

interesting are the known facts in regard to the distribution and spread in America of the shell we are considering, that an inquiry into the nature of these facts, and a search for an explanation for them becomes a matter of more than special importance. The value of the settlement of the question as to whether *Littorina litorea* has been introduced in recent times or is a native of America, is not limited to the settlement of this fact only. It has a broader value as well, inasmuch as it has a bearing upon the science of the distribution of animals.

It must be remembered that no species of animal or plant can, in the strict sense of the word, be indigenous to both Europe and America. If such were the case it would be necessary to suppose that the two independent lines of descent, either from a common near or remote ancestor, culminating in the species, had followed precisely identical courses of development. The latter would require precisely identical conditions of environment—and such we know would not exist upon two separate continents. Hence a shell which is common to two continents must in some way have been introduced from one to another. It may be introduced by the agency of man, or by purely natural and physical causes, such as ocean currents, etc. For want of a better term the word *indigenous* has been used in the present paper to apply to a species introduced in past time by *natural* agencies and now thoroughly established as a resident.

Such a species is our so-called "native periwinkle," *Littorina palliata* (Say). It is common to Europe, Greenland and America, and has existed for a long time in all three countries, being found fossil in the Post-pliocene of all of them. It will be presently shown that this shell was probably introduced from the continent in which it *originated* to the other by way of Greenland and Iceland, and by strictly natural agencies. We therefore speak of it as indigenous to America, though whether its descent from its parent species took place here or in Europe we are unable to say. But we hope to be able to show that *Littorina litorea* did not exist in America until introduced from Europe by man, and that since the beginning of the present century.

Mr. John Willis, who was the first to announce its discovery in America (Trans. Nova Scotia Inst. Nat. Sci., Vol. 1), found it at Halifax in 1857. He considered it to be indigenous to Nova Scotia chiefly for the reason that "some of the oldest inhabitants