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TO: Mr. H. E. Harper

FROM: J Douglas Bell

SUBJECT: Bobbitt Copper Prospect, Pinal County, Arizona

DATE: 17 May 1963

General

On April 26, I visited the above property in company with the owner, Allen B. Bobbitt, Box 570, Hayden, Arizona. The sixteen claims lie in a favorable area situated about midway between the large copper producers at San Manuel and Ray; some copper mineralization has been developed by the owner, and Laramides intrusives have been mapped in the area. The property was mapped in 1960 by geologists of Magma Copper Company; study of the Magma map, following the reconnaissance visit, suggested the probability of thrust faulting, and on May 6, I returned for a further examination.

Although the suspected thrust fault was found, it was unmineralized, and the intrusive in its vicinity appears little altered. The generally slight degree of alteration of the rocks in the area does not indicate the presence of a sizable disseminated ore body, and I do not feet it justifies further interest on Hecla's part. Following is my report on the examination.

Location

The 16 unpatented lode claims are shown on the included map; they are located almost entirely in Sec. 30, T 5 S, R 15 E, approximately 4 miles due west of the Kennecott and Asarco smelters at Hayden, in Pinal County, Arizona. Access is via State 77 south from Winkelman 0.5 miles, thence west across the San Pedro River and NW'ly for 4 miles on fair road to Smith Wash, thence W'ly up the wash on poor road 2.5 miles to the property. The claims are 13 miles west of Christmas, 17 miles south of Ray, and 20 miles north of San Manuel, well situated within the main copper province of SE Arizona. They are located in the easterly foothills of the Tortilla Mountains, in an area of fairly steep ridges and alluvium-filled arroyos. Nearest water is the San Pedro, about 3 miles distant. Smelting facilities are present at Hayden.

History

The claims were located by Bobbitt in 1953, and have been held by annual labor. Development by Bobbitt has consisted of construction of jeep roads over portions of the property, some stripping and open-cut over a length of about 400', sinking of a 30' shaft, and driving a short 20' adit, the above work being located largely on the Javelina No. 2 and 3 claims.

In 1955, three holes, with a maximum length of 391 feet, were drilled to test the mineralized area on the above two claims; locations and results are shown on the map. Weak to moderate copper mineralization was found, but the results are not conclusive.

In 1960, the property was carefully mapped by Hammer and Thomas, of Magma Copper, in a joint investigation with Hughes Steel Company. The Magma geologists informed Bobbitt that they considered the property had a potential of 15-20 million tons of copper ore, with possible enrichment in the 1% Cu range at a depth of 150 feet. Their map and section is reproduced herewith; geology in the SW corner is added from mapping by James Evensen, done for a Master's thesis, University of Arizona, in 1961.

Magma-Hughes considered the potential too small to be of interest, and relinquished the option. Bobbitt is attempting to interest other companies in further exploration.

Geology

Basement rock in the area is a coarse-grained batholithic quartz monzonite of Precambrian age, probably the Oracle granite of the San Manuel area; it weathers to a buff-orange color. Resting on it are the Late Precambrian Apache Series sediments, the Pioneer shale, Barnes conglomerate, Dripping Springs quartzite, and Mescal limestone, in ascending order. Cambrian Troy quartzite overlies the Mescal limestone, and is exposed as a ledge-like mass facing the San Pedro valley. Low areas in the hills are filled with the bedded and partly Consolidated Gila conglomerate of Tertiary-Quaternary age; the washes are filled with Recent alluvium.

Intruding the Pre-Cambrian granite and later meta-sediments are sills and dikes of diabase of probable Mesozoic age; the diabase and earlier rocks are intruded by a Laramides crystalline rock variously identified as monzonite porphyry and quartz diorite porphyry. It is a fine-grained medium gray rock with white feldspar phenocrysts, weathering to a dull gray color.

The sediments trend generally N 20 W, with varying dips usually to the east. Study of the map suggests early faulting on east-west trends, indicated by the displaced block of Dripping Springs quartzite, Pioneer shale, and Pre-Cambrian granite on the Javelina 2 and 3 claims, and two thrust (?) faults, one trending along the monzonite-quartzite contact in the Red Top claim and extending through the easterly part of the Javelina claim, and a second one trending NNW'ly between the Gila 1 and Limey 1 claims. Thrust movement is indicated by the rolled and overturned beds of Pioneer shale resting against the basement granite west of the NW corner of Javelina 3 claim, by the repetition of the formation sequence easterly from the basement granite, and by the much steepened dips of beds east of the westerly thrust (see section). Examining the quartzite-monzonite contact on the Red Top claim, I found a 5'-6' zone of strongly crushed quartzite dipping 36-39 degrees NE'ly, certainly suggesting movement roughly parallel with the bedding.

