NOTES ON THE STRATIGRAPHY OF NORTHEAST TEXAS, NORTHWEST LOUISIANA AND SOUTHWEST ARKANSAS

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During the time that the oil operators of East Texas were discussing at great length proration, overproduction and unit operation, the geologists working in the same area were arguing about the age of the producing sand. These geological disputations culminated in a general meeting called at Dallas, Texas, in March, 1931. At this assembly arguments were advanced by the "Tokio age" sponsors, by the "Woodbine age" advocates and many others. A "straw vote" taken at the close of the meeting revealed that twenty of those present favored the Tokio age; twenty-seven were for the Eagle Ford; and nine wanted to combine Eagle Ford and Woodbine; sixty-three thought that the oil sand was undoubtedly Woodbine in age; ten combined Tokio with Woodbine, and three geologists were safe in venturing that it was the basal sand of the Cretaceous. This division of opinion on the age of a stratigraphic horizon that was studied in close detail for several months preceding the Dallas symposium suggests that the study of age relationships and formational nomenclature has been neglected or is in part inaccurate in many areas. It is assumed that East Texas is not the only place where current stratigraphic problems exist.

STRATIGRAPHY

A generalized correlation chart showing the Comanchean and Cretaceous formations in the vicinity of the Sabine Uplift is given in Figure 1. The thicknesses on the chart are from subsurface data based on micropaleontological determinations.

Brief lithologic descriptions of these formational units are as follows:

Arkadelphia (Upper Navarro Clays). Gray calcareous clays in part marly. Usually very fossiliferous.

Nacatoch (Middle Navarro). Gray and green calcareous sand and sandstone; hard sandy limestone; some clay and marl. Few fossils.

Saratoga (Lower Navarro Clays). White to gray chalk, marl and calcareous clay. Very fossiliferous.

Marlbrook (Upper Taylor). Gray calcareous marl and clay. Very fossiliferous.

Annona or Pecan Gap (Middle Taylor). Hard white chalk, marl, and gray calcareous clay. Occasionally fossiliferous.

Ozan-Buckrange (Middle Taylor). Gray to blue calcareous clay, micaceous sand, sandy limestones. Glauconitic sand and sandy clay in Buckrange at base of Ozan. Few fossils. (Buckrange sand same as old term "Blossom sand" in Arkansas).

Gober (Lower Taylor). White to gray hard chalk, marl, some clay. Usually fossiliferous.

Brownstone (Lower Taylor). Gray to blue calcareous clay, marl. Very fossiliferous.

Blossom (Upper Austin). Gray to brown, unconsolidated, sand and silty sand. No fossils. (A local sand lens).

PERIOD	Group	N. E. TEX.	S. W. ARK.	E. CENT. TEX.	N. LA.
UPPER CRETACEOUS (Gulf Series)	NAVARRO	Up. Nav. Clays Nacatoch 600' Low. Nav. Clays	Arkadelphia Nacatoch 500-600' Saratoga	Upper Navarro Clays Nacatoch Lower Navarro Clays 700'	Arkadelphia Nacatoch Saratoga 190-875'
	TAYLOR	Upper Taylor Clays Annona Brownstown 500-1060'	Marlbrook Annona Ozan Buckrange Brownstown 300-480'	Upper Taylor Clays Pecan Gap Ozan Gober Brownstown 574-1394'	Marlbrook Annona Ozan Buckrange Brownstown 100-980'
	AUSTIN	Blossom Bonham 405-600' Ector 0-50'	Tokio 0-350'	Bonham 154-452' Ector 0-186'	Tokio 0-800 '
	EAGLE FORD	Eagleford 0-500'	Absent	Eagle Ford 0-339'	Absent
	WOODBINE	Woodbine 400-565'	Woodbine 0-100'	Woodbine 0-421'	
COMANCHEAN (Low. Cret.)	WASHITA	Washita gr. 152-423'	Absent	Georgetown 458'	Wash. 0-667'
	FREDRICKSBURG	Goodland 32-79'	Goodland 0-25'	Edwards 630-735'	Fred. 0-37'
	TRINITY	Paluxy DeQueen or Glen Rose 535-1290' Basement Sds.	Paluxy DeQueen 600-2500' Holly Creek Dierks Basements Sds.	Paluxy 0-360' Glen Rose +823' Basement Sds. ?	Up. Red Beds Up. Glen Rose Anhydrite zone Low. Glen Rose Low Red Beds Low Marine Zone Basal Sds? 6000'±

Figure 1—General Correlation Chart of Cretaceous and Comanchean Formations in the Sabine Uplift Area.

