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James Doyle Sell Mining Collection

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KEEP THIS ON TOP

Subject: PLACER GOLD SOURCES

Includes: Research notes by J. R. Wojcik into Pre-Cambrian sources of Gold in Basal Triassic Conglomerates in Arizona.

See: General Minerals - Gold

ASARCO

Exploration Department
Southwestern United States Division
W. D. Payne
Manager

July 10, 1981

Mr. A. Cornell
P.O. Box 126
Spokane, Washington 99210

Dear Mr. Cornell:

The information which you recently sent to our New York Office has been referred to Tucson for response.

The uranium property which was referred to us by Mr. Schedlbauer is not of interest to Asarco. It is not one of the commodities which Asarco is presently interested in.

The gold property is of moderate interest and one of our geologists, Mr. George Stathis, will shortly contact you to request more information and possibly to establish some time later this summer when he might make a visit to the prospect area.

Thank you for bringing these properties to the attention of Asarco.

Sincerely yours,

W. D. Payne

WDP:lb

cc: GJStathis
RLBrown
ADSchedlbauer

ASARCO Incorporated P. O. Box 5747 Tucson, Az 85703
1150 North 7th Avenue (602) 792-3010

ASARCO
Salt Lake Exploration Division

June 28, 1974

Mr. J. H. Courtright
Tucson Office

Dear Sir:

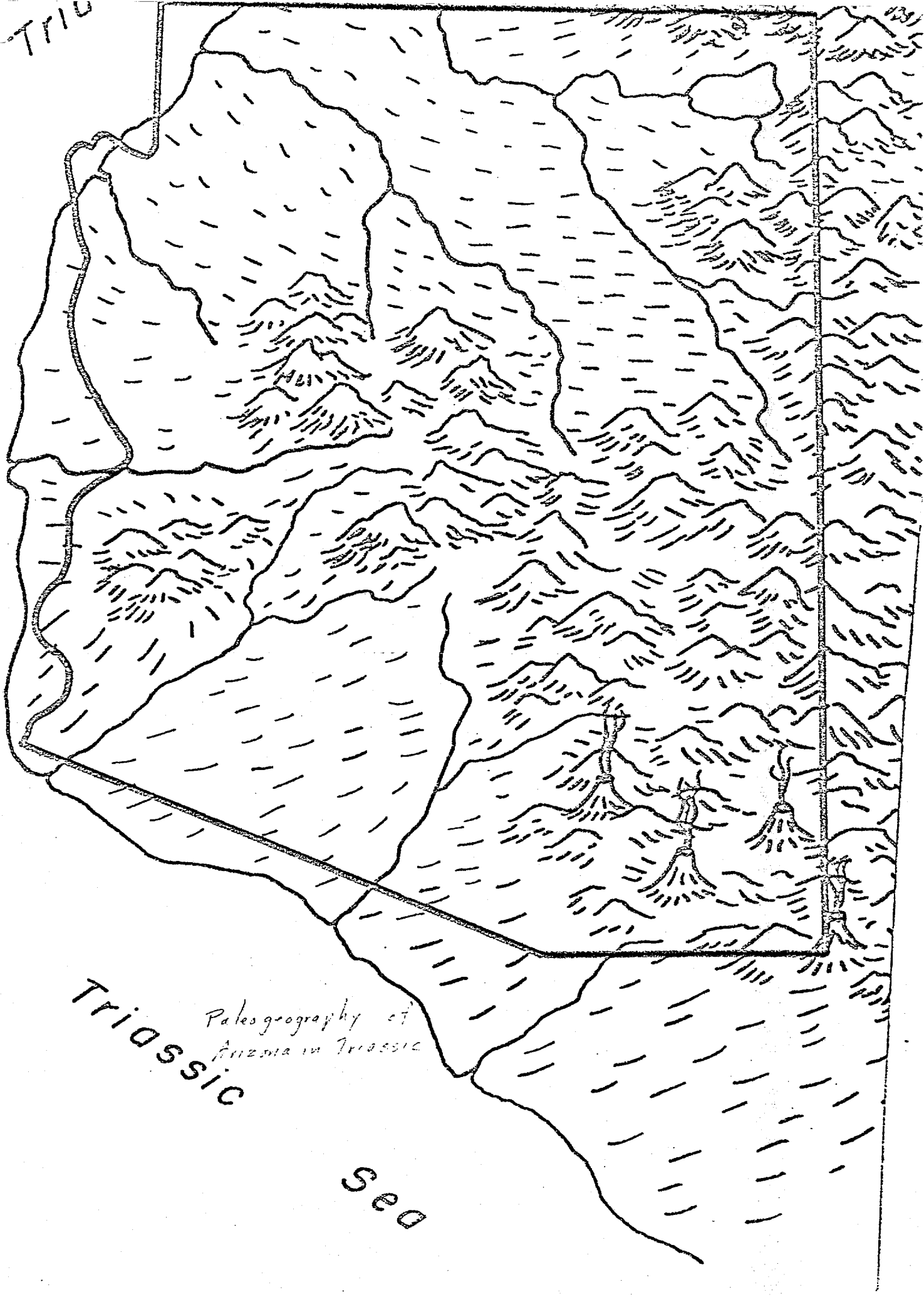
I read with considerable interest, your comments on Paul Handverger's proposal to research the younger pre-Cambrian of Arizona for massive sulphide deposits but particularly precious metal deposits. Just before my transfer to Alaska in 1971, I had done a little research on the origin of the gold in the Shinarump formation (Basal Triassic) near Paria in southern Utah. The source is either in north central Arizona or eastern Arizona - northwestern New Mexico. I did some mapping and sampling in the Sierra Ancha Mtns. guided by the excellent work of Gordon Gastil but had not yet identified specific areas for exploration. I enclose copies of a) a paleogeographic map of Arizona in Triassic time and b) a reproduction from USGS PP 424 showing Triassic drainage directions. It is an interesting problem and I would like to see Mr. Handverger's program proceed.

Very truly yours,

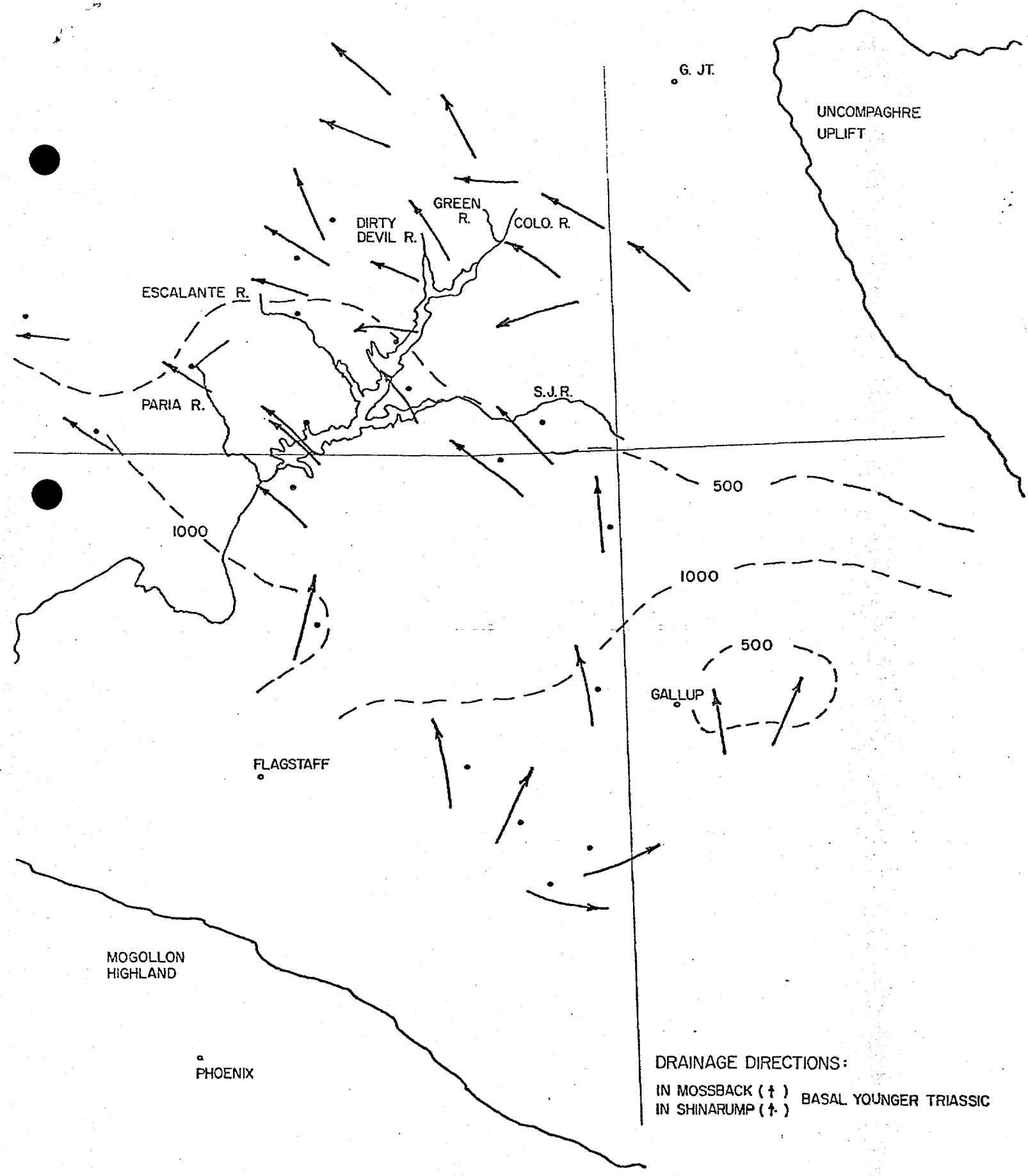
J. R. WOJCIK

JRW/mb
Enc.

