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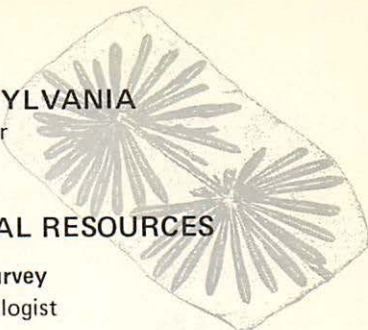

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THE PENNSYLVANIA GEOLOGICAL SURVEY
VOL. 2/6



COMMONWEALTH OF PENNSYLVANIA

Milton J. Shapp, Governor

DEPARTMENT OF ENVIRONMENTAL RESOURCES

Topographic and Geologic Survey
Arthur A. Socolow, State Geologist

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ON THE COVER — Massive Shawangunk conglomerate layers exposed in Delaware Water Gap.

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DECEMBER 1971

FROM THE DESK
OF THE
STATE GEOLOGIST . . .



MEETING THE CHALLENGE

The Annual Meeting of the Geological Society of America, held in Washington, D. C., this November, was a noteworthy event in many ways. First of all, the record number of over 4300 geologists registered in attendance was a tribute to the scope and quality of the technical program in the face of economic austerity.

Particularly of interest, however, was the emergence of a recognition, even among some of the most technical and scientific sessions, that geologists have a responsibility to provide an input into environmental quality studies, and to do so in a language intelligible to non-geologists. This was really the first time that such a broad-based, national assemblage of geologic scientists, representing government, industry, and the academic community, was clearly challenged to fulfill its obligations, both as scientists and as citizens. Members of Congress, the Executive Branch, and non-geological planners all stressed the need for prompt and adequate reports by geologists to give the decision-makers a sound basis upon which to function.

Some geologists are having difficulty in relating their abilities and their activities to our society, and some still seem to be reluctant. Certainly in a state like Pennsylvania, where very few of man's activities can escape the contact and impact of geology, we geologists have a particular responsibility to share our knowledge and to do so in a format understandable to the users and the decision makers.

The Pennsylvania Geological Survey aims to meet its obligations by striving to adapt its geological investigations and reports to the needs of the community. Our Environmental Geology Division has been rendering prompt and excellent service to state and local government agencies and to Pennsylvania citizens faced with geologic problems. During the past year that division of the Survey has completed 181 environmental geology site evaluations for Pennsylvania Department of Transportation projects, 96 water well site studies for state agencies and municipal authorities, 64 engineering geology studies and 22 economic geology studies for fellow governmental agencies. To this record of service, it should be added that the Pennsylvania Survey in the past year completed and published 21 major geologic and mineral resource studies, and released 210 new detailed topographic quadrangle maps. All in all, the Pennsylvania Geological Survey is very actively striving to meet the contemporary needs of the Commonwealth.

Arthur A. Socolow

UNUSUAL MINERALS FOUND IN PENNSYLVANIA

The occurrence of unusual minerals is of interest from several aspects. The collecting of minerals is a rapidly growing hobby devotedly pursued by many enthusiasts in Pennsylvania. Not only is the discovery of an unusual mineral or crystal an exciting surprise but it also can be a rewarding scientific experience that enlarges our view of our environment. In addition, unusual minerals are of interest to the professional geologist because often they provide critical information about the origin of a rock and about its minor-element composition. Both of these pieces of information are necessary to properly assess the economic potential or environmental significance of a rock formation. For these reasons, the Pennsylvania Geological Survey has a continuing program of mineral identification, much of it aided by the industry and curiosity of mineral collectors. We are grateful to them for sending to us for confirmation unusual mineral finds that otherwise might have escaped our attention.

Several rare and unusual minerals recently have been collected by Mr. Laveré Wolf at the Cedar Hill serpentinite quarry in Lancaster County. The rarest of these is the magnesium-calcium carbonate called **huntite**. This mineral has never before been reported from Pennsylvania and is quite rare elsewhere. The rhombohedral huntite occurs as white crusts on magnesite and daweyleite as a result of surface-water alteration of these two minerals. Another excellent specimen found by Mr. Wolf contains large masses and excellently formed crystal books of the mineral **penninite**, a member of the chlorite family. Also in this specimen were small but visible tan crystals of **zircon**, a mineral that is rarely large enough to see with the naked eye. White crystals of **fluorapatite** and black grains of **magnetite** also were present.

