ON THE COVER: Oil well pump “graveyard,” south of Grand Valley (1/4 mile west of Pa. Route 27) in Warren County, Pennsylvania. The equipment is testimony of the intensive drilling and production activity in this area for over a century. Photo courtesy of Tom and Michael Berg.
DATA DATA EVERYWHERE

With the exception of the achievements of a few rare geniuses (a la Einstein), advances in science are made on the basis of accumulation, interpretation, and analysis of data. This is the time-consuming, non-glamorous aspect of science, the phase for which it is commonly difficult to gain adequate support, since positive results can never be assured, and at best, are likely to be years in coming.

Geology too requires data collection and evaluation, both for the advancement of basic scientific principles, as well as for direct applications, such as the management of geologic resources. At the Pennsylvania Geological Survey we have been accumulating such data since the inception of the Survey in 1836. In the last 30 years the volume of our accumulated geologic data has greatly escalated, in part due to expanded geologic field investigations and in part due to legislation resulting in voluminous input of water well data and of data from new oil and gas wells.

The advent of the computer offers scientists a tremendous "tool" for handling of massive quantities of data, both for storage and rapid retrieval and particularly for data analysis and evaluation. At the Pennsylvania Survey we are trying to utilize this "tool" and have been working at developing operational computer data programs for our accumulated water well records (over 60,000 on hand and some 15,000 new well records arriving yearly), our oil and gas well data (over 70,000 well records on hand), a comprehensive directory of Pennsylvania mineral producers, and a detailed data file of the physical and chemical properties of Pennsylvania's coal resources (including coal reserves and structures). The coal resources data bank is being developed with the cooperation and support of the U.S. Geological Survey's National Coal Resources Data System.

(Continued on page 31)
Pennsylvania's Valuable Nonfuel-Mineral Production

While Pennsylvania is reknowned for its outstanding coal, oil, and gas production, the Commonwealth also has traditionally had a high national ranking with respect to nonfuel-mineral production. In fact, Pennsylvania's mineral production and the people who produced it helped win the Revolutionary, Civil, and World Wars. It has also provided construction materials for homes and industry as well as improving the state's agricultural production. There is an old adage in the mining fraternity that states "if it doesn't grow, it's mined." Pennsylvania is unique in that early development and industrialization was promoted in this state by the rich abundance of naturally occurring mineral resources. This, combined with developing transportation networks and harbors, provided a sound foundation for our country's world status.

Preliminary data for 1984 have recently been published by the United States Bureau of Mines which estimated the Commonwealth's nonfuel-mineral production to exceed $600 million for the year (Prosser, 1985). Table 1 is a modified listing of this data which shows production, value, average price per ton, and approximate percen-

Table 1. Nonfuel-Mineral Production in Pennsylvania for 1984
(Modified from Prosser, 1985)

<table>
<thead>
<tr>
<th>MINERAL</th>
<th>QUANTITY (thousands of short tons)</th>
<th>VALUE (thousands of dollars)</th>
<th>VALUE (dollars per ton)</th>
<th>PERCENTAGE OF TOTAL VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEMENT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Masonry</td>
<td>255 tons</td>
<td>$19,480</td>
<td>$76</td>
<td>3%</td>
</tr>
<tr>
<td>Portland</td>
<td>5,600</td>
<td>240,000</td>
<td>43</td>
<td>37</td>
</tr>
<tr>
<td>CLAYS (mostly shale for brick manufacture but includes refractory, excludes kaolin)</td>
<td>934</td>
<td>4,689</td>
<td>5</td>
<td>&lt;1</td>
</tr>
<tr>
<td>LIME (used for steel making, acid neutralization-environmental, and agriculture)</td>
<td>1,620</td>
<td>85,565</td>
<td>53</td>
<td>13</td>
</tr>
<tr>
<td>PEAT (used for agriculture and horticulture)</td>
<td>24</td>
<td>707</td>
<td>29</td>
<td>&lt;1</td>
</tr>
<tr>
<td>SAND AND GRAVEL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction (used for aggregate, concrete, and road base)</td>
<td>13,200</td>
<td>57,000</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Industrial (used for glass, foundry, chemical, and metallurgical processes)</td>
<td>860*</td>
<td>12,000*</td>
<td>14*</td>
<td>2*</td>
</tr>
<tr>
<td>STONE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crushed (used for construction aggregate, road stone road base, and cement manufacture)</td>
<td>56,200</td>
<td>232,000</td>
<td>4</td>
<td>35</td>
</tr>
<tr>
<td>Dimension (sandstone, diabase, and slate, both as dressed and rough products)</td>
<td>44</td>
<td>6,001</td>
<td>136</td>
<td>&lt;1</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td>78,777</td>
<td><strong>$657,472</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*USBM 1983 data.
tage of total value for major commodity groupings. Portland cement, crushed stone, and lime account for more than 80% of the total value of nonfuel minerals produced in 1984. The order, based on dollar value per ton, shows dimension stone as the leader followed by masonry cement, lime, and portland cement, respectively. In recent years Pennsylvania nationally ranked first in the production of masonry cement, and third in the production of portland cement, lime, and stone.