cc: J. J. Collins (e/enc)



Paleogeography of Arizona in Triassic



MARCH '71

FROM POOLE 1961, U.S.G.S. pp. 424

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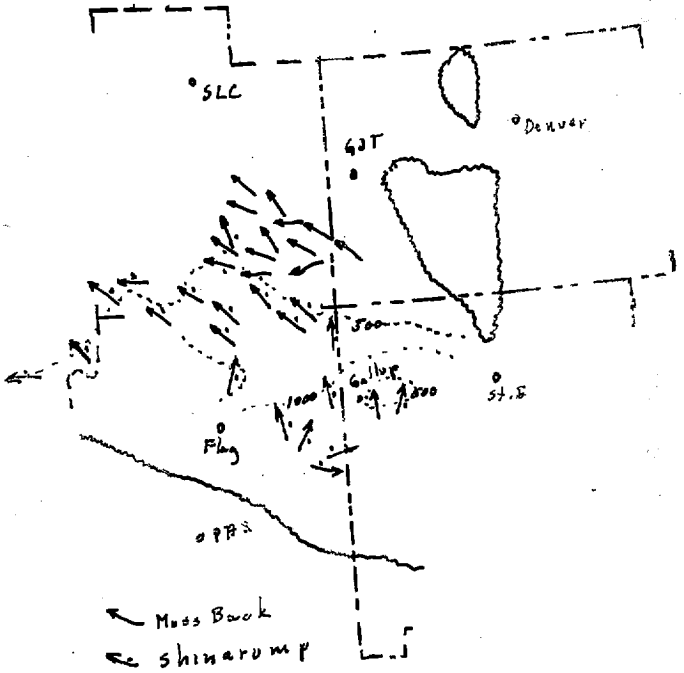
Isopachs of thickness of Triassic section


SLC
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Gallup
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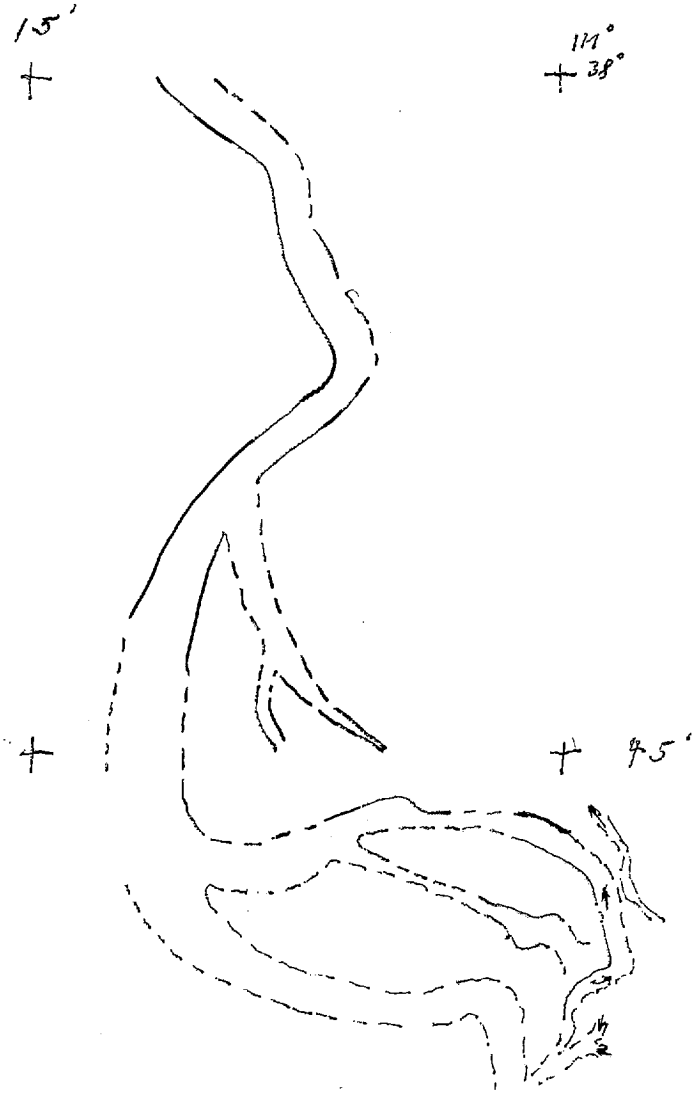
Flag
PAS
Moss Back
shinarump


15'
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Abstract

While searching the literature for clues to possible fossil or buried gold placer deposits, I was particularly intrigued by the mention of gold in the ~~Lower~~ Triassic Shinarump formation of southern Utah. Insert A ~~Insert A~~ Further search indicated a probable source for the sediments to be the pre Cambrian of central Arizona.(2) Insert B or northwestern New Mexico ~~This suggests the possibility of fossil placer deposits being preserved somewhere in northern Arizona.~~

(A) Values ran up to 12½¢/ton and average 4¢/ton (1913 price) over a vertical range of 175-240'. (1)

(B) If the gold was derived from the same source area, there could be placer deposits preserved nearer the source. A quick reconnaissance of the younger pre Cambrian in the northern Sierra Ancha Mts. disclosed conglomeratic strata but no clues to possible gold concentrations (USGS Heavy Metals program reported one sample from the Sierra Ancha at 100 ppb (3)). Since the known gold occurrences are more frequent to the west in the Mazatzal Range and particularly the Bradshaw Mts. They may be considered as a likely source for the gold in the Shinarump. A reconnaissance of the Cambrian Tapeats Formation should be undertaken

which would include ~~g~~ trace element analysis for gold content of panned concentrates of ~~the~~ all samples taken and collection of data ~~to~~ which indicates flow direction.

Introduction

~~Reviewing the~~ In USGS Heavy Metals Program Progress Report for 1966-1967 (Circular 560), the authors ~~I noticed~~ reported that in their investigation of ~~§~~ possible fossil placer deposits, they had obtained one sample from the pre Cambrian Scanlan conglomerate in the Sierra Ancha Mts of central Arizona that assayed 100 ppb Au. ~~Based~~ Assuming that this gold was of ~~and~~ fluvial origin or locally remobilized hydrothermally, I sampled the Scanlan at scattered locations

throughout the northern Sierra Ancha. ~~Flow direction indicated a source for the Scanlan to the southwest and the~~ The Scanlan is ~~This~~ ~~It~~ exposed in a relatively narrow belt along the east and north sides of the range and is overlain to the east and north by younger sedimentary and volcanic rocks. No gold was found in any of the samples. Further investigation of the literature produced a paper describing a gold occurence in the Basal Younger Triassic of southern Utah. More recent work shows that the source for this material was the ancient Mogollon Highlands in central Arizona. It seems unlikely that so heavy an element as gold ~~could have been~~ was transported such a distance in a single drainage system so I

suggest that the immediate source of the gold in the Utah Triassic was one or more older formations that were eroded and redeposited. Some evidence exists to support this theory. (H.S. Cooley, personal communication) If this is in fact the case then the Basal Paleozoic formations nearer to the source area could contain placer deposits that have not been destroyed or diluted.

Gold in Shinarump

Sometime during the period 1910-1913 about 20 men attempted to work the "Paria Gold Mine" (?) In 1943 a group attempted to mine mercury in essentially the same place. Gregory could find no trace of mercury in the pit where mining

was attempted. It is possible that the initial trace of mercury was introduced during the abortive gold "rush" of 1910-1913.

Lawson in 1913 cut 3 trenches covering the banks on the northeast and southwest sides of the Paria River floodplain just below Paria with the following results.

