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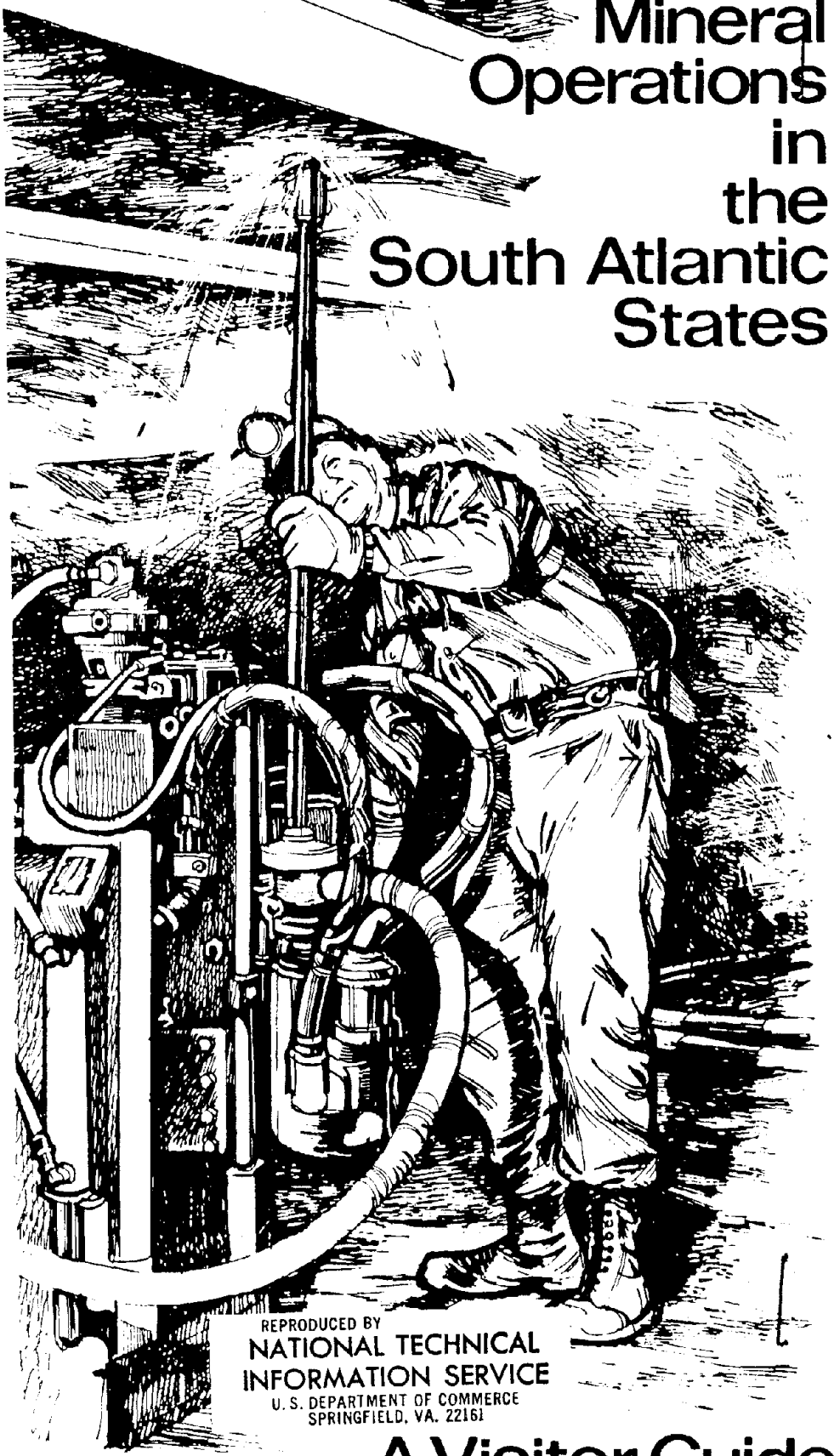
BuMines SP 2-77

Mining and Mineral Operations in the South Atlantic States



A Visitor Guide

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This publication presents general information on the mineral operations in the States of Delaware, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, and West Virginia. It contains State maps with specific locations cited in the text, and photographic illustrations of both historical and current interest. For tourist's use, the location of mineral operations it indicates that may be visited or seen from highways, as well as ghost towns, mineral tours or museums that may be visited. Each State also has bibliographic listings for persons with further or specific interests.

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Florida
Georgia
Maryland
North Carolina
South Carolina
Virginia
West Virginia
Minerals
Ghost towns
Historic sites

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MINING AND MINERAL OPERATIONS IN THE SOUTH ATLANTIC STATES

A VISITOR GUIDE

BY BUREAU OF MINES STATE LIAISON OFFICERS

1976

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CONTENTS

INTRODUCTION

Minerals are vital to any industrialized civilization. Annually, the United States uses more than 4 billion tons of new mineral materials, or about 40,000 pounds per person—about half being mineral fuels and the other half being metals and nonmetallics. Stable and economic domestic mining, mineral, metal, and mineral reclamation industries are essential to the economy. The value of United States energy and processed materials of mineral origin exceds $200 billion annually. Although a number of minerals are imported, especially some designated as "strategic and critical," most U.S. mineral supplies are derived from the domestic mines and processing facilities that you will be seeing, reading about, and visiting as you use this visitor guide. We hope you enjoy your experiences.

This pamphlet, a guide to mining and mineral operations that may be observed or visited and some other points of interest relating to minerals, is intended to aid tourists and students who are interested in mining. Some may wish to study our Nation's romantic past; others may plan to enter the minerals industry as a career; still others may have a primary interest in conservation practices. The pamphlet is also intended to aid State and local officials, Chambers of Commerce, and mining firms in answering some of the many questions of tourists and students.

Six visitor guides have been prepared covering mining and mineral operations in the United States. The regions covered by these guides are the New England and Mid-Atlantic States, the South Atlantic States, the North-Central States, the South-Central States, the Rocky Mountain States, and the Pacific States.

The text presents interesting highlights about mines and mineral operations that travelers may see from the highways. Longer descriptions of mines and plants that can be visited sometimes are provided. The mines mentioned are representative examples and are those most easily observed from, or are near, major highways. There are many others that are operating but are more remote. Selected references for detailed study are also included.

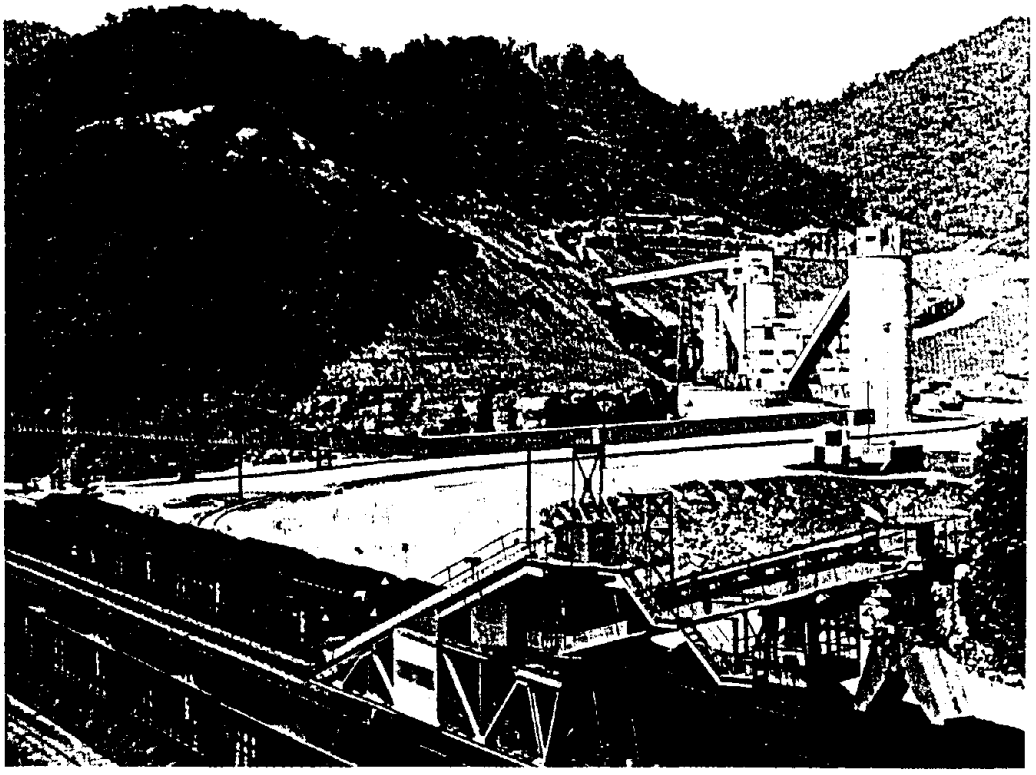
The Bureau of Mines publishes a Minerals Yearbook each year that summarizes the national production and status of each mineral commodity. The mineral industry production and status for each State are described in separate chapters. The Yearbook may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Separate chapters are available free from Publications Distribution Branch, Bureau of Mines, U.S.

Department of the Interior, 4800 Forbes Avenue, Pittsburgh, Pa. 15213.

Students who have a deep interest in some branch of mining will find most mine managers willing to help, even though the mine may not be open to casual tourists.

If you leave well-traveled highways to visit ghost towns, tell someone where you are going and when you expect to get back. You should also inquire locally about road conditions before traveling unpaved or unimproved roads.

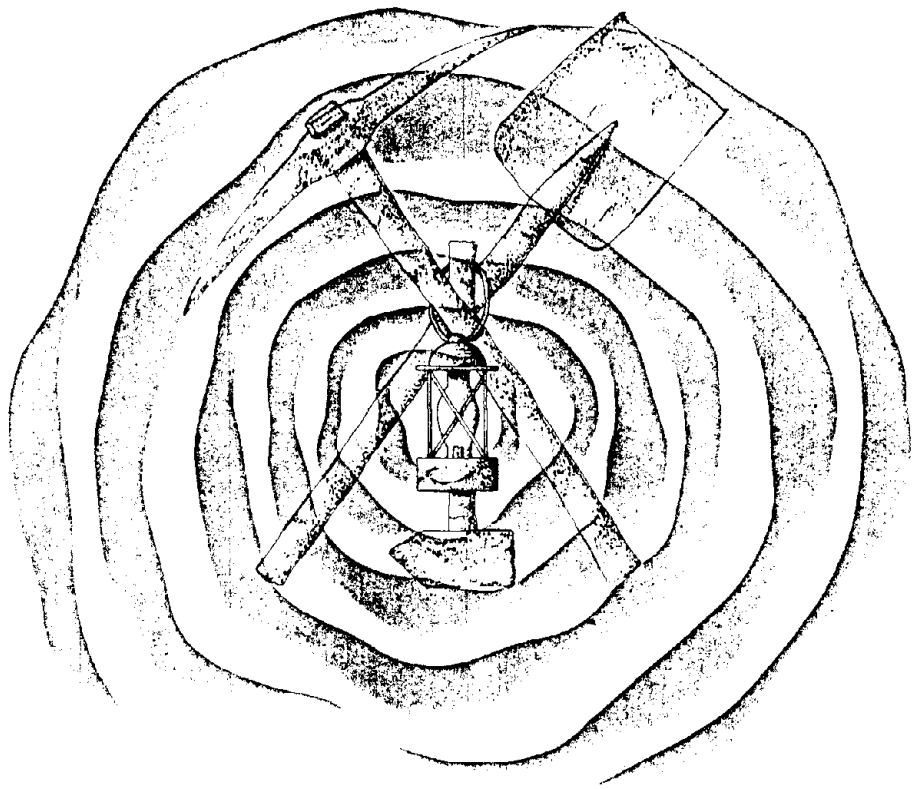
Bring your camera. Many prize-winning photographs have been obtained at the areas mentioned in this pamphlet.



Bethlehem Steel Corp. mine at Kayford, W. Va.

ACKNOWLEDGMENTS

Acknowledgments are due those who helped prepare this pamphlet. State geologists, State Offices of Information, Chambers of Commerce, mine managers, and Bureau personnel have freely contributed data.



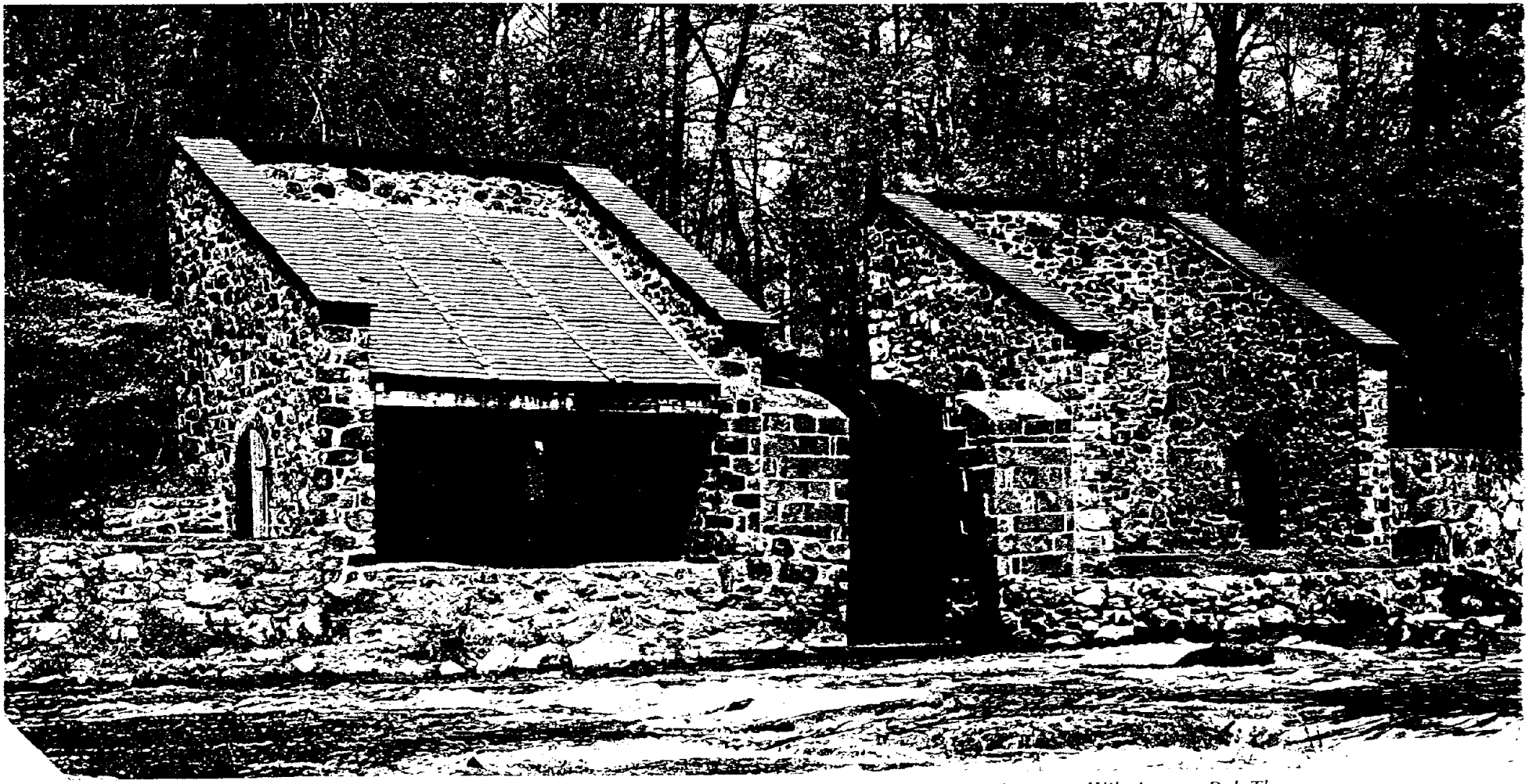
CAUTION

Remember that abandoned mines are death traps. Stay out of them. Old shafts often cave near the surface and form a funnel-shaped opening. Unwary visitors have been trapped in these funnels. Stay away from old shafts!

Always use available guide services. Mine openings (tunnels, adits, open pits) should never be entered except with a competent guide.

Sometimes the air is bad in abandoned mines and is not safe to breathe. Explosive gas may also be present. Gases frequently come from the rocks themselves, but during active operations, they are swept out of the mine by the controlled ventilating current.

Remember, too, that even the oldest mines usually are private property. Most mine owners do not object to the collection of a few mineral specimens (some do charge a fee), but all object to touring vandals, who wantonly destroy buildings and equipment, or to inexperienced trespassers, who present a hazard to themselves, the property, and the owners.



The Birkenhead rolling mills, built in 1822-24, were in use at the Du Pont black powder plant near Wilmington, Del. They are now

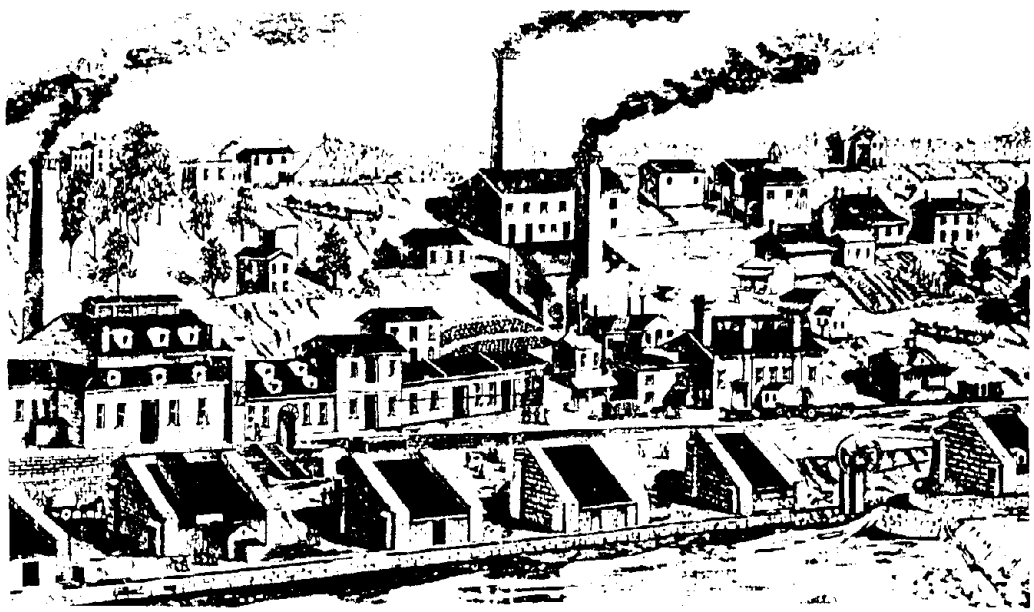
DELAWARE

by
Arnold F. Harvey

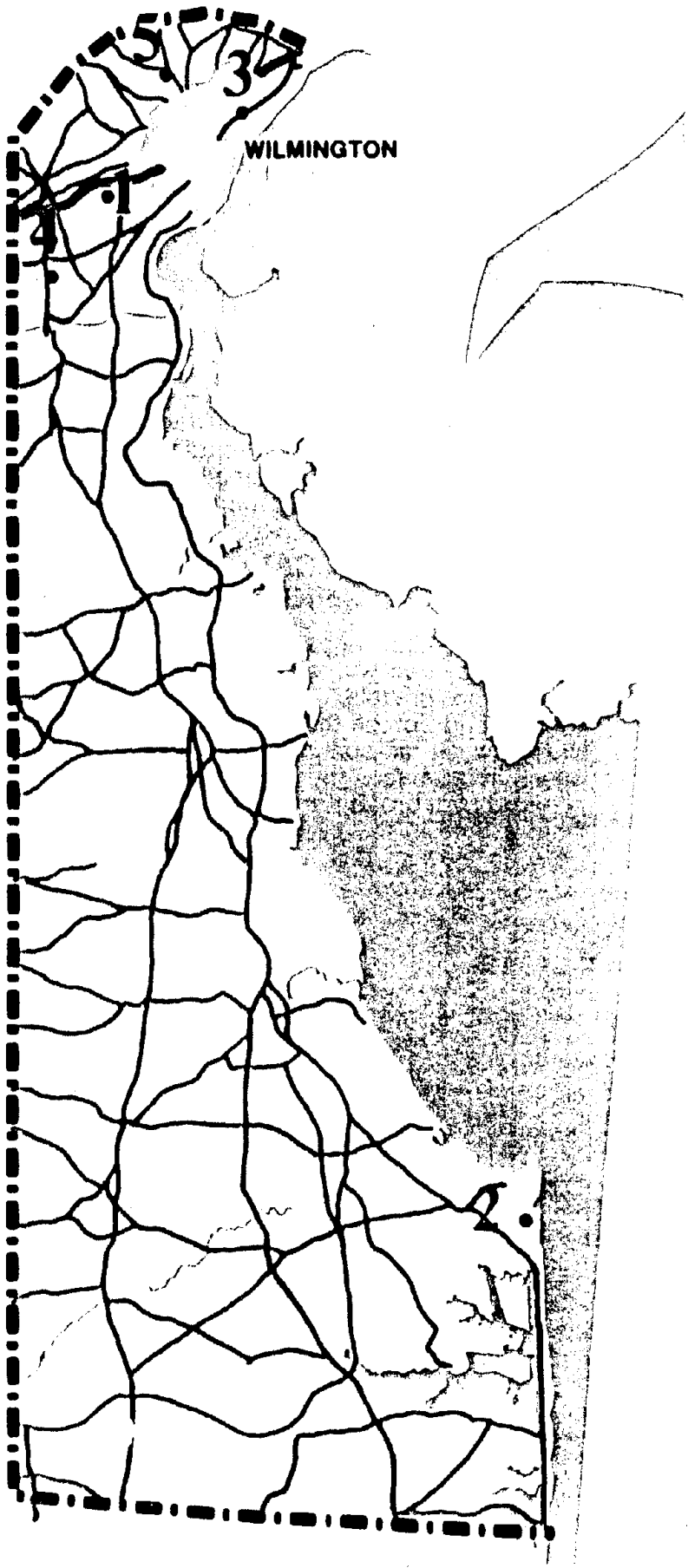
The State's nickname, "the Diamond State", alludes to its small size and has no relation to diamonds. Delaware's mineral industry is small and consists largely of sand, gravel, and stone production.