For every man, woman, and child living in the Commonwealth, about $55 worth, or about 7 tons, of nonfuel minerals was produced. Put another way, about $14,600 of production per square mile was achieved in 1984, not including coal, oil, and gas!

Pennsylvanians should be proud of their mineral heritage and the people engaged in extracting its resources. Production of crushed stone provides economical and safe material to build and repair the Commonwealth's highway system. Portland cement is a basic construction material needed for continued growth. Lime produced in Pennsylvania is used mostly in the production of steel, a major heavy industry of the area. These mineral industries provide both skilled and nonskilled jobs for our labor force.

In accordance with its legislative mandate, the Pennsylvania Geological Survey, through its Mineral Resources Division, seeks to provide clear insight into the character of the Commonwealth's mineral resources and insure that this information is available in a readily usable form. Our newly revised *Directory of the Nonfuel-Mineral Producers in Pennsylvania* is soon to be released and is an example of this effort.

REFERENCES


GEM AND MINERAL SHOW

The Central Pennsylvania Rock and Mineral Club will hold its 20th Annual Gem and Mineral Show on September 21 and 22 at the Zembo Temple, 2801 N. Third Street, Harrisburg. The hours are 10 a.m.-7 p.m. on the 21st, and 10 a.m.-5 p.m. on the 22nd. Admission is $1.50 for adults; parking is free.
This publication is the twenty-eighth annual report on Geological Research and Publications in Pennsylvania. It is an attempt to list all current geologic research in Pennsylvania and includes persons and projects other than those of the Pennsylvania Geological Survey. Because of the large number of projects reported to us, we exercise editorial license to reduce the description of the research projects to fit our available space.

We have also attempted to determine an anticipated completion date (ACD) for each project. The anticipated completion date is the estimate of the date when the author will complete his report; additional time should be anticipated until the report is published. If you wish 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. Reports published are listed alphabetically by author.

As with all compilations, there may be omissions; this is unintentional. Additional copies of this report may be obtained by writing to the Bureau of Topographic and Geologic Survey, Department of Environmental Resources, P.O. Box 2357, Harrisburg, Pennsylvania 17120.

T. M. BERG, Pa. Geol. Survey, MICHAEL O'NEILL, Shippensburg Univ., and JACKIE LUNDY, Bloomsburg Univ. Geologic Base Map of Warren Co., Pa. The map will be used as a base for a groundwater report on Warren County being done in cooperation with the Water Resources Division of the U.S. Geological Survey. The preliminary
compilations are completed. Brief field checking will be done, and
the final map will be transferred to a 1:50,000 base. ACD: Summer
1985.
W. E. DAVIES, Retired, U.S. Geol. Survey, and G. C. OHLMACHER,
Purdue Univ. Geology of the Cumberland 1:100,000 Map Sheet. Geologic mapping in Bedford and Fulton Counties completed; preparation of maps for 1:100,000 sheet underway. Subjects in atlas form cover areal geology, engineering geology, structural geology, and cultural features related to geology. ACD: Early 1986.
J. B. EPSTEIN and P. T. LYTTLE, U.S. Geol. Survey, and G. G. LASH,
Evolution of the Eastern U.S. Mapping of the distribution of lithology and age determinations of sedimentary rocks (Triassic-Jurassic), including fossil localities and Mesozoic faults (outside as well as within basins), will continue during FY 1985. ACD: FY 1987.