From a quarry in Triassic sediments, near diabase. Martin Anne discovered the rare hydrous nickel arsenate **erythrite** and the previously unreported cobalt arsenic sulfide **cobaltite**. This latter mineral is a primary ore of cobalt where it occurs in sufficient abundance. Although only a small amount occurs at the Pennsylvania locality, it is of great interest scientifically for the information this occurrence may yield about the origin of Triassic metallic ore minerals. Consequently, more studies of this occurrence are in progress.

At the Showalter limestone quarry in Blue Ball, Lancaster County, several unusual minerals have been confirmed from samples sent in by James Stauffer and Bryon Brookmyer. The most unusual are pale-yellow crystal plates of **celestite**, a strontium sulfate. This mineral commonly is pale blue to colorless; yellowish crystals have scarcely been reported at all in the literature. Other crystals recently found here include **pale blue celestite**, blue and purple **fluorite**, **calcio-strontianite** (or perhaps simply strontianite), pink **calcite** crystals, and flesh-colored **dolomite** crystals. Not only do these associated minerals make attractive mineral specimens, particularly for micromount collectors, but they also provide evidence of notable trace amounts of strontium and fluorine in the limestone.

Vein quartz at the Showalter quarry rarely contains a few small needle-like, black to brownish black, wiry inclusions of **rutile**, a titanium dioxide identified by x-ray diffraction.

Other recent unusual mineral discoveries of interest to both the collector and the geologist include the copper-bearing mineral **chrysocolla** near Hummelstown (by Wayne Downey), the uranium silicate **coffinite** from Jim Thorpe and the complex rare-earth silicate **chevkinite** from near Bethlehem (both by Robert Smith, II), **magnetite** crystals from the Mud Lake limonite pits (by James Stauffer), and **pumpellyite**, a complex aluminosilicate of calcium, magnesium, and iron, from the Bunker Hill volcanics near Jonestown (by E-an Zen from petrographic microscope observation).

Several of these identifications have been used in geological publications to clarify the origin of the rocks in which they occur. Others are useful as trace-element guides to possible low-grade metallic mineralization and are thus a potential tool in the search for future extractable mineral deposits. Some of them may influence the composition, and hence the quality, of utilizable surface and groundwater, particularly the soluble carbonates, sulfides, and the arsenate. Finally, we hope that specimens of these minerals and the geological history that they represent will enrich the lives of many collectors in Pennsylvania.

D. M. Lapham
J. H. Barnes

Magnetite crystal in chlorite schist, Lancaster County, magnified two times (photo by Les Chubb).



STATE GEOLOGIST CHAIRMAN OF ACSN

The American Commission on Stratigraphic Nomenclature held its annual business and technical meeting in Washington, D. C. on November 3, 1971. Upon completion of the technical program, officers were elected for 1971-72. Dr. Arthur Socolow, Pennsylvania State Geologist, was elected Chairman, and Dr. Zoltan de Cserna of Mexico was elected Vice Chairman and Secretary of the American Commission on Stratigraphic Nomenclature.

LANDSLIDES AND ROCK FALLS, PITTSBURGH AREA

Recorded landslides and rock falls in the Pittsburgh area for 23 years indicate that five slides per year result in average damages of \$11,500 and 0.3 injuries or deaths per slide or fall. Many slides are unrecorded and one can readily double the number of occurrences. A conservative estimate of average damages is over \$100,000 and three injuries or deaths per year from these hazards. This figure excludes costly delays and modifications of construction in progress when slides or falls occur.

Recorded data from 110 landslides and rock fall sites have been compiled by engineering firms and researchers. Reconnaissance geological investigation of a half dozen publicized slides and falls occurring in the past two years was made by Dr. Dana R. Kelly (formerly of the Survey) immediately after or during slide movement. The slides are associated primarily with red and variegated mobile clay and clay-shale zones of the Pennsylvanian Conemaugh Group which crop out in the hilly Pittsburgh area. Understanding of basic geology is the prime requisite in anticipation and prevention of these failures.

An unpublished report on the basic geological factors in landslides and rock falls of the Pittsburgh region by Dr. Kelly and the above mentioned half dozen geological investigations are on open file in the Survey's Pittsburgh office. An open file report may be reviewed at the office where it is filed and may be copied at the expense of the reviewer.