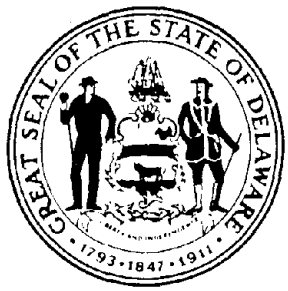
MINES YOU CAN SEE FROM THE HIGHWAYS

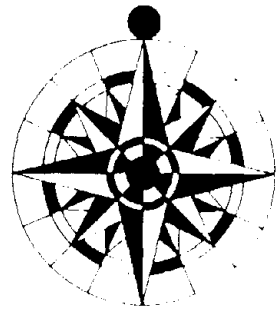
U.S. 13.—The larger portion of the State of Delaware is covered with a thin veneer of Pleistocene age sands and gravels. These sands and gravels were transported across the State by streams flowing from the outwash of continental glaciers in the past ice ages. In addition, the southern part of the State is covered by a broad flat sandy surface that has resulted from a time in the past when the ocean covered that area. In view of this, the sand and gravel industry is



An artist's view of the Du Pont gunpowder mills on Brandywine Creek near Wilmington, Del., in 1880. Cars were horsedrawn to eliminate the danger of flying cinders. (Courtesy of E. I. du Pont de Nemours & Co.)


WILMINGTON





LEGEND

1 — SAND AND GRAVEL
2 — DELAWARE SEASHORE STATE PARK
3 — STONE QUARRY
4 — IRON HILL
5 — HAGLEY MUSEUM

0 10 20

SCALE (MILES)

relatively important in the State of Delaware. Important pits may be observed at Hares Corner on Route 13 south of Wilmington. (map location 1). In addition, many smaller pits are scattered across the State.

1

Del. 14.—Delaware Seashore Park extends southward approximately 10 miles along the coast from Henlopen (map location 2). The park encompasses a large sand dune known as the Great Sand Hill or "galloping dune." The deposit is about 2 miles long, one-half mile wide, and 80 feet high. Records indicate the dune is being moved southward by wind action at a rate of about 20 feet per year. It has been a source of locomotive sand for the past 100 years. Access to the deposit and the adjacent dune fields is from Route 14 eastward through the town of Lewes.

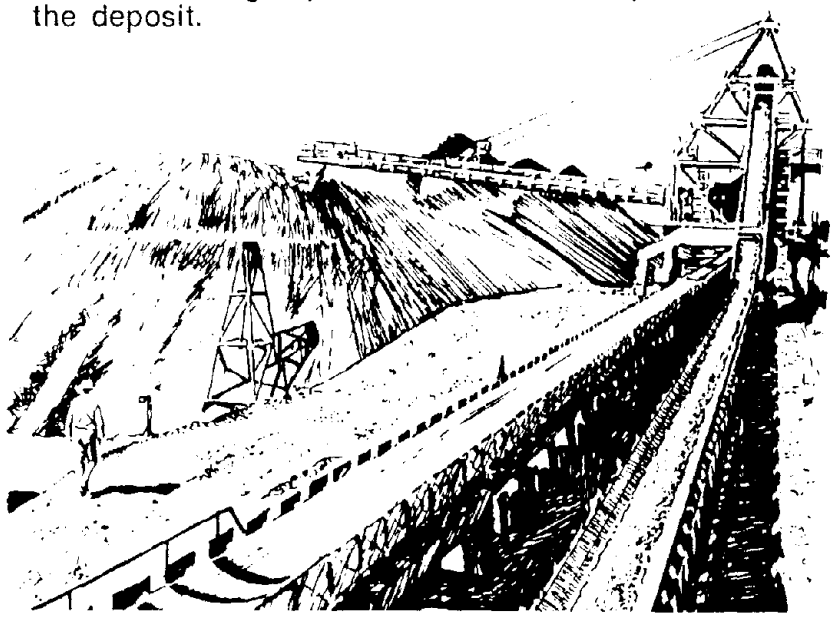
2

U.S. 13.—A stone quarry can be observed about 2 miles northeast of the center of Wilmington on U.S. 13 (map location 3). Riprap, large stones used to breakwaters, and crushed stone for roads and concrete aggregate are produced. The rock quarried is a dark-colored granitic material called gabbro by geologists and traprock by road builders.

3

Interstate 95.—Iron Hill is a small isolated hill south of Newark, Del. (map location 4). This hill of gabbro is believed to have been the core of an ancient Devonian (300 million years old) mountain range that was in this area. Historically, Iron Hill has been the site of numerous iron mining operations. The pits are visible on the top of the hill and are accessible via the Delaware Academy of Science property on the Old Baltimore Pike on the south side of Iron Hill. These iron pits were the material source of the 19th century iron industry in the State of Delaware. They are presently abandoned and have meager potential for future exploitation of the deposit.

4



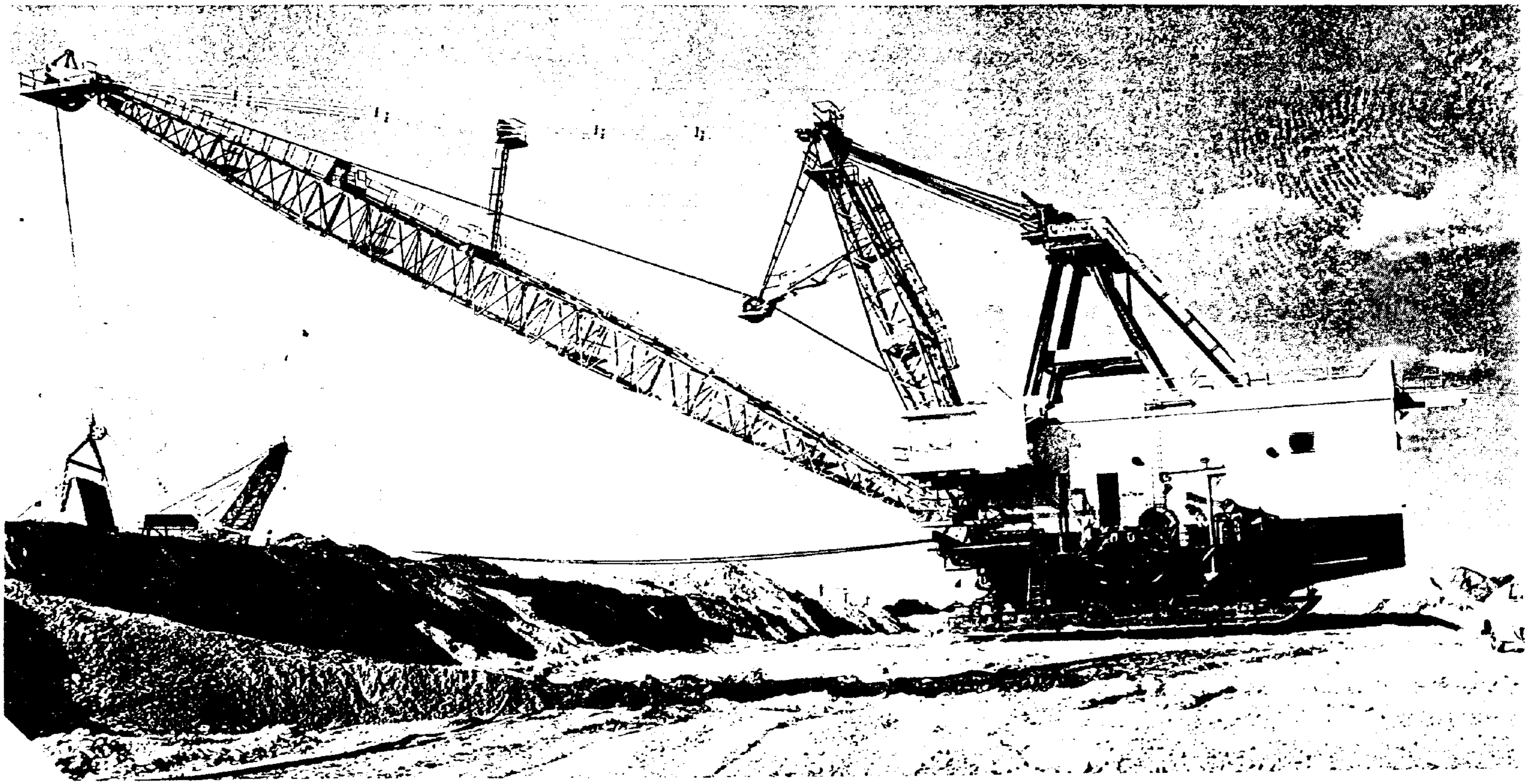
HISTORICAL SITES

Del. 141.—The Hagley Museum, about 2 miles northwest of downtown Wilmington, displays early colonial American industries, including gunpowder manufacture by the original firm of Du Pont and Co., early in the 1800's (map location 5). Du Pont black blasting powder found a ready market in the growing mining industry and in the building of roads and canals in the Eastern States. 5

FOR MORE INFORMATION WRITE OR VISIT

Department of Geology, University of Delaware, Newark, Del. 19711.

Federal Bureau of Mines Liaison Office, P. O. Box 783, Harrisburg, Pa. 17108.



... operating at Bartow, Fla. (Courtesy of American Mining Congress.)

FLORIDA

by
John W. Sweeney

Usually thought of as a vacation State because of its climate, oranges, and beaches, Florida is also one of our major mineral producing States. Florida reached a mineral value output of almost $985 million in 1974; phosphate accounted for almost half of that total. The fertilizers that you use on your lawn and many of the detergents you use to get your clothes clean originated as mineral products in Florida.

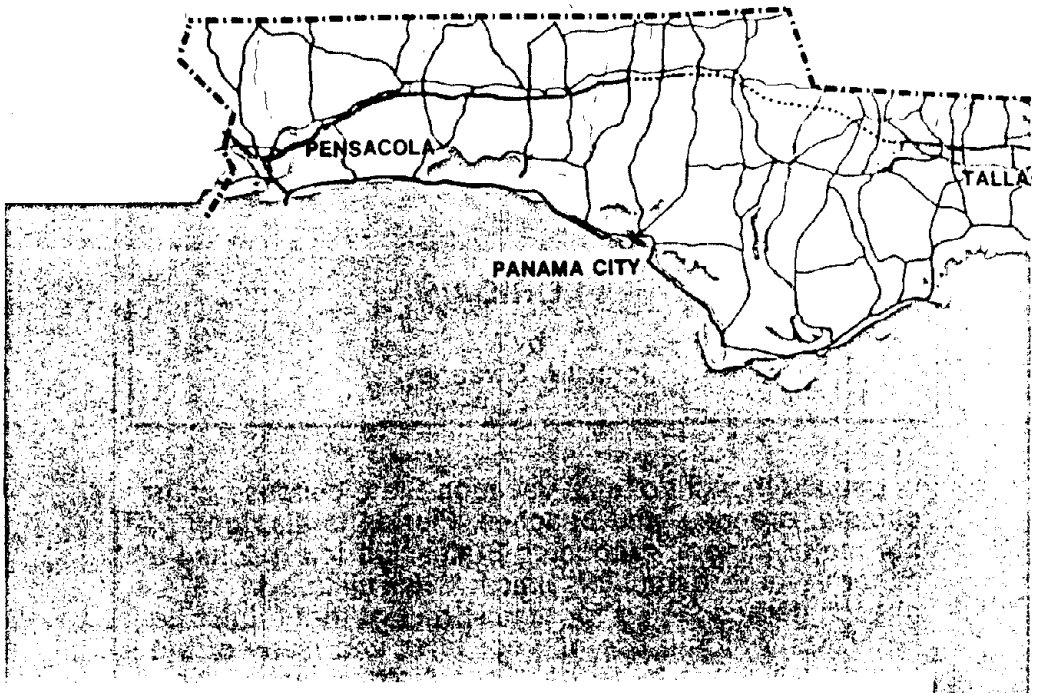
Of the 25 leading nonmetallic mines in the United States in order of output of crude ore, the first 14 are Florida phosphate mines. So you see, there is mining in Florida.

MINES YOU CAN SEE FROM THE HIGHWAYS

Fla. 555.—Five miles south of Bartow is International Minerals and Chemicals Corp.'s Noralyn mine, one of the largest single phosphate mines in the world (map location 1). At this large open pit, overburden is stripped by large electric-walking draglines. The ore is also removed by dragline; it is then hydraulicked into a sump and moved to a washing plant by pumps and pipeline. 1

Continuing another 4 miles south of Bartow on Fla. 555, one can see a similar mine of Swift Agricultural Chemical Corp. (map location 2). At this operation, reclamation simultaneous with mining takes place. 2

Fla. 630.—Turning east off of Fla. 555 toward Fort Meade, one can view the mining and washing operations of U.S.S. Agri-Chemicals, Inc. (map location 3). At the washing plants, the phosphate companies improve the grade of the ore. The concentrated phosphate minerals is then converted to phosphoric acid or superphosphates in separate plants. The products are sold as fertilizers or sold to firms manufacturing special fertilizers. Florida has been the leading phosphate-producing State for almost 80 years and currently supplies over 75 percent of domestic production. 3

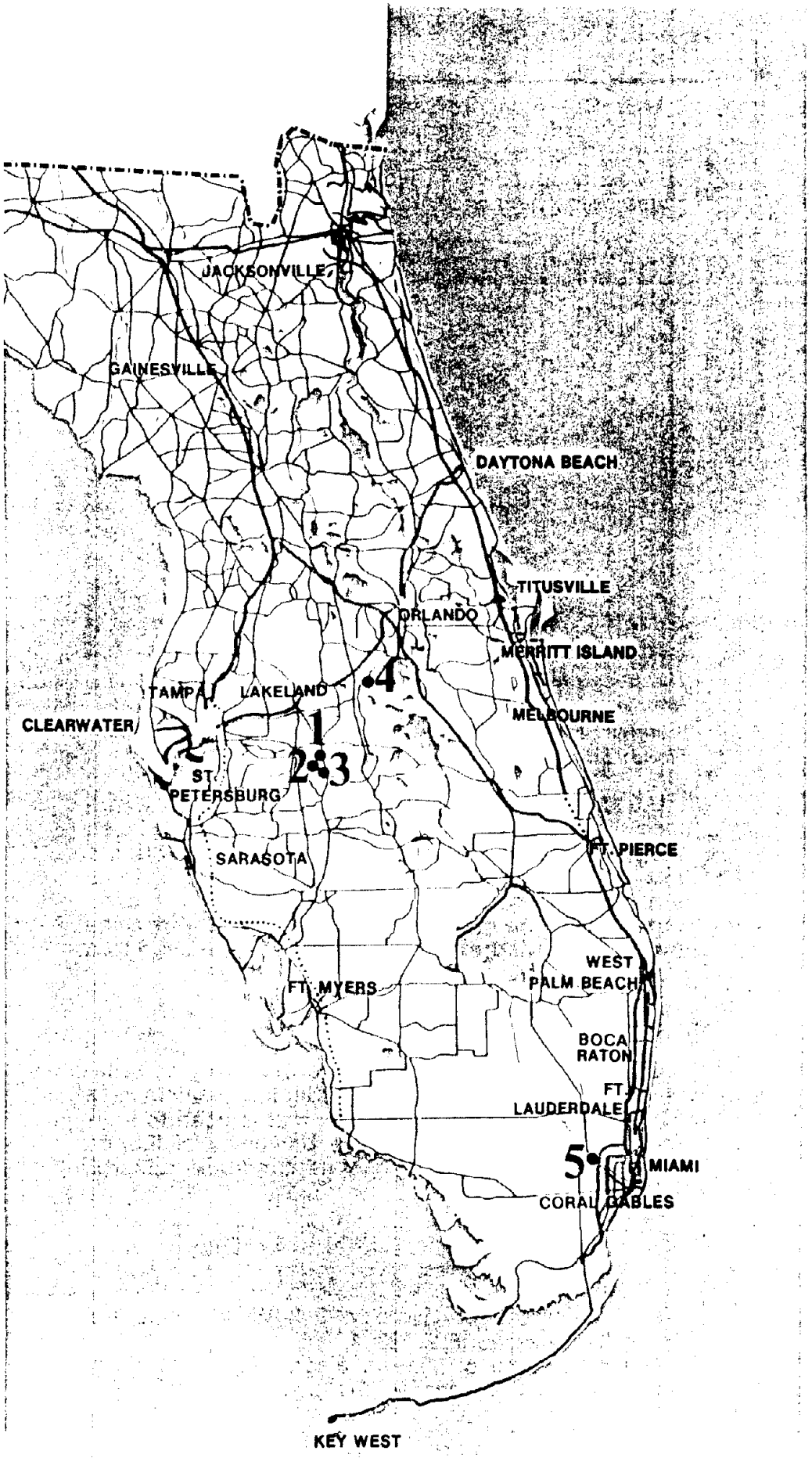


LEGEND

1 — PHOSPHATE STRIP MINE
2 — PHOSPHATE STRIP MINE
3 — PHOSPHATE STRIP MINE
4 — SILICA SAND DREDGES
5 — LIMESTONE QUARRIES

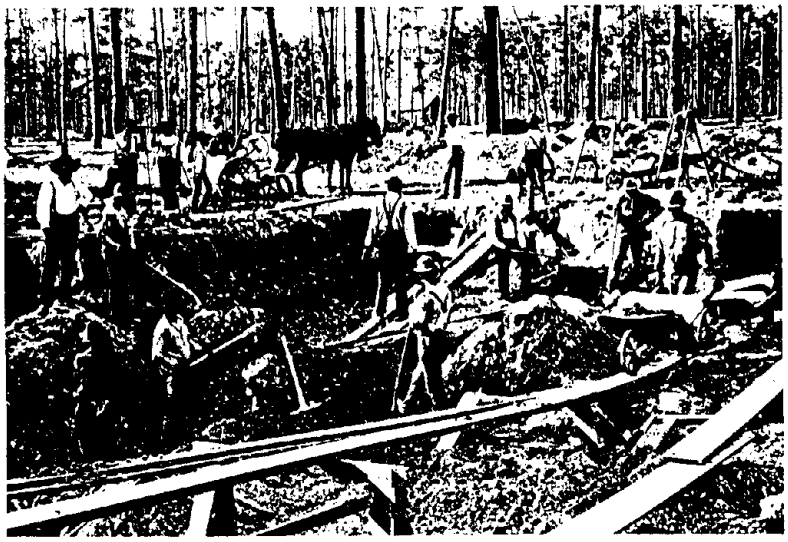
0 20
SCALE (MILES)

GREAT SEAL OF THE STATE OF FLORIDA
IN GOD WE TRUST


JACKSONVILLE
GAINESVILLE
DAYTONA BEACH
TITUSVILLE
ORLANDO
MERRITT ISLAND
TAMPA
LAKELAND
CLEARWATER
MELBOURNE
1
2
3
4
ST. PETERSBURG
SARASOTA
FT. PIERCE
WEST PALM BEACH
FT. MYERS
BOCA RATON
FT. LAUDERDALE
5
MIAMI
CORAL GABLES
KEY WEST

U.S. 17.—Standard Sand & Silica Co., located about 1 mile north of Davenport, mines high-grade silica sand for Florida's construction industry (map location 4). Most sand mining in Florida is done by dredge because of the high water table.

