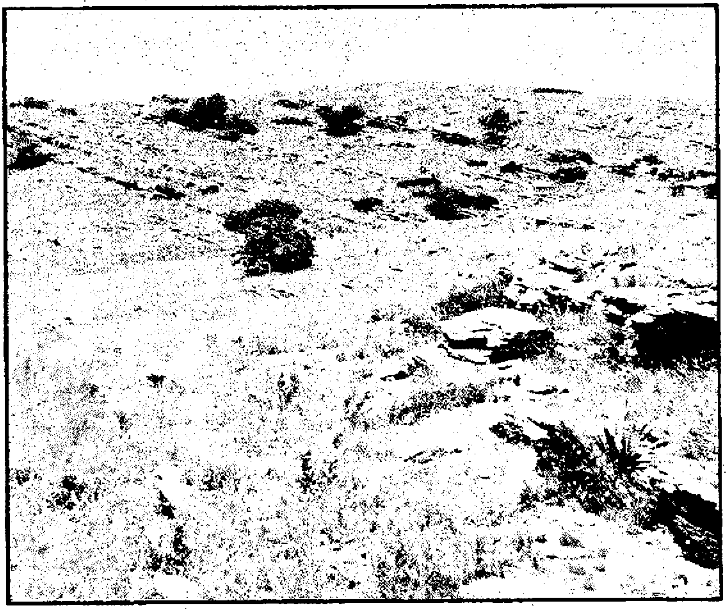

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OKLAHOMA GEOLOGY NOTES

Cover Picture

TOMBSTONE TOPOGRAPHY IN ARBUCKLE GROUP WICHITA MOUNTAINS

The cover photograph shows an outcrop of limestone beds of the McKenzie Hill Formation (Ordovician) in the middle part of the Arbuckle Group. The outcrop is north of State Highway 9, in sec. 14, T. 5 N., R. 13 W., Caddo County, Oklahoma. Limestone beds are dipping northeastward into the Anadarko basin, away from the Cambrian igneous rocks that form the core of the Wichita Mountains.

Differential weathering and erosion of alternating layers of resistant and nonresistant limestone produce the "tombstone topography" that is characteristic of parts of the Arbuckle Group in both the Wichita Mountains and the Arbuckle Mountains.

The McKenzie Hill is about 500 feet thick here, and it consists of light-gray to medium-gray calcarenites, mudstones, and intraformational conglomerates. Thin layers of chert are present in the upper part of the formation; the chert occurs as nodules and irregular masses replacing limestone. The McKenzie Hill was studied in this area by Harry E. Brookby. His master's thesis (1969), done at The University of Oklahoma, is entitled "Upper Arbuckle (Ordovician) Outcrops in the Richards Spur-Kindblade Ranch Area, Northeastern Wichita Mountains, Oklahoma."

—*Kenneth S. Johnson*

(Cover photograph by William E. Ham, 1968)

Editorial staff: William D. Rose, Rosemary Croy, Elizabeth A. Ham

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Short articles on aspects of Oklahoma geology are welcome from contributors. A set of guidelines will be forwarded on request.

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EAGLE-PICHER CLOSES CRETA COPPER MINE AND MILL

Eagle-Picher Industries, Inc., has shut down the open-pit copper mine it had operated at Creta in southwestern Oklahoma since 1965. The mine, located about 15 miles southwest of Altus in Jackson County, produced about 200,000 tons of ore annually. The ore is a chalcocite-bearing shale of Permian age that is about 7 inches thick, and the copper content averages about 2.3 percent.

The mine closing, according to company officials, resulted from lower copper prices and higher production costs. After reaching a record domestic price of about 87 cents a pound for electrolytic copper in June, July, and August 1974, the price of copper fell to about 63 cents a pound in March and April of 1975. The price reduction resulted from a copper surplus caused by the construction slump that began early in 1974 and accelerated during the second half of the year.

Rising production costs were standard for the mining industry during 1974-75; expenses for labor, materials, and mining operations were all higher at Creta. In addition, increased costs for smelting the copper concentrate in El Paso reduced the return to Eagle-Picher. Higher wages, more expensive materials, and the addition of pollution-control devices to minimize adverse environmental effects from the smelting of copper-sulfide ores combined to increase smelter costs.

