

then (1868) was not known to exist east of the Alleghany mountains.⁷

The discovery of bison bones in a cave on the upper Tularosa river, New Mexico, has extended the southwestern range of this mammal over one hundred miles.⁸

One of the most recent discoveries is that of some deer bones in Nova Scotia. Mr. Smith found a distal phalanx and some teeth in shell-heaps on Merigomish harbor, and I found several astragali, distal⁹ and proximal phalanges, the distal end of a humerus and teeth in a shell-heap on Mahone bay, about seventy-five miles west of Halifax. Nicholas Denys¹⁰ (circa 1653) does not mention the deer, and the first printed record of its appearance in Nova Scotia was in 1888. Even in New Brunswick it was not seen until 1818, only becoming plentiful by 1847.¹¹

Although they were plentiful in the days of early settlement, caribou seem to have been scarce around Mahone bay in prehistoric times, only a small piece of antler, doubtfully referred to this species, being found in the shell-heap there. Only a few individuals, also, are represented among the animal remains from Merigomish harbor.

Some archaeological discoveries may help to settle uncertain or disputed points in zoology. For instance, I found in the prehistoric shell-heap on Mahone bay, the shells of the land snail *Helix hortensis* Müller,¹² and Dr. G. F. Matthew found some in a shell-heap at Bocabec, New Brunswick.¹³ They have also been found on an island in Penobscot bay, Maine,¹⁴ and on Martha's Vineyard.¹⁵ This snail is considered to be " unquestionably identical with the European species," and it was for a long time generally accepted by conchologists that it had been introduced from Europe. Morse, however, considered it "strange

that, while in the old country it is found near the habitations of men, in this country it occurs only upon the most uninhabitable islands."¹⁶ The shells found in the Mahone bay shell-heap, while they still retain traces of the rarely occurring rufous revolving bands, bear the same appearance of age as the other shells composing the heap. There is a possibility that these snails worked their way down into the shell-heap recently, perhaps by way of the burrows of small mammals, but if this were really so we would expect them to be almost as fresh looking as recent shells. Besides, if these snails crawled into the heap recently, why did we not find other species also? Dr. Matthew found the shells of no less than six native species of snails at various levels in the heap at Bocabec, and Morse reported nine from a heap on an island on the coast of Maine.¹⁷ It seems to me, therefore, just as probable that the snail shells from the Mahone bay shell-heap were deposited with the rest of the shells when the heap was formed as that they were intrusive. This and other testimony would tend to prove that the species was indigenous or else had found its way to America through other channels than commercial intercourse long before the arrival of Europeans on this continent.¹⁸ Possibly they came by way of the much discussed land-connection between the old and the new world.¹⁹

The occurrence in a shell-heap on an island in Casco bay, Maine, "of the little snail *Zua lubricoides*" Stimpson (now known as *Cochlicopa lubrica* Müller), is also, according to Morse, "inconsistent with the view that it is an introduced species."²⁰

It is still doubtful whether *Litorina litorea* (Linn.), or "Periwinkle," is an indigenous species or one introduced from Europe. No shells have yet been found in any of the prehistoric shell-heaps of the Atlantic coast, but if some were found deep in one of these heaps it would certainly be indisputable evidence that this species was here long before the advent of the white man. The possibility of finding this shell again suggests the necessity for careful and thorough methods of archaeological

⁷Wyman, Dr. Jeffries, An Account of Some Kjoekkenmoeddings, or Shell-heaps, in Maine and Massachusetts, The American Naturalist, 1868, Vol. I, p. 572.

⁸Lyon, Marcus W., jr., Mammal Remains from Two Prehistoric Village Sites in New Mexico, Proceedings of the U. S. National Museum, 1907, Vol. XXXI, pp. 647-648.

⁹Identification confirmed by Dr. Gerrit S. Miller, of the U. S. National Museum.

¹⁰Description and Natural History of the Coasts of North America (Acadia), translated and edited by W. F. Ganong. Published by the Champlain Society (Toronto, 1908).

¹¹Chamberlain, Montagu, Mammals of New Brunswick, Bulletin Natural History Society of New Brunswick (St. John, 1884), No. III, p. 39.

¹²Identification confirmed by C. W. Johnson, Curator, Boston Society of Natural History.

¹³Discoveries at a Village of the Stone Age at Bocabec, N.B., Bulletin Nat. Hist. Soc., New Brunswick, No. III, p. 24.

¹⁴Johnson, C. W., *Helix hortensis* from a Maine Shell-heap, The Nautilus, 1914-1915, Vol. XXVIII, p. 131.

¹⁵Johnson, C. W., The Distribution of *Helix hortensis* Muller, in North America, *ibid.*, 1906, Vol. XX, p. 76.

¹⁶The Land Snails of New England, The American Naturalist, 1868, Vol. I, p. 187.

¹⁷Wyman, *op. cit.*, p. 566. Also Proceedings of the Boston Society of Natural History, 1866-1868, Vol. XI, pp. 301-302. The presence in the lower portion of this particular heap of so many species of snails which, as Morse notes, can only exist in hardwood growths, whereas the island at the time of the exploration of the shell-heap was covered with large spruce trees, would argue a considerable antiquity for the shell-heap.

¹⁸See Johnson, *op. cit.*, pp. 73-80. See also Dr. W. H. Dall's Land and Fresh-water Mollusks (Harriman Alaska Expedition, New York, 1905), Vol. XIII, p. 29, for its occurrence in the glacial Pleistocene of Maine.

¹⁹See Scharff, R. F., Distribution and Origin of Life in America (New York, 1912), p. 14.

²⁰Wyman, *op. cit.*, p. 566.