10:30 **William C. Dawson, Donald F. Reaser:** Trace Fossils in Middle and Upper Austin Chalk near Dallas, Texas—Paleoecologic and Economic Significance

10:55 **E. L. Trice, Robert C. Grayson, Jr.:** Depositional Systems and Stratigraphic Relationships of Strawn Group (Pennsylvanian), Colorado River Valley, Central Texas

11:20 **Robert C. Grayson, Jr., E. L. Trice, III, E. L. Westergaard:** Middle Atokan to Early Missourian (Pennsylvanian), Conodonts, Fort Worth Basin and Concho Platform, Central Texas

TUESDAY AFTERNOON, FEBRUARY 26
Gulf-Atlantic Room

1:30 **Clifton F. Jordan:** A Shorthand Notation for Carbonate Facies—Dunham Revisited

1:55 **Arthur W. Cleaves, Albert W. Erxleben:** Upper Strawn and Canyon Cratonic Depositional Systems of Bend Arch, North-Central Texas

2:20 **Marcus E. Staples:** Exploration of Basal Bend Bar System—Southeastern Foard County, Texas

2:45 **George A. Hillis:** Petrophysics of Morrow Formation, Southeast New Mexico

Abstracts

ADDY, SUNIT K., H. W. DEJONG, G. W. WHITNEY, and R. E. WORTHINGTON, ARCO Exploration Co., Denver, CO

A Fresh Look at the Marfa Basin, West Texas

The lack of production in the Marfa basin remains an enigma. Although covered with approximately 3,000 ft of thick volcanics, the basin has Paleozoic stratigraphy and lithologies similar to the prolific Delaware basin to the east. In a geologic and geophysical review, we analyzed the overall hydrocarbon potential for this basin.

The lower Paleozoic (Cambrian through Devonian) rocks, which are conducive to hydrocarbon generation in other Permian basins, have many undrilled structures, as revealed by seismic mapping, but have also pervasive fresh water and dead oil. Several fault systems are mapped on the surface. We believe that the rocks were uplifted in Late Mississippian and Pennsylvanian time and in certain areas were exposed to meteoric water. Hydrocarbons leaked out along with induction of fresh water into the formations. Recharge areas have been identified from isopach maps. In certain parts, the lower Paleozoic rocks are overmature and offer further obstacles to exploration.

During the Early Permian, arkosic sediments were deposited in a rapidly subsiding east-west graben. Tilted to the south, the graben accumulated as much as approximately 9,000 ft of Lower Permian sediments that have occasional hydrocarbon shows. Small stratigraphic traps due to pinchouts, truncations, and facies changes are to be expected in these rocks. Possible reef growths in the Late Permian offer further opportunities for trap development.

The rocks were also exposed to meteoric water during nondeposition in the Triassic, Jurassic, and post-Cretaceous periods. However, the subtle Permian traps, being small, could have escaped destruction and freshwater flushing and thus might offer some potential for future exploration.

ANDERSON, RANDALL L., Satellite Exploration Consultants, Inc., Abilene, TX

Evaluation of Landsat Thematic Mapper Data for Hydrocarbon Exploration

The thematic mapper (TM), an advanced sensor on board Landsats 4 and 5, was designed to alleviate problems that limit applications of multispectral scanner (MSS) data acquired by previous satellites. This paper presents the results of studies in Texas and Illinois that demonstrate the advantages of TM data over MSS data in standard photogeologic work.

The TM and MSS both provided the synoptic, small-scale imagery essential for mapping regional geologic trends; however, the increased resolution of the TM made it possible to enlarge the imagery to a scale of 1:48,000 (and larger with high-quality bands) allowing both regional and detailed studies from the same data. Analysis of large-scale TM imagery resulted in recognition of many surface anomalies that were not visible on MSS data and more accurate delineation of those that were. The TM thermal infrared band proved particularly useful in detection of faults, and in one locality showed a thermal anomaly over a linear producing sand.