Copper mineralization, while exhibited as small scattered shows over an extensive area, is strongest in the zone of E-W fracturing on the Javelina 2 and 3 claims. In the over-all area, it is found as small bunches and disseminations and as fracture coatings in the diabase, monzonite, Pre-Cambrian granite, and quartzites, but nowhere in sufficient quantity as to be minable. The open-cut shows fair kaolinization, confined principally to the fractured areas; elsewhere the monzonite porphyry is not strongly altered, retaining

its generally gray color. Even within the displaced block, kaolin is found only close to the fractures, and the intervening areas have the gray unaltered color. In this block, the porphyry shows thin veinlets of iron-stained quartz along blocky fractures; elsewhere, the porphyry is fairly well fractured, but exhibits little mineralization, even as quartz veinlets.

Magma sampled the claim group quite thoroughly, testing the porphyry for copper ore and the quartzites for metal values and fluxing qualities. The samples as shown on the map assayed only weak values in general, the best being obtained from the fracture zone exposed by the open cut and shaft. Drill hole No. 2 and the shaft show slight increases in copper content downward, but the values are not economic as tested so far.

The following geological sequence is suggested:

1. Faulting on ENE-WSW trends and intrusion of Pre-Cambrian quartz monzonite at close of Archeozoic (Mazatzal Revolution).

2. Deposition of Apache Series and Troy quartzite.

3. Tilting of beds and SW'ly thrusting, probably accompanying diabase intrusion in Mesozoic time. Beds of upper plate tilted sharply upward, with renewed fracturing on old E-W breaks, and displacement of the Javelina 2-3 block westerly.

4. Intrusion of monzonite porphyry as dikes and irregular masses cutting diabase and Pre-Cambrian granite, but principally intruding and filling area along the westerly thrust zone.

5. Mineralization, associated with monzonite intrusion, but confined to most fractured areas, particularly the zone of E-W fracturing at thrust intersection.

6. Erosion, deposition of Gila Conglomerate, further tilting, and continued erosion.

On the theory that a thrust zone intruded by Laramides porphyry in a copper province might form a good ore target, I checked the westerly zone carefully. Although a small mass of kaolin and some iron staining was found, the porphyry is generally unaltered and unmineralized above the crushed zone. My sample of the crush zone itself showed only a trace of copper. The porphyry is later than the thrust, and was either not sufficiently fractured to form an ore host, or was not reached by copper-bearing solutions, probably the latter.

This leaves the displaced block on Javelina 2 and 3 claims as the most likely place to find an ore body. The block is roughly 1000 x 1000 feet in extent; an ore zone 200 feet thick would yield 16 million tons. This is probably the basis upon which Magma estimated the 15-20 million ton potential. The drilling and grade indicated so far, plus an increasing stripping ratio as depth is gained, do not suggest that an economic ore body will be found.

Conclusions

The generally unaltered appearance of the Laramides intrusive, the lack of mineralization along the suspected thrust, and the economic factors in the partially developed area do not point to the presence of a large or economic copper ore body on the Bobbitt claims. I have informed Mr. Bobbitt that you probably would not be interested in their acquisition.

