HOUSTON REGIONAL MEETING, DECEMBER 2–3, 1948

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Houston, Texas

The Houston regional meeting of the Association was held on December 2 and 3, 1948, at the Rice Hotel, Houston, Texas. There were 1,050 registrations, making it one of the largest regional meetings yet held. In fact it was larger than the national meetings until recent years.

The meeting was devoted exclusively to the study of problems of stratigraphy, sedimentation, and tectonics of the salt-dome region of the Texas and Louisiana Gulf Coast. There were no field trips.

A breakfast was tendered to authors of all papers given at the meeting on the morning of the opening day. In addition to the Friday night dance which was semi-formal, there were a style show and luncheon for the ladies and a stag luncheon on Friday.

All of the officers and members of the executive committee of the Association were present: Paul Weaver, president; C. E. Dobbin, past-president; Roy M. Barnes, vice-president; J. V. Howell, secretary-treasurer; C. L. Moody, editor. The local arrangements were in general charge of George S. Buchanan of the Sohio Petroleum Company and A. F. Childers, president of the Houston Geological Society.

Abstracts are attached, descriptive of some of the papers presented at this meeting.

ABSTRACTS

1. Recent Sediments of Mississippi Deltaic Mass, H. N. Fisk, Humble Oil and Refining Company, Houston.

The Recent deltaic mass of the Mississippi River is a huge pile of seaward-thickening deposits which underlies the deltaic plain and continental shelf. It rests upon and buries a rugged surface sculptured during the last ice age when sea-level was 450 feet lower than at present. The sediments were deposited as the last Pleistocene ice sheets melted and sea-level rose, and their main lithologic characteristics reflect the gradual lowering of stream gradients. The mass can be divided into a substream of permeable, gravel-bearing sands and a finer-grained topstratum of relatively impermeable, more heterogeneous sands, silts, and clays. Lithologic, textural, and faunal characteristics of depositional units within the topstratum are similar to those of sediments now accumulating within depositional environments of the region.

These environments are mainly marshland and pro-delta marine, but they also include more restricted ones such as the fluviatile and brackish-water channels, bay and lake bottoms, and local beaches and spits. Interfingering and overlapping relationships of the various facies in the topstratum show that the Mississippi River changed its position many times while sea-level was rising. That active subsidence accompanies the deltaic accumulation is shown by the seaward tilt of mappable marine beds within the mass and by the slope of the late Quaternary surface underlying the Recent deposits.

2. Stratigraphy of Frio Formation. Orange and Jefferson Counties, Texas, Frank Reedy, Jr., division geologist, Crown Central Petroleum Corporation, Houston.

Recent developments in the Gulf Coast of Texas have indicated the productive possibilities of many of the sands composing the lower part of the thick Frio formation of Oligocene age. Exploration to the deeper sands of the Frio discloses facts of depositional conditions of this formation, which are as critical as structure for the accumulation of petroleum.

The area comprising northern Jefferson County and Orange County is herein considered as a stratigraphic unit. Electrical-log, strike, and dip sections have been constructed indicating the basis for the correlations, the lithologic character of each of the zones of the Frio formation, and the calculated isopach interval of each zone. Diagrammatic dip sections have been drawn showing the relationship of lithology with microfauna occurrence. To interpret accurately these correlations and apply the zonation for a structural basis, three isopach maps have been constructed. These isopach

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maps indicate the extent of sands, their depositional position, and the development of the shale wedge.

In Orange and Jefferson counties the Frio (Oligocene) formation is divisible into three lithologic units: an upper unit consisting primarily of sands; a middle unit of marine shale; and a lower unit consisting of sands and shale. Isopach maps reveal the location of ancient offshore bars and re-entrant basins and also show local thinning of beds in areas of structural uplift. The variation in stratigraphic position of certain foraminiferal associations is believed to be due to ecological changes and to the marine progressive overlap.

3. Salt-Dome Configuration, Marcus A. Hanna, Gulf Oil Corporation, Houston.

Factors which cause modification of a symmetrical plug to the configuration of the various salt stocks found in the Gulf Coastal area are evaluated. This configuration includes the limestone, gypsum, and anhydrite cap rock, as well as the spines, overhangs, and leaning plugs. Considered also are certain salt-stock rim-synclinal effects, as well as some resulting structural changes in the surrounding sediments.

The character of the salt as a metamorphic rock, the orientated fabric of certain of the anhydrites, and the modifications caused by density differences in the salt and surrounding sediments, and the effect of circulating waters are cited. Several of the theories of salt-plug origin and growth are considered in light of present information.

4. Sedimentary Facies of Upper Cenozoic and Recent in Gulf Coast Geosyncline, Shephard W. Lowman, Shell Oil Company, Inc., Houston.

Production of oil in the Tertiary formations of the Texas and Louisiana Gulf Coast is distributed in elongate trends that parallel the present coast. These trends coincide with the distribution of shallow marine and brackish sedimentary facies in the producing zones. There are also three prominent crosstrends along which the majority of the production is concentrated. These coincide with the three transverse embayments that cut perpendicularly across the elongate producing trends. These crosstrends indicate the intersection of another set of sedimentary conditions which are related to the embayments.

Sedimentary facies is defined as the present aspect of the rock, including its fossil content. Fossil assemblages in the Recent characterize environments, such as brackish, continental shelf, and continental slope. These relationships seem to be readily applicable to the Tertiary, but the various methods of applying them, all require a broad empirical base of stratigraphic correlation. The network method of stratal correlation is described and the facies nature of formation and of fossil zones is discussed against the combined background of faunal control in the Recent and network of correlations in the Tertiary.

Sedimentary facies and stratigraphy in the Gulf Coast Upper Tertiary are applied to two general problems. First, the presence and probable character of the Gulf Coast geosyncline are considered; second, the stratigraphic and facies data are applied to the problem of subsidence under load.

5. Tertiary History of Gulf Coast Geosyncline, M. M. Sheets, Production Maintenance Company, Houston.

The Gulf Coast geosyncline was first described by Barton and Ritz in 1933 as a long, narrow trough-shaped depression located parallel with and just inland from the shore of the Gulf of Mexico in Jefferson County, Texas. Since that time well data have made it impossible for such a trough to be present at drillable depths under the land. Geophysical data completed within the last few years seems to eliminate the possibility of such a trough under the continental shelf. In light of the new data, the former idea of the Gulf Coast geosyncline in the form of a long, narrow trough must be changed to a new concept of a bowl-shaped depression corresponding more or less with the form of the present Gulf of Mexico. Many additional data on sedimentation and structure, particularly faulting, supports this change in views.

This change in ideas may necessitate radical revision in the Tertiary history of the Gulf Coast, and doing so may cause radical revision of ideas of the thickness and character of the Tertiary and post-Tertiary sediments near shore and under the continental shelf.

In general it now seems that the Tertiary history of the Gulf Coast involves the following fundamental principles.

1. A large semiround bowl-shaped depression at the close of the Cretaceous and remaining relatively stable through the Tertiary.