

SHADED ELEVATION MAP OF OHIO

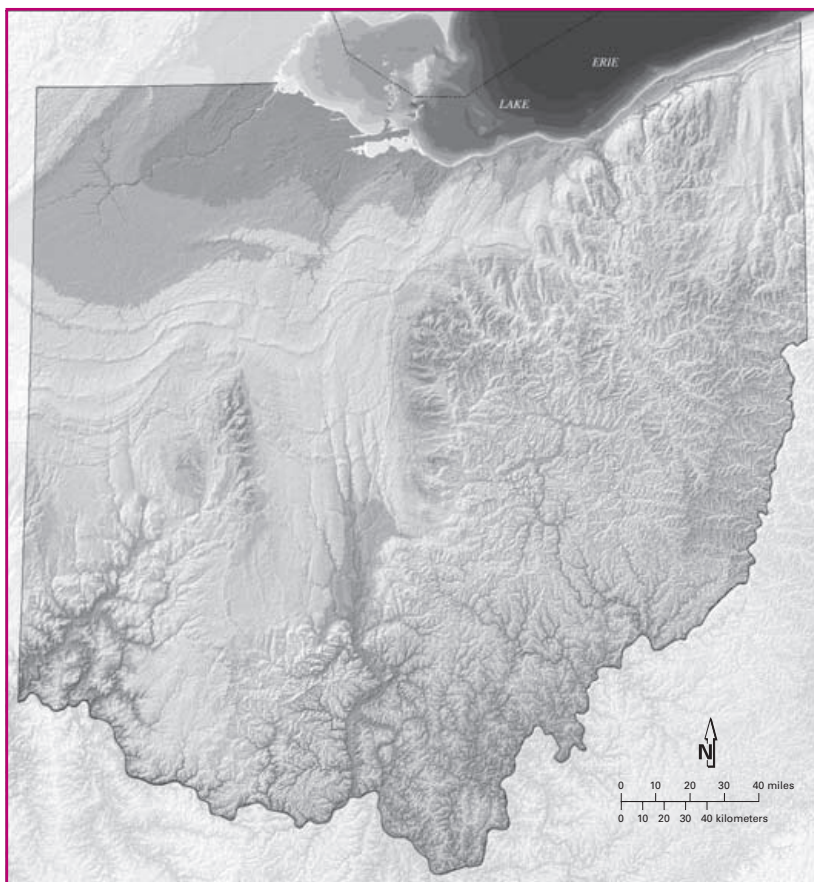
by E. Mac Swinford

The Ohio Division of Geological Survey has released an exciting new map product—a shaded elevation map—that will be of interest to those fascinated with the natural history of the state. This digitally derived map shows details of Ohio's topography unlike any map of the past and represents a powerful tool for visualizing many aspects of the geology of Ohio. Subtle surface features appear vivid on the map and make it easier to explain and understand the geologic processes that created these features.

The shaded elevation map depicts the topographic relief of Ohio's landscape using color to represent elevation intervals. The colorized topography has been digitally shaded from the northwest slightly above the horizon to give the appearance of a three-dimensional surface. The map is based on elevation data from the U.S. Geological Survey's National Elevation Dataset; the grid spacing for the data is 30 meters. Lake Erie water depths are derived from National Oceanic and Atmospheric Administration data.

Survey geologist Rick Pavey performed the initial investigation into generating a shaded elevation map for Ohio and produced a prototype of the map using ESRI software products. Survey GIMS Specialist Donovan Powers improved early versions of the map by resampling the National Elevation Dataset and recontouring large portions of the western half of the map to smooth the coarse, box-shaped depictions of the landscape. He also improved the shading to enhance the relief, added the Lake Erie bathymetry data, and enhanced other features to make the map more readable. Some of Ohio's more striking topographic features, outlined on the map on p. 3, are described below.

1 Glacial boundary—This boundary marks the southernmost extent of glacial ice in Ohio. Between 300,000 and 14,000 years ago, a series of continental ice sheets up to thousands of feet thick sculpted about two-thirds of Ohio's landscape. Upon melting, these glaciers deposited material formerly incorporated in the ice. Topography in the glaciated portion of Ohio is smooth compared to the highly dissected, unglaciated part of Ohio. The glacial boundary in eastern Ohio is farther north than the boundary in western Ohio because the erosion-resistant bedrock hills in eastern Ohio impeded southward glacial advances. The glacial boundary in central and southwestern Ohio typically represents the maximum advance of Illinoian-age (130,000 to 300,000 years ago) glaciers. The east-west-oriented

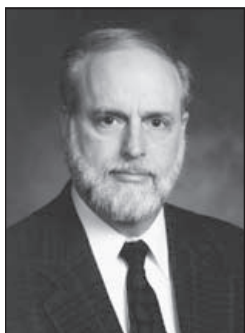


Shaded elevation map of Ohio

boundary in northeastern Ohio represents the maximum advance of Wisconsinian-age (14,000 to 24,000 years ago) glaciers.

