF-433, loc. 38	55°35'N, 132°28'W approx.

Summary: Deposit similar to that on It being explored, 1908. See also: Alarm, It.

Wright, 1909 (B 379), p. 79 -- Deposit similar to that on It being explored, 1908.

Research	Lead, Zinc
Ketchikan district	Craig (25.45, 4.05)
MF-433, loc. 86	55°13'N, 132°20'W

Summary: Lead-zinc claim staked on ground that may have been part of older groups of claims. See also: Hope (Cholmondeley Sound), Moonshine (Cholmondeley Sound).

Berg and Cobb, 1967 (B 1246), p. 173 -- Lead-zinc claim staked on ground that may have been part of old Hope or Moonshine claims.

Rex	Copper, Iron
Ketchikan district	Craig (21.3, 4.55)
MF-433, loc. 61	55°15'N, 132°32'W

Summary: Chalcopyrite and magnetite in garnet-epidote-diopside gangue in contact zone between quartz diorite and limestone on Green Monster Mtn. Little development and no record of production. May be part of Green Monster group. Includes reference to Idela.

Chapin, 1918 (B 662), p. 68 -- Open cuts and short adits on Rex and Idela claims expose a mineralized zone for several hundred feet. Lenses of chalcopyrite-bearing magnetite with masses of garnet-epidote-diopside rock along contact between quartz diorite and limestone. On south slope of Green Monster Mtn.

Rich Hill — Copper, Iron, Molybdenum

Ketchikan district — Craig (23.05, 9.5)
MF-433, loc. 43 — 55°32'N, 132°21'W

Summary: Chalcopyrite-pyrite-magnetite ore containing a little molybdenite in tactite and fault zone in greenstone (with interbedded foliated rock that may have been sedimentary in origin)and are cut by many dikes (one of diorite porphyry is about 50 ft. thick). Magnetite formed by replacement; sulfides in fractures in greenstone and magnetite. Lens of high-grade chalcopyrite mined out in 1917-18. Resources of lower grade (1.4%-2.0% copper) material in a block about 100 ft. long, 35 ft. wide, and 80 ft. deep and in material that is about two-thirds waste and the rest about 1% copper. Small magnetite bodies contain as much as 50% iron. Developed by surface excavations, a glory hole, and about 800 ft. of underground workings. Includes references to Ouray.

Wright, 1909 (B 379), p. 79 -- Assessment work on Ouray prospect, 1908.

Wright, 1915 (P 87), p. 94 -- Ouray is a deposit along a syenite porphyry dike and diorite.

Chapin, 1919 (B 692), p. 87 -- Being developed in 1917. Open cut on a lens of very rich chalcopyrite ore yielded 160 tons of ore which brought $20,000. Mineralized zone can be traced both NW and SE of open cut; adit being run to undercut it. On other claims of group other mineralized zones have been prospected. One, on Ouray claim, is a wide contact zone of garnet-epidote-magnetite rock carrying chalcopyrite.

Martin, 1919 (B 692), p. 28 -- Small production, 1917.

Martin, 1920 (B 712), p. 28 -- Mining, 1918.

Smith, 1933 (B 836), p. 15 -- Renewed activity reported, 1930.

Warner and others, 1961 (B 1090), p. 32 -- Replacement body of copper ore. Minor amounts of molybdenite and specular hematite.

p. 50 -- Sulfide minerals mainly confined to a network of minute fractures.

p. 126-132 -- Developed by many surface excavations, a small glory hole, and about 800 ft. of underground workings. Mining in 1917-18 and 1928. Country rock is andesitic greenstone with interlayered foliated material of possible sedimentary origin ; cut by many dikes of various types; largest dike is diorite porphyry traced 1/4 mi. and as much as 50 ft. wide. Main ore body is a mass of rich chalcopyrite ore (largely mined out) with little or no magnetite; strikes N 77° E and dips 80° N to vertical; in a fault zone; much low-grade ore remains. Disseminated chalcopyrite and pyrite in greenstone; probably less than 0.5% copper; a body of richer ore that runs 1.4%-2.0% copper is in a block about 100 ft. long, 35 ft. wide, and 80 ft. deep. Some masses of magnetite replaced country rock (possibly preferentially for material of sedimentary origin); sulfide in fractures in magnetite and country rock. Magnetic survey suggests more buried magnetite masses. Some material exposed at surface is about two-thirds waste; remainder probably contains about 1% copper. Most ore in 3 fault-controlled tactite zones.

Rich Hill -- Continued

Noel, 1966, p. 62 -- Data from Warner and others, 1961 (B 1090).

Berg and Cobb, 1967 (B 1246), p. 168 -- An unknown but probably small amount of copper ore was shipped. Ore body consisting of a rich chalcopyrite lens was mined out; lower grade material consisting of chalcopyrite, pyrite, and magnetite remains in a block about 100 ft. long, 35 ft. wide, and 80 ft. deep.

Bufvers, 1967 (SR 1), p. 4 -- Mainly historical data. Major development began in 1917; adit driven under ore body, raise to surface, and glory-hole mining. A 160-ton shipment returned $20 a ton. Most of high-grade ore mined out, but considerable low-grade material remains.

Rose	Gold, Silver
Ketchikan district	Craig (18.4, 9.35) approx.
MF-433, loc. 14	55°31'N, 132°49'W approx.

Summary: Vein 6-14 in. thick along a fault in a basic intrusive rock is reported to carry gold and silver values. See also Dew Drop.

Wright and Wright, 1905 (B 259), p. 66 -- At prospecting stage, 1904. In the general area quartz fissure veins in a porphyry dike carry galena, pyrite, chalcopyrite, and gold.

Wright and Wright, 1906 (B 284), p. 42-43 -- A little work, 1905.

Wright and Wright, 1908 (B 347), p. 163 -- Vein 6-14 in. wide along a fault in basic intrusive rock strikes N 60° W, dips 85° SW. Values reported to average well in gold and silver.

Herreid and Rose, 1966 (GR 17), p. 16 -- Same data as Wright and Wright, 1908 (B 347), p. 163.

Rush & Brown

Cobalt, Copper, Gold, Iron, Nickel, Silver

Ketchikan district
MF-433, loc. 28

Craig (20.6, 11.2)
55°37'N, 132°35'W

Summary: Mine operated almost continuously from 1906 to 1923; previously mined ore shipped in 1929. Developed by a glory hole, shafts, and a series of levels (deepest at depth of 500 ft.) and stopes. 2 ore deposits. Magnetite replacement deposit at contact between diorite and greenstone with calcareous interbeds contains small amounts of chalcopyrite and pyrite; partly mined to a depth of 200 ft.; hand-sorted ore contained 3.25% copper, 0.06 oz. gold a ton, and 0.25 oz. silver a ton. Deposit in shear zone in greenstone is as much as 14 ft. wide and consists of lenses and networks of veinlets of chalcopyrite and minor pyrite and pyrrhotite; mined out above 200-ft. level; considerable sulfide-rich rock probably remains below 500-ft. level. Hand-sorted ore contained 10.5% copper, 0.26 oz. gold a ton, and 1.6 oz. silver a ton. Data on amount of ore mined from each deposit (Holt and others, 1948 (RI 4349)) are not consistent with descriptions of mine workings. A sample from a pyrrhotite-pyrite vein not part of either mined deposit contained 0.07% cobalt and a trace of nickel.

Wright and Wright, 1906 (B 284), p. 48-49 -- Mining, 1905. Workings are 2 shafts 26 and 100 ft. deep and 2 short tunnels. One body has been followed for 100 ft. in depth. At one point ore body is limited by a fault.

Wright, 1907 (B 314), p. 68 -- Magnetite-chalcopyrite ore bodies with small gold values; in diorite country rock. In 1906 several thousand tons of ore was shipped to smelter at Coppermount.

Wright and Paige, 1908 (B 345), p. 106-107 -- Preliminary to Wright and Wright, 1908 (B 347), p. 123-125.

Wright and Wright, 1908 (B 347), p. 123-125 -- 2 ore bodies have been developed by 2 levels from a shaft 200 ft. deep. Ore was shipped in 1906 to Coppermount and in 1907 to Tyee smelter at Ladysmith, B.C. One ore body is a contact-metamorphic copper-bearing magnetite body 100 ft. long and 30 ft. wide in garnet-epidote-calcite gangue between granodiorite and greenstone tuff. The other ore body is in a shear zone in greenstone tuff and conglomerate; a sulfide (pyrite and chalcopyrite in quartz-calcite gangue) body 4-8 ft. wide; developed for a length of 85 ft.; strikes NE and dips 60° SE toward magnetite body.

Wright, 1909 (B 379), p. 78-79 -- Contact-metamorphic deposit from which considerable copper ore has been mined. No mining in 1908, but ore in bins was shipped to Tacoma smelter.

Knopf, 1910 (B 442), p. 142 -- No mining, 1909, but some ore mined earlier was shipped.

Brooks, 1911 (B 480), p. 77-78 -- Reference to Wright and Wright, 1908 (B 347), p. 123-125.

Knopf, 1911 (480), p. 102 -- Mine rehabilitated, 1910.

Rush & Brown -- Continued

Brooks, 1912 (B 520), p. 26 -- Mining, 1911.
Brooks, 1913 (B 542), p. 33 -- Mining, 1912.
Brooks, 1914 (B 592), p. 60 -- Mining, 1913.
Smith, 1914 (B 592), p. 77 -- Mining, 1913.
Brooks, 1915 (B 622), p. 41 -- Mining, 1914.
Wright, 1915 (P 87), p. 57 -- Leased by Alaska Copper Co. in 1907.

p. 73 -- Rocks grade from banded, aphanitic quartzite to graywacke and coarse conglomerate, which is highly epidotized.

p. 77 -- Near mine diorite contains numerous inclusions of gabbro.

p. 85-86 -- Shear-zone deposit consisting of chalcopyrite-pyrite-sphalerite ore and quartz-calcite-barite gangue. Near a small intrusive mass.

p. 98-99 -- About the same as Wright and Wright, 1908 (B 347), p. 123-125. Mine was practically idle in 1909 and 1910; work and shipments resumed in 1911.

Chapin, 1916 (B 642), p. 83 -- Mining, 1915.

p. 86-88 -- 2 ore bodies have been worked to 250-ft. level. One is a contact deposit between a diorite intrusive body and altered sedimentary rocks; made up of magnetite-chalcopyrite ore with a little native copper and copper carbonate; surface excavations indicate either extensions of this body or the presence of other similar bodies. The other body being mined is a shear zone 4-14 ft. wide containing chalcopyrite with minor amounts of pyrite, pyrrhotite, and magnetite in a gangue of altered country rock. Another similar shear zone deposit has not been opened by underground workings.

Smith, 1917 (BMB 142), p. 30-31 -- Geologic data also in Chapin, 1916 (B 642), p. 86-88. Mining, 1915.
Smith, 1917 (BMB 153), p. 28-29 -- Ore shipped to Anyox, B.C., 1916. Other data about the same as in Smith, 1917 (BMB 142), p. 30-31.
Chapin, 1918 (B 662), p. 65 -- Mining, 1916.
Chapin, 1919 (B 692), p. 86 -- Mining, 1917. 350-ft. level opened up.
Martin, 1919 (B 692), p. 28 -- Mining, 1917.
Martin, 1920 (B 712), p. 28 -- Mining, 1918.
Brooks, 1921 (B 714), p. 17-18 -- Example of both contact and shear-zone copper deposits.
Brooks and Martin, 1921 (B 714), p. 69, 76 -- Mining, 1919; largest operation in Ketchikan district.
Mertie, 1921 (B 714), p. 119-121 -- Contact-metamorphic deposit between diorite and graywacke; cut by lamprophyre dikes; mainly magnetite, with scattered chalcopyrite and pyrite; copper content of whole mass probably 0.5%-1% Cu. Too lean to mine in 1919. Shear-zone deposit in graywacke and tuff is from a few inches to 8 ft. wide and consists of chalcopyrite with some pyrite and pyrrhotite in lenses and veinlets in gangue of sheared country rock; both walls slickensided; carries considerable gold and silver. Mined from 6 levels; deepest is 400 ft. Shear zone deposit being mined in 1919.
Brooks, 1922 (B 722), p. 21, 34-35 -- Mining, 1920. References to Brooks, 1921 (B 714) and Mertie, 1921 (B 714).

