

The Geology of Weymouth

By G. Stinson Lord

Quartz Crystals
Idlewell, Weymouth

Photograph, Department of Geology
Princeton University



The Geology of Weymouth written for the 300th Anniversary of 1922-23 was, and still is, the finest account written upon the subject. Now we find ourselves putting together a pictorial supplement for our 1972-73 Anniversary, half a century later. I helped Thomas Clark as much as a sixteen-year-old amateur geologist could, with his thirty-two-page *Geology of Weymouth* in that town History. Now about all that can be done in a few pages is to let superb pictures say "a thousand words" hoping to bring the subjects up-to-date with a few brief additions to the titles. Since 1923 it has been brought up to date to be published through Princeton University as *Cambrian Geology, Fore River Bay Area, Massachusetts*, by G. Stinson Lord and Professor B. F. Howell.

The world-famous Middle Cambrian trilobites, *Paradoxides harlani* (Green) usually associated with the ancient Hayward Quarry at East Braintree, have been found in the ledges of Idlewell. The trilobites are a race of crab-like crawling crustaceans that came into being over five hundred million years ago, to become extinct at the end of the Paleozoic Era.



Some Weymouth Lower Cambrian Fossils By G. Stinson Lord

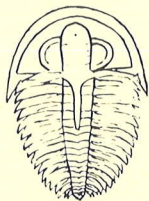
Weymouthia nobilis (Ford) *

This fossil was found by a Harvard geology field trip in 1913, at the famous "Olenellus Ledge," on Pearl Street, North Weymouth, Massachusetts. This places the name of our town on scientific literature for all time! Hist. Wey. (1923) Vol. 1: p. 135.

*"Weymouth nobility." Crustacean-Trilobite found by *Weymouth man* Thomas Clark, Geologist!



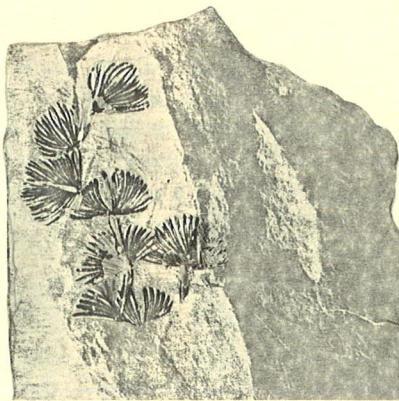
Correct size



Callavia broggeri (Walcott) *

All of these fossils are from the *Callavia broggeri* zone of the *Weymouth Formation*, Lower Cambrian Period. North Weymouth, Massachusetts. This formation also occurs at North Attleboro, and Nahant, Massachusetts. It extends from Weymouth into Quincy, also.

*Crustacean-Trilobite

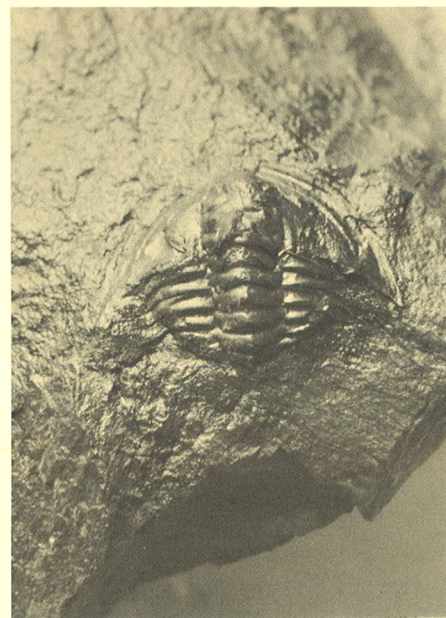


Oldhamia antiqua (Forbes) *

Made international news in 1921 when it was discovered by G. Stinson Lord at the famous "Olenellus Ledge", Pearl Street, North Weymouth, Mass. This key fossil for this lower Cambrian zone all over the earth had never been found with other fossils until that time, thus fixing its age! Also established a "Water bridge" with Ireland, the Grande Pitch Formation of Northern Maine and Weymouth, Mass., of over five hundred million years ago! Now in the Paleontological Collections of the Department of Geology, Guyot Hall, Princeton University, New Jersey.