ECONOMIC GEOLOGY

S. W. BERKHEISER, JR., Pa. Geol. Survey. High-Purity Silica Deposits in Pa. Potential high-purity silica sources from nine Paleozoic formations and six quartz veins were sampled, chemically analyzed, and described from 30 locations representing 14 counties in central and eastern Pa. Percent Al₂O₃ and Fe₂O₃ are reported for as-collected and beneficiated splits. Beneficiation consisted of hot acid baths
and magnetic separation. Potential resources for various manufactured silica products have been identified. ACD: In press.

S. W. BERKHEISER, JR., Pa. Geol. Survey. Pa.'s Slate Industry: Alive and Well [Lehigh, Northampton, and York Cos.]. The Lehigh-Northampton slate district is unique in that in addition to producing flagging, flooring tiles, blackboards, roofing, and structural slates, it is the only U.S. producer of electrical and billiard slates. This district produces over $4 million worth of slate products annually. The geology, mineralogy, mining, milling, and marketing of Pa.'s slate industry is summarized. ACD: In press.

S. W. BERKHEISER, JR., Pa. Geol. Survey, and J. A. AMES, Consultant. Limestone-Dolostone: Specialty Uses, Chapter 42D in The Geology of Pennsylvania. The carbonate rocks of Pennsylvania have played a long and historic role in the industrial and agricultural development of the state and nation. Limestones and dolostones represent about 80 percent of all rocks currently mined in the Commonwealth. The distribution and uses of the carbonate rocks will be summarized by physiographic province, and a brief historical perspective of carbonate mining in Pennsylvania will be presented. High-purity carbonates will be emphasized. ACD: In preparation.


S. W. BERKHEISER, JR., J. H. BARNES, and R. C. SMITH, II, Pa. Geol. Survey. Directory of the Nonfuel Mineral Producers in Pa. This compilation will provide a directory of the approximately one-half billion dollar nonfuel mineral industry in Pennsylvania. Mineral commodity, county, and producer listings include addresses, telephone numbers, list of products, producing formations, and lithologies. A location map at a scale of 1:500,000 will be included. ACD: In press.

G. M. FLEEGER. Possible Effects of Basement Tectonics on the Geometry of the Tuscarora Fm.-Medina Group of Northwestern Pa. Tuscarora-Medina geometry, previously interpreted to be the result of a deltaic depositional environment, is similar to that of other sedimentary units, thought possibly to be affected by basement tectonics. ACD: Sept 1985.
A. D. GLOVER, C. H. DODGE, J. G. PHILLIPS, J. R. SHAULIS, and V. W. SKEMA, Pa. Geol. Survey. Coal Resource Maps for All Bituminous-Coal-Bearing Counties, Main Bituminous Field, Western Pa. This study is an updated coal resource evaluation for this field. Part 1 will include crop lines for each of the principal coal seams, areas of deep and strip mining, and structure contours on a particular coal. Maps for Greene County have been published. Maps for Allegheny, Butler, Fayette, Washington, and Clarion Counties have been submitted for drafting. Cambria and Westmoreland County maps will be completed in 1985. ACD: 1990.

R. M. HARPER and C. D. LAUGHREY, Pa. Geol. Survey. Oil and Gas Reservoir Rocks of Pa. This report will use the integration of rock-pore data with laboratory petrophysical data, log-derived data, and geology for Pennsylvania's hydrocarbon reservoirs. These data will be used for classification of reservoir lithologies into pore types for the purpose of establishing reservoir-rock potentials. ACD: 1986.


G. R. ROBINSON, Project Chief, U.S. Geol. Survey. Metallogeny of the Early Mesozoic Basins of the Eastern U.S. Studies of the geochemical and mineralogical character of the eastern U.S. Mesozoic basalt and diabase will continue in FY 1985. Emphasis will be on understanding platinum-group-element systematics in tholeiitic systems and their use as a sensitive indicator of sulfide fractionation. Compilation of data on ore deposits, prospects, and occurrences associated with the eastern U.S. early Mesozoic basins will continue also. A geochemical study of base metal-barite vein occurrences associated with the eastern U.S. Mesozoic basins will be initiated. ACD: FY 1988.

