the deep Anadarko basin. Production to date has been excellent. Initial potentials are more than 1,000 BOPD. Liberal allowables of up to 580 BOPD and payouts of 4–6 months for the better wells account for the rash of drilling activity.

At the end of May 1971, 74 producing wells had been completed on 160-acre spacing in a producing trend extending over 15 mi from just west of Chickasha in T6N, R8W, to Dutton townsite in T9N, R9W. There are presently 10 wells drilling to the Marchand sandstone, 5 announced locations, and 18 wells that have run production casing and are in some stage of completion. Depths range from 10,100 to 11,000 ft and drilling costs are from $100,000 to $120,000 to casing point and $180,000 to $200,000 for a completed producer.

The Marchand is a fine-grained, well-sorted sandstone and is generally highly laminated with shale. Silt and clays are found in the matrix. Regional correlations and examinations of samples, cores, and thin sections lead the writer to believe that the sandstone is of deltaic origin. The deltaic deposition apparently was complicated by channeling and offshore bar development. Regional structure at the Missourian level is relatively uncomplicated, dip being monoclinal at approximately 1°/mi toward the basin axis and interrupted only by slight nosing. The trap appears to be purely stratigraphic.

Marchand sandstone pay thicknesses range up to 125 ft. The reservoir is undersaturated and oil wet with solution gas drive. Gas/oil ratios are approximately 700 to 1 and original bottomhole pressures between 4,600 and 6,300 psi. Primary recoveries should range between 12 and 16% of the oil in place and reserves for the better wells with the thickest pay sections should be more than 750,000 bbl of oil.

The excellent production from the Marchand sandstone touched off an extensive leasing campaign in southwestern Grady and southeastern Caddo Counties, Oklahoma. The Marchand is only one of several sandstones developed in the Missourian section and chances are good that wildcat drilling will uncover additional stratigraphic production from the Missourian section in this part of the Anadarko basin.

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PROBLEMS OF NATURAL GAS SUPPLY

Since 1968 the United States has produced more gas than it discovered. This trend will continue as more heavy industry turns to natural gas and away from other fossil fuels in efforts to stem air pollution. New and proved reserves in Alaska are far from the marketing stage. The decline in drilling, to a 28-year low in April 1970, has been the result of 17 years of unnatural price ceilings on natural gas and, more recently, of the reduction in 1969 in the depletion allowance. However, current pricing trends by the Federal Power Commission, and incentives by pipeline companies and funds, now make deep wildcatting in the Anadarko basin and elsewhere very attractive.

HEFNER, ROBERT A., III, Glover Hefner Kennedy Oil Co., Oklahoma City, Okla.

NATURAL GAS IN ANADARKO BASIN

Geologists tend to think of natural gas in geologic terms. However, Mid-Continent geologists also should think of gas in the Mid-Continent, and particularly in the deep Anadarko basin, in terms of the economics of the total system of production and delivery to market from the Mid-Continent area, and the overall economics of the energy industry in the United States.

Good exploration geologists have understood for years the importance of the interface between their discipline and others, but there are now more disciplines to which they must relate as they think of gas exploration in the long term. Geologists have included in their thought-processes operating constraints of the production phase of the business, but with the search for greater reserves, and particularly ultra-deep reserves, production technology has changed so substantially that a new and more comprehensive view of this developing technology is required. In addition, geologists must become economists in a sense, because the development of commercial reserves is closely related not only to the cost of production, transportation, and distribution, but also to the costs of all alternate sources of energy when delivered to the consumer.

LOUDEN, L. R., Dresser Magcobar, Houston, Tex., and BILLY W. AUD, Dresser Olympic, Houston, Tex.

INTERDISCIPLINARY APPROACH TO SUCCESSFUL DRILLING

A multidiscipline approach to well planning has proved successful in determining "drillability" lithology and pressure profile in unknown or relatively undrilled basins. The marriage of seismic velocity information to classic historical geology, facilitated by translation of the combined information into drilling parameters, guides the planning and drilling of technical wildcats. Work done in the Santa Barbara Channel and a case history of the GHK #1-22 Farrar are examples of the multidiscipline approach.

MASON, JOHN W., Amarex, Inc., Oklahoma City, Okla.

HAMON LOCKE MULTIPAY FIELD

The Hamon Locke field on the Wheeler-Roberts county line in the Texas Panhandle was discovered late in 1970 by the Jake L. Hamon No. 1 Locke. To date, 4 wells have been completed and 1 is currently staked. Producing formations are the Ellenburger, Simpson, Hunton, and Brown dolomite with proved productive granite wash and Mississippian zones behind pipe in 3 of the wells. The field is structurally controlled and was drilled on seismic information refined by subsurface data from 2 nearby dry holes which were also drilled on seismic information, emphasizing again the need for continuing review and interdisciplinary coordination. The hydrocarbons produced are significantly different from other nearby lower Paleozoic fields, and some conjectures are presented to stimulate further work to account for these differences.

MOORE, CARL A., Univ. of Oklahoma, Norman, Okla., and BIJAN ESFANDIARI, Univ. of Tehran, Tehran, Iran

GEOCHEMISTRY AND GEOLOGY OF HELIUM

Helium is formed as a product of radioactive decay of trace elements in several rocks and minerals. It is being produced continually in the earth's crust by the disintegration of uranium, thorium, and other elements which are alpha-particle emitters.

