particularly adapted for its occupancy. But, no sooner is this done than the individuals along the frontier begin to adapt themselves to an environment but slightly unfavorable, and, as their adaptation changes, so do they slowly advance outward from the territory originally occupied. A series of unfavorable seasons might occasion the occupation of a wide margin of adjoining country, while a series of unfavorable seasons might sweep this tide of advance back to the place of its origin. But, as the receding tide of the ocean leaves many pools of water in the depressions of rock, so will there be left, in especially favorable nooks, a few of the insects which will retain their hold and form small, local colonies, of perhaps not more than a few individuals, and the offspring of these will meet the investigator long distances from the real habitat of the species. There is scarcely a collector who does not know of one or more small, secluded areas, in his neighborhood, that are rich in varieties, and which he seldom visits without satisfaction, and frequently he is astonished at his success. How long this ebb and flow has been going on, and how many species have been brought to us in this way, are problems we are yet unable to solve. Therefore these facts have been brought together, and are here presented, not as a finished, nor, indeed, as an advanced study, but rather as a primary outline, to be revised and modified as our knowledge of the geographical distribution of our species shall be enlarged by additional study and research.

## A SKELETON OF STELLER'S SEA-COW.

BY BARTON W. EVERMANN, PH.D., ASSISTANT, DIVISION OF SCIENTIFIC INQUIRY, U S. FISH COMMISSION.

DURING the time from March to September of last year the U. S. Fish Commission steamer "Albatross" was engaged, under the direction of the State and Treasury Departments, in making investigations regarding the habits, distribution, and abundance of the fur seal in Bering Sea and the North Pacific Ocean; and it was my good fortune to accompany the vessel as senior naturalist.

While carrying on these investigations, we had occasion to visit the Commander Islands, situated in Bering Sea, off the coast of Kamchatka about 80 miles. We spent the first week of June on or about these islands, and in this article I wish to call attention to one of the most interesting and valuable results of our visit to Bering Island, the more important one of the group. This was no less than the discovery of a nearly perfect skeleton of the now extinct Steller's sea-cow, *Rytina gigas*.

This remarkable animal was first discovered in the fall of 1741 by Captain Vitus Bering when his ship was wrecked upon the island now bearing his name. Geo. W. Steller was the surgeon and naturalist of Bering's party, and it is to him that we owe about all that we know about the sea cow in life.

At the time of its discovery this large marine mammal was quite abundant about Bering Island, as Steller reports that he saw them in great herds feeding upon the kelp and other sea-weeds that grow in abundance in the shallow water about the island. It was soon discovered that the flesh of the sea-cow was good eating, and the men killed many of them for food.

According to Steller, the sea-cow when fully grown was 24 to 30 feet in length, 20 feet in girth, and weighed 6,000 to 8,000 pounds. It was of a nut-brown color and covered with hair, matted like the outer bark of a tree. The skin was exceedingly thick, and so tough that the hunters had to cut it with an ax. The head was very small when compared with the great size of the body, the jaws were toothless, but were furnished with a thick, horny pad. The anterior limbs were modified into flippers, while the hind limbs were entirely absent, and the tail was widely forked, as in the sperm whale.

This animal was gregarious, stupid, sluggish, and comparatively helpless, being unable to protect itself by diving, and was occasionally washed ashore by breakers.

When, in 1743, the news of the discovery of Bering Island reached Kamchatka, several expeditions were fitted out for the purpose of hunting the sea-cow and the various fur-bearing animals, such as the sea otter, fur seal, and blue fox, which are found there; and very soon many whaling vessels began to stop there to lay in a supply of sea-cow meat for food. So great was the destruction wrought by these whalers and fur-hunters that by 1754, only 13 years after its discovery, the sea cow had become practically exterminated. In 1768, according to the investigations of Dr. L. Stejneger of the National Museum, who has made a most careful study of the question, this large and important marine mammal became wholly extinct, the last individual ever seen alive having been killed in that year; and the fate which overtook Rytina so speedily has almost become that of the buffalo, and will as certainly become that of the fur seal unless it be protected.

Mr. Frederic A. Lucas of the National Museum has recently published a most interesting and valuable paper on "Animals Recently Extinct or Threatened with Extermination," in which he gives in readable form about all that is known of the sea-cow. In this paper, of which I have made free use in the present article, Mr. Lucas states that, up to 1883, but two skeletons of the sea-cow were known. One of these is in the Imperial Museum at St. Petersburg, and the other is in the Imperial Academy of Helsingfors. There are two ribs in the British Museum. During Dr. Stejneger's stay of about two years (1882–1883) upon Bering Island, he succeeded in finding a number of skulls, ribs, vertebræ, and other bones. One complete skeleton was found buried in the sand, but the bones were too far decayed to permit handling. From the various individual bones found by Dr. Stejneger a fairly good skeleton was "made up," which is now in the National Museum. This, together with the two skeletons at St. Petersburg and Helsingfors, and the two ribs in the British Museum, constituted the total amount of material pertaining to Rytina found in the museums of the world at the time of my visit to Bering Island.

Being conversant with these facts, imagine my surprise and delight upon learning, soon after landing, that a native had recently found a nearly perfect skeleton in a good state of preservation, and that he would sell it. I took the first opportunity to examine the skeleton, and was not slow in deciding that it should be purchased for our National Museum. This skeleton was found in 1891 by the same native who found the one which was sent to the Czar. It was embedded in the sand to a depth of a few inches, and lay several rods from the present water-line. It is in a good state of preservation and proves to be very nearly complete. The cervical vertebræ are complete and show that the number is seven instead of six a point that was in dispute until settled by the study of this skeleton made by Mr. Lucas of the National Museum.

Unfortunately the anterior limbs are incomplete, and whether Steller's sea-cow had any hand or finger bones must still remain an unsettled question.

## PLANT DISEASES, CAUSED BY NEMATOID WORMS OF THE GENUS APHELENCHUS BAST. I.

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BIS vor kurzer Zeit waren blos aus den Nematoden Gattungen *Heterodera Gruff* und *Tylenchus Bastian* in Pflanzen schmarotzende Arten bekannt; in den letzten drei Jahren gelang es mir drei neue, bisher unbeschriebene Species aus der Gattung *Aphelenchus Bastian* als die Ursache von Pflanzenkrankheiten zu entdecken.

Bekanntlich sind die *Aphelenchen* den *Tylenchen* nächst-verwandt; es sind beide aalförmige Anquilluliden mit schwach geringelter Cuticula und mit einem Mundstachel hinter der Mundöffnung zum Durchbohren von Zellwänden. Während aber bei *Tylenchus* der Darm in der halben Länge des Oesophagus eine kugelförmige oder ovale muskulöse Auschwellung (den "Muskelmagen") besitzt, und nachher am Hinterende des Oesophagus eine nochmalige Auschwellung (den "Magen"), findet sich bei *Aphelenchus* wohl das erst genannte, nicht das zweite Organ, sodass der eigentliche Darm unmittelbar hinter den Muskelmagen anfängt. Es haben weiter die Männchen der *Tylenchus*-