William S. Lytle



Home being crushed
by toe of slide,
along Route 28 near
Millvale.

NEW COAL REPORT ON WASHINGTON PA., AREA

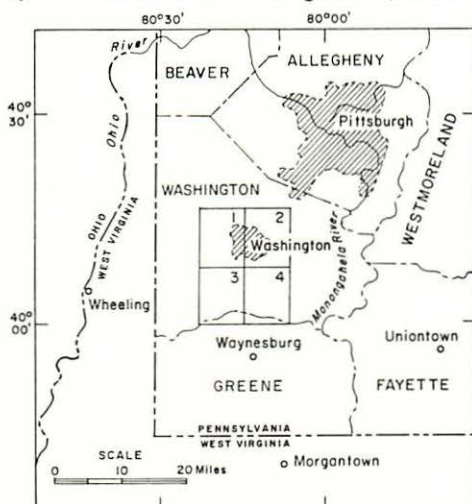
The U. S. Geological Survey has recently released an important new publication entitled "Coal-bearing Upper Pennsylvanian and Lower Permian Rocks, Washington Area, Pennsylvania" (Professional Paper 621).

The 320-square-mile area covered in this report lies immediately south of expanding Pittsburgh residential-industrial complex, and, in addition, is in the heart of Pennsylvania's most important and productive coal field. It is difficult to exaggerate the importance of sound geologic information in dealing with the manifold questions which are certain to arise as this area is urbanized. Complex and interacting problems of water supply, waste disposal, water pollution, coal mining, and construction stability are all intrinsically bound up in the geology of the area.

The report includes extensive discussion of the various rock-types occurring in the Washington area, as well as information on coal and other mineral resources, engineering geology, and hydrology. Large scale, multicolor maps permit users to readily determine the nature of the rocks at any point at the surface or in the sub-surface throughout the area.

Without doubt, this report will be the principal source of geologic information needed in the rapidly developing Washington area, and forms an effective companion piece to similar reports published by the Pennsylvania Geologic Survey on the area immediately to the east.

Professional Paper 621 may be obtained for \$6.75 from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.



Location of the Washington area, Washington and Greene Counties, Pa. Quadrangles included in report: 1, Washington West; 2, Washington East; 3, Prosperity; 4, Amity.

TRACE ELEMENTS IN COAL - POTENTIAL ECONOMIC SOURCES AND HAZARDS

Many trace elements, some quite scarce in other rocks, are known to occur in coal and coal refuse. In recent years two major aspects have come under scrutiny: the possibility that coal, or coal refuse, may be a future source of scarce trace elements and the pollution effects of some of these elements as they enter the air and water circulation systems. A recent survey of existing literature by the Pennsylvania State University (Special Research Report SR-83, 1971, by S. C. Sun, H. Vasquez-Rosas, and D. Augenstein) and identification of the products from burning coal mines and culm banks by the Pennsylvania Geological Survey contribute to our understanding of these two aspects of coal chemistry.

The major and minor elements in the inorganic fraction of coal are well known; chiefly silica, alumina, iron (ferric) oxide and calcium (largely as a carbonate or sulfate) with minor magnesium, titanium (0.5 to 2.5%), alkalies, and sulfur (largely as pyrite and sulfates). The abundance and distribution of the other elements, the trace elements, is less well known. In fact, for many such elements there are no adequate data for the coals in Pennsylvania. Some are of economic interest or are potential pollutants and their concentrations can only be inferred from coal studies elsewhere or from very scattered sample analyses. Among those for which more data on Pennsylvania coals are desirable are antimony, bismuth, the halogens (iodine, fluorine, chlorine), mercury, rubidium, selenium, thallium, uranium, zinc, and zirconium.

At some localities and for some coals, the factor of trace element enrichment over that for average crustal rocks may be 100 times or more; for example, for beryllium boron, scandium, germanium (up to 2800 times), arsenic, and perhaps yttrium, silver, and gold (Sun and others, p. 5). The coals of the northern Appalachians, compared to other domestic coals, are the richest in beryllium, copper, and yttrium and notably enriched also in cobalt, gallium, lanthanum, and nickel. Some data for Pennsylvania coals are presented in the accompanying table, taken from the summary by Sun and others, largely from anthracites.

