SOURCE OF DETRITUS IN THE GUEYDAN (CATAHOULA) FORMATION SOUTHERN TEXAS GULF COAST

WILLIAM L. LINDEMANN
Humble Oil and Refining Co.
Tyler, Texas

EARLE F. McBRIDE
The University of Texas
Austin, Texas

ABSTRACT

The Gueydan Formation in outcrop is pastel-colored tuffaceous clay, sandstone, conglomerate, bentonite, and minor ash. The clay, bentonite, and ash are composed predominantly of silicic pyroclastic debris or the alteration products of such debris. Sandstone and conglomerate are composed largely of debris from volcanic and hypabyssal rocks plus minor detritus from sedimentary rocks and reworked Gueydan deposits.

Bailey (1926) reviewed the problem of the source of the igneous material and, although the evidence was inconclusive, favored a source near Duval and McMullen Counties. Our study suggests that sand and gravel debris of igneous rocks were derived from the Big Bend region of Texas and adjacent parts of northern Mexico; the fine pyroclastic material may have come from the same area or farther west.

Cross-bed data show that streams flowed east-southeasterly to the Gulf during Gueydan deposition; hence, detritus was derived from terrain in an updip direction. Pebbles of soda-rich trachyte and trachyandesite (latite), rhyolite porphyry, and welded tuff in the Gueydan are similar in texture and composition to rocks exposed in the Big Bend region and adjacent Mexico. Although the Gueydan lacks detritus of some rocks exposed there, the rocks are mafic types that weather rapidly. Boulder-size clasts in the Gueydan were transported as stream bed-load and possibly short distances by mudflows; they are not proof of a local source. Cretaceous foraminifers and rock fragments in the Gueydan show that pre-Tertiary bedrock was exposed locally across the drainage area.

Upper-level winds today and presumably throughout the Tertiary moved eastward across Texas; hence, the source volcanoes were to the west. Although ash may have travelled to the site of deposition by wind, much was reworked by streams after initial deposition and subsequently modified by soil-forming processes.