SOUTHWESTERN SECTION 10TH ANNUAL MEETING
WICHITA FALLS, TEXAS, FEBRUARY 7–9, 1968

The North Texas Geological Society is host to the 10th annual meeting of the Southwestern Section of AAPG which will be held February 7–9, 1968 in Wichita Falls, Texas. Convention headquarters is the Memorial Auditorium, which is also the site of registration, technical sessions, and exhibits.

The theme is "Basins of the Southwest," and much geological information should be made available in a short period of time, much of it disseminated by well-known geologists.

In addition, the President and Secretary-Treasurer of the AAPG, J. Ben Carsey and John D. Moody, will be present, and each will speak. Moody, Exploration Vice-President of Mobil Oil, is the keynote speaker.

W. S. Wallace, general chairman, will preside at the meeting.

Entertainment includes a pre-meeting dance Wednesday evening at the Wichita Falls Country Club and a cocktail party Thursday evening to be held at the Wichita Club.

Entertainment will be provided for visiting ladies by the Geologists Wives Association of Wichita Falls.

TECHNICAL PROGRAM SUMMARY

THURSDAY MORNING, FEBRUARY 8

J. Ben Carsey, President, AAPG
John D. Moody, Keynote Address
John P. Olson, Coping with computers—suggestions for survival
H. H. Bradfield, Stratigraphy of deeper Marietta basin in Oklahoma and Texas

THURSDAY AFTERNOON, FEBRUARY 8

Harold J. Holmquest,* Robert T. Johansen, Harold M. Smith, Introduction to composition and stratigraphy relationships of Permian basin oils, Texas and New Mexico
Stewart Chuber,* Elton E. Rodgers, Jr., Pennsylvanian-Wolfcamp study
Elton E. Rodgers, Jr.,* Bill B. Belt, Ed H. McGlasson, Oils from Yeso reservoirs and their basinal equivalents
N. A. Sax,* William K. Stenzel, Oils from Abo reservoirs of Northwestern shelf
B. B. Coester,* Jacob L. Williams III, Relationships of oil composition and stratigraphy in multipay fields
John E. Galley, Some tectonic principles in Permian basin of Texas and New Mexico

FRIDAY MORNING, FEBRUARY 9

Gary E. Henry, Recent developments in Marietta basin
John E. Thornton, Critical evaluation of Hardeman basin and its environs
Glen S. Soderstrom, Stratigraphic relations in Palo Duro-Hardeman basin area
Frank E. Kottlowski, Sedimentational influence of Pedernal uplift

FRIDAY AFTERNOON, FEBRUARY 9

Arthur S. Ritchie, Natural chromatography—a factor in petroleum migration
William V. Trollinger, Surface evidence of deep structure in Anadarko basin
Donald C. Swanson, Geologic development of Anadarko basin and its deposits of hydrocarbons
Dan E. Feray, Nature of margins of sedimentary basins
Charles E. Mear, Stratigraphy of Permian basin

* Speaker.

ABSTRACTS OF PAPERS

(In order of presentation)

1. JOHN P. OLSON, Pan American Petroleum Corp., Tulsa, Okla.

Coping with Computers—Suggestions for Survival

The application of computers to geologic exploration is being influenced strongly by nongeologists. Experience suggests that management acceptance of and dependence on computer-produced information may exceed their understanding of how the information is produced. Deterioration of exploration efficiency and loss of influence by geologists may be expected unless geologists seize the initiative and dictate both the direction and priority of computer applications in their area of responsibility.

The tremendous amounts of information required by petroleum geologists create special problems in computerized data storage and retrieval. The solution to these problems requires imagination, logical ability, and knowledge of both the computer hardware and the geological significance of the data. Thus far poor communication between geologists and computer analysts, and inadequate understanding of each other's problems have prevented much meaningful progress in this area.

Merely storing and retrieving large amounts of exploration data with a computer are economically unjustifiable. The use to which the data are put once it is available is the key to success or failure of the program. *It is here that active participation by geologists is absolutely essential.*

Geologists need to familiarize themselves with computers, particularly the computers which their company is using. Exploration management must be willing to pay both for computer education and for a geologist's ability to use effectively the computer in petroleum exploration.

2. H. H. BRADFIELD, Independent Geologist, Dallas, Tex.

Stratigraphy of Deeper Marietta Basin in Oklahoma and Texas

The Marietta basin is in southern Oklahoma between the Muenster arch on the southwest and the Criner Hills uplift on the northeast; it extends from Love County, Oklahoma, southeastward through Cooke and Grayson Counties, Texas, the deepest part being known as the Gordonville trough.

The folded and faulted buried ridge (mid-basin ridge) on which the Southeast Marietta field is located has a more southward strike than the present basin axis, and divides the basin into two parts. The thickest sections of Atoka and older sediments were deposited north of the ridge.

The Gordonville trough developed in Late Mississippian or Early Pennsylvanian time from a gentle downwarp into a deep, relatively narrow trough with steep, commonly faulted sides, growing progressively as it received up to 5,000 feet or more of sediments of Atoka, Morrow, and possibly Springer (Goddard?) ages.

The Atoka and Morrow boundaries are indefinite on the basis of present knowledge. Some geologists place the top of the Atoka at the base of the Davis Sand (Grayson County, Texas). The writer has placed the top at an oölitic limestone (Lester?) midway between the Baker and Davis Sands. Westheimer believes the "micaceous sand" in the Ardmore basin Dornick Hills correlates with the micaceous Hartshorne Sandstone of the Arkoma basin and the Davis Sand of Grayson County. The sandstone correlated as Davis or "micaceous" in the Southeast Marietta field is several hundred feet higher stratigraphically than the Davis Sand of Grayson County.

