



FIGURE 47. Geologic sketch map of Tucson Mountains, Pima County, Arizona, showing route of Field Trip IV.

## CHAOTIC BRECCIAS IN THE TUCSON MOUNTAINS

Trip IV, Road Log

Thursday, April 2, 1959

Leaders: John E. Kinnison and J. H. Courtright

Driving distance: 25.0 miles

Logged distance: 22.4 miles

General Statement

The route of Trip IV (fig. 47) goes west from Tucson via 29th Street and past the southern tip of the Tucson Mountains via Mission and Ajo Roads. The route then skirts north along the western margin of the range via Kinney Road, and returns via Anklam Road and Gates Pass.

The Tucson Mountains consist of deformed Paleozoic and Cretaceous-Tertiary (?) sedimentary rocks unconformably overlain by gently dipping, faulted Tertiary volcanic rocks (Brown, 1939). A tabular breccia zone named the Tucson Mountain chaos (Kinnison, 12), characterized by extremely large fragments, lies between these two major rock sequences. The Tertiary volcanic rocks are locally capped by Tertiary-Quaternary basalt flows and interbedded tuffs and sediments.

0.0	0.0	Intersection of Speedway and the Freeway. TURN LEFT on the Freeway and proceed south.
1.0	1.0	Congress Street. Watch signal light. Proceed STRAIGHT AHEAD.
1.4	2.4	Intersection with 29th Street. TURN RIGHT.
0.5	2.9	Bridge across the Santa Cruz River. The Santa Cruz drains north and is the main water course of the Santa Cruz Valley. The channel has been extensively widened since the turn of the century. "A" Mountain and Tumamoc Hill, composed of nearly horizontal basalt interbedded with tuff and gravel of Tertiary-Quaternary age, are at 2:00.
0.5	3.4	Road swings left to intersect Mission Road. TURN LEFT.
0.2	3.6	Road cuts in Tertiary-Quaternary gravel.
0.4	4.0	The elongate, humpbacked hill at 2:00 is Cat Mountain, composed of the Tertiary Cat Mountain rhyolite.
1.0	5.0	Intersection with Ajo Road. TURN RIGHT.
0.7	5.7	Dirt road on right leads to a clay quarry on the east side of a small conical hill. TURN RIGHT, 0.2 miles to STOP 1. Time: 30 minutes. This site affords a close view of the Safford formation and overlying Shorts Ranch andesite, which are the upper two units of the Tertiary volcanic series in the southern part of the Tucson Mountains. The ridge south of Ajo Road is composed of Cat Mountain rhyolite. Road log mileage does not include this side trip.
0.3	6.0	At 9:00 is a small quarry in grey white agglomerate. This rock is part of the Cat Mountain rhyolite, the bottom member of the Tertiary volcanic series. The Cat Mountain rhyolite appears to consist largely of welded tuff and this small area is unique to the formation in that the pyroclastic material appears to be unwelded.
1.0	7.0	The ridges on each side of the road are composed of Cat Mountain rhyolite.
1.2	8.2	Desert road on left. TURN LEFT, and proceed 0.8 miles to STOP 2. Cat Mountain at 3:00. Saginaw Hill (Kinnison, 24; figs. 27, 28), a monzonite intrusive with weakly disseminated copper mineralization, appears at 10:00. The two knob-like hills in front of Saginaw Hill are plugs of Spherulitic rhyolite. The other hills on the left are composed of Cat Mountain rhyolite. The pediment area

Trip IV-Chaotic breccias

contains abundant exposures of Cretaceous-Tertiary (?) Amole group rocks. The desert road leading to the next stop crosses outcrops of shale and arkose, which are the predominant rock types in the Amole group.

STOP 2: Time: 1 hour. The gentle topography affords a good two-dimensional view of the Tucson Mountain chaos. Rock fragments here consist chiefly of Paleozoic limestone, Amole group arkose and shale, and Cretaceous (?) redbeds. Occasional fragments of Precambrian (?) schist are present. Irregular small bodies of Spherulitic rhyolite, but without the spherulites, intrude the chaos.

Road log mileage does not include the detour to STOP 2.

- 0.2      8.4      Desert road on right. Turn off 0.3 miles to STOP 3 at base of Cat Mountain. Time: 1 hour. Tucson Mountain chaos is generally well exposed in the steep gullies on the south side of Cat Mountain. A complete cross section of the formation, including the upper and lower contacts, is exposed in one of the gullies (fig. 5A). Of particular interest is a thick conglomerate at the base (fig. 6B). The chaos fragments which will be seen at this stop are smaller than many which occur in this area. An adjacent gully exposes a red bed fragment about 100 by 40 feet in size (fig. 6C).
- 0.8      9.2      Intersection with Kinney Road. Snyder Hill, the original type location of the Permian "Snyder Hill formation" (Stoyanow, 1936) at 12:00. This outcrop of limestone and dolomite is surrounded by alluvium, and was interpreted by Brown (1939) as a thrust fault klippe. Kinnison (1958, 24) interpreted it as being in normal stratigraphic position on the west limb of a synclorium.
- TURN RIGHT on Kinney Road toward the Tucson Mountain Park. STOP 4 is in a cleared area immediately north of Ajo Road. Time: 15 minutes. This stop affords a general view of the range, and the easterly dipping volcanics which form the crest of the range. Golden Gate Mountain, at 12:00, consists of Cat Mountain rhyolite overlying the Amole group. There the Tucson Mountain chaos is absent or very thin. The next stop will be for lunch. Road log mileage does not include side trip for lunch.
- 2.0      11.2      Graded road on right is turn off to STOP 5. The low hills at 10:00 consist of slightly metamorphosed Amole group sediments that dip to the southwest.
- 1.0      12.2      Intersection with another graded road. TURN LEFT.
- 0.5      12.7      STOP 5, in the pass between Golden Gate Mountain and the western escarpment. Time: 1 hour. The Tucson Mountain chaos is well exposed in steep gullies on the slope below the western escarpment due east of Golden Gate Mountain. Following this stop, the caravan will return to Tucson by following the graded county road across Gates Pass (fig. 47).
- 0.4      13.1      Intersection with Anklam Road. TURN RIGHT toward Gates Pass and Tucson. The west dip of the Amole group sediments appears on the skyline at 12:00. The road winding up the escarpment for the next one-half mile exposes Cat Mountain rhyolite, and, locally the Tucson Mountain chaos. The structure in this area is not well understood.
- 0.5      13.6      Gates Pass. Amole group sediments dip vertically.
- 3.0      16.6      Twin Hills, at 2:00, are capped by Shorts Ranch andesite, and underlain by the Ivy May andesite and Safford formations.
- 3.0      19.6      Tumamoc Hill at 3:00. SLOW DOWN for winding road ahead.
- 0.6      20.2      Intersection with N. Silver Bell Road. TURN LEFT SHARPLY.
- 0.2      20.4      Intersection with St. Mary's Road. STOP SIGN. PROCEED STRAIGHT AHEAD.
- 0.8      21.2      Intersection with W. Speedway. TURN RIGHT.
- 1.2      22.4      Intersection with Freeway. 1.6 miles to the University.