Selected Trace-Element Composition of Pennsylvania Coals

Element	Range (%)
Arsenic	.002-.01
Beryllium	.0001-.009
Chromium, anthracite	.001-.01
Chromium, bituminous	.01-.03
Cobalt	.001-.009
Copper	.001-.07
Germanium	.009-.015
Lead	.001-.01
Molybdenum	.001-.009
Nickel	.01-.09
Tin	.01-.09
Vanadium	.01-.02

As can be seen from the table, several elements exhibit a rather high concentration and the possibility of their extraction as processed by-products or collected from air or water filtering systems is of sufficient interest to merit further investigation. Among those for which there is little data, new techniques of mercury analysis may soon give us more information on this element that, as a water pollutant, can be so hazardous to health. The halogens too merit investigation from this standpoint. The Pennsylvania Geological Survey recently has identified compounds containing chlorine and fluorine from areas of burning anthracite beds. These halogens, carried in the air along with sulfur, can be powerful corrosive agents and also hazardous to health. Recently the Survey also has found lead, arsenic and selenium associated with burning anthracite. The latter two are not only rare commercial elements, but when compounded may become dangerous pollutants as well. Thus, it is clear that although research is underway by many investigators much remains to be done in Pennsylvania, particularly for detailed data at specific localities, both with regard to future resources and to the improvement of the quality of our environment.

D. M. Lapham

PENNSYLVANIA GRADE LUBE OIL DEMAND IS UP

Refinery capacity for Pennsylvania Grade crude oil is at present 42,000 bbls. per day. Completion of refinery remodeling and a new 10,000 bbls./day refinery going on stream will increase the present capacity 15,000 bbls./day to a total to 57,000 bbls./day by the first of 1972. This represents less than 1 percent of the total refinery capacity of the United States. Yet, the lubricating oils refined from Pennsylvania Grade crude commands 15 percent of the lubricating market in the United States.

National sale of lubricating oil has been growing at the rate of 1 to 2 percent a year; whereas sale of Pennsylvania Grade lubricating oil has grown 40 percent in the last 5 years, or an average of 8 percent per year for 5 years.

There is money in the lube oil business. The National average for the amount of lubricating stock in a barrel of crude oil is 2 percent. For Pennsylvania Grade crude it is normally 30 percent, while the new East Canton field of Ohio averages 35 percent. The high percentage of lube oil in a barrel of this crude is why Pennsylvania Grade crude sells at a premium price, and it is in such high demand because it is one of the best lubricating oils generally available.



PEAT IN NORTHEASTERN PENNSYLVANIA

"Peat Deposits of Northeastern Pennsylvania" has been issued by the U. S. Geological Survey as Bulletin 1317-A. Authored by Cornelia C. Cameron, this 90-page report deals with peat resources in portions of 10 counties: Monroe, Luzerne, Columbia, Wyoming, Pike, Wayne, Lackawanna, Susquehanna, Sullivan, and Bradford.

Peat resources in a 900-square-mile area in northeastern Pennsylvania are estimated at more than 13 million short tons of air-dried peat, chiefly of good quality reed-sedge type. Most deposits are 10 to 100 acres in extent, average 5 to 16 feet in thickness, and contain from 10,000 to 100,000 tons of potential resources. Individual mining operations are relatively small but require minimum facility investment. Accessibility to operation sites and to markets is good.

Ninety-five peat deposits in the Appalachian Mountains of northeastern Pennsylvania were studied. These represent various geologic settings related to structural control of bedrock and to differential erosion. Physical and chemical analyses of samples show that specific characteristics of the peat can be related to distribution of bedrock and unconsolidated material surrounding each deposit and to the size and position of the drainage basin. Ash content, water-holding capacity, and fiber size reflect the form and the kinds of material of the depression walls and of the surrounding drainage basin.

Bulletin 1317-A, "Peat Deposits of Northeastern Pennsylvania" is available for \$0.45 from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.

This new report supplements another recent peat report, Information Circular 65, Peat Bog Investigations in Northeastern Pennsylvania. This comprehensive report emphasizing the economic potential for peat development is available for \$0.85 plus tax from the Pennsylvania Bureau of Publications, P. O. Box 1365, Harrisburg, Pa. 17125 (check payable to Commonwealth of Pennsylvania).

Peat bog in Monroe County being excavated for peat.





