ALEXANDER AGASSIZ.

(*Continued from first page.*)

He made an expedition in 1875 to the west coast of South America, for the purpose of examining the copper mines of Peru and Chili. During this time he also made an extended survey of Lake Titicaca, and with the aid of his assistant, Samuel Garman, gathered an immense collection of Peruvian antiquities, which are now in the Peabody Museum at Cambridge. These collections represent the antiquities of the lake, of old Trahuanaco, and of the shore Indians at Ancon.

In 1875 he was invited by Sir Wyville Thompson to assist him in arranging and making up the collection of the great English exploring expedition of the Challenger. A portion of these collections he brought with him to Cambridge, and there wrote his report on the sea urchins of this famous expedition, which ranks high as a contribution to original research. His previous investigations on the Echinoderms gained for him, in 1873, the Walker prize of $1,000 from the Boston Society of Natural History. This was the first bestowal of the Walker prize. In 1878 he received the "Prix Serres," awarded only once in ten years, from the Academie des Sciences de Paris, and was the first foreigner to secure this distinction.

From 1876 till 1881 Mr. Agassiz spent his winters in deep-sea dredging, having had placed at his disposal, by the superintendent of the coast survey, the steamer Blake. These expeditions have enabled him to explore the deep waters of the Gulf of Mexico and of the Caribbean Sea. The success that has attended his trips has been very great, mainly, he says, from the interest shown by the commanders of the Blake, but much more, we are persuaded to believe, through his own great ingenuity and special familiarity with hoisting and mining machinery, which has enabled him to introduce new methods in place of the old ways of deep-sea dredging.

In 1887 he received the degree of LL.D. from the University of Cambridge, England. He was elected a member of the American Association for the Advancement of Science in 1869, six years later he became a fellow, and in 1879 was made vice-president. At the Boston meeting, held in 1880, he delivered his retiring address on "Paleontological and Embryological Development," in which he took a decided stand against the prevalent development theory. In 1866 he was elected to membership in the National Academy of Science and held the office of foreign secretary till 1886, since when he has entirely severed his relations with that organization, owing to the impaired condition of his health.

Mr. Agassiz is likewise a member of the following societies: The Academy of Natural Sciences, Philadelphia; the New York Academy of Sciences; the American Philosophical Society, Philadelphia; the Essex Institute, Salem, Mass.; the Society of Natural History of Montreal, Canada; the Geological Society of Manchester, England; the Zoological, Linnean, and Royal Microscopical Societies of London, and other less famous foreign societies.

His bibliography includes numerous titles in the "Proceedings of the Boston Society of Natural History;" "The Annals of Lyceum of Natural History," New York; "Proceedings of the American Academy of Arts and Sciences," Boston; "American Naturalist," "American Journal of Science," and the "Archiv der Zoologie." They are principally on subjects connected with marine zoology. The "Report of the Anderson School of Penikese," 1873, and the "Reports of the Museum of Comparative Zoology," from 1873 till 1885, are by him. To many of the "Bulletins" of the museum he has contributed valuable papers; and of the "Memoirs of the Museum of Comparative Zoology," he is the author of "Revision of the Echini," "Echini of the 'Hassler' Expedition," and "North American Starfishes." Besides the foregoing, he has written, with Mrs. Elizabeth C. Agassiz, "Seaside Studies in Natural History" (Boston, 1865), "Marine Animals of Massachusetts Bay" (1871), and the fifth volume of "Contributions to the Natural History of the United States," left incomplete by his father.

These great undertakings have unfortunately injured his health to such an extent that he has been advised to put aside all work and rest awhile. Early in May of the present year he started on a long voyage to Alaska, from which it is hoped he may return thoroughly recuperated and able to again prosecute his scientific labors.

Personally, Mr. Agassiz is a bright, intelligent, busy man, easily approached, something more than a man of science, abounding in liveliness, interested in all that concerns humanity, but too much occupied with special work ever to be idle. His life has been one of continuous development along the lines of which his genius or temperament has naturally led him. Though a Swiss by birth, he is essentially an American in his intellectual grasp and in all that belongs to his ordinary life.