Rush & Brown -- Continued

Brooks, 1923 (B 739), p. 10, 20 -- Mining, 1921.
Brooks and Capps, 1924 (B 755), p. 15, 23 -- Mining, 1922.
Brooks, 1925 (B 773), p. 28, 36 -- Mining, 1923.
Buddington and Chapin, 1929 (B 800), p. 316 -- Example of a contact deposit.
p. 318, 369 -- Quotations from Brooks, 1921 (B 714).
Smith, 1932 (B 824), p. 17-18, 59 -- Mine being rehabilitated under option by Solar Development Co., 1929; ore in bins shipped to smelter and gold, silver, and copper recovered.
Smith, 1933 (B 836), p. 61-62 -- No work, 1930; price of copper fell. Solar Development Co. pulled out.
Smith, 1936 (B 868-A), p. 17 -- Rush & Brown and Salt Chuck reopened, 1934, mainly for examination. Some ore mined and old tailings reworked and concentrates sent to Tacoma smelter. [Concentrates may all have been from Salt Chuck.]
Holt and others, 1948 (RI 4349) -- Discovered in about 1904. Mined fairly regularly until about 1926. Production from Shear Vein was 9,700 tons of hand-sorted ore averaging 10.5% Cu, 0.26 oz. Au, and 1.6 oz. Ag per ton; mined to a depth of 500 ft. Adit driven 1,250 ft. in 1929 to intersect workings on 300-ft. level did not reach them. Production from Magnetite ore body was about 35,000 tons of hand-sorted ore averaging 3.25% Cu, 0.06 oz. Au, and 0.25 oz. Ag per ton; partly mined to a depth of 200 ft. Magnetite ore body is a contact-metamorphic deposit (between diorite and greenstone) of magnetite, chalcopyrite, and pyrite with values in gold and silver; mined to limits of deposit on 100- and 200-ft. levels. Shear Zone deposit about 4 ft. wide and 200 ft. long; appears to be same size and grade at 500-ft. level; same mineralogy as Magnetite deposit. Details of sampling and diamond-drilling programs of Solar Development Co. and USBM.
Wells and others, 1957 (RI 5312), p. 5-6 -- Sample for testing contained essentially magnetite with some calcite, quartz, chalcopyrite, pyrite, chlorite, pyrrhotite, and limonite; small amounts of malachite and azurite.
Warner and others, 1961 (B 1090), p. 32 -- Bladed or tabular magnetite may be pseudomorphous after specular hematite.

p. 37 -- Vein-type sulfide deposit is only one in area to have been mined.

p. 42-43 -- Ankerite important gangue mineral in magnetite deposit; younger than the magnetite. Hypothermal quartz veins are youngest ore deposits in region; metallic minerals mainly pyrrhotite, pyrite, and chalcopyrite.

p. 48 -- Garnets in massive chalcopyrite.

p. 112-116 -- Country rock mainly greenstone (probably derived from andesite), a few rocks of probable sedimentary origin, and dikes of diorite and gabbro that in places grade into pyroxenite; another body (probably diorite) encountered in a drill hole. 2 deposits were mined. One is mainly magnetite with small amounts of pyrite and chalcopyrite; the other is a sulfide vein. Magnetite body formed by replacement of greenstone and calcareous rocks by magnetite and tactite; a block about 160 ft. long, 40-50 ft. thick, and 100 ft. deep was mined out. Most mining was in vein deposit; mined from several levels; lowest 500 ft.

Rush & Brown -- Continued

below surface; mined out above 200-ft. level. Vein strikes N 60° E at surface and nearly due E at lower levels; dips decrease from 60° SE at surface to 30° S at 500-ft. level. Thickness of vein variable; some stopes 14 ft. wide. Vein in shear zone. Another small vein nearby consists of 2 mineralized shears about 2 ft. wide separated by 2-3 ft. of barren greenstone; chief ore minerals are pyrrhotite and pyrite. Sample contained 0.10% Cu, 0.07% Co, and tr. Ni.

Noel, 1966, p. 53 -- Discovered in 1900; mined between 1906 and 1923.

p. 62 -- NE-trending quartz vein mineralized with chalcopyrite, pyrite, pyrrhotite, and magnetite in quartz-calcite gangue. Replacement lens of magnetite and chalcopyrite along a shear in brecciated greenstone and limestone of Silurian age.

Berg and Cobb, 1967 (B 1246), p. 165 -- Sample of pyrrhotite-pyrite vein contained 0.07% cobalt and a trace of nickel.

p. 168 -- Operated almost continuously from 1906 to 1923 and in 1929. Most ore shipped was chalcopyrite and minor pyrite and pyrrhotite that occurred as lenses and networks of veinlets in sheared greenstone. Considerable sulfide-rich rock probably remains below 500-ft. level. Some ore also mined from magnetite-rich rock containing small amounts of pyrite and chalcopyrite. Workings included a glory hole, vertical and inclined shafts, and a series of levels and stopes. Production and grade data not available.

Russian Bear	Copper
Ketchikan district	Craig (20.95, 4.2) approx.
MF-433, loc. 78	55°13'N, 132°34'W approx.

Summary: Small contact-metamorphic copper deposit.

Wright and Wright, 1908 (B 347), p. 107-108 -- Contact metamorphic deposit on western slope of the granodiorite batholith east of Hetta Inlet. Only small masses of [copper] ore have been exposed by open cuts and trenches.

Wright, 1909 (B 379), p. 82 -- Some development, but no important discoveries, 1908.

Wright, 1915 (P 87), p. 65 -- Same as Wright and Wright, 1908 (B 347), p. 107-108.

Saco	Copper, Gold, Silver
Ketchikan district	Craig (26.05, 4.4) approx.
MF-433, loc. 100	55°13'N, 132°04'W approx.

Summary: 50-ft. tunnel on vein that pinches from 4 ft. to 2 in. in talc schist. Vein contains scattered small masses of chalcopyrite and pyrite that carry small values in gold and silver.

Wright and Wright, 1908 (B 347), p. 168 -- 50-ft. tunnel on a vertical vein that narrows from 4 ft. at portal to 2 in. at face and strikes N 45° E. Country rock is talc schist that strikes E. Vein contains scattered small masses of chalcopyrite and pyrite carrying small values in gold and silver.

(St. Ignace I.) Barite

Ketchikan district Craig (12.4, 7.5)
55°25'N, 133°25'W

Summary: Narrow stringers of barite in fissure vein in sandstone and conglomerate.

Buddington, 1923 (B 773), p. 138 -- Narrow stringers consisting of white lamellar barite in beds of sandstone and conglomerate.
Buddington and Chapin, 1929 (B 800), p. 333 -- Reference to above.
Kaufman, 1958 (IC 7844), p. 9 -- Small fissure vein contains barite.
Condon, 1961 (B 1108-B), p. B37 -- Small amount of barite in a fissure vein.

Salmon	Copper, Gold, Lead
Ketchikan district	Craig (26.15, 2.7) approx.
MF-433, loc. 95	55°09'N, 132°03'W approx.

Summary: Two descriptions of this claim are very different. In one (Brooks) a pinching quartz vein in sheared crystalline limestone carries free gold, pyrite, and galena. In the other (Wright and Wright) a breccia vein in greenstone schist contains pyrite and chalcopyrite and is much oxidized at surface; gold can be panned from surface material.

Brooks, 1902 (P 1), p. 80 -- Quartz vein that pinches from 5 ft. wide at surface to 1 ft. at bottom of a pit carries free gold, pyrite, and galena. Average assay said to be $8 a ton. Wall rock is sheared crystalline limestone.

Wright and Wright, 1908 (B 347), p. 175 -- Breccia vein 5-15 ft. wide in greenstone schist strikes N 80° W and is exposed for a length of 300 ft. by open cuts and shallow pits. Pyrite and chalcopyrite much oxidized at surface; colors of gold panned from oxidized material.

(Salmon Lake) Copper, Lead, Tungsten

Ketchikan district Craig (10.1, 10.3)
MF-433, loc. 25 55°34'N, 132°38'N

Summary: Rocks near contact between quartz diorite and schist contain disseminated sulfides and quartz veins carrying sulfides and a few grains of scheelite. Sulfides are mainly pyrite and pyrrhotite; a little chalcopyrite and galena. No development.

Sainsbury, 1961 (B 1058-H), p. 353 -- Quartz diorite and bordering schist contain as much as 5% sulfides; mainly disseminated pyrite, pyrrhotite and a little chalcopyrite. Quartz veinlets in schist contain the above, some galena, and a few grains of scheelite.

Salt Chuck (Mining Co.) — Copper, Gold, Platinum, Silver, Vanadium

Ketchikan district — Craig (20.85, 11.3)
MF-433, loc. 29 — 55°38'N, 132°34'W

Summary: Pipelike body of gabbro and pyroxenite in Silurian graywacke contains irregularly distributed masses of bornite with minor chalcopyrite, chalcocite, covellite, native copper, and (in places) as much as 10% magnetite. Ore bodies of replacement rather than magmatic origin; generally at intersections of a large fault and cross fractures and small faults. Ore contains recoverable amounts of gold, silver, and palladium with a little platinum. About 326,000 tons of ore mined had an average metal content of 0.95% copper and 0.036 oz. gold, 0.17 oz. silver, 0.063 oz. palladium, and negligible platinum per ton. Sample of ore used for USBM beneficiation test contained 0.06% V_2O_5 (in the magnetite). Palladium and platinum occur with the copper. Mining, with interruptions, from 1905 to 1941; developed by 3 levels and a glory hole. Resources probably less than the amount mined. Includes references to: Alaska Gold & Metals Co., Alaska Palladium Co., Goodro, Joker.

Wright and Paige, 1908 (B 345), p. 110-111 -- Same as Wright and Wright, 1908 (B 347), p. 125-126.

Wright and Wright, 1908 (B 347), p. 125-126 -- Dominant ore mineral is bornite (only such occurrence in SE Alaska); also considerable chalcopyrite; chalcocite and native copper near surface; carries native [sic] gold. Ore is in small masses and disseminations associated with epidote, feldspar, and biotite in a basic diorite that has been largely replaced by these minerals. Post-ore diabase dike exposed in an open cut. Developed by surface excavations and a 125-ft. tunnel. Ore shipment to Hadley smelter in 1907 yielded good values in copper and gold.

Wright, 1909 (B 379), p. 79 -- Assessment work, 1908.

Brooks, 1910 (B 442), p. 38 -- Mining begun, 1909.

Knopf, 1910 (B 442), p. 141 -- Green dioritic rock with much biotite contains scattered bornite and sporadic blebs of chalcocite and chalcopyrite; chalcocite probably more common at depth, as ore runs 2% higher in Cu than at surface. Mining, 1909; ore shipped to smelters at Tacoma or Ladysmith, B.C.

Brooks, 1911 (B 480), p. 80 -- Reference to Knopf, 1910 (B 442), p. 141.

Knopf, 1911 (B 480), p. 101 -- Considerable development, 1910. Chalcocite in lowest workings (200 ft. below surface).

Brooks, 1912 (B 520), p. 26 -- Assessment work only, 1911.

Wright, 1915 (P 87), p. 77 -- Gabbro cut by diorite and pegmatite dikes.

p.85-86 -- Disseminated deposits of irregular masses of bornite-chalcopyrite ore in gabbro; secondary epidote and calcite. Goodro [Salt Chuck] is only deposit of this type that has been mined near Kasaan.

p. 98-99 -- Ore is mainly bornite with associated chalcocite, chalcopyrite, native copper and small amounts of gold; in small masses and disseminated particles in gabbro, the minerals of which were largely replaced by epidote, feldspar, and biotite. Discovered in 1904. Considerable development with open cut, tunnel, winze, and drifts. Ore shipments through 1910. Mine idle in 1911 except for assessment work.

Salt Chuck (Mining Co.) -- Continued

Chapin, 1916 (B 642), p. 83 -- Mining, 1915.

p. 85 -- Ore is essentially bornite; lesser amounts of other copper sulfides; country rock gabbro.

Smith, 1917 (BMB 142), p. 29 -- Small masses and disseminated particles of bornite associated with epidote, feldspar, and biotite in gabbro; native gold and chalcopyrite also present; chalcite and native copper near surface. Work resumed, 1915.

Brooks, 1918 (B 662), p. 22 -- Traces of platinum and palladium have been found. References to older reports.

Chapin, 1918 (B 662), p. 65 -- Mining, 1916. Traces of platinum and palladium and considerable gold in ore that is essentially bornite and chalcocite with lesser amounts of other copper sulfides in gabbro country rock.

Brooks, 1919 (B 666), p. 96 -- Traces of platinum in copper ore.

Chapin, 1919 (B 692), p. 86 -- Development (new mill), but no production, 1917. Ore is mainly bornite and chalcopyrite; carries gold and traces of platinum and palladium.

Martin, 1919 (B 692), p. 28 -- Flotation mill installed, 1917.

Martin, 1920 (B 712), p. 28 -- Mining, 1918. Concentrates yielded copper, gold, silver, platinum, and palladium.

Brooks, 1921 (B 714), p. 18-19 -- Bornite, chalcopyrite, and platinum-group metals in pyroxenite with gabbroic phases. Ores concentrated by oil flotation.

p. 38 -- Only mine in Alaska operated primarily for platinum-group metals, 1919; all other platinum production incidental to placer-gold mining.

Mertie, 1921 (B 714), p. 121-127 -- In a differentiated pyroxenite body with gabbroic and gabbro-pegmatitic phases. Mineralization irregularly distributed; copper sulfides (chiefly bornite and free gold) in grains and small patches in ore shoots that follow no apparent pattern. Ore minerals deposited in cracks and along fractures; not a magmatic segregation deposit. Secondary minerals (native copper, chalcocite, and covellite) found as deep as 200 ft. Average of 3 ore analyses is 1.427% Cu and 0.063 oz. Au, 0.217 oz. Ag, and 0.253 Pt+Pd. Ratio of Pd to Pt is believed to be about 50 to 1. Mine consists of a glory hole, about 1,865 ft. of underground workings, and numerous stopes. Mill described in detail.

Brooks, 1922 (B 722), p. 21 -- Copper produced, 1920.

p. 23 -- Platinum-group metals produced, 1920.

p. 34-35 -- Mining, 1920. Reference to Mertie, 1921 (B 714), p. 121-127.

Brooks, 1923 (B 739), p. 13, 20 -- Operations suspended at end of 1920.

Brooks and Capps, 1924 (B 755), p. 17 -- Did not operate, 1922; in receivership.