4



This is a scene at the Dunnellon Phosphate Co. mine April 15, 1890, showing how phosphate first was excavated in Florida. (Courtesy, State Photographic Archives, Strozier Library, Florida State University.)

U.S. 27.—Three miles northeast of Miami at Pennsuco, several large limestone quarries can be seen (map location 5). In this area, the term "excavating a lake" is used to describe quarrying—the water table is at the surface, and drilling and blasting are done underwater. The broken rock is removed by dragline and piled in windrows to drain. It is then moved to a plant for processing into aggregate and sand.

5

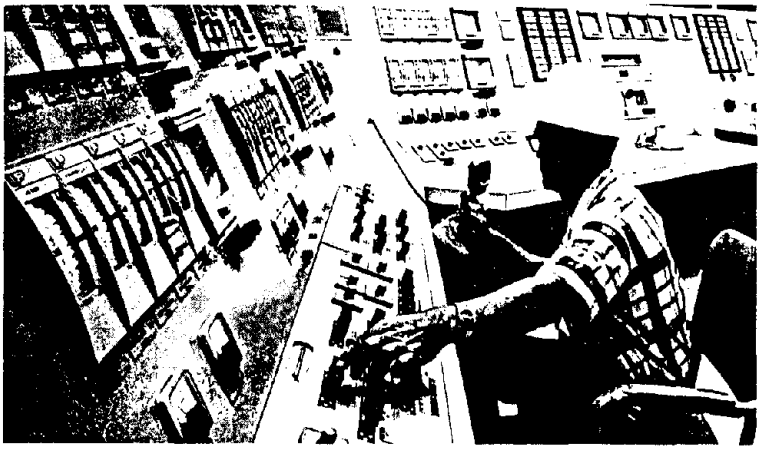
HISTORICAL SITES

On the campus of Florida State University at Tallahassee, the Florida Bureau of Geology maintains a rock, mineral, and fossil museum that is open to tourists. The State Museum on the University of Florida campus at Gainesville also houses a rock, mineral, and fossil collection.

FOR MORE INFORMATION WRITE OR VISIT

Florida Bureau of Geology, 903 West Tennessee Street, Tallahassee, Fla. 32304.

Federal Bureau of Mines Liaison Office, 547 North Monroe Street, Tallahassee, Fla. 32301.



Modern control panel at the Kingsford phosphate plant operated by one man; a computer working in conjunction with the controls scans the operation every 5 seconds and reports production. (Courtesy of International Minerals & Chemical Corp.)

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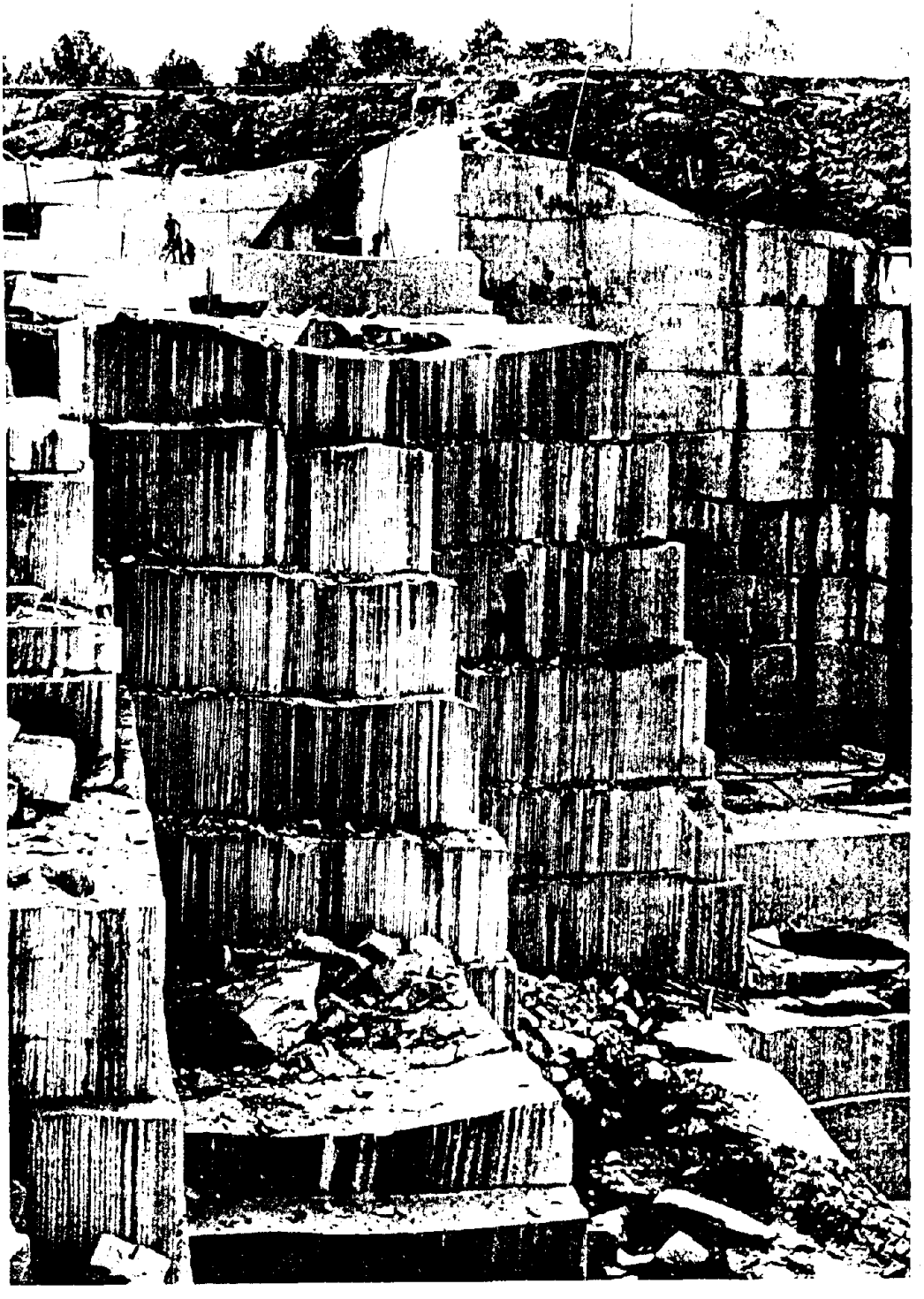
Vertebrate Fossil Localities in Florida. Florida Bureau of Geology, Special Publication No. 12, 1965, 28 pp.



General view of the Oglesby granite quarry of Southern Quarrying Co. near Elberton, Ga.

GEORGIA

by
James D. Cooper

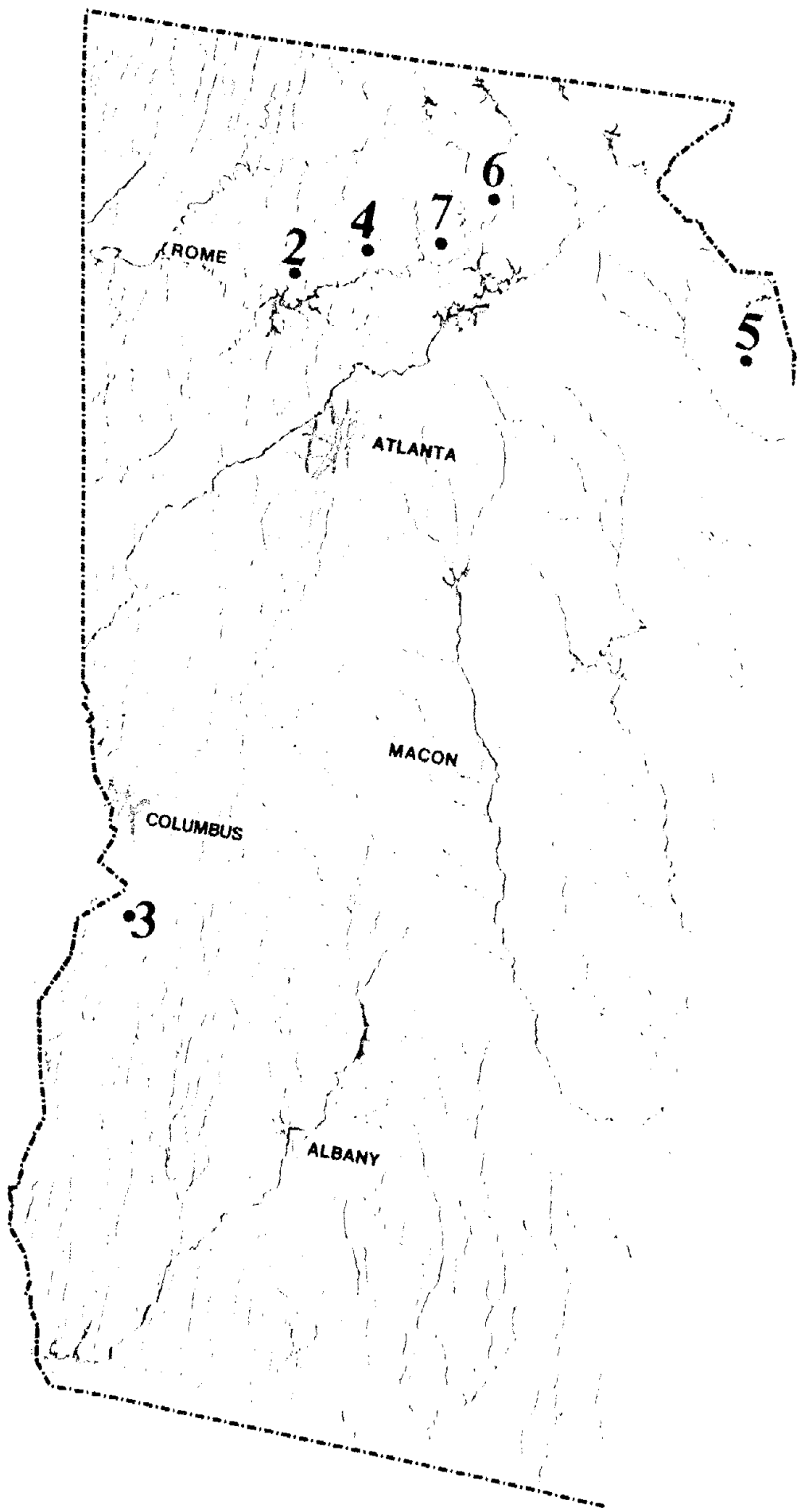
Georgia leads the Nation and the world in production of high-quality clays and is among the leading States in output of granite, marble, kyanite, zircon, and many other nonmetallic industrial minerals essential to the Nation's economic well-being. Gold was discovered in northern Georgia in 1828 and was produced in the State for more than a century. The State capitol dome in Atlanta is clad with Georgia gold.

MINES AND PLANTS YOU CAN SEE FROM THE HIGHWAYS

Ga. 17.—Kaolin, used extensively as a high-quality filler in paper, rubber, and plastics, and in refractories, ceramics, paints, and chemicals, is mined in a belt extending across the State from Columbus to Augusta. Processing plants are located at Andersonville, Huber, Gordon, McIntyre, Sandersville, Dry Branch, Wrens, and numerous other places within the kaolin belt. The plants, as well as some of the mines and reclaimed areas, can be observed from highway vantage points in the producing areas. An especially good view of kaolin mining and field processing can be obtained from the east side of Ga. 17 about 8 miles north of Wrens, where the clay is mined, blunged to slurry form, degritted, and pumped to holding tanks, from which it is subsequently transferred by pipeline to the main plant several mines to the south (map location 1). 1

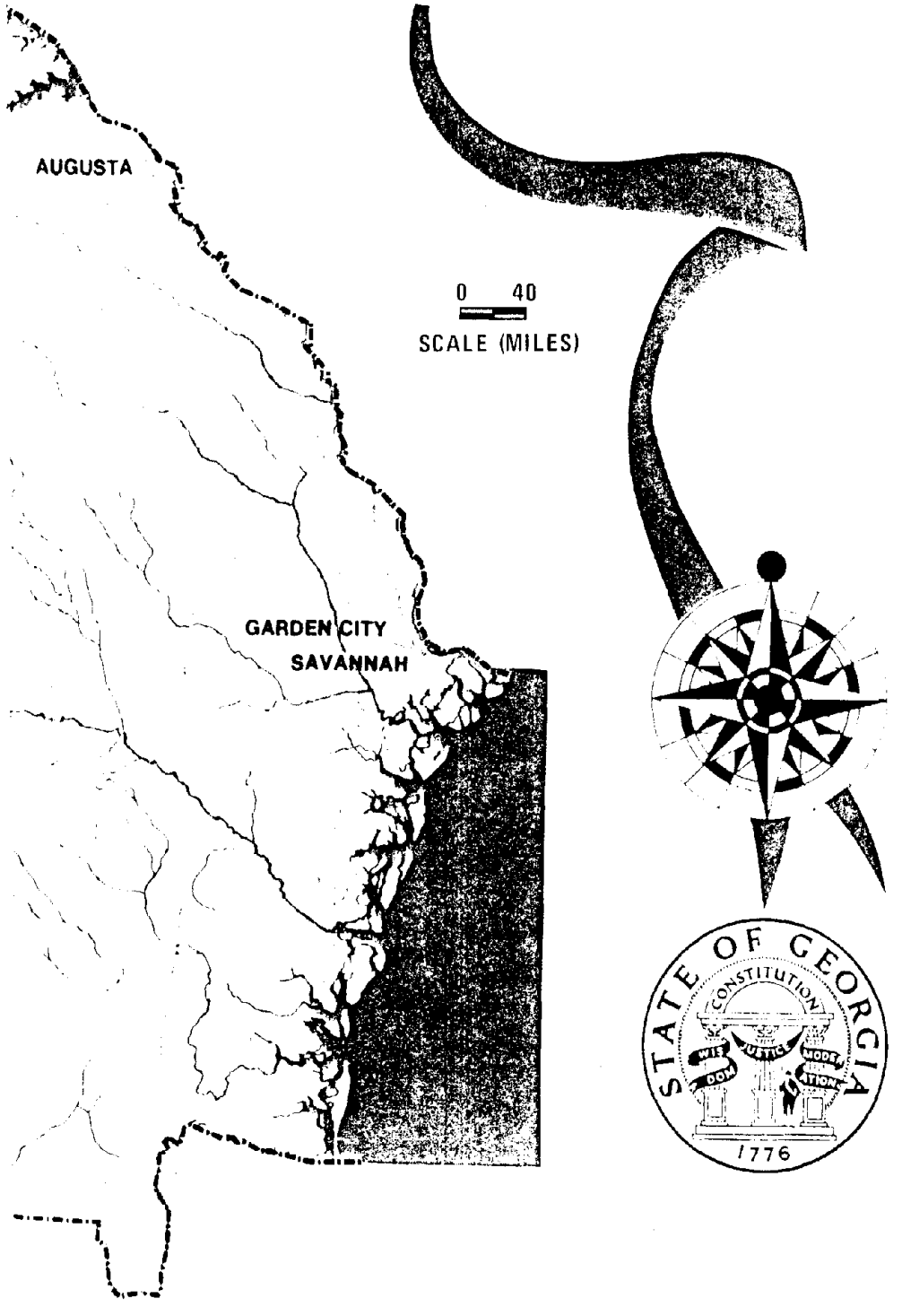
U.S. 41.—Barite, used for pigments and chemicals, is mined within the city limits of Cartersville by New Riverside Ochre Co., using large scraper-loaders, draglines, and shovels. From U.S. 41, the visitor can observe mining and reclamation operations and see the results of a well-executed plan for sequential land use (map location 2). Parking is available near the mining area at several restaurants and other business establishments along the highway. 2

Ga. 27, Ga. 39.—Iron ore is mined and processed in Quitman and Stewart Counties in west-central Georgia using conventional open pit methods of removing overburden with scraper-loaders and dozers and mining


ROME
ATLANTA
MACON
COLUMBUS
ALBANY
2
4
7
6
5
3

LEGEND

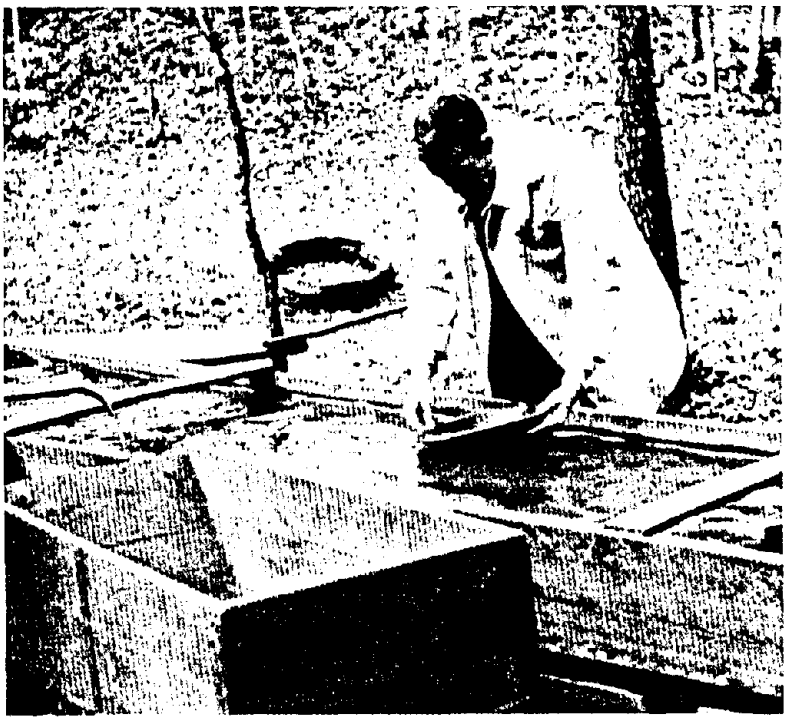
1 — GEORGIA CLAY MINE
2 — BARITE MINE
3 — IRON ORE MINING AREA
4 — MARBLE QUARRY
5 — GRANITE QUARRY
6 — HISTORIC GOLD MINING DISTRICT
7 — HISTORIC GOLD MINING AREA



3 the iron ore with small shovels and high-loaders (map location 3). Log washers are used to separate the salable lump ore from the fine waste, or gangue. The concentrated iron ore is shipped to steel producers in the Birmingham, Ala., area. Mining operations may be seen from Ga. 27 and Ga. 39 west of Lumpkin or from local roads in the area. Check in Lumpkin for mining locations; the locations change as the thin ore bodies are mined out.

Iron ore was once mined in the Cartersville district in northwest Georgia. The stone ruins of an old iron blast furnace still stand on the north side of the Etowah River just below Allatoona Dam south of Cartersville.

Old iron furnace near Allatoona Dam in Bartow County, Ga.



Tourist panning gold at Blackburn State Park near Dahlonega, Ga.

MINES YOU CAN VISIT

Ga. 5, Ga. 53.—Marble is quarried by Georgia Marble Co. at Tate and processed into monumental and building stone at Tate and Nelson (map location 4). 4
Georgia marble is used extensively in construction, including such buildings as the U.S. Capitol, the Georgia State office building complex, and many public and commercial buildings throughout the world. Visitor tours of the quarries and plants can be arranged by prior appointment by contacting the Georgia Marble Co. at Tate.

Ga. 17.—Granite is quarried near Elberton by about 30 firms and processed at 60 or more plants into monumental and structural stone (map location 5). 5
Vertical quarry cuts for removal of large granite blocks are made by flame jet piercing. Other cuts are made by more conventional methods of drilling and wedging to reduce the large blocks to manageable size for transportation and processing. Processing methods include sawing, polishing, sandblasting, and hand finishing to produce monuments and other stone products. Guided tours to quarries and plants are available through the Elberton Granite Association from May 15 to October 15 starting at 10:00 a.m. daily, with courtesy transportation for the first 10 guests each day furnished by the association.

HISTORICAL SITE

U.S. 19, Ga. 9E.—Gold was discovered in Georgia in 1828, and a U.S. Branch Mint was opened in 1838 at Dahlonega, which operated until the beginning of the Civil War (map location 6). Total production for the State was 870,774 troy ounces; the last output (2 ounces) was reported in 1953. The old Lumpkin County Courthouse at Dahlonega has been converted into a gold museum, and the administration building of North Georgia College, with gold-clad steeple, now stands at the site of the old U.S. Mint. Blackburn State Park, on Ga. 9E south of Dahlonega, has a refurbished gold mine, gold panning area, and mining and processing equipment from gold operations of the past (map location 7).

