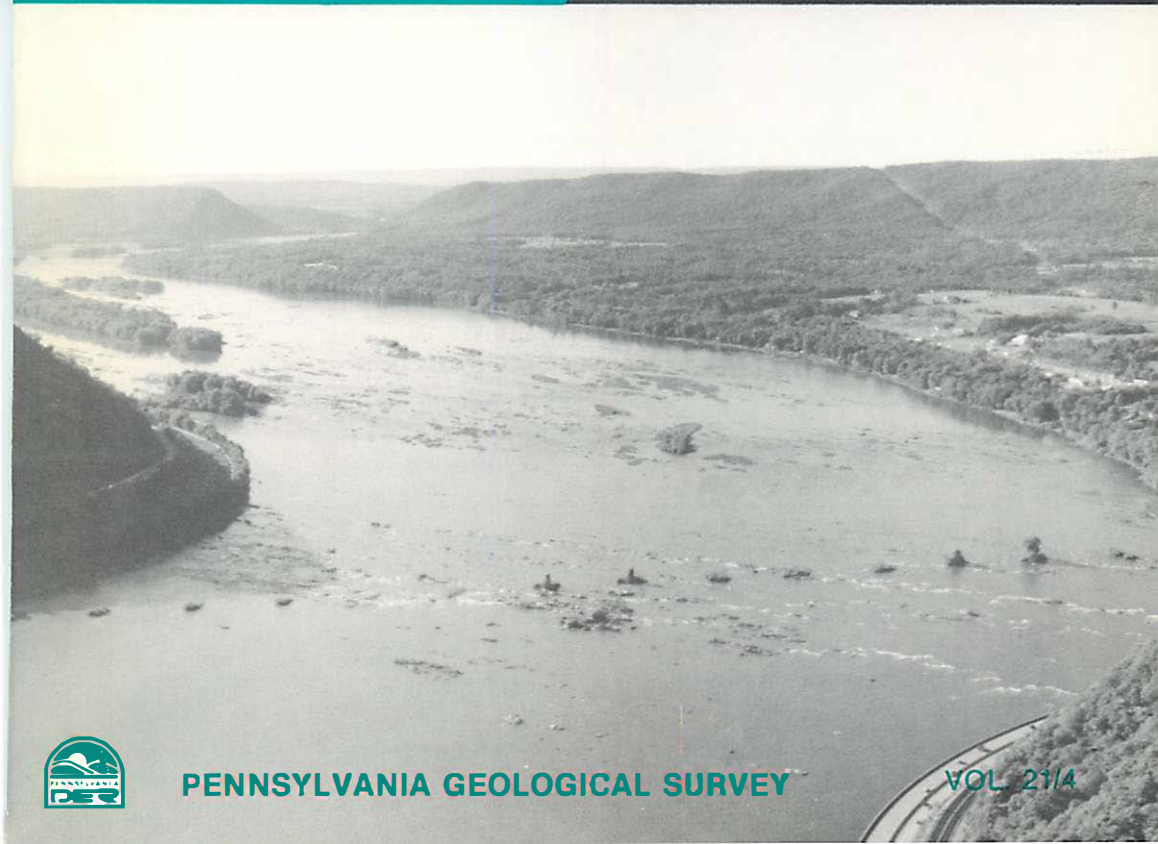


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PENNSYLVANIA GEOLOGICAL SURVEY

VOL. 21/4

COMMONWEALTH OF PENNSYLVANIA

Robert P. Casey, Governor

DEPARTMENT OF ENVIRONMENTAL RESOURCES

Arthur A. Davis, Secretary

OFFICE OF RESOURCES MANAGEMENT

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TOPOGRAPHIC AND GEOLOGIC SURVEY

Donald M. Hoskins, Director

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ON THE COVER: The Susquehanna River at Dauphin—"a mile wide and a foot deep." Ledges in the river in the near foreground are overturned Mississippian-age Pocono sandstone, which also underlies the linear ridge (with gap) in the background. The middle ground and river ledges are underlain by much less resistant sandstone of the Mauch Chunk Formation, which forms the core of the Cove Mountain syncline outlined by the Pocono sandstone. In the far background (seen through the gap) are Middle Devonian sandstones on Dicks Ridge; on the horizon is Tuscarora Mountain, which is underlain by Silurian-age sandstones. The evenly spaced features in the foreground are the piers of a bridge destroyed by one of the frequent floods of the Susquehanna River. Photograph by T. A. McElroy.

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Peat To Cleanse Toxic Waste

A recent report on the use of peat, an industrial "mineral" found in all 50 states and in most other nations, is the impetus for this preface to the annual report of geologic research in Pennsylvania. *Geotimes* (July 1990, p. 10) contains a report on current research that suggests "peat may be the cheapest effective material to clean up toxic-waste sites across the country. . . ." If this research on the use of peat is fruitful, new controversy may occur between mineral producers and those desiring to protect our natural environment, and perhaps even among environmental protection specialists themselves.

In the past few years, there has developed a public realization of the need to protect wetlands because of their importance as a habitat for flora and fauna, for recharge to aquifers, and for natural flood control. Our nation has established a goal of no net loss of wetlands; regulatory programs are being developed to assist in achieving this goal. Peat in Pennsylvania occurs in wetlands and is the result of thousands of years of accumulation of plant material in wet, boggy areas that remained after the landscape of parts of northern Pennsylvania was rearranged by huge continental glaciers.

The development and management of a protection policy for Pennsylvania wetlands must include consideration of the implications of the new research on peat. The environmental "value" of peat as a potential medium for cleansing toxic waste will have to be balanced against the environmental "value" of maintaining wetlands for their other beneficial purposes and uses. And each must be weighed against the economic value of peat as a mineral commodity.