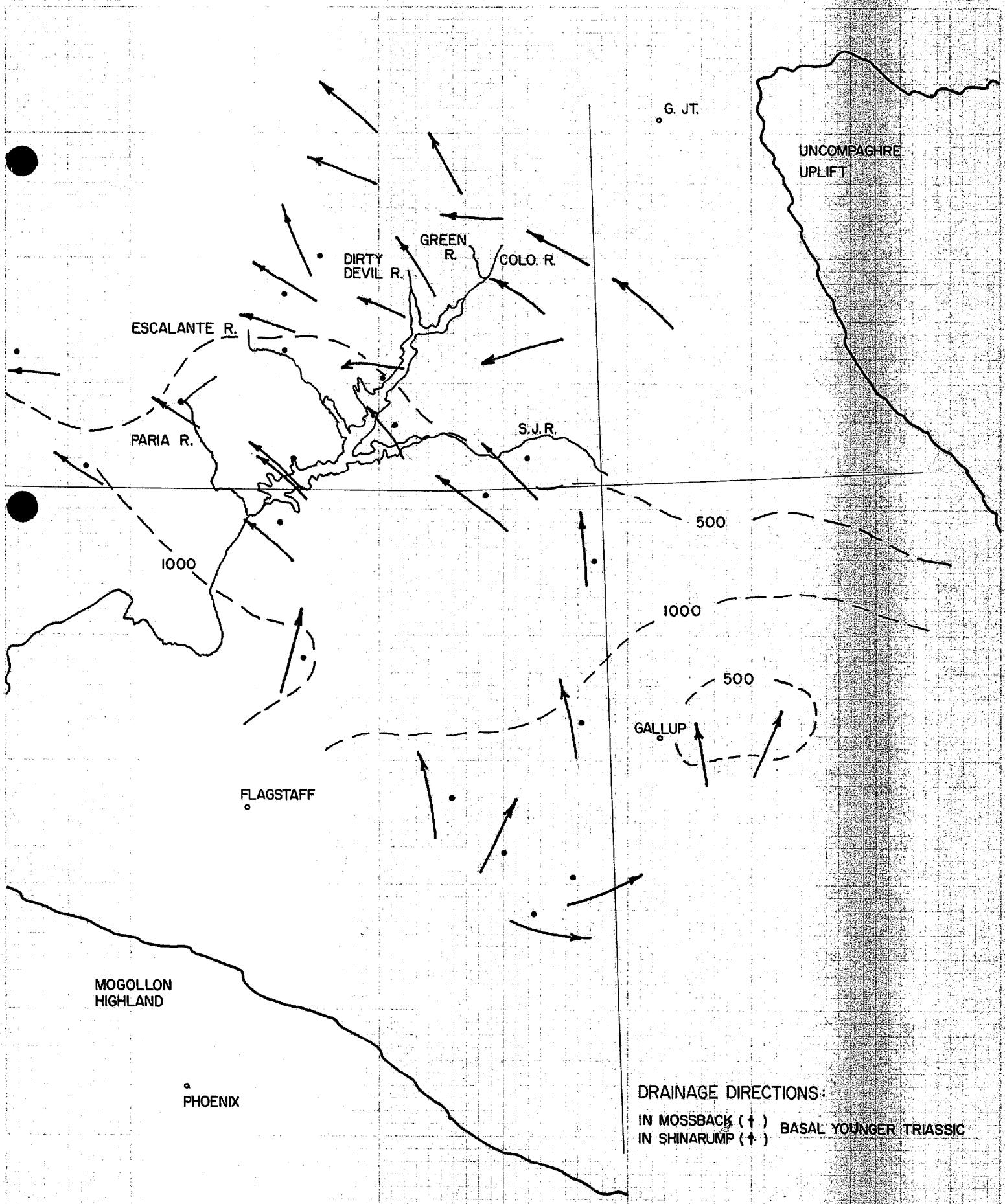
1) On northeast side of floodplain
210' from river level across middle part of formation.
22 samples
1 @ 12½¢/ton
2 @ 7½¢/ton
8 @ 5¢/ton
5 @ 2½¢/ton
5 @ trace
1 @ nil
Arithmetical average 3.6¢/ton
Composite assay 4¢/ton
The section at 1 is bentonitic clay except for two sandstone beds 50' and 4' respectively

separated by 9' of clay.

2) On southwest side
174' from river level across lower part of formation
18 samples
1 @ 10¢/ton, ~~9 @ 5¢/ton~~
9 @ 5¢/ton
2 @ 2½¢/ton
4 @ trace
1 @ nil
Arithmetical average 3.3¢/ton
Composite assay 5¢/ton

A 15' bed of sandstone at 125' produced the 10¢/ton sample.

3) On southwest margin where it overlooks the Permian plateau.
240' from top of basal sandstone across ± 2/3 of formation.
22 samples
1 @ 7½¢/ton
5 @ 5¢/ton
1 @ 2½¢/ton
16 @ trace



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FROM POOLE 1961, U.S.G.S. pp. 424

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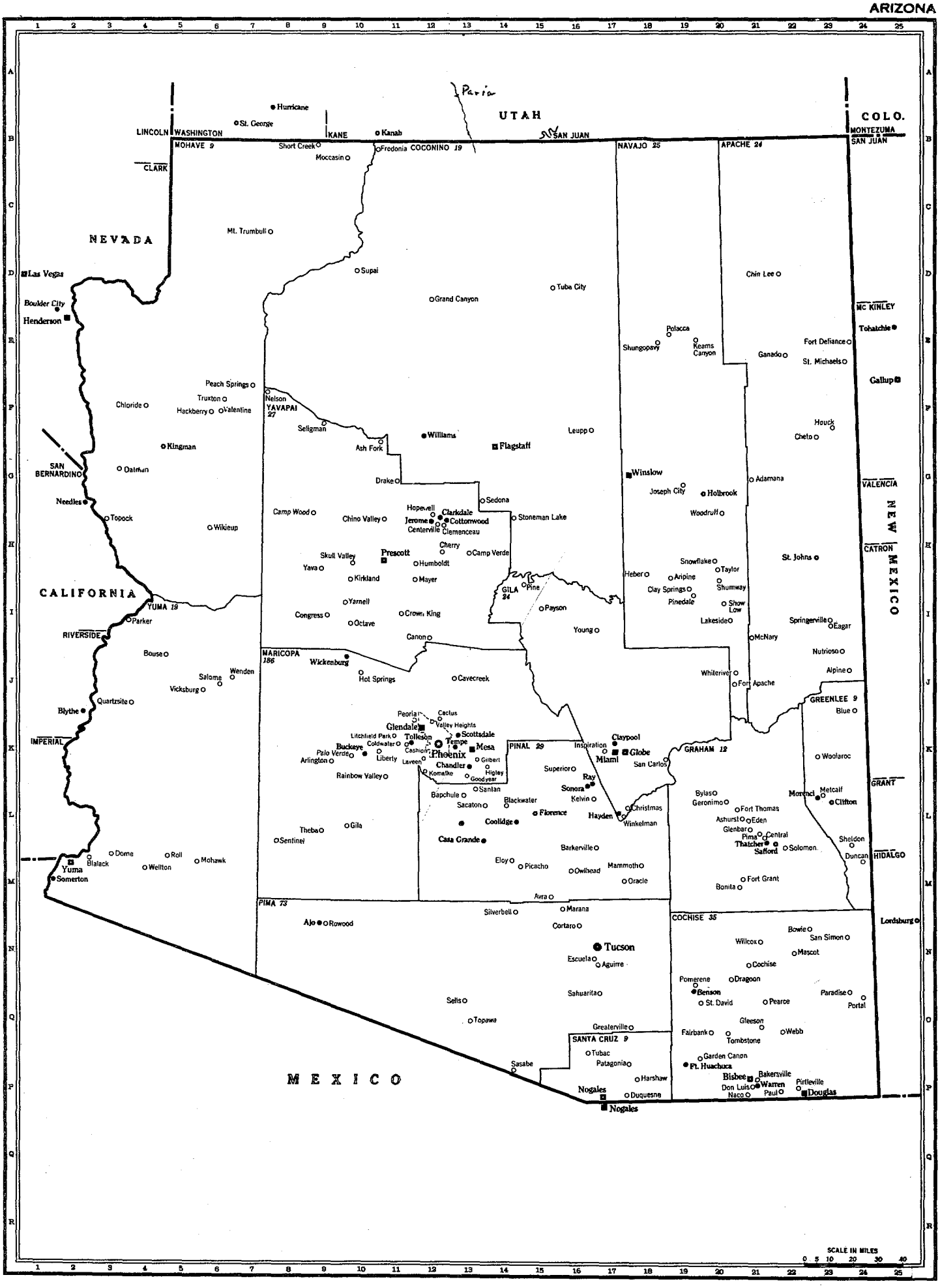
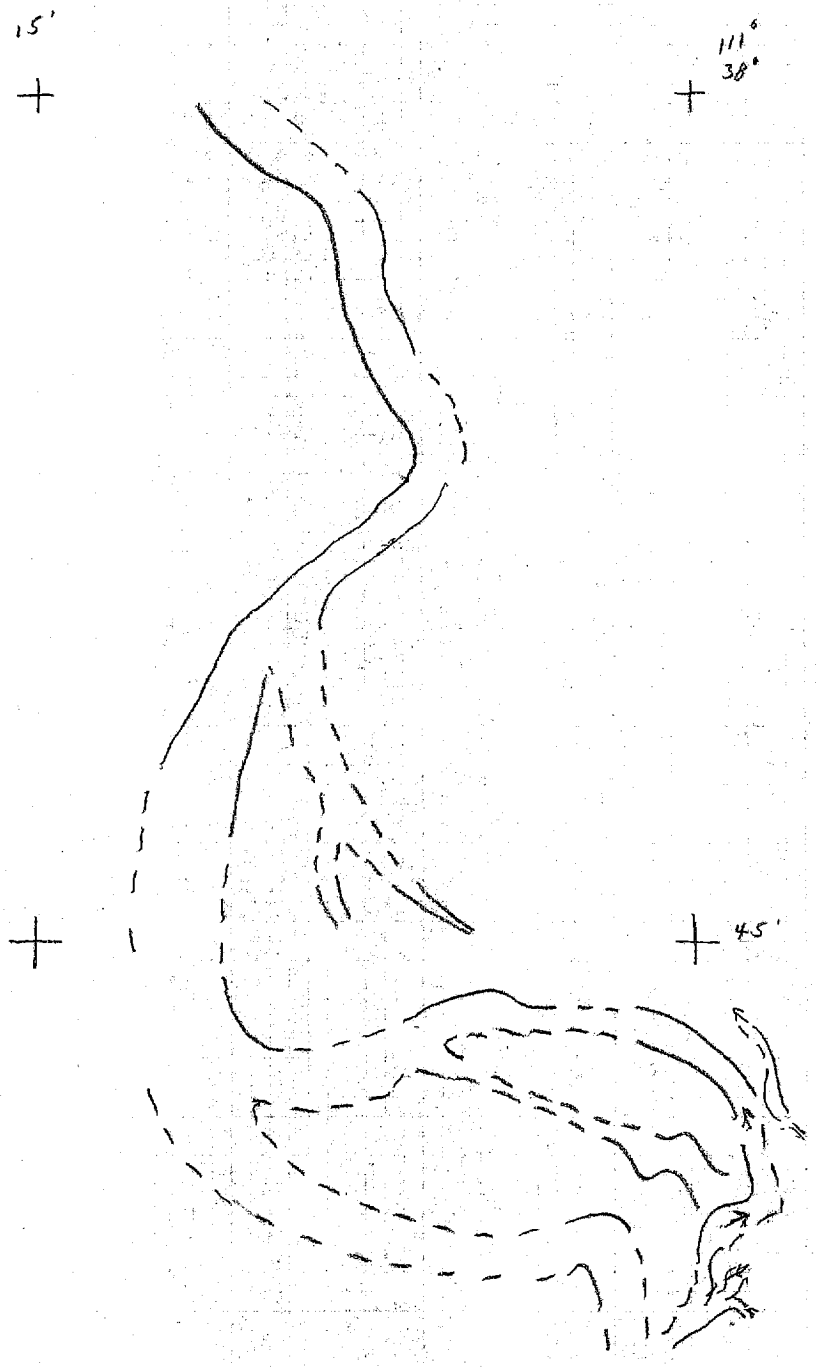
Isopachs of thickness of Triassic section

