MR 194-18

ALASKA DEPARTMENT OF MINES

SILVER-LEAD OCCURRENCES IN THE FAIRBANKS DISTRICT

by

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Historical Sketch of Lode Mining in the Fairbanks District.

The first lode claim in the Fairbanks district was staked in 1903, about one year after the first discovery of placer gold. The first mill was built in 1909, and the first production of lode gold was in 1910. In 1913, six mills were in operation, and more than 12,000 tons of gold ore was milled. Gold mining declined during the first World War, and from 1915 to 1923 the mining of lode-gold deposits continued at less than 2,000 tons per year. After the completion of the Alaska Railroad in 1923, lode mining activity increased; in the early 1930's, 5,000 to 6,000 tons per year was being mined and milled. By the late 1930's, production from the lodes was exceeding $400,000 per year, greater than the production of placer gold from the district if the production of the one largest producer of placer gold is eliminated. In 1942, the production of lode gold was stopped by the executive order closing gold mines. After World War II, attempts were made to resume operations at some of the mines, but, in most cases, increased costs had made mining unprofitable. One lode mine was operated by two men until 1954; since then only occasional small tonnages have been mined and milled. The total production of lode gold from the district has been about $7,000,000.

Besides gold, lode deposits in the district have been mined for antimony, tungsten, and silver-lead, but the production of those metals has been only a small fraction of the gold production.

Geology and Mineralization in the Fairbanks District. The country rock underlying most of the Fairbanks district is pre-Cambrian Birch Creek schist. This is a highly metamorphosed formation partly

of sedimentary and partly of igneous origin. The formation includes rocks of many types; among these are marble, mica schist, blocky quartzite, and gradations of the three. The lode deposits are genetically related to granitic intrusive rocks of late Mesozoic age. Most of the deposits have been found in two areas within the district: one at Ester Dome and the other extending east and west from Pedro Dome.

In the formation of the veins, there have been at least four different periods of silica deposition, as follows:

(1) coarsely crystalline white quartz with no metallics,

(2) quartz in smaller crystals with pyrite and free gold,

(3) grayish-white, fine-grained quartz with metallic sulfides and free gold (the principal ore-maker), and

(4) small crystals of white quartz with no metallics.

Narrow veins two inches to three feet in width have provided most of the gold production. Variations in physical and chemical characteristics of the wall rocks have played an important part in determining the distribution of ore-shoots within the individual veins. There are a few known lodes made up of closely-spaced quartz veinlets, but they are of lower grade than the veins and have not contributed an important part to the total lode production. Some of the minerals that have been identified in the veins are:

arsenopyrite - widespread but not in large quantities at any one locality,

calcite - uncommon,

chalcopyrite - at the Westonvitch prospect with pyrite, sphalerite, and galena, but not common in the district,

galena	– found sparingly in most gold ores, also massive in a few places with other sulfides,
jamesonite	– fairly common in small amounts, massive in a few places,
pyrite	– small amounts in all the gold ores, massive at the Westonvitch prospect,
sphalerite	– small amounts common,
stibnite	– widespread in small amounts, also local occurrences of segregated masses,
tetrahedrite	– rare constituent of some veins rich in silver.

Geologic Features of the Silver-Lead Deposits. In the Pedro Dome area there are a few known occurrences of massive sulfides consisting mostly of galena. The accompanying map shows the locations of ten such occurrences. Four of these deposits have been mined for their silver-lead content, but the total production has been very small. Typically, these silver-lead ores are massive deposits of silver-bearing galena with variable amounts of stibnite, jamesonite, tetrahedrite, and/or sphalerite; ordinarily gold contributes an important part to the value of the ore. All the known occurrences are in filled-fissure veins except the one at the Westonvitch prospect, which apparently is a limestone replacement.

In the Pedro Dome area, a series of folds whose axes trend east-west has provided structural control for the mineralization. The axis of one such fold lies just north of Pedro Dome, and the main belt of mineralization lies along the crest of this anticlinal fold. Most of the igneous intrusions in the area are elongated parallel to the axes of the folds, and most of the mineralized veins strike parallel

to those axes. The veins have been displaced by numerous faults, most of which trend north-south.