*Alga

Weymouth Lower Cambrian World Famous Olenellus Ledge And Attaquatock Limestone Beds



Trilobite

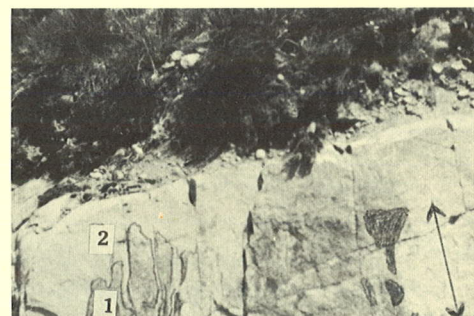
Callavia crosbyi (Walcott)
William F. Bowman, Collector

The Earth's crust, above the primary igneous rocks, is usually in layers as the pages of a great stone book. Those on the bottom are the oldest, having been deposited first upon the underlying primary base rocks from which they came as waste material laid down in water. This great "Book of Life" is in three sections or eras named Paleozoic, Mesozoic, and Cenozoic, meaning "Ancient Life", "Middle Life" and "Recent Life". Weymouth's Lower Cambrian lies deposited directly upon the Pre-Paleozoic underlying igneous rocks, the Dedham Granite and the gabbro-diorite. Just as the pages of a thick book can become folded up and torn apart, our earth is subject to powerful movements because of contractions, expansions, internal heat and external agencies. Tremendous foldings gave us mountains as large as the Alps but now mostly worn away to eroded remnants as the Blue Hills, Berkshires and White Mountains. With the tearing apart of our "stone pages" and up-and-down and cross-movements called faults, our section of the Blue Hills Complex is indeed complex enough, being reversed in its order of layers or strata in the most important places.

In Weymouth there are no known Mesozoic strata and only Pleistocene glacial deposits to represent the Cenozoic Era with Post-Pleistocene Recent deposits over it, making the geology relatively simple because of the great erosion of our coastal slope. This leaves the Pleistocene glacial deposits lying unconformably directly upon the strata of the Paleozoic Era, leaving us with a gap of about 200 million years in geologic time. In other words, the Boston Bay Group of rocks forming the top of the Paleozoic Era are of Carboniferous and Permian Periods (Permo-Carboniferous), presumably. They were also folded into making the Appalachian Mountains, climaxing the end of the Appalachian Revolution during Permian times. These Boston Bay rocks were thrust southeastward over our Cambrian Blue Hills Complex along a line from Sunrise Drive to about the center of King Cove. All the rocks underlying Weymouth to the Northward of this line are mostly the heavy-bedded slates, shales and Quartzites, with some conglomerates or "puddingstone" of this Boston Bay Group. This includes Slate, Grape and Sheep Islands.