Paleogeography of Arizona in Triassic


UTAH
COLO.
NEVADA
CALIFORNIA
NEW MEXICO
MEXICO
LINCOLN
WASHINGTON
KANE
SAN JUAN
MONTEZUMA
CLARK
MOHAVE 9
COCONINO 19
NAVAJO 25
APACHE 24
MC KINLEY
SAN BERNARDINO
YAVAPAI 27
VALENCIA
CATRON
YUMA 19
RIVERSIDE
MARICOPA 186
GILA 24
GREENLEE 9
IMPERIAL
PINAL 29
GRAHAM 12
GRANT
PIMA 73
COCHISE 35
HIDALGO
SANTA CRUZ 9
Hurricane
St. George
Kanab
Short Creek
Moccasin
Fredonia
Mt. Trumbull
Las Vegas
Boulder City
Henderson
Supai
Grand Canyon
Tuba City
Chin Lee
Polacca
Shungopavy
Keams Canyon
Ganado
Fort Defiance
St. Michaels
Tohatchie
Gallup
Peach Springs
Truxton
Hackberry
Valentine
Chloride
Nelson
Seligman
Ash Fork
Williams
Flagstaff
Leupp
Houck
Cheto
Kingman
Dalman
Needles
Topock
Wikieup
Drake
Sedona
Winslow
Joseph City
Holbrook
Adamana
Woodruff
Camp Wood
Chino Valley
Hopewell
Clarkdale
Jerome
Cottonwood
Centerville
Clemenceau
Stoneman Lake
Cherry
Camp Verde
Skull Valley
Prescott
Humboldt
Yava
Kirkland
Mayer
Pine
Payson
Snowflake
Taylor
Heber
Aripine
Clay Springs
Shumway
Pinedale
Show Low
St. Johns
Lakeside
Springerville
Eagar
Yarnell
Congress
Crown King
Octave
Canon
Young
McNary
Nutrioso
Alpine
Parker
Bouse
Salome
Wenden
Vicksburg
Wickenburg
Hot Springs
Cavecreek
Whiteriver
Fort Apache
Blue
Quartzsite
Blythe
Peoria
Cactus
Glendale
Valley Heights
Scottsdale
Litchfield Park
Tolleson
Tempe
Buckeye
Coldwater
Cashion
Mesa
Palo Verde
Phoenix
Arlington
Liberty
Laveen
Chandler
Gilbert
Komatke
Higley
Goodyear
Rainbow Valley
Inspiration
Claypool
Miami
Globe
San Carlos
Superior
Ray
Sonora
Kelvin
Santan
Bapchule
Sacaton
Blackwater
Florence
Hayden
Christmas
Winkelman
Coolidge
Casa Grande
Theba
Gila
Sentinel
Dome
Roll
Mohawk
Blalack
Wellton
Yuma
Somerton
Barkerville
Eloy
Picacho
Owlhead
Mammoth
Oracle
Woolaroc
Bylas
Geronimo
Fort Thomas
Ashurst
Eden
Glenbar
Pima
Central
Thatcher
Safford
Solomon
Morenci
Metcalf
Clifton
Sheldon
Duncan
Bonita
Fort Grant
Lordsburg
Avra
Silverbell
Marana
Cortaro
Ajo
Rowood
Tucson
Escuela
Aguirre
Sahuarita
Bowie
San Simon
Willcox
Mascot
Cochise
Pomerene
Dragoon
Benson
St. David
Pearce
Paradise
Portal
Gleeson
Fairbank
Tombstone
Webb
Selis
Topawa
Greaterville
Tubac
Patagonia
Garden Canon
Ft. Huachuca
Sasabe
Harshaw
Nogales
Duquesne
Bisbee
Bakersville
Warren
Pirtleville
Don Luis
Naco
Paul
Douglas
SCALE IN MILES
0 5 10 20 30 40


15'
111°
38°
45'

29.5 39% of 50mm =

2.3 ± 19½ mm

Mohone = ± 37mm

Fn 3 - 22 samples 1@ 7½¢/ton, 5@ 5¢/ton, 1@ 2½¢/ton
16@ tr & one nil
average 240'@ 2¢/ton 1,756 ave

Au Values @ 1913 prices

Some fm appears similarly auriferous @ Lee's Ferry and @ San Juan.

Gregory - 1948 - GSA Bull 59

1910-13 about 20 men attempted to work the "Paria Gold mine".

1943 a group attempted to mine mercury @ same place.

Manganese bearing rocks in Mine Gulch near the mouth of Park Wash contain est. 70,000 tons of 10% Mn.

Gregory could find no trace of Hg in the pit where mining was being attempted.

$t_1, dt =$

1018
529

Lexington Ave. Exp. to Wall Street
turn right. Equitable Bldg

Heylmun, E.B. 1961 Results of deep drilling in southwestern Utah; Bull. AAPG. v. 45 no 2 pp 252-255 see notes

Poole, F.G. 1961 Stream directions in Triassic rocks of the Colorado Plateau: USGS. PP 424-C p. C-139-C-141 see notes

Stokes, W.L. 1950, Pediment concept applied to Shinarump and similar conglomerates: GSA Bull v. 61 p 91-98 very good

McKee, E.D. 1954 Stratigraphy and History of the Moenkopi formation of Triassic age.
NC

Lawson - 1913 3 trenches @ Paria

N & S of Paria the River runs through @ narrow canyon. At Paria for 3 miles the floodplain is ½ mile wide

Moenkopi considered Permian in Lawson's paper.