6

7

Granite quarry near Elberton, Ga. (Courtesy of Elberton Granite Association, Inc.)

FOR MORE INFORMATION WRITE OR VISIT

Federal Bureau of Mines Liaison Office, 19 Hunter Street, S.W.—Room 431, Atlanta, Ga. 30334.

Earth and Water Division, Georgia Department of Natural Resources, 19 Hunter Street, S.W.—Room 400, Atlanta, Ga. 30334.

Georgia Marble Co., Tate, Ga. 30177.

Elberton Granite Association, Elberton, Ga. 30635.

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MARYLAND

by
Arnold F. Harvey

The miners of Maryland are specialists in the production of stone. Perhaps stone quarrying is not so romantic as is gold mining, but just as much skill is needed at stone quarries as at metal mines.

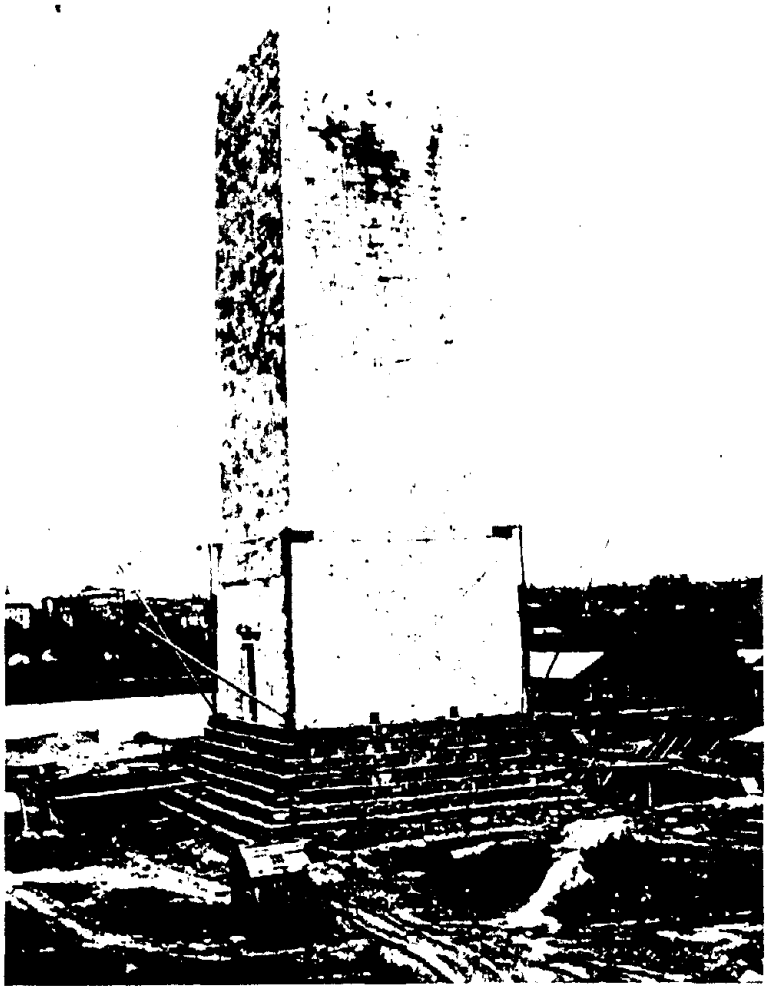
Although coal is a significant mineral product of Maryland, the mines are away from main highways and are not equipped to accommodate visitors.

MINES YOU CAN SEE FROM THE HIGHWAYS

Md. 136, Pa. 74.—The Maryland Green Marble Corp. mine and plant is just west of old Pylesville Road in Cardiff (near Whiteford), Harford County, about one-fourth mile south of the Pennsylvania-Maryland State line (map location 1). At a deep quarry and underground mine, serpentinite is quarried, cut, and polished for ornamental uses (wall panels, tabletops, and countertops). Serpentinite is also crushed for use in terrazzo floors. The Peach Bottom slate area is on a ridge one-half mile southwest of Cardiff and Whiteford. Slate is no longer produced, but large quarries and spoil piles are still visible. This was once the center of a large slate-producing industry in Maryland and southeastern Pennsylvania. 1

Interstate 83.—The Harry T. Campbell Sons Corp. (Div. of Flintkote) Texas quarry is in the village of Texas, east of the Baltimore-Harrisburg Expressway 3 miles north of the Baltimore Beltway (map location 2). It is a large quarry in Cockeysville marble. This area and the Cockeysville area to the north was once the center of a large marble industry. Some of the stone for the Washington Monument in Washington, D.C., is from the deposits. Only crushed-stone products are produced now. 2

Md. 194.—Quarries of S. W. Barrick and Sons, Inc., and LeGore Lime Co. are in the small village of LeGore, 1½ miles north of Woodsboro, west of Md. 194 (map location 3). Both of these operations are old ones. The LeGore operation was started in 1861, and 3



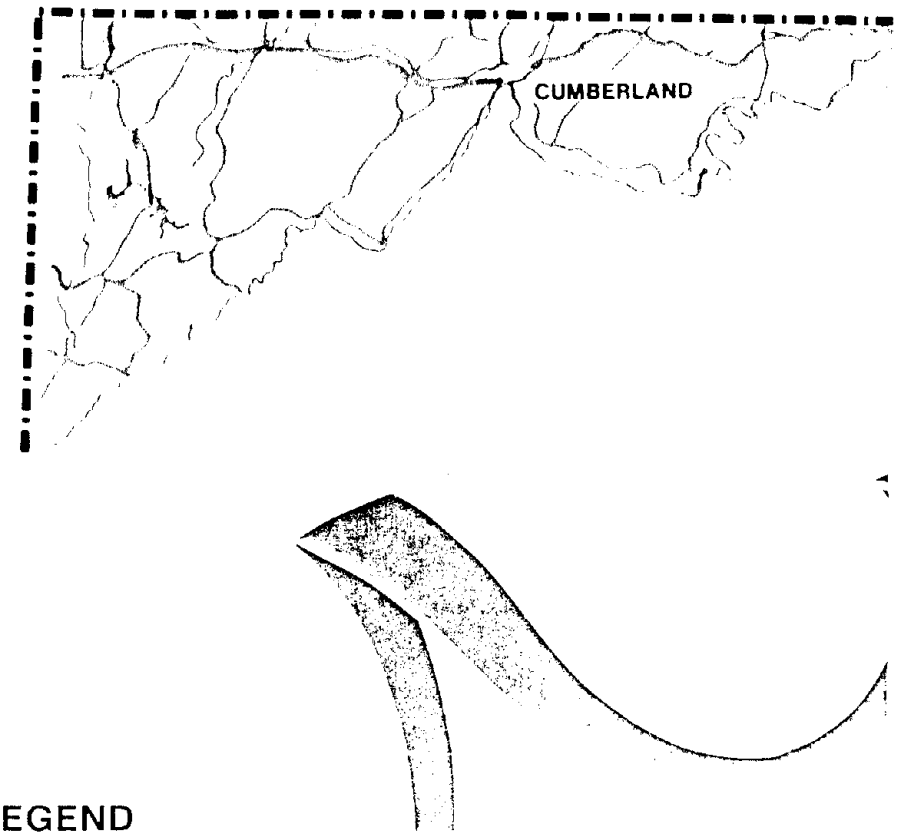
Maryland marble provided most of the facing on the Washington Monument. Begun in 1848, the monument rose to 153 feet by 1854. (Courtesy of National Park Service.)

the Barrick plant, in 1874. Lime is still burned in old vertical kilns at the Barrick operation, as it was almost a century ago. Both operations quarry their limestone from the Grove limestone formation.

Md. 550.—The Lehigh Portland Cement Co.'s Woodsboro plant is just south of Md. 550, 1 mile southeast of Woodsboro. Woodsboro is 10 miles northeast of Frederick on Md. 194 (map location 4). The plant is new (production initiated late in 1964) and is the only plant in Maryland producing lightweight aggregate from shale. Shale quarried from a member of the Frederick limestone formation is then crushed and passed through rotary kilns that subject the shale to high heat. Because of its inherent composition, the shale expands when heated and produces a lightweight aggregate suitable for use in concrete block manufacture and in construction as an aggregate in lightweight concrete.

4

Md. 64.—The North American Cement Corp. (Div.

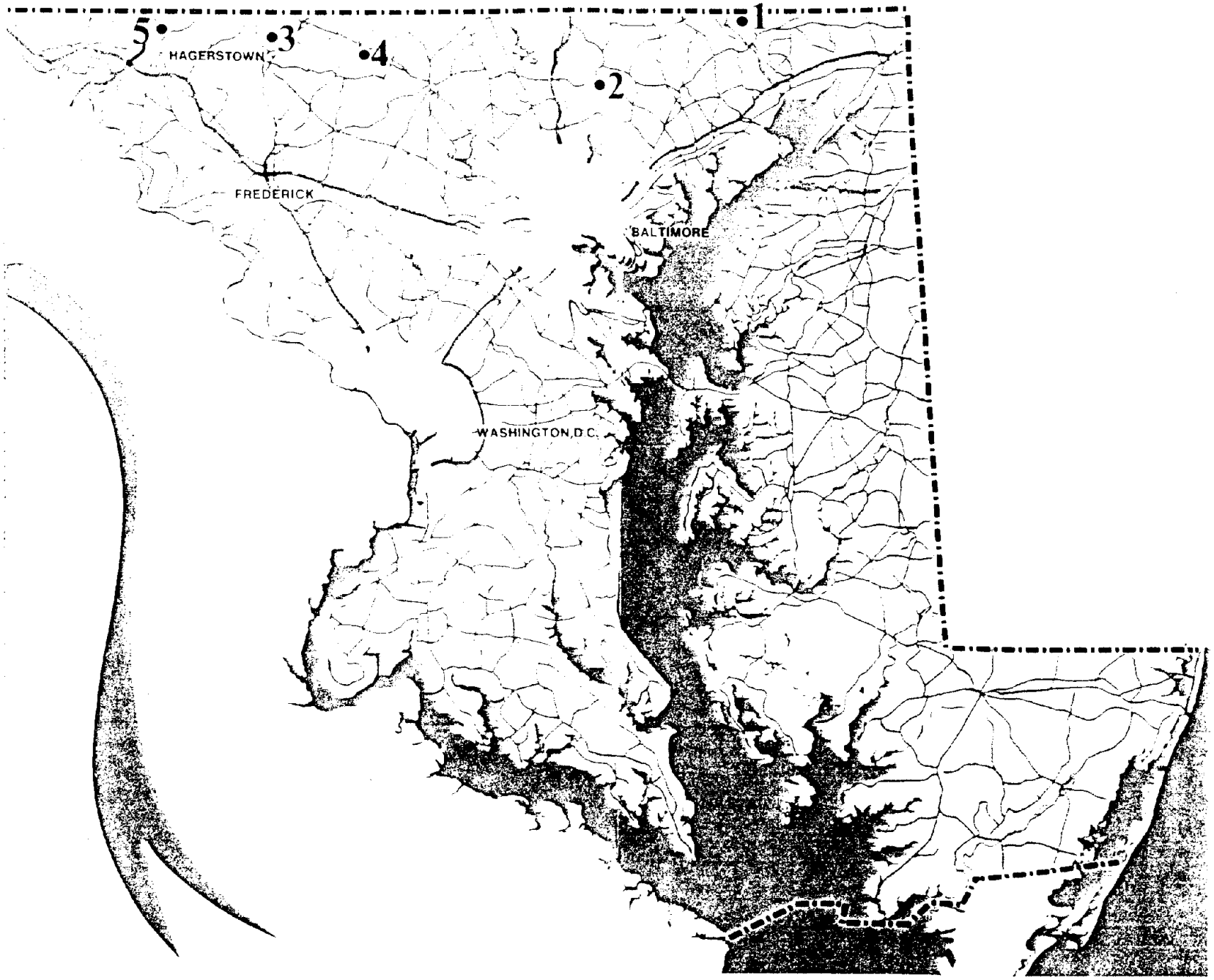


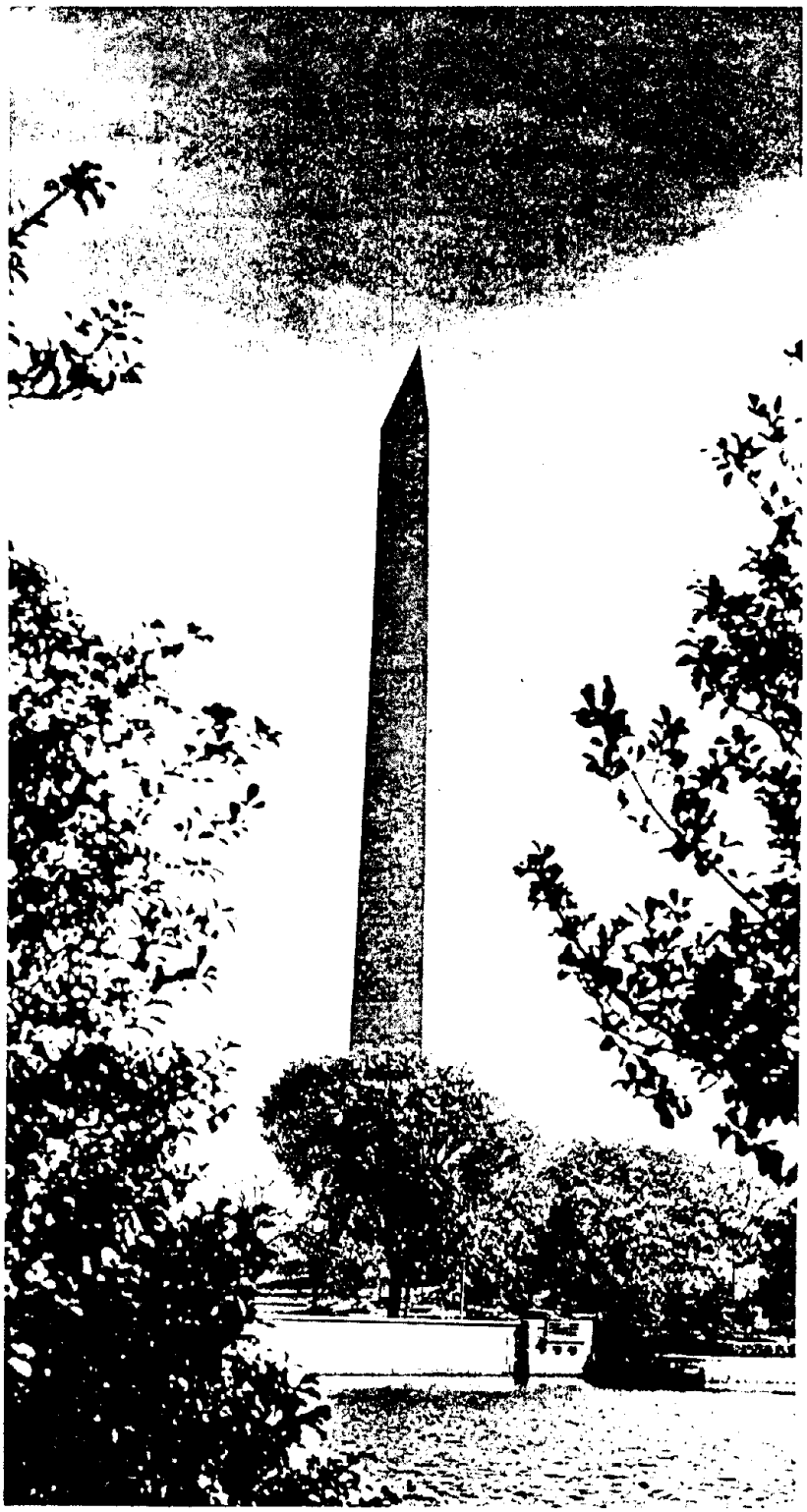
LEGEND

1 — GREEN MARBLE AND SLATE QUARRIES
2 — COCKEYSVILLE MARBLE QUARRIES
3 — LIMESTONE QUARRIES
4 — SHALE QUARRIES
5 — LIMESTONE QUARRY

0 30

SCALE (MILES)


1
2
3
4
5
HAGERSTOWN
FREDERICK
BALTIMORE
WASHINGTON, D.C.



Construction of the Washington Monument resumed in 1880, and the monument was completed to its present height of slightly more than 555 feet in December 1884. (Courtesy of National Park Service.)

5 of Marquette Cement Manufacturing Co.) Security plant is situated 2 miles east of Hagerstown and one-half mile north of Md. 64 (map location 5). The quarry is north of the plant along Old Forge Road; it is the oldest portland cement plant in Maryland and has been operating since 1908. Limestone used in making the cement is quarried from the Conococheague formation.

HISTORICAL SITES

LeGore, mentioned previously, has interesting examples of old vertical lime kilns. Texas, also mentioned before, represents a historical phase in marble production.

FOR MORE INFORMATION WRITE OR VISIT

Director, Maryland Geological Survey, John Hopkins University, Baltimore, Md. 21218.

Public Information Officer, Department of Natural Resources, State Office Building, Annapolis, Md. 21401.

Federal Bureau of Mines Liaison Office, Room 9008, 2401 E Street, N.W., Washington, D.C. 20241.

Rockhounds searching for rubies and sapphires near Franklin, N.C. (Courtesy of North Carolina Department of Natural and Economic Resources.)

NORTH CAROLINA

by
Lawrence E. Shirley

North Carolina leads the States in the production of feldspar, lithium minerals, and mica, is second in the production of olivine, and third in tungsten output. The State is also a leader in the production of asbestos, clays, and phosphate rock, ranking fourth among the States in production of these three important mineral commodities.

Historically, North Carolina was an important gold mining State until 1849, the year of the discovery of gold in California. From 1803 through 1828, North Carolina was the only recorded gold producing State in the Nation. There are now approximately 660 inactive gold mines in North Carolina, most of which are in the Piedmont province.

MINES YOU CAN SEE FROM THE HIGHWAYS

U.S. 19E.—About 2.5 miles west of Spruce Pine can be seen the Chalk Mountain mine of the Feldspar Corp. (map location 1). Feldspar ore is mined from this large opencut operation and hauled several miles by truck to a processing plant. The company is one of the largest feldspar producers in North Carolina and operates three open pit mines and two plants in the western part of the State. 1

U.S. 52.—The "world's largest open-face granite quarry" can be observed from several points along the Blue Ridge Parkway and from U.S. 52 near Mt. Airy, Surry County (map location 2). Both dimension and crushed granite is mined by this large producer, and several satellite industries that process the granite surround the operation. The quarry, owned by North Carolina Granite Corp., under actual operation is in excess of 90 acres and is 1 mile long and 1,800 feet wide. Over 80 years of carefully planned quarry operations have preserved and developed the almost ideal natural features of the deposit. The company invites visitors to tour their plant and facilities at any time. 2

MINES YOU CAN VISIT

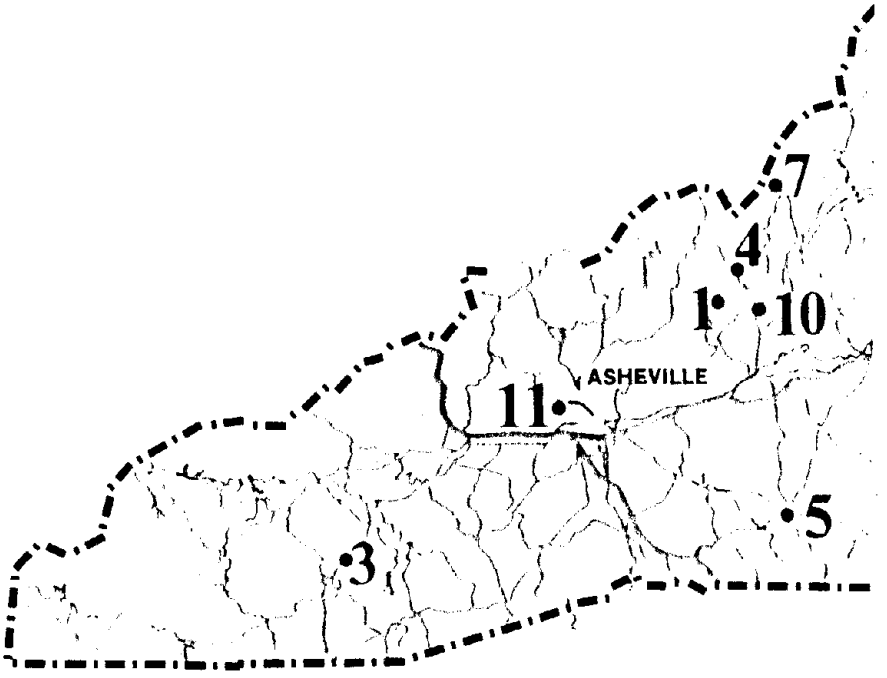
North Carolina has been called the mineral showcase of America because of the great variety of minerals found in the State. Western North Carolina is noted for its deposits—all attractive to rockhounds and collectors of gem stones. Franklin is a center for 3 rubies, sapphires, and garnet (map location 3). At Spruce Pine, mica, feldspar, beryl, and other pegmatite 4 minerals are found in abundance (map location 4). In the Piedmont area near Kings Mountain, pegmatite deposits are mined for lithium minerals and feldspar 5 (map location 5). Near Hiddenite, Alexander County, the mineral hiddenite, a very rare green variety of spodumene, has been found as well as emeralds and 6 other rare gem stones (map location 6).