2 Illinoian till areas—Thin till of Illinoian age is at the surface in a 10- to 20-mile-wide belt between the Illinoian and Wisconsinian maximum advances. (Till is an unsorted mixture of glacially deposited clay, silt, sand, and cobbles.) Terrain in this belt is typically transitional between the generally flat Wisconsinian till plains to the west and the dissected, unglaciated bedrock to the east. The surface deposits in this belt are characterized by loess (wind-blown silt) over thin till on ridge tops and thick colluvium (weathered bedrock) on slopes.

3 Ohio's highest elevation—Campbell Hill, the highest elevation in Ohio at 1,549 feet above sea



Thomas M. Berg, Division Chief and State Geologist

From The State Geologist...

Thomas M. Berg

TRANSFORMATIONS AT THE OHIO GEOLOGICAL SURVEY

These are beyond doubt the worst economic times I have experienced in my 38 years of state geological survey work. The Ohio Geological Survey is losing some of its most highly experienced and talented staff members. Due to the present economy and revenue shortfalls in state government, the Department of Natural Resources has offered early retirement incentives (ERI's) to eligible employees. In the second round of ERI's for fiscal year 2003, we have lost our Editor—**Merrienne Hackathorn**, our OhioSeis Coordinator, Geologic Hazards Officer, and *Ohio Geology* Editor—**Dr. Michael C. Hansen**, and our Boat Captain and Senior Researcher in our Lake Erie Geology Group—**Dale L. Liebenthal**. I do not deprecate these valuable professionals for taking advantage of the ERI, but each would have continued their careers a bit longer were it not for the economic constraints we are experiencing in state government.

Merrienne Hackathorn has B.S. and M.S. degrees, in biology and geology, respectively, from Bowling Green State University. She joined the Survey in 1973 as an assistant editor. As Editor, she has played a vital role in producing our publications and maps. Even as we have moved into the digital world with plot-on-demand and Web-enabled products, she worked to correct our spelling, punctuation, grammar, sense of meaning, and logic. Authors often get so close to their research and report writing that they become "blind" to errors. Merrienne has the unique capability of being able to see and root out those errors. Survey geologists, including myself, have often gone to her for help with important correspondence. One of her greatest achievements was in assembling the award-winning volume titled *Fossils of Ohio*, together with Rodney M. Feldmann of Kent State University. Merrienne oversaw recycling of paper, plastics, and glass at the Survey with much enthusiasm. She maintained our library, making sure that exchange volumes made their way to Orton Library at The Ohio State University. She also looked after social gatherings at the Geological Survey, including our annual awards luncheon and our "winter picnic." Merrienne will be greatly missed, but I am sure she will drop around to visit from time to time.

Mike Hansen began work at the Division of Geological Survey in 1972 after completing his masters degree at Ohio University. His first assignment was to work on educational aspects of Earth science. Mike wrote educational leaflets, gave many technical and popular presentations, was responsible for media relations, handled matters relating to paleontology and earthquakes, and conducted geologic mapping in northeast Ohio. In mid-1981, the first issue of *Ohio Geology* was published with Mike Hansen serving as its editor. This quarterly publication has been faithfully issued up to the present, although the publication schedule has been affected lately by budget cuts. Mike wrote lead articles for over two decades, covering a huge spectrum of geological subjects. His articles focused on mineral resources, earthquakes, gold and diamonds in Ohio, coal, meteorites, salt, unusual fossils, landslides, natural bridges, Lake Erie, mastodons, indoor radon, and many other subjects. Mike wrote a series focusing on the geologic systems in Ohio, starting with the Precambrian, and continuing in separate issues of *Ohio Geology*, with the Cambrian, Ordovician, Silurian, Devonian, and Mississippian. We fully expect that he will complete the Pennsylvanian, Permian, and Quaternary. Mike obtained his doctoral degree from The Ohio State University in 1986, and his dissertation focused on Paleozoic fish fossils. As the Survey's Geohazards Officer, he fielded all kinds of media contacts about landslides, indoor radon, and especially earthquakes. From 1998 to the present, Mike has been responsible for building and maintaining the Ohio Seismic Network called OhioSeis. Working with the Ohio Emergency Management Agency and a large number of volunteers, Mike was able to establish a 23-station network of seismometers and computerized recording devices. Data from events all over the globe and from seismically active areas of Ohio are now providing information about deep crustal structures never before seen. Mike's move into retirement leaves a great void here at the Geological Survey and he will be greatly missed. For my part, what I will miss the most is the intellectual stimulation that Mike is always able to elicit on any facet of geology. We hope to see him as a regular visitor.

