Yorktown is a mappable unconformity truncating the Eastover; seaward, in the lower James River area, marine-shelf deposits of both units converge and are distinguishable only on the basis of their faunas. These units thicken southward toward the Albemarle embayment. Across the same region, the distribution of upper Pliocene and lower Pleistocene transgressive and regressive deposits records a continued trend of tilting toward the southeast.

OLSEN, PAUL E., Lamont-Doherty Geol. Observatory, Palisades, NY

Significance of Great Lateral Extent of Thin Units in Newark Supergroup (Lower Mesozoic, Eastern North America)

The lacustrine sediments of the Newark Supergroup accumulated in rift valleys developed during the early phases of the fragmentation of Pangea. Analogy with modern rift valleys has led us to expect abrupt facies transitions and syndepositional structural complexity. However, in contrast to their supposed modern analogs, many thin (<6 m) organic-rich lacustrine units within the Newark can be traced over large areas ($+2{,}000$ km^2) with only gradual lateral changes in thickness and lithology.

Lateral correlation is afforded by: (1) detailed ecostratigraphic correlation of fossils in lacustrine cycles, (2) key marker beds such as earthquake-induced fluidized beds, (3) detailed paleomagnetic reversal stratigraphy (by others), and (4) matching of microlaminae and turbidites. These observations suggest that the lakes which produced the organic-rich units were very large ($+2{,}000$ km^2) and deep ($+100$ m) while at their maximum extent.

The continuity of thin beds across the major intrabasin faults and the gradual lateral change in thickness over the basins show that these faults were not active during the deposition of the units and that the size of the subsiding blocks of these Mesozoic basins was much larger than is currently the case in the east African rifts. Simple analogy between Newark and African rift systems in structure and facies is not justified and obscures their real and important differences.

OSSI, JOHN CHRISTOPHER, Univ. Maryland, College Park, MD

New Method for Interpreting Coal-Forming Environments of Deposition

Coal petrographic methods used to characterize coals for industrial purposes have further application in the interpretation of environments of deposition through the plotting of maceral data that have been grouped on the basis of mutual abundance using correlation coefficients. Huminite (or vitrinite), exinite, inertinite ternary diagrams do not readily distinguish environmental conditions during peat deposition because the three categories of macerals are based on broad ranges of reflectance. Macerals within each group are not genetically related. Lignite cores from Neshoba County, Mississippi, having an undetermined depositional environment, have been analyzed petrographically. Petrographic data from other Gulf Coast lignites of known environments of deposition (determined by nonpetrographic means) were grouped using the genetically discrete maceral associations formed by combining macerals that correlate with each other. These genetically discrete maceral groups are termed "lithogroups." When maceral data are plotted on ternary diagrams by lithogroups, the plot reveals fields that are characteristic of particular environments of deposition. The Neshoba lignites overlap in the fluvial/deltaic region of the ternary plot. An important factor controlling peat composition is thought to be pH, thereby affecting the petrography of the resulting coal.

OWENS, J. P., U.S. Geol. Survey, Reston, VA

Kirkwood Formation and Cohansey Sand of New Jersey: Age and Spatial Relation to Chesapeake Group of Virginia and Maryland

Time and space equivalency between the well-studied Neogene beds of Virginia and Maryland and those to the northeast in New Jersey are only generally understood. Diatom and foraminifer assemblages from a recently cored hole through the Cohansey Sand and underlying Kirkwood Formation indicate that Kirkwood is the same age as the Calvert Formation of Maryland (early to early middle Miocene). The Cohansey yielded no mega-invertebrates; however, pollen studies showed that the Kirkwood and overlying Cohansey have similar microfloras. The Cohansey is probably also middle Miocene in age and equivalent to the Choptank Formation of Maryland.

In New Jersey, the Cohansey is as high as 300 ft above sea level, with no Miocene or Pliocene deposits above it. In Virginia and Maryland, the Choptank is generally below 200 ft and is overlain by higher Miocene and Pliocene marine deposits in a series of small basins. The Cohansey and Kirkwood represent deposition in an older Miocene basin that was a highland when younger Miocene and Pliocene sediments were deposited in basins to the south.

The altitudes and areal distribution of the Miocene and Pliocene formations from New Jersey to Virginia suggest that tectonic movements along the continental margin have controlled sediment supply and sites of deposition. Eustatic changes in sea level only slightly modified this pattern.

PARKER, RONALD A., Stonewall Gas Co., Richmond, VA, and JOHN M. DENNISON, Univ. North Carolina, Chapel Hill, NC

Folds Along Junction of Central and Southern Appalachian Trends in Southeastern West Virginia and Adjacent Virginia

Field mapping of crest and trough lines of the larger folds clarifies the junction between central Appalachian structural trends (striking about N25°E) and southern Appalachian trends (striking about N65°E) in southeastern West Virginia and adjacent Virginia. Previous interpretations have argued whether the change in orientation is gradual or abrupt, whether the two trends formed simultaneously, whether the more obviously overthrust southern Appalachians overrode the central trend, whether the central Appalachians were overprinted across the southern trend, whether the junction of the two trends is caused by rotational movement, or whether the differences result from a major basement fracture zone separating the two blocks.

Our mapping shows that the folds are continuous across the junction of the trends, with a gradual bending of the fold traces. For tens of miles north of the junction of the two trends, gentle folding striking about N35°E can be mapped within the relatively flat major synclines of the central Appalachian area, but cannot be readily traced into the steeper flanks and more sharply folded crests of the major anticlines. We believe that these gentle anticline folds trending N35°E are related to the initial folding of the southern segment that trends N65°E. Subsequent to the development of the southern Appalachian folds, the central area was simultaneously folded and rotated, reorienting the northern extension of the southern fold generation to their present position of N35°E. This suggests that the southern fold and fault trend was overprinted by the central trend, a conclusion consistent with studies of stylolites by Dean and Kulander. Near the junction of the central and southern trend, structural domes and depressions formed as a result of fold interference.

PATCHEN, DOUGLAS G., West Virginia Geol. Survey, Morgantown, WV, and RICHARD SMOSNA,* West Virginia Univ., Morgantown, WV

Sedimentary Basin Analysis of Middle Ordovician Limestones in Central Appalachians

Seven of 28 wells penetrating the Trenton Limestone in West Virginia have reported shows of natural gas, enough to continue industry's interest in this potential reservoir. The formation consists of thin limestones interbedded with shales and bentonites. Sediments were deposited on a ramp that sloped eastward from a shallow platform in northwest Ohio into the foreland basin of Virginia, and the unit forms a wedge-shaped mass that thickens into the basin. Limestones of the upper ramp were deposited on sand shoals (skeletal grainstones) and restricted flats (lime mudstones), which passed downslope into skeletal patches of a deep, muddy environment (packstones and wackestones). Rapid downwarping of the carbonate ramp produced a major transgression, and deeper limestone facies migrated westward during time. Bentonites spread across the region from distant volcanic islands. In West Virginia, a lower bentonite package is present in the Black River Limestone to the southwest, whereas an upper package occurs in the Trenton to the east and north. This distribution