Mining at Creta ceased February 23, and the 1,000-ton-per-day mill closed March 28. The future of the mine is undecided, but, inasmuch as there are still reserves on the property, it is possible for the mine to reopen if the demand for copper and the price of copper both increase.

—Kenneth S. Johnson

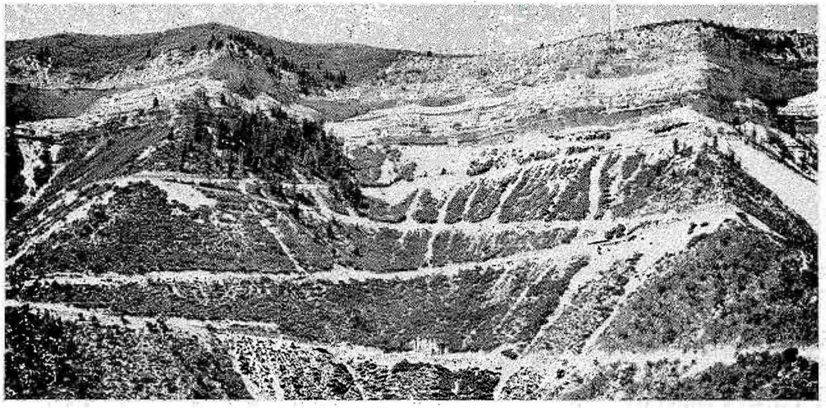
1975 Petroleum Encyclopedia Available

A publication date of July 1 has been announced for *International Petroleum Encyclopedia 1975.* The Petroleum Publishing Company, which also publishes the *Oil and Gas Journal,* bills their encyclopedia as the "oilman's total reference book" and affirms that it contains "more information . . . than any other single volume on petroleum."

In addition to updating information in last year's volume, the new edition features a rundown on the world's geothermal areas; a special section on the technology, pipeline facilities, new discoveries, and production potential of the North Sea area; a report on the outlook for synthetic natural gas; and new maps of the Gulf Coast of the United States.

Individual copies of the encyclopedia sell for $37.50; orders should be addressed to The Petroleum Publishing Company, P.O. Box 1260, Tulsa, Oklahoma 74101.

Colorado Headquarters Set for OU Energy-Fuels Course



Switchback road leading to oil shales in cliff face, Piceance basin, near Rifle, Colorado.

For the third straight summer, Kenneth S. Johnson, economic and environmental geologist with the Oklahoma Geological Survey, will direct the Energy Fuels Field Course and Workshop sponsored by The University of Oklahoma School of Petroleum and Geological Engineering.

The 3-week course—actually three 1-week courses—will be held July 28-August 15. It is designed to explore the geologic setting and the energy-fuel resources of the Piceance basin, the Uinta basin, and the Uravan mineral belt—all on the north side of the Colorado Plateau and the western slope of the Rockies. Oil shales, nuclear fuels, nuclear stimulation, coal, petroleum, and asphalt will be major topics. Informal discussion and instruction by engineers and scientists actively engaged in energy production by current and experimental methods are invaluable aspects of the program.

Although enrollment is offered on the basis of 1, 2, or 3 weeks, last year 15 of the 17 participants attended the entire course sequence, and the others signed up for 2 weeks. The group taking the course consisted of 6 faculty members from other colleges and universities, 5 geology graduate students, 2 geography students, 1 physics major, and 3 engineering students. Academic credit is assigned at the rate of 1 credit hour per week of instruction.

Headquarters for the class will be in Grand Junction, Colorado, but participants will camp out four nights on the Colorado Plateau and in the Rocky Mountains. Scenic areas surrounding the Colorado, Dinosaur, Black Canyon of the Gunnison, and Arches National Monuments will be high points of the field excursions.

For additional information concerning the course, please contact Dr. Johnson at the Oklahoma Geological Survey, The University of Oklahoma, Norman, Oklahoma 73069 (phone 405/325-6541 or 325-3031).