Brooks, 1925 (B 773), p. 30-31 -- Did not operate in 1923; to be reopened in 1924.

Buddington, 1926 (B 783), p. 41 -- Mining, 1924.

Smith, 1926 (B 783), p. 20 -- Produced copper, 1924.

p. 24-25 -- Palladium produced, 1924. Reference to Mertie, 1921 (B 714), p. 121-127.

Salt Chuck (Mining Co.) -- Continued

Moffit, 1927 (B 792), p. 10 -- Some gold recovered with platinum minerals.
p. 27-28 -- Copper produced, 1925; value less than that of palladium.
p. 33 -- Production of palladium, platinum, copper, gold, and silver, 1925.
Buddington and Chapin, 1929 (B 800), p. 319 -- Copper-palladium deposit in gabbroic rock.
p. 322-323 -- Bornite is a major mineral of the deposit. A little native copper has been found as much as 200 ft. beneath the surface.
p. 351 -- Reference to and summary of Mertie, 1921 (B 714), p. 121-127.
Smith, 1929 (B 797), p. 10, 32-33, 39 -- Mining, 1926; discontinued operations in September; palladium market price went down ($76.82 an ounce). Palladium shipped from Alaska in 1926 [undoubtedly all from Salt Chuck] was 3,566 oz.
Smith, 1930 (B 810), p. 13 -- Did not operate, 1927. Some previously mined ore shipped.
p. 51-52 -- Did not operate, 1927. Has produced several hundred thousand dollars' worth of platinum-group metals a year, a good deal of gold, and some copper.
Smith, 1930 (B 813), p. 16, 59 -- Did not operate, 1928.
Smith, 1932 (B 824), p. 17, 50 -- Salt Chuck and Rush & Brown optioned by Solar Development Co., 1929.
p. 65 -- No work done in 1929.
Smith, 1933 (B 836), p. 15, 61-62, 67-68 -- No work, 1930. Solar Development Co. pulled out.
Smith, 1933 (B 844-A), p. 67-68 -- Has been production; mine idle in 1931.
Smith, 1934 (B 857-A), p. 63-64 -- Has been production; mine idle in 1932.
Smith, 1934 (B 864-A), p. 69 -- Has been production; mine idle in 1933.
Smith, 1936 (B 868-A), p. 16-17 -- Rush & Brown and Salt Chuck reopened, 1934, mainly for examination. Some ore mined and old tailings reworked and concentrates sent to Tacoma smelter; gold, copper, and palladium recovered.
p. 66-67 -- Copper recovered from concentrates, 1934.
p. 70 -- Palladium recovered, mainly from reworked old tailings, 1934.
Smith, 1937 (B 880-A), p. 17-18 -- Mining, 1935.
p. 70 -- Copper recovered, 1935.
p. 74 -- Platinum metals recovered, 1935.
Smith, 1938 (B 897-A), p. 18 -- Mining, 1936. Ore concentrated by flotation and concentrates shipped outside.
p. 80 -- Copper recovered, 1936.
p. 83-84 -- Platinum metals recovered, 1936.
Smith, 1939 (B 910-A), p. 20-21 -- Mining, 1937.
p. 85 -- Copper recovered, 1937.
p. 89 -- Palladium, copper, silver, and gold recovered from concentrates, 1937.
Smith, 1939 (B 917-A), p. 21 -- Mining, 1938.
p. 83 -- Palladium, copper, gold, and silver recovered from concentrates, 1938.
p. 87 -- Copper recovered from concentrates, 1938.

Salt Chuck (Mining Co.) -- Continued

Smith, 1941 (B 926-A), p. 19 -- Mining, 1939.
p. 77 -- Palladium, copper, silver, and gold recovered, 1939.
p. 80 -- Copper recovered, 1939.
Smith, 1942 (B 933-A), p. 18-19 -- Mining, 1940.
p. 74 -- Palladium, gold, copper, and silver recovered from concentrates, 1940.
p. 76-77 -- Copper recovered from concentrates, 1940.
Gault, 1945 (OF 19) -- Mine developed by 3 levels and glory holes. Operated intermittently from about 1907 to 1941. Total production estimated at slightly more than 300,000 tons of milling ore; approximate average tenor estimated at 0.9% Cu and 0.02 oz. Au, 0.12 oz. Ag, and 0.053 oz. Pd per ton; negligible Pt. Precious metal recovery averaged about 67%. Mine is in gabbro and pyroxenite thought to be differentiates of the same magma; gabbro slightly younger; gabbro grades into diorite in places. Greenstone country rock away from gabbroic body; younger basaltic and aplite(?) dikes. Some small-displacement faults cut ore body; some contain considerable chalcopyrite and carbonate as well as gouge. Ore bodies are irregular randomly distributed masses mainly of bornite; minor chalcopyrite and secondary chalcocite, covellite, and native copper; contain recoverable copper, gold, silver, and palladium and a little platinum. Ore in pyroxenite is richer than that in gabbro. Copper minerals introduced along faults, cracks, and trough-shaped contact between gabbro (below) and pyroxenite (above). Report gives details of owner's and USBM diamond-drilling projects. Total reserves of ore in the 3 principal ore bodies with a 0.2% Cu cut off are 251,000 tons of material containing 0.65-0.92 percent Cu and (per ton) 0.005-0.025 oz. Au, 0.07-0.26 oz. Ag, and 0-0.013 oz. Pt-group metals.
Bain, 1946 (IC 7379), p. 30 -- Copper has been recovered from concentrates.
p. 73 -- Palladium has been recovered.
Holt and others, 1948 (RI 4358),, -- Operated intermittently from 1905 to 1941. Total production was 326,000 tons of ore; average metal content was 0.95% Cu, 0.036 oz. Au a ton, 0.17 oz. Ag a ton, and 0.063 oz. Pd a ton. Smelter returns from 80,000 tons of ore mined 1934-41 were 1,356,381 lbs. Cu, 1,861 oz. Au, 8,756 oz. Ag, and 3,115 oz. Pd; percent mill recovery was 85 for Cu, 68 for Au, 72 for Ag, and 65 for Pd. Data on geology and ore deposit quoted from Gault, 1945 (OF 19). Details of Solar Development Co. and USBM sampling programs, USBM drilling program, and USBM concentration tests. Weighted average composition of all ore bodies is 0.61% Cu and 0.014 oz. Au, 0.11 oz. Ag, and 0.017 oz. Pt-group metals per ton. Sample of ore used for beneficiation tests contained 0.68% Cu, 8.6% Fe, and 0.06% V_2O_5; vanadium concentrated in magnetite.
Wedow and others, 1952 (OF 51), p. 65 -- Copper-palladium lode mine at head of Kasaan Bay [name Salt Chuck not used]; copper sulfides (chiefly bornite) disseminated in basic igneous rock; hematitically altered zone 20 ft. wide discovered by diamond drilling, 1943-44.
Twenhofel, 1952 (C 252), p. 5 -- Contains bornite and chalcopyrite disseminated in gabbro and pyroxenite. Has produced more than 5,000,000 lbs. copper and an important amount of palladium.

Salt Chuck (Mining Co.) -- Continued

Condon, 1961 (B 1108-B), p. B34 -- Complex copper lode deposit.

p. B36 -- Bornite is chief ore mineral. Palladium has been recovered.

Sainsbury, 1961 (B 1958-H), p. 333-334 -- Pluton ranges in composition from pyroxenite to gabbro to diorite. Host rock of all but one of the prospects that contain bornite. Salt Chuck produced more than 300,000 tons of ore containing copper and palladium.

p. 355 -- Produced more than 300,000 tons of ore containing copper and palladium.

p. 358 -- Deposit is unique in district; deposits with bornite as the principal ore mineral and carrying platinum-group metals unlikely to be found outside the pyroxenite-gabbro pluton.

Warner and others, 1961 (B 1090), p. 5 -- Has produced more than $1 million in copper ore.

p. 37 -- Bornite is principal ore mineral; as fracture coatings and disseminated grains in gabbro and pyroxenite. Mineralized fault zone; contain chalcopyrite.

Noel, 1966, p. 53-54 -- Operated 1907-20, 1924-26, and intermittently 1935-41. Produced over 5,000,000 lbs. copper and an estimated 10,000 oz. of palladium from 300,000 tons of ore.

p. 62 -- Pipe-like replacement body in gabbro-pyroxenite stock which intruded Silurian graywacke. Bornite with some chalcopyrite and low values in palladium replaced sheared, fractured, and altered gabbro and pyroxenite at intersections of a major WNW-trending fault and numerous NW-trending fractures and small faults.

Berg and Cobb, 1967 (B 1246), p. 165-166 -- Produced more than $1 million worth of copper ore. Consists of abundant veinlets and disseminated particles of bornite, a little chalcopyrite and native copper, and recoverable amounts of gold, silver, and palladium that contains a little platinum; locally magnetite makes up about 10% of the ore; covellite, chalcocite, and secondary copper minerals also reported. Ore bodies in pyroxenite and gabbro. Approximate average tenor of ore was 0.9% copper, 0.025 oz. gold, 0.12 oz. silver, and 0.053 oz. palladium a ton; amount of platinum recovered was negligible. Operated intermittently from about 1907 to 1941. Remaining resources probably less than the amount of ore removed.

Bufvers, 1967 (SR 1), p. 1-2 -- Historical and anecdotal material.

Koschmann and Bergendahl, 1968 (P 610), p. 22 -- References to Holt and others, 1948 (RI 4358) and Mertie, 1921 (B 714). Gold production was 11,736 oz.

Mertie, 1969 (P 630), p. 76-77 -- Most of data from Wright, 1915 (P 87) and Mertie, 1921 (B 714). Average annual value of platinum-group metals has been much too high for there to be a major part palladium. Property should be called a platinum-copper mine rather than a palladium-copper mine.

Clark and Greenwood, 1972 (B 800-C), p. C159-C160 -- Average platinum and palladium contents of 6 samples were 0.057 ppm and 1.010 ppm respectively; maxima were 0.160 ppm and 2.900 respectively. No rhodium or iridium. Positive correlation of platinum and palladium with copper. Principal associated mineral is bornite; in hornblendite) of possible economic significance for platinum-group metals.

Salt Chuck (Mining Co.) -- Continued

Page and others, 1973 (P 820), p. 540-543 -- Platinum and palladium recovered as byproduct of copper mining; associated with bornite and chalcopyrite in small masses and disseminations in pyroxenite, gabbro, and gabbro pegmatite. Sperrylite identified in one specimen. Identified resource is 12,000 troy ounces. Tabular data about the same as in Clark and Greenwood, 1972 (B 800-C), p. C159.

Saxe — Copper, Gold, Lead, Silver, Zinc

Ketchikan district — Craig (17.45, 9.4) approx.
MF-433, loc. 12 — 55°32'N, 132°55'W approx.

Summary: Quartz-carbonate vein 2 ft. wide and stringers in andesite porphyry breccia contain abundant galena, pyrite, and sphalerite, traces of chalcopyrite, and as much as 0.07 oz. gold and 1.96 oz. silver a ton. Country rock between stringers contains disseminated pyrite; fracture surfaces coated with pyrrhotite-bearing quartz. Little development and no known production.

Buddington, 1926 (B 783), p. 52-53 -- Sheeted quartz fissure vein in massive green andesite porphyry breccia cut by diorite dikes. Mineralized zone exposed in a small open cut is about 10 ft. wide with a 2-ft. quartz vein along one side and half a dozen quartz stringers no more than 6 in. wide. Zone is exposed in stream bed upstream of cut to an elevation 250 ft. higher than cut; at least one vein 1-2 ft. wide everywhere and additional stringer(s) in most places. Quartz contains pyrite, galena, sphalerite, and a trace of chalcopyrite; considerable carbonate. Assays of grab samples showed 0.07 oz. gold and 0.24-1.96 oz. silver a ton; higher assays have been reported. Country rock between stringers is impregnated with pyrite; fracture surfaces in many places coated with quartz carrying pyrrhotite.

Berg and Cobb, 1967 (B 1246), p. 170 -- Prospect on quartz-carbonate vein and numerous stringers in andesite porphyry breccia. Where exposed in an open cut, vein contains abundant galena, pyrite, and sphalerite and a trace of chalcopyrite; assays 0.07 oz. gold and 1.96 oz. silver a ton. Country rock between stringers contains disseminated pyrite and is cut by fractures coated with pyrrhotite-bearing quartz. Development work not extensive; no known production.

Shellhouse	Copper
Ketchikan district	Craig (15.65, 1.1) approx.
MF-433, loc. 109	55°03'N, 133°07'W approx.

Summary: Chalcopyrite- and pyrrhotite-bearing veins in quartz-calcite gangue in limestone and siliceous schist. Minor development; no record of production. See also: Jumbo (Hetta Inlet), Yellowstone (Shellhouse was involved with these properties).

Wright, 1909 (B 379), p. 83 -- Several bodies of chalcopyrite-pyrrhotite ore in quartz-calcite gangue in limestone and siliceous schist were prospected, 1908.

Chapin, 1918 (B 662), p. 72 -- Samples from an open cut consist essentially of chalcopyrite and pyrrhotite. Explored by open cuts and an adit.

Berg and Cobb, 1967 (B 1246), p. 177 -- Quartz-calcite vein(s) carry chalcopyrite and pyrrhotite.

Shelton	Copper, Gold, Silver
Ketchikan district	Craig (20.15, 7.8) approx.
MF-433, loc. 51	55°26'N, 132°38'W approx.

