The American Association of Petroleum Geologists Bulletin
V. 66, No. 8 (August 1982), P. 1164-1177

Association Round Table

*Denotes speaker other than senior author.

AAPG EASTERN SECTION MEETING
In Conjunction With
NEW YORK STATE GEOLOGICAL ASSOCIATION MEETING

Buffalo, New York
October 6-8, 1982

Abstracts of Papers

BABCOCK, LOREN EDWARD, State Univ. New York College at Fredonia, NY

Paleontologic and Sedimentologic Character of Corell's Point Faunal Assemblage (Upper Devonian: Famennian), Southwestern New York State

The Corell's Point faunal assemblage of the lower Gowanda Shale Member, Canadaway Formation, represents a series of burrowed zones yielding biocoenoses of benthos, taphocoenoses of nektos, and wood fragments. Marine-transported animals and plants are generally pyritized, but many endemic organisms are not. The faunal assemblage occurs at various levels in the Gowanda Shale, and may recur in adjacent stratigraphic units. The Corell's Point faunal assemblage and associated pyrite nodules apparently formed in a "starved" shelf setting, influenced by sporadic influxes of sediment, possibly by distal turbidites.

Cephalopods were added to the Corell's Point assemblage by postmortem pelagic drift; their attendant epizoans probably detached and gave rise to small, locally abundant auloporid mounds. Some organisms may have been rafted in attached to algal mats; these mats possibly carried ammonoids, nautiloids, wood fragments, pelmatozoans, bivalves, gastropods, and fishes, producing infrequent dense associations of these organisms. Mild bioturbation of surface muds was effected by *Zoophycos* and infaunal mollusks. Winnowing of fine muds by organisms may account for the consistent silty texture of sediment associated with the Corell's Point faunal assemblages; underlying and overlying strata are generally fine-grained with discrete siltstone beds.

Zoophycos and other lebensspuren, plants, and some cephalopods are encountered in sections of the Gowanda Shale lacking the Corell's Point faunal assemblage. These shales and siltstones exhibit relatively little evidence of fauna-induced sediment mixing.

BAIRD, GORDON C., State Univ. New York College at Fredonia, NY, and CARLTON E. BRETT, Univ. Rochester, Rochester, NY

Condensed Sedimentary Sequence and Associated Submarine Hiatus Within a Cratonic Basin Setting—Case Study of Upper Devonian Genundewa Limestone of New York

The Genundewa Member (medial Genesee Formation: Frasnian) is a thin limestone, traceable from Canandaigua Lake westward to Lake Erie. This unit, bounded both above and below by black, fissile shales, is composed mainly of shells of the pelagic, conoidal organism *Styliolina fissurella*, and lesser amounts of pelmatozoan debris, cephalopod conchs, wood fragments, and conodonts. The Genundewa displays prominent westward sedimentary condensation; eastern sections, up to 13 ft (4 m) thick, are mudstone-rich. West of central Genesee County, the Genundewa is typically a thin, 2 to 14 in. (5 to 36 cm) thick, compact bed composed of *Styliolina* biosparite with localized lentils of cephalopod coquinite.

The Genundewa is underlain by a prominent discontinuity traceable from central Genesee County westward; this hiatus is coextensive with remanie deposits of the North Evans Member which overlie the Windom-Genesee unconformity in western Erie County. The sub-Genundewa unconformity displays westward erosional overstep of underlying beds across Erie County with consequent increase in hiatal interval. East of Cazenovia Creek, the disconformity is marked by exhumed, glauconite-coated Penn Yan concretions and a thin blanket of remanie sediment. From Cazenovia Creek westward, the remanie blanket thickens with appearance of reworked Windom-derived brachiopods, and concretions, numerous fish bones, and increased pelmatozoan debris.

Pre-Genundewa erosion occurred in an oxygen-deficient outer shelf setting, as indicated by absence of associated benthos and by local occurrence of the hiatus within black shale. Genundewa *Styliolina* ooze accumulated following the erosion event under conditions of prolonged sediment starvation on a dysaerobic sea floor.

