ABSTRACTS OF BILOXI MEETING, OCTOBER 24–25

1. HISTORICAL NOTES ON THE GEOLOGY OF MISSISSIPPI, Urban B. Hughes, consulting geologist, Laurel, Mississippi.

Brief summary of the more important historical events in the geology of Mississippi.

2. STRATIGRAPHY AND PETROLEUM GEOLOGY OF BLACK WARRIOR BASIN, MISSISSIPPI AND ALABAMA, F. F. Mellen, Mellen and Monsour, Jackson, Mississippi.

A great triangular area of approximately 35,000 square miles of normal Paleozoic sediments occupies a large portion of northern Mississippi and northwestern Alabama. The Black Warrior Basin, as its extension is herein proposed, is bounded on the east by the southwesterly plunging Appalachian folds; on the south and southwest by the southeasterly plunging Ouachita mountain system; and on the north by the high Ordovician areas in central and western Tennessee. A soft cover of Mesozoic and Tertiary sediments ranges from a feather edge at the Paleozoic outcrop in the northeastern part of the area to around 6,000 feet in central Mississippi. Several hundred test wells have penetrated Paleozoic sediments ranging in age from Cambro-Ordovician to Pennsylvanian. A combined total thickness of sediments penetrated by these wells is about 12,000 feet. Other than a test well in Webster County, Mississippi, which questionably encountered acidic igneous rock, no igneous or metamorphic rocks have been found in the basin. In the Ouachita boundary area south and southwest of the basin, basaltic intrusions of probable Mesozoic age are common in more or less metamorphosed sediments of Paleozoic age. Commercial gas production from Silurian, Mississippian and Pennsylvanian rocks has been insignificant; but the numerous shows of gas and oil, combined with many sharp unconformities and marked lateral lithologic changes, together with many known faults and anticlinal structures, make the Black Warrior Basin one of the large remaining undeveloped potential oil- and gas-producing provinces of the North American continent.

3. SURFACE OCCURRENCE OF CRETACEOUS BEDS IN THE SOUTHEASTERN STATES, Watson H. Monroe, Geological Survey, U. S. Department of the Interior, Washington, D. C.

The Cretaceous sedimentary rocks of the eastern Gulf region crop out in a crescentic band around the southwestern end of the plunging Appalachian Highlands in a belt 500 miles long and up to 75 miles wide. Their maximum thickness at the outcrop is estimated to be about 2,100 feet.

The oldest beds of the eastern Gulf Coastal Plain, the Vick formation, crop out in a small area in central Alabama. The age of the Vick is uncertain, being post-Paleozoic and pre-Tuscaloosa. It is probably Jurassic or Lower Cretaceous.

Above the Vick formation the Upper Cretaceous formations can be correlated fairly closely with the Texas section, the sequence being divisible into several groups of related formations.

The formations equivalent to the Woodbine of Texas include the Cottondale, Eoline, and possibly the Coker formation, the three lower formations of the Tuscaloosa group. These crop out in an arc extending from Marion County in northwestern Alabama to the Coosa River Valley in east-central Alabama.

The formations equivalent to the Eagle Ford formation are the Gordo formation at the top of the Tuscaloosa group and the McShan formation, formerly considered the lower part of the Eutaw formation. These extend from the Tennessee River Valley on the north into Georgia on the east.

The Austin equivalents include the restricted Eutaw formation and the basal formations of the Selma group, the Mooreville chalk and its sandy equivalents, the lower part of the Coffee sand in northeastern Mississippi and southern Tennessee and the Blufftown formation in eastern Alabama and western Georgia.

Above the beds of Austin age the Cretaceous sequence in the eastern Gulf region may be divided most naturally into two sequences: the lower correlated with Taylor marl and the lower part of the Navarro group and the upper correlated with the upper part of the Navarro.

The lower of these two sequences consists of the Demopolis chalk, its sandy northern partial equivalent of the Coffee sand, and its eastern equivalent, the Cusseta sand, and the Ripley formation, which overlies all three units. This stratigraphic sequence extends from southern Illinois to west-central Georgia.

The upper beds of the Cretaceous include the Prairie Bluff chalk and its two sandy equivalents, the Owl Creek formation on the north and the Providence sand on the east. These formations extend from southern Tennessee as far at least as central Georgia, broken in west-central Alabama by overlap by the overlying Midway beds.

Near the ends of the crescentic belt the sequence of deposition is broken by extensive overlaps. As may be expected, internal, progressive overlap is common in all the formations, but extensive overlap indicating crustal warping is especially notable at the base of each of the larger groups discussed.

4. SUBSURFACE OCCURRENCE OF CRETACEOUS SEDIMENTS OF MISSISSIPPI, C. W. Alexander, Dixie Geological Service, and R. M. Harris, Harris and Payne, Jackson, Mississippi.

The Gulf Cretaceous sediments comprise the most significant group of beds as related to the search for and production of petroleum in Mississippi. As a result, natural emphasis has been placed on their study.

This paper, and the sections which accompany it, represent a composite of available knowledge of the beds and the consensus on the, as yet, uncertain features of the stratigraphy of the Gulf Cretaceous.

5. CENOZOIC DEPOSITS OF MISSISSIPPI AND ADJACENT AREAS, Grover E. Murray, Jr., Magnolia Petroleum Company, Jackson, Mississippi.

20,000 feet or more of Tertiary and Quaternary sediments are present in the central Gulf region of southern United States. They comprise a large, seaward-thickening, wedge-shaped sedimentary complex (Gulf Coast geosyncline) composed predominantly of deltaic deposits. Thin, relatively uniform and widespread, marine strata are present between the thick deltaic deposits and on the seaward edges of the deltaic masses. These thin, generally distinctive, marine strata are adaptable on the surface to detailed structural mapping; they also serve as key strata in core-drilling, in tracing surface units into the subsurface, and in the preparation of subsurface structural maps. Fossils present in the marine units determine their position in the standard geological time scale and assist in determining the relative geographic position at the time of deposition. The thick, ladle-shaped, deltaic deposits are normally unadaptable to structural mapping; however, they are readily used in the construction of areal, facies, and isopachous maps. Landward, both marine and deltaic deposits are progressively of a deeper-water environment, the deltaic deposits are progressively more marine.

The Tertiary is represented by four, perhaps five, epochs of deposition, which are, in ascending order, Paleocene, Eocene, Oligocene, Miocene, and Pliocene (?). Each successively younger series of rocks occupies an outcrop position progressively nearer the present coastline. Similarly, each younger rock series has been downwarped less by the thick, geosynclinal sedimentary load and, therefore, has less southwest regional dip. The Midway (Paleocene), Claiborne (middle Eocene), Jackson (upper Eocene), and Vicksburg (Oligocene) groups each contain important marine units. The Wilcox (lower Eocene), Miocene, and Pliocene (?) are primarily deltaic deposits; they constitute the thickest Cenozoic sedimentary accumulations in the eastern Gulf region.