Summary: Pyrite and chalcopyrite make up no more than 1% or 2% of a quartz-calcite vein in fractured limestone; low gold and silver values. Sample across vein contained 0.25% copper. In early 1900's was explored by a 40-ft. draft and a 55-ft. winze. Includes references to: Lavina, Roman, Rosalie.

Brooks, 1902 (P 1), p. 93 -- 30-ft. tunnel and open cut on Lavina claim reveal an ore body 6 ft. wide in a brecciated zone in rhyolite(?). Zone contains many small quartz veins and strikes about E and dips 65° N; carries pyrite and chalcopyrite.

Wright and Wright, 1906 (B 284), p. 48 -- On Roman and Rosalie claims pyrite and chalcopyrite with low gold and silver values in a 6-ft. band of marble which is part of a schist complex that also includes greenstone and slate. Seam of gouge makes footwall. Developed by a 40-ft. drift and a 25-ft. winze.

Wright and Wright, 1908 (B 347), p. 128 -- Vein strikes N 20° E, dips 65° SE; in fractured limestone belt in a formation also including chlorite and greenstone schist and phyllite. Vein averages 6 ft. thick; contains pyrite, chalcopyrite, and malachite in quartz-calcite gangue; reported to carry some gold and silver. Explored by a short tunnel and an inclined shaft 25 ft. deep.

Twenhofel and others, 1949 (B 963-A), p. 8-10 -- Reference to Wright and Wright, 1908 (B 347), p. 128. Sulfide minerals (pyrite and chalcopyrite) make up no more than 1%-2% of quartz-calcite vein, principally in and near wallrock inclusions. Explored by a short drift and a 55-ft. winze. 6-ft. sample across vein contained 0.25% copper.

Berg and Cobb, 1967 (B 1246), p. 170 -- Summary of Twenhofel and others, 1949 (B 963-A), p. 8-10. Gold and silver also reported.

Silver Star	Copper, Gold, Lead, Silver, Zinc
Ketchikan district	Craig (16.05, 0.5) approx.
MF-433, loc. 110	55°01'N, 133°04'W approx.

Summary: Two parallel veins (no more than 2-1/2 ft. thick) in limestone contain sphalerite, chalcopyrite, galena, and notable amounts of gold and silver. Explored by adit and 2 drifts. No record of work since 1916 or of any production.

Chapin, 1918 (B 662), p. 72 -- 2 parallel lodes about parallel the enclosing crystalline limestone beds (strike N 55° W, dip steeply NE). Lodes pinch and swell; no more than 2-1/2 ft. wide; veinlets of sulfides penetrate wallrock. Sulfides are sphalerite, chalcopyrite, and galena; assays also show gold and silver. Developments (1916) are a 50-ft. adit and 2 drifts.

Berg and Cobb, 1967 (B 1246), p. 176-177 -- 2 parallel veins in limestone contain sphalerite, chalcopyrite, and galena with notable amounts of gold and silver. Explored by an adit and 2 drifts.

Snowdrift	Gold(?)
Ketchikan district	Craig (19.0, 8.7) approx. 55°29'N, 132°45'W approx.

Summary: Reported to be a (probably quartz) stringer 2 ft. wide that strikes N 60° E and dips steeply SE. Explored by a short adit in 1915 or earlier. Gold content, if any, low.

Chapin, 1916 (B 642), p. 81 -- Arrarastre has been built. 2-ft. stringer that strikes N 60° E and dips steeply SE being prospected by a short adit. No gold produced, 1915.

Herreid and Rose, 1966 (GR 17), p. 11 -- Minor gold-quartz deposit.

p. 14-15 -- Reference to above. Herreid and Rose did not find this prospect during their investigation in 1965.

Bufvers, 1967 (SR 1), p. 11 -- Ore samples assay low.

Standby	Gold
Ketchikan district	Craig (26.0, 3.0) approx.
MF-433, loc. 94	55°09'N, 132°03'W approx.

Summary: Quartz stringers in silicified limestone carry pyrite and free gold.

Chapin, 1916 (B 642), p. 81 -- Near Golden Fleece. Lode 3-1/2 ft. wide made up of stringers of quartz in silicified limestone. Abundant pyrite; free gold in lenticular quartz stringers.

Stella	Gold(?), Lead, Zinc
Ketchikan district	Craig (20.25, 8.9)
MF-433, loc. 21	55°30'N, 132°38'W

Summary: Quartz vein 3 ft. thick with gouge along one wall follows contact between a diorite porphyry dike and black slate. Contains pyrite, galena, sphalerite, and low values in precious metals (gold?; description is in a section on gold mines). Vein followed by a tunnel 130 ft. long. See also Monday.

Wright and Wright, 1908 (B 347), p. 162 -- Quartz vein along contact between a diorite porphyry dike and black slate footwall strikes N 40° W, dips 80° NE, averages 3 ft. in width. Gouge 1 in. thick follows footwall. Vein contains pyrite, galena, and sphalerite in quartz-calcite gangue. Values in precious metals are low. Vein followed by tunnel 130 ft. long.

Herreid and Rose, 1966 (GR 17), p. 17 -- Same data as in Wright and Wright, 1908 (B 347), p. 162.

Stevens	Copper
Ketchikan district	Craig (21.1, 11.1)
MF-433, loc. 30	55°37'N, 132°33'W

Summary: Small pit and trench expose irregular stringers and small masses of bornite in fractures in diorite; some fractures also contain aplitic material. See also: Cascade, Flagstaff, Stumble-On. Valparaiso (Stevens also was involved with these properties).

Gault, 1945 (OF 19), p. 8 -- Small pit and trench expose irregular stringers and small masses of bornite in fractures in diorite; aplitic material also in some of fractures.

Stevenstown — Copper, Gold, Iron, Silver

Ketchikan district — Craig (23.65, 9.4)
MF-433, loc. 48 — 55°31'N, 132°17'N

Summary: Regional data and material also applicable to Mamie summarized on Mamie sheets. Mine operated from 1906 to 1918 with interruption from 1909 to 1915. Average metal content of ore mined 1916-18 was 2.88% copper and 0.0308 oz. gold and 0.264 oz. silver per ton. Ore mined from 4 glory holes connected to a 550-ft. tunnel by ore chutes. A longer adit did not find minable ore. Ore was siliceous copper ore with very little magnetite in a body 8-25 ft. thick and a horizontal area of about 60,000 square feet; contained a considerable mass of barren dikes near middle; underlain and overlain by tactite. Small magnetite bodies (not mined) in and south of workings; mixed with tactite and contain irregularly disseminated chalcopyrite and pyrite.

Wright and Wright, 1906 (B 284), p. 47 -- Active exploitation, 1905. Ore body is a low-grade, flat-lying lens of chalcopyrite and magnetite capping a hill; 20 ft. thick in places; cut by many diabase dikes. Limestone with epidote and other contact minerals limits ore body on east and underlies it in places. Native copper in oxidized surface material. Surface and subsurface workings. Ore taken to smelter via Mamie mine.

Wright, 1907 (B 314), p. 67 -- Mining, 1906. Smelter at Hadley handled 90,000 tons of ore, mainly from Mamie and Stevenstown.

Wright and Paige, 1908 (B 345), p. 104-105 -- Same as Wright and Wright, 1908 (B 347), p. 114-115.

Wright and Wright, 1908 (B 347), p. 114-115 -- Flat-lying deposit on top of ridge; underlain by syenite intrusive, which forms footwall; limestone to NE is hanging wall of mineral zone, much of which has been eroded away at mine. Ore is magnetite, chalcopyrite, and pyrite with hornblende and calcite in somewhat banded garnet-epidote gangue. Secondary copper and iron minerals at surface. Mined from 3 glory holes connected by raises to a 550-ft. tunnel. Mining 1905-July 1907, when operations were suspended; ore went to Hadley smelter.

Wright, 1909 (B 379), p. 78 -- Management combined with that of Mamie. Development and probably some production, 1908.

Knopf, 1910 (B 442), p. 142 -- Idle, 1909.

Wright, 1915 (P 87), p. 88-89 -- Ore bodies of Mount Andrew, Mamie, and Stevenstown in contact rock between diorite and limestone; chalcopyrite and magnetite ore; individual bodies limited in horizontal and vertical extent, but continued exploration has generally found new bodies. In 1908 Mamie, Stevenstown, and Hadley smelter consolidated under one management.

p. 92 -- Essentially the same as Wright and Wright, 1908 (B 347), p. 114-115. Some ore mined and shipped in 1908; mine closed in fall of 1908.

Stevenstown -- Continued

Wright and Tolonen, 1947 (RI 4129), p. 5 -- Mining began in 1905. Production from Mount Andrew-Mamie area was about 270,000 tons of copper ore which yielded more than $124,000 in gold and $32,500 in silver.

Warner and others, 1961 (B 1090), p. 37 -- Coarse, bladed variety of hornblende forms large masses in and around ore bodies.

p. 54-80 -- Summarized on Mamie sheets.

p. 93-96 -- Mine active 1906-08 and (worked with Mamie) 1915-18. Average metal content of ore mined, 1916-18, was 2.88% Cu and 0.0308 oz. Au and 0.264 oz. Ag per ton. Workings consist of 4 glory holes, a 550-ft. tunnel below and connected to them, and one adit with 575 ft. of workings from which no ore was mined. Greenstone and associated metasedimentary (largely altered to tactite) are chief country rocks; diorite of an irregular stock in tunnel and exposed at surface nearby. Small bodies of marble, dikes of diorite porphyry and alkalic rocks, and a few small faults in workings. Ore mined was siliceous copper ore with very little magnetite in a layer 8-25 ft. thick, about 300 ft. long, and 200 ft. wide; diorite porphyry and alkalic dacite dikes with total thickness of about 50 ft. in body; irregular disseminations and scattered small masses of chalcopyrite and pyrite, some with a little magnetite. Tactite above and below ore body. Small magnetite bodies (not mined) in workings and exposed south of main workings; mixed with tactite and contain irregularly disseminated chalcopyrite and pyrite.

Noel, 1966, p. 61-62 -- Data mainly from Warner and others, 1961 (B 1090).

Berg and Cobb, 1967 (B 1246), p. 166-167 -- Material also applicable to Mamie summarized on Mamie sheets. Chalcopyrite containing a little magnetite was mined from a 550-ft. tunnel connected with 4 glory holes by ore chutes. Small masses of magnetite on property are probably leaner than that remaining at Mamie and Mount Andrew.

Bufvers, 1967 (SR 1), p. 6 -- Historical data.

Stumble-On | Copper, Gold, Silver, Zinc

Ketchikan district | Craig (21.2, 5.45)
MF-433, loc. 71 | 55°17'N, 132°21'W

Summary: Elongate sulfide lens parallel to schistosity of enclosing metamorphic rocks (cut by diorite in general area) consists of pyrite, disseminated chalcopyrite, and a little pyrrhotite, sphalerite, magnetite, gold, and silver. Assays of USBM samples indicated as much as 12.7% copper and 0.9 oz. gold and 0.3 oz. silver a ton. Staked and restaked from about 1900 to 1945. Explored by about 525 ft. of underground workings and surface excavations. Records too poor to determine if any ore was ever shipped. Includes references to: Lakeview, Mammoth (McKenzie Inlet).

Brooks, 1902 (P 1), p. 95-96 -- Mammoth-Lakeview group in area underlain by actinolite schist probably derived from a dioritic or andesitic rock. Mineralized body is 8-20 ft. wide and contains masses of sulfides separated by horses of greenstone. Explored by a crosscut. Ore contains mainly chalcopyrite with some pyrrhotite and pyrite and a little sphalerite; assays show 19.5% Cu, 3 oz/ton Ag, $4.80 Ag, and traces of Ni; galena probably present, but not seen by Brooks.

Wright and Wright, 1906 (B 284), p. 49 -- Mass of magnetite and garnet with variable amounts of chalcopyrite and pyrite caps a hill (similar to Stevenstown); probably contact metamorphic [term not used]. Workings consist of a short tunnel, pits, and crosscuts.

Wright, 1907 (B 314), p. 69 -- Deposit appears to be similar to, but smaller than, those at Khayyam.

Wright and Wright, 1908 (B 347), p. 137-138 -- Deposits on strike with and similar to those at Khayyam. Developments are tunnels 180 and 165 ft. long and surface excavations. Main workings are on a deposit 20 ft. wide (richer ore in a band 2 ft. thick along hanging wall) that strikes N 75° W and dips 80° N; schist country rock. Ore is pyrite, pyrrhotite, chalcopyrite, some sphalerite and magnetite; gangue is sparse quartz, calcite, and chlorite.

Fosse, 1946 (RI 3942), p. 1 -- Examined by USBM, 1945.

p. 3-4 -- Work in progress July-Oct. 1905; 2 adits driven and some trenching; was a 2-1/2-mi. surface tram. Relocated in 1939 and 1945. Ore (pyrite, chalcopyrite, sphalerite, magnetite, gold, and silver in quartz-calcite gangue) in a mass 20 ft. wide parallel to banding in hornblende gneiss (derived from diorite); richer material across a 2-ft. width along hanging wall; deposit strikes N 75° W, dips 80° N.

p. 6-8 -- Detailed description of underground workings (total length about 528 ft.) and of USBM sampling program; 7 chip samples contained from 0.46 to 12.70% Cu, from 0.1 to 0.9 oz. Au a ton, and from a trace to 0.3 oz. Ag a ton.