Dale Liebenthal began work for the Ohio Department of Natural Resources' Division of Wildlife after graduation from Sandusky High School in 1963. State Geologist Ralph Bernhagen hired Dale as a Geology Technician in 1964 to serve in the Survey's Lake Erie Section. He continued in that position until 1969, when he took a break from state employment and went to work in private industry. In 1972, he returned to the Survey and worked with Walt Lemke, who was the Captain of the Survey's 48-foot research vessel, the *GS-1*. He succeeded Walt as Captain of the *GS-1* in 1976. Dale served in the Army Reserves during the 1960's and received his diploma as Engineer Officer-Advanced Course, leaving with the rank of Captain. In 1992, he was promoted to the position of Researcher 2, and continued to captain the Division's research vessels. Dale Liebenthal was deeply devoted to providing the basic geologic information needed to manage Lake Erie's resources. He maintained a network of eight water-level gages from the 1960's to the 1980's. He helped collect more than 87 miles of nearshore bathymetric profiles. He collected and analyzed hundreds of sediment samples. He inventoried shore-protection structures along more than 200 miles of lakeshore in the 1970's. During the Survey's cooperative project with the USGS in the 1990's, Dale skippered the *GS-1* and *GS-3* to collect more than 2,000 miles of sidescan sonar surveys in nearshore waters of Lake Erie. In the 1990's, he helped locate a tugboat that sank offshore from Lakewood and an airplane that crashed off Cleveland. He personally developed design specifications for the research vessel *GS-3*. Dale worked successfully with many different agencies including the ODNR Divisions of Engineering, Natural Areas and Preserves, Wildlife, Watercraft, Real Estate and Land Management, Coastal Management Program, and Parks and Recreation. He also worked with the Lake Erie Protection Fund, the Great Lakes Protection Fund, the U.S. Army Corps of Engineers, the U.S. Geological Survey, Ohio Sea Grant, the Ohio Historical Society, the Ohio EPA, many Ohio colleges and universities, and the National Aeronautics and Space Administration. Dale helped designate the 30-year coastal erosion areas for Ohio in the mid-1990's. He authored or coauthored over 20 reports, articles, and abstracts having to do with Lake Erie. Most assuredly, Dale will be sorely missed at the Geological Survey and in our Lake Erie Geology Group. Most of all, I will miss Dale's upbeat spirit, good humor, and can-do attitude.

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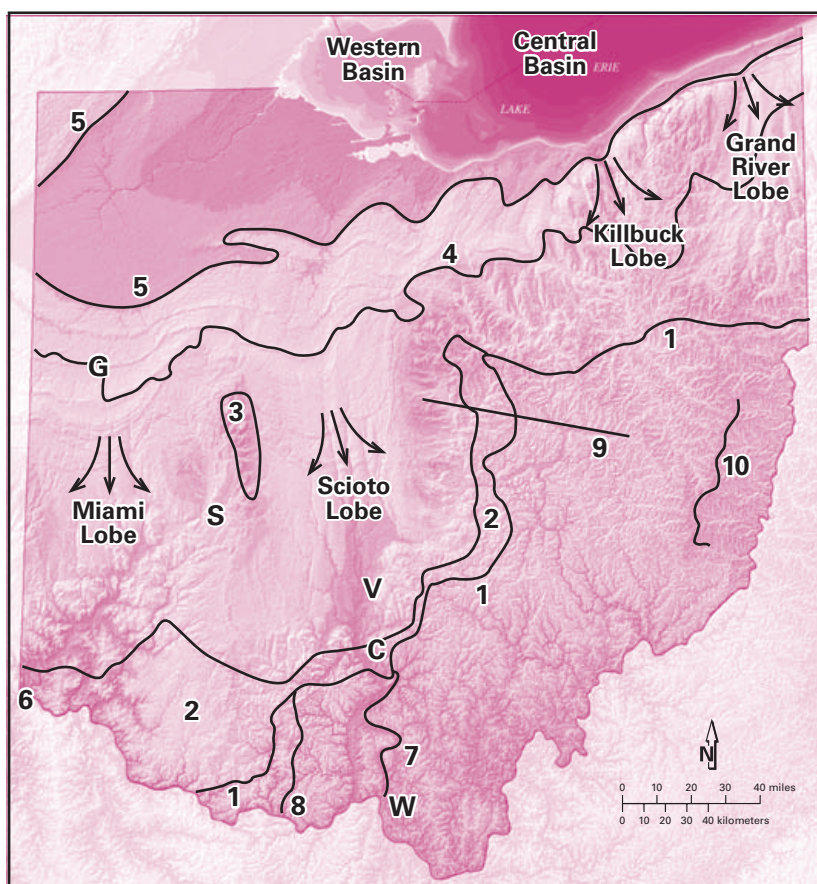
Bob Taft, Governor
Sam Speck, Director