Helium-generating potential of a material is a measure of its alpha emission activity. One gram of uranium may generate 1.16×10^{-7} ml of helium in 1 year.

Nearly all igneous rocks contain trace amounts of the uranium series. The acidic types are usually significantly more radioactive than those of the basic types. The helium-generating potential of sedimentary and metamorphic rocks appears to be dependent upon the rock type and its history rather than on the age or location of the sample. Comparative Specific Radiation Activity (SRA) values for the three classes of rocks are presented, with the calculated percentages of uranium in each sample.

The helium-generating potential of sedimentary rocks is a particular study: as a uranium-bearing granite is emplaced, cooled, uplifted, and eroded, for example, alpha particles are emitted at a constant rate. During transportation of the sands, silts, and shales, and deposition as sediments, these clastic grains continue to give off alpha particles which become helium atoms that are trapped in the rocks.

Helium cannot be trapped permanently in a geologic trap. Rather, the helium will diffuse out, or migrate out, over a period of geologic time. Helium must either be generated or migrate into a trap, be detained by the geometry of the rock and then either move out by migration or by diffusion. The helium that is produced is "in transit" through the rocks in the trap. A given trap has the ability to hold no more than 2% helium depending on the geometry of the rock, the pressures, and the helium holders associated with the trap.

ROGERS, FERRILL H., Attorney and Counselor at Law, Oklahoma City, Okla.

HOW SPACING CAN KEEP THE GEOLOGIST WORKING AND WHY

(No abstract submitted)

WOODS, DALTON J., Geologist and Petroleum Engineer, Shreveport, La.

SMACKOVER'S SIGNIFICANT WALKER CREEK (ARKANSAS)

Thirty years ago, the oil industry knew all there was to know about the Smackover in southern Arkansas. All production from that formation came from large anticlines that were found by seismograph—then came Walker Creek!

Now, stratigraphic traps at 11,000 ft, oolite bars trending across low relief structural noses, and porosity pinchouts bring a new frontier for the wildcatter. Leave your old ideas and your old tools behind if you join this search. Gravity and shooting are not much help. The "in" combination is an imaginative subsurface geologist working with an operator who is interested in trend plays.

When you are tracing the pattern of offshore bars along an ancestral Gulf of Mexico shoreline, it is a big country. Wherever oolites are formed, beach or bar deposits can be present, and these are the ingredients for lucrative but elusive oil fields.

How many "Walker Creeks" will be found from Mexico to Florida? That is an interesting challenge facing the industry today.

21ST ANNUAL MEETING

GULF COAST ASSOCIATION OF GEOLOGICAL SOCIETIES (GULF COAST SECTION OF AAPG)

and

SOCIETY OF ECONOMIC PALEONTOLOGISTS AND MINERALOGISTS (GULF COAST SECTION)

"WHERE THE ACTION IS"

NEW ORLEANS, LOUISIANA—OCTOBER 13–15, 1971

TECHNICAL PROGRAM SUMMARIES

THURSDAY MORNING, OCTOBER 14

GCAGS-GCS-SEPM Joint Session
Jung Hotel, New Orleans
Opening Ceremonies

ROBERT G. WILLIAMSON: Opening remarks
HONORABLE MOON LANDRIEU: Mayor, City of New Orleans, Welcome address
LEE H. MELTZER: GCAGS report of president
Introduction of AAPG officers
Presentation of awards
WILSON M. LAIRD: American Petroleum Institute, Keynote address

GCAGS TECHNICAL SESSIONS

1. H. YARBOROUGH: Sedimentary environments and occurrence of major hydrocarbon accumulations
2. R. W. BOEBEL: Quantifying multiple working geologic hypotheses—geology and competitive offshore lease bidding

THURSDAY AFTERNOON, OCTOBER 14

3. P. L. KEYES: Geology of Jurassic, Flomaton-Jay area, Alabama and Florida
4. R. L. LAYDEN: Story of Big Wells
5. G. O. WINSTON: Regional structure, stratigraphy, and oil possibilities of South Florida basin
6. M. OXLEY, D. E. HERLIHY: Geology and geophysics of East Nancy field, Clarke County, Mississippi
7. P. H. BENSON: Geology of Oligocene Hackberry trend, Gillis English Bayou-Manchester area, Calcasieu Parish, Louisiana
8. J. A. GILREATH, R. W. STEPHENS: Distributary-front deposits interpreted from dipmeter patterns
9. W. E. CONATSER, C. C. ALMY: Grand Isle barrier island, Louisiana—human activity in natural dynamic system

FRIDAY MORNING, OCTOBER 15

10. L. F. BOLAND, E. D. MINIHAN, W. A. THOMAS: Black Warrior basin
11. J. A. HARTMAN: "G_2" channel sandstone, Main Pass Block 35 field
12. W. F. BISHOP: Stratigraphic control of production from Jurassic calcarenites, Red Rock field, Webster Parish, Louisiana
13. B. J. SLOANE: Recent developments in Miocene *Planulina* gas trend of South Louisiana
14. D. A. REEL, G. M. GRIFFIN: Potentially petroliferous trends in Florida as defined by geothermal gradients