



CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
416 W. Congress St., Suite 100
Tucson, Arizona 85701
520-770-3500
<http://www.azgs.az.gov>
inquiries@azgs.az.gov

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NOBLE AND RUCKMICK
MINING AND EXPLORATION GEOLOGY
1475 EAST CALIFORNIA BOULEVARD
PASADENA, CALIFORNIA
SYCAMORE 3-9612

J. H. C.
AUG 9 1963

July 11, 1963

Kenyon E. Richard,
Ch. Geol., Southwestern Expl. Dept.,
American Smelting and Refining Co.,
813 Valley National Bank Bldg.,
Tucson, Ariz.

*Swansea
Arizona*

Dear Ken:

I enclose the colored copy of the Swansea map we discussed a few days ago, together with a key to the units and a table of formations as I have worked them out for this small area.

The table of formations may mean more to you and Courtright than it does to me, as this is the first detailed mapping I've done in Arizona. Of course I've seen and done some checking on the work the others have done on the two Indian Reservations - San Carlos and Papago; and I've made casual trips to most of the big camps, including some color photo reconnaissance. This suite of units at Swansea (also in the Buckskin Mountains and to the north across the Bill Williams River) has very little in common with the rest of Arizona that I've seen, but the geology does carry through much of Yuma and Mohave Counties and I think westward into California. I do think that the thick unit of volcanics (6) is the equivalent of the Cretaceous or Tertiary volcanics so widely distributed in Arizona. The breccia unit (11) may be equivalent to Gilluly's Locomotive fanglomerate at Ajo. I've seen nothing in the very extensive gneiss exposures in the Buckskin Mountains to correspond to his Cardigan gneiss; possibly that is equivalent to my nos. 6 and 5 (Wilson's mapping in Yuma and Mohave Counties suggests to me that the Cardigan may be younger than pre-Cambrian).

Sam Bowditch tells me that you are to leave soon for New York, but I hope we'll get chances to discuss these and other matters from time to time.

Best regards,

Jim Noble
James A. Noble

SWANSEA

Geologic Column
(mapping by J. A. Noble)

no.	name	age	description
INTRUSIVE ROCKS			
15	diabase	Ter?	dark fine-gr. ig. rock, some diabasic. Includes small apl. dikes, also qz veins. Cuts qz monz and all older rocks; qz monz chloritized, in places bleached (but no Cu). Many small bodies, especially in qz monz, not mapped.
14	qz monz	"	coarse-gr. qz monz (granite?); conspicuous qz. Cuts everything through congl (8); a separate body probably cuts amyg basalt (12). Commonly iron-stained at contacts.
13	intr bx	"	dense chertlike bx (rhy?). One small area only. Age not fixed relative to other intrusives.
SEDIMENTARY ROCKS			
12	amyg basalt	Ter?	dark amyg. basalt, resting on ls (3) and congl (8); part may be intrusive plug. Includes some porphyry flows on SW end? Possibly 500' exposed. large unconf.
11	breccia	"	sedimentary(?) breccia; angular frag of all sizes of all rocks, mostly in red or purple tuff(?) matrix. May be conformable with 10, but some indication it may be intrusive. Possibly 500' exposed. Contains one lens of congl like 8. May be base of thick Clara breccia to east and other unnamed units to west.
10	limestone	"	thin-bedded, very cherty limestone. Interbedded with congl and shale (tuff?); one place only; few feet thick.
9	shale (tuff?)	"	thin-bedded (paper-thin) shale or tuff; gray, purple, red. Interbedded and overlain by congl 8. Possibly 100' maximum thickness.
8	congl	"	pebble congl., well rounded pebbles and cobbles, mostly igneous, also ls; matrix white, light red, dark red or purple. Possibly 300' exposed here and overlying 9.
7	chert and volc.	"	jaspery chert or volcanics; iron-stained near base. Changes to angular jaspery bx on strike (then equivalent to 11?). Only on SW end. Probably 500' max. thickness.

large unconf.?