Survey Director Appointed to NRC Panel

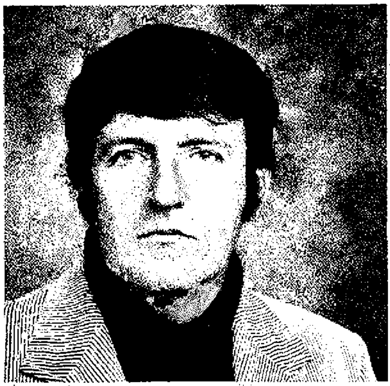
Charles J. Mankin, director of the Oklahoma Geological Survey and The University of Oklahoma School of Geology and Geophysics, was recently named to the National Research Council (NRC) Panel on Gas Reserve Estimates.

The panel was established as a result of a request made to the National Academy of Sciences (NAS) by the Secretary of the Interior. The Secretary asked for an evaluation of the techniques and procedures used by the Federal Power Commission, in cooperation with the U.S. Geological Survey, in preparing a report on gas reserves in shut-in leases on the outer continental shelf. The NRC, which is the research arm of the NAS, turned to one of its member boards, the Board on Mineral Resources, for assistance, and the creation of an 8-member panel (under the direction of Dr. Charles L. Drake of Dartmouth College) ensued.

The Panel on Gas Reserve Estimates has already met twice, once in Dallas and once in New Orleans, and a second meeting is scheduled for New Orleans in July. That city was chosen because of the accessibility of data on shut-in leases. The group will restrict itself to data available to the Federal Power Commission staff in early 1974 when the agency made its study. The report issued by the FPC was severely criticized by some individuals, including several congressmen, for being biased toward the oil industry. Determining the validity of the charge will be the underlying task of the investigative panel.

Dr. Mankin is president of the Association of American State Geologists, and he served as co-chairman last year of the Crude Oil Committee for the Oklahoma Energy Advisory Council.

Robin Vaught Receives BEST Award



The National Association of Geology Teachers has selected Robin Eugene Vaught, a teacher at Broken Bow High School, for the BEST—Best Earth-Science Teacher in Oklahoma—Award.

The award is presented each year to reward excellence in earth-science teaching. John Naff, OSU professor of geology and chairman of the selection committee for the BEST Award, reports that approximately 30 teachers were nominated for the honor by their colleagues and their principals.

Mr. Vaught has been teaching for 15 years. He received his B.S. degree in education from Southeastern State College, Durant, Oklahoma; he was a

2-year participant in an NSF (National Science Foundation) earth-science institute at Oklahoma State University from 1970 to 1971; and he completed requirements for an M.S. degree from OSU in July 1973. He is a member of the Oklahoma Education Association, the Southwestern Naturalists Association, the American Society of Mammalogists, the Broken Bow Jaycees, and the McCurtain County Education Association. In 1969, he was named the Oklahoma Jaycees' Outstanding Young Educator.

Our compliments to Mr. Vaught for his fine work; we extend our congratulations to him on receipt of this recognition.

OKLAHOMA ABSTRACTS

AAPG-SEPM Annual Meetings
Dallas, Texas, April 7-9, 1975

The following abstracts are reprinted from The American Association of Petroleum Geologists and Society of Economic Paleontologists and Mineralogists *Annual Meetings Abstracts,* v. 2, April 1975. Page numbers are given in brackets below each abstract. Permission of the authors and of Gary Howell, AAPG managing editor, to reproduce the abstracts is gratefully acknowledged.

Rock Type Discrimination Using Radar Imagery

P. JAN CANNON, Bureau of Economic Geology, The University of Texas at Austin, Austin, Texas

Geologic mapping from radar imagery of the Wichita and Arbuckle Mountains of southern Oklahoma indicates that in areas of sparse to moderate vegetation, certain rock types can be readily discriminated on the radar imagery. They can be distinguished because the returns of radar energy from rock outcrops are strongly influenced by the geometry of the rock surfaces. The angular configuration exhibited by the outcrop is the most important factor in returning the propagated radar energy to an air-

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OKLAHOMA ABSTRACTS is intended to present abstracts of recent unpublished papers relating to the geology of Oklahoma and adjacent areas of interest. The editors are therefore interested in obtaining abstracts of formally presented or approved documents, such as dissertations, theses, and papers presented at professional meetings, that have not yet been published.

borne receiver. The outcrop geometry can vary greatly between rock types due to the differences in grain size, rates of weathering, and structure. The scale of the outcrop geometry in relation to the wavelength of the propagated radar energy is also an influencing factor of importance. [8-9]

Middle Pennsylvanian (Strawn Group) Depositional Systems, North-Central Texas

ARTHUR W. CLEAVES, Department of Geology, Wayne State University, Detroit, Michigan

Fluvial and deltaic facies comprising the Strawn Group were deposited within the Fort Worth Foreland Basin and on the adjacent Concho Platform. Variations in the rates of subsidence within the adjacent basins led to development of unique sandstone geometry, facies distribution patterns and sandstone thickness.