continued from page 1

level, lies on the Bellefontaine Outlier, an upland area that covers portions of Champaign, Logan, and Union Counties in west-central Ohio. The outlier is an erosional remnant of Devonian-age limestone, dolomite, and shale that lies 25 miles west of the main outcrop belt of Devonian-age rock in Franklin and Delaware Counties in central Ohio. The outlier is mantled by up to 160 feet of till, which adds to the outlier's height. The higher, more resistant bedrock of the outlier impeded the southward-advancing glaciers, causing them to split into two lobes, the Miami Lobe on the west and the Scioto Lobe on the east. Ridges of thick accumulations of glacial material, called moraines, drape around the outlier and are distinct features on the map. Some moraines in Ohio are more than 200 miles long. Two other glacial lobes, the Killbuck and the Grand River Lobes, are present in the northern and northeastern portions of the state.

4 Eastern Continental Divide—A continental drainage divide extends east-west across northern Ohio. Surface water north of this divide flows northward to Lake Erie, over Niagara Falls into Lake Ontario, and eventually into the Atlantic Ocean. Surface water south of the divide flows south to the Ohio River, the Mississippi River, and eventually into the Gulf of Mexico. The divide follows the crests of glacial moraines in western Ohio. In north-central and northeastern Ohio, the divide follows bedrock-controlled hills and glacial valleys containing thick glacial-lake deposits.

5 Ancient Lake Maumee shoreline—About 14,000 years ago, the last continental ice sheet retreated northward across Ohio. The St. Lawrence River was blocked by glacial ice, and glacial meltwater created lakes in front of the ice. A large lake, called Lake Maumee, formed in the general position of Lake Erie but extended over a much larger portion of northwestern Ohio. Ancient Lake Maumee water levels were about 230 feet higher than modern Lake Erie and drained westward into the Wabash River system. The shoreline of ancient Lake Maumee had a series of sandy beaches and beach scarps, much like portions of Lake Erie today. The ancient sandy beaches are visible on the map as long, thin ridges on the surrounding flat lake terrain. Other beach ridges formed as the water level receded in stages before rebounding to its current level of approximately 573 feet above sea level. Lake Erie is the shallowest of the Great Lakes and has three basins: the western (averages 30 feet in depth), central (averages 60 feet in depth), and eastern (not shown on map; averages 80 feet in depth; maximum depth is about 212 feet). The flat landscape in northwestern Ohio is characteristic of the physiographic province called the Lake Plain and is generally poorly drained. At the time of Ohio's early settlement, this area was largely covered in standing water or soggy ground and was known as the Black Swamp. The Black Swamp represented a major barrier to movement in the region. The eventual drainage of the swampy



Direction of ice flow in glacial lobes

C = Chillicothe
G = Grand Lake St. Marys
S = Springfield

V = Circleville
W = Wheelersburg



The sinuous linear feature coming from the bottom center (arrow) of this aerial photo is a beach ridge in north-central Ohio. Roads and houses commonly are located on beach ridges because the topographic relief and sandy soil provide good drainage.



Eastward view across an abandoned segment of the preglacial Teays River valley near Wheelersburg, Scioto County. The valley is about 1.5 miles wide at this point and 150 feet higher in elevation than the modern Ohio River. Photo by Wilber Stout.

area by about 1885 opened up northwestern Ohio to settlement and farming of the fertile soil.

6 Ohio's lowest elevation—The lowest surface elevation in Ohio is about 455 feet above sea level and is located where the Ohio River exits the state at the extreme southwestern corner of Ohio. The Ohio River enters the state near East Liverpool in Columbiana County at 665 feet above sea level, some 210 feet higher than where it exits the state.