The silver-lead deposits undoubtedly are genetically related to the gold lodes. Probably all of the silver-lead and most of the gold were introduced during the third period of silica deposition. A vein that is primarily valuable for its silver-lead content or its antimony content at one place may be valuable as a gold ore in other places. Lenses of massive stibnite have been mined from a gold-quartz vein at the Cleary Hill Mine. Thus, in the veins that carry silver, lead, antimony, and gold, the total metal content varies from place to place within the vein, and the ratio of the individual metals to one another also varies.

In places, unaltered galena is found at the tops of the veins immediately under the overburden. In most places, however, there has been some oxidation of the sulfides, and the tops of the veins consist of cerussite stained with limonite and also commonly stained yellow-green with cervantite. Sugary quartz commonly is intermixed with the other ingredients at the tops of the veins. Ordinarily, oxidation of the metallic sulfides has not extended more than 20 feet below the surface. In veins carrying gold, the oxidized parts of the veins should be expected to have a higher gold content than the primary ores.

From the head of Fox Creek to Pedro Dome, the known silver-lead deposits lie along the south side of the main belt of gold mineralization, however, near the head of Cleary Creek, the known silver-lead deposits are within the main belt of gold mineralization. Silver-

bearing galena float has been reported on Dome Creek and some of its tributaries, and there are many occurrances of silver-bearing galena in small amounts in gold-quartz veins throughout the district. Ruby silver float has been reported on Silver Creek, and silver-bearing galena has been found in place at Coffee Dome. Because of the apparent close genetic relationship between the gold and the silver-bearing galena, it seems likely that the silver-lead deposits would be scattered throughout the zone of gold mineralization rather than in any special pattern within or near the zone.

Economic Considerations. Most of the silver-lead ore that has been mined in the district has been shipped to the smelter at Selby, California. The cost of shipping is such that the money paid for the lead ordinarily will pay for no more than the cost of shipping and handling; there must be enough gold and silver in the ore to pay for the cost of mining and the profit. The transportation companies that operate on scheduled runs have no facilities for handling ore in bulk, therefore, the ore must be packaged in suitable containers; fifty-gallon drums have been used for this purpose. Chrome ore has been shipped in bulk from the Kenai Peninsula on chartered barges; the ore was trucked to the beach, where a stockpile was built, and barges were loaded from the stockpile by a belt conveyor. A similar arrangement might be feasible for handling silver-lead ores if a deposit were found that showed promise of yielding a sustained production.

Sphalerite in the ore ordinarily presents no marketing problem, but a mixture of galena and stibnite may require careful hand-sorting before it can be sold for either its lead or its antimony content.

The presence of large amounts of jamesonite may make either a lead or an antimony deposit not marketable.

The silver-lead deposits that have been mined so far have been massive, and the ores have been hand-sorted and shipped without milling. Most of the deposits have been small and have not been of consistent width. None of the deposits have been explored very far in depth; in general, the margin of profit to be expected from the small-scale mining probably has been too narrow to provide for the added cost of deeper mining or deeper exploration.

Prospecting for Silver-Lead Deposits. Bedrock outcrops are not numerous in the Pedro Dome area, and any deposits that have not already been discovered probably are well hidded by overburden. Systematic soil sampling, the samples being tested for heavy metal content, has proved to be successful in tracing some of the known deposits. Self-potential electrical equipment has also been used successfully. After a deposit has been found, it ordinarily can best be exposed by a combination of bulldozer and hand-dug excavations. During the past ten years, the little silver-lead that has been produced in the district has been mined from small open-cuts, and the mining has been done more to gather information about the deposits rather than to make any immediate profit.

SILVER-LEAD OCCURRENCES IN THE FAIRBANKS DISTRICT

Numbers correspond to the numbers shown on the accompanying map.

1. Silvertone prospect. Now being prospected by Tury Anderson and Fred Wackwitz; formerly the Freeman and Scharf prospect. Apparently three or more veins within a wide quartz-diorite dike. The veins contain galena with arsenopyrite and probably minor amounts of other sulfides, also gold and silver; in places the sulfides are in quartz and in places they are massive. About 60 tons was produced in 1957, about 8 tons in 1958.

2. A galena lode reported to have been discovered by John Nightingale prior to 1912. No record of any production.

3. Burnet Galena prospect. A narrow, flat-lying veinlet of galena-jamesonite-cerussite. No record of any production.

4. Two galena prospects reported in Skoogy Gulch. No record of any production.

5. White Elephant claim. Silver-bearing galena in flat-lying lenses; one lens measuring 9 feet by 5 feet by 5inches thick was mined. No record of any other production.