The complexity of the earth's natural systems requires that we continually conduct geoscience research and, based on the results of that research, continually modify our understanding of those systems. Only in this way can we manage and regulate our human activities to achieve the highest environmental value and reach our economic goals. With forethought, we may sometimes be able to simultaneously achieve several goals—produce an economic mineral resource and preserve or enhance the environment—thereby creating a greater benefit than by focusing on only one goal.

Donald M. Hoskins
State Geologist



GEOLOGICAL RESEARCH IN PENNSYLVANIA 1990

Introduction

This publication, the thirty-third annual report in its series, contains a listing of all known current geological research in Pennsylvania and all known reports published during the past year pertaining to Pennsylvania geology. Because of the large number of projects reported to us, we editorially condense the descriptions to fit available space.

We have requested that each person estimate an anticipated completion date (ACD) for each project. The anticipated completion date is the author's estimate of the date when the project will be finished; additional time should be allowed for publication of the report.

If you wish to obtain more information on a project described herein, please write directly to the author; most of these projects will not be published by the Pennsylvania Geological Survey inasmuch as most are not Survey-sponsored projects.

The listings are grouped into major categories of research to facilitate your search for information on a particular subject. As with all compilations, there may be omissions; this is unintentional.

Additional copies of this report may be obtained by writing to the Pennsylvania Geological Survey, P. O. Box 2357, Harrisburg, PA 17105-2357.

Areal Geology

T. M. BERG, Ohio Geol. Survey, and C. M. DODGE and J. D. INNERS, Pa. Geol. Survey. **Map 61, Atlas of Preliminary Geologic Quadrangle Maps of Pennsylvania** (2nd ed). The popular "Map 61 Atlas" is being revised to include all quadrangles of Pennsylvania, and many corrections, additions, and changes are being included. The new edition will provide users with a single, desktop source for all of the bedrock geology of the Commonwealth. ACD: 1992.

T. M. BERG, Ohio Geol. Survey, W. D. SEVON and M. E. MOORE, Pa. Geol. Survey, and M. L. O'NEAL, C. B. CUBBISON, JACQUELINE LUNDY, and J. B. LESSMAN (all student interns, Pa. Geol. Survey). **Geologic Map of Warren County.** Bedrock and surficial maps are being prepared for the Warren County groundwater report, a cooperative project of the Pennsylvania Geological Survey and the U.S. Geological Survey, Water Resources Division. ACD: 1990.

J. B. EPSTEIN and P. T. LYTTLE, U.S. Geol. Survey. **Geology of the New Tripoli and New Ringgold Quadrangles.** Mapping of bedrock and surficial deposits; structural interpretation of Great Valley and Valley and Ridge; reinterpretation of Martinsburg stratigraphy. ACD: New Tripoli quad., June 1990; New Ringgold quad., Oct. 1991.

R. T. FAILL, Pa. Geol. Survey. **The Peach Bottom Structure, York County.** A 6- to 7-km-wide swath centered on the Peach Bottom slate is being mapped in detail to ascertain the origin of the slate, its relationship to the surrounding Cardiff conglomeratic quartzite and Peters Creek quartzose schist, and the overall structural setting. ACD: March 1991.

P. C. LYONS and W. F. OUTERBRIDGE, U. S. Geol. Survey, and E. S. BELT, Amherst Coll. **Late Paleozoic Depositional and Coalification Processes.** The project is a regional stratigraphic study of the Middle and Upper Pennsylvanian of the central and northern Appalachian basin using marker beds (marine units, volcanic units (tonsteins), coal beds, flint clays, etc.) for stratigraphic synthesis. The dynamic elements of the basin—sedimentation, tectonism, and coalification—will be examined in relationship to the Alleghanian orogeny. ACD: Sept. 1994.

D. B. MacLACHLAN, Pa. Geol. Survey. **Geology of the Freeburg Quadrangle, Snyder County.** Mapping of the Tuscarora-to-Catskill section on the nose of the Shade Mountain anticline and in the Northumberland syncline. Mapping is field complete; compilation of surficial units is currently on hold. Maps are scheduled to be placed on open file in 1991.

D. B. MacLACHLAN, Pa. Geol. Survey. **Lower Paleozoic Rocks of Platfomal to Marginal Facies in the Pennsylvania Piedmont.** Field reconnaissance of stratigraphic and lithologic relations of the Chilhowee Group to Middle Cambrian rocks has been conducted from the Susquehanna River eastward through most of Lancaster County and is being continued into Chester and Montgomery Counties. The objective is to clarify the pre-Taconic structure of the Lower Paleozoic carbonate bank edge and identify areas where detailed remapping is urgently required. Preliminary report is scheduled to be placed on open file in late 1990.

W. D. SEVON, Pa. Geol. Survey. **Surficial Geology of the Conestoga and Holtwood Quadrangles, Lancaster and York Counties.** ACD: 1990.

W. D. SEVON, Pa. Geol. Survey. **Surficial Geology of the Quarryville, Wakefield, Kirkwood, and Gap Quadrangles, Lancaster and Chester Counties.** ACD: 1991.

D. W. VALENTINO, Pa. Geol. Survey. **The Peach Bottom Structure, Lancaster County.** The Cardiff conglomeratic quartzite comprises three lenses that do not wrap around the eastern end of the Peach Bottom slate. This lithologic distribution does not support the synform model of earlier workers. ACD: Aug. 1990.



P. H. BENOIT AND C. B. SCLAR, Lehigh Univ. **An Electron Microprobe Study of Chromite Deposits of the Pennsylvania-Maryland State Line District with Particular Reference to the "Vein" Chromite of the Woods Mine.** Electron microprobe studies of the "vein" chromite from the Woods chrome mine show that the "vein" chromite has a different chemistry relative to the massive chromite. This difference may be due to the process of "ferritchromite" formation subsequent to emplacement of the "vein" chromite. It is doubtful that the chromite "veins" represent hydrothermal "vein" chromite, and it is also doubtful that the "veins" are igneous injections. ACD: May 1990.