Where so much has been done since he gained the wealth which has enabled him to do what he thought best worth doing, what may not be looked for in the rich prime and aftermath?*

*Julius H. Ward, in the *Harvard Register*, December, 1886.

Correspondence.

Scientific Improvement of Beef.

To the Editor of the Scientific American:

I desire to call your attention to a few physiological experiments recently made in the laboratory of Dr. Hal. C. Wyman, of Detroit, which may have a bearing upon certain economic questions. The experiments consisted in dividing certain nerves which supply motion and sensation (I will say certain spinal nerves) to the muscles in the necks of rabbits, and carefully noting the results. A large number of rabbits were experimented upon, and a careful microscopical examination made of the fibers of the trapezius muscles, which showed that such fibers had undergone fatty degeneration. This, however, is no more than what has been known to every physiologist and pathologist who has given any attention to the study of paralysis.

The nerves divided were the muscular branches of the inferior cervical nerves and that portion of the spinal accessory which supplies the trapezius muscle. The fiber of these muscles supplied by these nerves was found to have been very appreciably softened, and the writer desires to ask whether these experiments do not open a field for the study of processes by which the large, tough muscles of the necks of beeves may be converted into tender and more salable food. It is well known to all butchers that the most inferior portion of beef—that is, those parts which are most difficult to dispose of—are the muscles of the neck; and if experimental physiology can teach a method whereby this meat may be rendered more tender, digestible, and salable, a great good will have been accomplished.

The writer ventures to state that the studies promoted by Dr. Wyman are steps in that direction. It might be advanced as an objection that a division of the sensory and motor nerve of a muscle would result in its atrophy from disuse, and that the gain in quality would be lost in quantity. But the experiments dissipate such an idea, because there are left undisturbed sufficient of the deep muscles of the neck to maintain passive motion, insuring a fair amount of exercise and a reasonably good circulation of blood to maintain the volume of the enervated muscles.

Trusting you will give this matter space in your valuable journal, and that it will invite discussion, I have the honor to be, etc., ZINA PITCHER, M.D.

Detroit, May 26, 1887.

The Destructive Power of Torpedoes.

To the Editor of the Scientific American:

Having noticed your article on the power of torpedoes, I send you an account of the destruction of the Chinese corvette Yang Wo during the fight between the French and Chinese at Foochow. The French flagship had two torpedo boats attached to her. They were stationed on either side of her, at the gangways. This ship was about 300 yards below the Yang Wo. As soon as the firing commenced, both boats attacked the Chinese vessel. The first one fired her torpedo directly under the Yang Wo's after gangway—starboard side. No damage whatever was done to the ship, but the officer in charge of the torpedo boat was wounded in the chest by the return action of the torpedo. The other boat had in the mean time attacked the ship forward, a little abaft the cathead, on the same side. This torpedo was in direct contact with the ship. The effect was, when the torpedo exploded, that it penetrated the fore magazine (or, I should say, the fire from it did). This blew up, and the whole forward part of the ship was demolished. This all happened inside of three minutes. The remainder of the wreck drifted ashore, and burned for seven days. The Yang Wo was a wooden corvette of fourteen guns. The torpedoes used were booms—contact ones.

I was an eyewitness—in fact, too close a one. One of the torpedo boats was lost afterward at Samtur, Formosa, but in what manner the French have never stated. She is simply put down in their list as lost.

Gakow, April 27, 1887. AN EYEWITNESS.

Rapid Railway Building.

A correspondent of the St. Paul *Pioneer Press* thus describes some rapid railway construction:

"Just beyond this point, and eighty miles west of Minot, the traveler finds himself at what railroad men call 'the front,' or the end of the track of the extension which the Manitoba Railway Company is now making to Great Falls, Mont. To speak more accurately, this was the end of the track yesterday, but to-night that point will be five miles further westward, and by to-morrow yet five miles further. From Minot here the work has been in progress since the first week in April. From now on it is proposed to complete five miles of track each day, thus achieving the greatest feat ever attempted in the way of rapid railway construction. From here to Fort Buford the distance is a little over sixty miles, and it is the intention to have the road open to that point by June 1. Thence to Great Falls the distance is 403 miles, and trains will in all probability be running to that point before the middle of September.

