Introduction

Objectives Of This Paper

This paper describes some of the stratigraphic features of the Ouachita geosyncline of Oklahoma as they are believed to have been during late Mississippian and early Pennsylvanian time. There is considerable evidence that pre-Atoka sediments were deposited in rather deep water. The lithologic characteristics of the late Mississippian and early Pennsylvanian Stanley-Jackfork-Johns Valley-Atoka stratigraphic sequence are comparable to the typical black shale flysch facies of the Eocene of the Alps and the Eocene and Cretaceous of the Carpathians. The conclusion is reached that a predominately deep water black shale and radiolarian chert environment was periodically interrupted by turbidity currents flowing down the steep sides of the depositional trough and that these currents brought in sands foreign to the black shale environment. The presence of convolute bedding, graded contacts of sandstones and overlying shales, of abundant flow casts and groove casts on the under surfaces of the sandstones, the general lack of cross bedding and ripple marks, and the scarcity of fossils except for planktonic and nektonic forms, supports this thesis.

The Ouachita Facies

The arcuate pattern of folds which comprises the Ouachita Mountains of southeastern Oklahoma and southwestern Arkansas is but one portion of a sinuous foldbelt which extends from western Texas eastward to within approximately 60 miles of the buried extension of the southern Appalachian Mountains. The foldbelt is now largely buried beneath relatively undisturbed Mesozoic and Cenozoic rocks but it is exposed in two arcuate uplifts, the Marathon uplift of Tran-Pecos Texas and the Ouachita Mountains. The Ouachita facies has been encountered in the subsurface by numerous deep wells which start in Mesozoic or Cenozoic rocks (Morgan, 1952, pp. 2266-2274). Notwithstanding the fact that the Ouachitas and Marathons are several hundred airline miles apart, and much farther when measured along the winding course of the folds, the two geographic provinces have so many things in common that their rocks are collectively referred to as Ouachita facies, in contrast to shelf or platform types of sediments which comprises the Arbuckle facies to the north or west, as the case may be. The stratigraphic column within the foldbelt also shows some vertical variations in facies, the pre-Stanley section being relatively thin (in fact, it may be considerably thinner than the Arbuckle facies) and being characterized by cherts and dark graptolitic shales, the Stanley-Jackfork-Johns Valley-Atoka sequence being much thicker and containing much sandstone. In the minds of some geologists the pre-Stanley section with the cherts and novaculites constitutes the Ouachita facies, whereas, in the opinion of others, the abnormally thick shale and sandstone sequence of the Stanley and later rocks characterizes the Ouachita facies. We regard all portions of the Ouachita stratigraphic column as belonging to the Ouachita facies because at all levels the lithology differs appreciably from the Arbuckle facies, although there are transitional zones coinciding approximately with the faulted belt of the frontal Ouachitas. The earlier Ouachita

1 Professor of Geology, University of Wisconsin, Madison, Wisconsin.

2 Research Assistant, Department of Geology, University of Wisconsin.