7 Teays River valley—The ancient Teays River flowed across Ohio before and during the earliest Ice Age. A north-south-trending remnant of the Teays River valley in south-central Ohio is distinctly visible on this map. From its headwaters in North Carolina, the Teays River flowed northwest across Virginia and West Virginia and entered Ohio in the area of present-day Wheelersburg. The Teays River cut a wide, curving valley as it flowed northward through southern Ohio. This valley, partially filled with clay, silt, and sand, contains only small streams today and remains clearly visible on the map as far as Chillicothe (**C** on map on p. 3). North of Chillicothe, the valley is buried beneath hundreds of feet of glacial sediment but can be traced using well data to Circleville (**V** on map); the buried valley then turns northwestward, passing beneath Springfield (**S** on map) and Grand Lake St. Marys (**G** on map) and into eastern Indiana. In parts of western Ohio, the valley lies beneath 700 feet of glacially derived material. The valley commonly is about 200 to 300 feet deep and has steep to near-vertical walls. The Teays River valley was abandoned or buried when southward-advancing glaciers dammed the river, causing lakes to form. Deposits from these lakes (lacustrine silt and clay) remain along some hillsides in southeastern Ohio and today can be prone to landslides. Rising lake levels found new exit routes, cut new valleys in the landscape, and eventually formed the modern Ohio River valley.

8 Allegheny Escarpment—Beyond the glacial boundary, the Allegheny Escarpment of southern

Ohio marks a distinct change in topography. The land surface changes abruptly from the flatter, lower terrain in the west, which is underlain by soft carbonate rocks of Silurian age, to the higher, steeper terrain in the east, which is underlain by shale and sandstone of Devonian and Mississippian age. To the north, the escarpment was affected by glaciation, making it a less distinct topographic feature. The Allegheny Escarpment corresponds to a slight increase in the dip (tilt) of the rock layers as they descend eastward into the Appalachian Basin.

9 Surface lineament—A west-northwest-trending lineament (a linear topographic feature on the Earth's surface) across east-central Ohio is distinctly visible on the map. The Walhonding River and a portion of the Muskingum River flow in portions of this linear topographic depression. This lineament has been referred to as the Coshocton Fracture Zone by Greg Mason, a geologist with the NGO Development Corp. Although poorly understood, the Coshocton Fracture Zone has been attributed to fractures in the surface bedrock that are possibly related to faults present deeper in the subsurface. These zones of weakness were preferentially eroded by water, producing the wide valleys present at the surface today. Mason postulated that the fault zone may have influenced oil and gas migration and production along its extent.

10 Flushing Divide—A sharp, north-northeast-trending ridgelike feature in eastern Ohio is the Flushing Drainage Divide, named after the Belmont County village of Flushing, where it is well developed. Surface water west of the divide flows westward into a series of low-gradient creeks, such as the Sandy, Conotton, and Stillwater, and then to the Tuscarawas River. Surface water east of the divide flows eastward into a series of high-gradient, rapidly down-cutting creeks that flow into the Ohio River. The ridge is at an elevation of about 1,260 to 1,280 feet above sea level and separates two old Teays-era drainage basins.

HOW TO OBTAIN THE SHADED ELEVATION MAP

A page-size version of the *Shaded elevation map of Ohio* is available in Adobe's Portable Document Format (PDF) on the Division of Geological Survey's Web site at <www.ohiodnr.com/geosurvey/>. Plot-on-demand copies of the detailed, wall-size version (scale 1:500,000) of the map may be ordered from the Ohio Division of Geological Survey, 4383 Fountain Square Drive, Columbus, OH 43224-1362, telephone: 614-265-6576, fax: 614-447-1918, e-mail: geo.survey@dnr.state.oh.us. Cost is \$10.00 plus \$3.08 tax and mailing; please include \$1.50 for a mailing tube if a rolled copy is desired. Visa and MasterCard are accepted. The 1:500,000-scale map can be plotted in bright spectral colors or in Earth tones, so please specify your preference. A PDF file of the 1:500,000-scale map is available on CD-ROM for \$10.00 plus \$3.08 tax and mailing.

FURTHER READING

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The Allegheny Escarpment as seen looking east from Locust Grove Cemetery in Adams County. Flat terrain in the foreground is underlain by soft carbonate rock. The sharp rise and high-relief terrain in the background consist of more resistant sandstone and shale. The Berea Sandstone caps the flat-topped hills in the background.