J. B. ROEN, Project Chief, U.S. Geol. Survey. Paleozoic Black Shales, Appalachian Basin. Funding has been provided by the Department of Energy for the collection of Paleozoic black shales for geochemical analysis for source-bed potential. Devonian shales and oil samples will also be collected for geochemical fingerprinting to determine oil source and migration paths. Subsurface data will be used to determine the stratigraphy and distribution of Ordovician shales. Open-file reports for the Department of Energy on the progress of this research will be prepared on a regular basis. ACD: FY 1986.

Petrographic study indicates several different types of occurrences in this uraniferous province. ACD: Aug. 1985.


Coal Petrology. Additional samples from the Upper Freeport limestone outcrops in Ohio and Pennsylvania were collected for analysis in FY 1984. Sets of roof-rock and coal have been submitted for chemical analyses to evaluate the effect of roof-rock lithology on the sulfur content of coal. Reports describing nondestructive methods to predict variability in coal washability and interpreting petrographic data from five different physical depositional environments are being reviewed. ACD: FY 1989.

ENGINEERING GEOLOGY


ENVIRONMENTAL GEOLOGY

W. R. ADAMS, JR., Adams Geotechnical Consultants/Univ. of Pittsburgh, and N. K. FLINT, Univ. of Pittsburgh. Landsliding in Allegheny Co., Pa.—Characteristics, Causes, and Cures. Approximately 175 slope movements have been investigated for this Ph.D. research project. The intent is to use data from the field reconnaissances and published materials to develop a model to describe the stability of slopes in Allegheny County. ACD: Aug. 1986.

T. W. GARDNER, Pa. State Univ. Watershed Dynamics of Surface Mined Basins. This ongoing research involves analysis of the controls on and evolution of infiltration rates on reclaimed surface mines with the ultimate goal of hydrologic modeling and understanding of the geomorphic evolution of reclaimed mines. ACD: Ongoing.

ALAN GEYER, Geologic Consultant, and W. H. BOLLES, Pa. Dept. of Education. Outstanding Scenic Geological Features of Pa., Vol. 2. One hundred thirty-nine outstanding geologic features, not previously described in Volume 1, will be included in this volume. Lists of named springs and waterfalls will also be included. ACD: 1986.

S. T. PEES, Samuel T. Pees & Associates. The Early Days Along Oil Creek Pa. (1859–1865) [Venango Co.]. This study traces the major early oil strikes down Oil Creek and describes the geology of the shallow sands which they tapped. Period photographs and engravings are compared to the Creek as it is today. ACD: Nov. 1985.

A. W. ROSE and ADAM HUTTER, Pa. State Univ. Geologic Controls on Radon in Buildings in Pa. Available data suggesting a significant proportion of high radon values in limestone areas will be verified, and the regional and local causes studied in order to help predict risk levels. ACD: Sept. 1986.

JOHN WASHINGTON, A. W. ROSE, and D. E. BAKER, Pa. State Univ. Zn, Cd, Pb Contamination in Soils and Waters Around the Palmetton Zinc Smelter. Cd in soil exceeds 1.5 ppm for an average of 7.5 miles from the smelter and Zn exceeds 300 ppm for about 10 miles from the smelter, but well waters are little affected. ACD: June 1985.


W. B. WHITE and JOHN KASTRINOS, Pa. State Univ. Nitrate Transport in Carbonate Aquifers of Central Pa. [Centre Co.]. Nitrate, sulfate, and chloride levels are being monitored in a dozen springs and surface streams linked to the Ordovician carbonate aquifer. Nitrate levels are being correlated with source areas and with seasonal effects. ACD: Fall 1985.

**GENERAL GEOLOGY**


JANE EGGLESTON, U.S. Geol. Survey. Basin Analysis of the Pa. Anthracite Region. Project efforts are concentrated on the Northern Anthracite field, where stratigraphy and structure are being developed. The project also includes paleobotanical studies, characterization
of the Mill Creek limestone, and depositional interpretations. ACD: Fall 1989.

J. L. JONES, York County Parks. Geology of the York County Parks, York Co., Pa. Detailed geologic mapping of the six county parks is currently underway. Each park is located in a different stage of the regional geology. Points of interest, rock and structural descriptions, and geologic maps of each park will be included. ACD: Sept. 1985.

