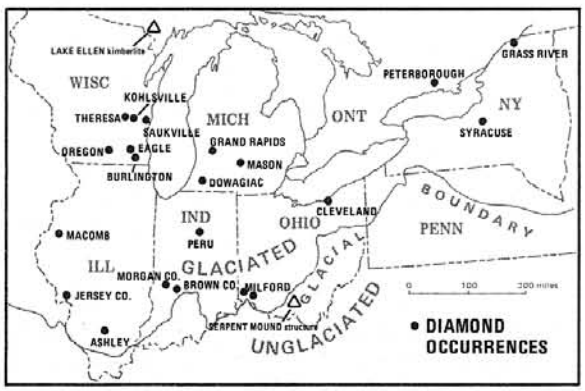
FALL 1982

Ohio Geology Newsletter

Division of Geological Survey

DIAMONDS FROM OHIO

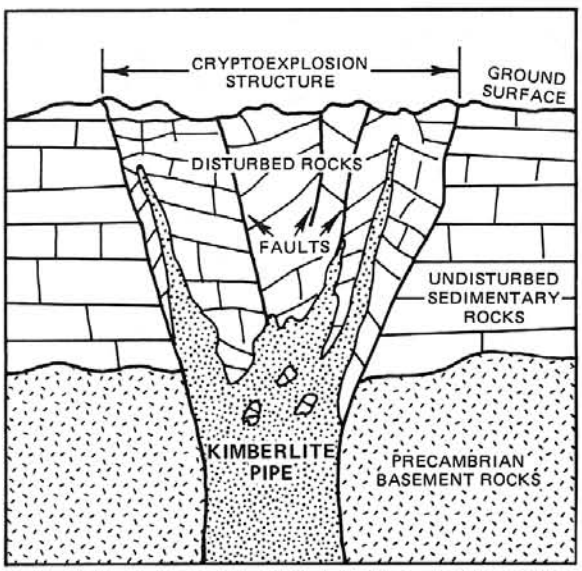
The discovery of precious commodities such as diamonds, gold, or silver captures the imagination of most people, and such discoveries have frequently touched off "rushes," which are commonly well attended by swindlers and other con men. Although Ohio has never experienced a large-scale "rush" for a precious commodity, there has been interest in the occasional discoveries of diamonds in the state.



Approximate distribution of drift diamonds. Dots may represent more than one discovery. Modified from Gunn, 1968.

Three diamonds have been reported from Ohio, all discovered in the last century in glacial drift deposited by the glaciers of the Ice Age. The Ohio discoveries form part of a relatively large area of occurrence known as the Great Lakes diamond field. The largest number of diamonds have been found in Indiana (34), followed by Illinois (25), Wisconsin (16), Michigan (3), New York (3), Ohio (3), and Ontario (1). All of these occurrences were in glacial sediments; the diamonds therefore have been transported from their original source by glacial ice. With these facts in mind, numerous people have attempted to determine the original source of the diamonds by charting the locations of the discoveries and projecting, along the paths followed by glacial ice, to a point of convergence generally somewhere in the vicinity of James Bay, Canada.

Diamonds have a primary source only in kimberlite, a type of igneous rock that forms deep within the earth's crust and makes its way to or near the surface through pipelike intrusions. Recently W. F. Cannon (U.S. Geological Survey) and M. G. Mudrey, Jr. (Wisconsin Geological and Natural History Survey) discovered a kimberlite pipe near Crystal Falls in Michigan's Upper Peninsula close to the Michigan-Wisconsin border. This highly weathered and poorly exposed kimberlite, known as the Lake Ellen kimberlite, has not produced diamonds as yet. However, Cannon and Mudrey speculate that this deposit, or



Cross section of a kimberlite pipe and its surface expression as a cryptoexplosion structure. Modified from Cannon and Mudrey, 1981.

perhaps other undiscovered ones like it in the area, could be the source of the Great Lakes drift diamonds, at least in Wisconsin and perhaps other nearby states such as Indiana, Illinois, Michigan, and Ohio. Occurrences in New York and southern Ontario appear to have been too far east to have been derived from this source.