Nine cycles of delta progradation and abandonment were delineated; 5,000 wells provided the principal source of data. Both high-constructive elongate and lobate deltaic facies have been recognized. Principal source areas include the Arbuckle Mountains of Oklahoma and the Ouachita Foldbelt of Texas.

When subsidence decreased within the Fort Worth Basin, deltas of the Strawn Group prograded across the foreland basin and onto the slowly subsiding Concho Platform. Deltaic facies deposited on the platform comprise thin (less than 200 feet thick), elongate, multilateral lobate delta systems. A typical vertical sequence of facies includes (upward) prodelta mudstone, delta front sheet sandstone, channel-mouth bar sandstone, distributary channel-fill sandstone and delta plain mudstone. Initial deltas prograded to the western edge of the Concho Platform; the Midland Basin to the west was poorly defined and no shelf-edge or slope facies of Middle Pennsylvanian age have been recognized.

High-constructive elongate delta systems (greater than 200 feet thick) were deposited in the northwestern end of the Fort Worth Basin during periods of active subsidence. These thicker deltas are characterized by linear, multistory sandstone bodies resembling barfinger sands of the Holocene Mississippi Delta. Incised, valley-fill fluvial deposits commonly overlie the high-constructive deltaic facies. [11-12]

Seismic Stratigraphic Model of Depositional Platform Margin, Eastern Anadarko Basin

W. E. GALLOWAY, M. S. YANCEY, and A. P. WHIPPLE, Continental Oil Company, Ponca City, Oklahoma

Three-dimensional stratigraphic analysis of cratonic basin margins has, in recent years, demonstrated complex interrelationships between shelf, shelf edge, and basinal facies. Application of seismic stratigraphic modeling has proved useful in analyzing the geometry of a cratonic platform margin in the Hoxbar Group (Missourian) of the eastern Anadarko Basin.

Seismic modeling requires four principal steps: (1) Tabulation of petrophysical parameters of the lithologies included in the model; (2) Construction of a series of model stratigraphic sequences along a line of section; (3) Generation of synthetic seismograms for each model sequence; (4) Comparison of the synthetic traces with corresponding field traces. Results of such a model study, combined with subsurface geologic data, suggest the following interpretation of Hoxbar platform evolution.

A progradational deltaic platform extended westward into the basin, producing an initial relief of approximately 500 feet (Phase I). Abandonment of the delta resulted in compactional subsidence and deposition of shallow water carbonates along the platform margin (Phase II). Contemporaneous with carbonate deposition on the platform, terrigenous clastic sediment accumulated on the basin floor as a submarine fan complex. Renewed influx of terrigenous sediment produced a second cycle of deltaic progradation, which extended across the carbonate shelf as a rapidly deposited, thin clastic veneer and constructed a thick progradational wedge basinward of the subjacent platform edge (Phase III). This younger progradational wedge is capped by distributary channel and delta margin sands of a fluvial-dominated, lobate delta system.

[28-29]

Ammonoids of the Upper Wapanucka Limestone and Their Bearing on the Morrowan-Atokan Boundary in Oklahoma

MACKENZIE GORDON, JR., U.S. Geological Survey, Washington, D. C., and PATRICK K. SUTHERLAND, The University of Oklahoma, Norman, Oklahoma

Ammonoids from the upper part of the Wapanucka Limestone are latest Morrowan in age. A small collection of these fossils was made by Sutherland from a roadcut on the Indian Nations Turnpike, 13.4 miles northwest of Daisey, Oklahoma, in the frontal Ouachita Mountains. The ammonoids include *Gastrioceras* sp., *Diaboloceras neumeieri* Quinn and Carr, *Christioceras?* sp., *Proshumardites morrowanus* Gordon, and *Stenopronorites arkansiensis* (Smith), as identified by Gordon. These are typcial of the *Diaboloceras neumeieri* Zone, which, in the type Morrowan section of northwest Arkansas, is found in the upper part of the Trace Creek Member of the Bloyd Shale and is the highest Morrowan ammonoid zone.