"Wood" Opal



Siderite Concretion "Blossom"

(Photos by Les Chubb)

ROCKS AND FLOWERS

Heretofore, horticultural pursuits have not intruded themselves upon the rock-bound world of the Pennsylvania Geological Survey. That isolation came to an abrupt end on September 22 when we were invited to participate in the 25th annual Garden Show at Linglestown. Our first thoughts came up with things like rose quartz, barite roses, and perhaps even cabbage-head quartz. However, this was not exactly what the show sponsors had in mind. It seems that natural rock and mineral specimens are beginning to command a significant interest as integral parts of floral displays. If chosen with imagination, rock specimens not only simulate the natural flower habitat, but they also may enhance the artistry of the display. Not being artists at this sort of thing, we decided to provide the show with a variety - 26 different rock and mineral samples, all of which could easily be collected in central Pennsylvania. The wide range of textures, shapes, and colors did seem to stimulate interest among the show visitors. Perhaps the moral of this venture is that if you don't want to collect rocks for their own sake, collect them for your flowers and for the fun of devising creative arrangements.

255 PENNSYLVANIA MINERALS

When Professor Arthur Montgomery, Lafayette College, up-dated Samuel Gordon's "Mineralogy of Pennsylvania" in "The Mineralogy of Pennsylvania: 1922-1965" he listed 237 verified mineral species. Since that publication, at least 18 new minerals have been described, bringing the total to at least 255. Of the total (66) added to Samuel Gordon's original list of 1922, 18 were first described in publications of, or first verified by, the Pennsylvania Geological Survey. All together, in the world there are more than 2000 described mineral species so that a total of 300 for Pennsylvania is not an impossible dream.

PRESERVING PENNSYLVANIA'S FOSSIL AND MINERAL LOCALITIES

On November 6, 1971 a group of 44 mineralogists and club representatives from all over Pennsylvania met in the William Penn Memorial Museum to discuss a series of related problems that rapidly are becoming acute. Mineral and fossil collecting has had a long and distinguished history in this state. Not only have unusually fine specimens been plentiful, but many world-famous scientists have described new species from Pennsylvania or studied unusual geological environments of the past in which the minerals formed and the plants or animals lived. Such materials have become type specimens and the localities studied have attained world-wide recognition.

Today, many of these localities and specimens from them are in danger of extinction. The press of progress is taking its customary toll. A few localities that were originally poorly described ("500 feet north on a line between the large oak and Jethro Snyder's barn") are lost. Many more have become lost by the encroachments of an expanding urbanization - housing developments, shopping centers, and industrial complexes. Some have suffered an ignominious demise by suffocation - trash and garbage fill sites. Still others have been trucked away and have become a part of our network of macadam and concrete highways. In our need for space and for materials, mineral and fossil localities have been the losers, and the trend is accelerating. Not only are scientifically important localities becoming inaccessible, but the ever-expanding group of collectors have, in the augmentation of affluence and leisure time, found it more and more difficult to pursue their hobby. Furthermore, industrial quarry operators have not always been pleased with this new influx of visitors rooting around in dangerous places and not infrequently disrupting their working activity.

What can be done to protect the future of collecting and study in Pennsylvania? Data must be gathered on all existing sites and proposals for preservation sought and implemented. These are the goals of the recently formed "Commission For The Preservation Of Pennsylvania Mineral And Fossil Sites". The first conference, chaired by Professor Raymond Grant of Lafayette College and addressed by Dr. Davis M. Lapham, Chief Mineralogist of the Pennsylvania Geolog-



ic Survey, was a resounding success. Specific problem areas were focused upon, solutions discussed, and investigations begun. Assistance from "The Friends Of Mineralogy", state agencies, colleges, universities, museums, and mineral clubs will give this endeavor a broad-based spectrum of support with, we hope, the enthusiasm and know-how to accomplish its difficult but worthwhile goals.