Cannon and Mudrey further suggest that these kimberlite intrusions have a surface expression in the form of a circular-shaped area of highly deformed strata known as a cryptoexplosion structure. Such structures are not uncommon in the midwest; indeed, Ohio has one of these features, the Serpent Mound cryptoexplosion structure. This feature, located in northern Adams County, has been the object of much study and speculation. George Botoman, a Survey geologist, has suggested that the Serpent Mound structure may represent a kimberlite intrusion because of many similarities between it and the northern Michigan intrusion. No kimberlite is exposed at Serpent Mound, however, because erosion has not removed the overlying layers of sedimentary rock as in the Lake Ellen structure. This lack of erosion, along with the fact that the Serpent Mound structure is too far south (it is on the glacial border), indicates that it could not have been a source of drift diamonds. Cannon and Mudrey also emphasize that on a worldwide basis only one in 10 kimberlites are diamond bearing and only one in 100 have diamonds in commercially economic quantities. Should the

continued on next page

ODNR
Ohio Department of Natural Resources
James A. Rhodes, Governor • Robert W. Teater, Director • Horace R. Collins, Chief

Chief's corner by Horace R. Collins

The season for preparing the next biennial budget request for the Division of Geological Survey is here again. As briefing documents on the work of the Survey were being prepared we felt as if we were once again reinventing the proverbial wheel. However, as this process neared completion we were strongly reminded of the tremendous importance of geology and mineral resources to Ohio and to the large number of individuals, companies, and agencies who are served each year by the Survey.

During the past biennium over 887,000 reports, maps, and records were distributed by the Division. These large numbers are not surprising when we remember that the users of geologic data cover the spectrum of Ohio society. Several thousand people representing industry, trade associations, governmental and quasigovernmental organizations, lawyers, educators, engineers, realtors, environmentalists, scouting groups, and private citizens were advised or otherwise assisted with matters pertaining to geology of Ohio. Private-industry representatives, from some of the largest multinational corporations down to companies with only one employee, were equally served in the acquisition of information needed to further the work of their respective businesses. Governmental officials ranging from those wanting to stimulate development to those responsible for regulating such development were similarly served with equal attention. The breadth of interest and range of people being assisted cause us to state again what has been said previously in this column. Wise use of minerals, well-informed public policies, healthy, productive mineral industries, adequate protection of the environment, planning and zoning ordinances, and information to assist individual citizens, private industry, and governmental agencies all depend on reliable, objective geologic and mineral-resource data on which to make informed decisions. Although individuals or agencies may disagree on the best course of action to follow on many of these matters, almost no one disagrees on the need for gathering information on which to formulate opinions. The collection, interpretation, and publishing of such data and making the data available to the public have been the role of the Division of Geological Survey since its inception in 1837. The great number of visitors to the Division and the huge numbers of technical documents distributed over the past two years tells us that the services of the Geological Survey are still very much in demand.

OHIO GEOLOGY

A newsletter published quarterly by the Ohio Department of Natural Resources, Division of Geological Survey, Fountain Square, Columbus, Ohio 43224.

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News items, notices of meetings, etc. should be addressed to the attention of the editor. Change of address and new subscriptions should be addressed to the attention of the secretary.

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Serpent Mound cryptoexplosion structure turn out to be a kimberlite intrusion the odds are against it being diamond bearing.

The three diamonds reported from Ohio were all accidental discoveries and have been summarized in an article by C. B. Gunn. The first stone was found about 1870 in the bed of a stream about 4 miles south of Cleveland, Cuyahoga County. This stone was reportedly of fine quality and sold in Boston for $10,000.

The second Ohio diamond was discovered sometime prior to 1880 by a laborer working a boulder-crushing machine in Cincinnati. This stone was reported to be of fine quality and weighed 0.8 carat.

The third diamond reported from Ohio was a white octahedron weighing 6 carats. This stone was found by two small daughters of J. R. Taylor of Milford, Clermont County, "in or near a kettle moraine." In 1899 it was acquired by Herman Keck of Cincinnati and eventually passed to the collection of the University of Cincinnati, which supposedly possessed it in 1961. In recent years the University of Cincinnati was not able to verify the existence of the diamond in their collections.

It is immediately apparent when reviewing the roster of Great Lakes diamonds that all of them were discovered in the last century or early in this century and almost none of them had precise geological documentation. Perhaps the first thought to come to mind is that these discoveries may have been fraudulent—con games aimed at selling worthless stock to unsuspecting locals. Such schemes were prevalent in the last century, but it appears that most of the diamond discoveries in the Great Lakes field were not part of a swindle. Cannon and Mudrey point out that in many of the diamond discoveries no attempt was made to exploit them, and in some cases the diamonds were found some years before the curiosity of the discoverers motivated them to bring the "odd" stone to the attention of a jeweller or other knowledgeable person. This suggests that many of the diamonds were genuinely found under the reported circumstances.