3 trenches cut

1 - 1 on NE side of floodplain

2 - 1 on SW side

3 - 1 on SW margin where it overlooks the Permian plateau

1 - 210' from river level across middle part of fm.

2 - 174' from river level across lower part of fm.

3 - 240' from top of basal ss. across ± ⅔ of fm.

In 3 a 2' bed of ss occurs @ 110'

In 2 a 15' bed of ss occurs @ 125'

In 1 @ 50' bed occurs and a 4' bed above 8' clay.

25-30 lbs each 10' vert.

In 2 - 18 samples, 1 @ 10¢/ton, 9 @ 5¢/ton, 2 @ 2½¢/ton, 4 @ tr and one nil

~~10¢ sample from 15' ss. bed~~

average 174' @ 5¢/ton (composite assay) 3.33 ave

In 1 - ~~22 samples 1 @ 12½¢/ton, 2 @ 7½¢/ton, 8 @ 5¢/ton~~

5 @ 2½¢/ton, five tr & one nil

average 210' @ 4¢/ton composite assay 3.636 ave

UTAH

Gregory, H.E. 1917, The Navajo Country
USGS pp 93.

Hunt, C.B. Structural & Igneous geology of the LaSal Mts. Utah. USGS pp 294-I, pp 305-364, 1958

W.L. Stokes. GSA Bull 61 1938 ~~Navajo~~ San Juan country "... no Triassic or Carboniferous formation so far mapped includes material that might supply the vari colored quartz and quartzite. The quartzites differ in no essential from those in the preCambrian of Utah and Arizona"

Spieker, E.M. 1926, Upper Cretaceous shoreline in Utah. G.S.A. Bull vol 37 pp 429-438

M 550.5 G29

16.55 An 7 Harshbarger, J.W. 1948, Dec. Upper Jurassic stratigraphy of Black Mesa, Ariz.
G.S.A. Bull v. 59, No. 12 p. 1372

Sedimentary facies in geologic history [symposium]
G.S.A. Memoirs. 39 p 35-48 discussion p 132-133
June 17, 1949

Stokes, W.L. 1950 Pediment concept applied to Shinarump and similar conglomerates OK - see above.
G.S.A. Bull vol 61 p 91-98

523 E. Grant
622-1801

Gregory, H.E. 1948, Geology and geography of central Kane County, Utah: Geol. Soc. Amer. Bull v. 59 OK

1951 Geology and geography of the Paunsaugunt region, Utah: USGS PP 226
OK but not applicable

The Kaiparowits region: USGS PP 164
Good

McFall, C.C. (1956) Geology of the Escalante-Boulder area, Garfield County, Utah: unpub. Ph D Thesis, Yale NA

Fisher, R.R. 1937 Sedimentary deposits of copper, vanadium, uranium and silver in southwestern United States: Econ. Geology vol. 32, pp 906-949 NC

Gregory, H.E. 1917 The Navajo Country USGS PP 93
NC
1938 The San Juan Country USGS PP 188
good

Spieker, E.M. 1926 Upper Cretaceous shore line in Utah: G.S.A. Bull. vol. 37, pp 429-438
OK but not applicable

Lawson, A.C. The gold in the Shinarump at Paria: Econ. Geol. vol. 8, pp 446-448
Basis of all this fuss 1913

Bajada placers of the arid southwest. AIME
Tech Pub 588 16pp 1935 Mng & Met. Abstracts
vol 16 no 338 p 114 Feb 1935 Year Book p 61 Jan '36
No good

✓ The San Juan country USGS PP 188 1938
In Tucson

The geologic structures mapped in Apache C. Ariz.
✓ Oil & Gas Journal vol. 36 no. 10 pp 29-30, July 1937
No good

Preliminary report on the Tonto group of the
✓ Grand Canyon, Ariz: Grand Canyon Nat.
History Assoc. Bull. 5 pp 1-16 May 1936
NA

Paleozoic formations in the Gold Hill Quad.
✓ Utah: Wash. Acad. Sci. Jour. vol. 20 no. 17 pp 421-
432 Oct. 1930 NC

The Gold Hill mining district, Utah: U.S.
✓ Geol. S. PP 177 NC

✓ Gold Placers of the Haina River in the
Dominican Republic: Rocks and Minerals
vol. 14, no. 1, pp. 10-14, Jan 1939 Langweiler
No interest.

nope

Upper Jurassic stratigraphy of Black Mesa, Ariz
G.S.A. Bull v. 59, no. 12 p 1372 Dec. 1948
Harshbarger, J.W.

S(274)
F59MX

A guide to the continental Triassic of Northern Arizona Plateau v. 20, no. 1, p 1-9 July 1947 Nogood, strictly for vert. bonediggers

Stratigraphy and ecology of the Grand Canyon Cambrian, Pt 1 of Cambrian history of the Grand Canyon ~~Cambrian~~ region. Carnegie Inst. Washington Pub. 563 p 3-168, Oct [15] 1945
E. D. McKee NA

Facies changes in the Colorado Plateau
Longwell, C. R. chm., Sedimentary facies in geologic history [symposium] G.S.A. Mem. 39, p 35-48 discussion p 132-133 June 17, 1949
NA

~~Marginal~~
Sedimentary basins of Arizona and adjoining areas G.S.A. Bull v. 60 no 12 pt 2, p 1908-1909 Dec. 1949 Nogood.

Permian deposits of the Arizona-Utah basin.
N.Y. Acad. Sci. Trans. ser 2, v. 2 no 6 p 153-155
April 1940
Nogood

Webber 1935 - AIME Tech Pub 588
Nogood

Spieker GSA Bull 37 1926
Westernmost Cretaceous of Utah appear in more or less isolated areas along a line extending through Cedar City at the southwest and Coalville at the northeast, OK.

July 1947 A guide to the continental Triassic of Northern Ariz., Plateau, vol. 20 no1, p.1-9.

April 1940, Permian deposits of the Arizona-Utah basin. N.Y. Acad. Sci. Tran. ser 2, vol. 2 no. 6, p 153-155

July 1937 The geologic structures mapped in Apache Co. Ariz. Oil & Gas Journal, vol. 36, no. 10 pp 29-30
Nogood

Circular 560
1966-1967

Witkind, I.J. 1957. Abajo Mts, Utah,
USGS Rpt. TEI-700 p 48-58

M622.33805
Am3

Heylmun, E.B., Aug 1958 Paleozoic stratigraphy and oil possibilities of the Kaiparowits region, Utah.
AAPG Bull vol. 42 no. 8 pp 1781-1811

Baker, A.A. 1935, Geologic structure of Southeastern Utah. AAPG Bull vol 19 no 10 pp 1472-1507

Heylmun, E.B. 1961 Results of deep drilling in Southwestern Utah.. Bull AAPG. vol. 45 no 2 pp 252-255

J. Ray McDermott No. 1 State SW/4, SW/4 sec. 2 T43S R8W
Kane Co.

Surface	Navajo	5315	Toroweap	8425	Elbert
2375'	Chinle	5757	Coconino	8786	? Cambrian
3313	Shinarump	5780	Hermit	9600	Muav
3560	Moenkopi	6404	Queantoweap	9836	Bright Angel
4995	Kaibab	7540	Redwall	10062	Tapeats
				10,335	PC

Young, R.B. 1907 Notes on the auriferous conglomerates of the Witwatersrand Geol. Soc. south Africa Trans. v.10, p.17-30
NC

— 1917, The Rand banket, a study of the auriferous conglomerates of the Witwatersrand and the associated rocks. London ~~p 125~~ 125 p. NC

Bancroft, Howland 1910, Platinum in southeastern Nevada [Clark County]: U.S.G.S. Bull 430 p 192-199 NC

Emmons, S.F. 1903, Platinum in copper ores in Wyoming: U.S. G.S. Bull. 213 p 94-97
NC

Finch, J.W. 1925 Platinum discoveries in Wyoming (Encampment district) Eng and Min. Jour. Press v.120 p.95-96 NC

Gregory, H.E. and Moore, R.C. 1931. The Kaiparowits region, a geographic and geologic reconnaissance of parts of Utah and Arizona: USGS PP 164 148 p.
good

no Australia, 1956, Mineral resources of Australia platinum group metals: Bur. Mineral Resources, Geology and Geophysics, Rept. no. 39, 22p.

