Boston rocks

A history of the earth in 13 landmarks

ACTIVITIES BUILDING MORE than the story of its people — they are the story of the earth itself. Over Boston’s 350-year history, its streets have become home to a collection of stone equal to any museum, from elegant marble to gaudy granite to humble brownstone. What follows is a tour of the earth’s history, as inscribed in the blocks and panels that make up buildings around Boston.

By DAVID B. WILLIAMS, Graphic by JAVIER ZARRACINA

1. 100 Cambridge St., Government Center

When you see the walls clad in grey pink granite, stone that looks as if it were molten, you’re looking at granite impossible for basalt in time. This is the Morton Grove, 3.5 billion years old, the oldest commonly used building stone in the world. We wouldn’t recognize the Earth if it came from a planet home to only the simplest of life forms, little or no water, and an inhospitable atmosphere.

2. Trinity Church, Copley Square

The church’s dramatic two-colored exterior comes from the contrast of two stones used throughout the city. The lighter is a 4.5-billion-year-old granite from Dedham — it also makes up Plymouth Rock — that formed the core of a volcanic arc that once collided with North America. The dark brown sandstone comes from quarries in Longmeadow; its color comes from iron that has oxidized at their formation temperature, which was 900°C. It was formed 4.5 billion years ago. The granite has been quarried — it was gathered from what later became the famous Quincy quarries.

3. Morse Auditorium, Boston University

Nothing exemplifies Boston’s geology better than puddingstone, also known in the Bernardy Conglomerate. Found only in and around the Hub, puddingstone formed around 550 million years ago by streams washing pebbles and cobbles into a matrix of sand and silt. Other good sites to see the blue-gray stone include Roxbury, Brighton, and the Boston College campus.

4. Massachusetts General Hospital

The 179th-century Bulfinch Building at the heart of the MGH complex is one of the earliest buildings in the city, primarily of granite. Its massive stone slabs were shipped down the Mississippi and were installed in the city.

5. Townshouse, Beacon Hill

The brown stone that gives these building their names was quarried at Portland, Conn. Popular as a building stone in the Northeast from the 1860s to the 1920s, it was easy to transport, relatively cheap, and made the best produced by gas and coal. The stone was deposited 500 million years ago and is a key ingredient in the state’s geology.

6. Cathedral of St. Paul, Downtown

In 1820, this became the first local building to extensively use marble rock. The simple structure’s sandstone columns came from Aquia Creek in Virginia, out of the same quartz that provided stone for the US Capitol. The Aquia sands began as a delta deposit about 400 million years ago in the quiet water of an ancient sea on the coast of the North American continent. An oxygen-rich environment produced the red slate; an oxygen-poor environment produced slate-colored green — or, if there was abundant organic material, black.

7. Old South Church, Copley Square

Nothing exemplifies Boston’s geology better than puddingstone, also known in the Bernardy Conglomerate. Found only in and around the Hub, puddingstone formed around 550 million years ago by streams washing pebbles and cobbles into a matrix of sand and silt. Other good sites to see the blue-gray stone include Roxbury, Brighton, and the Boston College campus.

8. Algonquin Club, Brookline

These white building blocks are Salem Limestones, the most commonly used building stone in the state. Famous for their invertebrate fossils, mostly broken but sometimes intact, they make up the stone. Despite the name, it comes from quarries around Bloomington, Ind., and formed outside Illinois more than 100 million years ago when a shallow sea covered most of what we now call the Midwest.

9. Mass Hall, Harvard University

Built in 1938, the brick and stone Harvard structure is clad in a 175-million-year-old German limestone loaded with fossils. The most notable ones are ammonites, extinct relatives of modern squid and chambered nautiluses that look like a cross-section of a cinnamon roll. The biggest, on the US Treasury building, was 200,000 years old.

10. Memorial Hall, Harvard University

This is Boston’s oldest intact-granite church, completed in 1794. The stone’s dark color resulted from a dry weather that oxidized at an elevation temperature when it was formed 450 million years ago. The granite has been quarried — it was gathered from quarries south of what later became the famous Quincy quarries.

11. Boston Public Library, Copley Square

Both the original and modern buildings of the Main Library are covered in Malden granite, a 610-million-year-old stone that looks like Ben & Jerry’s Chunky Monkey ice cream. During its heyday as a building stone a century ago, it was used widely in Washington, D.C. Look at the back of a $10 bill; the columns on the US Treasury building are made from the stone discovered Milford pink.

12. Boston College campus

A CITY’S BUILDINGS tell more than the story of its people — they are the story of the earth itself. Over Boston’s 350-year history, its streets have become home to a collection of stone equal to any museum, from elegant marble to gaudy granite to humble brownstone. What follows is a tour of the earth’s history, as inscribed in the blocks and panels that make up buildings around Boston.

13. King’s Chapel, Downtown

This is Boston’s oldest extant-granite church, completed in 1794. The stone’s dark color resulted from a dry weather that oxidized at an elevation temperature when it was formed 450 million years ago. The granite has been quarried — it was gathered from quarries south of what later became the famous Quincy quarries.

14. The three different roof stones have similar origins but different life stories. They formed between 150 and 400 million years ago in the quiet water of an ancient sea on the coast of the North American continent. An oxygen-rich environment produced the red slate; an oxygen-poor environment produced slate-colored green — or, if there was abundant organic material, black.

15. Thorndike Building, Financial District

These slabs of oatmeal-colored stones are the youngest building stones in Boston. Known as travertine, the stone precipitates from calcite-rich water, often associated with caves or springs. These stones come from Italian quarries first used more than 2,000 years ago for buildings such as the Colosseum; the stone formed outside Rome less than 100,000 years ago.

David B. Williams is the author of “Stories in Stone: Travels Through Urban Geology,” from which this article is adapted. For more: www.storiesinstone.info. Javier Zarracina is a graphic designer for the Globe.