Cannon and Mudrey also speculate on why no additional diamonds have been reported for nearly 80 years. They suggest that the "gold rush psychology" of the last century encouraged considerable prospecting in areas that today are well known to be lacking in economically important precious minerals. Cannon and Mudrey further suggest that additional diamonds may have been found but rest in boxes or drawers along with other curios, their true identities unknown to their owners. Perhaps another factor is that with 20th-century mechanization a relatively small amount of glacial drift is subjected to hand methods of removal and distribution.

Probably the greatest deterrent to discoveries of additional diamonds is that few people would recognize an uncut stone, especially in an area that has no well-known history of such occurrences. Uncut diamonds generally are small, greasy-looking, grayish to clear stones that commonly have an octahedral shape with curved surfaces. Their hardness (10

on Mohs' scale) is a sure test but few people would apply this test to an odd-looking piece of "glass."

Additional diamonds undoubtedly reside within the glacial sediments of Ohio but they are probably so widely distributed that prospecting for them would be an unrewarding task. For Ohio's next diamond discovery we will have to wait for the chance finding of an unusual pebble by some curious individual who calls it to the attention of an expert.

FURTHER READING

Cannon, W. F., and Mudrey, M. G., Jr., 1981, The potential for diamond-bearing kimberlite in northern Michigan and Wisconsin: U.S. Geological Survey Circular 842, 15 p.

Gunn, C. B., 1968, A descriptive catalog of the drift diamonds of the Great Lakes region, North America: Gems and Gemology, Summer, p. 297-303; Fall, p. 333-334.

Hobbs, W. H., 1899, The diamond field of the Great Lakes: Journal of Geology, v. 7, p. 375-388.

—Michael C. Hansen

GLACIAL GEOLOGY OF NORTHEASTERN OHIO

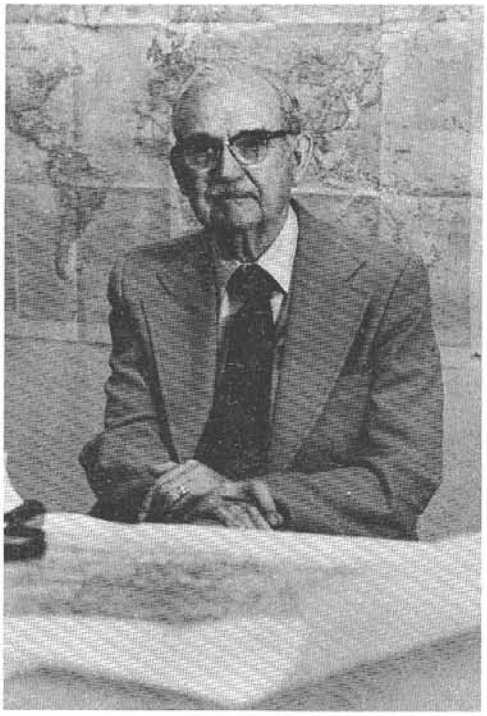
George W. White's long-awaited volume on the glacial geology of northeastern Ohio has recently been published by the Survey. This report, Bulletin 68, consists of a 75-page book containing 40 figures and 7 tables and a separate color map of the glacial deposits of northeastern Ohio at a scale of 1:250,000 (1 inch equals about 4 miles).

Bulletin 68 represents a summary of the work of Dr. White and his students in a 16-county area of northeastern Ohio spanning a period of more than 50 years. Counties dealt with in this report are: Ashland, Ashtabula, Columbiana, Cuyahoga, Geauga, Holmes, Lake, Lorain, Mahoning, Medina, Portage, Richland, Stark, Summit, Trumbull, and Wayne. Much of the information contained in Bulletin 68 has been published previously (or is scheduled to be published) in the form of county reports and maps; however, the perspective provided by dealing with 16 contiguous counties is of invaluable aid in grasping the "big picture" of the glacial history of northeastern Ohio. Not only geologists, but planners, mineral producers, engineers, and numerous other individuals and groups that deal with the surficial materials in northeastern Ohio will find Bulletin 68 to be a welcome companion.

This volume presents a detailed but easily understood summary of the Pleistocene history of northeastern Ohio. Till units that have been identified in northeastern Ohio are discussed in terms of location and extent, composition, weathering characteristics, stratigraphic position, and age and correlation. Also included in the report are chapters on geomorphology, mineral resources, environmental and engineering geology and a chapter on Pleistocene beaches and strandlines bordering Lake Erie. The latter chapter was authored by Stanley M. Totten, a former student of George White. In the past decades tremendous advances have occurred in our knowledge of the glacial history of Ohio, particularly in the northeastern part of the state. The advances in that quadrant of the state have occurred almost solely through the efforts and direction of George White. Dr. White, in his typically modest style, realizes that Bulletin 68 will not be the "last word" on the glacial geology of northeastern Ohio and that new advances in interpretation will occur, particularly from the subsurface studies of these glacial sediments. He aptly states his perspective in the Prologue to Bulletin 68:

> The next 50 years will be as productive as the past 50 years. May our successors feel as we do, that State Geologist Newberry and his corps of assistant geologists between 1870 and 1878 and Frank Leverett in 1902 saw the "big picture," but we are glad that they left parts of the canvas to be completed.