6. Westonvitch prospect. Also known as the Eldorado Mining And Milling Co. prospect. Mined in 1916 for silver and lead. No production figures available. Workings are no longer accessible. Massive pyrite, sphalerite, galena, arsenopyrite, and stibnite; apparently a limestone replacement.

7. Polaris group. Includes at least a part of the ground formerly covered by the Jackson claims. Massive galena and stibnite probably with some jamesonite in a flat-lying vein parallel to the foliation in the schist. About 34 tons was produced in 1952-3 by Fred Wackwitz; stibnite was hand-sorted and discarded.

8. Bobbie claim. A mixture of galena and stibnite said to carry considerable silver. No record of any production.

9. Anna and Mary claims. Vein of quartz with galena and arsenopyrite reported to be 4 to 8 feet wide but of low grade. No record of any production.

10. Shelden-Vetter prospect. Adjoins the Nordale property (Homestake group), which is patented. Presently being worked by John Shelden and Rudolph and Adolph Vetter. Galena, sphalerite, and stibnite, with gold and silver; in places massive and in places in quartz. Considered a silver lead prospect until late 1958, when 100 tons was mined, primarily for its gold content. The ore was milled at the Hi-Yu mill.

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Silverstone prospect - now being prospected by

(1) - Andersen & Wakefield prosp. - formerly Freeman and Schaaf property. Both sets of pits produced about 60 tons - chiefly galena - some arsenopyrite & jewel ~~about 8 in 58~~ minor assays of other sulfides.

(2) Galena lode reported to have been discovered by John Nightingale prior to 1912. No record of any production

(3) Burnet galena prospect - Narrow, flat-lying veinlet of galena - jamesonite - cerussite. No record of any production.

(4) Two galena prospects reported in Skeggy Gulch. No record of any production from either.

(5) White Elephant claim - Silver-bearing galena in flat-lying lenses; one lens measuring 9 by 5 feet by 5 inches thick was mined. No report of any other production.

(6) Eldorado Mining and Milling Co prospect also known as the Westonwich prospect. Mined in 1916 for silver and lead; no production figures available. This deposit appeared to be a limestone replacement, massive pyrite, sphalerite, galena, arsenopyrite, and stibnite.

(7) Polaris group. Polaris claims cover at least a part of the ground formerly covered by the Jackson claims. About 34 tons of silver-bearing galena was produced in 1952-3; stibnite was hand-sorted and ~~flat-lying~~ vein parallel to foliation in schist. Discarded

(8) Bobbie claim. One is a mixture of galena and stibnite said to carry considerable silver. No report of any production.

(9) Anna and Mary claims. Vein reported to be 4 to 8 feet wide but of low grade. No report of any production. Quartz with galena and arsenopyrite

(10) Sheldon - Vetter prospect. The Sheldon - Vetter prospect adjoins the Nordale property - (Homestake group), which is patented. Originally this was a silver-lead prospect, but in late 1958 some ore was being mined and milled primarily for its gold content. One hundred tons was mined in 1958 and milled at the Hi-Yu mill. galena, sphalerite, stibnite

Mention Coffee Dome & Silver Q.