Bonham (Austin). Gray calcareous clay, thin marl layers. Few fossils.

Ector (Austin.) Hard white chalk and marl. Occasionally fossiliferous. (Tongue of true Austin Chalk).

Tokio (Austin). Gray and blue calcareous clay, sandy clay, sand, and rarely volcanic ash. Few fossils.

Eagle Ford. Gray to black calcareous clays. Fossiliferous.

Woodbine. Gray, yellow and brown coarse loose sand, shaley sand and thin gravel beds. No fossils.

Georgetown (Washita). Hard gray and black shale, gray to black limestone and sandy limestone. Few fossils.

Goodland-Edwards (Fredericksburg). Hard white and gray limestone, sandy and shaley limestone. Rarely fossiliferous.

Paluxy (Upper Trinity). Gray and yellow calcareous sand, sandstone, and sandy shale. Few fossils.

Upper Red Beds (Upper Trinity). Red and brown micaceous sand and sandy shale. No fossils.

Glen Rose (Middle Trinity). Limestone, shale and sandy shale. Fossiliferous. Correlates with Dierks, Holly Creek and De Queen of Arkansas. Gypsum in Arkansas; anhydrite zone in Louisiana.

Lower Red Beds (Lower Trinity). Fine-grained, micaceous sands and sandy shales. No fossils.

Lower Marine zone (Lower Trinity). Hard gray to black limestone, dark-colored shale. Fossiliferous.

Basement Sands (Basal Trinity). Yellow to gray, medium to coarse-grained sand and sandstone, sandy shale, gravel and conglomerate.

A brief resume of the Cretaceous history of Sabine Uplift area follows: The Trinity sediments were laid down upon a subsiding Paleozoic floor peneplained during early Mesozoic time. The basal conglomerate and sand first deposited has been traced from northern Mexico, where it is Jurassic in age, northward across Texas into southern Oklahoma where it is lower Fredericksburg in age. The encroaching Trinity sea covered what is now east-central and northeast Texas, northwest Louisiana and a part of southwestern Arkansas. The sea gradually transgressed northward and westward causing an overlap of the Basement sands and part of the Glen Rose. After Glen Rose-De Queen time the sea was almost withdrawn and then advanced again, the Upper Sands or Paluxy being deposited during this oscillation. There followed another submergence and the limestones and shales of the Fredericksburg and Washita groups were laid down.

After the deposition of the Comanchean series an uplift movement began in northwest Louisiana and east-central Texas. This marks the initial rise of the Sabine Uplift, a regional high. Following the uplift the area was reduced to a peneplain or a plain of low relief, truncating the Comanchean rocks.

The subsequent down-warping which permitted the formation of a geosyncline in which the Woodbine and later Cretaceous beds were deposited began in what is now known as the East Texas Embayment and extended eastward over the Sabine high covering all of northern Louisiana by the close of Austin (Tokio) time. A period of relative stability followed in which only the finer clastic material entered the sea. This is represented by the Taylor and Navarro clays and chalks.

STRUCTURE

The general structural features of the Sabine Uplift are known by most geologists. The present East Texas oil field is located on the west flank of this regional arch, bordering a rather sharp down-flexing of Comanchean beds. The producing area is limited, so far, to the eastern extremity of the so-called Woodbine sand body where it pinches out to the east against the truncated Georgetown limestone. A study of north-south subsurface cross-sections of the field indicate that it is situated on top of a broad, flat structural "nose," projecting out from the Sabine Uplift proper.