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Mineralization in the Organ Pipe Cactus National  
Monument, Arizona, B. S. Butler and J. Voleny  
Lewis, 1940.

Somewhat over 500 mi<sup>2</sup>  
Only two springs -- Dripping Spring and Quitobaquito Spring.  
So called "valleys" aren't result of stream erosion, but built up  
by debris from elevated blocks. Great alluvial accumulations occupy  
2/3 of surface of Papago country. Drainage external, indicate long  
lapse since fault movement. Prospect includes copper, gold, silver.

Cardegan gneiss

Slab 1000 wide and 3/4 mile long forms inclusion on Tgr at Dixie  
Bell mine in S19, T14S, R6W. Larger mass forms hills at S border of Ajo  
Quad. In Ajo area it is irreg bounded and contorted, showing injection  
of refoliation, probably of two ages. It is thought to be of igneous  
origin.

In Growler Pass area it includes more sediments, as arkosic sand  
and conglom.

Sedimentary Series

At Dixie Bell mine includes a bouldery ls conglom. Bedded series  
includes sh, ss, ls, conglom metamorphosed to phyllite, qtzite, and marble.  
Is and boulders of ls in conglom generally silicated, making them more  
resistant. In places also silicified.

Conglomeratic upper member resembles in many ways the locomotive  
conglomerate but more strongly metamorphosed, more cemented, less sorting  
and bedding. Also intruded extensively by dikes of monz, aplite, rhyolite  
and in places permeated by mineralizing solutions. Also these contain  
no recognizable organic remains.

West of Bates well an oval outcrop of coarse conglomerate probably  
represents the upper conglomerate members of this series almost entirely  
unsorted, from sand to 10' boulders. Ores at Growler and Yellowhammar  
mines in this. NW and SE parts of outcrop (low hills) chiefly ls and  
qtzite. Intervening higher hills chiefly granite and aplite in arkosic  
matrix. Area sliced by several well-defined N - S fissures.

Area outcropping for 1-1/4 miles along north border <sup>of Monument</sup> dips west of  
~~movement~~ and probably aggregates 3-5000'.

Older "granite" and schist

Massive, laminated, and schistose rocks of great variety along SW  
foot of Puerto Blanco (Dripping Spring) Mts. These older intrusives  
represent both equigranular and porphyritic facies of granite, monz.,  
granodiorite, diorite, andesite, qtz. porphyry. Generally sheared into  
a parallel platy structure and much converted into schist--with sericitic  
or chloritic schist.

Younger "granite"

Facies range from granite, monz. granodiorite to diorite, include  
numerous aplite dikes and smaller numbers of pegmatites - both somewhat  
later in age.

Texture ranges also wide: coarse and fine-grained; equigranular  
and porphyritic.

### Intrusive rhyolites

In Growler Pass area, merging on west into alluvial plain of Growler Valley. Prevailing is grayish-white, massive rhyolite, generally shattered by numerous intersecting rocks. Both rhyolite and associated older formations cut by numerous rhyolite dikes - grayish-white to red with small amounts of black, gray, or green obsidian. Locally dikes are silicified and form ledges, many of which are highly colored. In places dikes partly replaced by ore minerals, as at Growler mine and elsewhere in vicinity. Association suggests rhyolite may be related to the younger "granite", which apparently was source of copper (as at Ajo). Possibly rhyolite is shallower intrusive phase.

### Older volcanics

Tuffs, breccias, and flows constitute most of many of ranges in area. Occupy about 90 mi<sup>2</sup> in monument, including greater part of Ajo and Puerto Blanco ranges and NW part of southern Growler Mtns. In this Growler area the later lava has been removed from the deeply eroded fault - block south of Bates Well.

Include wide range. Most prominent are andesite tuffs, breccias, flows. Tuffs and breccias dominate lower portions, and brown, reddish-brown, and purplish - brown flows are increasing prominent toward top of series. Gilluly estimated corresponding Ajo volcanics in little Ajo Mts. at 3-5000 feet, similar measurements would apply here.