Berg and Cobb, 1967 (B 1246), p. 172-173 -- In metamorphosed sedimentary and volcanic rocks cut by diorite. Elongate lenses parallel to schistosity of country rock consist of pyrite, disseminated chalcopyrite, and a little pyrrhotite, sphalerite, and magnetite. Samples a little higher in copper and lower in precious metals than samples from Khayyam (as much as 8.1% copper and 0.28 oz. gold and 2.5 oz. silver a ton).

Stumble-On -- Continued

Too little known of history to determine how much ore, if any, was shipped.

Bufvers, 1967 (SR 1), p. 23 -- Restaked in 1945. Examined by a company engineer in 1946; report was favorable, but company did not take over the property.

Sultana	Cobalt, Copper, Nickel
Ketchikan district	Craig (20.7, 5.35)
MF-433, loc. 67	55°17'N, 132°35'W

Summary: Contact-metamorphic deposit between granitic footwall and limestone hanging wall. Small masses and disseminated particles of iron and copper sulfides in garnet-epidote-calcite gangue; some magnetite. Sample of pyrrhotite contained between 0.1% and 0.2% nickel and a trace of cobalt. Explored in early 1900's by open cuts and tunnels (longest 130 ft.); no record of production.

Wright, 1908 (B 345), p. 95 -- Little or no development work, 1907.

Wright and Wright, 1908 (B 347), p. 87 -- Sample of pyrrhotite contained 0.1%-0.2% nickel and a trace of cobalt; no platinum.

p. 104-105 -- 6 claims. Ore bodies are contact-metamorphic deposits with granitic footwalls and banded siliceous limestone hanging walls. Iron and copper sulfides present as small masses and disseminated particles in gangue of garnet and epidote with considerable calcite. Exploratory tunnels (longest 130 ft. long) exposed some chalcopyrite. Open cuts show chalcopyrite associated with magnetite and pyrrhotite. Ore at Vulcan claim was suspected to carry considerable cobalt, but an analysis showed only a trace and less than 0.2% nickel.

Wright, 1915 (P 87), p. 49 -- Same as Wright and Wright, 1908 (B 347), p. 87.

p. 56 -- Property staked between 1900 and 1903.

p. 63 -- Same as Wright and Wright, 1908 (B 347), p. 104-105.

Berg and Cobb, 1967 (B 1246), p. 171 -- Sample of pyrrhotite contained 0.1%-0.2% nickel and a trace of cobalt.

Summit	Gold(?), Silver(?)
Ketchikan district	Craig (18.4, 9.35) approx.
MF-433, loc. 14	55°31'N, 132°49'W approx.

Summary: Prospect in 1904. In general area, quartz-fissure veins in a porphyry dike carry gold and sulfides.

Wright, 1905 (B 259), p. 66 -- At prospecting stage, 1904. In the general area quartz fissure veins in a porphyry dike carry galena, pyrite, chalcopyrite, and gold.

Herreid and Rose, 1966 (GR 17), p. 16 -- Near Lucky Nell.

Sunny Day	Copper, Gold, Silver
Ketchikan district	Craig (22.3, 9.2) approx.
MF-433, loc. 54	55°31'N, 132°25'W approx.

Summary: Vein carrying chalcopyrite and a little gold and silver follows a porphyry dike in metamorphosed greenstone with occasional bands of marble. Tunnel driven 135 ft. to undercut lode did not reach it. All work in early 1900's.

Wright and Wright, 1906 (B 284), p. 48 -- Vein follows one wall of a wide vertical porphyry dike striking N 65° E. Vein carries chalcopyrite and low gold and silver values. Country rock is "highly metamorphosed greenstone with occasional marble bands and bosses of diorite." Tunnel driven 135 ft. to undercut lode had not reached it in 1905.

Wright, 1907 (B 314), p. 68 -- Assessment work only, 1906. Tied up in litigation.

Wright and Wright, 1908 (B 347), p. 127 -- Same as Wright and Wright, 1906 (B 284), p. 48.

Berg and Cobb, 1967 (B 1246), p. 168 -- Vein adjacent to a porphyry dike carries chalcopyrite and a little gold and silver.

Tacoma — Copper, Molybdenum(?)

Ketchikan district — Craig (23.3, 9.4) approx.
MF-433, loc. 44 — 55°31'N, 132°20'W approx.

Summary: Open cuts at high-tide level and a short tunnel exposed small irregular patches and disseminations of chalcopyrite in garnet-epidote rock. All work in early 1900's. Molybdenite reported in an early report but not in later ones.

Wright and Wright, 1906 (B 284), p. 47 -- Peacock and Tacoma claims are on irregular and sporadic contact deposits; chalcopyrite, magnetite, and small amounts of molybdenite in gangue of garnet and epidote. On Tacoma claim are several short tunnels and open cuts. In 1905 considerable ore had been mined from Peacock or Tacoma or both and was awaiting shipment.

Wright and Paige, 1908 (B 345), p. 113-114 -- Same as Wright and Wright, 1908 (B 347), p. 121.

Wright and Wright, 1908 (B 347), p. 121 -- Open cuts on exposures that are covered at high tide; tunnel 60 ft. long 50 ft. above sea level. Chalcopyrite in garnet-epidote rock in small irregular patches and disseminated. No large ore masses have been found.

Wright, 1915 (P 87), p. 97 -- Same as Wright and Wright, 1908 (B 347), p. 121.

Teresa	Copper(?)
Ketchikan district	Craig (20.45, 1.45) 55°04'N, 132°38'W

Summary: Copper claim located in 1916 a mile north of Lime Point. No other data.

Chapin, 1918 (B 662), p. 69 -- Copper claim a mile north of Lime Point; located in 1916.

Texas	Copper
Ketchikan district MF-433, loc. 78	Craig (20.95, 4.2) approx. 55°13'N, 132°23'W approx.

Summary: Small contact-metamorphic copper deposit.

Wright and Wright, 1908 (B 347), p. 107-108 -- Contact metamorphic deposit on west slope of the granodiorite batholith east of Hetta Inlet. Little development; only small masses of [copper] ore have been exposed.

Wright, 1909 (B 379), p. 82 -- Some development, but no important discoveries, 1908.

Wright, 1915 (P 87), p. 65 -- Same as Wright and Wright, 1908 (B 347), p. 107-108.

(Tokeen) Lead

Ketchikan district Craig (11.95, 17.35) approx.
MF-433, loc. 2 55°59'N, 133°27'W approx.

Summary: Small galena-bearing vein; probably near contact between diorite and calcareous sedimentary rocks.

Houston and others, 1958 (B 1058A), p. 24 -- One small galena-bearing vein found; radioactivity did not exceed 0.001% eU.

Berg and Cobb, 1967 (B 1246), p. 178 -- Small galena-bearing vein at contact between diorite and calcareous sedimentary rocks.

Tolstoi — Copper, Iron

Ketchikan district — Craig (22.7, 11.25) approx.
MF-433, loc. 34 — 55°38'N, 132°22'W approx.

Summary: Low-grade magnetite-chalcopyrite masses. Very little exploration.

Wright and Paige, 1908 (B 345), p. 112 -- Same as Wright and Wright, 1908 (B 347), p. 127.

Wright and Wright, 1908 (B 347), p. 127 -- Low-grade magnetite-chalcopyrite masses similar to those at Iron Cap. No more than assessment work.

Wright, 1915 (P 87), p. 101 -- Same as above.

Triangle No. 2	Gold
Ketchikan district	Craig (26.0, 3.0) approx.
MF-433, loc. 94	55°09'N, 132°03'W approx.

Summary: Quartz and calcite in crystalline limestone reported to carry as much as 1.94 oz. gold a ton.

Brooks, 1902 (P 1), p. 80 -- Vein quartz interbanded with crystalline limestone strikes N 40° W, dips 35° NE, and reportedly contains as much as $40 [about 1.94 oz.] gold a ton; gangue quartz and calcite.

(Twelvemile Cr.) Copper

Ketchikan district Craig (19.7, 5.6)
MF-433, loc. 63 55°18'N, 132°42'W

Summary: Pyrite and chalcopyrite found in limestone quarries in 2 places.

Herbert and Race, 1964 (GC 1), p. 27 -- Pyrite and chalcopyrite found in limestone quarries in 2 places.
Berg and Cobb, 1967 (B 1246), p. 170 -- Same as above.

Uncle Sam — Copper, Gold(?)

Ketchikan district — Craig (22.75, 9.65)
MF-433, loc. 41 — 55°32'N, 132°23'W

Summary: Irregular masses of chalcopyrite and pyrite ore in a gangue of garnet, epidote, magnetite, and calcite. Country rock altered greenstone tuff intruded by syenite body and felsic and mafic dikes. Developed in early 1900's by open pits and about 800 ft. of underground workings. At least 350 tons of ore shipped in 1906; returned $22 a ton. Low gold values reported in one reference only. Includes references to White Eagle.

Brooks, 1902 (P 1), p. 101 -- On White Eagle claim country rock is jointed greenstone in which chalcopyrite bodies are separated by gangue, epidote, and vesuvianite. One body of about 2,000 cu. ft. of chalcopyrite ore was mined out. 2 tunnels and many surface improvements on property. Magnetite body exposed on mountain above one of tunnels.

Wright and Wright, 1906 (B 284), p. 47-48 -- Ore bodies are irregular shaped; chalcopyrite-magnetite with low gold values; have been exposed by 2 tunnels, a short shaft, and surface excavations. Probably formed in contact aureole of limestone and igneous rocks, which are altered diorite and felsite and diabase dikes.

Wright, 1907 (B 314), p. 67 -- 350 tons of ore shipped from White Eagle in early 1906; work then suspended.

Wright and Paige, 1908 (B 345), p. 107-108 -- Same as Wright and Wright, 1908 (B 347), p. 117.

Wright and Wright, 1908 (B 347), p. 117 -- Irregular masses of chalcopyrite-pyrite ore in gangue of garnet, epidote, magnetite, and calcite; country rock is chloritized and epidotized greenstone tuff underlain by intrusive syenite and crossed by small post-ore diabase dikes. Main ore body cut off by steep east-striking fault. Developed by open pits and about 800 ft. of tunnel and drifts. Ore mined and shipped in 1906-07.

Wright, 1915 (P 87), p. 94-95 -- Essentially the same as Wright and Wright, 1908 (B 347), p. 117 -- Mine has been closed since fall of 1907.

Warner and others, 1961 (B 1090), p. 5 -- Little or no production.
p. 132 -- Reference to Wright, 1915 (P 87), p. 95 -- Some magnetite exposed in pit, but virtually no dip-needle anomaly in area.

Berg and Cobb, 1967 (B 1246), p. 168 -- Has been minor production.

Bufvers, 1967 (SR 1), p. 4 -- Ore shipments to smelter in 1906 returned $22 a ton. Ore was a lens of pyrite and chalcopyrite 6-8 ft. wide; practically all mined out. Considerable magnetite present. Deposit discovered in 1899.

(Union Bay) Chromite, Iron, Platinum, Vanadium

Ketchikan district Craig (24.4-26.3, 13.35-14.65)
MF-433, loc. 113 55°44'-55°49'N, 132°00'-132°12'W

Summary: Pipe and large lopolithic offshoot of zoned ultramafic rock (dunite in center; pyroxenite and hornblende pyroxenite on periphery); pipe is about a mile in diameter; lopolithic body is 5 mi. by 3 mi. Intruded into a gabbro body that had intruded folded sedimentary rocks of probable Triassic and Cretaceous age. Magnetite is a primary constituent of the pyroxenite and occurs with chromite as disseminated crystals in dunite; chromite also in small (measured in inches) and discontinuous stringers in dunite. Anomalous amounts of platinum-group metals (mainly platinum) with iron and chromium in dunite; average contents of 0.093 ppm platinum and 0.023 ppm palladium; maxima of analyses were 29.000 ppm platinum (from hand-picked chromite), 0.200 ppm palladium, 0.062 ppm rhodium, and 0.215 ppm iridium. Deposit estimated to contain about a billion tons of material containing 18%-20% iron and a large(?) resource of vanadium. Includes references to (Mt. Burnett).

Buddington and Chapin, 1929 (B 800), p. 351-352 -- Ilmenitic magnetite associated with ultrabasic rocks. Considerable local magnetic variation.

Kennedy and Walton, 1946 (B 947-D), p. 80-83 -- Ultrabasic rocks form a composite stock about 7 mi. long and 1-2 mi. wide made up of diorite, gabbro, hornblendite, pyroxenite, wehrlite, and dunite surrounded by schist and in places overlain by Tertiary conglomerate and sandstone. Central part of mass is dunite, pyroxenite, and smaller amounts of wehrlite; separated from surrounding schists by hornblendite and marginal facies of pyroxenite. Diorite borders ultrabasic mass on south; may be part of a younger stock. Considerable magnetite in pyroxenite of border zone. Small pods of chromite scattered through dunite, particularly along cracks; about 5% of the rock. One pod contains about 25 tons of chromite; chrome-iron ratio is 0.50 to 1.26. Considered not economic as a source of chrome.

Walton, 1951 (OF 126), p. 227-231 -- Most of data the same as in Kennedy and Walton, 1946 (B 947-D), p. 80-83. Dunite core; out from it are successive shells of pyroxenite, hornblendite, and gabbro.

Twenhofel, 1952 (C 252), p. 11 -- Occurrence of chromite; considered too small to be of economic importance.