Respectfully submitted,

J Douglas Bell
Geologist, Exploration

JDB:jan

ResourceID	Title	Missing
1980-01-0044	American Metal Co. Re: Ajo	
1980-01-0045	Bobbit Copper Prospect, SW of Winkelman	
1980-01-0046	Copper Butte	
1980-01-0047	Coyote Mountains	
1980-01-0048	Eason Oil Co.	
1980-01-0049	Geology and Mineral Resources of the Quijotoa mountains	
1980-01-0050	Geology and Ore Deposits of the Sunshine Area, Pima County	
1980-01-0051	Geology of the San Xavier District, Pima	
1980-01-0052	Helvetia District, Hecla Mining Co.	
1980-01-0053	Homestake, Casa Grande	
1980-01-0054	Antelope Peak Quad and Casa Grande Area Quad	
1980-01-0055	Montizona	
1980-01-0056	Mount Fagan Marble Deposits	
1980-01-0057	Owlhead Iron Deposit, Pinal County AZ	
1980-01-0058	Owlhead - Pinal County Edwards property	
1980-01-0059	P.B.Y. Pantano Data plus Maps	
1980-01-0060	Pima - Twin Buttes - Papago Districts	
1980-01-0061	Pima County Ajo	
1980-01-0062	Pima County	
1980-01-0063	Silver Queen	
1980-01-0064	Pinal County, Tortilla Mountains	
1980-01-0065	Silver Bell	
1980-01-0066	Silver Bell, Adams - Franco	
1980-01-0067	The Geology and Ore Deposits of Hiltano Camp, AZ Pima County	
1980-01-0068	The Sierrita - Lofton - Peak ore bodies	
1980-01-0069	Tito, Queens, Ek	
1980-01-0070	Copper Creek Area	
1980-01-0071	Lake Shore Mine	
1980-01-0072	Maudina Maps	
1980-01-0073	Sultana and Ripsey	
1980-01-0074	Prospects in AZ	
1980-01-0075	Monitor Group and Hagen's data	
1980-01-0076	P.B.Y. San Manuel	
1980-01-0077	Pinal Prospects	
1980-01-0078	Pinal and Maricopa, Goldfields District and Apache Caves Claim	
1980-01-0079	Pinal County, Gregory and Page Agreements	
1980-01-0080	Pinal County; Owlhead Iron Deposit	
1980-01-0081	Pioneer Claim Group	
1980-01-0082	Queen Creek Copper Co. Pinal County	
1980-01-0083	Ray - Arizona Copper Co.	
1980-01-0084	Ray District, Gregory's Claims	
1980-01-0085	Ray District, Kennecott Inf. AIME Meeting April 1958	

SKETCH MAP
COPPER MOUNTAIN
PIMA COUNTY, ARIZONA
by
JACK A. JAMES
MARCH, 1952

SCALE IN FEET
0 25 50 75 200

Knox-Ariz. holds
18 claims - all adjacent

Map prepared by pace and brunton survey around base and intersection or resection from workings to stations

5000E 5200E 5400E 5600E 5800E 6000E 6200E 6400E

7200N
7000N
6800N
6600N
6400N
6200N
6000N

STA 2 ⊙
STA 3 ⊙
STA 4 ⊙
STA 5 ⊙
STA 6 ⊙
SP

Claim Marker ⊠

DDH1
DDH2

90° 72° 50° 60° 90° 55° 64° 70° 60° 51° 74°

Raise and winze

Arroyo
Arroyo

Approx. position of tunnel.

KNOLL

N

LEGEND

- ⊙ STARTING POINT
- ⊙ REFERENCE STATIONS
- DRILL HOLE & DIRECTION
- TUNNEL
- VERTICAL SHAFT
- INCLINED SHAFT
- TRENCH
- OPEN CUT
- MINERALIZED STRUCTURES
- DUMP
- ⊥74° STRIKE & DIP
- RHYOLITE CAP ROCK
- QUARTZ MONZONITE
- CONGLOMERATE
- BLUFF LINE
- ARROYO
- ROAD
- CONTACT

