GEOLOGY OF THE SANTA CATALINA MOUNTAINS

By

R. L. DuBois

Department of Geology, University of Arizona

During the fall of 1952, a project was instigated by the Department of Geology at the University of Arizona to learn something of the petrography and structure of the Santa Catalina Mountain range of Arizona. This range trends roughly north-south and is located some 25 miles northeast of Tucson in the south-central part of the State. It is composed mainly of anisotropic granitoid rocks with subordinate schists, marbles and weakly to unmetamorphosed Precambrian and Paleozoic sediments.

Previous work in the area includes unpublished reports on the Marble Peak mine, University of Arizona thesis, "Pegmatitic Rocks of the Catalina-Rincon Mountains, Arizona", by R. M. Hernon (1932) and an open file report by B. N. Moore, C. F. Tolman, B. S. Butler, and R. M. Hernon.

Current work by the author started with reconnaissance mapping and was followed by more detailed mapping in the central portion of the range to delineate the bedrock structure and to study the petrographic and petrogenetic aspects of a part of the granitoid rocks. These investigations have shown a variable trend to the foliation and a pronounced northeasterly lineation which becomes east-west near the eastern contact of the gneiss with schistose rocks. The last rock forming activity in the history of the Catalinas has been one of pegmatite formation. This was preceeded by a period of cataclastic metamorphism which developed most of the presently observed structure. This metamorphic action effected the Leatherwood quartz diorite and in the main granitic mass acted on an older, anisotropic metamorphic granitoid unit, the structure of which has locally escaped the cataclastic action. That the original material for at least some of the gneissic rocks was sedimentary is amply evidenced by partially preserved conglomeratic features in areas near Mt. Lemmon and along the eastern slopes of the mountain range near Redington. These and other features suggest that in part the "Catalina gneisses" represent granitized Apache rocks and that at least two periods of broad scale metamorphic activity have occurred.

In 1954, R. M. Wallace completed a Ph.D. thesis on the "Structures of the Northern End of the Santa Catalina Mountains, Arizona." This study covers structures and rock distribution of the area. A. K. Banerjee, in 1957, completed a Ph.D. thesis on the "Structure and Petrology of the Oracle Granite, Pinal County, Arizona." In this study Banerjee discusses gross structures, petrofabrics, and petrogenetic aspects of the oracle granite. He concludes that "metasomatism was important in the origin" of this granitoid unit. F. L. Peirce has recently (1958) completed a Ph.D. thesis on the structure and petrography of the area around Mt. Lemmon. This study discusses some aspects of the "Catalina gneiss" and the nearby metamorphics and sediments. In addition to these completed works, several graduate stduents, E. J. McCullough, M. C. Gardner, and R. A. Raabe are currently conducting studies on rocks of the Catalina Mountains.