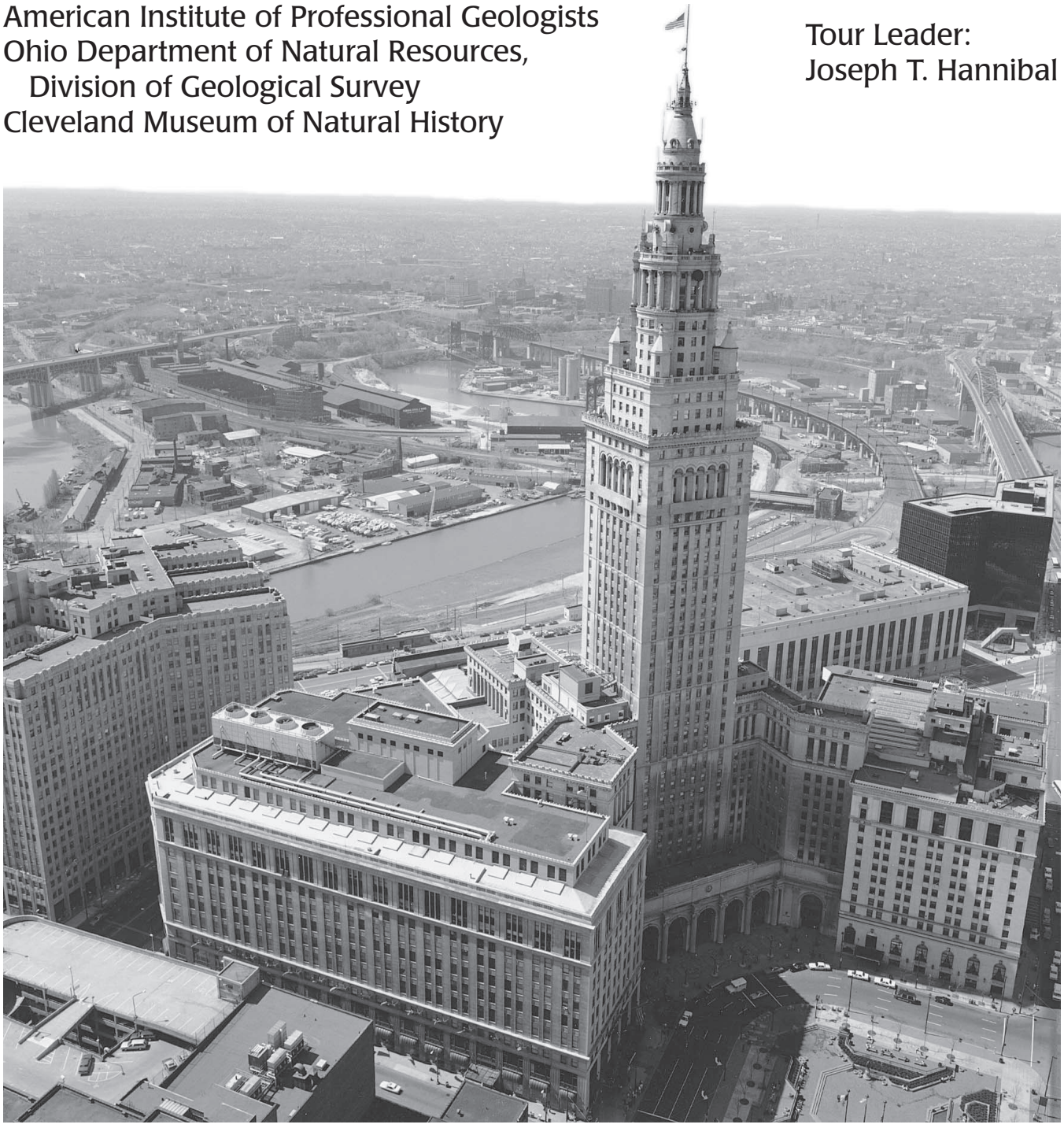
BUILDING STONES IN THE VICINITY OF PUBLIC SQUARE, CLEVELAND, OHIO

A walking tour in celebration of Earth Science Week 2000

Sponsors:
American Institute of Professional Geologists
Ohio Department of Natural Resources,
Division of Geological Survey
Cleveland Museum of Natural History

Tour Leader:
Joseph T. Hannibal



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A walking tour in celebration of Earth Science Week 2000

October 13, 2000

Tour Leader: Joseph T. Hannibal, Curator of Invertebrate Paleontology, The Cleveland Museum of Natural History

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AIPG Coordinators: Robin E. Roth, Ohio Petroleum Underground Storage Tank Release Compensation Board, and Gary Kotila, Flynn Environmental, Inc.