C. H. SHULTZ, Slippery Rock Univ./Pittsburgh Geol. Soc. "The Geology of Pennsylvania" is a writing project initiated and developed by the Pittsburgh Geological Society. C. H. Shultz is serving as editor. All aspects of the State's geology will be summarized. More than 70 authors from industry, government, and academia are participating. Most manuscripts are now undergoing technical review and editing, or are being revised. The Pennsylvania Geological Survey will be the publisher. ACD: Spring 1986.

GEOCHEMISTRY

J. M. McNEAL, Project Chief, U.S. Geol. Survey. Sulfur Isotopes in Triassic Basins. Over 150 ground-water samples were collected in FY 1984 and S-isotopes and chemical analyses are nearly complete. Follow-up water sampling for areas of interest identified by these analyses will be underway in FY 1985. Chilled diabase samples will be collected from the Zora Ring Complex in Pennsylvania and the Culpeper basin in Virginia. If time permits, NURE data in Pennsylvania and Virginia Mesozoic basins will be examined and compiled. ACD: FY 1988.

A. A. ROBERTS, Project Chief, U.S. Geol. Survey. Geochemical Prospecting Utilizing Gaseous Emanation. Helium surveys were completed in FY 1984 over a known fault in Pennsylvania that is intruded by a peridotite dike; higher helium in near-surface soil gases was present in areas very close to the fault (within a couple of hundred feet). Surveys were also conducted in an area in northern Pennsylvania containing the Tyrone-Mount Union lineament. Possible correlation with the lineament and determination of whether or not helium surveys are useful in mapping extensions of the zone of increased fracture permeability will have to await more detailed analysis of the survey results. ACD: FY 1987.

GEOMORPHOLOGY

K. F. CONNORS and T. W. GARDNER, Pa. State Univ. Simulated SPOT Imagery for the Investigation of Geomorphic Features and
Hydrologic Processes [Snow Shoe and Pine Glen, Pa.]. Simulated SPOT imagery has been used to identify mine spoil types of different lithologies and vegetative covers. Surfaces with high and low runoff rates can be discriminated. Groundwater recharge and discharge sites can be identified.


W. B. WHITE, Pa. State Univ. Caves of Pa. Data, including locations, physical description, and maps are being collected for the caves in the Valley and Ridge and Great Valley provinces. The object is to produce a complete catalog of Pennsylvania caves. ACD: 1988.

W. B. WHITE and E. L. WHITE, Pa. State Univ. Karst Landforms in the Appalachian Highlands [carbonate areas of Pa.]. The study is concerned with quantitative landform morphology, drainage basin evolution, and mechanisms of landform sculpture in the Appalachian karst.

GEOPHYSICS

J. D. PHILLIPS, Project Chief, U.S. Geol. Survey. Geophysical Mapping of Early Mesozoic Basins. Compilation activities in FY 1985 include digital aeromagnetic data sets and maps for the northern Hartford, Newark, Gettysburg, Culpeper, Davie County, Durham, and Wadesboro basins; and digital gravity data sets and maps for the Gettysburg, Culpeper, Farmville, Scottsville, and Richmond basins. Field work to acquire gravity data will continue in the Gettysburg and Newark basins. Aeromagnetic data for the Hartford, Newark, Gettysburg, and Culpeper basins will be digitized, and truck magnetometer surveys of the Gettysburg, Newark, Richmond, Durham, and Wadesboro basins will be conducted. ACD: FY 1987.

GLACIAL GEOLOGY

D. D. BRAUN, Bloomsburg Univ., and WILLIAM BRENnan, SUNY, Coll. at Geneseo. Development of a Secular Geomagnetic Declination Record for Use in Correlating Ice Margin Positions Across the Allegheny Plateau in North Central Pa. Proglacial lake rhythmites will be sampled in conjunction with mapping of glacial deposits in selected valleys. Geomagnetic declination values will be examined
to see if groupings of similar values can be traced across the Plateau. ACD: 1988.


**HYDROLOGY**

W. T. BALMER, U.S. Geol. Survey. Chester County Water Use. Chester County water-use data are being collected for the U.S. Geological Survey State Water Use Data System (SWUDS). This data base will have the capability of showing connected water use as well as withdrawals and return data. ACD: 1986.