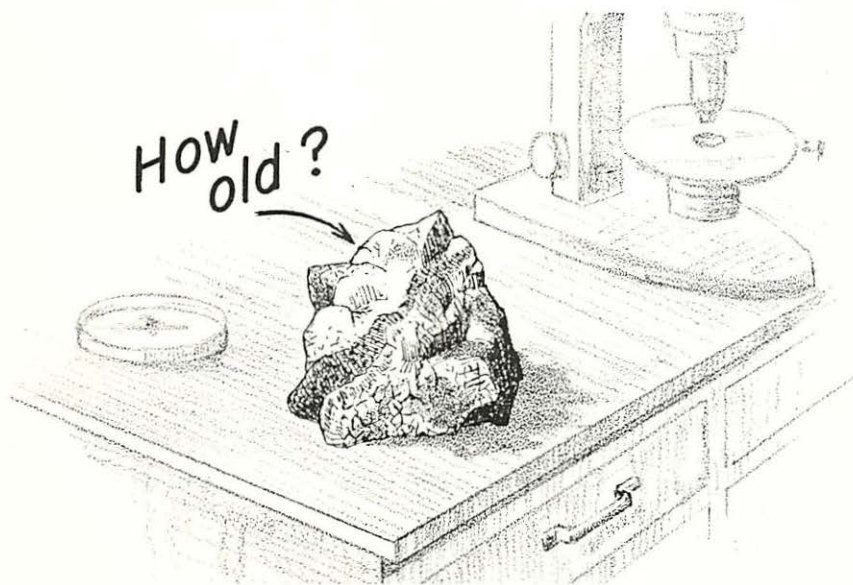
D. M. Lapham

AGES OF ROCKS IN PENNSYLVANIA

Lately, with respect to moon rocks, we have heard much discussion about the subject of geochronology — the subject that deals with the age of a rock obtained by measuring radioactive decay products. Many in Pennsylvania are interested in this subject. We frequently are asked, "What is Pennsylvania's oldest rock?" (Answer: probably older than 1,100,000,000 years.). Or we may be asked where Pennsylvania's oldest rock can be found (south or west of Philadelphia) or the age of a rock at a specific locality. In addition, many of today's students and geologic researchers are faced with the problem of interpreting the many radiometric dates in terms of past geologic events.

A new Pennsylvania Geological Survey publication, Information Circular 70, entitled "Summary of Isotopic Age Determinations In Pennsylvania" by D. M. Lapham and S. I. Root, attempts to answer these questions. This publication summarizes all data available through 1969 which pertains to age dating and age interpretation in Pennsylvania. The geological significance of the more than 75 determinations is emphasized in brief discussions of each geologic province. Ages have been found to fall into six major groups between 1100 million and 190 million years ago, indicating major events that re-set our radioactive time clocks. These data help to clarify Pennsylvania's complex and interesting geological history.

This publication is available for \$0.85 plus 6% state sales tax for Pennsylvania residents from The Bureau of Publications, 10th and Market Streets, Harrisburg, Pa. 17125.



SOLID WASTE SESSION TO MEET IN PHILADELPHIA

This year, the annual meetings of the American Association for the Advancement of Science (AAAS) will be held in Philadelphia from December 26 to December 31, 1971. There will be a full program of papers and symposia on time topics of current scientific research and advances.

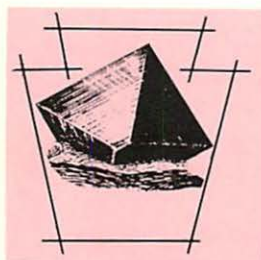
A highlight of the AAAS meetings will be a full-day symposium on December 29th on "Geologic Implications of Solid Waste Landfill." This is a subject of great interest in the light of present-day attention to maintaining the quality of our environment while disposing of our mountains of wastes.

The speakers on the symposium come from all parts of the country. Pennsylvania's leadership in this field of research is demonstrated by the participation of Professors R. R. Parizek and Donald Langmuir of the Pennsylvania State University, G. L. Merritt and W. C. Bucciarelli of the Department of Environmental Resources, and Grover Emrich, geologic consultant. Pennsylvania Geological Survey Director, Arthur Socolow, is the organizer and moderator of the symposium.

NEW SURVEY PUBLICATIONS

The following list of publications has been released by the Survey during the past few months. All of these publications are available at the Pennsylvania Bureau of Publications, P. O. Box 1365, Harrisburg, Pennsylvania, 17125. Checks should be made payable to the Commonwealth of Pennsylvania. For Pennsylvania addresses, please add 6% State Sales Tax. For free publications write to the Pennsylvania Geological Survey, Main Capitol Annex, Harrisburg, Pennsylvania.