Bulletin 68, *Glacial geology of northeastern Ohio*, is available from the Survey for $13.86, which includes tax and mailing.



GEORGE W. WHITE

The publication of Bulletin 68, *Glacial geology of northeastern Ohio*, in 1982 marks the 56th year since George W. White published his first paper on Ohio geology and over a half-century of association with the Division of Geological Survey, two years of which he served as State Geologist (1946-1947). The contributions of Dr. White to his native state have been immense and reach far beyond those of interest only to geologists. His numerous reports and maps on the glacial deposits of northeastern Ohio have been invaluable to planners, engineers, and decision makers in that heavily populated portion of the state. This work has, therefore, influenced a sizable segment of the state's citizens.

George W. White was born in 1903 at North Lawrence, Ohio, but spent most of his youth in the cities of Delaware and Westerville, Ohio. In 1921 he received an A.B. degree from Otterbein College in Westerville, in 1925 an M.A. degree in geology from the Ohio State University, and in 1933 a Ph.D. degree from the Ohio State University.

After holding teaching positions in Tennessee and New Hampshire, Dr. White returned to the Ohio State University in 1941. In 1946, upon the retirement of Wilber Stout, Dr. White became State Geologist of Ohio, a position he held until 1947, when he became chairman of the Department of

Geology at the University of Illinois. Dr. White retired from active teaching at the University of Illinois in 1971 and is now emeritus professor of geology.

Although George White spent most of his professional career in the employ of institutions ouside the state of Ohio, his geologic field work and publications have dealt principally with the geology of Ohio. Dr. White returned to the state nearly every field season under the auspices of the Division of Geological Survey or the U.S. Geological Survey.

George White's publications on the geology of Ohio number more than 70 and deal with a variety of subjects. His first publication on Ohio geology, in 1926, on the limestone caves and caverns of the state, remains as the most comprehensive published report on this topic. His publications in the late 1920's and 1930's centered on his first love, the glacial geology of Ohio. The 1940's—the war years and the period of his tenure as State Geologist—were devoted principally to reports on mineral industries, coal, shore erosion along Lake Erie, geology of the coal-bearing rocks of eastern Ohio, and a major bulletin published by the Survey on the geology of Holmes County. During the period of the 1950's to the present, Dr. White produced many reports on the glacial geology of Ohio, part of the effort to complete the county glacial mapping of northeastern Ohio.

Throughout this period of nearly 60 years of active investigation of the geology of Ohio, Dr. White has maintained an avid interest in the history of geology and today is internationally known as one of the foremost historians of the geological sciences. Many of his papers on the history of geology have dealt with early geologic investigations in Ohio and members of the early geological surveys.

George W. White has received many honors and accolades throughout his long and productive career. Included among these are honorary degrees from Otterbein College, the University of New Hampshire, and Bowling Green State University; the Orton Award from the Ohio State University; and the naming of the University of Illinois geological library in his honor. In 1981 Dr. White received a Conservation Achievement Award from the Ohio Department of Natural Resources in recognition of his many contributions to his native state.

LAND SUBDIVISIONS MAP REPRINTED

The color wall-size map, *Original Ohio land subdivisions,* by C. E. Sherman (1925), has been reprinted by the Survey. This map, at a scale of 1 inch to 6 miles, has been extremely popular over the years owing to the somewhat confusing systems of land subdivisions that have been employed in Ohio. The map is available for $5.78, which includes tax and mailing. If flat copies are desired please add 50 cents per order for mailing in a tube.

ODNR CALENDARS AVAILABLE

The Ohio Department of Natural Resources has produced an attractive 16-month calendar that covers the period of September 1982 to December 1983. Each month features a nature photograph by noted ODNR nature photographer Alvin Staffan. The calendar also lists ODNR events, dates of historic significance, hunting seasons, and other information of interest to individuals involved with Ohio's natural resources. The ODNR calendar is available for $4.95, which includes tax and mailing.