T. A. McELROY, Pa. Geol. Survey. Groundwater Resources of Cambria Co. The project will provide a description and inventory of groundwater resources in Cambria Co. Two adjacent basins, one mined, one not, have been gauged for 1½ years to determine the effect of mining on the hydrologic budget. ACD: June 1985.
T. A. McELROY, Pa. Geol. Survey. *Groundwater Resources of Fayette Co.* The project provides a description and inventory of groundwater resources in Fayette Co. It includes statistical analysis of the effect of coal and coal mining on groundwater chemistry and revised geology for western Fayette Co. ACD: In press.


E. L. WHITE and GERT ARON, Pa. State Univ. *Hydrograph Model Study of Brandywine Creek*, Pa. A hydrograph model study of the 287-square-mile Brandywine Creek watershed was made on low, medium, and high intensity rainfall events. The Hydrologic Engineering Center (HEC-1) and the Penn State Runoff (PSRM) Models were used to model the timing of subarea flood peaks and volumes at various points throughout the basin. ACD: 1985.

DON WILLIAMS, J. K. FELBINGER, and P. J. SQUILLACE, U.S. Geol. Survey. *Washington Co. Water Resources Study*. This study is being conducted to evaluate the surface-water and ground-water conditions throughout Washington County and to determine what effect deep coal mining will have on the water resources, particularly the ground-water resources in the unmined sections of the county. ACD: Mar. 1986.


**IGNEOUS AND METAMORPHIC PETROLOGY**

BRUCE CUSHING, PATRICK BAKER, M. L. HILL, and GEORGE MYER, Temple Univ. *Metamorphism and Deformation within the Martic Zone,*
Unionville and Coatesville Quads. Petrographic studies within the Octoraro Phyllite and Peters Creek Schist indicate at least two metamorphic and deformational events. The latest metamorphic/deformation event produced a large shear zone with left-lateral movement to the northeast. ACD: Aug. 1985.


M. S. Rutstein, SUNY, Coll. at New Paltz. Low Grade Metamorphism of Martinsburg and Related Strata. Delineation and mapping of “illite” (illite + illite-smectite ± chlorite) isocrystallinity contours. Study area is being extended from southeastern New York into New Jersey and Pennsylvania to determine transition from foreland across Paleozoic metamorphic front(s). ACD: 1986.


**PALEONTOLOGY**

J. R. Anderson, Jr., and H. B. Rollins, Univ. of Pittsburgh. Microgastropod Biofacies of the Upper Carboniferous System in the Northern Appalachian (Dunkard) Basin. This study is to update the taxonomy of the microgastropod species from the Upper Carboniferous marine units as well as determine the paleogeographical range of each species within 12 marine units in the Northern Appalachian (Dunkard) basin. ACD: Aug. 1985.

D. K. Brezinski, Md. Geol. Survey. Carboniferous Trilobites of the Northern Appalachian Basin [Ohio, Pa., W. Va., Md.]. Carboniferous (Mississippian and Pennsylvanian) trilobites are poorly known from the Appalachian region. The goal of this project is to describe trilobites present in Carboniferous strata of the Appalachians and their stratigraphic distribution. ACD: Dec. 1985.


with the post-Pottsville sediments in the Bernice coal basin with correlation between the anthracite coal basins to the east and the bituminous coal fields to the west. ACD: 1990.


ALFRED TRAVERSE, Pa. State Univ., and P. K. STROTHER, Boston Univ. Evidence of Early Land Plants in Ordovician and Silurian Rocks of Central Pa. Upper Ordovician and Lower Silurian rocks of central Pennsylvania have yielded some hints about early land plant evolution. The authors continue to seek more evidence, especially in the Tuscarora and Bloomsburg Formations. ACD: Ongoing.

SEDIMENTOLOGY

HUE-CHUNG CHOU and D. P. GOLD, Pa. State Univ. Controls on Porosity and Bulk Density of Upper Paleozoic Sandstones [western and central Pa.]. Authors will measure porosity and bulk density of

**JACK DONAHUE, R. C. CARLISLE,** and **J. M. ADOVASIO,** Univ. of Pittsburgh. *Historic Archaeology of Wells and Associated Material Found in Subway Construction* [City of Pittsburgh, subway construction]. Sedimentology of water well fill found during Pittsburgh subway construction. Analysis is just beginning and will interface with results of study of cultural material found in wells. ACD: Summer 1985.