<i>Publications</i>	<i>Price</i>
A 119 Geology and mineral resources of northeastern Franklin County by S. I. Root, (104 p., 51 figs., 2 pls.)	\$3.85
A214C Surficial geology of the East Stroudsburg 7½ minute quadrangle, Monroe County, Pennsylvania by Milena F. Bucek, (40 p., 12 figs., 1 pl.)	2.65
G 56a Geology and land use in eastern Washington County (California and Mongehela quadrangles) by B. H. Kent and others, (2 pls.) (text was published in G 56.)	2.25
IC 70 Summary of isotopic age determination in Pennsylvania by D. M. Lapham and S. I. Root (29 p., 1 fig.)	0.85
PR 183 Oil and gas developments in Pennsylvania in 1970 by W. S. Lytle and others; (50 p., 16 figs.)	0.95
W 28 Hydrology of the Pleistocene sediments in the Wyoming Valley, Luzerne County by J. R. Hollowell (77 p., 16 figs., 4 pls.)	5.40
W 29 Summary of groundwater resources in Montgomery County , by T. G. Newport (83 p., 14 figs., 2 pls.)	2.10



EARTH SCIENCE TEACHERS' CORNER

science theater

At the 1971 Geological Society of America annual meeting, several excellent films were shown. Some of these, are listed below; contact the listed producer for the conditions of availability.

HEARTBEAT OF A VOLCANO

(20 minutes)

This film of the 1969-70 Kilauea eruption contains good, often spectacular, coverage of Hawaiian volcanic activity. Overall perspective of the eruption is weak, but lava-falls, vents, fountains, and flows speak well for themselves.

Encyclopaedia Britannica Educational Corporation
425 North Michigan Avenue
Chicago, Illinois 60611

SUCCESSION ON LAVA

(14 minutes)

The step-by-step return of plant and animal life to areas overrun by basalt lava is well photographed on flows of different ages on Hawaii's Kilauea Volcano. The cycle begins again as new flows sweep through dense jungle.

Encyclopaedia Britannica Educational Corporation
425 North Michigan Avenue
Chicago, Illinois 60611

THE DRIFTING OF THE CONTINENTS

(45 minutes)

Bullard, Runcorn, Cox, Vine, and many others describe, in simple terms and with excellent use of graphics, the contributions of their specialty to the new global tectonics. A thorough, clear summary of this geological revolution A BBC production.

Time Life Films
43 West 16th Street
New York, New York 10011

DEEP SEA DRILLING PROJECT

(28 minutes)

A fast-moving account of the first 3 legs of the Glomar Challenger drilling program. Shipboard activities are shown by imaginative camera work; the concept of sea-floor spreading is captured by unusually effective animation. Split-screen images in the "Woodstock" tradition.

Association-Sterling Films
866 Third Avenue
New York, New York 10022

THE AGING OF LAKES

(14 minutes)

All lakes age and die, but the end comes sooner when man's carelessness causes an increase in the influx of sediment and dissolved nutrients. The concept of eutrophication is well explained. A crisp, informative film that "tells it like it is."

Encyclopaedia Britannica Educational Corporation
425 North Michigan Avenue
Chicago, Illinois 60611

THE RISE AND FALL OF THE GREAT LAKES (17 minutes)

A lone canoeist rides out the Quaternary ups and downs of the lakes, from the top of an ice cap to the bottom of a flooded reservoir. His oftentimes humorous encounters effectively convey concepts of recent geological change, but it's not so funny when he ends up with a mouthful of man-made scum.

National Film Board of Canada
Suite 819
680 Fifth Avenue
New York, New York 10019

AN APPROACH TO THE PREDICTION OF EARTHQUAKES

(27 minutes)

Model studies and lab tests are effectively used to explain seismic fundamentals, and modern tools of Japanese geophysical research are shown in use during the remarkable Matsushiro earthquake swarm of 1966.

American Educational Films
331 North Maple Drive
Beverly Hills, California 90210

**SAN FRANCISCO: THE CITY THAT
WAITS TO DIE**

(58 minutes)

San Francisco and the Geological Survey's National Center for Earthquake Research star in this dramatic, hard-hitting BBC production that demonstrates both the progress of modern seismology and the continuing human blindness toward real earthquake dangers. An informative and powerful film despite minor errors in the narrative.

Time Life Films
43 West 16th Street
New York, New York 10011

CONTROVERSY ON THE MOON

(15 minutes)

"Volcanic" Jack Green and "Impact" Gene Shoemaker trade punches on the origin of specific lunar features. Good use of models and photographs of both lunar features and terrestrial analogs.

