

New Information on Structure of the Hugo Syncline

J. O. BEACH, Oklahoma Geological Survey, Norman.

Just south of the Ouachita Mountains in Tps. 4 and 5 S., Rs. 18, 19, and 20 E., Choctaw and Pushmataha Counties, in southeastern Oklahoma, numerous inliers of Paleozoic rocks are exposed through the Trinity sandstone of Cretaceous age. Most of these inliers are composed of Jackfork sandstone and the remainder are Upper Stanley sandstone and shales of lower Pennsylvanian age.

The largest of these inliers, Signal Mountain and High Hill, was mentioned by Dr. C. W. Honess in Bulletin 32 of the Oklahoma Geological Survey published in 1923. A manuscript map prepared by Joseph A. Taff shortly after 1900 showed the second largest inlier, and this was included by Hugh D. Miser on the State Geological Map of Oklahoma published in 1926. From his observations on Signal Mountains and in harmony with the general structural trends of the Ouachita Mountains, Honess applied the name Hugo Syncline to a large synclinal structure which he believed plunged southward beneath the Cretaceous and extended toward Hugo.

Recent investigation has revealed the presence of numerous smaller inliers westward from the large inlier studied by Honess. Many of these inliers are exposed along the smaller streams of the area but there are several exposures at higher levels. In addition to the large inliers observed by Honess and Miser, several others were high enough to have stood temporarily as small islands in the Trinity sea. They also reveal that, in this region at least, there must have been considerable topographic relief on the floor on which Trinity sediments were deposited.

Interpretations of the structure in the Paleozoic rocks in the area are made from observations of numerous scattered inliers exposed in the area between the eastern side of Tps. 4 and 5 S., R. 19 E. and the western parts of Tps. 4 and 5 S., R. 18 E. Throughout this area the strike on all inliers observed is in the same general direction, averaging approximately N. 75-80° E. Along the Choctaw-Pushmataha County line between Tps. 4 and 5 S. the dips are slightly east of south. About two miles south the dips are to the north. These observations indicate that the axial trend of the Hugo syncline is nearly westward and not southwestward toward Hugo, as Honess believed. The axis of the syncline appears to lie not far from the towns of Spencerville and Apple. Observed dips in the bottom of the syncline are rather low for the Ouachita Mountains, as low as 4° in some exposures but progressively steeper both north and south away from the axis. The westward trend of the Hugo syncline is in harmony with the structure indicated by H. D. Miser on Plate II of Oklahoma Geological Survey Bulletin 50, published in 1929.

The eastern terminus of the Hugo syncline near Little River in McCurtain County, R. 21 E., is in the southern edge of the exposed mass of the Ouachita Mountains. The westernmost inliers so far observed which appear to reflect the structure are along the Kiamichi River some 18 miles westward. Of primary interest is the fact that the trend of the Hugo syncline is not in harmony with that of the adjacent Ouachita Mountains. The Corrine anticline is parallel to the Hugo syncline on the north side, but is less well exposed. Immediately to the north the major structures trend southwestward and the Hugo syncline and Corrine anticline appear to cut across this trend at an acute angle. Unfortunately, its westward continuation is buried beneath Cretaceous sediments and exact relations to the other structural features cannot be determined by surface studies.