S. W. BERKHEISER, JR., and R. C. SMITH, II, Pa. Geol. Survey. **Additional Occurrences of Specialty-Use Silica in Pennsylvania.** A 700-foot core from Adams County will be logged by E. L. Simpson of Kutztown University.

C. H. DODGE, Pa. Geol. Survey. **Coal Resources of Elk County—Part 1, Coal Crop Lines, Mined-Out Areas, and Structure Contours.** Detailed geologic mapping of the coal-bearing strata (Pottsville, Allegheny, and Glenshaw Formations) of Pennsylvanian age. Emphasis is on the major coal-bearing structural basins. A series of maps will be prepared including (1) separate crop-line maps for each principal coal seam showing areas of strip and deep mining, and (2) composite maps showing the crop lines of major and minor coals, as well as structure contours and fold axes. ACD: 1992.

J. S. FOX and S. T. PEES, Samuel T. Pees and Assoc. **Density Porosity and Porosity Trends of Sandstones in the Cabot Head Formation, Medina Group, Portion of Northwestern Pennsylvania.** ACD: Dec. 1990.

A. D. GLOVER, Pa. Geol. Survey. **Coal Resources of Jefferson County—Part 1, Coal Crop Lines, Mined-Out Areas, and Structure Contours.** Published and unpublished data will be used to prepare a series of maps including (1) separate crop-line maps for each principal coal seam showing areas of strip and deep mining, and (2) composite maps showing the crop lines of all principal coals, as well as structure contours and fold axes. ACD: 1993.

A. D. GLOVER, Pa. Geol. Survey, and W. A. BRAGONIER, Rochester and Pittsburgh Coal Co. **Coal Resources of Armstrong County—Part 1, Coal Crop Lines, Mined-Out Areas, and Structure Contours.** Published and unpublished data will be used to prepare a series of maps including (1) separate crop-line maps for each principal coal seam showing areas of strip and deep mining, and (2) composite maps showing the crop lines of all principal coals, as well as structure contours and fold axes. ACD: 1991.

J. A. HARPER, Pa. Geol. Survey. **Oil and Gas Fields of Pennsylvania.** Revision of Pennsylvania Geological Survey Map 3, last published in 1982. ACD: 1992.

J. A. HARPER, **Oil and Natural Gas Pipelines of Pennsylvania.** Revision of Pennsylvania Geological Survey Map 62, last published in 1983. ACD: 1991.

J. A. HARPER and C. D. LAUGHREY, Pa. Geol. Survey. **Measuring and Predicting Reservoir Heterogeneity in Complex Deposystems—Cambrian and Ordovician Carbonates of Northwestern Pennsylvania.** ACD: Oct. 1992.

J. D. INNERS, Pa. Geol. Survey. **Anthracite Geology of the Hazleton Quadrangle, Luzerne, Carbon, and Schuylkill Counties.** Project mainly involves preparation of 1:12,000-scale coal-bed outcrop and structure-contour (Buck Mountain/Mammoth seams) maps of the anthracite basins in the Hazleton area of the Eastern Middle field. A 1:12,000-scale open-file surficial geology map is also being prepared. ACD: Indefinite.

L. J. LENTZ and P. F. BUIS, Pa. Geol. Survey. **Coal Resources of Greene County—Part 2, Overburden Thickness, Coal-Reserve Estimates, and Coal Quality.** Computer compilation and manipulation of coal data for Greene County continues. Data base includes point and line data, stratigraphic data, and chemical data stored in files managed by the U.S. Geological Survey in Reston, Virginia. ACD: Ongoing.

L. J. LENTZ and P. F. BUIS, Pa. Geol. Survey. Coal Resources of Washington County—Part 2, Overburden Thickness, Coal-Reserve Estimates, and Coal Quality. Computer compilation and manipulation of coal data for Washington County continues with the entry of new records and the updating of others. Data base includes point and line data, stratigraphic data, and chemical data stored in files managed by the U.S. Geological Survey in Reston, Virginia. ACD: Ongoing.

A. K. MARKOWSKI, Pa. Geol. Survey. Preliminary Feasibility Study of the Coal-Bed Methane Resource in Pennsylvania. Data from exploratory drill holes and pre-mining degasification/methane recovery test projects in 11 counties were compiled and analyzed. Variations in gas contents with other geologic controls are used in assessing economic viability. ACD: 1990.

S. T. PEES, Samuel T. Pees and Assoc. Distribution of Cabot Head Formation Sandstones of the Lower Silurian Medina Group, Portion of Northwest Pennsylvania [Crawford Co. and parts of adjacent counties]. Isopachs of Cabot Head Formation sandstones facilitate seeking geological trends and hydrocarbon reserves in this stratigraphic section. Buildups and lean areas become apparent. Medina Group drilling programs can be planned to incorporate these additional reservoirs. ACD: Sept. 1990.

S. T. PEES, Samuel T. Pees and Assoc. Stratigraphy of the Gatesburg Formation and Distribution of Hydrocarbons in It and Older Beds, Northwestern Pennsylvania and Environs. The Gatesburg Formation in northwestern Pennsylvania contains the Rose Run stratigraphic unit of Ohio as one of its members (Upper Sandy Member). Hydrocarbon shows are recorded in all four members and in the underlying Warrior Formation. ACD: Aug. 1990.

G. R. ROBINSON, JR., D. GOTTFRIED, A. J. FROELICH, AND J. SMOOT, U. S. Geol. Survey. Metallogeny of the Early Mesozoic Basins of the Eastern United States [area of the Newark and Gettysburg basins in Pennsylvania]. Maps (at 1:125,000 scale) showing the distribution of metallic mineral deposits and geochemical anomalies from the NURE data base relative to geologic units in the Gettysburg and Newark basins (geology supplied by Froelich and Smoot) are under compilation. ACD: Oct. 1990.