### Daniels Conglomerate

Coarse, conglomerate outcrops beneath lava 3 miles north of monument and beneath Scarface Mts. Rock slightly unsorted, coarse stream and fine gravels and boulders. Diverse rock types reflect local diversity of bedrock. Gilluly estimated max of 200 feet.

### Younger Volcanics

Basaltic andesite and basalt cover large areas of Papago County. Generally rests on eroded surface of older volcanics, and in places overlaps upon other, older formations. Locally covers and protects Daniels conglom. Even younger <sup>vol.</sup> and are tilted, faulted, and in places deeply eroded. In places covered by great thicknesses of alluvium.

Probably much of both volcanic series was fissure types. No local eruption center known within monument.

### Alluvium

Generally texture varies with distance from mtns. Probably in the deepest basins it dates back to Pliocene time.

### Structure

Folds - only in youngest volcanics and may be related to faults. Faults - Gneiss indicates several periods of mt. building. Recognizable are succession of Tertiary faults.

Refoliation and alteration of earlier intrusive (Mesozoic?), indicates compressive forces at later time (late Mesozoic?). Younger granite invaded region in perhaps early Tertiary.

Chilled borders and general disregard of older structures at Ajo indicates intrusion at relatively shallow depth, in contrast with older, deep-seated intrusion.

Before mineralization in Growler Pass area, but following it in Ajo area, probably in mid-Tertiary time, thousands of feet of coarse alluvium deposits accumulated, witnessing strong uplift. Followed by great series of older volcanics. Further faulting, upthrusting, and erosion produced Daniels. Probably in Pliocene time came eruption of younger volcanics aggregating many hundred feet. In Pinacate Mts. volcanism continued into recent times.

In Pliocene time N - S faulting formed "valleys" now partly modified by rock-flooded pediments which merge into alluvium plains. Streams now cutting channels in pediments and plains.

#### Ore Deposits

SW area. Granite core of Sonoita Mts. dominates. Veins in central and eastern portions of granite and in the schists to the NW. Victorian and Martinez, Pb - Ag with some Au, at east contact. Victoria shaft 400 feet deep, flooded to 200 feet.

Gold - veins in granite ore fairly numerous west of these mines. Milton mine is Au veins in greenstone schist, locally strongly stained by copper oxidation.

Schists at Dripping Springs and 4 - 5 miles west have veins in E-W and N-S fissures, Au in some, Ag-pb in others. Gangue chiefly qtz., some carbonate. Most veins in chloritic schist (andesite) that is intrusive *into* mts sericitic schist (qtz. prophyry)

#### Northwest Area

Geology must be more complex. Granite intruded into sh, ls, ss, conglom. area of which now form inclusion. Rhyolite in SW and also dikes in sediments. Mineralization is veins and shear zones in granite and sediments. Growler group (Growler and Yellowhammer) have copper in sediments, locally these are coarse conglom. (granitic). At Growler shaft it is said ls carried ore to 120 feet and little ore found in "granite" beneath. At Yellowhammer ore in granitic conglom. Between these other N - S mineralized shears crop out. In places mineral accompanies rhyolite dikes.

Dixie Bell mine partly in granite and gneiss. Numerous prospects across granite northwest to Clark Mine.