Brochure produced by Merrianne Hackathorn and Lisa Van Doren, Ohio Department of Natural Resources, Division of Geological Survey

INTRODUCTION

Many kinds of rocks, both locally quarried and imported from various parts of the world, have been used as building stones in downtown Cleveland. Examples of igneous, metamorphic, and sedimentary rocks can be seen within a short distance from the Terminal Tower. The stones used for buildings, monuments, and other structures have been selected by the artists, architects, and builders on the basis of appearance (color, texture, and patterns), physical properties (durability and workability), availability, and cost. The stones are referred to by two types of terms: a formal geologic rock name, such as Salem Limestone, and a trade name, such as *Indiana limestone*, which in this brochure is *italicized*.

One of the most used building stones of the late 1800's and early 1900's in Ohio and North America is the Berea Sandstone, named for the city of Berea, southwest of Cleveland. This sandstone (also called the Berea Grit) was quarried in Berea and other areas in Ohio. The largest quarries are in the South Amherst area in Lorain County. One of these quarries is said to be the deepest sandstone quarry in the world. This quarry first opened in 1869 and is 240 feet deep, 600 feet wide, and 1,800 feet long.

Most of the information in this brochure came from *Guide to the building stones of downtown Cleveland: a walking tour*, by Joseph T. Hannibal and Mark T. Schmidt (1992). See the Further Reading section of this brochure.

TERMINAL TOWER

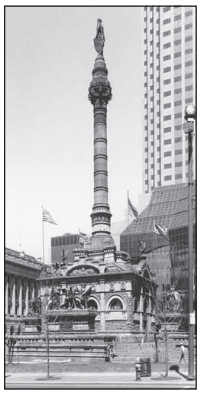
The Terminal Tower is Cleveland's best known landmark. It is 52 stories and 708 feet high, measured from the concourse level. At the time it was built, in 1927-28, the Terminal Tower was the second tallest building in the United States. Much of the exterior of the Terminal Tower is clad with Salem Limestone, quarried in southern Indiana. This rock is marketed as *Indiana limestone*; the particular variety used for the Terminal Tower is *Gray Indiana limestone*.

The Salem Limestone is made up chiefly of the calcium carbonate skeletons of fossilized marine animals. Fragments of larger organisms can be seen with the unaided eye. With a magnifying lens, many smaller skeletal elements can be seen. Fossils in the Salem Limestone include bryozoans, sea lilies, brachiopods, and foraminiferans. These animals lived in warm, shallow seas that once covered southern Indiana and adjacent areas about 340 million years ago during the Mississippian Period.

A small amount of granite is used along the base of the exterior of the Terminal Tower. The lobby contains flooring of *Tennessee marble* and walls of *Botticino marble* (see description of the Cleveland Public Library).

Some 118,000 tons of granite, limestone, and terracotta (a fired clay) were used in the original construction of the building. A variety of other stones is used in the Tower City complex, located in and adjacent to the Terminal Tower; the complex opened in 1990. The Terminal Tower is supported by steel-reinforced concrete supports that reach bedrock, the Chagrin Member of the Ohio Shale, about 250 feet below ground level.

SOLDIERS' AND SAILORS' MONUMENT



The Soldiers' and Sailors' Monument was dedicated in 1894. Much of the monument, including the large ramps and pedestals, a portion of the column, and the trim on the building, is composed of light-colored Berea Sandstone from the South Amherst area. Berea Sandstone is composed mostly of the mineral quartz and has been interpreted as having been deposited as river deposits, beaches, shallow marine sands, and/or sand dunes about 350 million years ago during the Mississippian Period. Inclined layering, called cross beds or cross strata, can be seen in the large blocks used in this monument. Wavy layering can be seen on the pedestals.