Gem stone properties in North Carolina are generaly open to the public for a fee. Specifically, in the Franklin area there are several gem stone mines located in the Cowee Creek area off of N.C. 28 and on the Cowee Valley Road approximately 9 miles north of Franklin. Rubies, sapphires, garnet, and many other minerals may be found at mines throughout Macon County.

GHOST TOWNS AND HISTORICAL SITES

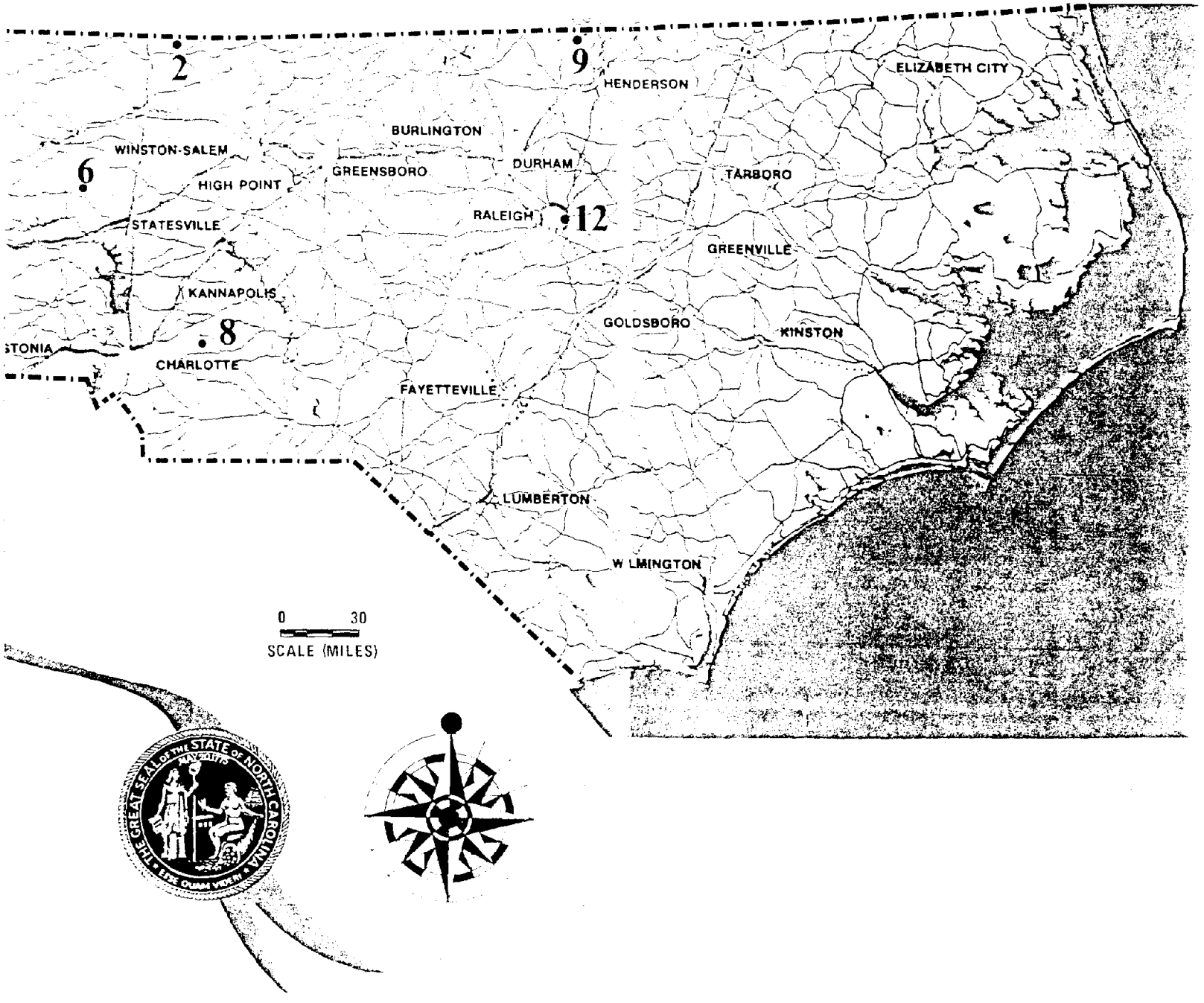
U.S. 19E.—The Cranberry magnetite mine is near the town of Cranberry on U.S. 19E, 23 miles north of Spruce Pine and 29 miles southeast of Elizabethton, 7 Tenn. (map location 7). The iron deposits of the Cranberry area were reportedly worked as early as 1820. Originally, ore was smelted at the mine but in 1900, a furnace was built at Johnson City, Tenn., and the furnace at the mine was abandoned. The mine has been worked intermittently for many years, most recently by Cranberry Magnetite Corp. of Cranberry, N.C., a subsidiary of Handy & Harman, Boston, Mass., a metals refining, processing, and fabricating company.

N.C. 27.—The Reed gold mine is 13 miles south of Concord off a State-maintained road between N.C. 200 8 and N.C. 27 in Cabarrus County (map location 8). Gold was first discovered on this property in 1799—the first authenticated discovery of gold in North Carolina. The mine was first worked as a placer operation and was perhaps the richest placer deposit in the State. In 1972, 800 acres of the Reed gold mine property was purchased by the North Carolina State Department of Archives and History, and plans were undertaken to develop the mine into a State historic site. Plans include (1) a visitor center that will contain exhibits on gold mining in North Carolina and (2) rehabilitation of underground workings to show visitors an actual gold mine.



LEGEND

1 — OPEN PIT FELDSPAR MINE
2 — GRANITE QUARRY
3 — GEM STONE DEPOSITS
4 — MICA, FELDSPAR, AND BERYL DEPOSITS
5 — LITHIUM AND FELDSPAR MINES
6 — GEM STONE OCCURENCES
7 — CRANBERRY MAGNETITE MINE (INACTIVE)
8 — HISTORIC GOLD MINE (INACTIVE)
9 — TUNGSTEN QUEEN MINE (INACTIVE)
10 — MUSEUM OF NORTH CAROLINA
11 — COLBURN MINERAL MUSEUM
12 — NORTH CAROLINA STATE UNIVERSITY
MUSEUM OF NATURAL HISTORY


2
9
HENDERSON
ELIZABETH CITY
BURLINGTON
WINSTON-SALEM
6
GREENSBORO
DURHAM
TARBORO
HIGH POINT
RALEIGH
12
STATESVILLE
GREENVILLE
KANNAPOLIS
8
GOLDSBORO
KINSTON
CHARLOTTE
FAYETTEVILLE
LUMBERTON
WILMINGTON
0 30
SCALE (MILES)

U.S. 15.—The Tungsten Queen mine, formerly the Hamme tungsten mine, is near Townsville, Vance County (map location 9). In past years, the mine has been one of the Nation's leading producers of tungsten minerals. The property was discovered in 1942 and operated continuously until 1958. The mine has been worked only intermittently since that time. Ranchers Exploration & Development Corp., the present owner of the mine, purchased the mine in 1968 from Howmet Corp. The mine was reopened in 1970, operated for about 1 year, and then placed on a standby basis by Ranchers in 1971. 9

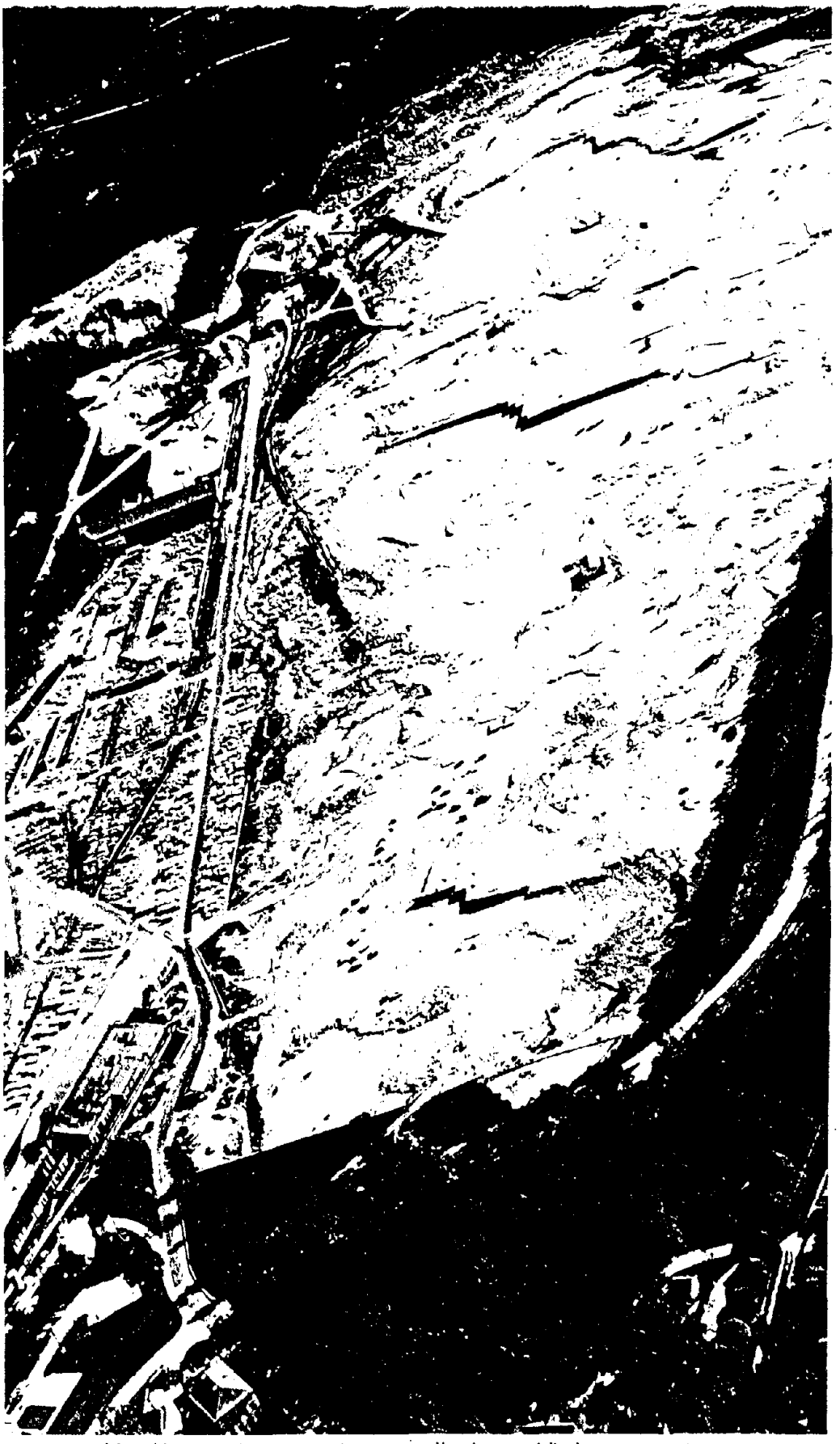
N.C. 226.—The Museum of North Carolina Minerals is near the intersection of N.C. 226 and the Blue Ridge Parkway, 5 miles south of Spruce Pine (map location 10). Located in the midst of the highly productive Spruce Pine mineral district, the museum is operated by the National Park Service, U.S. Department of the Interior. Mineral specimen collectors can study excellent rock and mineral exhibits at the museum and inquire about mines that are open to collectors in the Spruce Pine area. However, collectors planning to visit any abandoned mine that has not formally reopened are advised to obtain permission first from the property owners before going on the property. The museum is open from May 1 through October; there is no admission charge. 10

U.S. 19, U.S. 23.—The Colburn Mineral Museum, sponsored by the city of Asheville and the Southern Appalachian Mineral Society, is located at 170 Coxe Avenue in Asheville (map location 11). Exceptional specimens of interest to both the scientist and the gem collector are to be found in this outstanding display. There is no admission charge to the museum. 11

U.S. 70.—The North Carolina State Museum of Natural History is located in the Agriculture Building on Capitol Square in Raleigh and has a large collection of rough and cut gems from North Carolina, as well as other exhibits on the geology and mineralogy of the State (map location 12). There is no admission charge to the museum, which is open year round. 12

FOR MORE INFORMATION WRITE OR VISIT

Federal Bureau of Mines Liaison Office, Room 222—Century Postal Building, P. O. Box 2828, Raleigh, N.C. 27602.



Mt. Airy granite quarry is reportedly the world's largest granite quarry. (Courtesy of North Carolina Granite Corp.)

Rockhounds panning for rubies and sapphires in Cowee Valley near Franklin, N. C. (Courtesy of Jim Page.)

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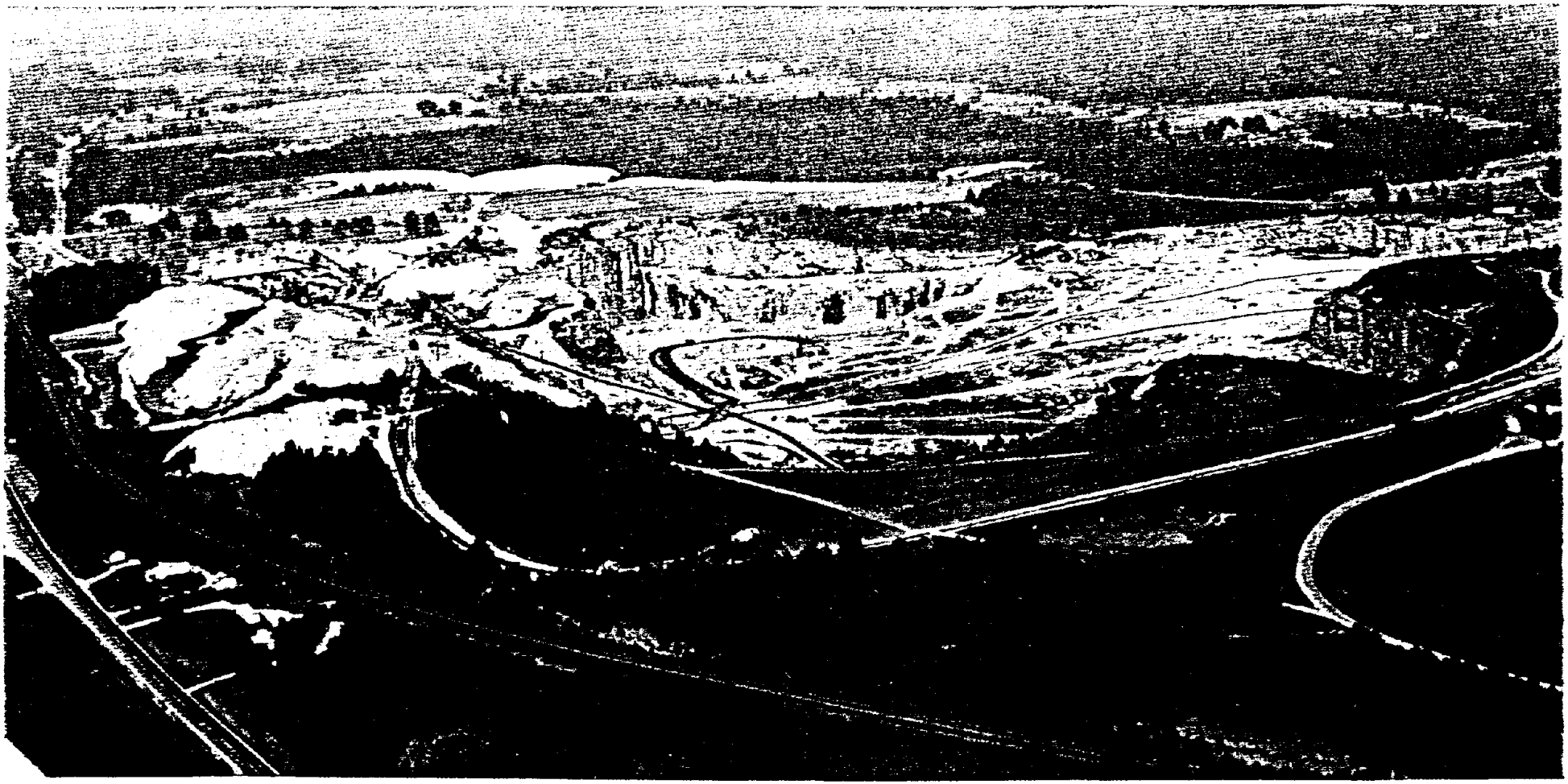
Mineral Localities of North Carolina, by J. F. Conley, 1958. Revised in 1971 by O. F. Patterson, III, and G. Ganis. North Carolina Department of Conservation and Development, Division of Mineral Resources, Information Circular 16, 1971, 128 pp.

The Rubies of Cowee Valley, Franklin, N.C., and Other Native Gem and Mineral Locations in Macon County, N.C., by L. Harshaw. Hexagon Co., 474 Windsor Road, Asheville, N.C. 28804, 1973, 78 pp.



The Beverly quarry near Liberty, S.C., is a source of crushed granite. (Courtesy of Vulcan Materials Co.)

SOUTH CAROLINA

by
Herman W. Sheffer

The entire mineral production in South Carolina at the present time comes from surface mining of nonmetallic minerals. Although mining occurs in 30 of 46 counties in the State, the largest number of mines is located in Aiken, Lexington, Richland, Kershaw, and Chesterfield Counties along the fall line that separates the Coastal Plain region from the Piedmont region. While traveling through this area of the State, one can see kaolin and other clay mining, stone quarries, and sand and gravel operations.

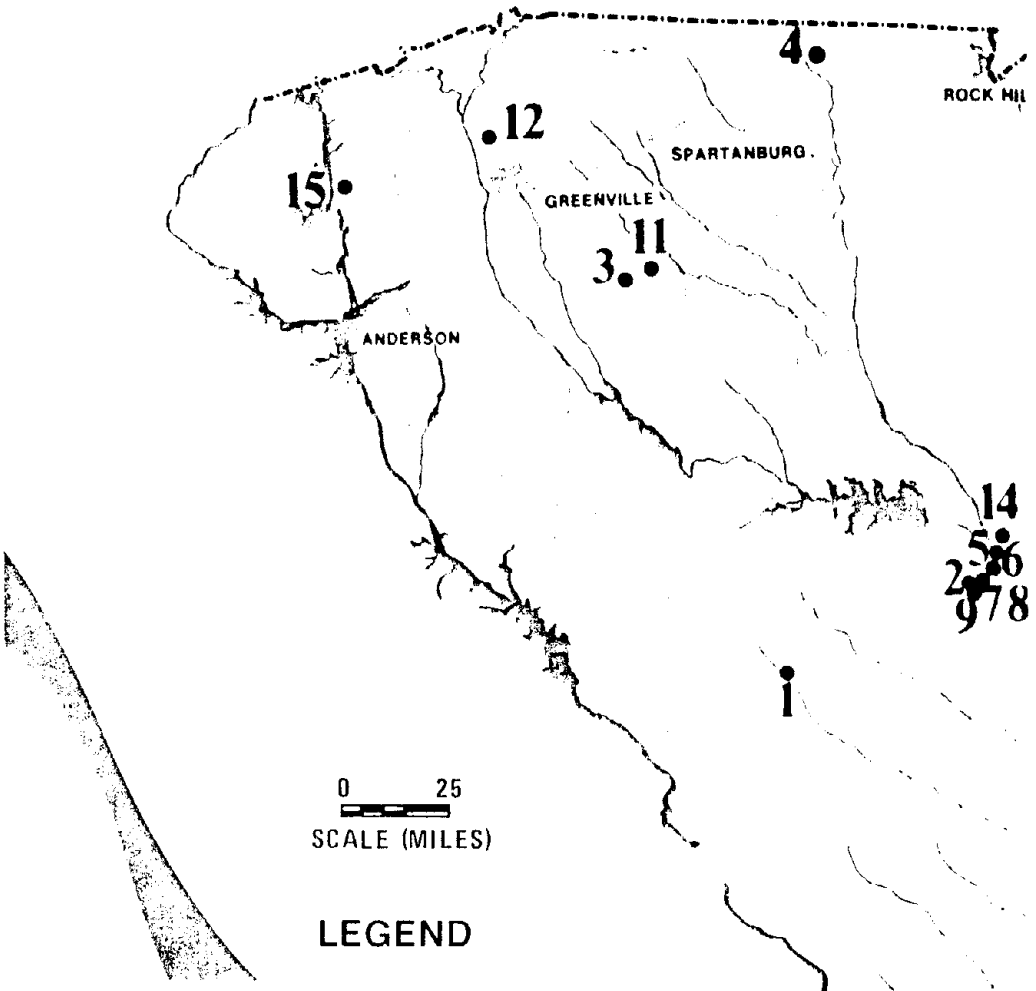
Commodity subdivisions occur within each of the three major groups of clay, stone, and sand and gravel, which collectively account for nearly 60 percent of the value of South Carolina's mineral production. These subdivisions include fuller's earth, used as an all-purpose absorbent compound, and clay for brick, tile, and portland cement; crushed stone for concrete and general construction, and dimension stone for monuments; and silica sand for glass containers, fibreglass, and other specialty items, as well as general construction.

