by the location of the structure on the western flank of a series of gravity and magnetic positives. High resolution seismic reflection profiles, gravity, and magnetic-intensity data indicate the structure continues under Lake Ontario into Canada. The geophysical anomalies also suggest the fault has a northwest branch near Attica, NY, which may account for the moderate seismicity between Attica and Buffalo. The mafic intrusions associated with the fault probably indicate fracture zones in the Precambrian basement. The potential of these fracture zones for generating earthquakes in the area is of major concern in nuclear power plant site location.

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Computer Enhancement of Old Well Logs Suggests New Plays in New York State

There has been oil and gas exploration in New York State since the 1860s, and geophysical well logs have been recorded and deposited in state well information repositories since the 1930s. These logs contain a wealth of information that has largely been overlooked in the recently intensified search for new petroleum and natural gas reserves. The majority of old wells were drilled by small companies using numerous logging contractors. There were a wide variety of logging tools and an astonishing number of both vertical and horizontal scales employed. Often log interpretation was minimal. Regional exploration has been very difficult because of this general lack of well-to-well uniformity, as displayed by the various logs.

The Department of Geology at Syracuse University has compiled a data base of digitized computer processable well logs for a large part of central New York State. These logs have been standardized to a uniform lithology response and uniform scales for optimum correlation, porosity computation, and lithology evaluation. Evaluation of these corrected logs suggests that reservoirs which were either overlooked or considered uneconomic when the wells were drilled could, under today's economic conditions, provide extensive new and potentially profitable gas reserves.

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Newburg Porous Carbonate Zone of Lockport Group (Middle Silurian), Northeastern Ohio

The Ohio driller's "Newburg sand" or Newburg zone lies in a stratigraphic position approximately equivalent to part of the Guelph Formation of the Lockport Group (i.e., at the top of the Lockport and just below the Salina A Unit of the Cayugan). The Newburg is characterized by a higher overall porosity than the rest of the Lockport. The porous dolomite extends downward as much as 80 to 100 ft (25 to 30 m) below the top of the Lockport. More than one interval may be porous. Stratigraphically, the base of the Newburg zone parallels the top of the Lockport regardless of whether the Lockport is thick or thin. The thickening of the Lockport occurs locally, especially where there has been a thickening of the lower unit of that group, the Gasport Formation. The thick Newburg zone in the upper Lockport tends to overlie thick Gasport and may reflect reef or reefoid buildup in the Guelph Formation. Mapping of the Lockport surface shows that local structure is caused by the thickening. The small local structures can be detected several hundred feet up-section because of the draping effect of overlying beds on the more rigid Lockport dolomites. Structural mapping of the top of the Lockport or of the top of the Devonian "Big Lime" (Columbus Limestone) may reveal areas of potentially productive thickening of the Newburg zone.

The Newburg usually contains salt water. Accumulation of commercial gas is controlled both by local structural features and by changes in the relative percent porosity in the Newburg and consequent change in the total porosity feet. Examination of production records from four Newburg gas pools in Summit County, Ohio, shows that the largest and longest yields come from wells located high on structure.

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Depositional Environments of Silurian Whirlpool Sandstone (Medina) in Western New York

The Whirlpool Sandstone (Medina Group), quartzose, white, clean, well-rounded, and well-sorted, is the basal Silurian unit in western New York. Its source was the Queenston delta some distance to the southeast. Sedimentary structures indicate that deposition occurred in a beach-shore face environment. Fragmented phosphatic marine fossils are found throughout the sandstone.

Erosion of Upper Ordovician sediments in western New York was minimal and involved only the uppermost green (reduced) portion of the Queenston Shale, which supplied lags of flat, green shale pebbles to the Whirlpool Sandstone. Soft sediment deformation and burrowing in the Queenston substrate (the transitional contact between the red Queenston Shale and red Grimsby Sandstone [Silurian] in Rochester, New York, immediately to the east of the area of Whirlpool deposition) suggest a short period of nondeposition or possibly mild erosion following the deposition of the Queenston Shale. Thus, the Ordovician-Silurian boundary in western New York is essentially conformable and signified only by an abrupt influx of clean quartz sand.

Petrographic analysis shows that the Whirlpool is a second or multicycle sandstone composed primarily of quartz grains originally derived from igneous and metamorphic terranes with only a minor sedimentary component. Because the sandstone is cemented by quartz overgrowths, usually in an advanced stage of development, primary porosity is reduced and the overall porosity of the Whirlpool Sandstone is low (less than 5%). Higher porosities are attributed to the development of secondary moldic porosity caused by dissolution of detrital quartz grains and their original calcite cement. These zones of higher porosity are the most prolific natural gas producing areas in the Whirlpool Sandstone when hydraulic fracturing is used.

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Computer Mapping of Quality Data for Coals in West Virginia—An Aid in Matching a Specific Coal Grade to a Specific End Use

In 1907, the first studies of the state's coal reserves were initiated as part of the West Virginia Geological and Economic Survey's statewide geological mapping program. Since then, extensive work has been conducted to map and characterize the state's 62 minable seams. This effort has shown that the coals exhibit a wide diversity of quality, and this diversity provides the coal user a choice of grades to meet specifications for varied applications. Approximately 6,000 coal samples have been analyzed and a computer data base of coal-quality information is now maintained and continues to grow. An extensive coal-quality mapping project makes this information convenient to use.

The objective of coal-quality mapping is to produce a series of contour maps showing the variations in coal quality for the most important seams. Parameters being mapped include sulfur, ash, Btu, fuel ratio, Hardgrove grindability, volatile matter, fixed carbon, and kilocalories per kilogram. This type of information is extremely valuable for someone interested in buying, selling, evaluating, or developing West Virginia coal.

The maps are computer-generated at a scale of 1:500,000 and