Kaufman, 1958 (IC 7844), p. 11 -- Magnetite-bearing pyroxenite.

Condon, 1961 (B 1108-B), p. B35-B36 -- Large potential resource of titaniferous magnetite in mafic intrusive body.

Noel, 1966, p. 64 -- Magmatic segregation deposit with magnetite largely confined to the peripheral pyroxenite and hornblende pyroxenite layers of an ultrabasic lopolith. Estimated to contain a billion tons with 18%-20% total iron and over 2% titanium.

Berg and Cobb, 1967 (B 1246), p. 183 -- Magmatic iron deposit in pyroxenite in a composite ultramafic lopolith that intruded gabbro and metamorphic rocks. Contains 10%-25% magnetite, some ilmenite, and a little chromite. In an area of about 8 sq. mi. pyroxenite is about 20% (by weight) magnetite.

(Union Bay) -- Continued

Clark and Greenwood, 1972 (P 800-C), p. C21-C27 -- Body of gabbro, approximately circular in plan and about 6 mi. in diameter intruded folded sedimentary rocks of probable Triassic and Cretaceous age. Gabbro intruded by a vertical pipe about 1 mi. in diameter to which is attached a lopolithic offshoot about 5 mi. long and 3 mi. wide; concentric zoning from dunite in center outward to pyroxenite or hornblende pyroxenite on the periphery. Magnetite is a primary constituent of pyroxenite unit. Dunite core is strongly serpentinized; magnetite and chromite in disseminated subhedral to euhedral fine grains; chromite also in pods 2-6 in. long and 1/4-4 in. in short dimension and as discontinuous locally complexly folded stringers. Serpentinization caused 6%-20% increase in volume of dunite.

Clark and Greenwood, 1972 (P 800-C), p. C159-C160. -- Of platinum-group metal-bearing samples, the average metal contacts were 0.093 ppm platinum, and 0.023 ppm palladium. The maxima were 1,600 ppm platinum, 0.200 ppm palladium, 0.062 ppm rhodium, and 0.215 ppm iridium. Positive correlation between platinum-palladium and iron; associated with chromite and magnetite in dunite. Platinum-group metals in concentrations of possible economic significance.

Page and others, 1973 (P 820), p. 540 -- Anomalous concentrations as high as 29 ppm in chromite-bearing dunite core.

p. 542-543 -- Pt-group average concentration shown in table as 0.093 ppm platinum and 0.023 ppm palladium; maximum concentrations shown as 29,000 ppm platinum, 0.200 ppm palladium, 0.062 ppm rhodium, and 0.215 ppm iridium. [Table in Clark and Greenwood, 1972 (P 800-C), p. C159, shows maximum platinum as 1.600 ppm, which was from whole-rock analysis; 29 ppm (this report) was from analysis of hand-picked chromite (oral commun., A. L. Clark, 6/28/78).] Strong correlation of platinum-group metals with iron and chromium in dunite.

Fischer, 1975 (P 926-B), p. B5 -- Table shows 18%-20% Fe, resource of 1,000 million tons, and a large(?) vanadium resource in a disseminated deposit in mafic and ultramafic host rock.

Valparaiso — Copper, Gold, Lead, Silver, Zinc

Ketchikan district — Craig (25.3-25.5, 1.9-2.1)
MF-433, loc. 93 — 55°09'N, 132°05'-132°06'W

Summary: Quartz-breccia veins in limestone carry gold, pyrite, chalcopyrite, tetrahedrite, galena, sphalerite, and (near surface) secondary copper and iron minerals. Some of veins bounded by faults with gouge. Calcite and, rarely, muscovite in gangue. Four or more shafts and several levels to a depth of at least 400 ft. Mill on property. Discovered in about 1900 and mined until about 1933 (test shipment). Mine put in shape twice since then, but not put in production. Some of ore was very rich; some ore mined in early 1900's ran $200-$250 a ton in gold (at $20.67 an ounce) and silver. Samples of veins and old dumps taken in 1934 ran $5.50 to $42.07 a ton in gold and silver. Includes references to: Dolomi Gold Mines, Inc., Jessie, Lakeside, Paul, Pauline, Princeton Mining and Milling Co.

Brooks, 1902 (P 1), p. 82-84 -- Several claims near Paul Lake. Country rock is limestone. Ore deposits are quartz veins (some bounded on one side by a fault) and mineralized wall rock. Ore minerals include free gold, tetrahedrite, galena, pyrite, chalcopyrite, and sphalerite. Most veins are about 3 ft. thick; one is 12 ft. wide at the surface. Has been mining; one shipment is reported to have yielded $185 [about 8.95 oz. if all value was in gold] a ton.

Wright and Wright, 1905 (B 259), p. 65 -- Quartz ledge 6-8 ft. thick in crystalline limestone; richest ore in streaks on footwall; considerable ore running $200 -$250 a ton in gold and silver has been mined. Ore is free gold, tetrahedrite, and pyrite in quartz and calcite gangue. 3 inclined shafts and a few hundred feet of drifts and stopes, 1904.

Wright and Wright, 1906 (B 284), p. 43 -- Vein trends N 55°-60° W and dips 35°-45° NE. Quartz vein in contorted marble. High gold values in shoots which pitch 70° E.

Wright, 1907 (B 314), p. 62 -- In 1906 shaft was deepened to 180 ft.; pay streak reported to have widened from 16 in. to nearly 30 in. On Paul and Lakeside claims inclined shafts were sunk 60 ft. and drifts begun.

Wright, 1908 (B 345), p. 91-92 -- Mining, 1907. Vein attitude on Valparaiso claims given as strike N 55° W, dip 30°-50° NE. Vein 4-10 ft. wide.

Wright and Wright, 1908 (B 347), p. 173-174 -- Main workings (2 shafts and 3 levels of drifts) on vein that strikes N 55° W and dips 30°-50° NE. Central part of vein is quartz-cemented limestone breccia with veins of massive quartz; ore shoot in footwall. Fault planes marked by gouge parallel to vein. Wallrock limestone. Ore minerals are tetrahedrite carrying free gold, chalcopyrite, and pyrite. Similar veins on Paul and Jessie claims carry free gold, pyrite, chalcopyrite, tetrahedrite, galena, and sphalerite and (at surface only) malachite, azurite, and limonite; explored by surface cuts and shafts 10-60 ft. deep.

Wright, 1909 (B 379), p. 73 -- Further shaft sinking and extension of drifts , 1908.

Valparaiso -- Continued

Brooks, 1913 (B 542), p. 33 -- Work continued, 1912; 10-stamp mill erected.
Brooks, 1914 (B 592), p. 60 -- Stamp mill operated, 1913.
Smith, 1914 (B 592), p. 80-81 -- Country rock is limestone with some silicified zones. Hanging wall of ore body is a "strongly marked slip seam," the footwall is determined by assay. 5-stamp mill. On Pauline claim muscovite is in the gangue.
Brooks, 1915 (B 622), p. 42 -- 450 ft. of drifting done, 1914. Mill did not operate.
Chapin, 1916 (B 642), p. 81 -- Development, but little or no production, 1914-16.
Smith, 1917 (BMB 142), p. 30 -- High-grade gold-bearing quartz ore at contact between schist and dolomitic limestone. Ore body has been opened to a depth of several hundred feet. 10-stamp mill on property.
Smith, 1917 (BMB 153), p. 27 -- Vein from a seam to 14 ft. wide; averages 4-5 ft.; strikes eastward, dips about 30° N. Shaft sunk on ore for a little more than 300 ft.; 4 levels from it. Data on mill and other equipment.
Smith, 1932 (B 824), p. 18 -- Had been production in 1928. None in 1929; may have been some development or assessment work.
Smith, 1933 (B 844-A), p. 16 -- Some work, including an encouraging test run of ore, 1931.
Smith, 1934 (B 864-A), p. 17 -- A very small amount of gold recovered from a test shipment, 1933.
Smith, 1936 (B 868-A), p. 17 -- Considerable preparatory and development work, 1934.
Smith, 1937 (B 880-A), p. 18 -- Preparatory and development work slowed by a fire that destroyed part of surface plant, 1935.
Noel, 1966, p. 54 -- Gold has been produced.
p. 61 -- Reference to Brooks, 1902 (P 1).
Berg and Cobb, 1967 (B 1246), p. 174 -- Source of most of production from Dolomi area. 4 or more shafts and several levels. Opened about 1900; worked as recently as 1933 (possibly for a mill test). One early lot of ore said to have yielded $185 a ton in gold and silver.
Bufvers, 1967 (SR 1), p. 24-26 -- Mainly historical and anecdotal data. Mining ceased in about 1932; was put in shape twice since then, but was never put into production. Assays of samples of veins and dumps (taken in 1934) showed gold values from $5.50 to $42.07 a ton in gold and silver.
Herreid, 1967 (GR 27), p. 11-13 -- Data summarized from older reports summarized above.

Venus	Copper, Gold, Silver, Zinc
Ketchikan district	Craig (20.5, 10.95)
MF-433, loc. 26	55°37'N, 132°36'W

Summary: Located by magnetic survey in 1904. Pyrrhotite-chalcopyrite-pyrite-sphalerite vein with quartz-calcite gangue in a shear zone in greenstone carries a little gold and as much as one oz. per ton silver. Explored in early 1900's by 800 ft. of trenches and one or two short adits. No known production. See also (Hole in the Wall); there is a different Venus claim there.

Wright, 1907 (B 314), p. 68 -- Large, low-grade body of pyrrhotite-chalcopyrite ore exposed by stripping and 2 short tunnels, 1906.

Wright and Paige, 1908 (B 345), p. 112 -- Same as Wright and Wright, 1908 (B 347), p. 125.

Wright and Wright, 1908 (B 347), p. 125 -- Located in 1904; magnetic survey. Explored by pit, trench, and 75-ft. tunnel that exposes ore at face. Ore in a shear zone in greenstone tuff and interbedded quartzite. Considerable sphalerite and pyrrhotite associated with [chalcopyrite] ore; gangue is quartz and calcite.

Wright, 1909 (B 379), p. 79 -- Assessment work, 1908.

Wright, 1915 (P 87), p. 73 -- Beds of conglomerate interstratified with banded slate and graywacke; some hornblende developed.

p. 87 -- Shear-zone deposit.

p. 98 -- Ore bodies in area discovered in 1904.

p. 100-101 -- Same as Wright and Wright, 1908 (B 347), p. 125.

Warner and others, 1961 (B 1090), p. 5 -- Little or no production.

p. 37 -- Only vein deposit with sphalerite in Kasaan area.

p. 42-43 -- Hypothermal veins that are the latest in the region carry mainly pyrrhotite, pyrite, and chalcopyrite.

p. 117-118 -- Prospect explored by about 800 ft. of trenches and a short adit. Country rock mainly greenstone; one small outcrop of diorite. Pyrrhotite vein containing sphalerite and chalcopyrite with quartz, pyrite, and calcite in gangue is from a few inches to 6 ft. (average about 2-1/2 ft.) thick; strikes N 85° E, dips steeply S; exposed for 200 ft. along stike in one trench and may extend another hundred feet. 3 samples contained 0.01 oz. gold a ton, 0-1.00 oz. silver a ton, 0.91%-1.78% copper, 33.1%-52.4% iron, and 0.13%-2.01% zinc.

Berg and Cobb, 1967 (B 1246), p. 165 -- Sphalerite has been found.

Wakefield	Copper, Gold(?), Silver(?)
Ketchikan district	Craig (24.9, 1.6) approx.
MF-433, loc. 103	55°04'N, 132°11'W approx.

Summary: Lenticular mass of chalcopyrite 10 ft. wide in belt of mineralized schist that contains much pyrite with quartz and epidote. Shaft sunk 50 ft. in early 1900's. Assessment work reported as late as 1915. May be a little gold and silver.

Wright and Wright, 1906 (B 284), p. 50 -- Claims located in 1904. Shaft sunk 50 ft. and drift run from it. Ore and its mode of occurrence similar to those at Niblack. Low-grade chalcopyrite-pyrite ore with small values in gold and silver in a band of mineralized schist.

Wright and Wright, 1908 (B 347), p. 132 -- Country rock is greenstone schist and altered slates and grits. Ore body is a lenticular mass of chalcopyrite 10 ft. wide (other dimensions undetermined). Belt of mineralized schist is 60 ft. wide and contains much pyrite with quartz and epidote. [No mention of gold or silver values mentioned in Wright and Wright, 1900 (B 284), p. 50.]

Chapin, 1916 (B 642), p. 90 -- Assessment work, 1915.

Wallace	Copper, Iron
Ketchikan district	Craig (22.7, 11.25) approx.
MF-433, loc. 34	55°38'N, 132°22'W approx.

Summary: Small scattered masses of chalcopyrite in vein of garnet-epidote rock. Very little exploration.

Wright and Paige, 1908 (B 345), p. 111-112 -- Same as Wright and Wright, 1908 (B 347), p. 127.

Wright and Wright, 1908 (B 347), p. 127 -- Small scattered masses of chalcopyrite ore in vein of garnet-epidote rock that strikes N 15° W and dips 20° SW and associated with magnetite elsewhere on property. Has not been enough work to determine the extent of the deposits.

Wright, 1915 (P 87), p. 101 -- Same as above.

Washington	Copper(?), Gold, Silver(?), Zinc(?)
Ketchikan district	Craig (25.3, 3.4) approx.
MF-433, loc. 91	55°10'N, 132°09'W approx.