The outer steps and esplanade are made of red *Medina stone*. This sandstone also was used for paving in Cleveland at the turn of the century. The formal name of this rock is the Grimsby Sandstone. It was formerly quarried in Pennsylvania and New York and is of Silurian age (about 435 million years old). Groups of curved markings seen on the esplanade are remnants of prehistoric wave ripples.

Most of the outer walls of the building and the tall central column at the top of the monument are composed of dark-gray Quincy Granite, quarried in Quincy, Massachusetts. The building is made of roughly dressed blocks; the column is polished. Each of the 10 blocks of Quincy Granite composing the column weighs about 14 tons. The

statuary on the pedestals is bronze.

White marble said to have come from Italy, red and green slate, and red and white *Medina stone* are used in the interior of the monument. The outside of the monument was cleaned in 1966 and 1979. Low stone walls and outer stairways installed around the monument in 1989 are made of *Charcoal Black granite* and *Cavallo buff sandstone*. *Charcoal Black* is a 1.8-billion-year-old Precambrian granite and was quarried in St. Cloud, Minnesota. *Cavallo Buff* is the Massillon sandstone and was quarried in Coshocton County, Ohio. The Massillon sandstone is part of the Pottsville Group of Pennsylvanian age and is about 325 million years old. This sandstone has been quarried from several locations in Knox, Holmes, and Coshocton Counties since 1857. This geologic unit was deposited in very shallow water, probably in a fluvial environment.

THE OLD STONE CHURCH

The Old Stone (First Presbyterian) Church was dedicated in 1855. It is the oldest building in the Public Square area, but is actually the second "Old Stone Church" to stand on this spot. The church is faced with Berea Sandstone quarried by the Black River Stone Company south of Elyria in Lorain County. Until recently, the sandstone had a black surficial coating, which gave the church an antique look. It was cleaned in 1996-97 (note photo). The stone facing of this church has been remarkably durable, withstanding major fires in 1857 and 1888. A 1961 addition on the north side of the church complex is faced with Salem Limestone.

KEY TOWER

The 57-story Key Tower (formerly known as the Society Tower) was constructed in 1990-91. Most of the facing is *Stony Creek granite*, quarried in Connecticut. It is more than 245 million years old. *Napoleon Red granite* from Vanga, Sweden, is used for the lower two floors of the building. Most of the facing of the Key Tower is flamed, that is, the surface has been roughened by flame. Stone used inside the Key Tower and the adjacent hotel complex includes *Rosso Verona* (*Red Verona*) *marble*, a nodular, orange-colored limestone quarried in the Venice, Italy, area; purple *Rosso Levanto marble* quarried in the Mediterranean area; and *Breccia Pernice marble* from Italy. *Rosso Verona* and *Breccia Pernice* are of Jurassic age and are about 200 million years old; *Rosso Levanto* is of Tertiary age and is less than 65 million years old.

CLEVELAND PUBLIC LIBRARY

The Cleveland Public Library Main Building, constructed in 1923-25, is a treasure trove for those who enjoy fine building stone. It is clad with *Cherokee marble*, a coarse-grained white marble with light-gray veining. The stone was quarried in the Tate, Georgia, area and is Cambrian in age, about 550 million years old. The formal geologic name for this rock is Murphy Marble. It was deposited as carbonate sediment along an ancient barrier reef and was later transformed to marble by heat and pressure.

Some of the marble, particularly on the face of sculpted figures and designs, has deteriorated over time, probably owing to acid rain. The building was sand blasted in 1980 and 1986, possibly adding to the deterioration. The original marble balusters (railing support posts) were replaced with concrete balusters in 1980. The steps of the main entrance are made of *North Jay granite* quarried in Maine.

Inside the Main Building, various types of limestone are used. *Botticino marble*, a cream-colored limestone quarried in northern Italy, lines many walls. Natural, dark-colored, irregular seams, called stylolites, are prominent in this rock. Some of the stylolites are seen in side view, some in top and bottom view.