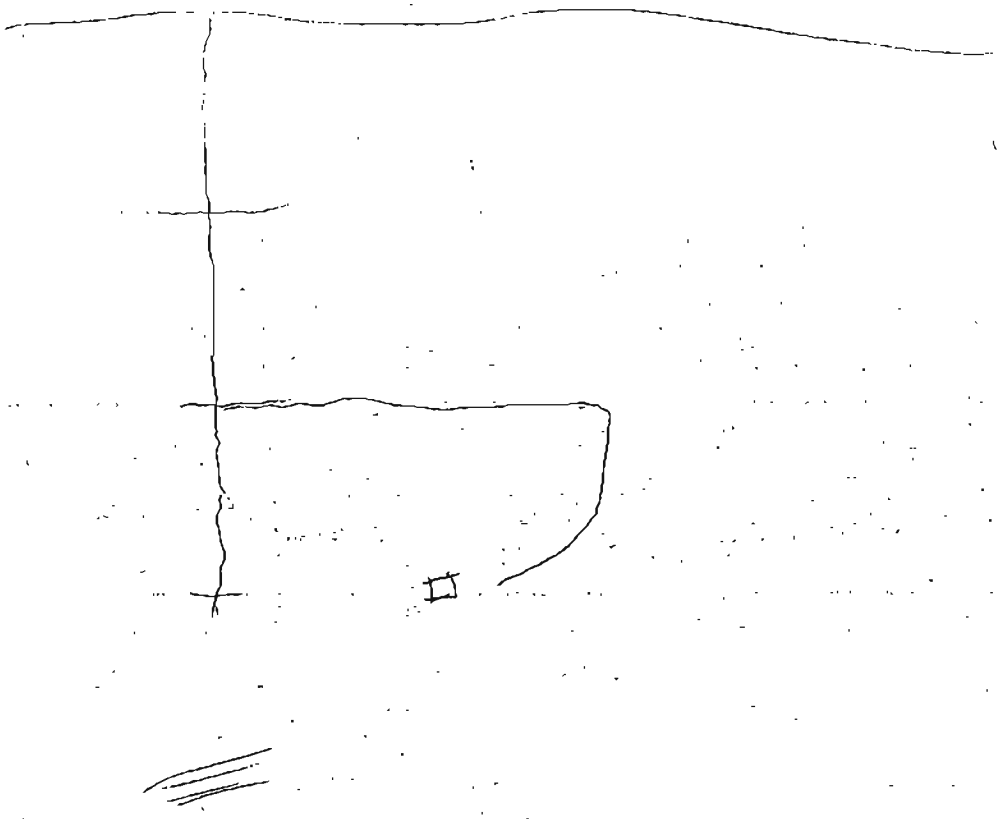
Ag-Pb occurrences in Skoogy Gl.

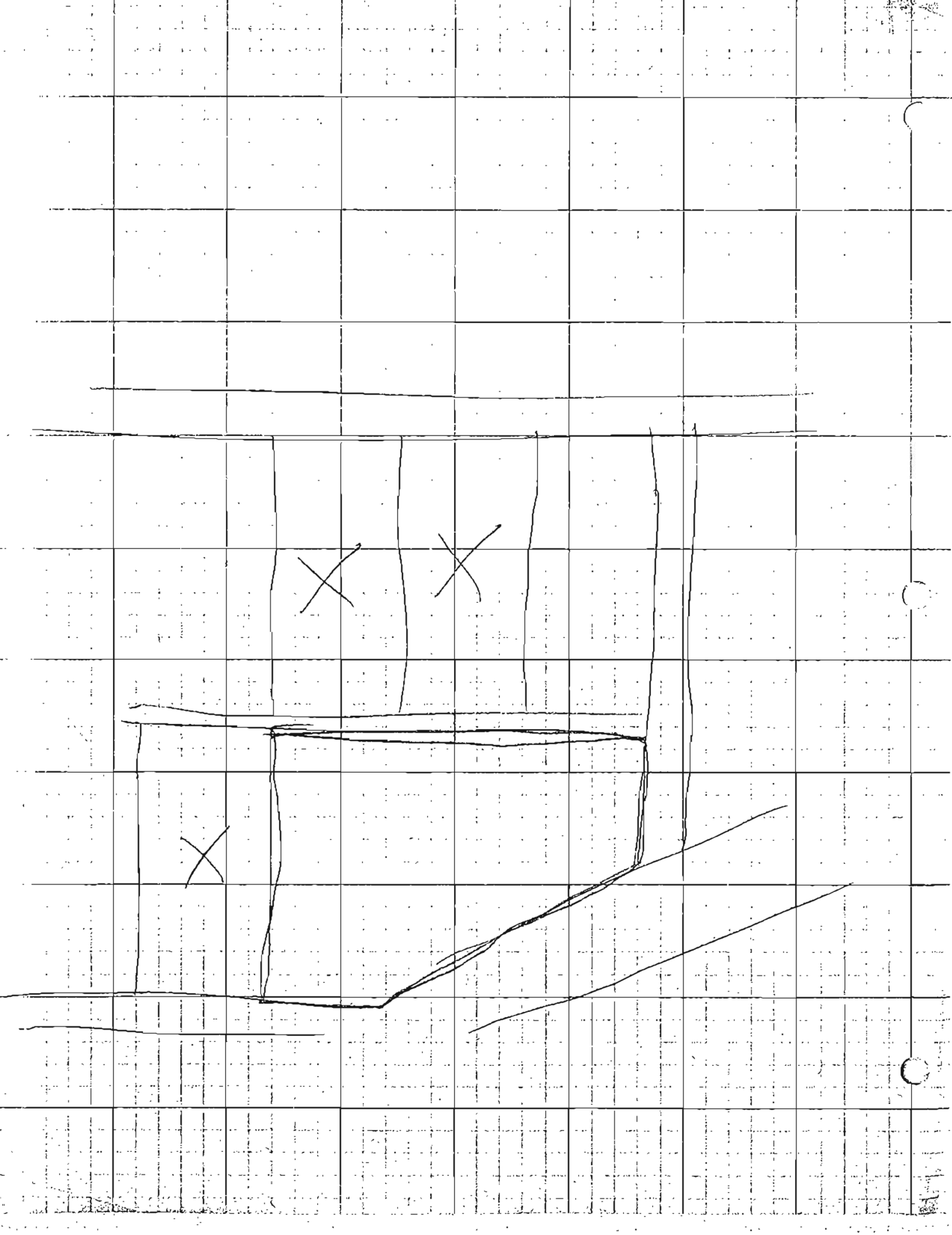
Short distance up Skoogy Gl. below road - Tunnel 200' - N.10°-E - no distinct vein

