SCENES OF THE PAST

OKLAHOMA CITY—24th ANNUAL CONVENTION—1939

At the dinner dance in the Silver Glade Room of the Skirvin Tower Hotel, twenty-fourth annual meeting, Oklahoma City, March 23, 1939. Left to right: ALEX W. McCOY, PHYLLIS McCOY, MRS. IRA H. CRAM, IRA H. CRAM, MRS. D. C. BARTON, D. C. BARTON, MISS GERTRUDE DRACH, H. B. FUQUA, W. H. TWENHOFEL, MRS. W. H. TWENHOFEL, GEORGE C. MATSON, MRS. GEORGE C. MATSON, MRS. FRANK R. CLARK, FRANK R. CLARK, MRS. A. I. LEVORSEN, A. I. LEVORSEN, W. E. WRATHER, MRS. W. B. HEROY, F. H. LAHEE, MRS. F. H. LAHEE, W. B. HEROY, and ALEXANDER DEUSSEN.

ABSTRACTS

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LOWER DEVONIAN BRACHIOPOD FAUNAS IN OKLAHOMA

Three brachiopod faunas have been described from Lower Devonian strata in Oklahoma: Haragan-Bois d'Arc Formations of Helderbergian (Gedinnian) age, Frisco Formation of Deerparkian (Siegenian) age, and the Sallisaw Formation of early Onesquethawan (Emsian) age. Beds with the Haragan-Bois d'Arc fauna are confined to south-central Oklahoma, and those with the Sallisaw fauna to eastern Oklahoma. The Frisco fauna is distributed more widely, being present in strata which crop out in the Arbuckle Mountains of south-central Oklahoma and the Ozark region of eastern Oklahoma, and in the subsurface of central and southwestern Oklahoma. Cores from the central part of the state show Frisco strata with a well-developed Deerparkian brachiopod fauna resting on the Upper Silurian Henryhouse Formation bearing a fauna of pentamerid brachiopods. These two faunas make it possible to define the Silurian-Devonian contact with precision through a substantial area in the central part of the state. Frisco brachiopods also have been recovered from a core in southwestern Oklahoma where the Frisco rests on Ordovician strata. Oil production from the Devonian of central Oklahoma, notably the West Edmond field, is believed to be largely from the Frisco Formation.

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SURFACE SEDIMENTS OF KARA SEA, NORTH OF 76°

Two re-entrants or troughs extending from the Arctic basin into the northern Kara Sea, an epicontinental sea on the Eurasian continental shelf, were sampled during the summer of 1965. The program was limited to depths exceeding 100 fm.

Distinct sedimentary zones exist in the westernmost trough which is open toward the southwest. These zones are expressed most strongly by the chlorite-kaolinite clay-group distribution which reflects a mixture from two distinct sources. The chloritic clays enter from the southwest and are dispersed northward along the eastern margin.

The sedimentary zones depend more on the bottom relief, currents, and source than on the absolute water depth. The zones trend north-south, paralleling the dominant currents which consist of a north-flowing near-surface current on the east side and a south-flowing bottom current on the west. The zonation is shown on maps of clay-group facies, water content, insoluble residue, and organic carbon. Similar zonation is suggested by the distribution of the grain size, the composition of the sand-size clastic grains, and foraminiferal populations.

In terms of relative amounts, the easternmost zone or slope is characterized by a low water content, and abundant chloritic clays, sand, and Foraminifera. The deposits at the foot of the slope have a high water and organic-carbon content, little chloritic material, and the greatest amounts of soluble material, though they contain few Foraminifera. The trough-floor sediments are characterized by an intermediate water content, low amounts of organic carbon, a very low chloritic content, and varying amounts of soluble material. The easternmost trough, which is open only to the Arctic, does not contain distinct sedimentary zones, nor does it have a recognizable current pattern.

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NATURE OF CALCIFICATION IN CODIACEAN ALGAE

The true relations between $CaCO_3$ hard parts and living tissues in the algae are poorly understood. It has been known for many years that calcification in the Rhodophyta (red algae) occurs within the cell walls of the organism, and that calcification of the dasycladacean Chlorophyta (green algae) partly encloses the plant within an external calcareous encrustation. However, the nature of calcification in the very important codiacean algae (siphonaceous algae, Order Caulerpiales of modern algologists) has not been investigated previously. Because it is important to relate preserved calcareous structures to the cell morphology of the parent organism, the genus *Halimeda* was studied in detail to aid in the interpretation and classification of fossil codiacean material.

Previous work by Lowenstam showed that calcareous skeletal material of *Halimeda* is composed of acicular crystals of aragonite, but no mention has been made of the relations between the aragonite and the living cell. Living *Halimeda* was collected along the Florida Keys and preserved in formaldehyde, impregnated with Vestapol plastic, sectioned with an ultramicrotome, and studied under an electron microscope. The aragonite was found to consist of acicular to blocky crystals ranging in length from 0.10 to 1.0 micron. The crystals occur as distinctly separate individuals suspended in a slurry *outside* of the cell walls which fuse to form a rigid calcareous structure on the death of the alga. No $CaCO_3$ was seen within the cells or cell walls. *Halimeda* is an alga composed of a single coenocytic, tube-shaped cell which branches repeatedly until the tiny cell tips (utricles) form the outer surface where photosynthesis occurs. Calcification occurs outside the cell walls but inside the uticle layer, forming a calcareous mold of the living cell. Therefore, fossil codiacean algae like *Halimeda* would not contain preserved parts of the cells or cell walls, but instead would consist of calcareous molds of the cell material. Openings formed by the removal of cellular material usually are infilled with sparry calcite in fossil codiaceans, whereas the intercellular aragonite usually is composed of dense, fine-crystalline $CaCO_3$. Fossil Codiacea may be classified safely on the basis of their external cell and utricle morphology.

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MIDDLE TERTIARY PLANKTONIC FORAMINIFERAL FACIES, SAN JOAQUIN BASIN, CALIFORNIA[1]

Biofacies analyses of the middle Tertiary marine units of the San Joaquin basin, California, show that the most continuous deep-water areas were near the southern end of the basin and close to the San Andreas fault system which bounds the basin on the west. Isopach maps demonstrate that the major sediment accumulation was generally in the more rapidly subsiding and deeper water areas of the basin, suggesting that mechanisms such as turbidity currents, sand flow, *etc.*, must have been important in the deposition there.

Planktonic foraminiferal facies are restricted to the southern part of the basin. Minor planktonic facies occurred in the Zemorrian and Saucesian Stages, perhaps 28 to about 20 million yr B.P. A major expansion of planktonic facies occurred during the Relizian Stage, about 20 to perhaps 17 million yr B.P. Only minor planktonic faunas are identified with the Luisian Stage, about 17 to perhaps 14 million yr B.P. A second major expansion of planktonic faunas occurred during the Mohnian Stage, perhaps 14 to about 11 million yr B.P. After the Mohnian, the deeper oceanic connection was attenuated rapidly and planktonic faunas disappeared in the latest Miocene.

Abundance variations and distribution patterns of middle Tertiary planktonic foraminiferal facies of the San Joaquin basin indicate that (1) there was an important deep-water opening toward the west across the San Andreas fault system, (2) other possible connecting channels must have been of a much smaller magnitude, allowing no major influx of oceanic planktonic populations, (3) the main distribution pattern is counterclockwise indicating a similar counterclockwise current pattern around the southern boundary of the basin, (4) there were two major expan-

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