"It can readily be surmised that the accomplishment of this gigantic enterprise requires little less than an army of workers, and that is what one finds here. The number of men now at work is 6,600, and the number of teams 3,000. With this force it is hardly to be wondered that the dirt is flying at a lively rate. From here to seventy miles beyond Fort Buford there is one unbroken series of graders' camps. Fifty of these camps can be seen from one point some distance beyond White Earth. By June 1, between 3,000,000 and 4,000,000 cubic yards of earth will have been taken out, and by the time Great Falls is reached the amount will aggregate not far from 10,000,000. On the Canadian Pacific, during the whole of last summer, the amount of earth handled was 6,700,000 cubic yards, and this was considered a remarkable piece of work. A few figures may serve to give a clearer conception of what is involved in the construction of five miles of railway track in one day. A rail is 30 feet long, and there are consequently 352 to the mile, or 1,760 to every five miles. As each rail weighs 600 pounds, the amount of steel handled in one day aggregates 1,056,000 pounds. It takes 2,640 ties to the mile, or 13,200 per day. Thirty-six 200 pound kegs of spikes are used to the mile. There are 32 'spikers' to every five miles of track, each man of whom drives 840 spikes a day, which, at the average of three blows to the spike, gives 2,520 blows per man per day. A mile of rails takes 1,408 bolts, which are handled by fourteen 'bolters,' or 503 each per day. To avoid delays in the progress of construction by reason of rough country, it is the intention of the contractors to work five gangs of men in five hour reliefs during a portion of the time. Work will begin at 3 o'clock in the morning, and the darkness will be scattered by thousands of torches.

"With such an army of men and teams at work far from the centers of civilization, and in a totally unproductive country, it can be readily seen that the task of securing and distributing supplies is one of enormous magnitude. Indeed, there is little doubt that greater executive ability is required in this than in almost any other department of railway construction in the far West. Here at White Earth is, for the present, the headquarters of the supply train, consisting to-day of twenty cars filled with every conceivable thing necessary for man and beast. There is grain, flour, canned goods of all sorts, butter, hams, sugar, wagons, harness, plows, boots and shoes, pipes and tobacco—in fact, nothing is lacking. Every day sees a big hole made in the stock, and every day sees the hole replenished by incoming trains. Day before yesterday 15,000 bushels of oats were sent out by wagon and yesterday 5,000 bushels, all for distribution along the line for a distance of forty miles. From here on the trail along the line is marked by one continuous stream of freighters' teams distributing supplies to the various camps. The other day a herd of 170 head of cattle was driven in, and it seemed that there at least was enough meat for some time to come. A rapid calculation, however, showed that it would furnish only about ten pounds to the man. Already 250,000 pounds of flour and 500,000 bushels of oats have been purchased. Lovers of baked beans will learn with alarm that the supply of that luxury is about exhausted. A letter just received from one of the largest wholesale firms of St. Paul states that if the demand is to continue throughout the summer as large as it now is, it will be necessary to import from Europe. They say they have now secured all the beans that can be found in the United States, and that they have only enough to last this army here for two months.

"Another interesting feature of this train is the hospital cars, where the laborers suffering from disease or accident are cared for by a regular physician, assisted by several nurses, the expenses being met by a contribution of two cents a day from each laborer employed."

Luminous Paint in Theaters.

Herr Stehle, the Government Inspector of the Royal Bavarian Court Theater, has, according to *Iron*, given high testimony to the use of luminous paint as a safeguard against panic in theaters. Any explosion or disaster with gas leaves the exit passage of the theater in total darkness, and even if additional oil lamps were used, they would probably be extinguished by the air concussion. In the above named theater inscriptions in luminous paint are suspended over the exit passages, which direct the audience to the "way out" (*Ausgang*). "These placards, in spite of being exposed to the very poor light of the corridors in the daytime and the gaslight in the evening, are so luminous after the gas has been turned out that any one can gain the stairs in each corridor without difficulty." The *Lancet* says the precaution is so simple and inexpensive that we wonder it is not immediately adopted in all theaters. Indeed, we see no reason why its use should not be made compulsory. Surely some provision of the kind might be included in the theaters bill now before Parliament.

THE first street railway in America was completed in New York city in 1832.