Dr. Richard D. Hoare awarded the Mather Medal

Dr. Richard D. Hoare, Emeritus Professor of Geology at Bowling Green State University, is the 2002 recipient of the Mather Medal, the highest honor of the Ohio Division of Geological Survey. The Mather Medal is awarded in recognition of significant, lifelong contributions to the geology of Ohio and is named in honor of William W. Mather, the first State Geologist of Ohio (1837-1838). Dr. Hoare accepted the award at a banquet held in Columbus in October. More than 40 family members, colleagues, and friends gathered to honor Dick.

During his 44-year career at Bowling Green State University, Dick Hoare has published more than 60 technical papers pertaining to the geology of Ohio, particularly on the rich fossil deposits found in marine rocks of Pennsylvanian age in eastern Ohio. This is a greater number of Ohio paleontological papers than produced by such prolific icons of science as John S. Newberry and August F. Foerste. And Dick is still publishing!

Most of these contributions have appeared in peer-reviewed paleontological journals, but Dick has been a co-author, primarily with the late Myron T. Sturgeon, the first Mather Medal recipient, of major summary bulletins on brachiopods, bivalves, cephalopods, and trilobites from Pennsylvanian rocks of Ohio. The Ohio Division of Geological Survey has been honored to publish these important and lasting contributions to our science.

Dick Hoare was born in 1927 in Rosiclair, Illinois, an area famous for fluorite mines. His first introduction to fossils was by his older brother, who worked for the U.S. Geological Survey in Alaska. When Dick enrolled at Augustana College, he had his sights set on being an engineer. However, he took a course in paleontology and became hooked on studying the life of the past.

After completing a Ph.D. in geology at the University of Missouri at Columbia, Dick took a job as a professor at Bowling Green State University (BGSU) and never left. In 1958, Dick met Myron Sturgeon of Ohio University on an intercollegiate field trip and began a more than 40-year friendship and collaboration with Myron on Pennsylvanian fossils. Myron invited Dick to work on a collection of Pennsylvanian chonetid brachiopods that Myron had assembled at Ohio University. This initial study led to publication of Ohio Division of Geological Survey Bulletin 63, *Pennsylvanian brachiopods of Ohio*, the first in a series planned to describe the entire Pennsylvanian marine fauna of Ohio. Although the entire series was not completed, the volumes on brachiopods, bivalves (clams), cephalopods, and trilobites would never have been published without the expertise and assistance of Dick Hoare.

Dick's paleontological versatility is amazing.



Dr. Richard D. Hoare receiving the Mather Medal from State Geologist Thomas M. Berg.

In recent decades, paleontologists have specialized in one small group of fossils of a particular age. Such specialization is necessary to be a master of the subject. Dick has the remarkable ability to be a master of many groups of fossils and to write authoritative papers that have appeared in the leading scholarly journals. He has described many groups of fossils, from ostracods to peccaries, and ranging in age from Devonian to Pleistocene. As testimony to his diversity of knowledge, Dick authored three chapters in the Survey's highly acclaimed *Fossils of Ohio* bulletin. He could easily have written many more chapters and, indeed, could have written the entire book!

Dick's work on fossil chitons from Pennsylvanian rocks of Ohio gained attention from the world paleontological community, and he began to receive specimens from around the globe. As a result of this work, Dick has become a world authority on chitons and has published numerous papers on these interesting and rare fossils.

In addition to publishing an astonishing quantity of paleontological papers, Dick was chairman

of the Department of Geology at BGSU for 11 years, served for four years as Associate Vice-President for Academic Affairs at BGSU, and was editor of the *Journal of Paleontology*, the most respected journal in this field, for four years. As a teacher, Dick was a mentor to many students. At least 15 theses on Ohio geology were completed by his students.

In 1990, Dick retired from full-time teaching and administrative work in the Department of Geology at BGSU. "Retirement" gave him the opportunity to spend even more time working on his beloved fossils. During his emeritus years, Dick has continued to publish; his papers are almost a regular feature of the *Journal of Paleontology*.

Dr. Richard D. Hoare has established himself among the icons of Ohio geology—giants such as Newberry, Orton, Foerste, and Stout. We are privileged to know him not only by his remarkable work, but personally as a warm, kind gentleman. Thus, the Division of Geological Survey is honored to present the Mather Medal to Dr. Richard D. Hoare.