Botticino marble also contains fossils. Some of these, including tiny snails, are preserved within coated grains that look in cross section like sliced-open M & M's. This rock is about 200 million years old (Jurassic age) and was deposited on shallow limestone banks similar to the modern Bahama Banks.

A pink crystalline limestone known as T*ennessee marble* or *Holston marble* is used for much of the flooring in the library's corridors. This stone is from the Holston Formation and is quarried in the Knoxville, Tennessee, area. It was part of a bryozoan-dominated Ordovician reef tract about 450 million years ago. Branching and hemispherical bryozoan colonies, some over 2 cm long, can be seen in this stone. *Tennessee marble* also has stylolites.

Travertine, a limestone deposited by fresh-water springs, also has been used for flooring in the Main Building. Many other types of building stone have been used for walls, trim, and columns.

The Louis Stokes Wing of the Library, dedicated in 1997, is partly clad in *Cherokee marble*. Most of the stone is roughly cut. Because of the way the stone is cut, crystals in the marble sparkle in bright sunlight. The same marble is used for flooring in the lobby of the Louis Stokes Wing, but that stone is polished.

FURTHER READING

Except for Bownocker's Bulletin 18, which is out of print, the books below are available from the Ohio Department of Natural Resources, Division of Geological Survey, 4383 Fountain Square Drive, Columbus, OH 43224-1362, telephone 614-265-6576. They also may be consulted in many libraries across Ohio.

Bownocker, J. A., 1915, Building stones of Ohio: Ohio Division of Geological Survey Bulletin 18, 160 p.

Haneberg, W. C., Riestenberg, M. M., Pohana, R. A., and Diekmeyer, S. C., 1992, Cincinnati's geologic environment: a trip for secondary-school teachers: Ohio Division of Geological Survey Guidebook 9, 23 p.

Hannibal, J. T., 1998, Geology along the towpath: stones of the Ohio & Erie and Miami & Erie Canals: Ohio Division of Geological Survey Guidebook 14, 60 p.

Hannibal, J.T., and Davis, R. A., 1992, Guide to the building stones of downtown Cincinnati: a walking tour: Ohio Division of Geological Survey Guidebook 7, 44 p.

Hannibal, J.T., and Schmidt, M.T., 1992, Guide to the building stones of downtown Cleveland: a walking tour: Ohio Division of Geological Survey Guidebook 5, 33 p.

Melvin, R. W., and McKenzie G. D., 1992, Guide to the building stones of downtown Columbus: a walking tour: Ohio Division of Geological Survey Guidebook 6, 33 p.

Sandy, M. R., 1992, Geologic glimpses from around the world—the geology of monuments in Woodland Cemetery and Arboretum, Dayton, Ohio: a self-guided tour: Ohio Division of Geological Survey Guidebook 8, 29 p.

*1) Terminal Tower
*2) Soldiers' and Sailors' Monument
*3) Old Stone Church
4) Society for Savings Building and *Key Tower
5) Old Federal Building
*6) Cleveland Public Library
7) Federal Reserve Bank Building
8) Board of Education Building
9) War Memorial Fountain
10) Justice Center
11) Cuyahoga County Courthouse
12) City Hall
13) Ohio Bell (Ameritech) Headquarters Building
14) Galleria
15) One Cleveland Center
16) St. John's Cathedral
17) National City Center Building
18) National City Bank Building
19) Old Arcade
20) BP Building

MAP OF DOWNTOWN CLEVELAND SHOWING STOPS DESCRIBED IN OHIO DIVISION OF GEOLOGICAL SURVEY GUIDEBOOK 5

***LOCATIONS DESCRIBED IN THIS BROCHURE**

Illustration on front cover: Terminal Tower complex as viewed from the northeast, with the Cuyahoga River in the background.
Photo by Jennie Jones, courtesy of Tower City Archives, Forest City Enterprises.
Photos of Soldiers' and Sailors' Monument and Cleveland Public Library by Dan Flocke.