J. R. SHAULIS, Pa. Geol. Survey. Coal Resources of Somerset County—Part 1, Coal Crop Lines, Mined-Out Areas, and Structure Contours. Published and unpublished data will be used to prepare a series of maps including (1) separate crop-line maps for each principal coal seam showing areas of strip and deep mining, and (2) composite maps showing the crop lines of all principal coals, as well as structure contours and fold axes. ACD: 1990.

SMITH, R. C., II, Pa. Geol. Survey, A. K. SINHA, Va. Polytechnic Inst., and S. W. BERKHEISER, JR., and J. H. BARNES, Pa. Geol. Survey. **Trace-Element Content of Some Pre-Mesozoic Basaltic Rocks in Pennsylvania** [southeastern Pa.]. Two distinct compositions of Catoc-tin basalt flows appear to be present in the Reading Prong and Honey Brook Upland as dikes.

V. W. SKEMA, Pa. Geol. Survey. **Coal Resources of Clearfield County—Part 1, Coal Crop Lines, Mined-Out Areas, and Structure Contours**. Detailed geologic mapping of the coal-bearing strata of Pennsylvanian age. Emphasis is on the major coal-bearing structural basins. A series of maps will be prepared including (1) separate crop-line maps for each principal coal seam showing areas of strip and deep mining, and (2) composite maps showing the crop lines of major and minor coals, as well as structure contours and fold axes. ACD: 1992 (first phase).

A. A. SOCOLOW, Consulting Geologist. **Market Analysis of Lime-stone Specialty Products** [eastern Pa.]. Assessment of market poten-tial for proposed new carbonate products installation, with reference to domestic and foreign markets. ACD: Completed.

RON STANTON and BRENDA PIERCE, U. S. Geol. Survey. **Quality and Succession of Coal Facies** [part of west-central Pa.]. ACD: 1990-91.

Engineering Geology

R. P. BRIGGS, Geomega, Inc., CRAIG PARKE and WILLIAM JOHNSON, Rizzo Assoc., H. P. OSHEL and DAVID LIENHART, U. S. Army Corps of Engineers; W. R. ADAMS, JR., Pa. Dept. of Transpor-tation, R. F. FONNER, W. Va. Geol. and Economic Survey, and others. **Field Trip Guide, 33rd Annual Meeting, Association of Engineering Geologists, Pittsburgh, 1990**. Field Trip 1—Cincinnati to Pittsburgh, with stops in Ohio and West Virginia (2 days); Field Trip 2—U. S. Bureau of Mines facility, Fayette County; Lake Lynn Dam repair (Monongalia County, W. Va.), airport and landfill (Allegheny County, Pa.) (1 day); Field Trips 3 and 4—Geology and engineering geology, chiefly in Allegheny County ($\frac{1}{2}$ day each). ACD: July 1990.

J. V. HAMEL, Hamel Geotechnical Consultants. **Bank Instability Along the Monongahela River in Southwestern Pennsylvania**. Bank failures are highly site specific and typically involve mass wasting (landslide) and piping (internal erosion) processes that break down

bank soils, increasing their susceptibility to erosion by the river. ACD: Ongoing.

GREG MOLINDA, U. S. Bur. of Mines. **The Effect of Topography on the Stability of Underground Openings.** The project involves relating ground control problems in coal mines to surface topography by a statistical analysis of terrain (valley width, relief, valley orientation, depth of cover, valley shape factor) and its proximity to poor-quality roof. The goal is to determine if simple topographic measurements can be used to indicate the approach to unsafe roof conditions. ACD: Ongoing.

A. M. STERNAGLE, Pa. Dept. of Transportation. **Instability Problems Associated with the Tuscarora Formation in the Valley and Ridge Province of Central Pennsylvania.** Several major highway projects have been constructed in or near Silurian-age Tuscarora sandstone. Construction problems, some unique, occur within this formation. ACD: 1993.



M. R. BELL, CHARLES GEIGER, and C. K. SCHARNBERGER, Millersville Univ. **Geostatistical Analysis of the Occurrence of Radon in Lancaster County.** ACD: May 1990.

H. C. FRY, Univ. of Pittsburgh at Johnstown, and members of the Greater Johnstown Watershed Assoc. **Update of Water Quality of Stony Creek** [Somerset and Cambria Cos.]. A follow-up of studies made over 20 years ago by the U. S. Environmental Protection Agency and the Pennsylvania Department of Environmental Resources of the water quality of Stony Creek to determine what changes, if any, have occurred in the interim. ACD: Jan. 1991.

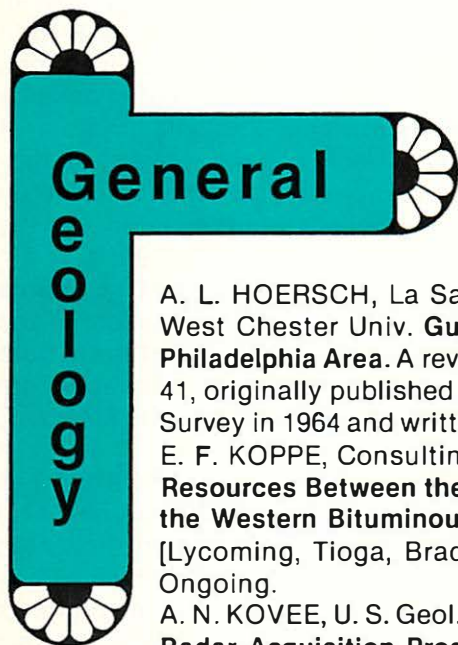
W. E. KOCHANOV, Pa. Geol. Survey. **Sinkholes and Karst-Related Features of Centre County.** ACD: Winter 1990-91.