**JACK DONAHUE, TOM EAST, J. M. ADOVASIO, R. C. CARLISLE,** **GARY COOKE,** and **STEVE KENNEDY,** Univ. of Pittsburgh. *Late Woodland Site on Low Terrace of North Branch, Susquehanna River, Catawissa, Pa.* Sedimentology, clay mineralogy, and depositional history of Susquehanna River terrace, dated between 1,000 and 500 years B.C. ACD: Summer 1986.

**ALBERT L. GUBER,** Pa. State Univ. *Facies Analysis of the Middle and Upper Silurian Formations of Central and Western Pa.* A geochemical, paleontological, and sedimentological approach is being used to define facies sequences, prepare facies maps, and develop facies models for the Mifflintown, Wills Creek, and Tonoloway Formations. ACD: Continuing.

**G. G. LASH,** SUNY, Coll. at Fredonia. *Turbidite Sedimentology of the Martinsburg Formation, Eastern Pa.* Preliminary sedimentologic analyses of the Ramseyburg Member of the Martinsburg Formation suggest that it was deposited from sheetlike turbidites rather than as part of a classical submarine fan. ACD: Sept. 1986.

**M. A. RENDINA** and **WAYNE MARTIN,** Miami Univ., Ohio. *Provenance, Petrography and Diagenesis of Some Selected Sandstones and Mudrocks of the Dunkard Group (Upper Pennsylvanian-Permian) in Ohio, Pa., and W.Va.* Petrographic and paleocurrent studies reveal
that the Dunkard basin received sediments from two sources: (1) a predominate southeastern foreland fold-thrust highland that consisted mainly of reworked sedimentary and low-grade metamorphic source rocks, and (2) from multicycle sedimentary strata occurring on the stable craton of the north. ACD: May 1985.


STRATIGRAPHY


D. K. BREZINSKI, Md. Geol. Survey. Revision of Upper Mississippian Stratigraphy of Md. and adjacent Pa. and W.Va. Owing to the intertonguing nature of upper Mississippian strata of western Maryland and adjacent Pennsylvania and West Virginia, true stratigraphic relationships have become clouded and nomenclature confusing. The purpose of the project is to update stratigraphic terminology and document the lateral relationship of each unit. ACD: June 1986.

RICHARD DALTON, ROBERT CANACE, and DONALD MONTEVERDE, N.J. Geol. Survey, and AVERY DRAKE and JOHN REPETSKI, U.S. Geol. Survey. COGEO MAP—Subdivision of Cambro-Ordovician Kittatinny Supergroup of N.J. [Reading area, Lehigh Valley area]. The project is part of the greater COGEO MAP effort between the New Jersey Geological Survey and U.S. Geological Survey to remap New Jersey geology. This undertaking will be an attempt to reexamine type sections of Cambro-Ordovician carbonates in Pennsylvania and establish a correlation with New Jersey carbonates.

gram for recording stratigraphic data on active coal and clay strip mines and collecting coal samples for analysis. The project will provide data for future mapping and regional resource evaluation. ACD: Ongoing.


E. F. KOPPE, Consultant. Correlation of Coal Strata between the Main Anthracite and Bituminous Coal Fields of Pa. [north-central Pa.]. The stratigraphy of isolated northern coal fields is being refined and the relations between basins clarified (in manuscript). Sullivan County coals correlate well with the anthracites of Lackawanna County. ACD: 1986.


R. C. SMITH, II, and J. H. WAY, Pa. Geol. Survey. Seven or More Tioga Ash Beds in the Valley and Ridge of Pa Outcrops within the Middle Devonian Tioga zone reveal at least seven correlatable ash beds, ranging from a millimeter to a few tens of centimeters in thickness. This horizon was originally recognized by Fettke (1931, Pa. Geol. Survey, Prog. Rept. 102B, p. 8). ACD: Continuing.