COAL WASHING

Although demand for coal has been increasing, Ohio's coal production has been declining in recent years. New air-quality standards place a limit on the amount of sulfur dioxide emissions permitted from coal-fired facilities. Most of Ohio's coals have a relatively high sulfur content, which has made it both difficult and costly to comply with the new standards. As a result many coal consumers have turned to other sources of coal with lower sulfur content.

The problem has inspired a search for economical technologies to help Ohio's coals comply with the standards. Coal washing is one currently available and proven technology for removing impurities from coal. The product is a cleaner, higher Btu, and lower sulfur coal. It's no surprise that Ohio's utilities, coal companies, and government should be eager to foster the use of coal washing in order to put Ohio coal back to work.

Coal washing is the name given a group of processes that physically separate coal particles from impurities, such as pieces of rock from the layers surrounding the coal seam or minerals that have formed in the coal itself. The washed coal has a higher Btu content per pound because much of the noncombustible material has been removed. A higher Btu rating means the coal produces more energy per pound. Thus, the coal is more valuable after washing.

Another important benefit of coal washing is the removal of some of the substances that can cause problems during or after combustion. Some mineral impurities form ash when the coal is burned. Ash can interfere with the workings of a boiler, creating maintenance problems and wasting some of the energy produced by the coal. Washed coal improves the performance of a boiler, saving time, energy, and money. Also, small particles known as fly ash escape through the stack and add pollutants in the form of particulate matter to the atmosphere. Capturing fly ash is another difficult and costly job. Lowering the ash content by washing before burning the coal results in a decrease in air-borne particulate problems.

The most important benefit of coal washing for Ohio coals is the reduction in sulfur content. The sulfur in coal forms the air pollutant sulfur dioxide. Sulfur occurs in several different forms in coal, as sulfate, organic sulfur, and pyrite, but washing only removes pyritic sulfur. Nevertheless, washing can remove significant amounts of sulfur from coal, so that the coal can meet air-quality standards more readily. In today's markets cleaner coals with lower sulfur content are preferred commodities.

The 1980 Keystone Coal Industry Manual lists 18 plants in Ohio with coal-washing facilities. At most coal-washing plants, the first step is crushing the coal to reduce oversized pieces and help liberate the impurities from the coal. The crushed coal is then sorted into coarse and fine size fractions by screening. Coarse and fine coal particles are washed using different processes.

Most coal-washing techniques differentiate between the coal and its impurities on the basis of specific gravity. A coal particle of a given size generally weighs much less than a mineral particle of the same size; that is, coal has a lower specific gravity than most of its impurities.

Coarse particles are commonly washed using gravity methods. This technique washes the coal in baths of agitated water (jigs) or baths of spinning water (cyclones). The mineral particles with their greater specific gravity settle out more quickly than the coal particles owing to the force of gravity and, in the case of the cyclone, to centrifugal force as well.

Coal washing plants in Ohio

Heavy-media methods use water-based liquids having specific gravities slightly greater than that of coal. In the heavy-media bath, coal particles float and impurities sink. Sometimes the portion that sinks is carried to another bath and the process repeated in a liquid with slightly greater specific gravity. In this way, the cleaner coal particles are salvaged and the more impure removed. Some heavy-media cyclones are used as well.

Fine particle sizes are more difficult to clean and therefore more costly to wash. When coal was cheaper, the finer size fractions were often discarded or left untreated. Pyrite is especially difficult to remove from fine coal particles, because fine particles of coal and pyrite tend to behave differently from their coarse counterparts. Froth flotation, used to clean fine coal particles, is not particularly effective in removing pyrite, although it works well on ash-forming minerals.

The amount of coarse and fine size fractions depends on the characteristics of a particular coal, and on the type of mining employed. In the same way, coal washability differs from coal to coal, some being easier to clean than others because of the nature of the impurities and the character of the coal itself. A study of the characteristics that determine the washability of Ohio coals is being conducted by the Survey (See *Ohio Geology,* Fall 1981).

In 1979 only 48 percent of the coal produced in Ohio was washed, according to the 1979 Division of Mines Report. Of the 20,738,191 tons of coal washed, 76 percent was produced from underground mines and 24 percent from surface mines. Between 1979 and 1980 Ohio added three coal-washing facilities and washed coal is now reported to be over 50 percent of the annual production. The Otisca process, a new washing technique that uses an organic liquid in a heavy-media bath, is being tried in a new 125-tons-per-hour demonstration plant built by American Electric Power Co. at Beverly in Washington County.