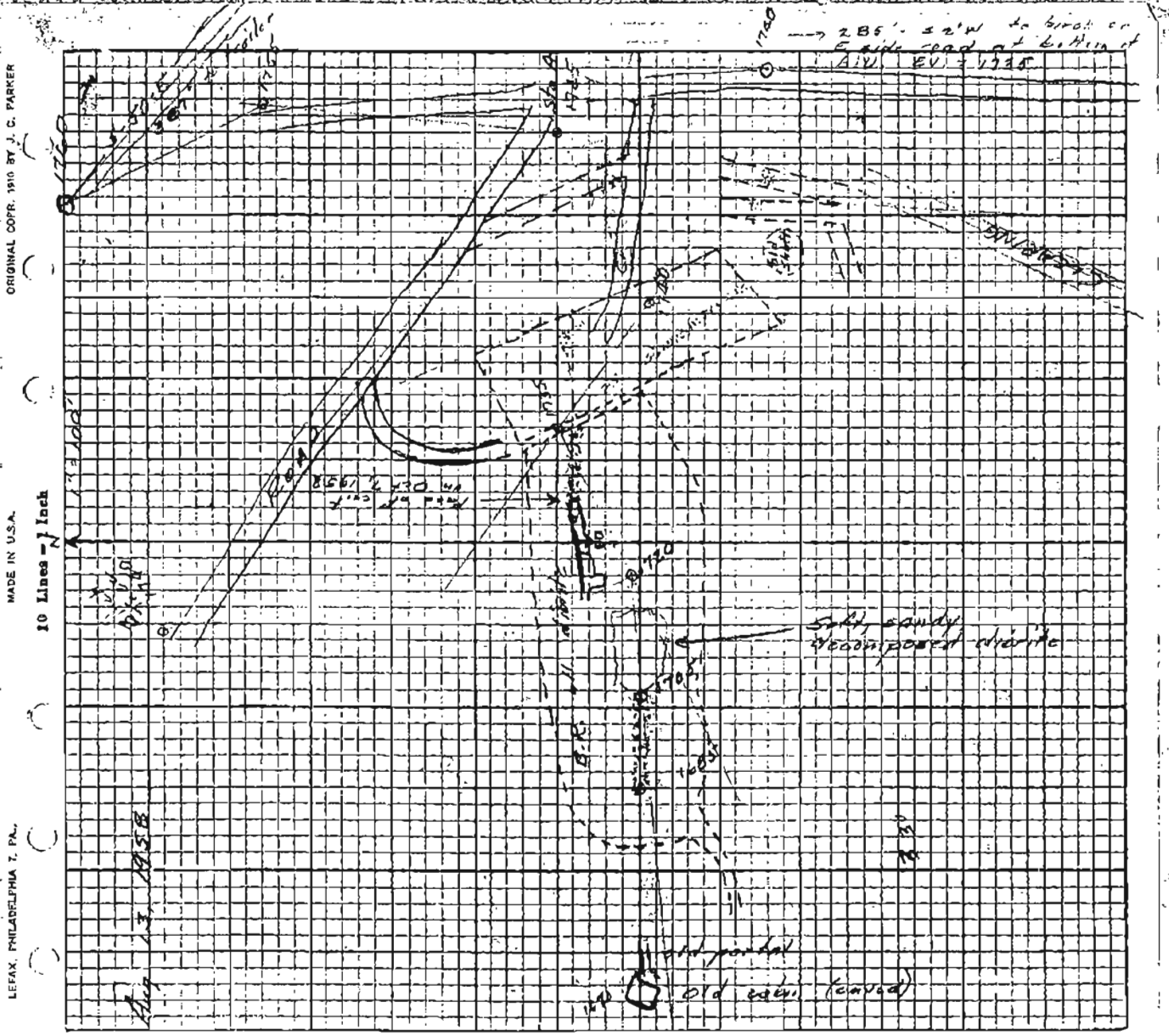
Farther up Skoogy Gl at 1750' el. - "ledge said to carry considerable galena" - short tunnel