Summary: 10-ft.-wide band of brecciated limestone and schist contains a network of quartz veinlets with sulfides (probably pyrite, chalcopyrite, and sphalerite) and gold (assay of $4.80 [about 0.23 oz.] a ton reported). See also Oregon (Kitkun Bay).

Brooks, 1902 (P 1), p. 85 -- Maggie May claim[later restaked as Oregon and Washington] is on a vein of pyritiferous vitreous quartz that strikes N 30°E and dips 75° NW along contact between crystalline limestone footwall and chloritic schist hanging wall. Assay said to have given $4.80 a ton [in gold?].

Wright and Wright, 1908 (B 347), p. 168-169 -- 10-ft. band of brecciated limestone and schist. Strikes N 45° E [dip not given]. Traversed by a network of quartz stringers and veinlets carrying small amounts of sulfides.

Bufvers, 1967 (SR 1), p. 26 -- At one time was owned by a prospector named Admons.

Wednesday	Gold(?)
Ketchikan district	Craig (25.4, 1.9) approx. 55°08'N, 132°05'W approx.

Summary: Vein (mainly calcite) in schist band in crystalline limestone. No data on metal content.

Brooks, 1902 (P 1), p. 83 -- South of Paul Lake. Vein, mainly calcite, about 3 ft. thick in schist in country rock of crystalline limestone containing bands of mica schist. Vein strikes N 50° E, dips 45°-60° S. Exposed in small cut.

Welcome	Gold(?)
Ketchikan district	Craig (26.0, 3.0) approx.
MF-433, loc. 94	55°09'N, 132°03'W approx.

Summary: Shear zone along contact between limestone and schist (both silicified) contains pyrite and possibly free gold.

Brooks, 1902 (P 1), p. 80 -- Mineralized shear zone along contact between limestone and graphitic schist (both silicified) carries pyrite; free gold reported. Only development is a small pit.

Wellfleet	Gold
Ketchikan district	Craig (26.2, 2.9) approx.
MF-433, loc. 96	55°09'N, 132°03'W approx.

Summary: Quartz ledge 20-25 ft. wide in graphitic schist contains pyrite and is said to carry about 0.15 oz. gold a ton. Last reported activity was assessment work in 1915.

Brooks, 1902 (P 1), p. 82 -- Quartz ledge 20-25 ft. wide in graphitic schist contains graphite and pyrite and is said to carry $2-$4 a ton in gold.

Chapin, 1916 (B 642), p. 81 -- Assessment work, 1915.

Westcott	Copper
Ketchikan district	Craig (25.3, 1.6) approx.
MF-433, loc. 104	55°04'N, 132°09'W approx.

Summary: Claim on which is a body of pyritic material 120 ft. across containing a little chalcopyrite in a siliceous gangue; may be part of Niblack property.

Chapin, 1916 (B 642), p. 90 -- Near Niblack [may be part of property]. Body of low-grade ore 120 ft. across in quartz-sericite schist is mainly pyrite, but contains a little chalcopyrite; siliceous gangue.

Westlake — Gold, Lead, Zinc

Ketchikan district — Craig (25.1, 2.25) approx.
MF-433, loc. 102 — 55°06'N, 132°10'W approx.

Summary: Quartz veins along and near contact between granite and schist contain gold, galena, sphalerite, and pyrite. 2 generations of quartz in some veins. Most exploration was in the early 1900's. Work reported in 1918 may have been at Lucky Boy, which was once owned by Westlake. Includes reference to: Blue Bird, Homestake, Little Annie, Little Annis, Sleepy Eye. See also Lucky Boy.

Brooks, 1902 (P 1), p. 78 -- On Homestake claim small quartz veinlets in granite cut by an andesitic dike are in a zone 6 ft. wide [no data on possible gold content.] On Bluebird and Little Annie claims a quartz vein along contact between granite and chloritic schist carries free gold; assays of $40-$60 [a ton] reported.

Wright and Wright, 1908 (B 347), p. 176 -- On Little Annis claim quartz stringer veins of variable width in granite near contact with schist strike N 30° E, dip 70° SE, and contain a little pyrite and (reportedly) a little gold. On Blue Bird (Sleepy Eye) claim a vein in mineralized schist strikes N 60° W, dips 55° SW, and contains galena, sphalerite, pyrite, and free gold in a quartz and graphite gangue. Schist is banded and varies from phyllite to green chlorite schist. Vein has been fractured and recemented by later quartz fillings. Shaft has been sunk 40 ft.

Martin, 1920 (B 712), p. 28 -- Drifts extended; ore-treatment experiments; 1918. [May really refer to Lucky Boy].

Berg and Cobb, 1967 (B 1246), p. 175 -- Staked in about 1900 on quartz veins potentially valuable for gold; sulfides also present.

Bufvers, 1967 (SR 1), p. 27 -- Blue Bird staked in 1901. Shaft sunk 40 ft. in mineralized schist; probably passed through flat-lying vein [without realizing it?] Galena, sphalerite, pyrite, and free gold in quartz and graphite gangue. Dirt from surface of vein said to have run $0.25 a pan in gold.

Yellowstone	Copper, Gold
Ketchikan district	Craig (15.1, 1.7) approx.
MF-433, loc. 107	55°05'N, 133°10'W approx.

Summary: In 1909-10 a little work was done on auriferous chalcopyrite-pyrrhotite veins; quartz-calcite gangue.

Knopf, 1910 (B 442), p. 143 -- Work in 1909. Parallel lodes of auriferous chalcopyrite-pyrrhotite ore said to have been found.
Knopf, 1911 (B 480), p. 102 -- Minor development, 1910.
Berg and Cobb, 1967 (B 1246), p. 177 -- On Shellhouse, Miller, and Yellowstone properties quartz-calcite veins carry chalcopyrite and pyrrhotite.
Bufvers, 1967 (SR 1), p. 20 -- Was discovered by Aaron Shellhouse.

Young	Copper
Ketchikan district	Craig (20.5, 10.95) approx.
MF-433, loc. 26	55°37'N, 132°36'W approx.

Summary: Calcite veins and adjacent black slate country rock in a shear zone next to a porphyry dike carry chalcopyrite and pyrite; very little development.

Chapin, 1919 (B 692), p. 86-87 -- Northwest-striking shear zone. Ore in calcite veins that follow a porphyry dike. Country rock is black slate. Veins and black slate next to them carry chalcopyrite and pyrite. Also some tiny quartz veinlets. Exposed along a stream; only development is a little stripping.

Unnamed occurrence	Copper
Ketchikan district	Craig (19.9, 5.5) 55°16'N, 132°40'W

Summary: Chalcopyrite veins in stream-bed float.

Herreid and Trible,1973 (GC 27), sample 545 -- Stream-bed float is siltstone, marble, and dolomite with chalcopyrite veins.

Unnamed occurrence	Copper
Ketchikan district	Craig (19.8, 5.0) 55°16'N, 132°41'W

Summary: Chalcopyrite in till from stream bed.

Herreid and Tible, 1973 (GC 27), sample 555 -- Marble, phyllite, greenstone, and dolomite with chalcopyrite in till from stream bed.

Unnamed occurrence	Copper
Ketchikan district	Craig (10.2, 4.8)
MF-433, loc. 9	55°16'N, 133°38'W

Summary: Pyrite-pyrrhotite and chalcopyrite in quartzite.

Clark and others, 1970 (OF 419), p. 4 (Sample 27) -- Quartzite with pyrite, pyrrhotite and chalcopyrite.

Unnamed occurrence	Copper
Ketchikan district	Craig (10.2, 4.8)
MF-433, loc. 9	55°16'N, 133°38'W

Summary: Pyrite and minor chalcopyrite in phyllite.

Clark and others, 1970 (OF 419), p. 4 (sample 31) -- Phyllite with pyrite and minor chalcopyrite.

Unnamed occurrence	Copper
Ketchikan district	Craig (19.85, 5.55)
MF-433, loc. 64	55°19'N, 132°41'W

Summary: Chalcopyrite in 1-in.-thick quartz vein in deformed lava.

Herreid and Rose, 1966 (GR 17), p. 29 -- Chalcopyrite in quartz vein about 1 in. thick in strongly deformed amygdaloidal lava.

Unnamed occurrence	Copper
Ketchikan district	Craig (18.75, 5.8)
MF-433, loc. 61	55°19'N, 132°47'W

Summary: Pyrite and minor chalcopyrite in calcareous greenstone.

Clark and others, 1970 (OF 417), p. 5 (sample 60) -- Calcareous greenstone with pyrite and minor chalcopyrite.

Unnamed occurrence	Copper
Ketchikan district	Craig (18.45, 6.8)
MF-433, loc. 59	55°22'N, 132°48'W

Summary: Pyrite and minor chalcopyrite in greenschist.

Clark and others, 1970 (OF 417), p. 4 (sample 48) -- Greenschist with pyrite and minor chalcopyrite.

Unnamed occurrence	Copper
Ketchikan district	Craig (17.9, 6.75)
MF-433, loc. 58	55°22'N, 132°52'W

Summary: Pyrite and minor chalcopyrite in greenschist.

Clark and others, 1970 (OF 417), p. 4 (sample 49) -- Greenschist with pyrite and minor chalcopyrite.

Unnamed occurrence	Copper
Ketchikan district	Craig (13.6, 7.2)
MF-433, loc. 10	55°24'N, 133°18'W

Summary: Pyrite, pyrrhotite, and chalcopyrite in tactite.

Clark and others, 1970 (OF 418), p. 3 (sample 18) -- Tactite with pyrite, pyrrhotite, and chalcopyrite.

Unnamed occurrence	Copper
Ketchikan district	Craig (13.6, 7.2)
MF-433, loc. 10	55°24'N, 133°18'W

Summary: Pyrite and chalcopyrite in diorite.

Clark and others, 1970 (OF 418), p. 3 (sample 19) -- Diorite with pyrite and chalcopyrite.

Unnamed occurrences	Copper
Ketchikan district	Craig (14.05, 7.55)
MF-433, loc. 11	55°25'N, 133°15'W

Summary: Minor pyrite and chalcopyrite in diorite.

Clark and others, 1970 (OF 418), p. 4 (samples 27, 28) -- Diorite with minor pyrite and chalcopyrite.

Unnamed occurrence	Copper
Ketchikan district	Craig (18.4, 8.3)
MF-433, loc. 16	55°28'N, 132°59'W

Summary: Minor chalcopyrite in greenstone.

Clark and others, 1970 (OF 417), p. 3 (sample 14) -- Greenstone with pyrite and minor chalcopyrite.

Unnamed occurrence	Copper
Ketchikan district	Craig (10.25, 8.35)
MF-433, loc. 5	55°29'N, 133°38'W

Summary: Quartz-chalcopyrite pod, probably in argillite.

Clark and others, 1970 (OF 419), p. 3 (sample 3) -- Quartz-chalcopyrite pod [probably in argillite].

Unnamed occurrence	Copper, Gold, Lead, Silver, Zinc
Ketchikan district	Craig (19.25, 8.7)
MF-433, loc. 20 (approx.)	55°29'N, 132°44'W

Summary: Adit (now caved 8 ft. from portal) was driven on a quartz vein from 1/2 to 3 inches wide in granodiorite about 50 ft. from its contact with graywacke. Vein contains galena, sphalerite, chalcopyrite, and pyrite, and (by assay) 0.88 oz. gold and 5.88 oz. silver per ton.

Herreid and Rose, 1966 (GR 17), p. 15 -- Caved adit near Cascade driven in granodiorite along a quartz vein 1/2 to 3 in. wide that strikes N 50° W and dips 80° SW. Vein contains galena, sphalerite, chalcopyrite, and pyrite; assay showed 0.88 oz. gold and 5.88 oz. silver a ton. Adit is about 50 ft. from contact between granodiorite and graywacke; caved 8 ft. from portal.

Unnamed occurrence	Copper, Lead
Ketchikan district	Craig (19.35, 9.4)
MF-433, loc. 22	55°31'N, 132°43'W

Summary: 100-ft.-wide zone contains thin quartz-carbonate veins, probably in black slate and/or argillite, with pyrrhotite, chalcopyrite, and galena in them.

Herreid and Rose, 1966 (GR 17), p. 26 -- Zone 100 ft. wide contains numerous lenses of pyrite and quartz and occasional thin veins containing pyrrhotite, chalcopyrite, and galena in a quartz-carbonate gangue. Country rock largely black slate and argillite.

Unnamed occurrence	Lead, Zinc
Ketchikan district	Craig (20.75, 5.55) approx.
MF-433, loc. 68	55°18'N, 132°35'W approx.

Summary: Sphalerite and galena in crystalline limestone on ridge 1-1/2 mi. NE of Sulzer.

Chapin, 1918 (B 662), p. 68-69 -- Sphalerite and galena in a limy matrix. Country rock is crystalline limestone, black slate, and quartzite, which strikes N 70° W and dips 70° NE. Ore deposit in limestone. On ridge 1-1/2 mi. NE of Sulzer.

Unnamed occurrence	Molybdenum
Ketchikan district	Craig (21.15, 4.05) 55°13'N, 132°33'W

Summary: Molybdenum minerals in diorite skarn.

Herreid and Trible,1973 (GC 27), sample 599 -- Molybdenum minerals in diorite skarn.