W. E. KOCHANOV, Pa. Geol. Survey. **Sinkholes and Karst-Related Features of Lancaster County.** ACD: Summer 1990.

W. E. KOCHANOV, Pa. Geol. Survey. **Sinkholes, Karst, and Engineering Considerations in the Carbonate Terrains of Pennsylvania** [central and southeastern Pa.]. ACD: 1991.

A. W. ROSE, J. W. WASHINGTON, D. J. GREEMAN, and E. J. CIOLKOSZ, Pa. State Univ. **Generation and Mobility of Radon in Soils** [eastern U.S.]. Detailed measurements of soil gas radon at sites in Centre, Berks, and Bradford Counties show seasonal variations of 2- to 10-fold with high values in summer. Radium is enriched relative to uranium in vegetation and soil organic matter. ACD: July 1990 (this phase).

A. A. SOCOLOW, Consulting Geologist. **Municipal and Hazardous Wastes Site Evaluations and Screening** [eastern half of Pa.]. Assessment of geologic, hydrologic, and topographic conditions at designated sites, with particular reference to regulations of the Pennsylvania Department of Environmental Resources. ACD: Ongoing.



A. L. HOERSCH, La Salle Univ., and C. G. WISWALL, West Chester Univ. **Guidebook to the Geology of the Philadelphia Area**. A revision of General Geology Report 41, originally published by the Pennsylvania Geological Survey in 1964 and written by B. K. Goodwin. ACD: 1990.
E. F. KOPPE, Consulting Geologist. **Coal Geology and Resources Between the Northern Anthracite Field and the Western Bituminous Coal Region of Pennsylvania** [Lycoming, Tioga, Bradford, and Sullivan Cos.]. ACD: Ongoing.

A. N. KOVEE, U. S. Geol. Survey. **U. S. Geological Survey Radar Acquisition Program** [Warren and Williamsport 1:250,000 quads.]. The acquisition of the Warren and Williamsport 1:250,000 radar image mosaic quadrangles completes side-looking airborne radar coverage of the entire state. A single compilation of radar data for the state is being planned at 1:1,000,000 scale.
P. B. MYERS, D. J. ANASTASIO, and M. J. PODNIESINSKI, Lehigh Univ. **Geology of Lehigh Tunnel #2, Pennsylvania Turnpike** [eastern Pa.]. Mapping of the sedimentological and structural characteristics during construction of Lehigh Tunnel #2 in the Martinsburg, Shawangunk, and Bloomsburg Formations. ACD: Sept. 1990.



FRED BALDASSARE, Pa. Dept. of Environ. Resources, Bur. of Waste Mgmt., and C. D. LAUGHREY, Pa. Geol. Survey. **Stable Carbon ($^{13}\text{C}/^{12}\text{C}$) and Hydrogen (Deuterium) Compositions of Methane from Various Sources in Western Pennsylvania.** We are exploring the possibility of identifying methane from various sources (Upper/Lower Devonian gas, coal seams, landfills, methane associated with shallow groundwater, etc.) through stable carbon isotopic analyses. Twenty-three samples have been analyzed to date. ACD: Aug. 1991.

K. R. CERONE, JOHN TAYLOR, and 1990 geochemistry class, Indiana Univ. of Pa. **Biogeochemistry of Fossil Invertebrates from the Brush Creek Marine Interval** [southwestern Pa.]. As a joint student-faculty research project, a comparative study of shell chemistry is being done on invertebrates from Johnstown and Shelocta outcrops of the Brush Creek. X-ray diffraction, trace-element chemistry, and stable-isotopic ratios are being used to determine the degree of original shell preservation and the process of recrystallization. ACD: June 1990.

C. D. LAUGHREY, Pa. Geol. Survey. **Oil and Gas Source Rocks in Pennsylvania.** The purpose is to identify the oil and gas source rocks in Pennsylvania utilizing data that document the amount, type, and maturation state of organic matter present in the Paleozoic and Mesozoic rocks of the state. ACD: Aug. 1990.

M. L. MORGART, Pa. Dept. of Environ. Resources, Bur. of Oil and Gas Mgmt. **The Effects of Road Spreading of Gas Well Brine on Local Groundwater** [southwestern Pa.]. Water samples are being collected using lysimeters installed along unpaved roads approved by the Commonwealth for brine spreading for dust control. The project goal is to determine the impact of brine spreading on the shallow groundwater environment. ACD: 1991.

M. L. MORGART, Pa. Dept. of Environ. Resources, Bur. of Oil and Gas Mgmt. **The Taylorstown Groundwater Study, Washington County.** Monthly samples were collected from 23 water wells for one year. Trilinear diagrams were used to determine effects of waterflooding for enhanced oil recovery on groundwater. Negative impacts observed were attributed to past improper surface brine discharges and not to waterflooding. ACD: Feb. 1990.

Geomorphology

P. H. DOUGHERTY, Kutztown Univ. **Investigation of Tectonic Caves in the Appalachian Province of Pennsylvania.** ACD: Ongoing.

DRU GERMANOSKI, Lafayette Coll. **Land Use Change and Accelerated Erosion in the Bushkill Creek Watershed, Northampton County.** ACD: Aug. 1991.

J. C. RIDGE, Tufts Univ., W. D. SEVON, Pa. Geol. Survey, and E. B. EVENSON, Lehigh Univ. **Wisconsinan Landscape Development Outside the Limit of Late Wisconsinan Glaciation in the Delaware Valley** [Northampton Co., Pa., and Warren Co., N. J.]. The project is designed to compile the evidence of landscape development not associated with the direct influence of glaciation. Of particular interest are the rates and processes responsible for the formation of colluvium aprons, soils, and periglacial landforms. ACD: 1991.

Geophysics

E. R. KING, Project Chief, U.S. Geol. Survey. **Development of Geophysical Techniques for Investigating Occurrence of Polymetallic Sulphides in the Eastern United States.** Magnetic, gravity, and radiometric expressions of sulphide deposits in the Blue Ridge and Piedmont provinces are being examined for possible diagnostic criteria for locating mineral resources. ACD: 1991.