#### Northeast Area

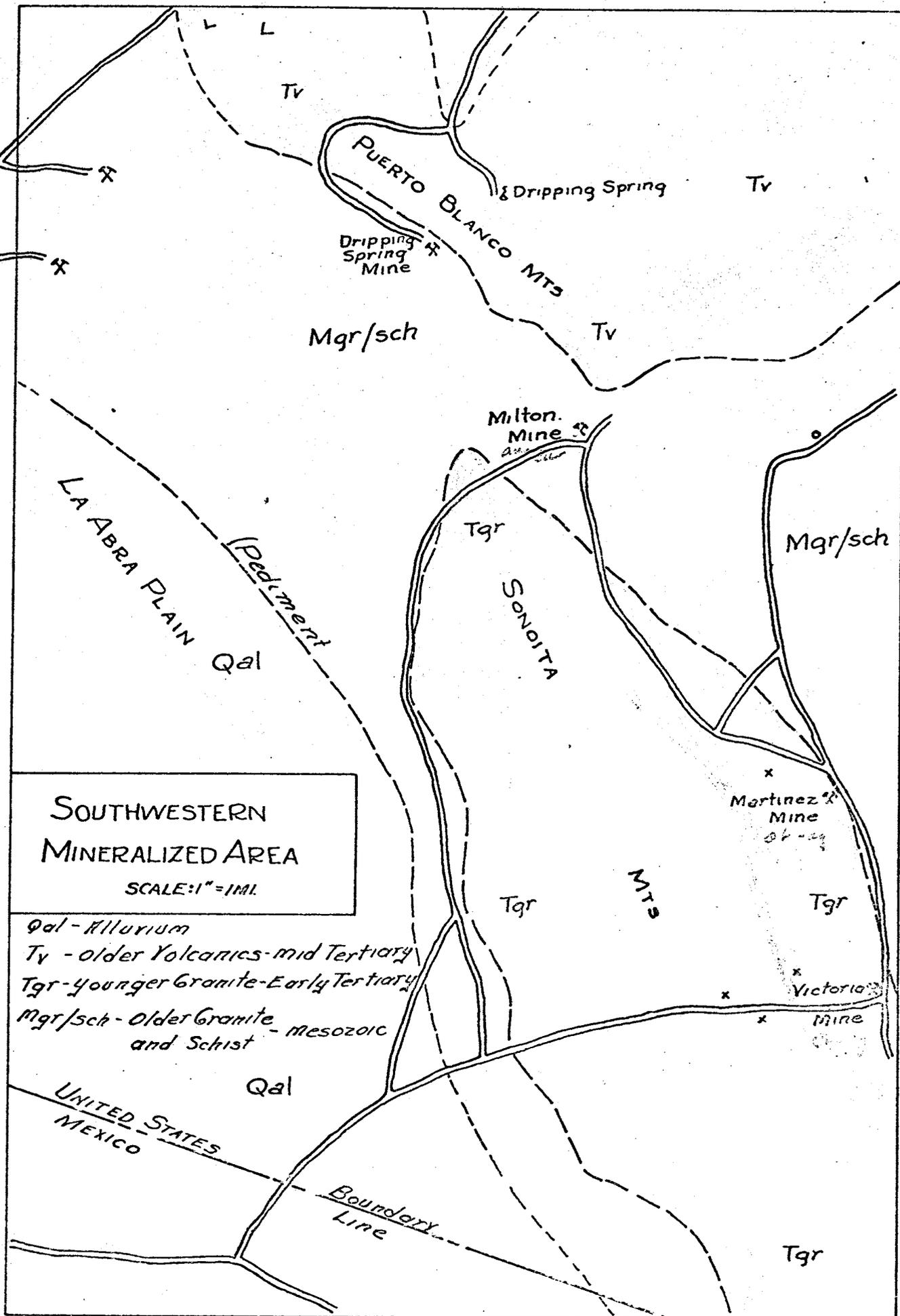
Centers at Copper Mountain where quartz monzonite surrounded by alluvium. Fissures cut rock in several directions, and some faulting occurred. N-S fissures carry copper bearing quartz veins, and oxidation stains common.

At Gunsight Pass, 5 miles NE, granite seems to underlie the volcanics.

Evidences of diamond drilling at Copper Mountain (AS&R)

Gunsight Ag-Pb ore in NE fissure in quartz monsonite. Galena and cerussite in banded quartz with carbonate, barites, and a little copper. Mine credited with \$100,000 Ag.

A gold mine was active at that time (of field work) in Cerro de Santa Domingo across the mountain. Small copper mine active in Agua Dulce Mountains, 7 miles west of Monument.



**SOUTHWESTERN  
MINERALIZED AREA**

SCALE: 1" = 1 MI.

