CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
3550 N. Central Ave, 2nd floor
Phoenix, AZ, 85012
602-771-1601
http://www.azgs.az.gov
inquiries@azgs.az.gov

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Chamiso
Mescal
Miramonte
Amoli
Benson
Curvo
Tully
Ochoa
Sibyl
Whetstone
St. David
San Juan
Land
Dragoon Pk.
Roy Spr.
Mt. Glen
Rockfellow Dome
Cochise Memorial Park
Jones Mtn.
Cochise Pk.
China Pk.
Sugarloaf
Middlemarch
Granite Spr.
Black Diamond Pk.
Black Diamond
Walnut Spr.
Buckshot Spr.
Pearce
Sixmile Hill
Courtland
Browns Pk.
Gleeson
Cottonwood Pk.
East Pk.
McGrew Spr.
Apache Pk.
Apache Spr.
Willow Spr.
French Joe Pk.
WHETSTONE MTNS.
PIMA CO.
COCHISE CO.
Granite Pk.
Oak Spr.
Mescal Spr.
Cottonwood Spr.
Boquillas
Contention
LAS BOQUILLAS
SAN PEDRO
Fairbank
Brookline
Three Brothers
Mays Hill
Comstock Hill
Tombstone
Uncle Sam Hill
Military Hill
Ajax Hill
TOMBSTONE HILLS
Stockton Hill
Signal Hill
Outlaw Mtn.
Antelope Spr.
BABOCOMARI
Turner
Standard
NOGALES
DEL
Babocomari
Mustang Mtns.
Lewis Springs
Government
Draw
Dean Horse Spr.
Fort Huachuca
Garden Canyon
FORT HUACHUCA
MILITARY RES.
Target Range
Huachuca Pk.
McCoy Spr.
SAN RAFAEL DEL VALLE
San Pedro
Hereford
Sandy Bob
Porter Mtn.
Dixie
MULE
Tombstone Canyon
Bisbee
Lowell
Mt. Martin
Mt. Ballard
Don Luis
Naco Hills
Naco
Stark
Osborn
Sawmill Spr.
Miller Pk.
Carr Pk.
Sutherland
Bob Thompson Pk.
Copper Canyon
Coronado
Bodie Spr.
Peterson Pk.
Sylvania
R.19 E.
R.20 E.
R.21 E.
R.22 E.
R.23 E.
R.24 E.
20′
10′
110°00′

SUMMARY OF PAPER ON THE GEOLOGY OF THE COMMONWEALTH MINE

by Lewis A. Smith

The Commonwealth Deposit is an example of not only exceptional supergene enrichment of silver values, but very significant supergene enrichment of gold values. It also shows a very striking horizontal zoning in the enrichment. A good case can be made for the correlation of the enrichment zones with the changes in water level indicated by the ancient shore lines of Pleistocene "Lake Cochise", which points to the relative age of the various horizons of maximum enrichment. The distribution of values was controlled by primary "ore shoots", but only the enriched material made commercial ore.

The Commonwealth Mine produced about ten and one-half million dollars in gross metal value between 1895 and 1931. The production was chiefly silver, but gold values were of some importance in most of the ore. The writer was associated with the development of the mine between 1920 and 1931. Practically all of the workings have been inaccessible since 1934.

The Commonwealth Mine is located near the town of Pearce in Cochise County, Arizona, about fifty miles north of Douglas and Bisbee. It lies in a group of low volcanic hills composed of two distinct volcanic series overlying cretaceous sandstone. The older series consists of alternating andesites and rhyolite-andesite breccias. The younger series is made up of rhyolites and basalts. The flows dip northeast at a low angle. The two groups are separated by conglomerate containing vein quartz identical with that of the Commonwealth veins.

The older flows are cut by the Commonwealth group of quartz-filled fissures. The bulk of the filling consists of cockaded, vuggy, amethystine and fine grained white quartz. Very dense, fine grained glassy quartz, which seems to be slightly younger, occurs locally in the main veins and predominates in footwall spurs with associated brecciation suggesting forcible injection. Silicification and propylitization are prominent in the wall rocks.

PEARCE - COCHISE CO

Hypogene sulphides included sulph-antimonides and sulph-arsenides of silver with pyrite, gold, and to a lesser degree, chalcopyrite (or tetrahedrite), molybdenite and some vanadinite? Down-hole drilling showed the entirely unoxidized unenriched material to average no more than two ounces of silver to the ton. This would mean an eight or ten fold enrichment factor if the overlying protore were no better. The hypogene silver minerals are proustite and stephanite with minor amounts of pyragyrite.

Supergene silver enrichment consisted of the extensive replacement of the hypogene sulphides by argentite. This enrichment is largely concentrated in four nearly horizontal zones, with relatively low grade material in between. The zones of relatively strong enrichment are believed to correspond to periods of relatively stable water level, or water level "stop points". Three of these "stop points" correspond to "Lake Cochise" shore lines, using the present water table as a datum.

Gold enrichment zones overlie three of the silver enrichment zones and correspond to zones of abundant siderite which appear to have developed during or early in the silver enrichment periods and then served as a trap for the gold due to the effectiveness of siderite as a gold precipitant.