K. P. KODAMA and JOHN STAMATAKOS, Lehigh Univ., and ART GOLDSTEIN, Colgate Univ. **Effects of Shear Strain on Remanence** [Ridge and Valley province in Pa. and Md.]. A detailed rock paleomagnetic and strain study of the Silurian Bloomsburg Formation shows that the previously reported Bloomsburg paleomagnetic pole may have been affected by strain. We derive a low strain pole more consistent with North American APW. ACD: Sept. 1990.

J. D. PHILLIPS and D. L. DANIELS, U. S. Geol. Survey. **Geophysical Mapping of Early Mesozoic Basins.** Preparation and interpretation of aeromagnetic and gravity maps for Mesozoic basins in the eastern United States, including the Newark and Gettysburg basins in Pennsylvania. ACD: Sept. 1990.



T. F. BUCKWALTER, U.S. Geol. Survey, and M. E. MOORE, Pa. Geol. Survey. **Groundwater Resources of Warren County.** Countywide groundwater conditions will be evaluated. Extensive water-quality data will be used to determine impacts of oil and gas production on the resource. A revised geologic map will be included. ACD: 1991.

JACK CROOK, Pa. Dept. of Environ. Resources, Bur. of Community Environ. Control. **Identification of Aquifers in Public Water Supply Wells** [northwestern Pa.]. ACD: June 1991.

P. H. DOUGHERTY, Kutztown Univ. **Impact of Urbanization on a Karst Aquifer in the Lehigh Valley: the Shantz Spring Basin.** ACD: Dec. 1991.

DRUGERMANOSKI, PAMELA BRAUNWELL, and JASON KELSEY, Lafayette Coll. **Possible Influence of Point Source (Industry) and Nonpoint Source (Agricultural) Land Use Activity on Water Quality of the Bushkill Creek in Northampton County.** ACD: May 1990.

D. M. HOSKINS, Pa. Geol. Survey, WILLIAM GAST, Pa. Dept. of Environ. Resources, Bur. of Water Resources Mgmt., and ERIC ANDERSON, U. S. Geol. Survey. **Stream Map of Pennsylvania.** The 1965 "Higbee" stream map of Pennsylvania, long out of print and out of date, is being replaced by an up-to-date version based on digital data from the U. S. Geological Survey 1:100,000-scale

topographic maps. This is a pilot project designed to learn how to use digital data organized by quadrangle at state map scale. ACD: 1991.

R. A. SLOTO, U.S. Geol. Survey. **Geohydrology and Groundwater Quality of Chester County.** A comprehensive evaluation of the groundwater resources and a statistical evaluation of inorganic, organic, and radiochemical groundwater data. ACD: Sept. 1990.

A. M. STERNAGLE, Pa. Dept. of Transportation. **Short- and Long-Term Effects on Groundwater Supplies Due to Construction Practices.** A study of water problems attributed to blasting and slope cutting shows that turbidity, total-solids ratios, and static water levels may fluctuate. Both shallow- and deep-well monitoring exhibit highly variable rates. ACD: 1992.

K. E. WHITE and R. A. SLOTO, U.S. Geol. Survey. **Base-Flow Recurrence Intervals for Selected Pennsylvania Streams.** This report will provide base-flow recurrence intervals determined by computer program using fixed-interval and local-minimum hydrograph-separation techniques. A discussion of physical factors affecting base flow is included. ACD: June 1990.

D. R. WILLIAMS, U.S. Geol. Survey, and T. A. McELROY, Pa. Geol. Survey. **Geology and Water Resources of Indiana County.** Field work has been completed. Two-, 4-, 24-, and 72-hour pump tests were conducted at the Plumville well nest. All field data have been entered into computer data bases. The geologic map has been compiled, and a basic-data report has been completed. ACD: 1990.

DAWNA YANNACCI, Pa. Geol. Survey, and DANIEL HIPPE and DENNIS LOW, U.S. Geol. Survey. **Aquifer Characteristics of the Rocks of Pennsylvania.** A comprehensive summary of the hydrogeologic characteristics of individual formations and regional systems will be developed using available data. The study will be conducted in three parts, the first covering southeastern Pennsylvania. ACD: Aug. 1990 (first part).

Igneous and Metamorphic Petrology

JOSEPH HULL, Uppsala Univ., Sweden, BOB KOTO, L. E. S. I., and JOHN PUFFER, Rutgers Univ. at Newark. **Ordovician Orogenic Alkaline Magmatism in the North-Central Appalachians.** We are studying alkaline basaltic dikes of the Taconic foreland, intruded late in the orogenic history (Group Y magmatism). Current work involves radiometric dating. ACD: 1991.

M. T. MANGAN, U. S. Geol. Survey, BRUCE MARSH, Johns Hopkins Univ., and A. J. FROELICH AND D. GOTTFRIED, U. S. Geol. Survey. **Flow Differentiation in York Haven Diabase Sheet, South-Central Pennsylvania** [York and Lancaster Cos.]. ACD: Aug. 1990.

D. W. VALENTINO, Pa. Geol. Survey. **Metamorphism and Structures of the Tucquan Antiform** [Lancaster Co.]. A detailed metamorphic and microstructural study across the Tucquan antiform has been completed. Syndeformational metamorphism is characterized by an episode of greenschist facies retrogression. ACD: 1990.