- Qal - Alluvium
- Ty - older Volcanics-mid Tertiary
- Tgr - Younger Granite-Early Tertiary
- Mgr/sch - Older Granite-mesozoic and Schist

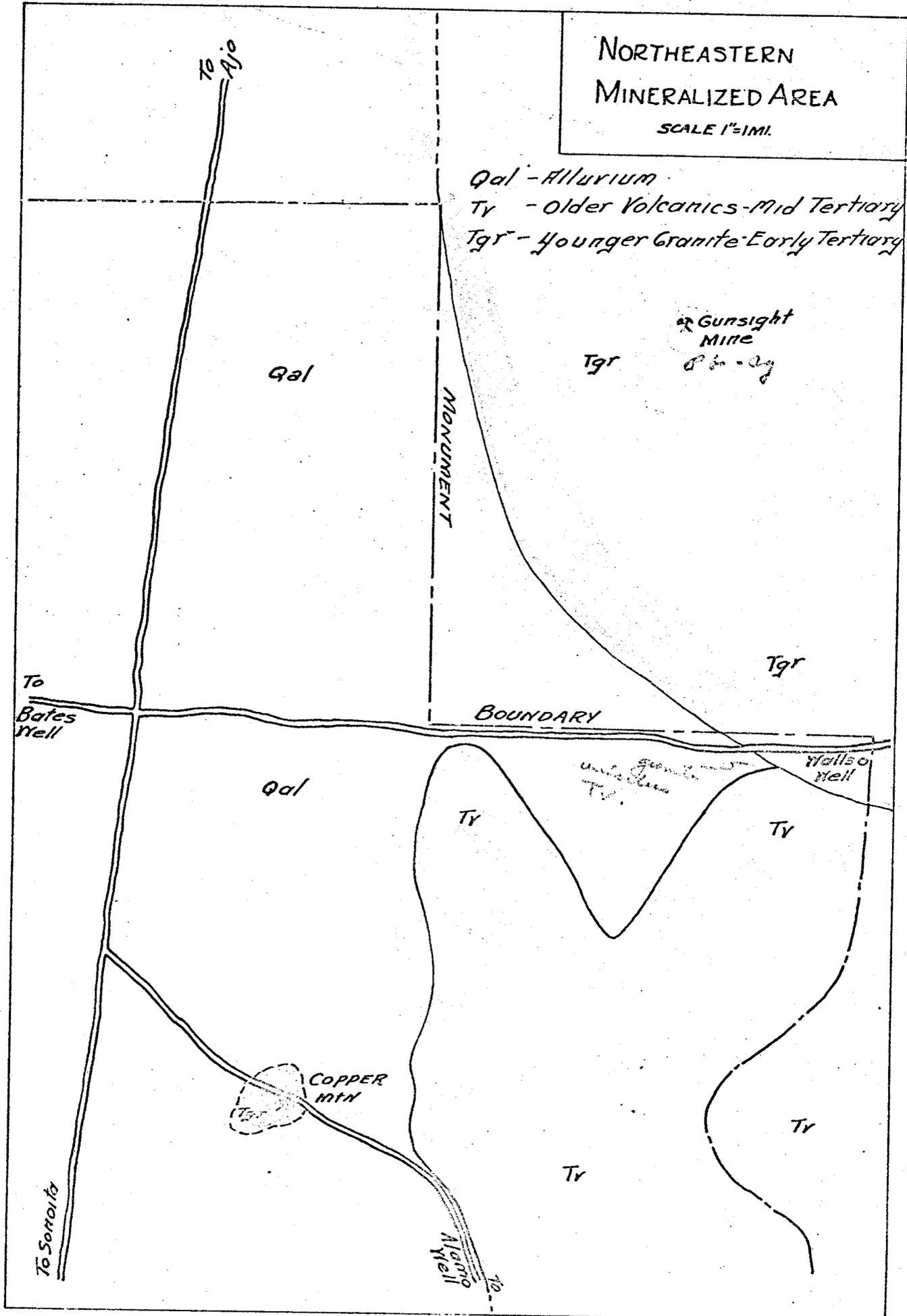