Encyclopaedia Britannica Educational Corporation
425 North Michigan Avenue
Chicago, Illinois 60611

MARINER/MARS

(21 minutes)

This film, produced by the Jet Propulsion Lab, presents an interesting summary of Mars exploration to date. No advertising.

NASA Goddard Space Flight Center
Photographic Branch Code 253
Greenbelt, Maryland 20771

SURVIVAL IN THE SEA

(28 minutes)

Beautiful underwater photography emphasizing the food chain of the sea. Big fish eat little fish, and the techniques of attack, defense, and camouflage are well shown in this award-winning film.

Contemporary Films/McGraw-Hill
330 West 42nd Street
New York, New York 10036

SURVEY ANNOUNCEMENTS

NEW ANNUAL OIL AND GAS REPORT

The Pennsylvania Geological Survey has published Progress Report 183, "Oil and Gas Developments in Pennsylvania in 1970". This annual summary of new activities and developments will be of interest to all concerned with oil and gas production in Pennsylvania. It's particularly timely in view of the great interest in adequate gas supplies for the Northeast, as well as the great spurt in exploration activity in the New York-Pennsylvania border region.

The new report is divided into three parts: Part 1, Completion Highlights for 1970; Part 2, Oil and Gas Activity in 1970; Part 3, Summarized Records of Deep Wells Reported in 1970.

A significant deep test, the #1 Nellie C. Martin in Armstrong County, became an Oriskany (Lower Devonian) discovery in the former no sand area, after finding the upper part of the Cambrian dry at 15,574 feet and plugging back to the Oriskany. Another Oriskany discovery in this county was made on the Roaring Run Anticline.

Oil production and reserves decreased 10 and 7 percent, respectively during the year, while gas production decreased 2 percent and gas reserves increased 6 percent. The production histories of several highlight oil and gas wells that were drilled in 1968 are shown in graphic form.

The Maraflood project in the Bradford Field, McKean County, was expanded and another Maraflood project in the Venango Sandstone was started in Warren County.

Progress Report 183 may be purchased from the Bureau of Publications, P. O. Box 1365, Harrisburg, Pennsylvania 17125 for \$0.95 plus sales tax.

CORRECTION: PENNSYLVANIA RANKS HIGHER IN ZINC

In the October, 1971, issue of PENNSYLVANIA GEOLOGY, the article on Pennsylvania Mineral Industry Growth stated that the Friedenville Zinc Mine in Lehigh County produced 1% of all zinc mined in the United States last year. We goofed; Arnold Willman, New Jersey Zinc Company's Resident Geologist at that mine, points out that on the basis of the U. S. Bureau of Mines' statistics, the Friedensville mine ranks as the second largest zinc producing mine in the United States, producing nearly 7% of the total United States zinc production.

We're pleased to set the record straight and proud of our ranking position in such a vital industrial and strategic commodity as zinc.



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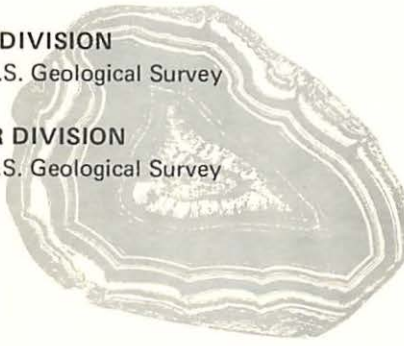
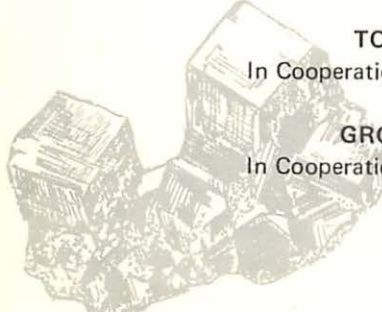
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CORRECT ADDRESS REQUESTED

Map of Pennsylvania showing county-level precipitation trends for 1997-1998. The map uses three background patterns: diagonal lines for 'High', white for 'Normal Range', and a dotted pattern for 'Low'. Red dots indicate counties that were 'Above last year' and white circles indicate counties that were 'Below last year'. The map includes county names and a legend on the right.

HAPPY NEW YEAR