Data from collections of the U.S. Geological Survey indicate that the underlying *Axinolobus modulus* Zone of middle Bloyd age is represented in the middle part of the Wapanucka Limestone and the *Branneroceras branneri* Zone of early Bloyd (Brentwood) age probably has equivalents in the lower part of the formation. Two species of *Gastrioceras* of Brentwood age are also fairly common in the upper few hundred feet of the underlying Springer Shale of the frontal belt.

This evidence indicates a lateral equivalence of the Wapanucka Limestone with most of the Bloyd Shale, excluding only the lower part of the Brentwood Limestone Member. It would preclude the correlation of any part of the Wapanucka with the Atoka Formation, or any part of the Atoka, including the Barnett Hill Formation and its zone of *Profusulinella*, with the type Morrowan. [30]

Evaporites from the Sea? A Western Kansas Permian Enigma

KATRINE A. HOLDOWAY, University of Kansas, Lawrence, Kansas

An unusual red-bed evaporite sequence of the Nippewalla Group, upper Leonardian, Permian, in Wichita County, Kansas, was cored for the Atomic Energy Commission in 1972. The core is 170 meters long, and extends upwards from the Harper and Salt Plains Siltstones, through the Cedar Hills Sandstone, Flowerpot Shale and the Blaine Formation. In the core, the Harper and Salt Plains Siltstones and the Cedar Hills Sandstone are typical red-bed deposits, frequently cemented by halite. Overlying the Cedar Hills, the sediments corresponding to the Flowerpot Shale and the Blaine Formation are composed of fine to coarsely crystalline halite crystals, which are intimately associated with varying amounts of red, silty mudstone.

The bromine concentration of the halite is very low throughout the section, frequently being less than 5 ppm. The textural and stratigraphic relationships of the sediments suggest that this is not the result of widespread post-depositional recrystallization.

The low bromine concentration of the halite, minor amount of carbonate in the sequence, and the intimate association of evaporites with red-beds suggest that the deposition of these sediments took place in a continental basin, which was subject to occasional flooding by the sea.

[36]

Stratigraphy of the Permian Blaine Formation and Associated Strata in North-Central Texas

K. S. JOHNSON, Oklahoma Geological Survey, Norman, Oklahoma, W. D. WOLFE, U.S. Army Corps of Engineers, Tulsa, Oklahoma, and M. V. SMITH, U.S. Army Corps of Engineers, Tulsa, Oklahoma

A Permian red bed-evaporite sequence, consisting of (ascending order) the San Angelo, Flowerpot, Blaine, and Dog Creek Formations, comprises 600 to 700 feet of strata cropping out on the northeast shelf of the Permian basin. The three uppermost formations were previously called the "Blaine of Texas," but they can be subdivided now on the basis of cores and detailed field work. The proposed subdivisions are consistent with nomenclature and stratigraphic concepts used for these same formations northward for 300 miles along their outcrops into Oklahoma and Kansas.

A complete cycle of evaporite deposition in the region includes (ascending) dolomite, gypsum/anhydrite, salt (halite), red-brown shale, and gray shale. Individual beds in each cycle are typically 3-20 feet thick. The main part of the evaporite sequence contains 15 to 20 complete or partial cycles.

Strata dip gently to the southwest into the basin, but outcropping units are collapsed and disturbed where soluble evaporite layers have been dissolved by ground water. Gypsum layers have been removed at a number of places at and near the outcrop, and salt layers have been dissolved where they are within 500 to 800 feet of the present surface: these solution and collapse features locally obscure the stratigraphic and structural relations.

[39-40]

Evidence for and Use of the Model of a Hot Deep Origin of Petroleum in Exploration

L. C. PRICE, U.S. Geological Survey, Geologic Division, Office of Energy Resources, Branch of Oil and Gas Resources, Denver Federal Center, Bldg. 25, Rm. 2403, Denver Colorado

The model of a hot deep origin of petroleum places rigid constraints on the migration and entrapment of crude oil. Specifically, oil escaping from depth must migrate vertically along faults and be emplaced in suitable traps at shallower horizons. This model predicts that petroleum accumulations are situated in traps adjacent to and updip from faults extending into the basin deep. The model also predicts several new exploration plays, the major one being stratigraphic trapping updip from major faults. Empirical evidence from petroleum basins worldwide is consistent with such a model.