In addition to the advantages of new levels of anomaly discrimination and greater probability of successful prediction of structures, the TM has operational advantages, such as ready transfer to base maps because of evident small townsites, secondary roads, and first order drainage. TM imagery unquestionably extends the scope and effectiveness with which Landsat can be used for hydrocarbon exploration.

BEBOUT, DON G., Bur. Econ. Geology, Austin, TX, and DAVID A. LEARY, Univ. Texas, Austin, TX

Depositional Facies of San Andres and Grayburg Formations and Their Control on Porosity Distribution and Production—Dune Field, Crane County, Texas

Dune field is located on the eastern margin of the Central Basin platform on the western side of the Midland basin. Major production is from Permian (lower Guadalupian) San Andres and Grayburg porous dolomites. The southern half of Dune field (University Land, block 30) was selected for study because of the large amount of data readily available at the University Lands Office and because a cooperative operator (Mobil) provided cores and core analyses. The study centered around the Mobil University Unit 15/16, where cores were obtained from nine wells, and logs from hundreds of wells.

Cores from all wells show a similar upward-shoaling sequence with fusulinid wackestone and crinoid wackestone in the lower part, pellet and ooid grainstone near the top, and pisolite grainstone at the top of the approximately 300-ft thick section. Very thin (5 to 10-ft thick) siltstone beds occur commonly in the upper part of the section studied. Core and log correlations of the siltstones have permitted delineation of the lateral distribution of carbonate facies and recognition of a logical facies tract comprising arid island, tidal-flat, and shallow-water subtidal depositional environments.

Production is highest in the eastern third of University Unit 15/16, where porosity is best developed in 20- and 30-ft-thick pellet grainstone reservoirs; porosity also occurs in the much thicker fusulinid wackestone facies. In contrast, production in the western part of the area is from a thick section of low porosity sponge and algal framestone, equivalent to the pellet grainstone and crinoid wackestone in the lower part of the eastern sequence. Consequently, the eastern and western areas essentially function as two distinct reservoirs that are located in different parts of the San Andres and Grayburg section and have considerably different performance characteristics. The nonporous siltstones probably form barriers to vertical migration of fluids throughout the field.

BERG, ROBERT R., and JOHN T. LEETHEM, Texas A&M Univ., College Station, TX

Woodbine Reservoir Facies, Kurten Field, Brazos County, Texas

Woodbine–Eagle Ford reservoirs are productive over an area of about 55 mi^2 (140 km^2) in Kurten field. The Woodbine "C" sandstone is its most extensive reservoir and has an average net thickness of 30 ft (9 m). The "C" sandstone shows distinctive changes in rock type from south to north: (1) a dune facies, which consists of thin-bedded, medium-grained (0.28 mm) quartzose sandstones; (2) a rippled facies, which consists of thinly interbedded shale and fine-grained (0.17 mm) sandstone; and (3) a bioturbated facies, which consists of highly churned, very fine-grained (0.12 mm) sandstone. These facies result in decreasing permeabilities from an average 17 md in the south to 0.1 md in the north.

The "C" sandstone was deposited in a middle to outer-shelf location, and sands were supplied by storm-driven or tidal currents from the "Harris delta" to the east. The southern limit of the reservoir is controlled by a deep salt dome or ridge, called Hill dome, that trends northeastward. The upper Woodbine–Eagle Ford section was truncated by erosion along this trend and unconformably overlain by lime muds of the Austin Chalk. Sandstone facies suggest that salt uplift during deposition created a bathymetric high on the sea floor that was scoured by currents. Successively finer grained sands were deposited to the north under conditions of decreasing flow regime and increasing water depths.

BLANCHARD, PAUL E., and JOHN M. SHARP, JR., Univ. Texas, Austin, TX

Free Convection in Gulf Coast Reservoirs

Several observed diagenetic changes in Gulf Coast sediments, such as dissolution of calcite and feldspar and pore cementation by silica and cal-