For high-sulfur coals, coal washing alone is generally not enough to bring the emissions from a coal-fired facility into compliance with air-quality standards. Also, the New Source Performance Standards issued by the U.S. Environmental Protection Agency state that all new coal-fired facilities must install Flue Gas Desulfurization Systems, such as stack-gas scrubbers. Scrubbers are a relatively costly way to remove sulfur. Coal washing can save money by reducing the sulfur content of a coal before it is burned, thereby reducing the amount of sulfur that must be removed from stack gases. Also, coal washing may sufficiently reduce the sulfur content of a coal that otherwise could not comply with standards if only scrubbing were used.

Coal washing has been hailed by coal companies, utilities, and legislators as a good near-term solution to some of Ohio's high-sulfur-coal woes. With Ohio coal production declining despite increasing demand for coal, Ohio must improve the marketability of its high-sulfur coals. Coal-washing techniques that separate pyrite and ash-forming minerals from the coal provide a cleaner, higher Btu product that is worth more, can travel farther, and meet more standards than before.

In the next few years, research should provide several improvements in coal-washing technology. The processes used at coal-preparation plants can be adapted more closely to the regional and local characteristics of the coal. Improvements in the removal of pyritic sulfur from coal will come as we learn more about the nature and occurrence of pyrite in coal. More clean coal will be retrieved from the finer size fractions, which used to be discarded. The results of these improvements will be greater efficiency in the use of Ohio's most valuable mineral resource.

—Karen Van Buskirk
Technical Publications Section

BOOK REVIEW

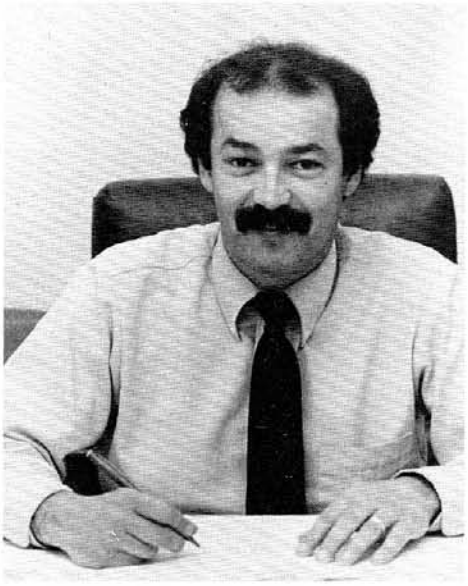
Our modern stone age by Robert L. Bates and Julia A. Jackson. Available from William Kaufmann, Inc., 95 First Street, Los Altos, California 94022. 132 pages, cloth, 8½ x 11. $18.95.

Bates and Jackson, editors of the second edition of the *Glossary of geology,* have once again teamed up to produce a valuable geological publication. *Our modern stone age,* however, is directed at nongeologists and is a remarkably successful attempt to call attention to the importance of nonmetallic rocks and minerals to industrial societies.

This profusely illustrated book is organized into ten chapters that include discussions of the occurrence and use of various nonmetallic rocks and minerals, methods of transporting the raw materials to their place of usage, and methods of disaggregating and separating these raw materials into their desirable components. The authors succinctly deal with the problems of the nonmetallic mineral industry using as examples the Florida phosphate industry and the asbestos industry. In another chapter aptly titled "Blast it out and break it up (but not in my neighborhood)," Bates and Jackson tackle the increasing problem of competition for space between mineral industries and other uses.

Our modern stone age is written in a clear and concise style that makes the text of a potentially dull subject tell a story that is not only fascinating but also of no small importance to an industrial society. It has commonly been said in recent years that geologists and mineral producers spend too much time talking to one another and not enough time talking to the general public—Bates and Jackson have taken a large step forward to remedy that situation.

—Michael C. Hansen



NEW DEPUTY CHIEF APPOINTED

Philip V. Connors joined the Survey in late September in the newly created position of Deputy Chief for Administration. His responsibilities will include financial, personnel, and administrative matters within the Division.

Phil is a graduate of Ohio University with a degree in public administration. He has served in various administrative capacities with the Ohio Department of Natural Resources since 1978 and has most recently served as employee relations coordinator for the Department. Phil brings with him skill in management practices, an emphasis on good communications, and considerable enthusiasm. Phil, a Columbus native, is married and has two children.