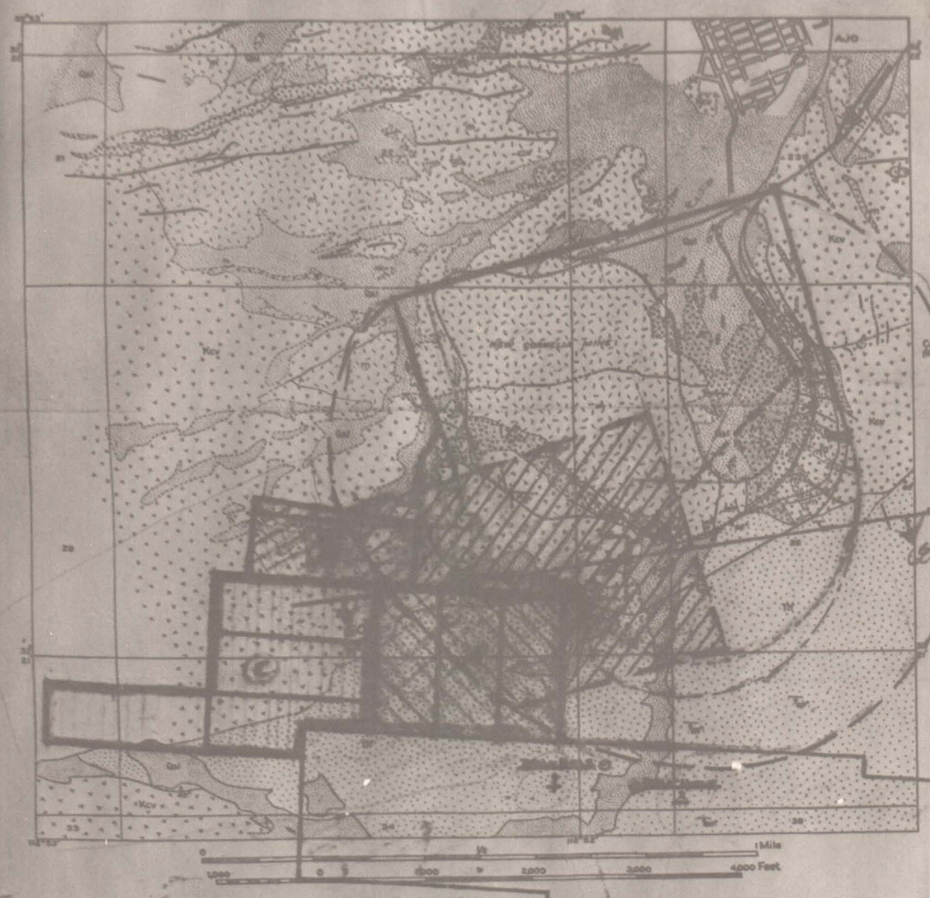


Plate III.—Geologic map of the mining area of the Ajo district, Arizona.

A±61 + B±26 + C±75 = 162 Acres

* X-X' Added By H.A.S.

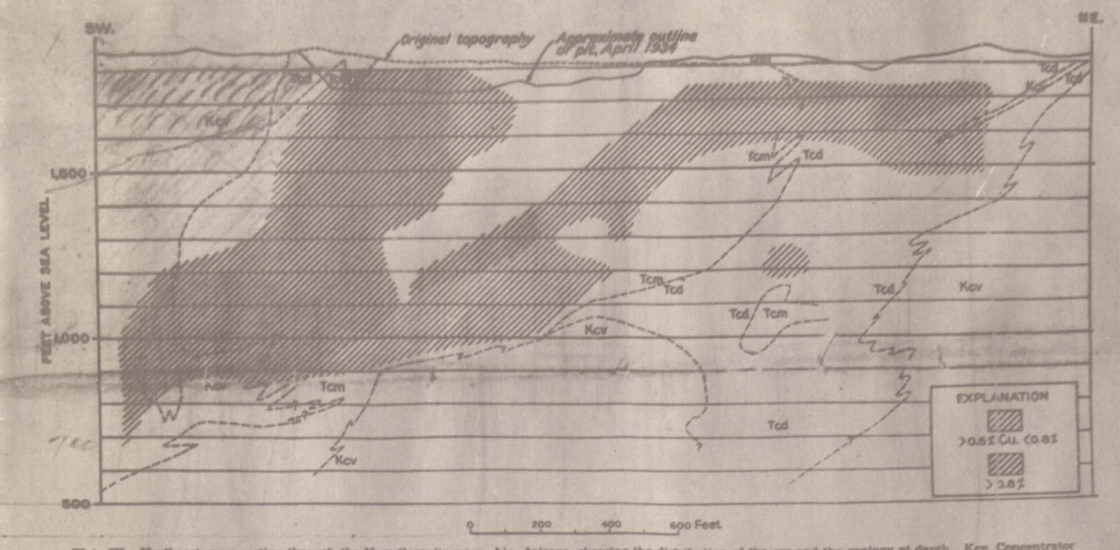


Plate IV.—Northeast cross section through the New Cornelia mine, Ajo, Arizona, showing the distribution of the ore and the geology at depth. *Kcv*, Concentrator volcanics; *Tcd*, dioritic facies of Cornelia quartz monzonite; *Tcm*, Cornelia quartz monzonite; *Qal*, alluvium.

Plate II.—Schematic diagrams, looking S. 15 E., illustrating structural evolution of the east end of the Little Ajo Mountains in which is situated the New Cornelia mine. Legend for all blocks: *PECD*, Cardigan gneiss; *KCV*, Concentrator volcanics; *TCM*, Cornelia quartz monzonite; *TLF*, Locomotive fanglomerate.

I. Structural relations following the intrusion of the Cornelia quartz monzonite. The dashed line marks the course of the Gibson Arroyo fault, not yet developed.

II. Relations following the displacement on the Gibson Arroyo fault, arbitrarily assumed to be a dip-slip normal fault with a throw of 4,000 feet. The dashed line indicates the approximate extent of erosion prior to the deposition of the Locomotive fanglomerate.