—Michael C. Hansen

THE REMARKABLE STATUES AT BAUGHMAN PARK, MUSKINGUM COUNTY, OHIO



George Washington

A hill in Muskingum County east of Newark that seems identical to the other hills in the Appalachian Plateau region of Ohio is actually a unique treasure. This unremarkable hill is home to Baughman Park, a long-forgotten area containing amazing statues carved from a Pennsylvanian-age sandstone of the Pottsville Group quarried on the property.

Brice Baughman was a local undertaker whose passion for stone carving is highlighted throughout the park. Beginning in early childhood during the 1880's, Brice would carve figures into the rock outcrops on his father's 42 acres. Though it is impossible to determine the exact chronological order of his early carvings, the images that remain scattered about the hillside reveal an increasing amount of detail and sophistication. Brice seemed to like to bring life from the stone, concentrating on animals or human faces. In 1898, his father opened a sandstone quarry to supply the nearby Pennsylvania railroad. Brice now had tons of quarried sandstone to practice on and perfect his natural talent for stone carving.

It is the free-standing, larger-than-life statues sculpted by Brice Baughman that are his lasting legacy. He concentrated on famous people in American history, particularly U.S. presidents. It is believed that the first statue he carved was William McKinley in 1898 and the last was Warren G. Harding in 1927. His other major works, in general chronological order, include Abraham Lincoln; James B. McPherson, a major general in the Union Army; James A. Garfield; Ulysses S. Grant; George Washington; The Doughboy, a World War I soldier; William T. Sherman, a Union Army general; and Theodore Roosevelt. As Brice Baughman's skills and reputation grew, crowds became larger at each

statue unveiling. When the statue of Harding was dedicated on June 12, 1927, an estimated 10,000 people attended the event. Brice was never paid a commission for any of his work and began to think of the hill as a memorial, often allowing the public to use his land for picnics. In 1931, the Governor of Ohio, Vic Donahey, honored Brice Baughman's work by dedicating the hill as "Baughman Memorial Park." The Ohio Department of Transportation highway map still recognizes the park as a point of interest, though few people know it exists and is not presently open to the public.

Brice eventually could no longer take care of the park. The land sat idle for many years and eventually was sold. Vandalism has taken its toll. In 1968, vandals broke off the heads of two statues in the park, Roosevelt and Sherman. Roosevelt's head was eventually returned and reattached, but Sherman's head and a hand were never recovered. Considering the age and lack of preservation, the statues are in very good condition. The land is currently owned by the Longaberger Company, which is carefully maintaining the statues and evaluating future public access. Occasionally, tours of the park are scheduled. Baughman Park is not only a testimony to one man's self-taught artistry, but shows the convergence of local geology and the inspiration to make the rocks come alive.

FURTHER READING

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—Mark E. Wolfe

Gregory A. Schumacher *Employee of the Year for 2002*

Gregory A. Schumacher, Senior Geologist in the Geologic Mapping Group, received the Employee of the Year award for 2002. Division Chief Thomas M. Berg presented Greg with a plaque recognizing his achievement at the Division's annual holiday luncheon and awards ceremony. Greg was chosen as the 2002 recipient by a special committee selected to review nominations submitted by fellow staff members.

Greg has worked on most major projects that the Geologic Mapping Group has been challenged with over the past 19 years, including the geologic report for siting the Super-conducting Super-Collider, mapping of known and probable karst in

Ohio, drilling bedrock cores in southwestern Ohio, and describing the cores drilled in the Serpent Mound structure. Through most of the 1990's, Greg's work time was consumed by remapping the bedrock geology and bedrock topography of Ohio. This seven-year project showed that Greg's dedication and performance on the job is without peer. Throughout his Survey career, Greg has frequently given presentations at professional meetings and societies on technical topics concerning the geology of Ohio.

Recently, Greg has transitioned from mapping bedrock to mapping surficial geology. This change was made with enthusiasm and commitment and is a testament to his considerable geologic abilities, professional attitude, and dedication to the Survey and its mission.

Greg's expertise and passion has always been with the study of rocks of Ordovician age in southwestern Ohio. Many years after mapping the bedrock of southwestern Ohio, Greg remains committed to researching and publishing results of investigations concerning the stratigraphy and paleontology of Ordovician-age rocks in Ohio. Greg currently is serving a term on the Editorial Board of the Ohio Journal of Science.

Greg joined the Survey in 1984 and has a B.S. degree in geology from Wright State University and an M.S. degree in geology from the University of Cincinnati. Greg, his wife, Rita, and their son, Benjamin, live in Delaware County along with their numerous pets. Greg's personnel interests include world history, gardening, and woodworking.