Mineralogy

J. H. DOOLEY, N. J. Geol. Survey, and J. S. DELANEY, Rutgers Univ. at New Brunswick. **An Exceptional Monazite Specimen in the Basal Hardyston Formation from Morgan Hill, Pennsylvania** [I-78 roadcut]. Scanning electron microscopy/energy dispersive X-ray spectroscopy examination of a 36-mm-diameter euhedral specimen of monazite ((Ce,La,Y,Th)PO₄) reveals light rare-earth-element-rich (predominantly La, Ce, and Nd oxides) exsolution lamellae of cerianite ((Ce,Th)O₂) and xenotime (YPO₄). Other mineral inclusions in the monazite specimen include thorite (ThSiO₄), thorianite (ThO₂), pyrite (FeS₂), and uraninite (UO₂). Metamict zones, which are highly degenerated by radioisotope decay, consist of thorium- and uranium-rich phases. ACD: Completed.

Paleontology

J. F. TAYLOR, Indiana Univ. of Pa., and J. D. LOCH, Univ. of Missouri. **Franconian (Middle Upper Cambrian) Trilobite Faunas in the Central Appalachians** [south-central Pa. and adjacent Md., W. Va., and northern Va.]. Faunas in the Ore Hill Limestone (Gatesburg Formation) are under study to update the taxonomy, refine correlations, and collect lithologic and range data critical to evaluation of hypotheses regarding Late Cambrian mass extinctions. ACD: Ongoing.

ALFRED TRAVERSE AND CARMEN MOY, Pa. State Univ. **Palynostratigraphy of Catskill Magnafacies Rocks of Pennsylvania** [central Pa., from N. Y. border to Md. border]. ACD: Ongoing.

P. D. ZELL and ROGER CUFFEY, Pa. State Univ. **Paleontology of the Lower Ordovician Nittany Dolomite in Central Pennsylvania**. Investigation of a diverse mollusc-dominated assemblage, with the intent of recognizing fossil communities of Tremadocian age. ACD: 1992.

Sedimentology

EDWARD COTTER and JOHN LINK, Bucknell Univ. **Genesis of Clinton Ironstones (Silurian), Central Pennsylvania**. ACD: Summer 1992.
A. E. GATES, Rutgers Univ. at Newark, and D. W. VALENTINO, Pa. Geol. Survey. **Evidence for Rift-Generated Deposits in the Peters**

Creek Formation: Precambrian/Cambrian(?) Age [Lancaster Co.]. QFL plots of quartzite compositions for the Peters Creek Formation indicate that the sedimentary provenance is a continental block, transitional to basement uplift. The quartzite compositions and numerous other features are consistent with rift generation. ACD: 1990.

M. J. PODNIESINSKI and BOBB CARSON, Lehigh Univ. **Sedimentary Petrology and Geochemistry of an Unroofing Event in the Taconic Clastic Wedge Source Terrane, Eastern Pennsylvania.** A study of the change in provenance in Silurian sedimentary deposits in eastern Pennsylvania and the tectonic implications of the unroofing of the southeastern source terrane. ACD: Oct. 1990.

DON WOODROW and ARTURO CORTES, Hobart and William Smith Colls. **Study of a Nearshore Sand Body (Late Devonian), Tioga and Hammond Dams, Tioga, Pennsylvania.** ACD: Spring 1991.

J. T. DUTRO, JR., and JOHN REPETSKI, U. S. Geol. Survey, J. F. TAYLOR, Indiana Univ. of Pa., BOB GANIS, Tethys, Inc., and DAVE HOPKINS, J. E. Baker Co. **Cambrian Shelf-Edge Stratigraphy, York Valley.** All formations in the West York quadrangle are Early or Middle Cambrian. The time-transgressive nature of the rock units between York and Lancaster Counties supports the model proposed by John Rodgers in 1968. An unconformity below the York County "Conestoga" is not indicated. ACD: 1991.

W. E. EDMUNDS, Consulting Geologist. **Lower Pennsylvanian Marine Invertebrate and Plant Fossil Zone, Fulton County.** A previously unrecognized Lower Pennsylvanian marine invertebrate and plant fossil zone occurs in the rocks equivalent to the Tumbling Run Member of the Pottsville Formation at least several hundred feet above the Wymys Gap marine zone. It may correlate with the Pocahontas Formation or lower New River Formation of southern West Virginia. ACD: 1991, unless expanded.

A. D. GLOVER, P. F. BUIS, C. H. DODGE, L. J. LENTZ, J. R. SHAULIS, and V. W. SKEMA, Pa. Geol. Survey. **TASIC (Temporarily Available Stratigraphic Information Collection).** A continuing program to collect strati-



graphic data and coal samples for analysis from active coal and clay mines and from drill cores in north-central and western Pennsylvania. The project will provide data for future mapping and regional resource evaluation. ACD: Ongoing.

W. M. GOODMAN, C. E. BRETT, and S. T. LoDUCA, Univ. of Rochester. **Stratigraphic Dynamics of the Medial Silurian (Wenlockian), Northern Appalachian Basin** [Pa., Md., N. Y., and Ontario]. We have mapped disconformity-bounded sedimentary sequences in the upper Clinton (upper Rose Hill, Keefer, Rochester, basal McKenzie, and equivalent Lizard Creek). This summer we will work near Swatara to study the Clinton-Shawangunk facies transition area. ACD: Fall 1990.

J. D. INNERS, Pa. Geol. Survey, W. E. EDMUNDS, Consulting Geologist, and L. J. LENTZ, Pa. Geol. Survey. **Mauch Chunk/Pottsville Stratigraphy and the Mid-Carboniferous Boundary in the North Half of the Anthracite Region** [northeastern Schuylkill Co., northwestern Carbon Co., and Luzerne Co.]. Objective is to determine the nature and areal extent of the basal Pottsville disconformity that is evident in the Northern Anthracite field and the northern part of the Eastern Middle field and to interpret the sedimentary environments of the upper Mauch Chunk strata beneath the disconformity. ACD: March 1991.