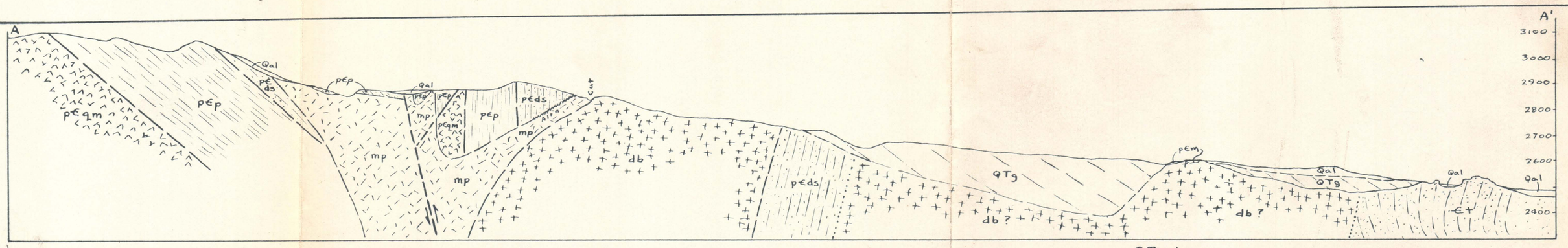
III. Conditions following the erosion of the area prior to the deposition of the Locomotive fanglomerate. The dashed line indicates the place where the block is cut in two in later diagrams.

IV. Block of Diagram III split in half in order to show the structure at depth in the center of the area.

V. Blocks of Diagram IV after deposition of the Locomotive fanglomerate. The dashed lines outline the inscribed blocks shown in diagrams VI and VII.

VI. Same relations as in Diagram V except that the geology is shown on the inscribed blocks of that diagram. These inscribed blocks are so oriented that after tilting on the Little Ajo Mountain fault (the position of which is indicated by the heavy dashed line) the faces *ABCD*, which here appear in their original attitude, will become horizontal.

VII. Present conditions, after tilting on the Little Ajo mountain fault. Somewhat generalized, with topography not shown. The face *ABCD* is horizontal. *TCM* on top of the left-hand block marks the site of the New Cornelia mine.



SAMPLE DATA

Magma Copper Company, 10-13-60

	No.	Au	Ag	Cu	MoO_3
From stripped cut in mp	588	.01	.55	.16	
	589	.005	.10	.04	
	590	Tr	.05	.04	
	591	Tr	.05	.02	
	592	Tr	.10	.03	
	593	.005	.20	.04	
	594	Tr	.05	.02	
	595	Tr	.02	.02	
	596	Tr	.05	.03	
	597	.01	.35	.07	
	598	Tr	.05	.04	
	599	Tr	.05	.05	
	600	Tr	Tr	.03	
Grab of ore pile from E. end cut	751	.05	2.4	.66	
At Surface, near shaft	752	.002	.15	.17	.001
9-12' in Shaft, composite of E and W walls,	753	Tr	Tr	.18	
Shaft, W. wall, 17' to 24'	754	.002	.05	.27	
Shaft, W. wall, 24' to 30'	755	.002	.65	.20	
Shaft, E. wall, 17' to 24'	756	.002	.05	.04	
Shaft, E. wall, 24' to 30'	757	.002	.30	.09	
Samples in Troy and Dripping Springs quartzites	758	.002	.15	.29	
	759	.002	.01	.02	
	760	.002	.02	.015	
	761	Tr	Tr	.015	
	762	Tr	Tr	.02	
	763	Tr	Tr	.01	
	764	–	–	.01	
	765	.04	.10	.14	
	766	–	–	.02	
	767	Tr	–	.02	
	768	–	–	.02	

LEGEND

Qal - Quaternary Alluvium
QTg - Gila conglomerate
mp - Laramides monzonite porphyry
db - Mesozoic ? diabase
Ka - Cretaceous ? andesite
Et - Cambrian Troy quartzite
pEm - Apache Mescal limestone
pEds - Apache Dripping Springs quartzite
pEp - Apache Pioneer shale
pEqm - Precambrian quartz monzonite

GEOLOGY AND CLAIMS
BOBBITT COPPER PROSPECT

PINAL COUNTY, ARIZONA

SCALE: 1" = 300'

Geology: Thomas & Hammer, Magma Copper, 10-13-60

Traced: JDB, 5-1-63