Abstracts*

AMATO, ROGER V., and ANTHONY C. GIORDANO, U.S. Dept. Interior, Minerals Management Service, Vienna, VA

Great Stone Dome—Great Disappointment?

Baltimore Canyon Trough's Great Stone dome is one of the largest, most prominent subsurface structural features in the Atlantic offshore. The dome, with nearly 140,000 ac under closure and more than 11,000 ft of structural relief, was formed by the early Late Cretaceous intrusion of a large mafic igneous body. The uplifting resulted in a major Barremian unconformity across the dome along with minor higher unconformities.

The dome was the site of intense bidding during 1976 when $651 million was bid for 37 tracts including $107.8 million for one crestal tract. Seven wells were subsequently drilled on the dome to total depths from 12,000 to 17,449 ft. The wells penetrated Cretaceous and Jurassic sandstones with porosities ranging up to 30%, but none encountered pay or significant shows. Lack of hydrocarbons in the section tested appears to be a result of low organic matter content of shales. Thermal maturation profiles show source rocks changing abruptly from immature to overmature across the Barremian unconformity. If hydrocarbons were generated (probably gas), lack of adequate seals at or above the unconformity prevented entrapment in crestal parts of the structure.

The seven wells mainly tested structural traps on the dome. Additional prospects remain to be tested, such as possible flank fault traps and stratigraphic traps formed by sands pinching out around the dome's flanks where mature source rocks are likely to occur.

BERMINGHAM, DIANA, Univ. Pennsylvania, Philadelphia, PA

Anchizone Metamorphism in Triassic Sedimentary Rocks of the Newark Basin, Pennsylvania–New Jersey

The degree of crystallinity of authigenic illite was determined, by x-ray diffraction, for samples from the Lockatong Formation (Triassic) of the Newark basin of southeastern Pennsylvania and adjacent New Jersey. Sixteen samples from approximately 30 m of section in the lowermost Lockatong near Trooper, Pennsylvania, were analyzed.

Preliminary results ranging from 22° to 41° $\Delta 2\Theta$, indicate a range of metamorphism extending through the anchizone to the boundary with the greenschist facies, and indicate that the rocks were subjected to temperatures of ~300°C for a period of time.

An episode of elevated temperature might have resulted from proximity to an intrusive rock body, from burial a short distance beneath a lava flow, or from burial beneath ~8-10 km of overlying rock. None of these proposed mechanisms is consistent with the geologic evidence; another explanation for such a high temperature must be sought.

Four other samples from widely distributed localities within the Newark basin also fall within this range of illite crystallinity. Samples from the Gettysburg basin and the Connecticut basin are less well crystallized, suggesting that the thermal event hypothesized here was restricted to the Newark basin.

BERQUIST, CARL R., JR., Virginia Division of Mineral Resources, Williamsburg, VA, and KELVIN W. RAMSEY, Univ. Delaware, Newark, DE

The Barhamsville Unit: An Intertidal to Fluvial Sequence Between Yorktown and Windsor Formations, Southeastern Virginia

The Barhamsville unit represents a major phase of deposition in the southern Salisbury embayment during the late Pliocene. Deposition was dominantly intertidal to nonmarine. On the York-James Peninsula and south of the James River, the unit unconformably overlies the marine Yorktown Formation or, to the west, older Tertiary units and is cut into and overlain by the Windsor Formation.

The Barhamsville unit is the major surficial unit of the region and ranges in thickness from near 0 m at its westernmost exposure to 20 m in paleochannels. The unit contains an eastern tidal flat complex consisting of mixed flat, lower flat, and tidal channel deposits and a western fluvial and reworked fluvial complex consisting of coarse-grained, gravelly, nearshore(?) and fluvial channel deposits. These coarse-grained deposits are overlain by fine-grained marsh(?) and estuarine(?) deposits.

Antecedent topography may have had an influence on deposition of the unit. Structure contours on its base show a gently seaward-dipping surface, which is channeled along its western margin near the present James River. This surface has a distinct break in slope coincident with the tidal-flat nearshore/fluvial boundary. The break in slope is considered to be an erosional rather than a structural feature. Direct dating of the Barhamsville unit is not available due to a lack of body fossils and pollen. It's age is considered to be late Pliocene based on stratigraphic position.

BJERSTEDT, THOMAS W., and THOMAS W. KAMMER, West Virginia Univ., Morgantown, WV

Sedimentology of Mississippian Price Delta in Southeastern West Virginia

The Price (Pocono) delta in southeastern West Virginia is the final westward prograding sequence of the Acadian clastic wedge. A 256-m section exposed near Caldwell provides an excellent reference section. The Price delta was composed of a subaqueous delta platform rimmed by shoreface sands. Protected from marine processes on the platform, distributary channel and mouth-bar systems in a shoal-water deltaic complex built rapidly westward into the foreland basin waters approximately 100 m deep.

The Appalachian basin was oxygen-deficient during Early Mississippian (Kinderhookian) time. Dark, Sunbury-type silt-shale lithosomes recur in the stratigraphic sequence and mark transgressive periods of decreasing clastic influx and an increased rate of basin subsidence, which brought dysaerobic prodeltaic facies onto the delta slope and front.

Prodeltaic facies contain phosphate pebbles in commonly laminated, dark silt-shales. At the toe of slope, turbidites in BC and BCE sequences occur. Distal tempestites occur on the upper delta slope. Fine-grained sands on the shoreface delta front contain siderite/quartz pebble pavements from storm events. The delta platform edge is marked by a sand-bar system. Back-bar sheet sands on the delta platform contain an abundant fauna in shelly lags. The inner platform contains flaser bedded, dark shales, silts and fine-grained sands in interdistributary bays, mouth bars, low-energy beaches, and mud flats.

Distributary channels on the delta plain contain mud/coal clast and siderite pebble conglomerates and coaly stringers in large-scale, trough cross-bedded, medium-grained sands. Maccrady red beds of the coastal plain cap the deltaic sequence.

BOSWELL, RAY M., West Virginia Univ., Morgantown, WV

Regional Analysis of Distribution of Catskill Deltaic Sands in Northern West Virginia

Detailed mapping of "clean" sandstones of the Hampshire and Pocono formations of northern West Virginia illustrates paralic facies of north-south trend, intersected by belts of sandstones with east-west trends representing fluvial and tidal channel facies. The strike-trending paralic sandstones commonly have maximum thickness of 20 to 30 ft, and successive isopach maps of individual sandstones indicate irregular shifts that are interpreted to represent embayed shorelines advancing and retreating in uneven fashion. These small-scale changes affect small segments of the shoreline and probably result from fluctuations in sediment supply related to upstream avulsion or stream capture. Isolith maps of multiple sandstones of intervals such as the Fifth, Fourth, Gordon, Thirty-foot and Fifty-foot, show greater shoreline shifts probably due to sea level changes.

Regional cross sections through the Catskill clastic wedge show vertical stacking of shoreline sands in a belt with north-south trend. This preferential zone of subsidence is bounded on the west by the eastern margin of the Rome trough, and on the south by the northern edge of the Pocono dome. This interpreted subsidence increases southward toward the Pocono dome, suggesting basement sub-blocks with southerly tilt.

*Denotes speaker other than senior author.