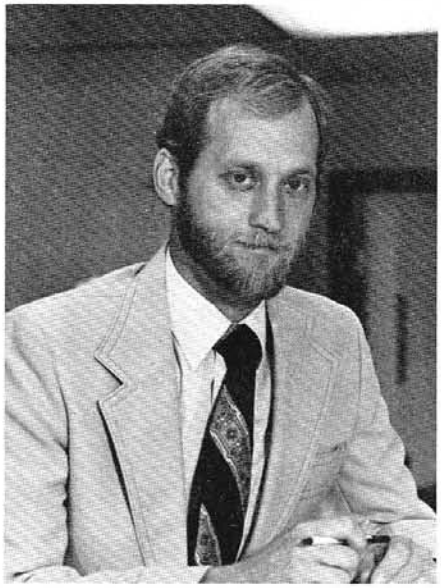
EARTHQUAKE BOOKLET AVAILABLE

The U.S. Geological Survey recently released a new publication, *The severity of an earthquake.* This 15-page booklet explains, in nontechnical language, the two most commonly used methods of measuring earthquakes—the Modified Mercalli Intensity Scale and the Richter Scale. Single copies of this booklet are available free upon request from the U.S. Geological Survey, Branch of Distribution, 1200 South Eads Street, Arlington, Virginia 22202.

ANALYSES OF OHIO COALS, 1977-1978

As part of a continuing cooperative program with the U.S. Geological Survey, the Division of Geological Survey recently published Information Circular No. 50, *Analyses of Ohio coals, 1977-1978,* authored by George Botoman and David A. Stith, both of the Division of Geological Survey.

The report lists analyses for 315 coal samples collected during 1977 and 1978 from strip mines, deep mines, and cores throughout the coal fields of the eastern part of the state. Analyses include standard measurements of moisture, ash, fixed carbon, sulfur, and heating value. Also included are analyses of 71 major, minor, and trace elements for each sample. Analyses are organized in tabular form by county and township and by coal seam. Information Circular No. 50 is available from the Survey for $9.32, which includes tax and mailing.



NEW REGIONAL GEOLOGY SECTION HEAD APPOINTED

Dennis N. Hull has been named to head the Regional Geology Section of the Survey. Denny, a geologist in the Regional Geology Section since 1977, succeeds Bob Van Horn, who was appointed as Deputy Chief of the Survey earlier this year.

Denny is a graduate of Wright State University in Dayton, where he received an M.S. degree in geology in 1976. His research at the Survey has included mapping of sand and gravel resources and surficial materials and evaluating the suitability of land areas for solid-waste disposal. Denny also has prepared several highway road guides for the Survey's Educational Leaflet series.

As Section Head, Denny will supervise the programs of the Regional Geology Section; these include mapping of mineral resources, glacial and bedrock geology, and the locations of abandoned underground mines in the state; operation of the Survey core-drilling rig; and compilation of mineral-production statistics. The Section also investigates the utilization of Ohio's high-sulfur coals and the geologic aspects of land-capability analysis.

Denny and his wife, Shirley, both natives of Brookville, Ohio, west of Dayton, live with their two young sons in Union County.

OHIO GEOLOGY POSTER SETS AVAILABLE

The Ohio Geology Notes series (see *Ohio Geology,* Winter 1982), which has been distributed weekly to all newspapers in the state, has been converted into a Poster Set. The posters measure 8½" x 14" and are printed on heavy tan-colored paper stock. The first Poster Set, titled *Poster Series No. 1,* consists of 26 individual posters that cover a wide range of geologic topics pertinent to Ohio, including gold, earthquakes, coal, salt brining, and Ohio's first oil well. The posters are particularly suitable for classroom use but also can be attractively displayed by anyone interested in geology. *Ohio Geology Poster Series No. 1* is available from the Survey for $2.89, which includes tax and mailing.

OHIO GEOLOGY SLIDE CONTEST AWARDS PRESENTED AT STATE FAIR

Ohio Geology Slide Contest winners at awards ceremony at the Ohio State Fair. Front row, l. to r.: John L. Lamb; Daniel Province; George A. Bell; Patrick Pringle. Back row, l. to r.: Horace R. Collins, State Geologist and Division Chief; Horton H. Hobbs, III; Janet Province; Robert Fridenstine; Michael C. Hansen, Ohio Geology *editor.*

Award plaques and certificates were presented to winners of the Ohio Geology Slide Contest in a ceremony held during Conservation Day festivities at the Ohio State Fair on Saturday, August 14. A large crowd was present when Division Chief and State Geologist Horace R. Collins made the presentations in the amphitheater at Teater Park on the fairgrounds. Attractive award plaques, consisting of the winner's photo laminated on hardwood and featuring an inscribed brass plate, were furnished through the generosity of the Ohio Aggregates Association, Robert A. Wilkinson, Managing Director.

