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Riverside Dist.



# GEOLOGIC MAP OF THE KEARNY QUADRANGLE, PINAL COUNTY, ARIZONA

By H. R. Cornwall and M. H. Krieger

## GEOLOGIC SETTING

The oldest rock in the Kearny quadrangle is the Ruin Granite of early Precambrian Y age; it is unconformably overlain by Precambrian Y sedimentary rocks, and all these units are intruded by late Precambrian Y diabase dikes and sills. These rocks are disconformably or unconformably overlain by Paleozoic sedimentary rocks and Mesozoic and Tertiary volcanic rocks. The entire sequence has been intruded by Late Cretaceous and Tertiary dikes and plutons. The dikes, mostly striking east-west, probably occupy faults and fissures that formed shortly before dike intrusion. Miocene alluvial and playa sediments with interbedded tuffs and megabreccias have been deposited in intermontane basins in the quadrangle and are overlain by Quaternary gravels and alluvium.

Paleozoic and older rocks in the northeastern part of the quadrangle are gently to moderately dipping and have been moderately to intensely deformed along high-angle normal faults. Rocks in the eastern part of the quadrangle are believed to be separated from rocks in the central and western parts by a major shear zone, largely concealed beneath the Gila River flood plain. In the central and western parts of the quadrangle, narrow linear belts of vertically dipping Paleozoic and Precambrian sedimentary rocks overlying the Ruin Granite to the west trend north-northwest and are believed to be parts of a monocline that developed partly in pre-Miocene time but was split later into several parts by high-angle transcurrent faults. These interpretations are supported by data from quadrangles to the south and southeast (Krieger, 1974a). Krieger has found evidence that some repetition of the linear belts was caused by thrust faulting nearly parallel to the sedimentary beds prior to formation of the monocline (Krieger, 1974a).

During the Tertiary, as Miocene intermontane basins formed along the areas now followed by the Gila River and Ripsey Wash, the intervening and bounding areas, particularly to the west, were uplifted, and debris from the bounding areas was shed into the basins. Large blocks, mainly of Paleozoic and Precambrian sedimentary rocks, slid eastward into the western side of the valley during the early Miocene, forming megabreccia plates in the alluvial and playa deposits of the San Manuel Formation. As the basins subsided, bounding normal faults developed along their margins and the San Manuel Formation was folded and tilted, the dips becoming progressively steeper toward the western margins.

During the late Miocene, debris continued to be shed into the basins from the surrounding highlands, depositing sediments that represent the Big Dome Formation unconformably above the San Manuel Formation. The Big Dome Formation has been moderately deformed by tilting along northwest-trending normal faults.

A breccia pipe, herein named the Riverside breccia pipe, crops out half a mile west of the Riverside. The pipe, 1,000 feet in diameter, is mostly in diabase but partly in Ruin Granite. There has been a little mixing of fragments such that some granite fragments occur in a diabase matrix and some diabase fragments occur in a granite matrix. The pipe is transected by dikes of the Paleocene Teapot Mountain Porphyry and the Late Cretaceous or early Tertiary rhyodacite porphyry and therefore is Paleocene or older.

## ECONOMIC GEOLOGY

West of the Riverside breccia pipe in secs. 11, 12, and 13, T. 4 S., R. 13 E., east-trending mineralized veins occur in fissures as much as 20 feet wide in Ruin Granite. The veins contain quartz, limonite, chrysocolla, and malachite. The steeply dipping fissure zones have been trenched in several places, and seven diamond drill holes have been drilled to intersect the fissures at shallow depths. Most of this work was done by the Occidental Petroleum Co. in the 1960's.

The Florence mine, located in the SE¼ sec. 12, T. 5 S., R. 13 E., owned by Edward O. Ryden of Miami, Ariz., contains pyrite and silver-bearing galena in veins and as disseminated minerals in Paleozoic carbonate rocks. The Old Ripsey mine, located in the SW¼ sec. 12, T. 5 S., R. 13 E., is a small deposit of pyrite and copper sulfides as veinlets and disseminations in diabase and Ruin Granite.

Granite and diabase on the north and south sides of the hill in the NE¼ sec. 14, T. 5 S., R. 14 E., as well as some of the adjacent Precambrian sedimentary rocks, have been extensively brecciated and the fractures filled with carbonate and manganese oxide.

Several adits have been dug in megabreccias east and just southwest of the center of sec. 8, T. 5 S., R. 14 E., in part along shear zones that probably developed later than the emplacement of the breccias.

## ACKNOWLEDGMENTS

The writers are grateful to the Kennecott Copper Corp. and to C. H. Phillips, Chief Geologist at Ray, for information supplied concerning the Riverside mining district; and to Occidental Petroleum Co. for information they supplied concerning their exploration in the district. We appreciate the friendly cooperation of John Lucero, Ralph S. Dubois, and other ranchers living in the quadrangle. We profited from discussions with E. A. Schmidt, who made a structural investigation of the northern Tortilla Mountains.

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PRODUCER
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