Vermiculite and peat, mined in only relatively few areas in the United States, are mined in South Carolina.

Gold was produced in South Carolina from 1829 until 1942 when gold mines were closed by government order. At one time, the Haile mine near Kershaw was the most noted and successful gold mine east of the Mississippi River. South Carolina ranks third (behind North Carolina and Georgia)in total gold production among the southeastern States. Gold prospects are located in 18 counties in the State.

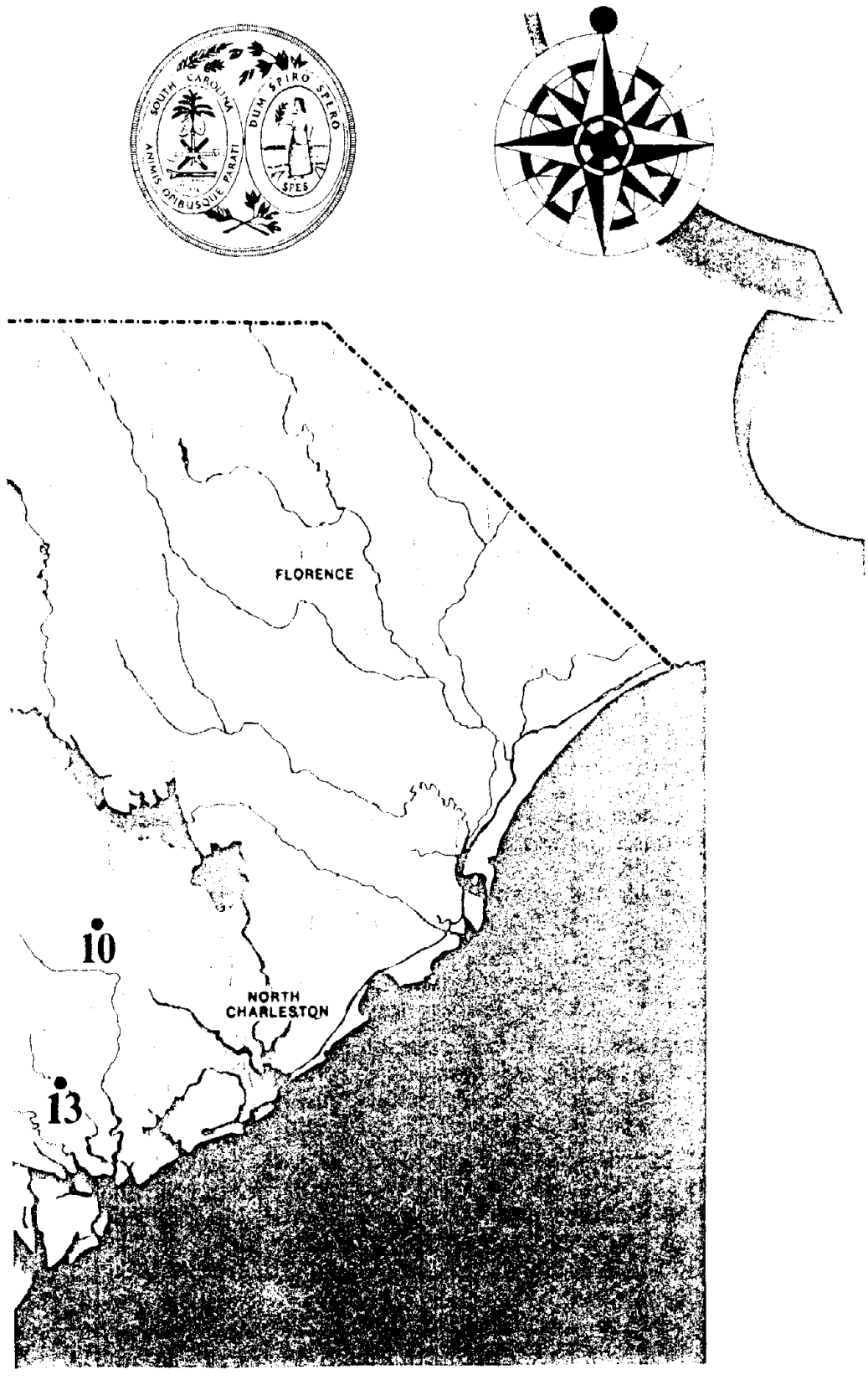
MINES AND PLANTS YOU CAN SEE FROM THE HIGHWAYS

Interstate 20, U.S. 1.—Kaolin—a nearly white, pure clay used extensively as a high-quality filler in paper, rubber, and plastics, and in refractories, ceramics, paints, and chemicals—is mined almost entirely in Aiken County. Twenty-two mines and six processing



LEGEND

1 — KAOLIN MINING DISTRICT
2 — BRICK MANUFACTURING PLANT
3 — GRANITE QUARRY
4 — LIMESTONE QUARRY
5 — GRANITE QUARRY
6 — GRANITE QUARRY
7 — SAND PITS
8 — SAND PITS
9 — GLASS SAND PROCESSING PLANT
10 — CEMENT PLANTS
11 — VERMICULITE PROCESSING PLANTS
12 — VERMICULITE PROCESSING PLANTS
13 — PEAT PROCESSING PLANT
14 — MINERAL MUSEUM
15 — KEOWEE — TOXAWAY VISITORS CENTER


SOUTH CAROLINA
ANIMIS OPIBUSQUE PARATI
DUM SPIRO SPERO
SPES
FLORENCE
10
NORTH
CHARLESTON
13

plants are located along a northeast-southwest trending zone paralleling Interstate 20 in Aiken County and are concentrated near Aiken, Langley, and Graniteville just off U.S. 1 (map location 1). Kaolin, mined from nine other operations northeast of Aiken County, is used by various brick companies as a colorant (map location 2).

U.S. 276.—The granite quarry of Vulcan Materials Co. can be seen on the west side of U.S. 276 near Gray Court. The stone quarried here is crushed for use in highway construction and as an aggregate in concrete (map location 3).

Interstate 85.—Near Blacksburg, south of Interstate 85, the Vulcan Materials Co. operates a limestone quarry and processing facilities that yield crushed stone for a variety of uses (map location 4).

U.S. 1, U.S. 321.—Two large granite quarries operated by Lone Star Industries, Inc., and Martin-Marietta Aggregates, are located on the east and west sides of the Congaree River just south and west of downtown Columbia. The bottom of each quarry is many feet below the bottom of the Congaree River. Crushed stone from these quarries is used as concrete aggregate and in highway construction (map locations 5 and 6).

Sand and gravel is produced mainly in the Coastal Plain region of the State at locations usually remote from major highways. Sand operations can be viewed near Lugoff just south of U.S. 1 and can be seen along U.S. 321 south of Columbia (map locations 7 and 8).

S.C. 215.—A special processing plant for producing glass sand is located on the south side of S.C. 215 southwest of Columbia (map location 9).

Interstate 26.—Three cement plants are located just off Interstate 26 near Harleyville. One of these plants have been recently constructed and can easily be seen from Interstate 26 (map location 10).

U.S. 221, U.S. 276.—Vermiculite is produced only in South Carolina and Montana. Mining is conducted in Laurens County, and exfoliating plants are located north of Laurens, west of U.S. 221 (map location 11), and north of Greenville in Greenville County off U.S. 276 (map location 12).

U.S. 17.—Peat is mined from a peat bog located in a swampy area near the South Edisto River in Colleton County. The peat is trucked to a processing plant for packaging. The plant is located on the north side of U.S. 17 near Green Pond (map location 13).

United States Peat Corp. peat fields located at Green Pond, S.C.

MINES YOU CAN VISIT

Operating mines in the State do not have tourist facilities and do not encourage visitors. Mining professionals and mining students can usually arrange visits at larger mines and plants by communicating in advance with mine managers.

MUSEUMS AND VISITOR CENTERS

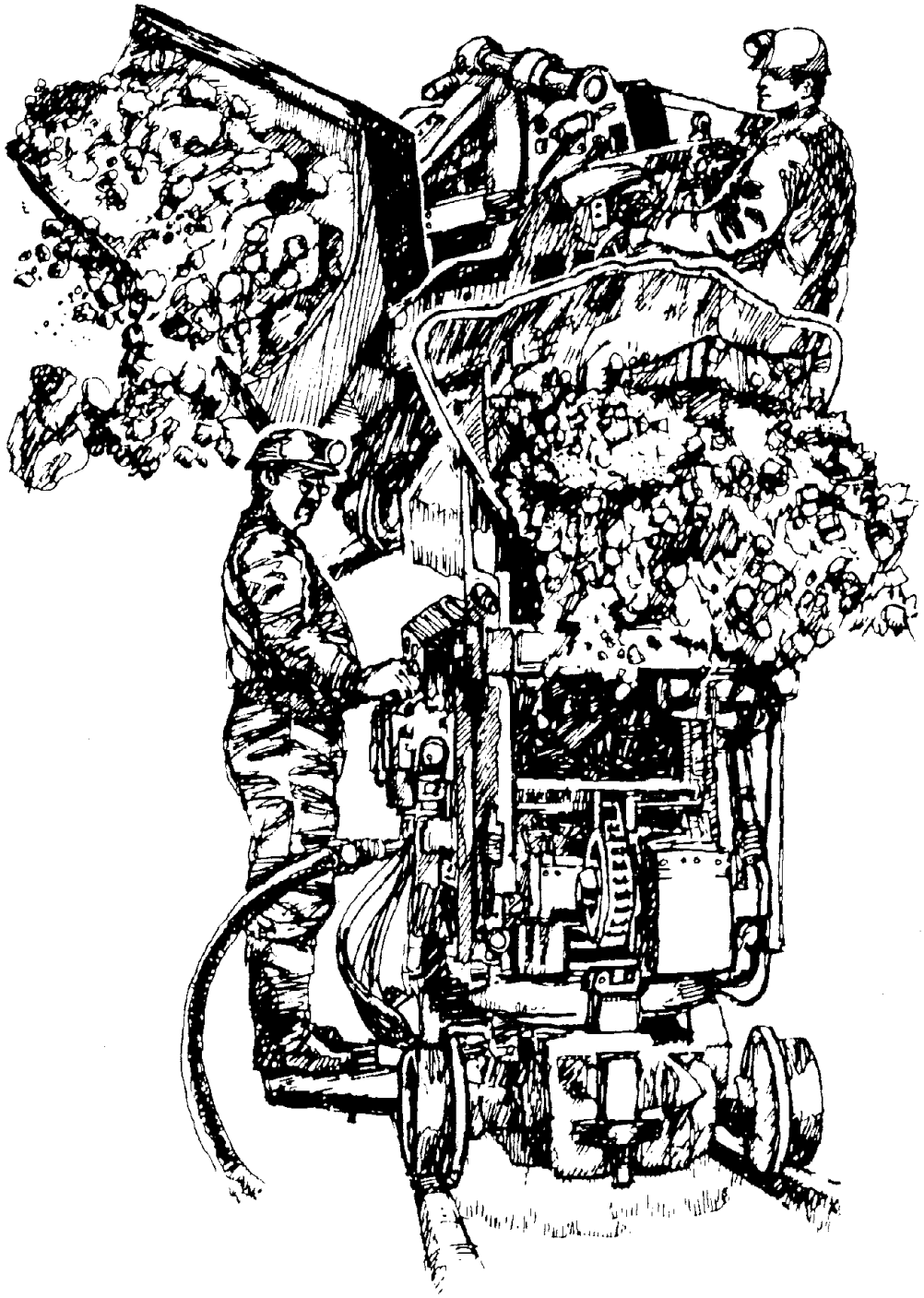
Laurence L. Smith Museum—The Laurence L. Smith Museum contains thousands of prize minerals and fossils from all over the world. Four collections—those of Cooper, Vanuxem, Brumby, and Colburn—form the nucleus of the displays. Many rare and beautiful crystals are on display in the museum, which was dedicated and reopened in April 1973 following a major redecorating. The museum is located in the LeConte Building (Department of Earth Sciences), University of South Carolina (map location 14). Visiting hours are Monday through Friday, 8:30 a.m. to 4:30 p.m.; the museum is closed Saturday, Sunday, and University holidays. Admission is free.

14

Keowee-Toxaway Visitors Center.—The Keowee-Toxaway Visitors Center is situated on a hill overlooking Duke Power's Oconee Nuclear Station and offers a panoramic view of beautiful Lake Keowee and the Blue Ridge Mountains. Displays at the center involve the visitor in what is being seen: a working waterwheel, thunderstorm, reconstructed coal mine, and other realistic exhibits. Other displays show how electricity is produced at the Keowee Dam and Powerhouse, the Jocassee Dam and Powerhouse, and at the Oconee

Nuclear Station, as well as at modern coal-burning powerplants. The center is open to the public 7 days a week—from 10:00 a.m. to 5:00 p.m., Monday through Saturday, and from 1:00 p.m. to 5 p.m. on Sunday. Admission is free. The center is located at the intersection of S.C 130 and S.C. 183 near Clemson (map location 15).

15



FOR MORE INFORMATION WRITE OR VISIT

Federal Bureau of Mines Liaison Office, Room 403 Columbia Building, Columbia, S.C. 29201.

Division of Geology, South Carolina Development Board, P. O. Box 927, Columbia, S. C. 29202.

South Carolina Land Resources Conservation Commission, 1400 Lady Street, P. O. Box 11708, Columbia, S.C. 29211.

Aggregate Producers Association of South Carolina, Suite 702 Columbia Building, P. O. Box 5612, Columbia, S.C. 29250.

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The following publications are issued by the South Carolina State Development Board, Division of Geology, Columbia, S.C.:

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Common Clays of the Coastal Plain of South Carolina and Their Use in Structural Clay Products, by G. C. Robinson, B. F. Buie, and H. S. Johnson, Jr. Bulletin 25, 1961, 67 pp.

Corundum Resources of South Carolina, by C. K. McCauley and J. F. McCauley. Bulletin 29, 1964, 9 pp.

Gem Stone Resources of South Carolina, by C. K. McCauley, Bulletin 30, 1964, 30 pp.

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Heavy Minerals in South Carolina, by L. Williams. Bulletin 35, 1967, 35 pp.

Limestone Resources of the South Carolina Coastal Plain, by S. D. Heron, Jr. Bulletin 28, 1962, 101 pp.

Silica for Glass Manufacture in South Carolina, by B. F. Buie and G. C. Robinson. Bulletin 23, 1958, 39 pp.

Shovel and bulldozer operating in a Virginia kyanite quarry.

VIRGINIA

by
Lawrence E. Shirley

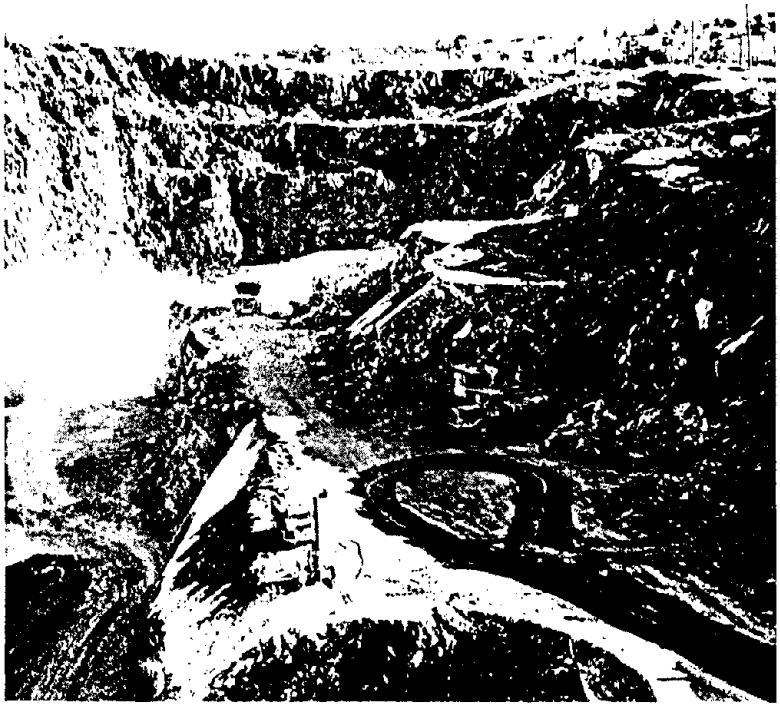
Virginia's mineral industry began in 1619 near Richmond. Principal mineral commodities now produced, listed in order of value, are bituminous coal, stone, sand and gravel, cement, and lime. Virginia has the largest known reserves of kyanite in the United States and is the leading producing State of kyanite and aplite.

Historically, Virginia has been a large producer of zinc. The Gulf + Western's New Jersey Zinc Co. mines at Austinville have been mined continuously since 1756, the year of discovery by Col. John Chiswell, a record unique in the annals of North American mining history. The mines supplied lead for the armies of General Washington during the Revolutionary War and also for Confederate forces during the Civil War. For the first 100 years, only lead was produced from the Austinville mines, but at the turn of the century, the New Jersey Zinc Co. acquired the properties, and both zinc and lead have been produced since that time.

MINES AND PLANTS YOU CAN SEE FROM THE HIGHWAYS

U.S. 15.—The Willis Mountain kyanite mine (opencut) may be seen on a high ridge (Willis Mountain) east of U.S. 15, about 6 miles south of Dillwyn (map location 1). This monadnock is one of the most prominent features in Buckingham County. Mining was begun on the deposit in 1957. The kyanite-bearing rock is mined by power shovel and trucked to a nearby plant, also visible from U.S. 15, where it is crushed, ground, screened, classified, and washed. After separation by flotation, the beneficiated kyanite is marketed in the raw state or converted to mullite for use in the refractories, ceramics, and other related industries. 1

U.S. 11.—Two large crushed-stone quarries can be observed from U.S. 11 and Interstate 81 in the vicinity of Buchanan (map location 2). The two quarries are 2



A shovel, dumpsters, and drilling equipment operating in a Virginia hard rock quarry.

both producing limestones from the Shady Dolomite at the foot of the Blue Ridge for use as roadstone, for agricultural uses, and for a variety of chemical and industrial purposes. The north quarry is operated by the James River Limestone Co., Inc., and the south quarry by Liberty Limestone Corp.

U.S. 52, U.S. 11.—Active zinc and lead mines can be seen near the towns of Austinville and Ivanhoe, at junction of Va. 94 and Va. 69, about 10 miles southeast of the junction of U.S. 11 and U.S. 52 (map location 3).

3

U.S 23.—Just north of Esserville between the towns of Norton and Wise, a battery of beehive ovens for the production of coke are operated by Christie Coal & Coke Co. (map location 4). The company normally operates about 70 ovens, but the number of ovens has declined in recent years.

4

On the west side of U.S. 23, between Va. 160 and Va. 68, is Westmoreland Coal Co.'s Bullitt mine and preparation plant (map location 5).