BEINKAFNER, KATHIE J., Sohio Petroleum Co., San Francisco, CA

Structural Revelations from Seismic Interpretation, Southern Tier, New York

When published structure contour maps of the Devonian outcrop, Tully formation, base Hamilton Group, and Oriskany Sandstone are overlain, the locations and trends of anticlinal and synclinal axes are not coincident, suggesting a lack of vertical continuity. The traces of fold axes within these specific stratigraphic units and their vertical orientation are not well defined by previous work.

In order to develop a cohesive, three-dimensional structural model for the Trenton Group (Middle Ordovician) through the Tully formation (Middle Devonian) interval, seismic surveys from six prospect areas in the southern tier were interpreted and well data from over 2,000 wells were used to make computer-drawn geologic structure and isopach maps as well as cross sections. The stratigraphic framework of such an analysis is built upon the strong seismic reflectors, in this case carbonates, specifically the Tully formation, Onondaga Formation, Lockport Group, and Trenton Group.

Subsurface facies were identified for the thickest intervals, namely the Hamilton, Salina, Lockport, and Clinton Groups, as well as the Queenston-Oswego-Lorraine sequence. The lithologic facies analysis is then used in conjunction with the seismic sections to define seismic facies. The importance of seismic facies is that they may reveal how certain lithologies deform in the stack of

subsurface sedimentary layers.

Seismic mapping indicates much greater variation of near-surface horizons than mapping with well data. Axial planes of Acadian folds appear to be vertical. Fold amplitude diminishes between the Tully formation and the Lockport Group in some areas, while in other areas amplitude remains constant through the Devonian and Silurian section. In Chautauqua County, an anomalously thick Onondaga to Lockport interval parallel to regional fold axes has been interpreted as an anticline with a salt core, suggesting decollement tectonics.

BENNETT, BRUCE A., Desert Gas Exploration Co., Inc., Fredonia, NY

An Exploration Model for Medina Group Sandstones of Western New York and Northern Pennsylvania

Hydrocarbon accumulations in the Medina Group of western New York and northern Pennsylvania are controlled by stratigraphic traps. The discontinuous productive sand lenses were previously considered to be unmappable due to the erratic fluviatile deposition and marine reworking of the deltaic sediments. Wells were subsequently drilled only on the basis of pipeline availability, government spacing regulations, and general geology. Many of the completed wells proved to be marginal or noncommercial. Using core analysis, log data, and well production histories on several thousand wells, an exploration model has been developed to improve Medina well success ratios and performance. Specific sedimentary structures can be identified using characteristic gamma-ray patterns and they can be mapped in the subsurface. Highly productive coarsening-upward channel and bar-sand sequences can be projected into undrilled acreage, thereby reducing the percentage of non-economic wells drilled into the Medina sands.

BIGGS, THOMAS H., and CHARLES S. BARTLETT, JR., Bartlett Energy Exploration, Inc., Abingdon, VA

Oil and Gas Exploration in Appalachian Overthrust Belt of Southwestern Virginia

Hydrocarbon exploration is on the upswing in the southwestern Virginia portion of the "Eastern Overthrust belt." Several potential reservoir horizons have been identified on surface exposures, but remain untested. Major faults, including the Saltville and Pulaski thrusts, have as much as 16,000 ft (4,877 m) of displacement, suggesting potential structural traps in the largely allochthonous belt. Excluding the Early Grove gas field and the oil fields of Lee County, only a small number of wells have tested the strongly folded and faulted 20,000-ft-thick (6,100 m) sequence of Paleozoic sediments in the Valley and Ridge province. Seismic and leasing activities indicate several significant tests in the near future.

The Early Grove gas field was developed on an anticlinal flexure within the Greendale syncline. The field produced gas from porous anhydrite beds in the Lower Mississippian Little Valley Formation until shut-in in 1957. Five new wells since March 1980 have encountered near-virgin pressures in the old Little Valley pay zone and have discovered significant gas in the sandstones of the Price Formation.

