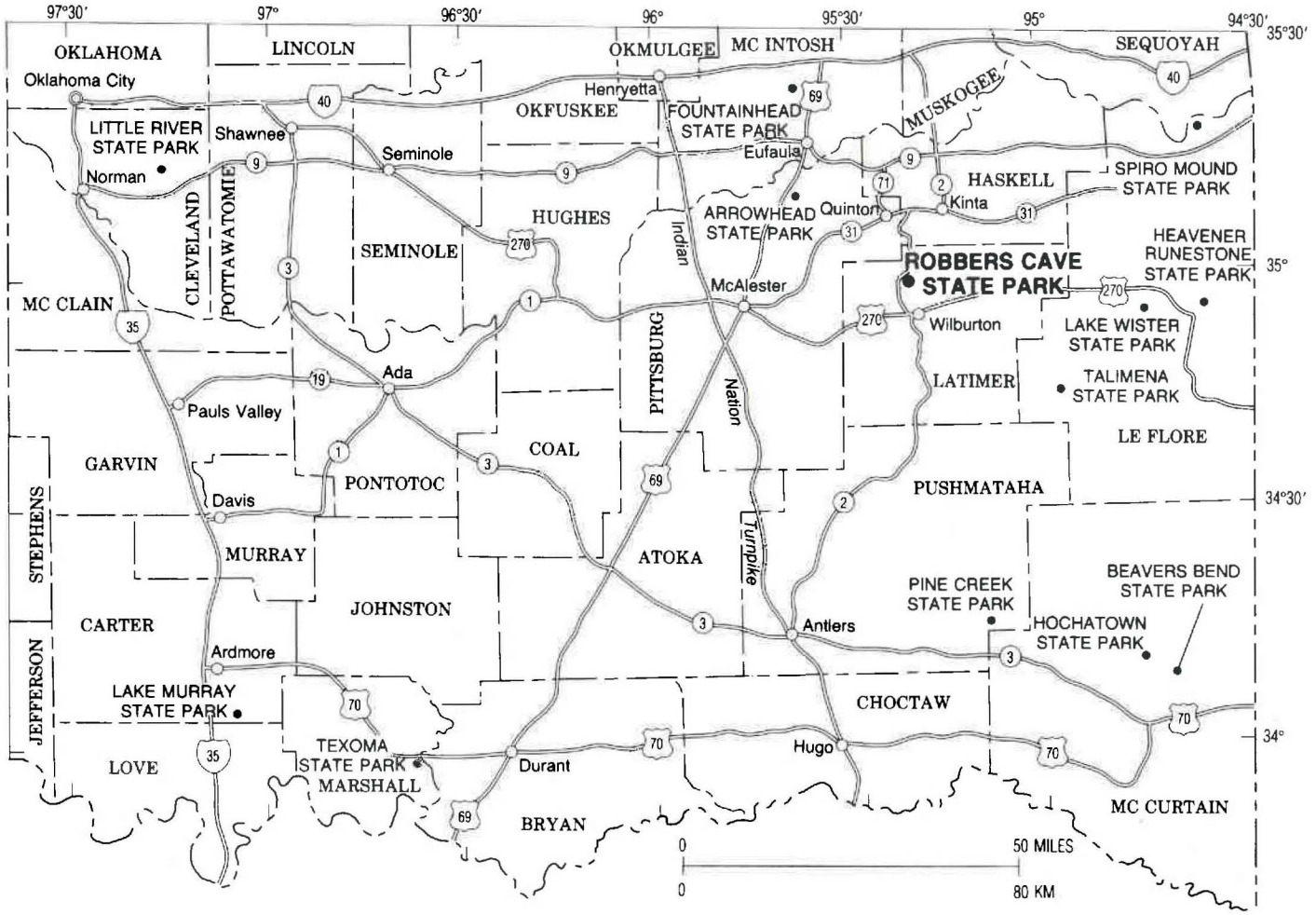

Figure 1. Map of southeastern Oklahoma, showing routes of major highways and location of Robbers Cave State Park and nearby State parks.

Meramec Caverns in Missouri, and Carlsbad Caverns in New Mexico.

Not everyone is in complete agreement about the detailed mechanics of cave formation. There is agreement that caves are formed when soluble rock is dissolved by subsurface water; although some scientists believe the dissolution takes place above the water table, some believe it is at the water table, and some believe that it is below the water table.

Most caves form in limestone, which is made up of the mineral calcite, whose chemical composition is calcium carbonate or $CaCO_3$. Carbonic acid, a weak acid that forms in water where there is decaying organic matter, reacts with the $CaCO_3$ to form a soluble bicarbonate. As a result, ground water moving along joints and bedding planes will dissolve the rock and form enlargements which, in time, become caves.

Gypsum is another rock that is soluble in water, and again, water moving along joints and bedding planes can dissolve the rock and form caves. Alabaster Cavern, in Woodward County, Oklahoma, was formed by this method in gypsum.

Robbers Cave formed in sandstone that is composed of the mineral quartz (SiO_2), which is relatively insoluble. However, the quartz grains have been cemented together by calcium carbonate so ground water can dissolve the calcium carbonate cement, and then the loosened quartz grains can be removed by the circulating ground water. The sandstone bluff (IPsv-11 on geologic map, pl. 1, in pocket) in which Robbers Cave has formed rises about 140 feet above the camp's parking area. The cave is approximately two-thirds of the way up the bluff, where it has formed along the junction of a bedding plane and a fault. This was a zone of weakness, and downward-percolating ground water moving along this zone gradually enlarged the opening to form the cave. As the cave became larger, blocks of rock were loosened by dissolution of the cement-