A thick section of pre-Atokan appears northward as well as eastward from the mid-basin ridge. This is believed to be mostly Morrowan-lower Dornick Hills, Springer (Goddard?), and Caney. The boundaries are indefinite and based on electric-log characteristics, related to early sample work. More qualified determinations are necessary in samples from later wells.

Post-Atokan Dornick Hills also thickens eastward and northward in Grayson County, but thins and disappears southwestward against the lower faulted margin of the Muenster uplift. The same components may be noted in the Des Moines or Strawn (Deese), although the thickening here may be more related to the development of the present Gordonville trough by foundering and filling during erosional destruction of the Ouachitas.

More intense folding and thrust faulting, even deep within the basin, complicate considerably the development of structure and stratigraphy because of the loss of section (a loss which is not the result of depositional factors).

3. HAROLD J. HOLMQUEST, JR., Mobile Oil Co., Midland, Tex.; ROBERT T. JOHANSEN, U.S. Bureau of Mines, Bartlesville, Okla.; AND HAROLD M. SMITH, U.S. Bureau of Mines, Bartlesville, Okla.

INTRODUCTION TO COMPOSITION AND STRATIGRAPHY RELATIONSHIPS OF PERMIAN BASIN OILS, TEXAS AND NEW MEXICO

The present Oil Study Committee of the West Texas Geological Society was organized to study the oil composition and related stratigraphy of six projects in the Permian basin. These projects include the Simpson, Pennsylvanian, Wolfcamp, Abo, and Yeso rock units, and the multipay field study. Crude oils and associated water samples were analyzed by the U.S. Bureau of Mines Petroleum Research Center at Bartlesville, Oklahoma. Carbon isotope data were provided by the Sinclair Research Laboratory, Tulsa, Oklahoma.

Oil samples were distilled and the gasoline-gas oil part determined. The volume percent of paraffins (straight or branched chains), aromatics, and naphthenes (ring compounds) were derived for boiling fractions 1-7 (gasoline) and also of the aromatics for fractions 8-12 (gas oil). The carbon isotopic composition was determined for the high boiling fraction (+350°F). This composition is a function of the type of organic material deposited, the environment of deposition, and maturation history of the organic material. Data from Recent sediments show an increasing C^{13} isotopic composition from the rocks deposited in the terrestrial environment through those deposited in the open-marine, marine-carbonate, and marine-evaporite environments. Water samples were analyzed for pH, specific gravity, calcium and magnesium, sulfate, chloride, sodium, and resistivity.

Analytical data, including aromatic profiles, were used to group the oils based on elements of similarity. These groups were compared with isotopic composition and associated water data. Interpretation was based on the geologic history of the rock units involved in each project.

4. STEWART CHUBER, Consulting Geologist, AND ELTON E. RODGERS, Skelly Oil Co., Midland, Tex.

PENNSYLVANIAN—WOLFCAMP STUDY

Eighty-seven crude-oil samples were used in the Pennsylvanian-Wolfcamp study. Most of these were from carbonate reservoirs on the Eastern shelf and Horseshoe atoll.

Four geologic factors influence the Pennsylvanian-Wolfcamp crude-oil compositions: (1) the age of the shale envelope, (2) the paleogeography, (3) the migration history, and (4) the association with unconformities. Pennsylvanian shale envelopes yield crudes with low carbon isotopes. Local paleoenvironments have caused minor differences in the oil-generating character of the shales. Late migration or remigration into structural traps, and vertical mixing with pre-Pennsylvanian crudes in strato-structural fields, explain several distinct crude-oil types. Unconformity traps contain another type of Pennsylvanian crude which results from indigeneous generation and mixing with older crudes at the subcrop.

A classification of the Pennsylvanian-Wolfcamp crudes evolved from the use of carbon-isotope measurements in conjunction with the oil analyses. The classification appears also to be compatible with geological factors. The following groups are recognized:

Group	*Geologic Interpretation*
Ia	Penn. envelope, late structural accumulation, NE shelf
Ib	Penn. envelope, late structural accumulation, Central Basin platform
IIa	Penn. envelope, southeastern Eastern shelf
IIb	Penn. envelope, central Eastern shelf
IIc	Penn. envelope, north-central Eastern shelf
III	Wolfcamp envelope, primarily Horseshoe atoll,
IV	Penn. and Wolfcamp envelope, pre-Penn. unconformity assoc.
V	Penn. and Wolfcamp envelope, northern part of shelf.

5. ELTON E. RODGERS, Skelly Oil Co., Midland, Tex., BILL B. BELT, Gulf Oil Corp., Midland, Tex., AND ED H. McGLASSON, Mobil Oil Co., Midland, Tex.

OILS FROM YESO RESERVOIRS AND THEIR BASINAL EQUIVALENTS

Yeso rocks contribute a high percentage of the oil produced in the Permian basin. The Yeso was deposited as three distinct facies in late Leonardian time. The shelf deposits of slightly anhydritic dolomite are divided into the Glorieta and the upper and lower Clearfork rock units; the shelf-edge deposits around the basin margins consist of massive reef-like dolomite; and the basin deposits are predominantly