State Geologist Thomas M. Berg presenting Gregory A. Schumacher with the Employee of the Year award.

OHIO'S MINERAL INDUSTRIES & THE ENVIRONMENT TEACHERS WORKSHOPS

Forty-three K-12 teachers from Ohio investigated the issues surrounding Ohio's mineral resources, mining, reclamation, and environmental protection during the 16th annual Ohio's Mineral Industries & The Environment—North and South workshops sponsored by the Ohio Department of Natural Resources, Division of Geological Survey and the University of Akron, Department of Geology. The northern Ohio workshop was conducted June 24-28, 2002, and was based at the University of Akron. The southern Ohio workshop was conducted July 8-12, 2002, and was based at Survey facilities in central Ohio.

For a fourth consecutive year a large number of sponsors provided financial assistance that covered half to three-fourths of each participant's tuition cost. The Ohio Aggregates & Industrial Minerals Association and seven of its member companies contributed grants totaling over \$14,000; these companies include American Sand & Gravel, Belden Brick Company, Holmes Safety

Association, Kimble Clay and Limestone Company, Olen Corporation, Shelly Materials, Inc., and Watson Gravel, Inc. Additional financial assistance was provided by the American Coal Foundation, Eastern Section of the American Association of Petroleum Geologists, Northern Ohio Geological Society, Ohio Coal Association, Ohio Geological Society, Ohio Oil and Gas Energy Education Program of the Ohio Oil & Gas Association, Ohio Chapter of the Society for Mining, Metallurgy, and Exploration; Ohio Section of the American Institute of Professional Geologists, and Women in Mining.

PLEASE NOTE that the Ohio Mineral Industries & The Environment teachers workshop will undergo a change for 2003. Conducting two, weeklong, high-quality workshops for graduate-or undergraduate-level college credit requires considerable staff time and funding, both of which have been severely diminished since September 2001. As a result, the Ohio Division of Geological Survey must suspend its co-sponsorship of these

workshops, at least temporarily. Survey staff will continue to provide assistance in the form of workshop presentations, but workshop coordination will be managed solely by the University of Akron. Dr. David McConnell, Department of Geology, University of Akron, intends to run the northern workshop June 23-27, 2003. The southern Ohio workshop will not be

offered in 2003. Toward the end of 2003, the Division will re-evaluate its ability to participate in and co-support in these workshops. To enroll for the northern workshop, you must register for 2 semester hours of graduate or undergraduate credit through the University of Akron. For registration and fee information, please contact Dr. David McConnell,

Department of Geology, University of Akron, Akron, OH 44325-4101; telephone: 330-972-8047, fax: 330-972-7611, e-mail: dam6@uakron.edu.



EARTH SCIENCE WEEK 2002

On Sunday, October 13, 2002, staff members of the Geological Survey participated in the 5th Annual Earth Science Week Expo at Highbanks Metro Park, north of Columbus in Delaware County. Survey geologists volunteered their time to display examples of maps, rocks, and samples and answer questions from hundreds of park visitors. Various topics concerning the geology of Ohio were highlighted. Division Chief Tom Berg displayed information concerning geohazards such as karst, earthquakes,

landslides, and radon. Greg Schumacher brought examples of fossils from Ohio rocks from his personal collection. Mac Swinford displayed glacial and bedrock maps and discussed landforms in Ohio. Mac noted that the new shaded elevation map (see p. 1) was a very popular item at his station. Merriane Hackathorn had the most popular station—she distributed nearly 200 free Ohio rock and mineral sets to teachers, Scouts, and interested children and adults at the Expo.



Earth Science Week participants study the Quaternary map of Ohio. Photo by Mac Swinford.

2001 Report on Ohio mineral industries now available

The *2001 Report on Ohio mineral industries* contains production and employment information and operator directories for minerals produced in Ohio as well as information on oil and gas wells drilled in the state. The report includes a *Mineral industries map of Ohio* (black and white, scale approximately 1:750,000, or 1 inch equals about 12 miles). The report is \$10.00 plus tax and shipping and can be ordered from the Ohio Division of Geological Survey, 4383 Fountain Square Drive, B-2, Columbus, OH 43224-1362; telephone 614-265-6576; fax: 614-447-1918; e-mail: geo.survey@dnr.state.oh.us. Visa and MasterCard are accepted. The *2001 Report on Ohio mineral industries* also can be viewed in PDF format on the Survey's Web site at <<http://www.ohiodnr.com/geosurvey/ogcim/minstat/minstat1.htm>>.

Ohio Geology

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