Unnamed occurrence	Zinc
Ketchikan district	Craig (13.6, 7.2)
MF-433, loc. 10	55°24'N, 133°18'W

Summary: Pyrite-sphalerite veinlet, probably in hornfels.

Clark and others, 1970 (OF 418), p. 3 (sample 17) -- Pyrite-sphalerite veinlets [probably in hornfels].

Synonyms, Claim Names, Operators, and Owners

Many mines and prospects have undergone changes in both their own names and in the names of their operators and owners. All names that appear in the cited references appear in this summary either in the first section as occurrence names or in this as synonyms. Many descriptions of some groups of deposits give information applicable to most or all of the individual occurrences, so the names of all the prospects or mines and their owners and operators are in this section with a notation to refer to the description of the entire group, which commonly is a geographic location and therefore shown in parentheses.

Adkins -- see Golden Fleece
Admons -- see Washington
Alaska -- see Helm Bay King
Alaska B.C. Mining Co. -- see Valparaiso
Alaska British Columbia Gold Mines, Ltd. -- see Valparaiso

Alaska (Consolidated) Copper Co. -- see Copper Mountain, Rush & Brown
Alaska Consolidated Mining & Smelting Co. -- see Copper Mountain
Alaska Galena Co. -- see Moonshine (Cholmondeley Sound)
Alaska Gold & Metals Co. -- see Rush & Brown, Salt Chuck
Alaska Industrial Co. -- see Green Monster, Jumbo (Hetta Inlet)

Alaska-Kassan Gold Mining Co. -- see Dawson
Alaska Metals (Mining) Co. -- see Corbin
Alaska Palladium (Mining) Co. -- see Salt Chuck
Alaska Tidewater Co. -- see Florence, Teresa
Alexandria -- see Alexander

Allen & Angelson -- see Stumble-On
Allison, Stedman & Whitney -- see Dawson
Anderson (Kasaan Peninsula) -- see Poorman
Andrew -- see Rich Hill
Andrews -- see Mount Andrew

Annette -- see Flagstaff
Aus -- see Stevenstown
Baker (& Allison) -- see Puyallup
Baranovich -- see Copper Queen
Bawden -- see Crackerjack, Dawson

Beulah -- see Golden Fleece
Black Warrior -- see Green Monster
(Blanket I.) -- see (Flat I.)
Blue Bird -- see Westlake
Blue Jay (Kasaan Peninsula) -- see Stevenstown

Bradford -- see Niblack
Bradley -- see London
Braintree -- see Crackerjack
Brice -- see Houghton
Brown -- see Stumble-On

Brown-Alaska (Mining) Co. -- see Crackerjack, Mamie, Stevenstown
Brown & Metz -- see (Noyes I.)
Brown & Newell -- see Brown & Metzdorf
Brown & Smith -- see Puyallup
Buffer -- see Rich Hill

Bunard -- see Copper Queen
Burked Lang -- see Burke & Lang
Carlson -- see Cymru
(Chomley) -- see Moonshine (Cholmondeley Sound)
Chomley Mining Co. -- see Moonshine (Cholmondeley Sound)

Cimru -- see Cymru
Clifton -- see Lucky Boy
Coleman (and associates) -- see Blackbird, Kansas, Poorman
Commander -- see Lucky Nell
Commonwealth -- see Mount Andrew

Complex -- see Lucky Boy
Consolidated Mining & Smelting Co. of Canada -- see Salt Chuck
Conumdrum -- see Lookout
Copper (Lake Bay) -- see McCullough
Copper Chief -- see Niblack

Copper Cliff -- see Dama
Copper Harbor Co. -- see Copper Mountain
Copper Lake -- see Golden Fleece
Coppermount -- see Copper Mountain
(Copper Mtn.) -- see Copper Mountain, Jumbo (Hetta Inlet)

Coronation Island Mining Co. -- see (Coronation I.)
Corwin -- see Corbin
Cuprite Copper Co. -- see Houghton
Cuprite (Mining Co.) -- see Houghton
Cymra -- see Cymru

Davis -- see Dawson
Dawson & Wooten -- see Dawson
Dean -- see It
de Nomie (& Bradford) -- see Falgstaff, (Palmer Cove)
Detlifson -- see Lucky Nell

Diamond B. -- see Green Monster
Dolomi Gold Mines, Inc. -- see Valparaiso
Dunton -- see Dawson
Dutton -- see Dawson
Eagle's Nest -- see Alarm, It

East Mount Andrew -- see Mount Andrew
(Egg Harbor) -- see (Coronation I.)
Ella -- see Marion
Eureka -- see (Hole in the Wall)
Excelsior -- see Cymru

Fawn -- see Kid
Fickert & Allison -- see Mamie
Flora (& Nellie) -- see Luchy Nell
Forest -- see Niblack
Fortuna -- see Fortune

Fredricks -- see (Hole in the Wall)
Freeburn & Silverman -- see Mamie
Free Gold -- see (Helm Bay)
Frisco (Dora Lake) -- see Lucky Boy
Fuller -- see Dolly Varden

George -- see Dawson
Gervais -- see Puyallup
Gervais & Crowell -- see Lucky Nell
Gervais & Matuska -- see Lucky Nell
Gervais, Lynch & James -- see Lucky Nell

Glory -- see Mount Andrew
Goodenough -- see Dawson
Goodluck -- see Mount Andrew
Goodro (Mining Co.) -- see Salt Chuck
Gopher -- eee Haida

Goshen -- see Jumbo (Hetta Inlet)
Graimes -- see Uncle Sam
Granby Consolidated Mining, Smelting & Power Co. (Ltd.) -- see It, Mamie, Rich Hill, Stevenstown
(Green Monster Mtn.) -- see Green Monster
Grindall Mining & Smelting Co -- see Peacock (W. of Mt. Andrew)

Guzman -- see Valparaiso
Hadley (Consolidated) Copper Co. -- see Stevenstown
Hal -- see Mount Andrew
Hardy -- see Dawson
Harris -- see Dawson

Harris Creek -- see Dawson
Harris River -- see Dawson
Hautop -- see Independent
Heckman -- see Golden Fleece, Khayyam
Hendy -- see Dawson

Hickman & Co. -- see Khayyam
Hill, Calhoun & Tucker -- see Big Harbor
Hilma -- see (Hole in the Wall)
Hollis -- see Crackerjack
Homestake -- see Westlake

Hope (Harris Cr.) -- see Puyallup
Hope (Moira Sound) -- see Navaho
Horseshoe -- see McCullough
Howard & Bufvers -- see Khayyam
Howbuff -- see Khayyam

Humboldt -- see Dawson
Hyda -- see Haida
Idaho -- see Lucky Boy
Idela -- see Rex
Index -- see Sultana

Indiana -- see Copper Mountain
Interval -- see Rich Hill
Iola -- see Green Monster
Iron & Copper -- see Niblack
Iron Cliff -- see Rush & Brown

Iron Creek -- see Venus (Karta Bay)
Iron Crown (Tolstoi Mtn.) -- see Iron Cap
Iron Mast -- see Stumble-On
Jackson -- see McCullough
Jefferson -- see Niblack

Jem -- see Mount Andrew
Jessie -- see Valparaiso
Jim -- see Mount Andrew
Johnlee -- see Stumble-On
Johnson -- see Valparaiso

Joker -- see Salt Chuck
Judge -- see Niblack
Julia -- see Dawson
(Jumbo Basin) -- see Jumbo (Hetta Inlet)
Kasaan Bay Mining Co. -- see Copper Queen

Kasaan Gold (Mining) Co. -- see Dawson
Kasaan Mines -- see Dawson
Kassan (Gold) Mining Co. -- see Dawson
Kennecott Copper Corp. -- see (Baker I.)
Keokuk -- see Dawson

Kiam -- see Khayyam
Kitkun, Adkins & Watson -- see Hula Hula
Kirman -- see Poorman
Knapp -- see Moonshine (Cholmondeley Sound)
Knight -- see Golden Fleece

Knuckolls -- see Cascade
Koel -- see Salt Chuck
Lady of the Lake -- see Lucky Boy
Lake Bay -- see McCullough
Lakeside -- see Valparaiso

Lake View -- see Stumble-On
Lane -- see Crackerjack, Golden FLeece, Puyallup
Last Chance -- see Dawson, Flagstaff
Lavina -- see Shelton
LeBrandt & Redienloe -- see Cascade

Libe -- see Blue Jay (Helm Bay)
Lichtenstadter -- see Constitution, Mount Andrew
Libe -- see Blue Jay (Helm Bay)
Lindeman & Ulander -- see Brown & Metzdorf, Independent
Little Annie -- see Westlake

Little Annis -- see Westlake
London -- see Keystone
Luck, Erickson & Adams -- see Puyallup
Lucky Jack -- see Puyallup
Luella -- see Niblack

Maggie May -- see Oregon, Washington
Magnet -- see Rich Hill
Mahoney -- see Iron Cap
Mahoney, McGann & Coleman -- see Independent
Mammoth -- see Haida, Lookout, Stumble-On

Matuska -- see Cascade
Mayflower -- see Mount Andrew
McCuen -- see Gladstone
McCann & Bell -- see Haida
McGilveny -- see Independent

McGilvery -- see Independent
McKay -- see Rich Hill
McKenzie -- see Khayyam
McLeod -- see (Flat I.)
McMicken -- see Crackerjack

Metzdorf -- see Haida
Minnetonka -- see Lucky Boy
Moeser -- see Venus
Moira Copper Co. -- see Wakefield
Moquist -- see Copper Center

Mount Andrew Iron & Copper Co. -- see Mount Andrew
Mount Andrew Mining Co. -- see Mount Andrew
(Mt. Burnett) -- see (Union Bay)
Munoz -- see (North Pole Hill)
Myrtle -- see Niblack

Nellie -- see Lucky Nell
Nesbitt (& King) -- see Lucky Jim
New York -- see Copper Mountain
Nichols -- see Constitution, It
Northland (Development Co.) -- see Big Harbor

North Star -- see Mount Andrew
Nuckolls -- see Cascade, (Hole in the Wall)
(Nutkwa Lagoon) -- see Marion
Nutqua Gold Mining Co. -- see Marion
Olsen -- see Valparaiso

Omar Mining Co. -- see Khayyam
Oregon (Dora Lake) -- see Lucky Boy
Oregon (Hetta Inlet) -- see Copper Mountain
Ouray -- see Rich Hill
Palladium -- see Salt Chuck

Paul -- see Valparaiso
Paul & Benolkin -- see Valparaiso
Pauline -- see Valparaiso
Peacock (E. of Mt. Andrew) -- see Mount Andrew
Pelaska -- see (Hole in the Wall)

Pennsylvania -- see (Hole in the Wall)
Phelps-Dodge -- see (Coronation I.)
Philbrook & Bufvers -- see Constitution
Pitcher & Anderson -- see Marion
Plumley -- see (Hole in the Wall)

Polymetal Lode -- see Research
Portal -- see Crackerjack
Portland -- see Lucky Boy
President -- see Lucky Nell
Princeton Mining & Milling Co. -- see Valparaiso

Princeton Mining & Smelting Co. -- see Valparaiso
Quartzite Ledge -- see (Helm Bay)
Radenbaugh -- see Cascade, Snowfrift
Ready Bullion -- see Puyallup
Red Jacket -- see Lucky Nell

Redman -- see Dawson, Puyallup
Red Snapper -- see Rich Hill
Red Wing -- see Copper City
Reese (& Webber) -- see Dawson
Reynolds & Wright -- see Copper Mountain, Jumbo (Hetta Inlet)

Rico -- see Mount Andrew
Roberts -- see Research
Rodgers -- see Dawson
Roman -- see Shelton
Rosalie -- see Shelton

Ryan -- see Valparaiso
San Antonio Metals Co. -- see (Baker I.)
San Juan -- see Croesus
Santiago Mines, Inc. -- see Valparaiso
Sea Island (Copper) Mining Co.

Sarah -- see Wellfleet
Seattle -- see Lucky Boy
Shepard (& Dunton) -- see Brown & Metzdorf
Silverman -- see Cascade, Stevenstown
Skookum -- see Elm City

Sleepy Eye -- see Westlake
Smith & Fox -- see Rex
Smith, Van Zandt, Roselle & Runge -- see Lucky Boy
Solar Development Co. -- see Rush & Brown, Salt Chuck
Southeastern Alaska Copper Corp. -- see Big Harbor

Story & Detlifson -- see Dawson
Sultzer, Chas. -- see Jumbo (Hetta Inlet), (Lime Point)
Sultzer, Wm. -- see Green Monster, Jumbo (Hetta Inlet)
Sunrise -- see (Hole in the Wall)
Sweet, Sweet & Olson -- see Big Harbor

Taylor -- see I
Texas Gulf Sulphur -- see Khayyam
Thane, B. L., Exploration Co. -- see Poorman
Theis -- see Salt Chuck
(Tolstio Mtn.O -- see Iron Cap

Tomboy -- see Alameda, Frisco (Kitkun Bay)
Treasure -- see Flagstaff
Trio -- see Dama
Tyee Copper Co. -- see Jumbo (Hetta Inlet)
Vesta -- see Cymru

Vulcan -- see Sultana
Wakefield Mineral Lands Co. -- see Lookout, Niblack
Walper -- see Puyallup
Webber & McKenzie -- see Puyallup
White Eagle -- see Uncle Sam

Wicks -- see (Hole in the Wall)
Wyman -- see Copper City
Zimmerman -- see Big Harbor

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