The basin structural style governs the distribution, types, and amounts of hydrocarbons expected and thus the exploration strategy. For example, production from Tertiary depocenters (U.S. Gulf Coast, Niger Delta) is from structures associated with major growth faults, and structures not associated with such faulting are barren. Production in block-faulted basins is from horst blocks next to deep troughs (Central Basin Platform of West Texas and the Sirte basin, Libya). Major accumulations are also found in traps adjacent to basin-margin upthrusts (Southern Oklahoma and some Laramide basins of the Rocky Mountains). In highly structured basins (Los Angeles and Ventura) the main oil occurrences can be specifically predicted by analysis of both the fault systems and possible hydrocarbon migration routes. This model also applies to prospecting on the stable shelf (Western Canada and Anadarko Shelf). There hydrocarbons from the deep basin undergo long lateral migration and are emplaced in a generally predictable manner in laterally continuous reservoirs and are not charged into isolated reservoirs from a local source. [60-61]

The Significance of Light Mineral Fractions in Sandstone Provenance Studies

JOHN B. THOMAS, Department of Geology, College of William and Mary, Williamsburg, Virginia

It is common for much emphasis to be placed on the suite of heavy minerals when studying sandstone provenance. Less value is placed on clay mineral and light mineral fractions of the same rock. A detailed study of the Permo-Pennsylvanian Vanoss Formation in south-central Oklahoma was undertaken to test the validity of this generalization and to map its mineralogic dispersal patterns.

Since the source rocks for the Vanoss are exposed in the Arbuckle Mountains, it is possible to compare directly source rock mineralogy to that of the Vanoss Formation. Without knowledge of the two principal sources; (1) the pre-Vanoss Paleozoic sedimentary rocks and (2) the Precambrian "core" granites of the Arbuckles, interpretations as to the nature of the source rocks would have been incorrect.

Dominant in the non-opaque heavy minerals are zircon, tourmaline, rutile and garnet. These minerals are found in both known source rock complexes, but their presence in the Vanoss implies either a sedimentary, metamorphic or mixed sedimentary-metamorphic source. Intrastratal solution has removed most of the heavies which would have been diagnostic of the igneous source.

Diagenesis has obscured the original clay mineralogy of the Vanoss, too. Only in more argillaceous portions of the Formation has kaolinitization not completely destroyed the original clay suite.

The light mineral fraction is zoned into carbonate-chert rock fragment material in westernmost outcrops of the Vanoss, a mixed carbonate-silicate clastic phase in the middle and a quartz-feldspar granite rock fragment suite along the eastern outcrop margins. According to Slemmons (1962) the high ratios of albite-to Carlsbad-twinned plagioclase is a good metamorphic indicator. High ratios in the Vanoss, however, are found to be due to disintegration of the coarser, simple Carlsbad twins during transport from the granitic source.

It is concluded, therefore, that the mineralogy of the light mineral fraction should be carefully considered in future provenance studies of sandstones, especially when comparison to the original source rocks is impossible. [73-74]

