

UPPER JURASSIC CARBONATE ROCKS IN NORTHEASTERN TEXAS AND ADJOINING PARTS OF ARKANSAS AND LOUISIANA¹

Carbonate rocks make up only a small part of the total Upper Jurassic sequence, but they are widespread and are sensitive indicators of their environments of deposition. Consequently, carbonate studies have yielded data vital for stratigraphic correlation and interpretation of environment. Rocks of Upper Jurassic age include, in ascending order, the Smackover and Buckner Formations and the Bossier and Schuler Formations of the Cotton Valley Group. These rocks are in the subsurface at depths ranging from 3,000 to 12,000 ft.

The Smackover Formation contains three informal members. The lower member, one of the most widespread and easily recognized units of Late Jurassic age, consists of dark-gray, commonly laminated, silty to argillaceous limestone, that was deposited throughout a deep, possibly stagnant, basin. The middle member, generally restricted to basin margins, consists of medium-brown pelletoid or structureless limestone deposited in the shallower parts of a basin that supported a relatively abundant fauna. The upper member, also limited to basin margins, consists mostly of light-brown to black oölitic to pisolitic limestone that represents deposition in a shallow-water high-energy environment. This member includes the petroleum-producing Reynold's öolite.

The Buckner Formation contains two members. The lowest member consists mostly of laminated micro-grained anhydrite and anhydritic mudstone, but in restricted areas consists of fine-grained dolomite. It represents deposition in an evaporitic basin and associated mudflats. The upper member consists mostly of nodular anhydritic mudstone that represents deposition in evaporitic mudflat. It contains a bed of limestone, known locally as the A zone, that represents a temporary advancement of the sea across the mudflat.

The Bossier Formation represents the offshore equivalent of the Buckner and parts of the Smackover and Schuler Formations. It consists mostly of dark-gray splintery calcareous shale, but contains shell material in various amounts. A limestone at the base of the Q tongue consists mostly of silty micrite containing a fossil assortment that is characterized by algal-encrusted grains but also includes foraminifers, gastropods, ostracods, and echinoid fragments.

The Schuler Formation, which includes a marine and a nonmarine facies, consists mostly of mudstone, shale, and sandstone but contains some limestone in the marine facies. Algal micrite is present in the upper part, and some argillaceous coquina and phosphatic clastic limestone that apparently represent beach environments are present near the base.

DARYL P. DOMNING, Tulane Univ., New Orleans, La.

LIST, BIBLIOGRAPHY, AND INDEX OF FOSSIL VERTEBRATES OF LOUISIANA AND MISSISSIPPI

Species of fossil vertebrates reported from Louisiana and Mississippi are listed. The bibliography consists of 167 titles and contains detailed annotations on vertebrates from those states. Both systematic and chronologic-geographic indexes are provided.

¹ Publication authorized by the Director, U.S. Geol. Survey.

WILLIAM C. ELSIK, Humble Oil & Refining Co., Houston, Tex.

LATE NEOGENE PALYNOMORPH DIAGRAMS, NORTHERN GULF OF MEXICO

The cyclic nature of late Neogene climate is reflected in the relative frequency diagrams of palynomorphs deposited in the northern Gulf of Mexico. A general cooling through the late Neogene and at least five glacial cycles for the Quaternary are indicated. An additional prominent cold cycle in latest Miocene time is interpreted from the frequency diagram of *Picea*, spruce. The Pliocene-Pleistocene boundary is marked by an abundance of *Ambrosia* and *Helianthus* types of Compositae pollen below and increased frequency of *Alnus* and *Exesisorites* above. A new species of fungal spore occurs abundantly in the lower part of the Pleistocene and also lower in the Neogene.

CLINT F. FAGG, Explorations, Inc., Houston, Tex., and DANIEL E. HERLIHY, Jackson, Miss.

PROFILE ANALYSIS—A GEOLOGICALLY ORIENTED GRAVITY INTERPRETATION

A byproduct of the examination of three different analytic methods of reducing gravity data to a form useful to the geologists is the presentation of the local gravitational field of one complete quadrangle in the Jurassic trend of Mississippi. The major salt dome minima are qualitatively confirmed by all three methods, although the quantitative effects vary. The more subtle effects of the Jurassic features are more susceptible to distortion by the process of removing the influence of regional density changes. The least distorting method of regional removal is shown to be the interlocking profile network. This technique obtains the most definitive resolution of the local gravitational effects of deep, low-volume structures.

DAVID E. FRAZIER, Esso Production Research Co., Houston, Tex.

DEPOSITIONAL EPISODES: THEIR RELATION TO QUATERNARY SEA-LEVEL FLUCTUATIONS IN GULF COAST REGION

The stratigraphic record yields evidence that each episode of clastic deposition has been of limited duration and that each has been preceded and followed by a significant hiatus. Evidence for alternations of deposition and nondeposition is readily apparent in the landward part of Pleistocene sequences along the Gulf Coast because of the glacioeustatic changes in sea level. Evidence of alternations, although elusive, exists also in the basinward part of the sequences. The concept of depositional episodes explains the significance and relation of these alternating conditions throughout the basin for clastic Pleistocene sequences.

A depositional episode is the duration of time required for the sedimentation of a depositional sequence. The depositional sequence attributed to each depositional episode is composed of several discrete facies sequences. A facies sequence consists of either a single delta lobe within a deltaic complex or one of the several repetitive facies sequences deposited in an interdeltic environment.

Each depositional sequence indicates three phases of development. Deposits of the initial phase record a stillstand of the sea during which each of the rivers entering the basin prograded a succession of delta lobes and interdeltic facies sequences. The second phase of development is recorded by the intercalation