ment.

At the experimental site in Sanilac County, Michigan, the Antrim Formation is about 200 ft (60 m) thick at 1,200 to 1,400 ft (365 to 425 m) below the surface. Under Task 2, several wells have been drilled into the Antrim layer in three 10-acre plots. Each plot has been subjected to a different fracturing procedure: (a) hydraulic fracturing followed by explosive fracturing; (b) explosive underreaming followed by explosive fracturing; (c) chemical underreaming followed by explosive fracturing.

The plot which appeared, on the basis of permeability studies, well-to-well communications, and various downhole logging studies, to offer the best chance of success in Task 3 was chosen for an in-situ extraction trial. This trial was scheduled to begin in August 1979.

WHEELER, RUSSELL L., West Virginia Univ., Morgantown, W. Va.

Cross-Strike Structural Discontinuities—Exploration Rationale for Eastern Plateau Province

Cross-strike structural discontinuities (CSDs) are zones of structural disruption several kilometers wide in the Appalachian and other overthrust belts. CSDs are not faults or fault zones. They typically contain about 1,000 cu km of unusually fractured rock. For example, in eastern West Virginia, one CSD (Parsons lineament) trends west-northwest at least from the Appalachian front to the Intraplateau structural front, with no evidence of basement involvement. The Parsons lineament has double to triple the normal joint intensity in exposed Upper Devonian siltstones. Another CSD (Petersburg lineament) trends west-southwest from the western Valley and Ridge province, and crosses the Appalachian structural front. The Petersburg lineament aligns with Arkle's hinge line, a probable basement flexure under the western and central Plateau province, and has twice-normal joint intensity in exposed Lower Pennsylvanian sandstones. The two CSDs appear to intersect in southern Tucker and northern Randolph Counties, West Virginia.

CSDs and their intersections, particularly beneath intersections of short air-photo lineaments, may comprise highly permeable fractured reservoirs. If the seal is preserved, CSDs can provide a tool for extending exploration into the little-tested eastern Plateau province of West Virginia and adjacent states, where organic-rich Devonian shales are thick and thermally mature.

WILLETTE, P. D., and J. E. ROBINSON, Syracuse Univ., Syracuse, N.Y.

Structural Control of Onondaga Reefs (Devonian) in South-Central New York State

The lower Middle Devonian Onondaga Formation is a restricted marine limestone that extends throughout southern New York State. Thicknesses locally range from 15 to about 260 ft (5 to 78 m) with the thicker parts generally attributed to organic reefal buildups. The reefs may be algal and mudbank as well as wave-resistant structures, however, they contain porous sections that form natural-gas reservoirs if coincident with structural closure. Early interpretations considered the reefs and tectonic structures independent; however, recent investigations suggest that incipient folding was the main control on reefal formation.

Structure and isopach maps constructed from tops picked on about 1,400 wells drilled in New York State in the area bounded by 75°30′ and 78°30′ indicate that anticlinal folds are coincident with isopach thicks that indicate reefal buildups. Organic accumulations thus are interpreted as related directly to Appalachian folding. Breaks in trends accompanied by changes in thickness are related to contemporaneous organic reaction to tectonic relief. This relation not only dates the inception of folding but also simplifies exploration for natural-gas reservoirs. Because the reefs are confined to the anticlines, there is no need for stratigraphic tests off structure.

WOOD, GORDON H., JR., and THOMAS M. KEHN, U.S. Geol. Survey, Reston, Va.

Revision of U.S. Geological Survey and U.S. Bureau of Mines Coal Resources Classification System

In 1976, the U.S. Geological Survey and U.S. Bureau of Mines published a system of coal-resources classification that incorporated definitions and criteria to be used by the two agencies. This system was adopted by many state geological surveys. However, because of criticism and ambiguities, the two agencies decided to revise, enlarge, and make more precise the definitions and criteria and to include advice, suggestions, and recommendations aimed at guiding those engaged in resource estimation. In addition, a decision was made to include conversion data for the English and metric systems of measurement. Finally, a report was to be written that would be a compendium on the methodologies and criteria for the classification of coal resources and reserves.

Advice from the state geologists of the principal coal-bearing states was solicited. Similarly, the existing 1976 classification system was discussed with representatives of the nations cooperating in the International Energy Agency's (IEA) World Coal Reserves and Resources Data Bank Service. Their comments were considered and incorporated in the revision that is nearing completion.

In 1977, the U.S. Department of Energy took over most of the coal-related functions and personnel of the U.S. Bureau of Mines. The revision is under the auspices of the Department of Energy and the U.S. Geological Survey.

Throughout the revision, every effort has been made not to negate the hundreds to thousands of coal-resource estimates already published or being prepared by geologists and engineers in the United States. Also, foreign resource specialists have indicated that the revision should have international comparisons as an objective. This objective has been accomplished.

ZIELINSKI, R. E., J. A. DIXON, Mound Facility, Miamisburg, Ohio, and R. D. MCIVER, Geochem Research, Houston, Tex.