STRUCTURAL GEOLOGY

P. S. BAKER, BRUCE CUSHING, M. L. HILL, and G. H. MYER, Temple Univ. Ductile Deformation and Retrograde Metamorphism within the Octoraro Phyllite. Evidence for a Shear Zone [Parkesburg Quad.]. By studying outcrops, oriented hand samples and oriented thin sections we have determined that the Octoraro Phyllite lies within a shear zone. Shear indicators reveal a subhorizontal, left-lateral movement with a NE-SW trend. ACD: June 15, 1985.

M. B. GRAY, Bryn Mawr Coll., and R. P. NICKELSEN, Bucknell Univ.
Slickensided Soil Fractures as an Indicator of Strain [primarily central Pa.]. Slickensided soil fractures (SSF) form in expansive soils and are preserved in the rock record. SSF may serve as strain indicators in conjunction with other strain markers. Formations studied include the Bloomsburg (Silurian), Catskill (Devonian), Mauch Chunk (Mississippian), and Lockatong (Triassic). ACD: 1986.


WARREN MANSPEIZER and MARK LUCAS, Rutgers Univ., Newark. Lower Mesozoic Structures: Narrow Neck between the Gettysburg and Newark Basins. Geologic mapping of the Jacksonwald syncline in the narrow neck shows the syncline to have characteristics typically found in foreland fold-and-thrust belts. Structures, e.g., cleavage, shear fractures, faults, and deformed clastic dikes, are being mapped. ACD: Sept. 1985.

RICHARD NICKELSEN, Bucknell Univ. Folded Roof Thrust and Its Overlying Imbricates in the Pa. Valley and Ridge [Kishacoquillas Valley and Seven Mountains including the following 7½ minute quads.: Allensville, Barrville, Belleville, Burnham, McAlevys Fort, Mt. Union, Newton Hamilton]. Strain disharmonies at the Coburn-Antes Gap detachment and in the Tuscarora Formation at Laurel Creek have been interpreted, respectively, as the folded roof thrust of the Cambro-Ordovician carbonate duplex and as ramp faults cutting up section from the roof thrust to the Wills Creek-Salina detachment. ACD: Late fall 1985.


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Our data computerization efforts are not without a variety of difficulties and frustrations. These range from the problems of mastering the operational procedures, to the un-ending "bugs" which seem to infest each and every computer program and require endless hours of correction. And it is equally unnerving to be told shortly after delivery and installation of a computer unit that a new and highly improved model is now on the market.

Despite it all, we have no choice but to push forward with our efforts to utilize the most modern techniques to handle and utilize the wealth of geologic data for the benefits to the science of geology and the citizens of Pennsylvania.
A RECIPE FOR COAL FLOWERS

The formula for developing crystal growths on coal and similar materials has been around for many decades and has been used in schools and science clubs for the edification of young and old. Periodically we receive inquiries for the procedure and we share it here, as we clipped it many years ago from a paper, for all who may be interested. While the ingredients are common, household items, we urge care in handling them.

The first recipe calls for 6 tablespoons salt, 6 tablespoons bluing, 6 tablespoons water, 1 tablespoon ammonia water. After thoroughly mixing, pour over clinker from the furnace, a piece of coke or a brick. After piece has been well wet with the liquid, drop on it a few drops of mercuriochrome solution or red or green ink. Do not use any other solution in the mixture or you might get an adverse chemical reaction. After materials have been brought together a coral-like growth soon begins to appear on the clinker. This increases rapidly. It also tends to form on the edges of the dish and will climb up and over them unless the edges have been rubbed with vaseline. Addition of a little more ammonia water to the dish will produce more growth after the first has stopped. Or, the whole may be allowed to dry and then kept without further change.

The second recipe calls for 1 lump of hard coal placed in a bowl, 4 tablespoons salt, 2 tablespoons bluing, 3 tablespoons water, 6 drops mercuriochrome. (Add these ingredients in the order mentioned.) A few drops of water once a week (on the side of the coal) after original mixture has been absorbed will keep it moist and growing. If the growth should go over the bowl do not put cut-off pieces in the drain, but place in the trash as the water will make it grow in the pipe. It is most interesting to watch it grow.

HUMOR(?) IN GEOLOGY

Courtesy of Tom Austin,
Austin Exploration Inc., Houston, TX

I could have worked in potential field geophysics, but I didn’t have a magnetic personality.
I could have worked hard and become a seismologist, but I didn’t want to make waves.
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