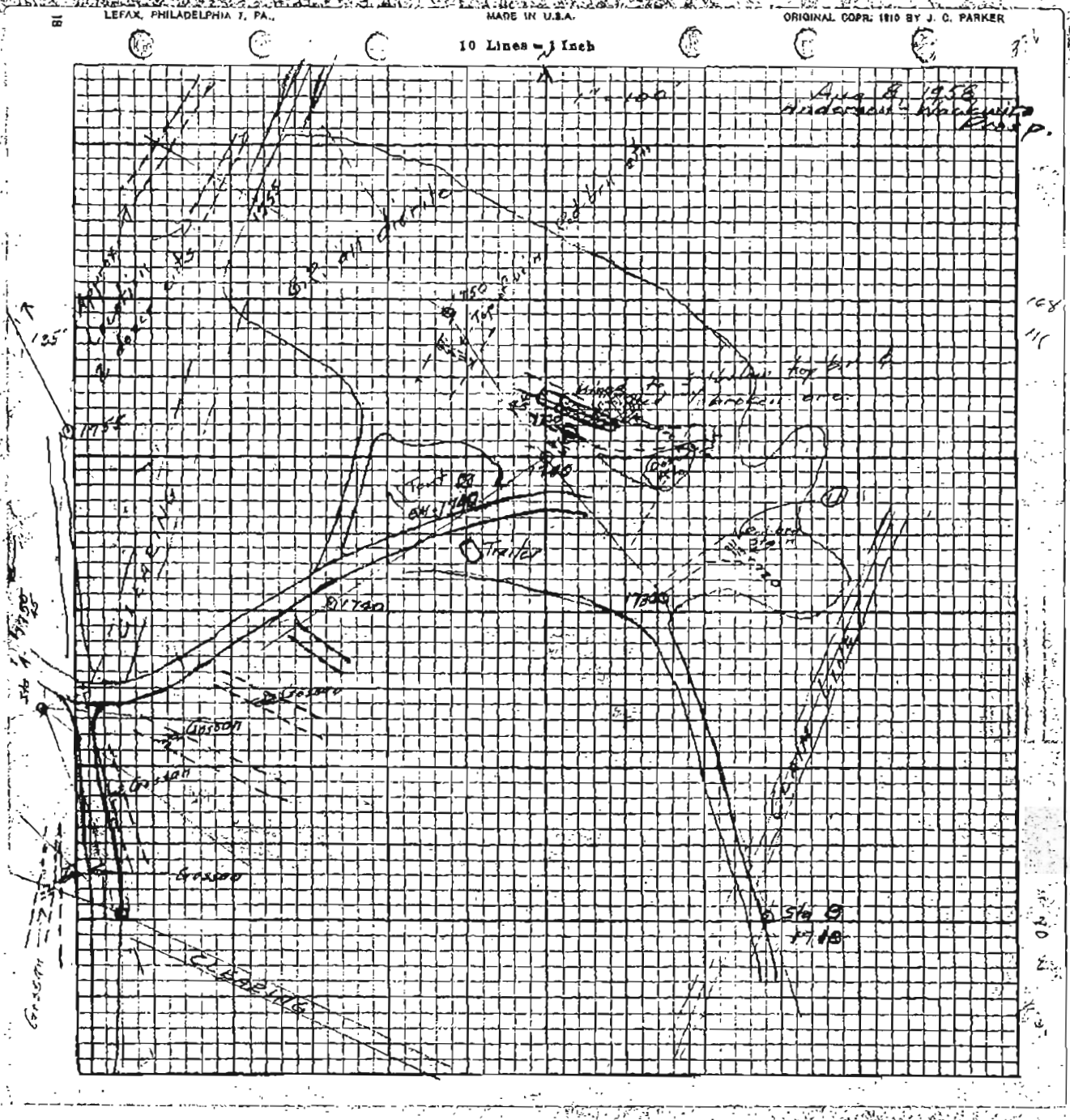
old map #3 not too high

Another galena lode said to have been found W of Skoogy at 1725' - near N contact of the southern granite mass. - ore reptd to lie flat. due to downhill creep.