Geotectonic Evolution of Fort Worth Basin

JACK L. WALPER, Texas Christian University, Fort Worth, Texas

The Fort Worth basin had its origin in the culminating Ouachita orogeny which formed as the result of a sequence of Paleozoic tectonic events and associated sedimentation. A Precambrian continent, composed of what is now North and South America and Africa, rifted forming a proto-Atlantic Ocean. Thermal doming associated with this rifting produced the Wichita and Delaware aulacogens of Oklahoma and West Texas respectively. Epeiric seas transgressed the retreating and subsiding plate margin flooding into the aulacogens, as they subsided more rapidly, to deposit the thick carbonates of Cambro-Ordovician age in Texas and Oklahoma. Subsequent closing of the proto-Atlantic began with subduction along the North American margin of this sea, forming volcanic arcs that supplied clastic detritus for the "Ouachita facies" of the early Paleozoic. It is suggested that, as the Afro-South American plate collided with the volcanic arcs, an orogenic welt grew and was thrust toward the craton. This orogenic welt and back-arc thrust belt supplied the early synorogenic deposits of the Stanley-Jackfork sequence and its correlatives. As plate collision continued the orogen grew and was thrust cratonward, particularly where it encountered the weaker, aulacogen zones, composed of a thick, incompetent sedimentary prism. Broad dilation arcs of thrust faults and folds comprising the Ouachita and Marathon salients formed in these areas. In areas where the craton was rigid and stable, as was the Texas craton, the advancing plate impinged against this buttress forming pericratonic basins such as the Kerr and Fort Worth. Here the early-formed synorogenic sequence or flysch was crushed and thrust against the cratonic margin which subsided along a series of migrating hinge lines, under the onslaught of the advancing tectonic belt to allow for the deposition of a postorogenic or molasse sequence represented by the Atoka and Strawn Series.

[78]

GSA Annual Meeting, North-Central Section Waterloo, Ontario, May 15-17, 1975

The following abstract is reprinted from the *Abstracts with Programs* of The Geological Society of America, v. 7, no. 6. The page number is given in brackets below the abstract. Permission of the authors and of Mrs. Jo Fogelberg, managing editor of GSA, to reproduce the abstract is gratefully acknowledged.

Exceptional Radiolaria and Associated Conodonts from the Sycamore Limestone, Arbuckle Mountains, Oklahoma

ALLEN R. ORMISTON and H. RICHARD LANE, Research Center, Amoco Production Company, P.O. Box 591, Tulsa, Oklahoma

An abundant (40,000 specimens) and diverse (D=0.8) fauna of exceptionally preserved Radiolaria has been recovered together with conodonts from a burrowed lime mudstone near the base of the Sycamore Limestone. Ten spumellarine and three albaillellarine genera are present. Some of these have European Lower Carboniferous occurrences; others are new. The Sycamore Radiolaria supply data on structure and variability conducive to a more rational taxonomy of Paleozoic Radiolaria.

This Sycamore radiolarian fauna is associated at its lowest occurrence with *Gnathodus punctatus* Zone conodonts assignable to the *Siphonodella* biofacies of Druce (1973) and 35 feet higher with a younger Osage, gnathodid-dominated fauna. The equivalent interval in the Lawrence Uplift (pre-Welden Shale, Welden Limestone, and, possibly, part of the post-Welden Shale) contains abundant conodont faunas with more varied platform elements but no Radiolaria.

The presence of a low-diversity, gnathodid-dominated conodont fauna, seemingly analogous with gnathodid-rich Permian faunas regarded as shallow water by Clark (1974), seems incongruous in a radiolarian-rich lime mudstone which is extensively burrowed by *Scalarituba* and *Zoophycos,* devoid of shelled benthos, and has other biotic and sedimentary attributes incompatible with a shallow setting. Although the common equation of abundant Radiolaria and deep water settings is questionable in light of Casey's (1971) studies of modern radiolarian distributions, the radiolarian horizons in the Sycamore seem at least to qualify as intermediate-depth deposits. The Sycamore example may be a warning against facile analogies of conodont environmental requirements through time.

[832]

AAPG Researches Oil Probability

The Kansas Geological Survey and Stanford University are sponsoring a conference that will survey the application of probability methods to oil exploration. The American Association of Petroleum Geologists Computer Application Committee is assisting with arrangements for the August 2[illegible]-22 meeting, which has been set up as an AAPG Research Conference, and Stanford University, Stanford, California, will be the site.

Topics for discussion include statistical forecasting of the volume of undiscovered oil and gas in sedimentary basins; the use of statistical methods for the combined analysis of structural, stratigraphic, geophysical, and production data; statistical relationships between oil-field size and sequence of discoveries; estimating numerical probabilities of favorable results for specific oil plays and prospects before drilling; the state of the art in computer mapping and analysis; the use of computer well-data systems in subsurface mapping; and the statistical assessment of the reliability of exploration maps.

John C. Davis, Geologic Research Section, Kansas Geological Survey, and John W. Harbaugh, Professor of Applied Earth Sciences, Stanford University, are the conference conveners. For additional information, please contact Dr. Harbaugh, Department of Applied Earth Sciences, Stanford University, Stanford, California 94305.

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