1957 v. 9, p 1-37

509. Bleckrode, S., 1858, Platinerz von Borneo: Poggendoff's Annalen, v. 103, p. 656

Bracho, V. F., and Franco, L. M., 1945 Estudio tecnico de las propiedades mineras y plata de "El Cerdo", de la Cooperativa Minera "Las Dos Estrellas", en El Oro y Tlalpujahua, Michoacan: Bol. Minas y Petroleo, v. 16, no. 6, p. 3-9 and no. 7 p. 11-43

JN 28 A333

no Codazzi, R.L., 1929, Aluviones platiniferos: Bol. Minas y Petroleo v. 2, p 199-213

no 1934, Platino: Bol. Minas y Petroleo v. 11, p. 55-56

DO

no Cotelo Neiva, J.M. 1945, Possibilidade de ocorrencia de platina no distrito de Braganca [Portugal]: Servicios de Fomento Mineiro Estudos, notas e trabalhos, v. 1, p. 6-12 in Portuguese

French summary

— 1946, Cromite, platina, silicatos, niquelíferos e silicatos cobaltíferous em rochas do distrito de Braganca
D.O. v. 2, p 1-21 (French summary)

— 1947 Platina no distrito de Braganca
D.O. v. 3, p. 19-25 (English summary

— 1948 Rochas e ~~minerka~~ minerios da regiao Braganca - Vinhais.
D.O. v. 14, 251p (English summary)

G(569)
c64p

— 1949 Geology and genesis of Portugese ores of chromium and platinum, Braganca district: Coimbra Univ. Mus. e Lab. Mineralog. e Geol. Mem. e Noticias, no. 24, 289p.

Farquharson, ~~Farquar~~ R. A., 1913 The platinum placers of Orepuki, New Zealand: New Zealand Inst. Trans. v. 43, p. 471

Henderson, J. 1923, Gold and platinum in the Orepuki district. New Zealand Geol. Survey Br., 17th Ann.

Rpt. for 1923 p. 13

1923-24, Notes to accompany a geological sketch map of the Mt. Arthur district: New Zealand Jour. Sci. and Tech. v. 6, p. 174-190

Herior, E.M. 1918, Mining in Spain, Mining Mag. v. 19, p. 132 Bigood

MacKay, R.A. 1953, The world's sources of platinum: Mining Mag. v. 89, p 216-218 Bigood

Martinez Perez, Felipe, 1946, Estudio geologico-minera del ex-distrito de San Ignacio, Estado de Sinaloa, Mexico: Bol. Minas y Petroleo, v. 17, no. 12 p. 3-5

Morgan, P.G. 1927, Minerals and mineral substances of New Zealand: New Zealand Geol. Survey Branch, Bull 32 p. 76-77 and 81-82

Nicholl, J.J. 1925, Platinum in Mexico: Mining Jour. v. 149 p. 352

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S(520) M68

3rd floor

(800)
Au1b
1967
Bulletin no. PNG 1
(Its Bulletin no 93)

Nye, P. B. and Fisher, N. H. 1954, The mineral deposits and mining industry of Papua-New Guinea: Canberra, Bureau of Mineral Resources, Geology & Geophysics report n. 9, 35 p.

Rep t no 9
1954
(800)
Au7r

Stanley, E. R. 1921, A contribution to the geology of New Guinea: Bull. Terr. Papua, no. 7, p 1-15

—— 1923, The geology of Papua (to accompany the geologic map of the Territory of Papua): A. J. Mullett, Govt Printer. Melbourne, 56 p.

Uglow, W. L. 1920, Douglas gold-platinum gravels North Saskatchewan River, Alberta: Mineral Resources Commission, Canada Final Report, Toronto p. 185-194
NC

Wöhler, F. 1866, Über ein neues Mineral von Borneo: Annalen der Chemie und Pharmacie v. 139, p 116-120 NC

Worley, W. F. 1923-24, Platinum in alluvium from Nelson mineral belt rocks: New Zealand Jour. Sci and Tech. v. 6, p 136-138

Hess, F.L. 1926, Platinum near Centennial, Wyoming
USGS Bull 780 p 127-135 NC

McDonald, Donald
1959, The platinum of New Granada, I
NC : Platinum Metals Rev., v. 3, no. 4 p. 140-145

NC 1960a, The platinum of New Granada II
: Platinum Metals Rev. v. 4, no. 1, p 27-31

Report no. 9,

Louisiade district (Islands of Misima, Rossel & Sudest)
(southeastern Archipelago.

Prod. to June 30 ~~1912 20,497 oz.~~

	1931	152,003
+	32	~~4,689~~
	33	7,135
	34	12,594
	35	15,630
		16,712
	37	27,133
	38	30,687
	39	31,859
	40	38,631
	41	39,658
+	38	4,689
	39	26,691

Morua district (Woodlark or Murua island to NE.)

to June 30 1931 206,805 oz.

Gira district - Northern division - headwaters of Gira River
flows NE to Pacific 20 mi SE from Morobe,

to June 30 1931 67,690 oz.

Milne Bay dist. 14,230 + 771 + 110 g

Yodda dist. on Yodda R. NE of Port Moresby

Total Au content 612,026 oz Papua to 1951

Gold of the Sepik district is reconcentration of gold contained in conglomerates of the Miocene-Pliocene sedimentary series.

Tertiary channels in New Guinea

Thompson investigated heavy mineral sands around the coast of Bougainville in 1961

Many of the present day sands contain high concentrations of heavy minerals, and similar concentrations probably occur in many of the old strands on the coastal plains. The heavy mineral content locally exceeds 95% of the total mineral content. Titoniferous magnetite containing about 4% TiO_2 (Ilmenite?) is the predominant heavy mineral, with subordinate hematite, pyroxene and hornblende.

G (255) Mich Bas. Geol. Soc. June 1948

9 M55f 2nd Pleist. of east. pt. of north. peninsula.

~~F34 (255)~~

~~M50m 1st Council of defense Michigan copper survey~~ Aug. 1941

~~(255) 8 1st~~

~~M c~~ . ~~Mich. geol. source book~~

580 (255)

M588i 1st Mich. Nat'l Res. Council 1961

Nope. Metall u. Erz. Jg. 30, H. 1, p 6-10, Jan '33 Dittman, Adolf
Kurze Mitteilungen über Zinnerz-Lagerstätten
in Spanien und Portugal

nope Rev. Minera, Madrid an. 86 no. 3441 p 37-38 Ja. 35
Maldonado, Manuel Los aluviones auríferos
de Granada

nope Inst. Geol. y. Min. Notas y Com. v 7 no 7 p 3-37
1936, Rubio, E. Nota acerca de los
aluviones auríferos de los ríos Alagón y Jerte
en la provincia de Cáceres: Spain

nope PO no. 15 p. 175-180, 1946, Sampelayo, P. H. Nota
sobre el afloramiento aurifero en Sésamo, Vega
de Espinareda (León):

nope Z. Angew. Geol. vol. 13 no. 3 p 150-153 Aug 67
Gorbunov, Ye. Z. Einige Arten alluvialer
Seifen:

~~Nev. Bureau of Mines Rept. 13 pt. C p 51-61~~
Michigan Basin Geol. Soc. 1961 Annual field excursion
Geologic Features of parts of Houghton,
Keweenaw, Baraga and Ontonagon Counties.

Dept. Res. Devel., Agr. Expt. Sta., Mich. State Univ.
1958 Isopachous map - deth of glacial drift.
Sec. 6 in Pt. A of Michigan water resources
folio - natural characteristics. Akers, James.
(about 1:500,000)

For Pat O'Neil: When @ Pato or Choco I made some remark about a comparison of reliability of 4" size casing to 6" size casing.

Gold, Utah: ~~Andrews, W.B.~~ 1, Baker, A.A. 7, Beutner 1,
~~Chaney 21~~; ~~Gilluly 5~~; ~~Green J. 1~~,
Gregory, H.E. 4, ~~Karpinsky 1~~, ~~Nolan 6~~.

Baja Calif: Hisazumi 3, Santillan 5,

Gold: Barrera 5, Garrison 1, ~~Krieger 3~~, Moehlman 4,
Salizar Salinas 3

Los placeres auriferos: Rev. industrial
tomo 3, nos. 1-3, pp 53-64. July, Aug. Sept. 1934
Barrera

~~S(520) M68 & 9M68 (1964-)~~

The gold of Mexico: Min. Mag. vol. 47 no. 4
pp 201-208 Oct. 1932

Dikes and veins of the Alamo gold district
Lower California: Econ. Geology vol. 30, no. 7
pp 750-764 Nov. 1935

~~431 9En8g~~

Oro en Mexico: Gold Resources of the World
pp. 233-246 Pretoria XV International
Geologic Congress. 1930 Salazar-Salinas

Packard, E.L. Prelim. Rpt. of the Cret. of
central Oregon. GSA vol 40 no. 1 p. 166
March 1929

Arizona

Schuchert, Charles May 1918. The Cambrian of the Grand Canyon of Arizona. Amer. Jour. Sci. 4th ser. vol. 45 pp 362-369.