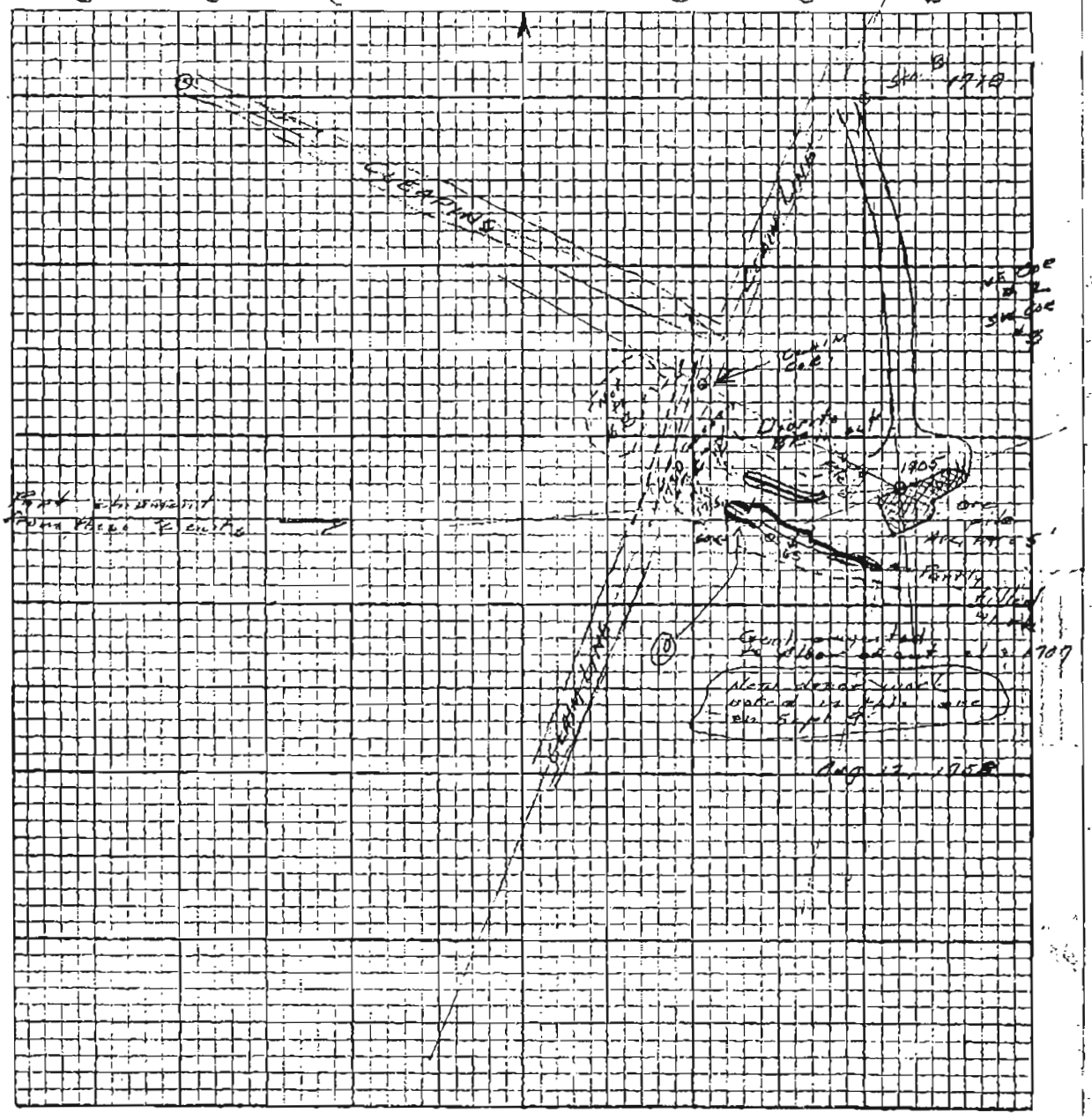





ORIGINAL COPR. 1910 BY J. C. PARKER
MADE IN U.S.A.
10 Lines - 1 Inch
LEFAX, PHILADELPHIA 7, PA.
18
Spoil, mainly decomposed chalk
old road (paved)