Projection of Favorable Gas-Producing Areas from Paleoenvironmental Data

Paleoenvironmental biofacies analysis of recently drilled wells in dark Devonian shales in the Appalachian basin has shown that these facies can be projected to areas with no control points. In particular, the facies distributions in Perry County, Kentucky, were found to be precisely those that were predicted earlier from biofacies and organic geochemical data from the VA-1 well in Wise County, Virginia, and the KY-2 well in Martin County, Kentucky. This demonstrates the importance of these data in assessing the volume of gas in the shale throughout the basin as well as in selecting future test sites.

The recent biofacies and geochemical work combined with a review of the tectonics of the basin have contributed to an evolving interpretation of the geologic control of the biofacies.

While a marine environment persisted throughout the Late Devonian over the Appalachian and Illinois basins (and probably the Michigan basin), dynamic emergent areas controlled an intermittent introduction of large amounts of organic matter. Large amounts of nonmarine organic matter were periodically transported into the basin from a dynamic source provenance on the southeast; massive "blooms" of *Tasmanites* intermittently spread both east and west from the edges of the emerging Cincinnati arch. At times one or the other of these organic types swept entirely across the basins; at other times a more normal open-marine biota flourished and was deposited, probably under the influence of connections to the open seas on the south and northwest, the north being closed by the collision and suturing of continental plates and the east by the growing Appalachian Mountains.

ZIELINSKI, R. E., J. A. DIXON, Mound Facility, Miamisburg, Ohio, R. D. MCIVER, Geochem Research, Houston, Tex., and A. E. HUNT, Morgantown Energy Technology, Morgantown, W.Va.

Pressure Coring of Gas-Bearing Devonian Black Shales, Erie County, Pennsylvania

A Christiansen model pressure-retaining core barrel (the Pressure Core Barrel) was used in the drilling of an EGSP research well in Erie County, Pennsylvania, the well being a joint Mound Facility-METC effort. Offgassing of cores begins as soon as air-drilled cores are cut, and large quantities of gas are lost while such a core is being brought to the surface. Drilling mud was used to minimize gas loss during core cutting, and the pressure core barrel allowed as complete as possible recovery of the total in-place hydrocarbons in the dark shale.

MID-CONTINENT SECTION BIENNIAL MEETING

October 7-9, 1979, Tulsa, Oklahoma
Host: Tulsa Geological Society

A field trip preceding the meeting will be led by ALLAN P. BENNISON, independent, Tulsa, Sunday, October 7, 1979, 7:30 a.m. to 5:30 p.m. The trip will cover the Desmoinesian Dawson to Hartshorne coals and related sandstones of east-central Oklahoma, Tulsa, Okmulgee, and Muskogee Counties. Guidebooks will be provided.

An ice-breaker cocktail party will be held Sunday night, and an all-convention dinner with special program is scheduled for Monday night. Exhibitors' booths and wives' activities will be available.

The theme of the meeting will be "Pennsylvanian Sandstones of Mid-Continent Area." The areas to be covered are northern Texas through Kansas, and Arkansas through western Oklahoma. A book containing the papers presented, with six introductory chapters covering the Mid-Continent, will be on sale at the meeting which will be held in the new downtown Williams Plaza Hotel.

HARRISON TOWNES, consultant, 1510 Fourth National Bldg., Tulsa, Okla. 74119, is the general chairman. Committee chairmen are: program, RALPH W. DISNEY, Southport Exploration Inc., and NORMAN J. HYNE, University of Tulsa; hotel and housing, GEORGE R. BOLE, Amoco Production Co.; financial, NORMA J. SMITH, Transok Pipeline; registration, GENE CAMPBELL, Reading and Bates Offshore, and LARRY BARLOW, Min-Tex Oil Corp.; entertainment, WILLIAM RICHARDSON, independent; exhibits, CAL SUTTERFIELD, independent; publicity, NORMAN S. MORRISEY, consultant, and JOHN MCCASLIN, Oil and Gas Journal; printing and advertising, MARSHALL UDDEN, Natomas-North America; technical services, BYRAM E. REED, JR., Amerada Hess Corp.; ladies' activities, JEAN REEDER; awards and judging, WILLIAM RUSSELL, Texaco Inc.

Mid-Continent Section officers are: president, GEORGE W. KRUMME, Krumme Oil Co., Bristow, Okla.; vice-president, ROBERT D. COWDERY, Petroleum Inc., Wichita, Kans.; secretary, GARY WAYNE HART, independent, Oklahoma City; treasurer, GUY W. LEACH, Oil Development Co. of Texas, Amarillo, Tex.

GULF COAST ASSOCIATION OF GEOLOGICAL SOCIETIES and GULF COAST SECTION SEPM 29TH ANNUAL MEETING

OCTOBER 10-12, 1979
San Antonio Convention Center
San Antonio, Texas
Host: South Texas Geological Society

Technical Sessions

GCAGS and GCS-SEPM technical sessions are scheduled for Thursday, October 11, following the joint opening session, and for all day Friday, October 12. GCAGS technical sessions will include a balance of field papers, electric log applications to geologic problems, stratigraphic studies, and papers of general interest to Gulf Coast geologists. The GCS-SEPM will present sessions on paleontology, surface and subsurface stratigraphy, and surficial processes on our ancient and modern Gulf Coast.