LESLIE OLINGER and A. C. DONALDSON, W. Va. Univ. **The Stratigraphy and Sedimentology of the Acadian Clastic Wedge in Southwestern Pennsylvania**. Master's thesis will include correlation of well logs into cross sections of the Upper Devonian-Lower Mississippian stratigraphy of southwestern Pennsylvania. Isopach maps of the correlated sand bodies will be used to determine shoreline position and strike/dip trends. ACD: Dec. 1990.

B. N. SHAFFER, Cyprus Emerald Resources Corp. and W. Va. Univ. **The Stratigraphy of the Allegheny and Conemaugh Groups and the Economic Geology of the Upper Freeport Coal in Eastern Greene County**. A compilation of the relatively unknown stratigraphy of the Allegheny and Conemaugh Groups, as well as a quantitative survey of the economic geology of the Upper Freeport coal in eastern Greene County. ACD: Feb. 1991.

R. C. SMITH, II, and S. W. BERKHEISER, JR., Pa. Geol. Survey, and J. H. WAY, Lock Haven Univ. **Lower Devonian and Other Bentonites and Ash Beds** [Va. to Quebec]. Bald Hill Bentonite Beds A, B, and C have now been correlated from Monterey, Virginia, to Cherry Valley, New York. These as well as the Upper Ordovician bentonites and Tioga ash beds are associated with the drowning of carbonate platforms by major marine transgressions. ACD: Ongoing.

J. F. TAYLOR, Indiana Univ of Pa., and N. J. DURIKA, J. T. DUTRO, and J. E. REPETSKI, U. S. Geol. Survey. **Cambrian-Ordovician Bio-**

stratigraphy of the Conestoga Valley. Mildly deformed shelf-marginal carbonates in the Kinzers and Ledger Formations near York, Pennsylvania, are being sampled for trilobites and phosphatic microfossils to establish a standard for correlation of Lower Cambrian strata in the Appalachians. ACD: Summer 1991 (first phase).

J. F. TAYLOR AND K. A. RITTLE, Indiana Univ. of Pa., and J. E. REPETSKI, U. S. Geol. Survey. **Upper Cambrian and Lower Ordovician Biostratigraphy in the Central Appalachians** [Nittany Arch and Great Valley areas (Pa., N. J., Md., W. Va., and Va.) and Frederick Valley, Md.]. The Stonehenge Limestone and the units above and below it are being systematically sampled to establish a trilobite- and conodont-based biostratigraphy for precise correlation with Trempealeuan and Ibexian strata elsewhere in North America. ACD: Ongoing.

Structural Geology

R. T. FAILL, Pa. Geol. Survey. **Tectonic Map of Pennsylvania.** Map will show locations and names of anticlines, synclines, anticlinoria, structural fronts, thrust, normal, transcurrent, and other faults; basement contours; contours on top of the Onondaga Formation; earthquake epicenters; radiometric dates; nappes and terranes; metamorphic isograds; and other sundry tectonic features. ACD: Nov. 1990.

M. B. GRAY, Univ. of Rochester. **Tectonothermal History of the Southern Anthracite Region.** ACD: 1991.

H. A. POHN, U. S. Geol. Survey, and J. L. COLEMAN, JR., Amoco. **Appalachian Structures** [central Pa.]. Radar data, seismic-reflection profiles, and field studies have shown the presence of a lateral ramp in central Pennsylvania. A basement connection is suspected because of seismicity under the ramp. ACD: Completed.

SAM ROOT, Coll. of Wooster. **Basement Tectonics of the Transylvania Fracture Zone, Pennsylvania and Ohio.** Study of Paleozoic reactivation of a Precambrian basement fracture.

R. W. VALENTINO, Temple Univ., D. W. VALENTINO, Pa. Geol. Survey, and B. J. LAMPORT, Elizabeth Seton Coll. **Post-Taconian Structures of the Philadelphia Terrane.** The Springfield ductile thrust and the Rosemont and Crum Creek conjugate shear zones have the same post-Taconian metamorphic history, indicative of cogenetic development. A transpressional deformation model has been proposed for these structures. ACD: 1990.

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Pennsylvania Geological Survey

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Engineering Geology

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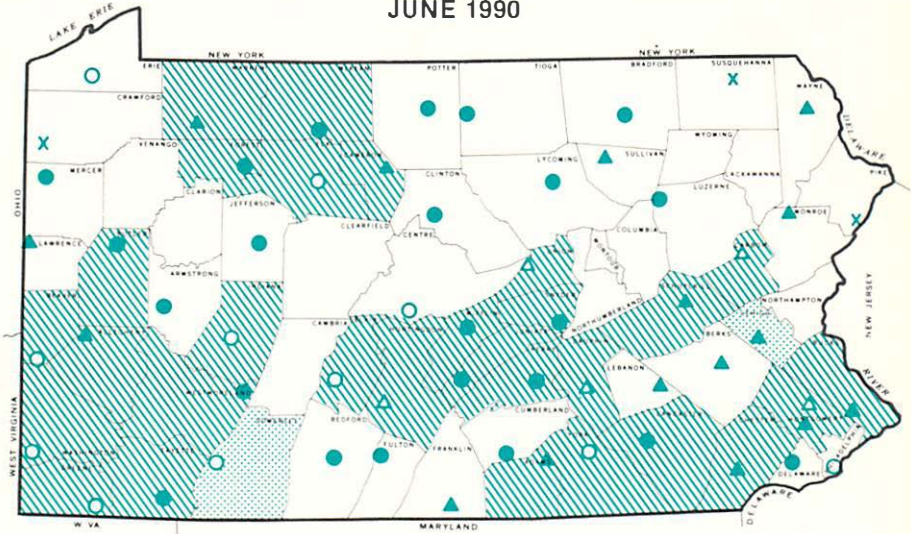
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EXPLANATION

○ Above
last year
● Below
last year
Observation well

△ Above
last year
▲ Below
last year
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equipped with
data-collection platform

X
No data

High

Normal
range

Low

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