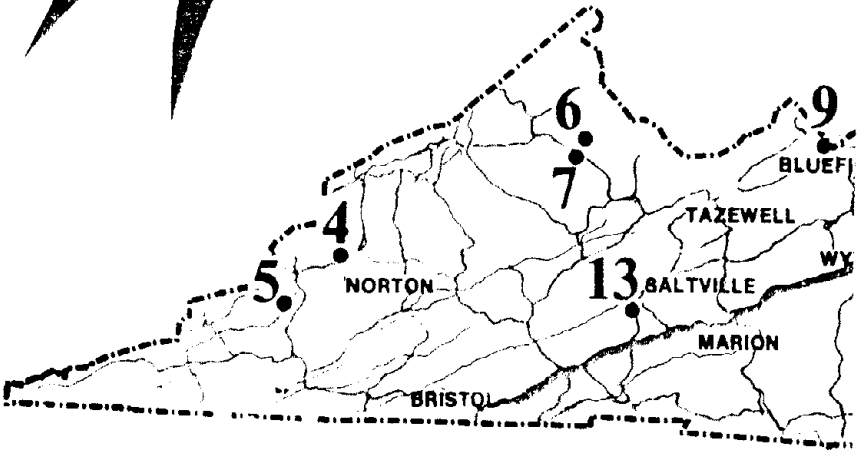
5

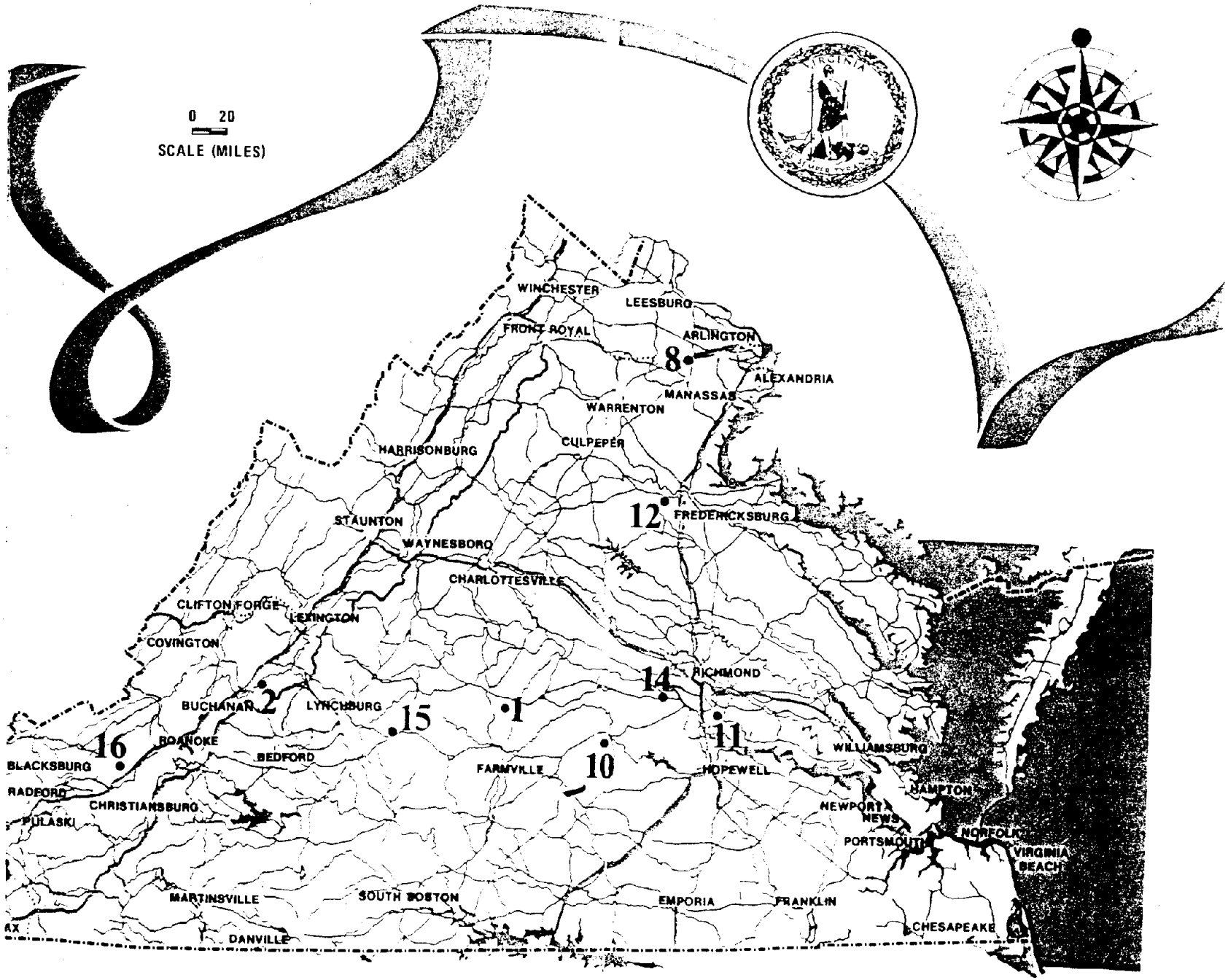
U.S. 460.—On the northeast side of the highway near the Levisa fork of the Big Sandy River, the Jewell Coal & Coke Co. operates a battery of about 300 ovens for the production of coke; 254 of the ovens are of the Mitchell type, and the remainder are the company's own design (map location 6).

6

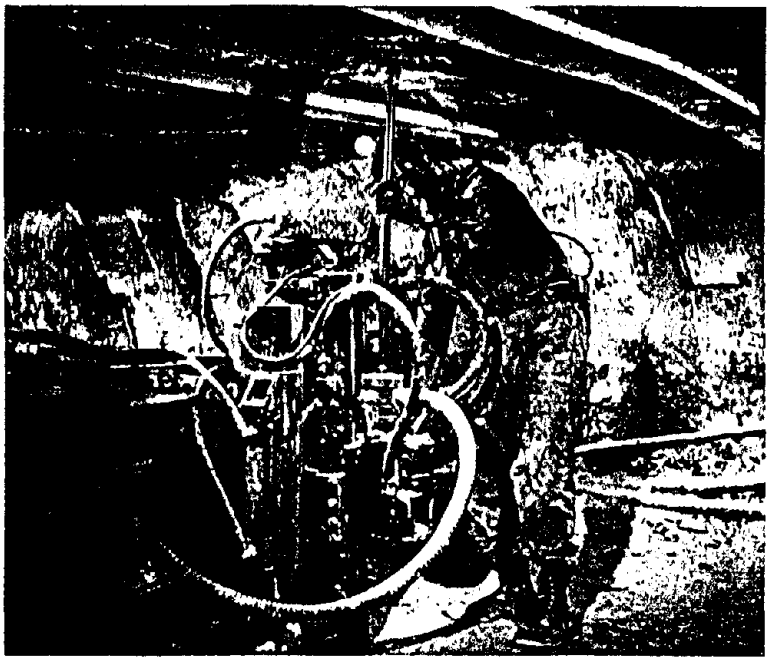
LEGEND

1 — OPEN PIT KYANITE MINE
2 — LIMESTONE QUARRIES
3 — LEAD AND ZINC MINES
4 — COKE OVENS
5 — BULLITT COAL MINE
6 — COKE OVENS
7 — BEATRICE-POCAHONTAS COAL MINE
8 — DIABASE ROCK QUARRY
9 — EXHIBITION COAL MINE
10 — AMELIA PEGMATITE MINING DISTRICT
11 — HISTORIC IRON FURNACE
12 — HISTORIC IRON FURNACE
13 — SALT MINES (INACTIVE)
14 — HISTORIC COAL MINES (INACTIVE)
15 — HISTORIC IRON FURNACE AND IRON ORE MINI
16 — ROCK SPECIMEN MUSEUM




0 20
SCALE (MILES)
WINCHESTER
LEESBURG
FRONT ROYAL
ARLINGTON
8
ALEXANDRIA
MANASSAS
WARRENTON
CULPEPER
HARRISONBURG
12
FREDERICKSBURG
STAUNTON
WAYNESBORO
CHARLOTTESVILLE
CLIFTON FORGE
LEXINGTON
COVINGTON
14
RICHMOND
BUCHANAN
2
LYNCHBURG
15
1
16
ROANOKE
11
WILLIAMSBURG
BLACKSBURG
BEDFORD
FARMVILLE
10
HOPEWELL
RADFORD
CHRISTIANSBURG
HAMPTON
NEWPORT NEWS
PULASKI
NORFOLK
PORTSMOUTH
VIRGINIA BEACH
MARTINSVILLE
SOUTH BOSTON
EMPORIA
FRANKLIN
CHESAPEAKE
DANVILLE

7 On the southeast side of U.S. 460 just west of the town of Keen Mountain is the Beatrice-Pocohontas coal mine and coal preparation plant of Island Creek Coal Co. (map location 7). This modern mine and plant are typical of the larger operations completed in recent years in the southwest Virginia area.



A roof-bolting machine bores a hole in the roof of a coal mine. A steel expansion bolt will be inserted in the hole and tightened, binding overlying rock layers together like plywood to make a firm roof without traditional wood props. (Courtesy of National Coal Association.)

8 **U.S. 29, U.S. 211.**—Diabase rock quarries are operated by Fairfax Quarries, Inc. (map location 8). A tunnel under the highway connects quarries on both sides of the road, permitting truck access without crossing the highway.

MINES THAT YOU CAN VISIT

9 **Va. 102.**—At Pocohontas, in the southwest Virginia coalfield, visitors can drive their cars through the Pocohontas exhibition coal mine, operated by the town and within the corporate limits of Pocohontas (map location 9). The mine is in the No. 3 coal seam, which is about 12 feet thick at that locality. The mine, leased to the town by the Pocohontas Fuel Co., is open to the public from 8 a.m. to 6 p.m. daily from March 15 through December for a small admittance fee.

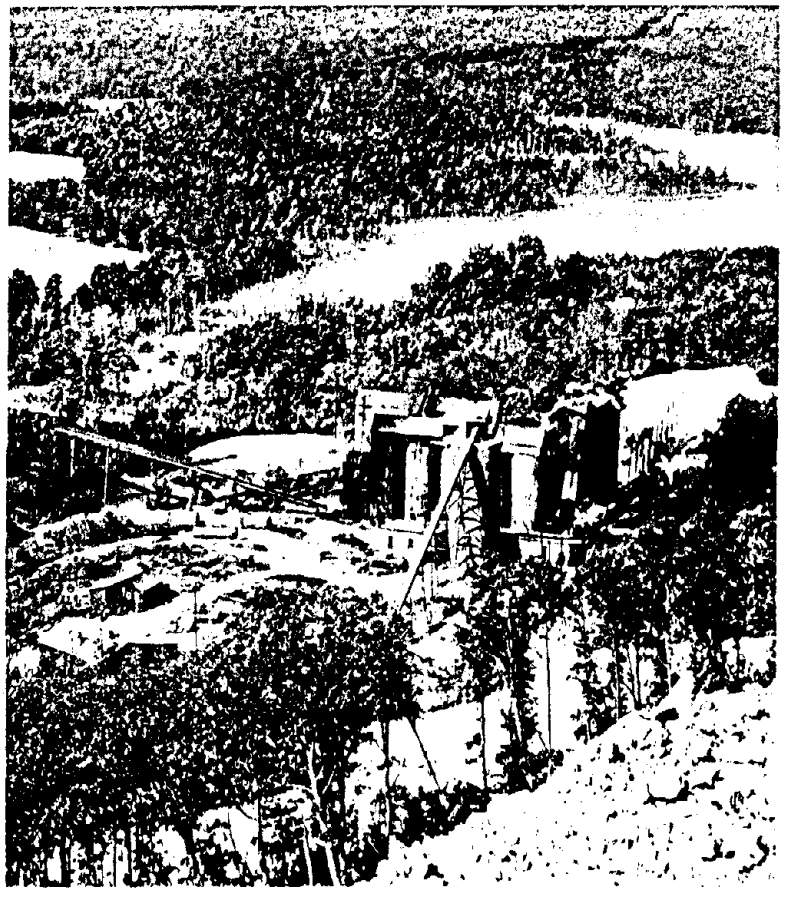
U.S. 360.—The Amelia pegmatite district is 38 miles

10 southwest of Richmond (map location 10). Virginia Highways 38 and 49 cross the district, and evidence of past mining of pegmatites for mica, feldspar, and other minerals can be seen from these roads. Two of the most prominent mines in the district are the Morefield mine and the Rutherford mine. A few of the mines in the area are open to the public for a fee. Inquiry should be made in Amelia for information concerning mines that may be visited.

GHOST TOWNS AND HISTORICAL SITES

U.S. 1.—The first iron furnace in the 13 colonies, located 1.5 miles south of Richmond, was built in 1619
11 and was destroyed by Indians in the massacre of 1622 (map location 11).

Va. 3.—Four miles west of Interstate 95 on this side road is the site of an ancient iron furnace established
12 about 1716 by Governor Alexander Spotswood (map location 12). It was the first fully equipped iron furnace in the colonies. Iron was hauled along this road



General view of a Virginia kyanite processing plant and tailings pond.

to the Rappahannock River for shipment. William Byrd visited the furnace in 1732 and described it.

Va. 91.—Salt recovery in the Saltville area dates back to pre-colonial days when the salt was utilized by Indians (map location 13). Commercial salt production began in the late 1700's by evaporating salty well water in open kettles over wood fires. William King built saltworks here in 1795. In October 1864, the Union troops raiding Saltville were driven off, but in December 1864, they destroyed the works. Since 1904, most of the brine, together with high-purity limestone and coal from nearby deposits, has been used in the manufacture of chemicals. Recent production has been by means of wells. Freshwater was pumped underground where it dissolved the salt; the brine was recovered for use in the chemical processes. Such products as dry ice, hydrazine rocket fuel, chlorine, and soda ash were manufactured by the Olin-Mathieson Chemical Corp., who ceased all operations in Saltville in 1972. **13**

U.S. 60.—One mile south of Midlothian are the Midlothian coal mines, probably the oldest in America (map location 14). Coal was first mined here before 1730, and a railway was built from the mines to the James River before 1830. Operations were continuous until 1865. The coal used in cannon casting at the Tredegar Iron Works, Richmond, was obtained here. **14**

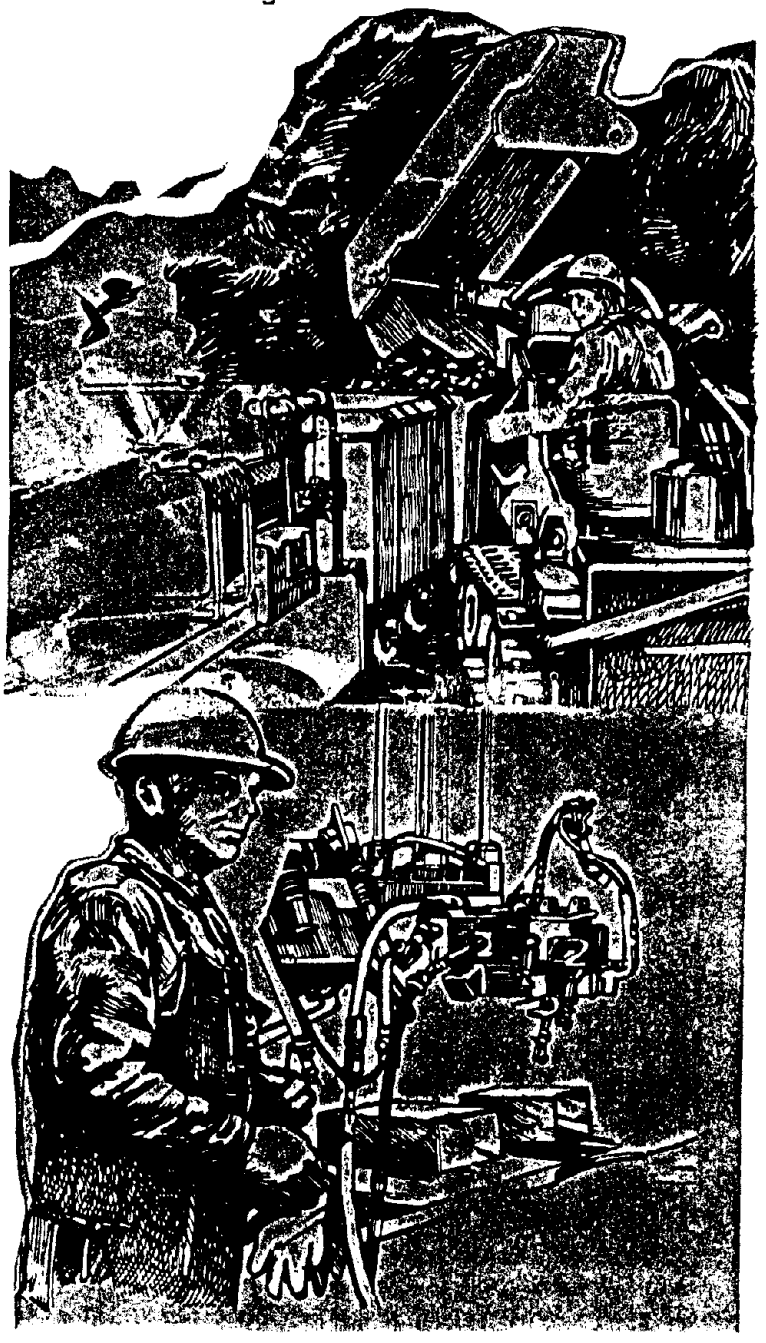
Richmond Crushed Stone Co. quarry located west of Richmond on the north side of Interstate 64 in Goochland County, Va.

U.S. 460.—Oxford Furnace, 2 miles west of Concord, was operated during the Revolutionary War by James Calloway to supply military materials (map location 15). Iron mines were nearby. The furnace was operated until 1875; the mill, until 1900.

15

An excellent mineral and rock specimen museum is housed in room 2062 of Derring Hall (center section) on the campus of Virginia Polytechnic Institute and State University (map location 16). The display is maintained by the Department of Geological Sciences and is free of charge.

16



FOR MORE INFORMATION WRITE OR VISIT

Federal Bureau of Mines Liaison Office, Room 222, Century Postal Building, Box 2828, Raleigh, N.C. 27602.

Commissioner and State Geologist, Virginia Division of Mineral Resources, Natural Resources Building, McCormick Road, Box 3667, Charlottesville, Va. 22903.

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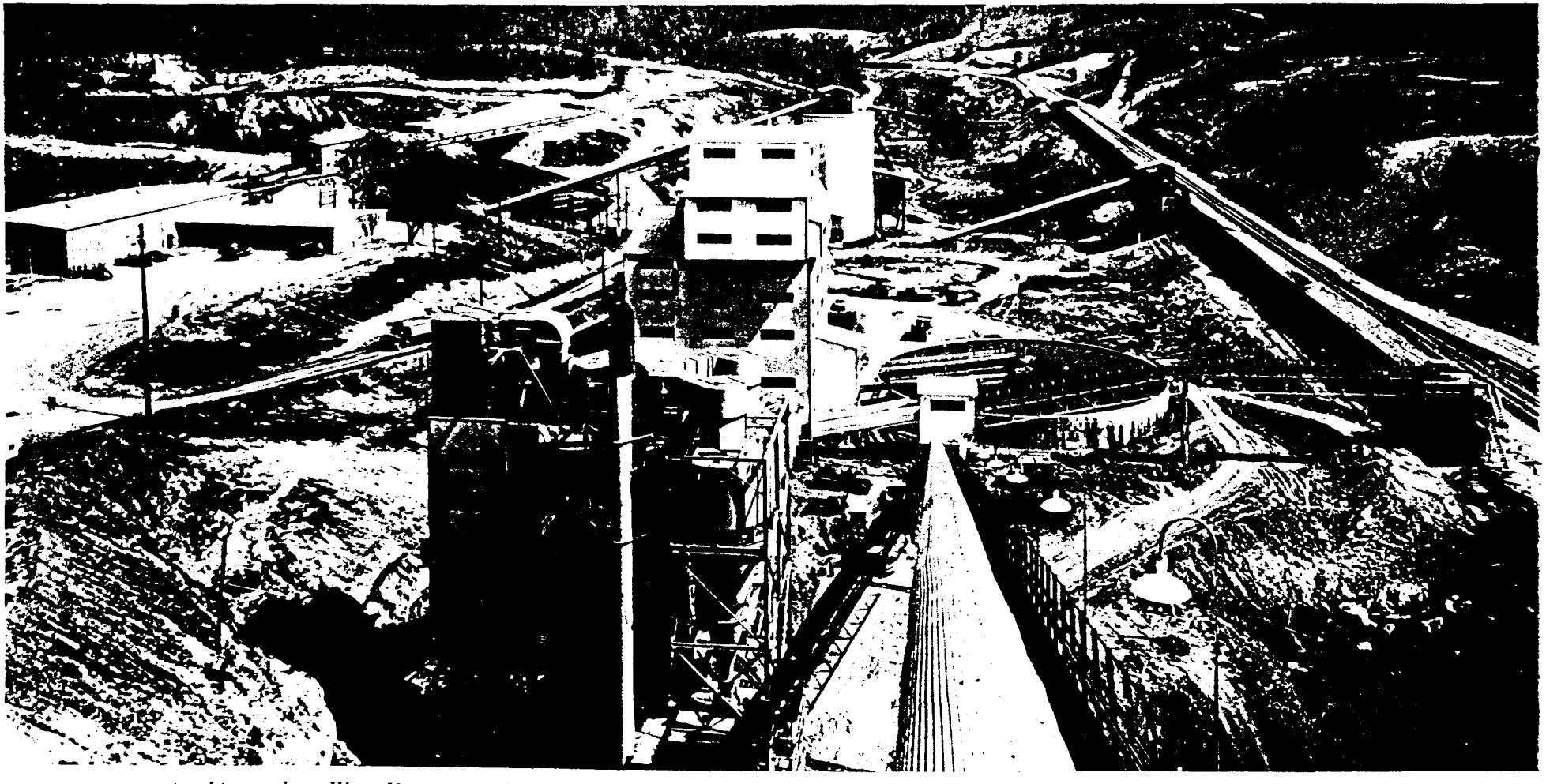
Minerals of Virginia, by R. V. Dietrich. Virginia Polytechnic Institute and State University, Blacksburg, Va., Research Division Bulletin 47, 1970, 325 pp.



