contains some anomalously thick sandstones and siltstones, which are generally limited to the north and have been tentatively assigned to the "Mohawk"(?) unit. These sandstones are mostly medium to coarse-grained, calcite-cemented quartzarenites. Upper Jurassic "Abenaki" limestone as much as 2,210 ft (675 m) thick was penetrated by most of the eastern wells. The limestone is mostly wackestone to grainstone, with varying amounts of oolites and fossils. Thick-bedded sandstones characterize the Lower Cretaceous "Mississauga" unit. These sandstones are mostly fine to medium-grained, calcite-cemented quartzarenites. The overlying "Naskapi" unit consists of calcareous shale. Thick sandstone beds dominate the uppermost "Logan Canyon" unit, which consists mostly of fine to coarse-grained, calcite-cemented quartz arenite.

LYNCH, ROY W., JR., and JAMES R. APUTIC, Berea Oil and Gas Corp., Buffalo, NY

Regional Depositional and Tectonic Model for Lower Mississippian Pocono Formation Sandstones, Hydrocarbon Entrapment, and Play Generation—Southern Appalachian Plateau of West Virginia and Virginia

Local and basin analyses were integrated into a regional depositional and tectonic model for hydrocarbon migration and entrapment for the Lower Mississippian Pocono Formation sandstones for a study area located in the Appalachian Plateau of West Virginia and Virginia.

Subsurface mapping on a local scale led to the recognition of a suite of depositional facies corresponding to the Pocono Formation sandstones and the tectonic effects exerted on them. The Pocono depositional sequence consists of sediments deposited in wave-dominated linear clastic shorelines. These features include the corresponding facies of barrier islands and strand plains. Structural elements observed from local mapping on Pocono horizons include northeast-southwest strike, northwest dip, high-angle reverse faults, low-relief folds, and northwest-southeast cross-strike structural discontinuities (tear faults).

Basin analysis generated a basin history model, which was described using the following parameters: basin-forming tectonics, depositional sequences, and basin-modifying tectonics.

Placing the local Pocono Formation study area within the framework of the generated basin history model yielded a tracing for the movement of the study area through time relative to basin evolution. This permitted identification of the genetic relationships among the observed local depositional and tectonic features and the mechanisms responsible for their generation, thus providing a basis for exploration and field extension.

For the study area, we place the Pocono Formation sandstones at the wedge top of a Middle Silurian through Lower Mississippian depositional sequence deposited within an interior sag basin situated immediately west of a westward-converging mobilized fold belt.

LYONS, PAUL C., U.S. Geol. Survey, Reston, VA, EDWIN F. JACOBSEN, Vienna, VA, and ROMEO M. FLORES, U.S. Geol. Survey, Denver, CO

Paleoenvironmental Control of Accumulation and Quality of Upper Freeport Coal Bed (Allegheny Formation, Middle Pennsylvanian), Castleman Coalfield, Maryland

The upper Freeport is generally a thick, widespread coal bed in the north-central Appalachian basin. It is a principal bed mined in the Castleman coalfield, Garrett County, Maryland, as delineated on a new geologic map of the coalfield. In the northern part of the coalfield, the upper Freeport is 21-48 in. (53-122 cm) thick and thickens toward the northwest, where the ash and sulfur contents are generally 7-10 wt. % and less than 1.5 wt. %, respectively. This coal bed thins southward and eastward and is absent from a large area in the central part of the coalfield, where its position is occupied by a carbonaceous claystone or flint clay. Toward the south and east, the upper Freeport coal bed generally contains 12-15 wt. % ash and 1.5-6.2 wt. % sulfur.

Lithofacies analysis of the floor rocks and their lateral equivalents indicates deposition of the upper Freeport coal bed in floodplain swamps. Limestone and limy claystone floor rocks in the northwest represent distal floodplain lake deposits. Where the coal is unminable or absent to the south, proximal overbank floodplain shale, siltstone, and silty claystone grade laterally into channel sandstone. The gradation of thin coal into carbonaceous claystone to the south indicates increased oxidation and shoaling in a well-drained swamp. There, the coal has the highest ash and sulfur contents, which probably reflect the influx of detritus and iron-rich clays. Thus, the upper Freeport is thickest and has the lowest ash and sulfur contents where the paleoenvironment was a poorly drained, distal floodplain swamp.

MEHRTENS, CHARLOTTE, Univ. Vermont, Burlington, VT

Bioclastic Turbidites in Trenton Limestone: Significance and Criteria for Recognition

Bioclastic turbidites are identified and described from the Denley Limestone (Trenton Group) in the Mohawk Valley, New York. These turbidites are recognized by the repetitive Bouma sequences within limestone beds separated by shale interbeds interpreted as interturbidite deposits. The general characteristics of bioclastic turbidites includes internal structures identifiable as Bouma sequences Ta through Te. Bioclastic turbidites differ from the clastic turbidites described by A. Bouma in that they include an additional subdivision termed Td'. This unit, composed of unfossiliferous, bioturbated, but otherwise structureless carbonate mud, is similar to the ungraded, unlaminated mud described by others as representing the finest grained sediment emplaced by turbidity currents. The Trenton bioclastic turbidites are associated with slump-fold zones and syndepositional block faults and have been used by other workers to redefine the Trenton limestones as foreland basin or trench slope deposits. The Trenton Group sediments have been interpreted previously as deposits formed in situ on a subsiding shelf, rather than storm-generated shelf sediments from turbidites. It is suggested that the internal structures of the limestone beds are similar to those that would be produced by storm-surge ebb-flow currents, but differ in that they are associated with other indicators of the slope setting, are consistently associated with vertical burrows descending into the sediment rather than escape burrows, consistently exhibit Bouma sequences, and show a statistical relationship between grain size and bed thickness.

MEHRTENS, CHARLOTTE, and RONALD PARKER, Univ. Vermont, Burlington, VT

Comparison of Foreland Basin Sequences: Trenton Group in Southern Quebec and Central New York

Numerous high-angle faults are recognizable within the autochthonous Middle Ordovician (Trenton Group) shelf sequence in southern Quebec. These faults were active during deposition of the Trenton limestones, as evidenced by rapid thickness changes over short distances on the shelf, abrupt facies changes between fault blocks, and associated slump-fold zones. Syndepositional block faults have been described recently from the Trenton Group of central New York. The times of movement were documented by use of the numerous interbedded bentonite beds. Bentonites, although present in the Trenton Group in southern Quebec, are not abundant enough to correlate fault blocks. Instead, the syndepositional nature of the fault blocks can be seen by examining the facies distribution of the Deschambault Limestone. The Deschambault Limestone represents a skeletal buildup on the Trenton shelf, similar to those described from the southern Appalachians. The core facies of the buildups is exposed in the Pont Rouge region. Flank facies are present to the west, near Joliette. The buildup facies are absent both downshelf and upshelf. Using the buildup facies as marker beds, at least one period of movement can be recognized. Fault blocks were primarily active after the Deschambault deposition.

The Trenton in southern Quebec can be compared to that in New York and southern Ontario. The facies changes among these areas can be shown to be controlled by proximity to or position within the Taconic foreland basin.

MILLER, MARC A., BRUCE A. BENNETT, and GARY G. LASH, State Univ. College, Fredonia, NY

Consideration of Possible Productive Zones Within Gatesburg and Postsdam Formations, Northwest Pennsylvania