Detailed field mapping near Rose Hill, Lee County, identified several fensters through the folded Pine Mountain overthrust block, and most oil exploration efforts have been concentrated in those windows. Recently, fensters near Ben Hur have also proved successful targets. Production is from shallow fractured carbonates of the Ordovician Trenton formation. An 8,020-ft (2,444 m) test by Shell Oil discovered a deeper major thrust, proving the allochthonous structure of the area, and indicating potential deep targets. An ARCO test now being drilled will help to evaluate the deeper possibilities.

BRETT, CARLTON E., Univ. Rochester, Rochester, NY

Stratigraphy and Facies Relationships of Silurian (Wenlockian) Rochester Shale: Layer Cake Geology Reinterpreted

Along its east-west trending outcrop belt in western New York and Ontario, the Silurian Rochester Shale displays classic "layer cake" stratigraphy. Lower and upper members and their component beds are traceable for distances exceeding 62 mi (100 km) east-to-west, without substantial change in lithology, fossil content, or relative thickness. In contrast, abrupt facies changes occur within the Rochester along short, 3 to 6 mi (5 to 10 km) north-south oriented sections (e.g., Niagara Gorge). Fossil-rich calcareous mudstones and thin limestones tongue out southward and are replaced by sparsely fossiliferous shales. Similarly, the frequency of storm-generated coquinites and calcisiltites decreases to the south. These observations indicate that facies belts are elongate east-west, perpendicular to a gently south-dipping paleoslope, and subparallel to the modern outcrop belt.

Vertical facies changes in the Rochester Shale at local sections reflect lateral (north or south) shifting of environmental tracts, due to migration of the northern paleoshoreline. The entire formation appears to comprise two transgressive-regressive sequences; the lower (Lewiston) member represents a symmetrical deepening-shallowing cycle, while the upper units (Burleigh Hill-Stoney Creek members) record a shallowing-upward hemicycle. Facies tongues in the north-south sections confirm these interpretations.

Layer-cake stratigraphy in the Rochester Shale is thus an artifact of parallelism between the outcrop belt and depositional strike. As such, the Rochester provides a useful paradigm for understanding numerous similar stratigraphic units in the northern Appalachian basin.

BROOKFIELD, M.E., Guelph Univ., Guelph, Ontario, Canada

Glacio-Eustatic Sedimentary Cycles in Trenton Limestone (Middle Ordovician) of Southern Ontario

The fully-developed ideal cycle consists of the following, from base to top, always with calcareous clay seams throughout.

(a) Coarse, poorly sorted intrabiosparite or biosparite grainstones, in crosscutting (often cross-stratified) lenses, or channelized. In places, grain flow is shown by lobate, steep-sided edges, often smoothed by well-sorted biosparite grainstones.

(b) Fine to medium-grained well-sorted biosparite grainstones, parallel or cross-laminated, usually in several thin beds.

(c) Very fine-grained, well-sorted, commonly graded biosparite and biomicrosparite packstones and grainstones, with coarser shell fragments concentrated at their bases.

(d) Nodular bioturbated biomicrite mudstones and wackestones, alternating with bioturbated calcareous clays. This unit may also contain lenses of poorly sorted biosparite.

Units (a) to (c) show abundant evidence of rapid deposition of individual beds, followed by extensive periods of non-deposition, erosion, or both, when the bed surfaces were burrowed by omission-type trace fossil-forming organisms, cemented, and colonized by attached organisms. The abundant and diverse hardgrounds of the Ordovician sequence are concentrated at these horizons. In the more argillaceous sections, subdued cyclicity occurs.

The difficulty of explaining these cycles by normal facies changes has led to a glacio-eustatic explanation. Actualistic comparison can be made with the recent Arabian shelf of the Persian Gulf.

CHUGH, YOGINDER P., Southern Illinois Univ., Carbondale, IL, and M. SILVERMAN, Peabody Coal Co., Henderson, KY

Preliminary Investigations for Underground Coal Mines

Coal exploration and development drilling techniques for under-