LEFAX, PHILADELPHIA 7, PA.
MADE IN U.S.A.
ORIGINAL COPR. 1910 BY J. C. PARKER
10 Lines = 1 Inch
Aug 8, 1958
Anderson-Nichols & Co. P.
Gasoline
Gasoline
Gasoline
Gasoline
Gasoline
Gasoline
Trailer
Trailer
Trailer

10 Lines = 1 Inch



① - Silvertone (Ridepzom - Hackenite) formerly Freeman and Schorf. being prospected

② ~~Eldorado Mining & Milling Co.~~ also Westonwick Mined in 1915 for Ag-Pb. no prod. since

③ White Elephant claims Ag-bearing PbS in flat lenses - mined

④ ~~Tom's group of claims~~ last worked prior 1912-13

⑤ Bobbie claim - Str N-S, dip W - ore mostly Sb_2S_3 & PbS - said to carry considerable Ag.

⑥ Anna and Mary claims N-70-W, dip 70 S. 4-8 ft wide but prob too lo-grade to mine.

⑦ ~~Burning Galena~~

⑧ ~~Stoney Creek - Ag-bearing PbS vein explored.~~

⑨ Steamboat Cr - PbS lode discovered by John Wright in gate prior to 1912.

⑩ Shelden-Vetter prospect.

Westervelt - No. 19 on pg 85-849 B
Massive sulfide ore - also
Eldorado Mining & Milling Co.
mined in 1916 for Ag-Pb
Appears to be ls. replacement.
No production figures.

Jackson - No. 25 on pg 85-849 B
On pg 92 - arsenopyrite,
Jamesonite, galena, Ag, Au,
Hd Bedrock Cr. Polaris?

White Elephant - No 1 on pg 113-849-B
close. pg. 114 L.L. Twin Cr.
Galena in flat lenses - 1 mined
said to be high in Ag.

Burnet Galena - No 9 on pg 113
close. pg 118 - open cut flat-
lying vein let - galena · jamesonite
'cerussite. - also pg 349, Bull
592.

592 - pg 324
Ag - Pb
Pb-sulfide, Pb sulfantimonite, and qtz. Non-persistent, flat-lying bodies conforming to the foliation of the schist & appear to be replacements of calcareous bands. Ag in notable amts.

Bull qtz leases more abundant adjacent to ore shoots than along leader portions of vein - at Homestake pg 334

pg 338.
Silver King claim - one of Jackson claims - on ridge betw. Bedrock & Tamarack Gs. Flat-lying, parallel to foliation in schist, sulfantimonite of lead w/ considerable Ag.

pg 339 qtz
stibnite - bryn vein at Tolvana Mine.

Check Bull 592 pg 345-6
for desc. prospects on Gilmore
& Steamboat Crs.

Steamboat Cr -
Silver Dollar claim on E side
25-ft tunnel - network of
tiny veinlets - no visible Au
or sulfides.
May Florence claim - across trib
from Silver Dollar - also on
E side Stwibt. Tunnel w/
23' shaft above - brecciated
schist w/ blue gouge - no glz.

Birch & Anderson on Granite Cr
3/4 mi above mouth - shaft
& 390' tunnel which intersects
3 parallel lodes.
① brecciated zone w/ qtz
stringers, pyrite, arsenopyrite
② "Blue-clay lead" - 186' in.
50' wide, qtz, blue-clay gouge,
horses country rock, pyrite,
arsenopyrite.
③ qtz. w/ arsenopyrite, pyrite,
free Au - 30' wide to face

Newsboy & Cleary Hill near crest of anticline.

PROSPECTS NOTED ON
FIELD TRIPS

FLUME CR –
None

STEAMBOAT CR –
Hand-dug pit on R.L. mr road @ 1120 cl.

Composite w/ small prosp. holes on upstrm side trib. – some holes old; some new

Old pit on L.L. side cr. above bend @ 1030 cl. – decomp granite

GRANITE CR –
Old pits on L.L. side where cr is at 1300.

Caved adit @ 1350 where cr is at 1330 – prob over 100' – N15E

Hand-dug pits L.L. side @ 1540

Prosp hole on R.L. where cr is at 1480.

Caved adit R.L. side @ 1400 – trench above at 1440 – Cr opposite 1400
↗ prob in creek