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TERTIARY FOSSILS ON LONG ISLAND.

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Myron L. Fuller in his *Geology of Long Island* (p. 79) writes: "Long Island has never yielded any fossils of Tertiary Age, the diatoms from Rockway and elsewhere described by A. M. Edwards, being from deposits that are clearly interglacial or post-glacial."

Mr. Thomas C. Topping of Bridghampton, Long Island, a highway commissioner, in digging out the side of a bare hill to widen a road, six miles east of the village of Southampton, lately uncovered some fossil shells, which interested him, and were by him given to Mr. William S. Pelletreau, the historian of Southampton.

The shells taken from a light yellow sandy marl, at a depth of eight to ten feet below the surface, were in excellent preservation, and unmistakably of tertiary origin. The locality is three or four miles from the sea, and has an approximate elevation of seventy five feet above high tide water-mark.

The shells were kindly shown to me by Mr. Pelletreau who recognized their interest. They consist entirely of *Arcas*, and number in all twelve separate valves. There are ten valves of *Arca* (*Scapharca*) *transversa* Say and two of *Arca* *limula* Conrad.

The latter species is significant. It is referred by Dr. Dall to the Miocene of North Carolina, Virginia, Maryland, S. Carolina and New Jersey, and to the Pliocene in Florida, Georgia and S. Carolina. Dr. Dall writes of it (Contributions to the Tertiary Fauna of Florida, 1898); "*Arca limula* is with little doubt the progenitor of *A. ponderosa*, Say, from which it differs by a more quadrate outline and more anterior beaks. The sculpture is usually more elegant." This species does not survive in the recent molluscan faunas.

A. (Scapharca) transversa, Say, very familiar to-day along the eastern sea-board of the United States, apparently began its life history in the Pliocene, and in the upper beds of that formation, (Dall): attaining its maximum development perhaps in the Pliocene also. The determination of the formally correct reference in time of these fossils, which are unquestionably contemporaneous with each other, is—without more evidence—uncertain. But assuming as fixed the datum point of *A. transversa* as somewhere in the Pliocene, and allowing weight to the probability of *A. limula* finishing its career in the Pliocene, an age not later than that formation may be safely predicated for the shells at Southampton. And the deduction seems legitimate that at that day the climatic conditions along the edges of Long Island were more mild than to-day. It is to be hoped that explorations in this neighborhood will establish more valuable and extended conclusions.

In view of the discussions now pertinaciously continued as to the stability of our coast line, it is, in this connection, interesting to learn that at Southampton, according to the old records (Pelletreau) the ocean has encroached on the land to an extent of the whole width of the beach, and fence-posts formerly set up back of the "beach banks" (sand dunes) are now down to the level of the water at ordinary high-water mark. These dunes ("beach banks") also retreat before the incessant whipping and pressure of the winds, and deserted whaling boats, formerly abandoned behind them, viz., on their northern slopes, have been overwhelmed and have subsequently re-emerged on the south side of the northwardly shifting sand mounds, whose transgression for a time buried them.



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