McKee, E.D. Oct. 1945. Stratigraphy and ecology of the Grand Canyon Cambrian. Pt. 1 of Cambrian History of the Grand Canyon region. Carnegie Inst. Washington Pub. 563 p 3-168

Dom. Rep.

Lengweiler Jan 1939, Gold Placers of the Haina River in the Dominican Republic: Rocks and Minerals vol. 14, no. 1, pp 10-14

Bajada Placers of the arid southwest.
Pope 1935 AIME Tech Pub 588, Min & Met Abstracts vol. 16 no 338 p 114; Year Book p. 61 Jan. '36

Mexico & Baja - Hisazumi, 3; Santillan 5,

Barrera July, Aug, Sept. 1934; Los placeres auriferos. Rev. Industrial. Tomo 3, nos. 1-3 pp 53-64

Pope The gold of Mexico 1932, Oct. Mining Mag. vol. 47, no 4 pp 201-208

Salazar-Salinas
550 A063,2a2 Oro en Mexico 1930; Gold Resources of the World pp 233-246, Pretoria XV Int'l Geol. Congress

Flores 5 (1929-1939) Mexico - Lower California

Cotelo Neiva, J. M. 1945. Servicios Fomento Minero
Estudoes, notas a trabalhos, vol. p. 6-12
"Possibilidade de occorrencia de platina no
distrito de {Braganca} [Portugal]
1946 DO v. 2, p 1-21
"Cromite, platina, silicatos, niqueliferos e
silicatos cobaltiferous em rochas do distrito
de Braganca
1947 DO v. 3 p 19-25
Platina no distrito de Braganca
1948 DO v. 14 251p. Rochas e minerios da
regiao Braganca - Vinhais.
1949 Coimbra Univ. Mus. e Lab. Mineralog. e Geol.
Mem. e Noticias, no. 24, 289p.

McDonald, Donald, 1959, Platinum Metals Review
v. 3 no. 4 p. 140-145
"The Platinum of New Granada I"
1960a v. 4, no. 1 p 27-31
"The Platinum of New Granada II"

AAPG Bull 45 no 2 1961

Cambrian sediments transgress time lines eastward and northward. In Silurian or early Devonian the region was tilted gently westward, uplifted and subjected to erosion.

Schuchert, Charles, The Cambrian of the Grand Canyon of Ariz. Amer. Jour. Sci. 4th ser. vol. 45, pp 362-369 May 1918 Not consulted

Janin, Charles, Gold Dredging in the United States, U.S. Bur. Mines Bull. 127 1918 Not consulted

Spurr, J. E. Commercial control of the mineral resources of the world. G.S.A. Bull vol. 30, pp 108-109 1919 (March) Not consulted

USGS Bull 692 Au-Pt Placers of Kiwalik-Koyuk reg. NC

Chinle fm. Vander Hoof 5, ~~Keyes 2~~ 76 (1929-1939) MusN. Ariz. Mus. Notes vol. 6, no 7, pp 35-38 Jan. 1934

Mexico Lower California: Flores 5 Hogood " "

Not consulted

Cretaceous, Calif., Mex. Ore: Anderson, F.M. 14, ~~Imlay 6~~

" " ~~Anderson, 3, 12, 13, 14, Church 6, Nentand 1, Popenoe 4~~

Huff, L.C. Preliminary Geochemical studies in the Capitol Reef area, Wayne Co. Utah. USGS Bull. 1015-H p iii 247-256 1955
No good

Wittkind, I.J. Abajo Mts., Utah. US GS Rpt. TEI-700 p 48-58 1957 NA

Hunt, C.B., Structural and Igneous geology of the La Sal Mts, Utah USGS PP 294-I 305-364 1958 NA

Geology & geography of the Henry Mts. Area. USGS pp 228 1953 good but not applicable

~~Bissell, H.J. Stratigraphy of the Fivemile Pass and North Boulter Mts. guad in Utah Soc. Guidebook No 14 p 128-182, 1959~~

Heylmun, E.B. Paleozoic stratigraphy and oil possibilities of the Kaiparowits region, Utah AAPG Bull v. 42 no. 8 p 1781-1811 Aug 1958
No good

Baker, A.A. 1935, Geologic structure of Southeastern Utah: AAPG Bull vol. 19 no 10 pp 1472-1507
No good

Friday 10/30 — TUS - PHX — RW 503 11:30a - 12:07p
RW 85 12:30p - 12:50p -

PHX - RNO — RW 744 1:20p - 3:32pm
RW 263 — PHX - RNO

Sunday 11/1 — RNO - PHX — RW 869 8:40a - 10:48am
RW 253
RW 684 11:40a - 12:17pm

#67

987255

Reservations @ Ponderosa Fri, 10/30
Invite Geo. & Stephanie for dinner

Student for Saturday.
Return res. for Sunday.

XI pp 420-448

Cal. Jour. V. 31, no. 3 p 255-338 - Siskiyou G.
Callaghan & Buddington USGS Bull 893, 1938
Metalliferous mineral deposits of the Cascade Range in Oregon.

TN
1
M653

Diller, Topographic development of the Klamath Mts. USGS Bull 196, 1902

PP 98 K Some Paleozoic sections in Arizona
Bull. 1046 P
USBM RI 4093 Stewart, L.A.

E.B. Holt, Gold Mines of the Cherry Creek District Min. Jour. Vol 26, no. 7 p 4-5 (1942)

Rsanda, C.J. Identification of diamond in the Canyon Diablo Iron. Am. Mineral. vol. 24, no. 11, pp 677-80 (1939)

Bulls. 546
380
340

Josephine & Jackson Cos. Ore.
Uns are younger than Cretaceous and older than Eocene.
Some veins in metasediments may be pre Cretaceous

Klamath Mts are composed in large part of rocks like those of the Sierra Nevada, with traces here and there of lavas like those of the Cascade Range. Their present nucleus was an island in an ancient sea but in their later development they are closely related to the Coast Ranges.

"Among the hills on the valley border between Riddle and Canyonville there are a number of small mines which appear to derive at least part of their gold from the decomposition of the K beds on which the gravel rests"

USGS Folio 218 Riddle Quad, J. S. Diller and G. F. Kay

"The exception is at the High Gravel or Allen Gulch mine, near Waldo. Here the gravels are of Cretaceous age and lie on the divide between the east and west forks of Illinois River." Diller & Kay Bull 380

Dunn. R. H. California State Mineralogist Twelfth Report., pp. 459-471, 1894

Cretaceous cgl. in 1887± yielded for 20' 3.52/ton by hand & arrastra (free gold @ 20.67/oz)

XI Report State Mineralogist

Emmons, W.H. Gold Deposits of the World, 1937
McGraw Hill Book Co.

Gilluly, 1937 Geol & Min Res. Baker Quad
U.S.G.S Bull 879

Koch, G.S. 1959 Lode mines of the central part of the Granite Mng Dist. Grant Co. Ore. Ore. Dept. Geol. & Min. Res. Bull 49.

O'Brien, J.C. 1947 Mines & Min Res of Siskiyou Co.
Cal. Jour. Mines & Geol. v. 43 no. 4 p 413-462

Oregon Dept. of Geol & Min. Ind. 1942 Bull 14-C, v. 2, sec. 1
1943 Bull 14-C v. 2, sec. 2.

Parks & Swartley, Handbook of the mng. ind. of Oregon
Ore. Bur. Mines & Geol., Min. Res. of Ore. v. 2, no. 4
1916

Sherwin, P.J. ~~1931~~, U.S.G.S. Bull, 830-B 1933a
" 846-B 1933b
" Circ. 2, 1933c

Thayer, 1940 Chromite Deposits of Grant Co. USGS Bull 922-D

Wells, Hotz & Cater, 1949 Prelim. Desc. geol. of Kerby Quad Ore. Dept Geol & Min Ind Bull 40

Wells, Walker 1953 Geology of the Galice Quad. Ore. USGS, Survey Geol. Quad Map GQ-25

Winchell, Pet. & Min. Res of Jackson & Josephine Cos, Ore, Min Res of Ore. vol. 1, no 5 ore. Bur Mines & Geol 1914.

Bull 360 1909

pre geol of NA. C.H. Van Hise
C.K. Leith

"p. 37 " Most of the Archean & Algonkian continent was practically base leveled before and during the encroachment of the Cambrian sea. Occasional Monadnocks stood out upon this plain. About these, the base of the Cambrian is marked by coarse conglomerates.