CINCINNATI FOSSILS

The Cincinnati Museum of Natural History has recently published *Cincinnati fossils,* a new and revised version of the popular *Elementary guide to the fossils and strata of the Ordovician in the vicinity of Cincinnati, Ohio,* which has been out of print for some time. The current work was edited by R. A. Davis of the Cincinnati Museum of Natural History. Collectors of Ordovician fossils from the Cincinnati region—certainly a large group of Ohioans—will find the new edition a necessity. Copies may be ordered from the Cincinnati Museum of Natural History, 1720 Gilbert Avenue, Cincinnati, Ohio 45202. Cost of *Cincinnati fossils* is $5.25, which includes postage and handling.

FUTURE EMPLOYMENT IN THE GEOLOGICAL SCIENCES

A free 15-page booklet, *Future employment opportunities in the geological sciences,* has been issued by the Geological Society of America. Contributions from leading geologists in industry, government, and academia add insight to the future personnel needs of the geological sciences. This booklet is available from the Geological Society of America, P.O. Box 9140, Boulder, Colorado 80301.

Historical vignettes

Big Rock, a massive promontory of Sharon sandstone (Pottsville Group, Lower Pennsylvanian) exposed in section 12, Liberty Township, Jackson County. This area of southern Ohio is characterized by high cliffs of Sharon sandstone and spectacular scenery. (Photo by Wilber Stout, circa *1915.)*

SURVEY STAFF NOTES

David A. Stith

John L. Sullivan

David A. Stith is head of the Geochemistry Section, a position he has held since 1977. A Kentucky native, Dave received a B.S. in geology from the University of Kentucky and an M.S. in geology from the University of Oklahoma. After brief experiences in the petroleum industry Dave came to the Survey in 1967, which makes him one of the senior members of the staff. Dave has worked with many aspects of Ohio geology, but his particular research interest is in the physical and chemical characteristics of carbonate rocks. He has witnessed the growth of the Survey's laboratory capabilities from almost no equipment to the current modern laboratory that is stocked with an array of sophisticated analytical devices. Dave is married and has three children.

John L. Sullivan is the assistant driller on the Survey's core-drilling rig and his skills as a machinist and mechanic are invaluable in keeping this sometimes temperamental machinery functioning at peak capacity. John, a 20-year veteran of the Marine Corps, served three tours of duty in Vietnam and was wounded several times. It was during John's Vietnam duty that he acquired experience with a core-drilling rig. John lives in Granville, is married, and has two children. He is an avid collector of muzzle-loading rifles and pistols and enjoys black-powder competitions.

"False facts are highly injurious to the progress of science, for they often indure long; but false views, if supported by some evidence, do little harm, for every one takes delight in proving their falseness."

Charles Darwin, in *Descent of Man*

MADGE FITAK NAMED ODNR EMPLOYEE OF THE MONTH

Madge R. Fitak, geologist and supervisor of the Publications Center for the Survey and the Department of Natural Resources, was named the ODNR Employee of the Month for August 1982. Madge and her staff are faced daily with the sometimes difficult task of ensuring that Survey and other ODNR publications are promptly mailed to customers and answering the wide variety of questions that daily are directed to the Survey. Madge has been with the Survey since 1973.

GUIDE TO THE GEOLOGY ALONG INTERSTATE 75

The Survey has just released Educational Leaflet No. 13, *Guide to the geology along Interstate 75 between Toledo and Cincinnati*, written by Survey geologist Dennis N. Hull. The text and illustrations of this full-color leaflet cover such topics as the geology of western Ohio, formation of glacial deposits, history of Lake Erie, and drainage changes.

The inside of the fold-out leaflet features a geologic strip map covering the corridor between Toledo and Cincinnati. Fifteen points of geologic or historical interest are noted on the strip map and are located and explained in the text accompanying the map. These include such features as the Black Swamp, beach ridges, the history of oil and gas in northwest Ohio, the Teays Valley, earthquakes at Anna, and limestone quarries. Educational Leaflet No. 13 is available free of charge from the Survey.

SURVEY STAFF CHANGES

COMINGS

Philip V. Connors, Deputy Chief for Administration.

Henrietta Gaskins, Environmental Technician, Subsurface Geology Section.

James M. Miller, Environmental Technician, Subsurface Geology Section.

David E. Richardson, Cartographer, Technical Publications Section.

AND GOINGS

J. Sue Hubbard, Geologist, Public Service Section, to Environmental Technician, ODNR, Division of Reclamation.

Michele L. Risser, Geologist, Regional Geology Section, to nursing student, Mt. Carmel School of Nursing, Columbus.

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