STOP 7—EAGLE (CRATERVILLE) PARK AREA

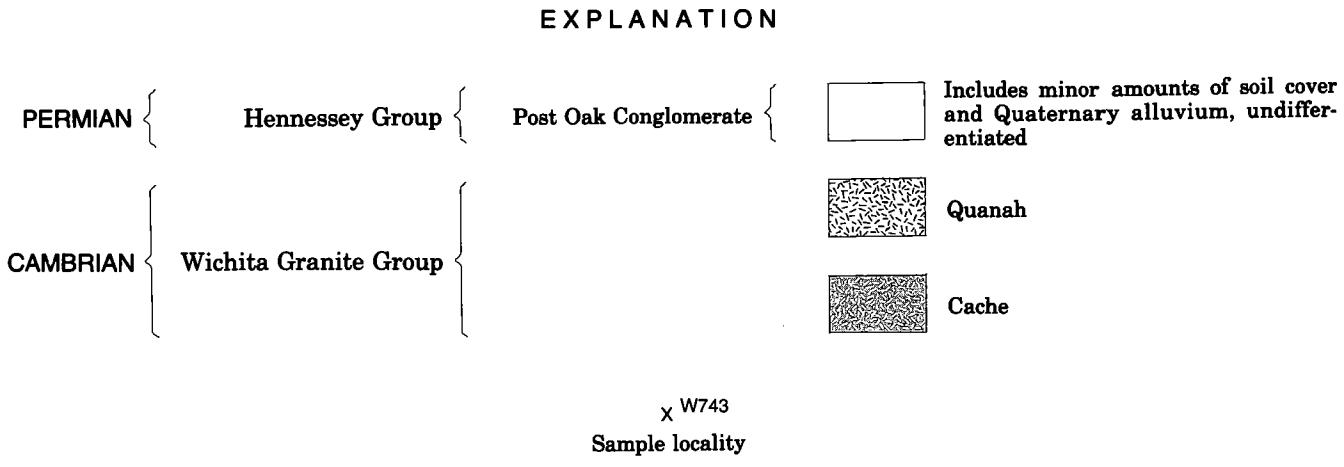
Cache granite–Quanah Granite contact, Eagle Park (Craterville Park)–Hill 1545 area, Fort Sill Military Reservation. Secs. 6, 7, 18, T. 2 N., R. 13 W., and secs. 1, 12, 13, T. 2 N., R. 14 W., Comanche County, Oklahoma. **M. C. Gilbert.**

Introduction

Schoonover (1948) and Green (1952) mapped this area originally. The contacts shown on the present map do not differ significantly from theirs except that ours are placed on a topographic base (fig. 144). Hamilton (1959) reported chemical data from Hill 1545, apparently from what is here being called the Cache granite. Al-Shaieb (1978) used the north side of Hill 1545 as a stop for a field trip emphasizing radioactive anomalies, apparently in the Quanah Granite.

The area beautifully illustrates intrusive contact relations of regional scale between two granites: one relatively coarse grained, one fine grained (fig. 145). These relations are clearly visible from U.S. Highway 62 and State Highway 115. Both Schoonover and Green saw these differences. Schoonover considered the fine-grained granite as Mount Scott (then called "Lugert") but also recognized another fine-grained granite called "aplite." Status of the latter unit is not yet resolved. Green called the fine-grained granite "Cache," a designation found useful by Myers and others (1981) in their study of the chemistry of the Wichita Granite Group. All workers recognize the relatively coarse-grained granite as Quanah.

The topography in this area is controlled by rock type and fracture patterns. It has long been noted that core–stones and tors are larger and more prominent in areas of Quanah Granite (fig. 146). This is confirmed by comparison of surfaces underlain by the two rock types here (fig. 145), and the rough surface of the Quanah Granite (fig. 146). Taylor (1915) pointed out in the Wichitas that wider spaced fractures correlate with coarser grain size. The reason for this does not seem to have been explained. It does not appear to be some differing mechanical response of different rock textures to the same applied stress (in the Pennsylvanian). Most of the finer grained rocks, that is, the Cache, quenched rapidly, possibly even to a partially glassy state. Thus, the change in volume from the liquid state to the crystalline state, with a contraction of 5 to 10 percent in these rocks, could not be taken up gradually. Apparently, many fractures and incipient fractures formed immediately on cooling (in the Cambrian), just as columnar jointing forms in basalts. Later tectonic stresses could have propagated and extended these, but their distribution and pattern would need to have been partly set early. The coarser grain size of the Quanah indicates that it cooled more slowly. In this case, the contraction on crystallization was taken up more gradually by liquid–crystal movement in response to the ambient load. Consequently, fewer and more widely spaced fractures of this type formed. In general, Quanah tors are larger farther west, and smallest in the east as in this area. Granophyric texture is common in the Quanah only in the east. These two observations indicate that the crystallizing Quanah had a lower overburden pressure here and a higher pressure to the west.



Geology by M. C. Gilbert, after Schoonover (1948) and Green (1952)
Base from U.S. Geological Survey, Mount Scott, 1:24,000, 1956
Photorevisions as of 1970