Attaquatock Limestone Beds
Myriad of hyolithes fossils

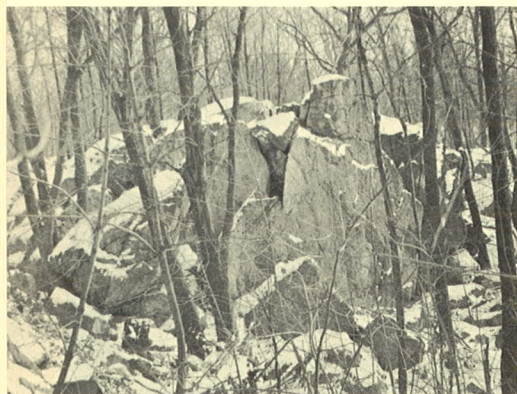


2 Pre-Cambrian Dedham Granodiorite
1 Gabbro-Diorite in "Melted" Granodiorite
North of 186 Main Street



2 Bottom of Paleozoic Cambrian
1 Pre-Cambrian weathered rocks
King Oak Hill Section

Pleistocene Glacial Period



Roche Moutonnee Glacial Quarrying

Cavern Rock
Cavern Rock Park Earth Science's Field Trip
1971 South High School



Fossil Shell Beds
Great Weymouth Esker



Perfect Weymouth Kettle Hole
Under Great Pond
Great Drought 1965

The great ice sheet, slowly grinding its way southward from its source in the wilderness of Laurentide Canada, tore off and carried away most of the pre-glacial features of the rough landscape with its virgin soil, built up during hundreds of millions of years of geological periods. The Pleistocene Era lasted only about a million years, relatively a short time in comparison, adding only a thin veneer of deposits to the final smoothing and polishing of old Mother Earth in this area. Before this the landscape was much like that to the south of our glaciated area, beyond Nantucket, Martha's Vineyard and Long Island, New York and the southern states. About twelve thousand years ago the climate rather abruptly became warmer, and then somewhere in the vicinity of ten thousand years ago a rapid melting of the ice began during this last Wisconsin stage of the Pleistocene glaciation. In some places the ice was a thousand feet thick and probably ten thousand feet farther north. While the ice was moving the debris called till or hardpan, a heterogeneous mass of rock material from boulders as large as House Rock (of 3,500 tons) to pebbles, sand and clay, was pushed and rolled along under, in and on the ice. Sometimes the till lodged upon a projection of the underlying bedrock and the great weight of the ice as it over-rode it compressed it into the smooth and pleasing contours called drumlins. King Oak Hill (166 feet) and Great Hill (153 feet) are fine examples. Even the rock hills, and every part of the town owe their configuration to the work of the glacier. Weymouth's shape is that of a miniature Massachusetts. Our highest ground elevation is 209 feet at the base of the water tower near the corner of Main and Park Streets.

The last onrushing melt-water rivers poured millions of tons of gravel and land-waste onto glacial deltas and into glacial lakes and dumped piles of boulders, as terminal moraines. Left were the casts of the shapes of gravel-filled rivers from in, on and under the ice called eskers, and kames from gravel-filled crevasses. The shapes of buried ice-blocks left by the melting ice-sheet are known as kettle holes.

Weymouth, Carboniferous Period Boston Bay Group of Rocks Slate Island Quarries

"here is plenty of slates at the Isle of Slate in Masathulets Bay, . . ." 1629. Rev. Francis Higginson, page 244, Young's New England Planters. "Thomas Lamb's liberty, 1633." "to demise slate on Slate Island."



The author splitting "lifting" slate to make a slate shingle, August 31, 1953, at only good slate bed left.

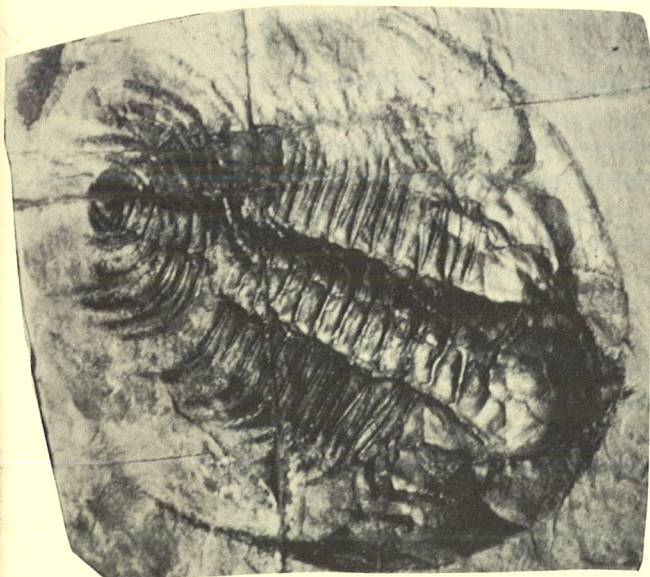
Photographs by Stuart E. Briggs, from FLAIR!

Some Weymouth Middle Cambrian Fossils
Paradoxides harlani Zone



Paradoxides harlani (Green)
One half natural size

Collected 1930 By G. S. Lord, Washington Street, Weymouth, Mass. Glacial drift from Hayward's Quarry to Weymouth



Paradoxides harlani (Green)
Reduced about nine times

Collected 1940 By G. S. Lord, Hayward Quarry East Braintree.

**Glacial Sand and Gravel Deposits
Once Our Most Valuable Mineral Resources**

"Weymouth's rocks will speak out"
Weymouth Glacial Boulders



House Rock "Watching Rock" House Rock Park



Perched Rock Oak Street

Once the Bottom of a Glacial Lake, these Gravel Beds of the Great Sand Plain, North of East Street, gave at least five gravel companies their source of supply!