Bull GSA vol 5 1894
Geol sketch of Lower Calif.

BULLETIN OF THE GEOLOGICAL SOCIETY OF AMERICA
VOL. 69, PP. 1495-1514, 6 FIGS., 2 PLS. DECEMBER 1958

Bull 620

Gastil, Univ. Cal. Dr. Thesis Unpub
Geology of Eastern ½ of Diamond Butte Quad
G.S.A. Bull. 69 no 12, 1958; ~~65 no 12, 1954~~
Porphyritic biotite granite exposed in the deep gorge of Sally May Cr. 5 miles east of Greenback Valley and at several places along the west base of the range between Greenback Cr. & Tonto Cr.

Hardt's Ranch in Tonto Basin - best access to Del Shay Bay.

Magnetic Qtzt form part of the schist series in D.S.B. striking NE, occupy a belt ¼ mi wide & 1 mi long. deposits are lenticular & are max 50' wide

SE of the magnetite belt is

Section on east wall of basin = poorly rounded pebbles of white qtz in arkosic matrix.

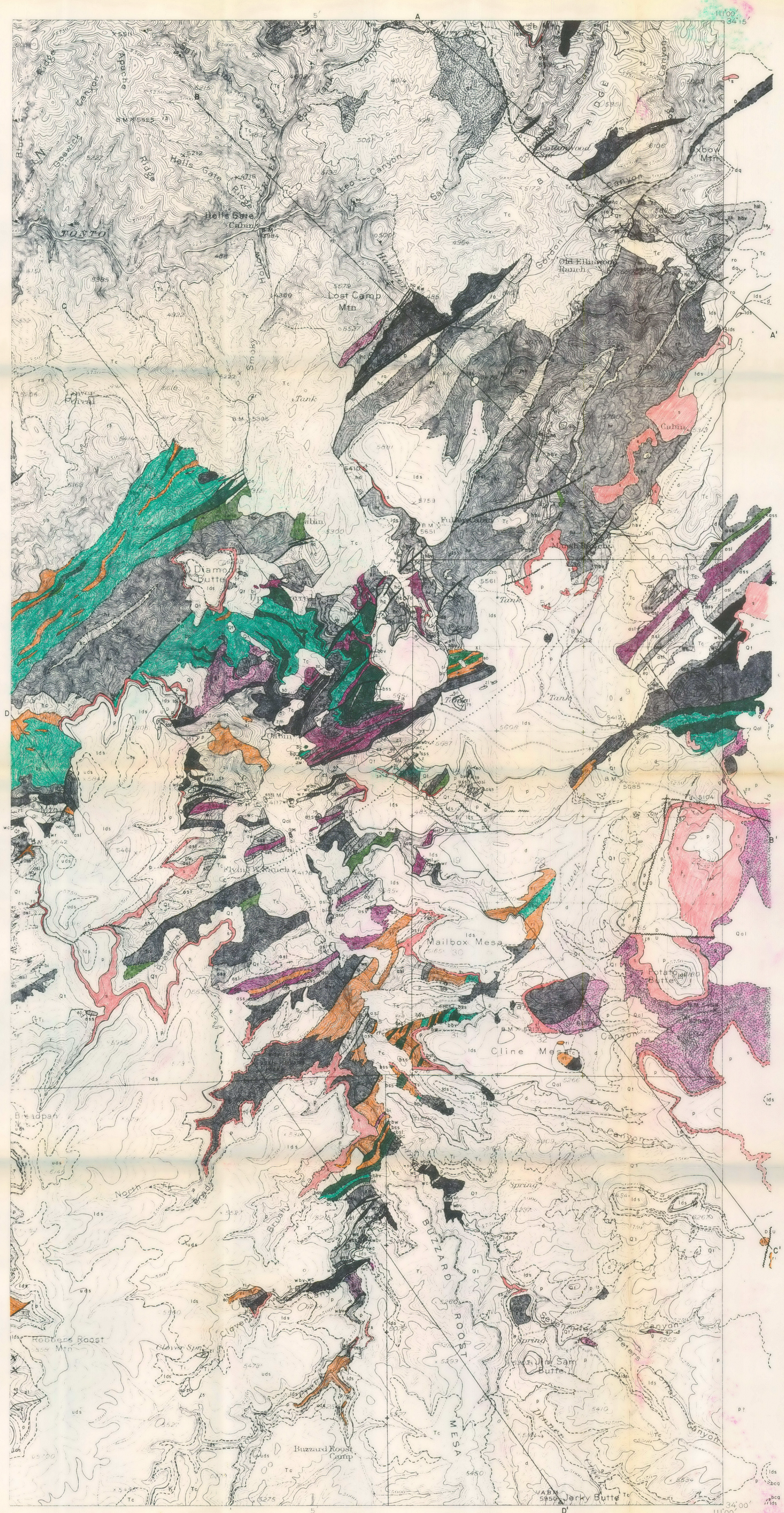
G.S.A. Bull. 69, 12, 1958 pp. 1495 - 1513
& pl. 1.
Gordon Gastil.

U.S.B.M. R.I. 4093 - Apache Iron deposit (1947)
U.S.G.S. Bull 821(c) (1931)
no good.

"... To the northeast, where it crosses the Tonto Basin and extends past the north end of the Sierra Ancha, the area of schistose rocks is probably at least 15 miles wide"

Ransome, F.L., Quicksilver Deposits of the Mazatzal Range, Arizona: U.S.G.S. Bull 620 (F), pp 114-117

Associated with these rocks are great masses of quartzite with some conglomerate and shale clearly pre-Apache in age. They constitute Mazatzal Peak and most of the northern part of the range and



GEOLOGIC MAP AND SECTIONS OF THE EASTERN HALF OF THE DIAMOND BUTTE QUADRANGLE GILA COUNTY, ARIZONA

TOPOGRAPHIC BASE MAP BY U.S. GEOLOGICAL SURVEY 1943

GEOLOGY BY GORDON GASTIL 1953

EXPLANATION

Strike and dip of bedding

Strike and dip of jointing

U upthrown side
D downthrown side
Faults of pre-Apache age

Faults of post Apache age

observed — approximate
Contacts

quartzite — chert — slate
Narrow beds

Abandoned mines

TERTIARY AND QUATERNARY

Qt talus
Qal alluvium
Tc stream gravel, lacustrine deposits
Ti lamproite flows, sills, dikes

UNCONFORMITY

LATE PRECAMBRIAN OR EARLY CAMBRIAN (?)

Intrusive rocks of post Apache pre-Devonian age
qd quartz diabase dikes
d olivine diabase and minor syenite sills and dikes

INTRUSIVE CONTACT

YOUNGER PRECAMBRIAN

Apache group
uds upper Dripping Springs formation
lds lower Dripping Springs formation
bc Barnes conglomerate
p Pioneer formation
s Scanlan and basal Apache conglomerate

MARKED ANGULAR UNCONFORMITY

OLDER PRECAMBRIAN

Rhyolite believed to be younger than Haigler formation (includes some intrusive rhyolite)
rh columnar rhyolite tuff of Hell's gate area
ro welded rhyolite tuff and porphyry of Oxbow Mountain area
r extrusive rhyolite unassigned

Haigler formation
Hsl slate
Hw wacke, volcanic sandstone
Hc conglomerate
Hbv basic volcanic flows
Hr rhyolite tuffs and flows

SLIGHT ANGULAR UNCONFORMITY (?)

Board Cabin formation
bp porphyritic basic flow
bbv basic pyroclastics and pillow lava, agglomerate
bc conglomerate
bw wacke, volcanic sandstone, includes some quartzite, arkose, and slate
bss quartzite, arkose
bsl slate

Houden formation
zu upper quartzite member
zm middle slate and quartzite
zl lower quartzite member and basal conglomerate
z combined zu and zl with zm not present

SLIGHT ANGULAR UNCONFORMITY

Flying "W" formation
wbv basic volcanic flows and pyroclastics
wr rhyolitic pyroclastics rocks
wc conglomerate

Alder formation
ass sandstone, conglomerate
aw wacke, conglomerat, slate
asl slate, conglomerate, sandstone

FAULT CONTACT

Unassigned rocks that may be older than Alder formation
bv basic volcanic flows and pyroclastics rocks
sl slate, minor limestone

INTRUSIVE CONTACT

Intrusive rocks
g granite
gr granophyre
ub ultrabasic rocks
bi basic volcanic rock
ri intrusive rhyolite and quartz porphyry
xi unclassified intrusive rocks

Horizontal and vertical scale
0 — 1 — 2 Miles

Contour interval 50 feet

GEOLOGIC MAP AND SECTIONS OF THE EASTERN HALF OF THE DIAMOND BUTTE QUADRANGLE, GILA COUNTY, ARIZONA