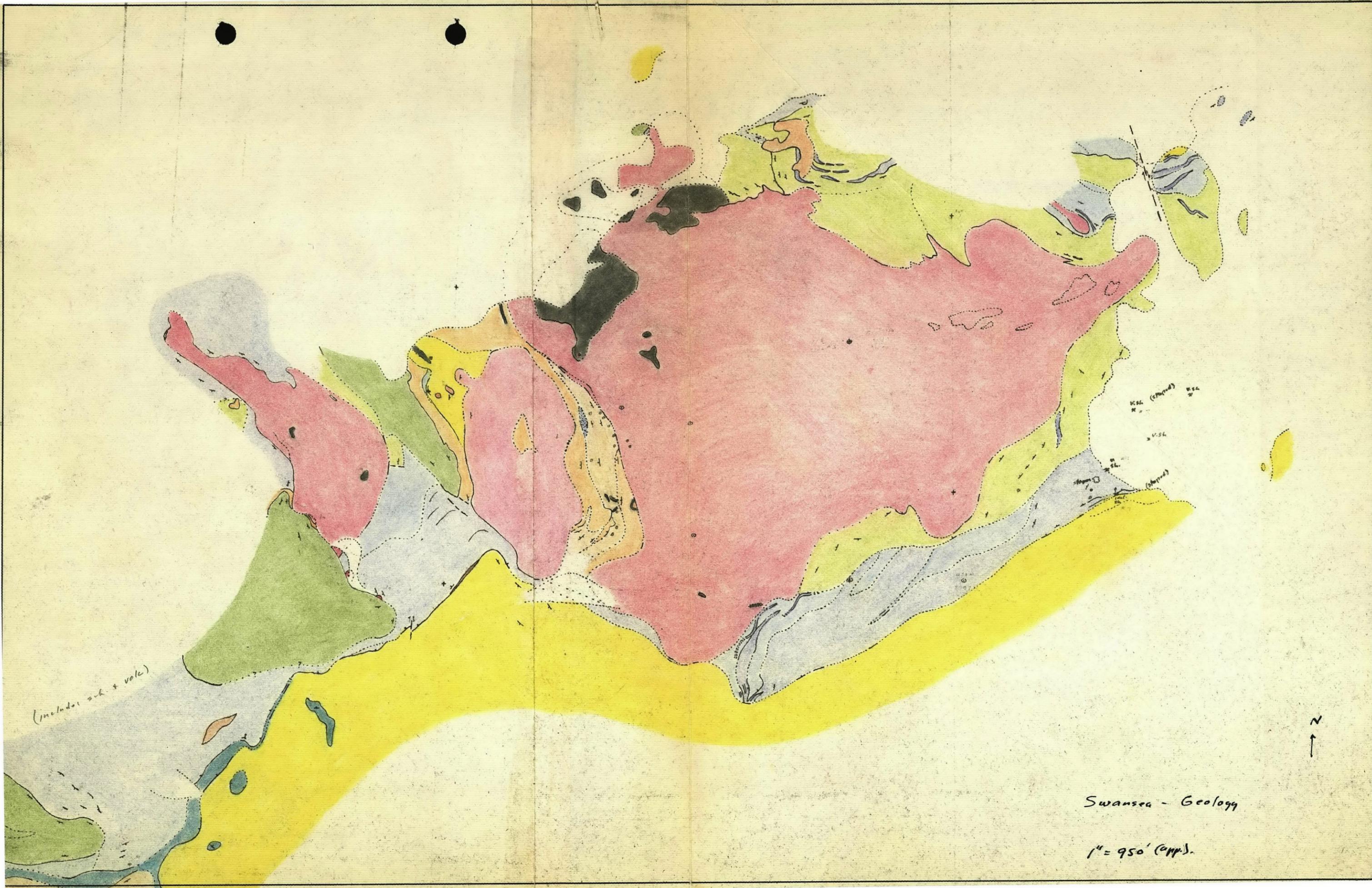
- | | | | |
|---------------|-----------------|-----------------|---|
| 6 | volcanics | Mes?
(Cret?) | schistose volcanics, mostly dense and dark, also green, red, gray. Structure (schistosity?) generally mappable. On NE corner, sch and volc repeat, unless there is faulting. Possibly 500-1000 ft. maximum thickness; possibly more extensive elsewhere in the district. (6 may grade to 5 along strike in places?) |
| 5 | sericite schist | " | gray nearly pure sericite schist, structureless. Interbedded with ls (3), almost everywhere on ls, but in places rests on gneiss (then generally iron-stained). Few hundred feet aggregate thickness. |
| 4 | tuff or agglom. | " | pink tuff or agglomerate, lens in 3. One place only, 50' max. thick., but may be more extensive to west. |
| 3 | limestone | " | brown cherty nearly structureless ls; rarely yellow or pink or white. Rests on all the earlier units and also interbedded with ser. sch. (5) and volc. (6). Several hundred feet thick; possibly more extensive elsewhere in the district |
| 2 | sandstone | " | red quartzitic grit, little shale. Rests on gneiss. One place only; max. thick. 50'. |
| large unconf. | | | |
| 1 | gneiss | preC | banded gneiss; folded; structure mappable(?); presumably metamorphosed sediments. Extensive exposures throughout the district. |

Note:

Regional mapping suggests that there are also other younger Tertiary formations above 11 or 12, plus a basalt and tuff sequence that may be Quaternary; several unconformities in this sequence.



Swansea
Numbers of formations



(includes sub. + vale)

Swansea - Geology

1" = 950' (app.)