UNITED STATES  
-  
MEXICO

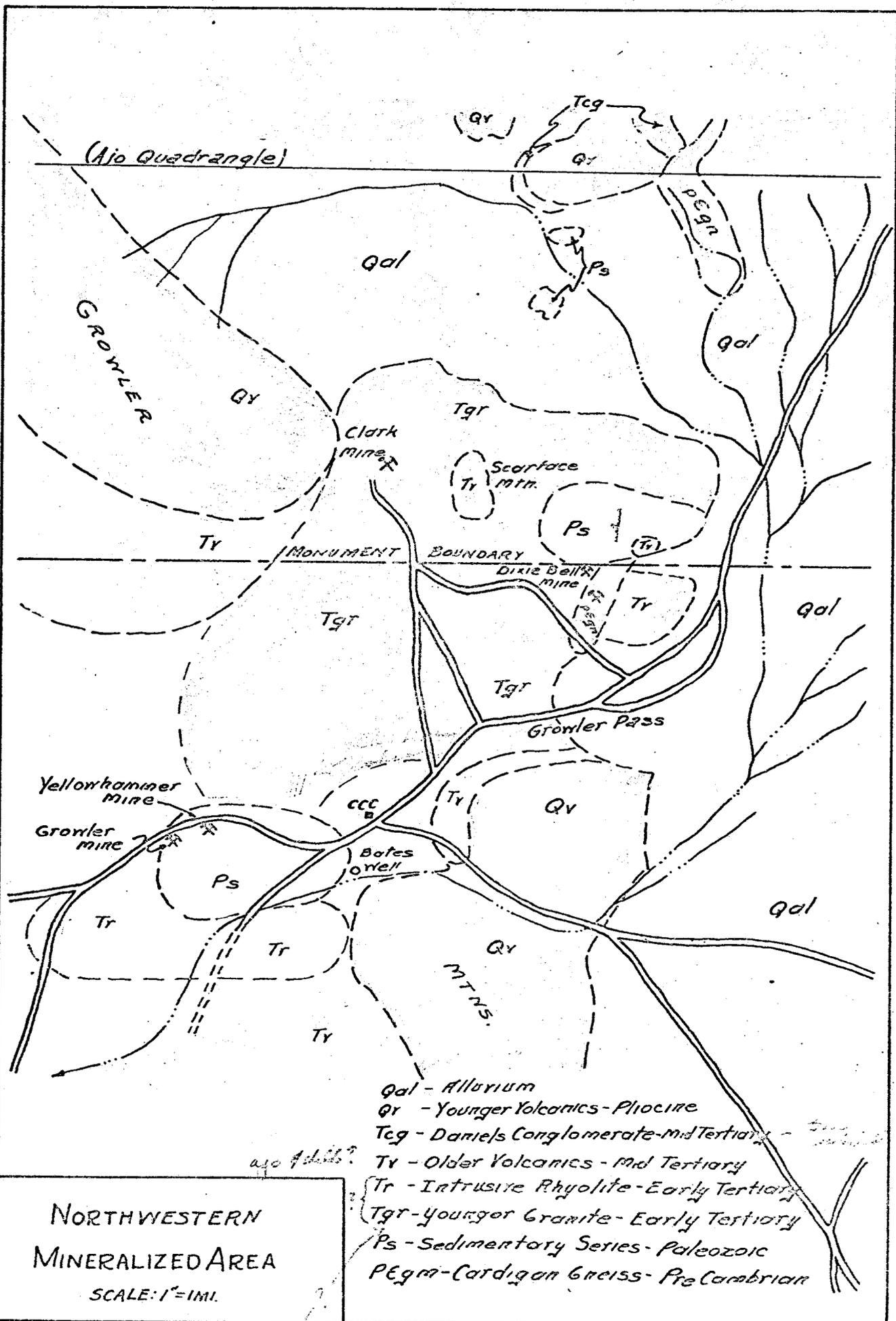
Boundary  
Line

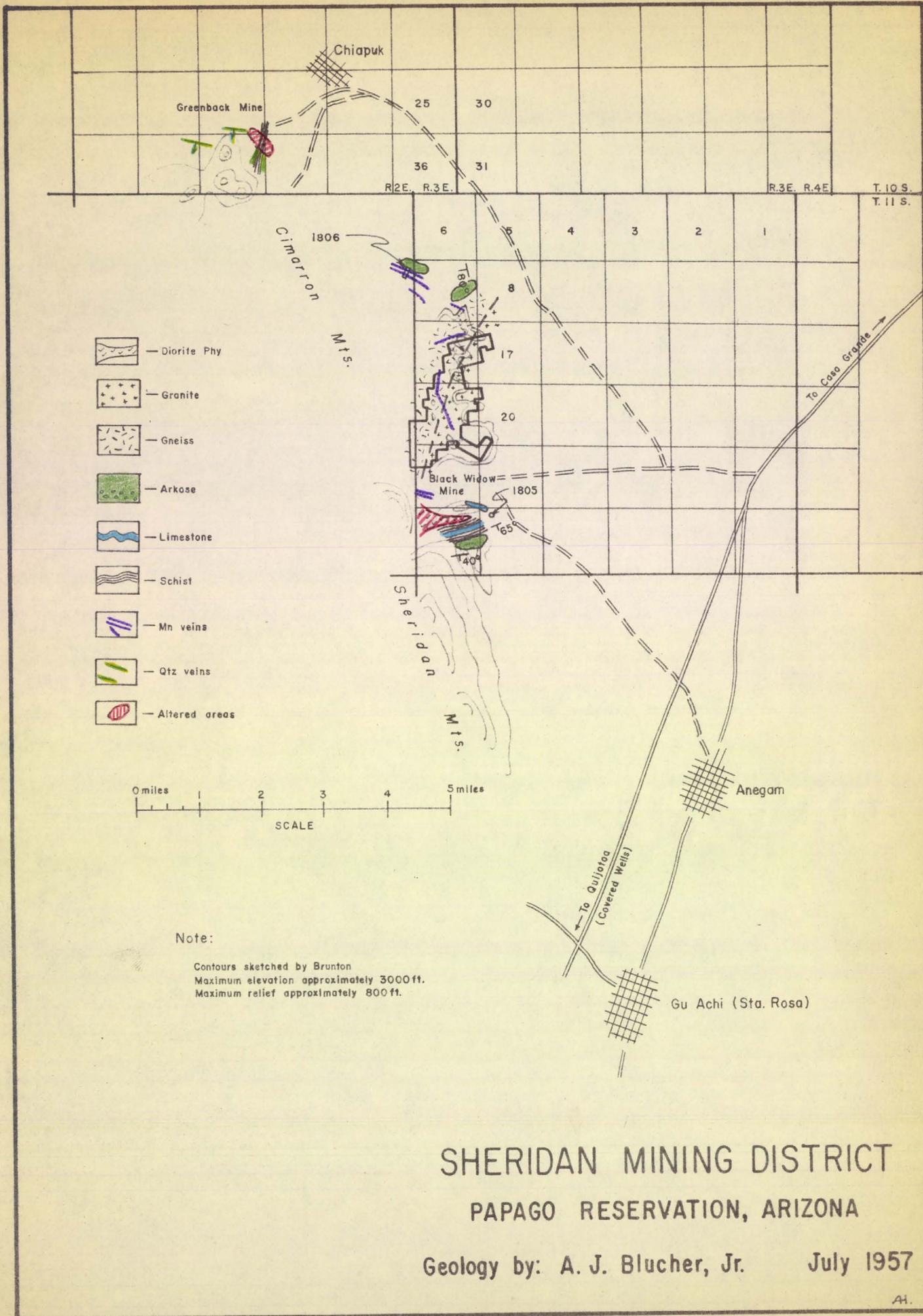
NORTHEASTERN  
MINERALIZED AREA

SCALE 1"=1MI.

Qal - Alluvium  
Ty - Older Volcanics - Mid Tertiary  
Tgr - Younger Granite - Early Tertiary







# SHERIDAN MINING DISTRICT PAPAGO RESERVATION, ARIZONA

Geology by: A. J. Blucher, Jr. July 1957