It is believed that the various enrichment zones are best explained as the result of a major reversal in the normal downward progress of the water table, with alternating periods of rapid change and of relative stability; with no pause long enough for more than partial distruction of the sulphides remaining above the water table. This interpretation calls for a rise in water level after the formation of the deepest enrichment zone with pauses for the formation of two overlying zones, then a drop to the present water level with a pause for the fourth zone. The fourth zone is believed later than the highest zone because either the blanketing effect of the higher zone or the progressive exhaustion of source material in the overlying capping may best explain the absence of siderite and gold enrichment with this zone.

The final drop in the water table was followed by oxidation in place, rather than removal, of much of the secondary argentite. This is attributed to relatively arid climatic conditions, and perhaps exhaustion of solvents in the overlying material, to some extent.

Desert SW

State Maps

Intensive Maps

Pre & Pattern

Intensive field

Methods within capabilities of available staff

McConnell to write Anderson for notes

Personal help - semi-text

Editorial help occasions

TO EXAMINE FOR
NAT. LEAD

SE of Padoquin
Canelo Hills

See 2 or 3

T 23 S
R 18 E

Mt Hughes Quad
1:25,000 Army
Map Series

Ernest Bohn

Just outside
of Patagonia

Write him
at Patagonia

Courtland Gleeson Cochise Co

CONSOLIDATED COPPERMINES CORPORATION
~~KIMBERLY, NEVADA~~
Safford, Arizona

A. J. O'CONNOR
GENERAL MANAGER

JOHN EABY
CHIEF CLERK

June 19, 1952

Mr. E. N. Pennebaker
% O'okiep Copper Company
Nababeep
Cape Province
Union South Africa

Dear Penny:

American Smelting and Refining have stolen the march on us in the Courtland - Gleeson area. Sometime in March they reportedly optioned eighty claims and have located seventy three new claims of their own over the monzonite area and over about two square miles of alluvium below the monzonite.

Ray and I were going down to scout the area again on June 13th and on the eve of our departure John Hope called and told us about A. S. & R. staking claims. Ray and I made the trip anyhow and went over the best looking area they have staked.

Part of the area shows some relief limonite after chalcocite with a high iron content. Some of the cavities are somewhat rounded with a black skins of botryoidal limonite. Other cavities are cleam and cubic after pyrite. In this area there are zones of very heavy silicification with highly altered zones between. The rest of the area shows very little evidence of copper with pyrite within a few feet of the surface.

Hope is sweating this one out as he spent three or four days on the ground last October.

I have Ray in Socorro for a few weeks with our new man Tipton, before sending him to Prescott to map the Humboldt project. I think Tipton will do us a lot of good in New Mexico as he knows considerable about the state and is very interested in the type of work we are doing. We were fouled up on insurance for a week so I had him in the library at the Socorro School of Mines assembling all the information he could find on Copper, lead and zinc.

Larry is in Las Cruces now scouting the Organ and Jarilla Mountains. It is unfortunate that so much of these two areas are taken out by the White Sands proving grounds as there are reports of some good porphyry type mineralization in the area.

Best regards

Frank.

J. Frank Sharp

JFS/mec

September 6, 1953

Mr. Thomas G. Moore
Manager, Geol. & Expl. Dept.
The American Metal Co., Ltd.
61 Broadway
New York 6, N. Y.

Dear Tom:

Sorry to have missed John Payne on his recent trip through Arizona. Didn't know that he was headed this way, and, as I wrote Phil on August 21, I made a brief trip to California due to my mother's recent illness. Had hopes to return on the 27th but was delayed until the 29th.

Newmont has gone into action at Tombstone. Believe I heard about it when I was in New York in July, thought it was common knowledge, and didn't bring it up for discussion. My information is about the same as that noted by John under (1). John Hope told me recently that Dr. Norman is doing the geology, and no doubt Brant will do some fancy geophysics.

My only dope on A.S. & R. is that they churn drilled the Courtland-Gleeson area (75 miles SE of Tucson) earlier in the year in search of a porphyry copper deposit. After 6 holes were put down they pulled out. John Hope sampled some of the sludge streams by the dark of the moon and said they were lousy. This might be the project about which John Payne heard rumors, but, on the other hand, they may be at something new. Shall try and find out what goes on.

With kind regards,

Yours sincerely,

E. N. PENNEBAKER

ENP:mc
cc - Mr. John Payne, Jr.

Township No. 19 South, Range No. 25 East, Gila and Salt River Meridian, Arizona.

Surveys Designated	By Whom Surveyed	Group No.	Group Date	Amount of Surveys Mls.	chs.	lks.	When Surveyed Begun	Completed
th & West Boundaries	John F. Hesse &	5	August 25, 1910.	12	21	22	July 21, 1911	July 26, 1911.
th Bdy. Retraced	Alfred N. Oliver	"	" " "	5	76	23	August 4, 1911	
tial E. Bdy. Retraced	U.S. Transitmen	"	" " "	1	7	56	"	8, "
Subdivisions	"	"	" " "	60	67	11	July 28, 1911	August 3, 1911
Connections	"	"	" " "		20	87	"	"
st Boundary	J. B. McLaughlin	Contract	June 18, 1883	6	5	70	February 25	February 29, 1884

The above map of Township No. 19 South Range No. 2
Meridian Arizona is strictly conformable to the
in this office, which have been examined and approved
U.S. Surveyor General's Office.
Phoenix, Arizona, August 3, 1912