At this modern West Virginia coal preparation plant, coal is crushed, cleaned, washed, and dried before being shipped to

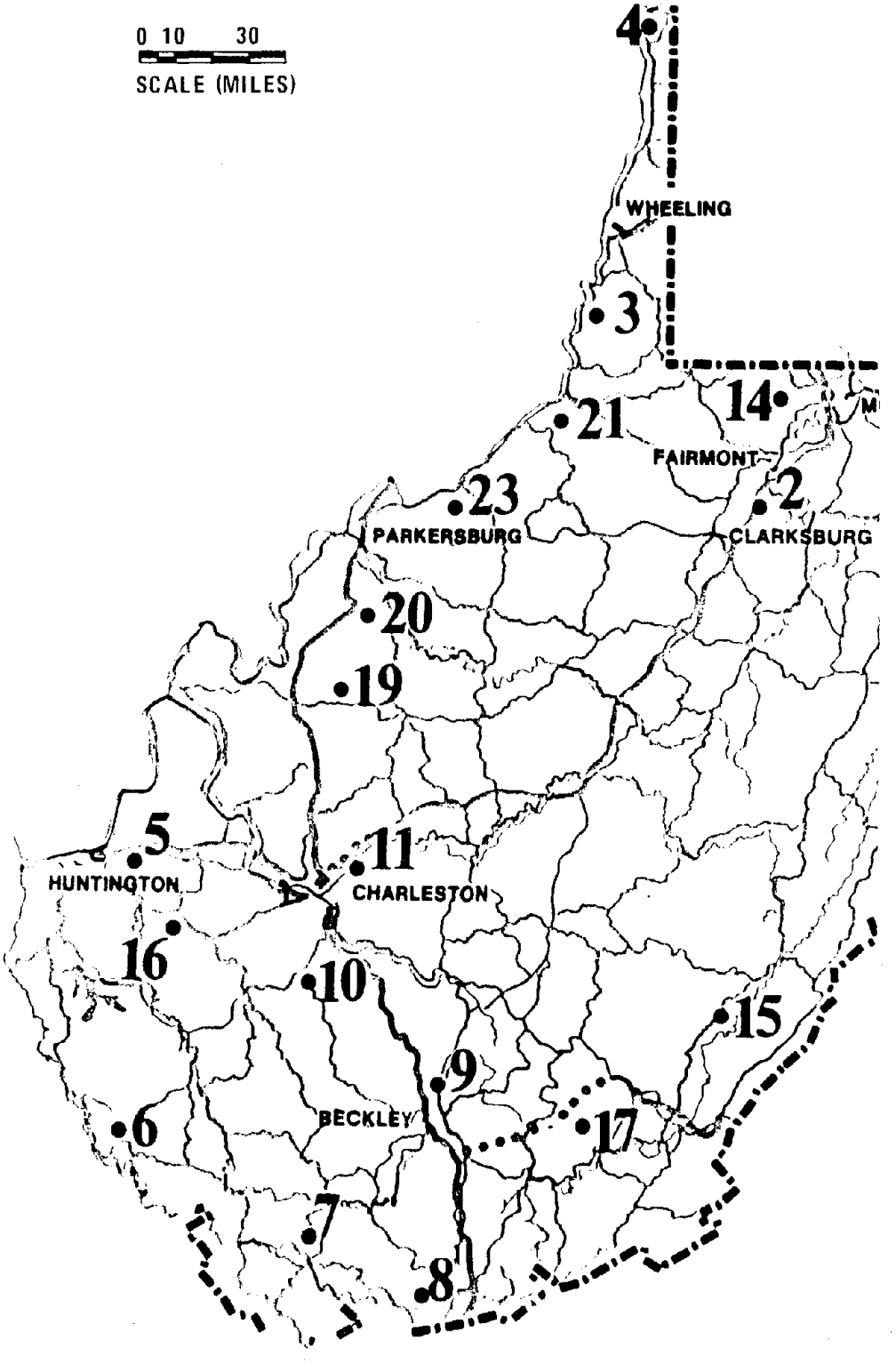
WEST VIRGINIA

by
William T. Boyd

Although early historical records are somewhat obscure, West Virginia's mineral industries began about 1742 when coal was first discovered in the northern panhandle area. Principal minerals now produced, listed in order of value, are bituminous coal, natural gas, crushed and dimensional stone, petroleum, and sand and gravel, along with small production of salt, clay, and gem stones. The value of this mineral production in 1974 exceeded $2.4 billion. West Virginia ranks fourth in the Nation with respect to value of minerals produced.

COAL

West Virginia's minable coal reserves are distributed through 44 of the 55 counties and underlie more than 13,700 square miles. Although more than 6 billion tons of coal already have been produced from this area, reportedly a selected group of 28 counties each still contain more than 1 billion tons of bituminous coal. This vast wealth of one mineral now very much in demand is a strong asset for future generations, and it is secured in more than 60 minable coalbeds and distributed through about 5,000 feet of geologic formation. These reserves occur in two distinct coal basins—a northern and southern—separated by a geologic hinge line running nearly northeast to southwest from Tucker County through Charleston to Wayne County and on into Kentucky. The coal-bearing formation in the northern basin is relatively thin, and the coalbeds contain a high sulfur and ash content. The southern basin has many more coalbeds with a relatively low sulfur and ash content. Owing to the mountainous topography, more than three-fourths of the annual coal production is obtained by underground mining methods, which requires expensive modern machinery for all phases of the mining operation. A coal loading machine, shuttle car, mantrip car, and roof-bolting machine may be seen in typical underground conditions.


0 10 30
SCALE (MILES)
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WHEELING
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14
FAIRMONT
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PARKERSBURG
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CLARKSBURG
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HUNTINGTON
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CHARLESTON
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BECKLEY
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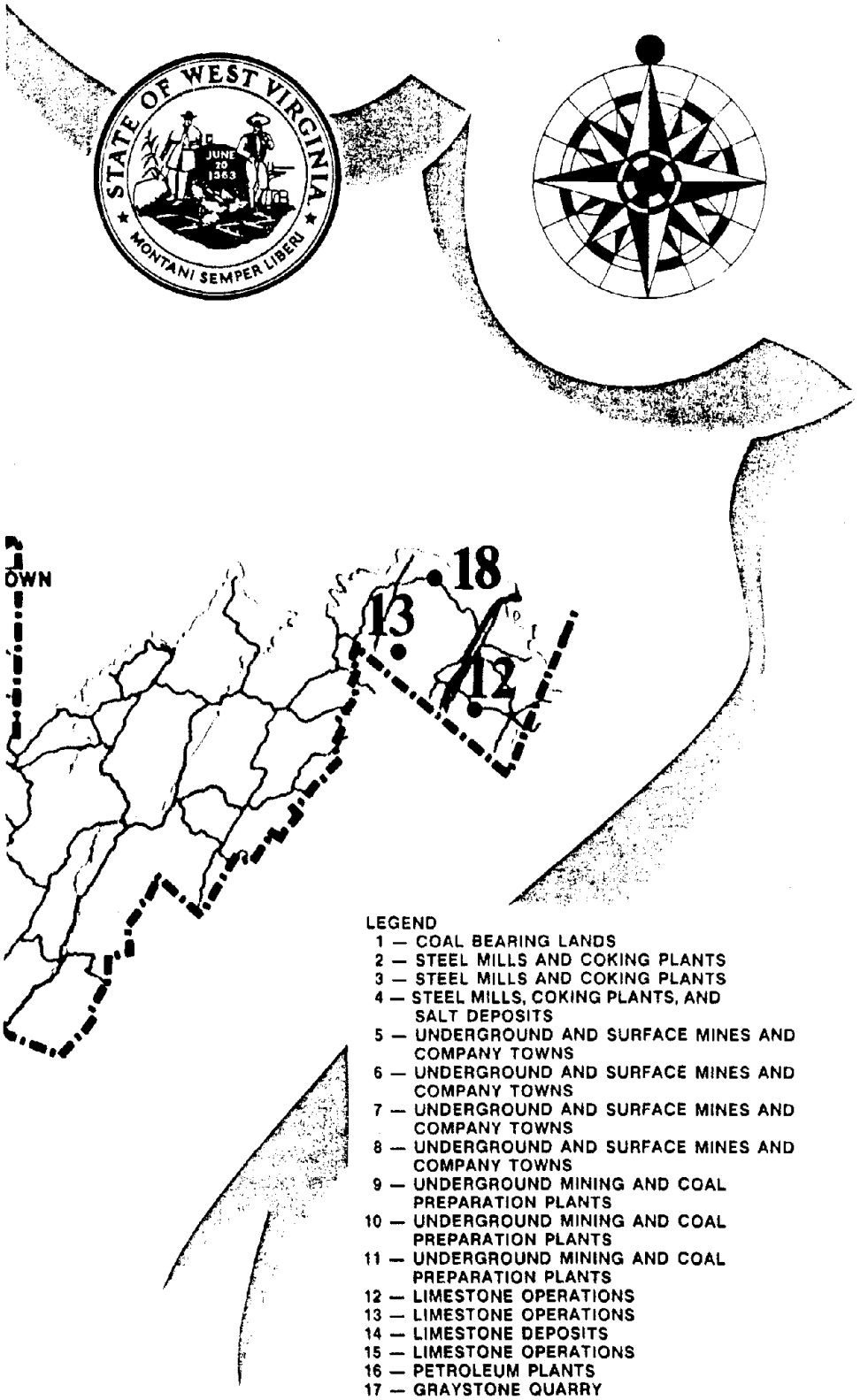

LEGEND

1 — COAL BEARING LANDS
2 — STEEL MILLS AND COKING PLANTS
3 — STEEL MILLS AND COKING PLANTS
4 — STEEL MILLS, COKING PLANTS, AND SALT DEPOSITS
5 — UNDERGROUND AND SURFACE MINES AND COMPANY TOWNS
6 — UNDERGROUND AND SURFACE MINES AND COMPANY TOWNS
7 — UNDERGROUND AND SURFACE MINES AND COMPANY TOWNS
8 — UNDERGROUND AND SURFACE MINES AND COMPANY TOWNS
9 — UNDERGROUND MINING AND COAL PREPARATION PLANTS
10 — UNDERGROUND MINING AND COAL PREPARATION PLANTS
11 — UNDERGROUND MINING AND COAL PREPARATION PLANTS
12 — LIMESTONE OPERATIONS
13 — LIMESTONE OPERATIONS
14 — LIMESTONE DEPOSITS
15 — LIMESTONE OPERATIONS
16 — PETROLEUM PLANTS
17 — GRAYSTONE QUARRY
18 — LARGE LIMESTONE QUARRY
19 — PETROLEUM PLANTS
20 — PETROLEUM, SAND AND GRAVEL PLANTS
21 — SAND AND GRAVEL PLANTS
22 — QUARRY AND SAND PLANT
23 — SHALLOW SALT DEPOSITS

Beginning their shift, bituminous coal miners board steel-topped mantrip cars that take them to the working face where coal is mined. (Courtesy of National Coal Association.)

After more than 40 years as the leading coal-producing state, West Virginia has dropped into second place during 1972-73, owing mainly to prolonged labor problems that hampered coal production for extended periods. However, the more than 1,350 underground and surface mines annually produce 120 million tons of bituminous coal.

MINES AND PLANTS YOU CAN SEE FROM THE HIGHWAYS

Most of the major highways within the State traverse through narrow valleys and pass the entrances to numerous underground mines, as well as the necessary coal preparation plants. These highways also present excellent views of contour stripping operations along the mountainsides several hundred feet above the roadways.

1
2 **W. Va. 50.**—This highway enters from Aurora near the Maryland border (map location 1) westward to Clarksburg (map location 2) traversing some of the most picturesque coal-bearing lands within the State. More than 30 percent of the annual production is obtained from the immediate six-county area, and several underground and surface mines are visible along this road. This tour provides an excellent view of surface mining in the rolling hill terrain.

W. Va. 250, W. Va. 2.—The headframes of several underground mines as well as many surface mines are visible along W. Va. 250 from Clarksburg to Moundsville and along W. Va. 2 to Newell. Also, many steel mills, coking plants, and other industries using coal or its byproducts are situated near the Ohio River, and these, too, are visible from these roads (map locations 2, 3, and 4). 2 3 4

Their shift completed, miners in the Federal No. 1 coal mine in Grant Town, W. Va., wait at the foot of the shaft for the elevator that will lift them to the surface. (Courtesy of National Coal Association.)

W. Va. 52.—Along this road from Huntington, Williamson, Welch, and finally Bluefield (map locations 5, 6, 7, and 8), many underground and surface mines are visible, and several small, inhabited and some abandoned "company towns" can be seen extending back into narrow valleys. Many of these small communities are accessible only by very narrow, company-constructed roads and bridges, or by walking along the railroad tracks. At Williamson (map location 6), the Chamber of Commerce Building is constructed entirely from 65 tons of bituminous coal. Some of the larger towns such as Welch (map location 7) are famous for particular coalbeds or types of coal, such as the "Black Diamond" coal that comes from this immediate area. 5 6 7 8 9

W. Va. 3, W. Va. 21, and W. Va. 119.—These highways extending from Bluefield, north to Beckley, Racine, and then Charleston (map locations 8, 9, 10, and 11) bisect some of the most picturesque terrain in 10 11

the Appalachian area and provide excellent views of many underground mining sites, coal preparation plants, and large areas of mountainous contour-mined lands that are now in various stages of reclamation. Also, a Federal Coal Mine Safety Academy is located at Beckley for training Federal, State, and industry employees primarily concerned with the enforcement and improvement of coal mine safety programs.

NATURAL GAS

Although natural gas production has declined somewhat in the past 5 years, West Virginia continues as one of the largest producers in the Eastern United States. Additionally, most of the depleted production areas have been converted to underground storage, thus insuring an adequate and peak load supply, and the State now ranks fifth in natural gas storage capacity. As a result of the energy crisis, many new shallow and deep wells are being drilled throughout the State. Some of these wells are almost 4 miles in depth and permit exploration of very deep geologic formations that heretofore were largely unexplored. Many of the old and new producing natural gas wells may be visible along the valleys, but most deep drilling operations are being conducted in remote areas, and its highly unlikely that they can be seen from the highways.

STONE

There are 39 commercial limestone and 24 sandstone mining operations in the State. The bulk of the limestone production comes from the northern counties of Berkley, Jefferson, and Monongalia and the eastern county of Greenbriar (map locations 12, 13, 14, and 15). In addition to highway construction uses, a substantial volume of limestone is used in underground coal mines to allay and reduce concentrations of coal dust. Sandstone operations are concentrated in Wayne, Raleigh, Lincoln, and Kanawha Counties. Most of these operations are in remote areas and may not be visible from the highways. Sandstone is used almost entirely for surface construction by the housing and related industries.

12 13 14 15

W. Va. 63.—The Graystone Quarry has a large operation near Alderson (map location 17). This is an open-face limestone quarry using conventional extraction methods and equipment.

17

W. Va. 9.—Several small- and medium-sized operations are situated within the three-county area traversed by this road, and several are visible from the highway (map locations 12 and 13).

12 13

W. Va. 45.—Near Martinsburg in the northeast corner of the State, the Blair Limestone Div., Jones and Laughlin Steel Corp., has a large quarry and an under-

ground mining operation (map location 18). The quarry was originally developed in large, steeply-dipping beds, and now the total production from both the quarry and underground mine is used for steelmaking purposes. 18

PETROLEUM

Petroleum was first produced in West Virginia in 1876. Since then, extensive fields of petroleum and natural gas have been developed principally in the western portion of the State by shallow wells (map locations 16, 19, and 20). Although petroleum production has been steadily declining in recent years, more than 200,000 barrels are produced annually, and the product is much in demand because of its superior lubricating characteristics. 16 19 20

SAND AND GRAVEL

About 22 different operations produce sand and gravel at locations scattered throughout 22 counties. Most of the production, however, is obtained from Hancock, Tyler, and Wood Counties, which are situated along the Ohio River. Several large operations using small dredges and other similar equipment produce nearly 10 million tons annually, which is used largely in highway and residential construction (map locations 4, 20, and 21). 4 20

U.S. 217.—The Fairfax Sand and Crushed Stone Co. has a quarry and sand plant near Thomas (map location 22). 21 22

SALT

Salt is extensively produced in West Virginia, mostly by shallow wells. In the Kanawha Valley area (map location 11), an extensive chemical industry has been developed around these resources. More than 27 counties contain extensive salt reserves, but the most favorable shallow deposits occur along the Ohio River from Hancock County southward to Pleasants County and within the Kanawha Valley area (map locations 4, 11, and 23). 4 11 23

CLAY

Several small open pit and two underground clay mining operations are situated in the Berkley and Hancock County areas (map locations 4 and 13). Clay production has been declining rather markedly in recent years, and present production is used primarily for local production of fire and building bricks. 4 13

MINES THAT YOU CAN VISIT

None of the operating coal, stone, and clay mines have established a policy for visitors. Generally speaking, mining companies discourage visits from the general public, mainly because of the inherent safety hazards for persons not familiar or trained to recognize these conditions. However, mining professionals and mining students can usually arrange visits at some larger mines by requesting approval from company officials.

9 **Interstate 64, Interstate 77.**—At Beckley (map location 9), in the New River Park, is a demonstration coal mine. The worked-out mine in the Sewell coalbed has been renovated by the city and was opened to the public in 1962. The mine opens on May 1 and closes September 30 each year and is available for visits between the hours of 10:00 a.m. and 6:00 p.m. with tours every half hour. Also, special tours can be arranged during the off-season for schools and other interested groups.

GHOST TOWNS AND HISTORICAL SITES

There are many old mining communities in the southern and northern parts of the State where the miners have left abandoned or worked-out mines and moved to the next valley or other active areas—leaving behind single or groups of small, deserted houses; old mine tipple structures; and mine office buildings. Although visiting these areas can be a fascinating experience, visitors must be extremely cautious and under no circumstances attempt to enter any abandoned underground mine entrances.

Two places of interest that certainly should be visited by tourists are (1) the West Virginia Geological and Economic Survey, and (2) Department of Mining Engineering. In Morgantown, the West Virginia Geological and Economic Survey and the Department of Mining Engineering have a display of minerals occurring in West Virginia that undoubtedly would be of interest. Also, the Coal Bureau, Department of Mining Engineering, has an interesting display of byproducts that can be produced from minerals associated with the coalbeds.

FOR MORE INFORMATION WRITE OR VISIT

West Virginia Geological and Economic Survey, P. O. Box 879, Morgantown, W. Va. 26505.

West Virginia Department of Mines, Capitol Building, Charleston, W. Va. 25305.

West Virginia Coal Association, Kanawha Valley Building, Charleston, W. Va. 25354.

West Virginia Department of Natural Resources, 1800 Washington E., Charleston, W. Va. 25311.

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