A CURIOUS INHABITANT OF THE SARGASSO SEA AND ITS NEST.

What is generally known as the Sargasso Sea is the vast area of 260,000 square miles, more or less, to the west and southwest of the Azore Islands, reaching tothe Bahamas westward, and finding its northern and southern boundaries in the 36th and 19th degrees of latitude. Other areas, notably that in the Pacific, five hundred miles E. S. E. of New Zealand, and, again, one thousand miles west of San Francisco, possess the same characteristics, but the former is the best known and defined. The great Atlantic currents form a gigantic eddy, thus collecting the algæ that forms its component parts. The vegetable fauna is generally comprehended in the two genera, *Fucus* and *Sargassum*, of the latter two species, namely, *vulgare* and *bacciferum*.

The disconnected masses of weed that make up the "Sargasso Sea" are usually "from a couple of feet to two or three yards in diameter, sometimes much larger; we have seen, on one or two occasions, fields several acres in extent, and such expanses are probably more frequent nearer the center of its area of distribution. They consist of a single layer of feathery bunches of the weed (*Sargassum bacciferum*), not matted, but floating nearly free of one another, only sufficiently entangled for the mass to keep together. Each tuft has a central brown thread-like branching stem studded with round air vesicles on short stalks, most of those near the center dead and coated with a beautiful netted white polyzoon.

After a time vesicles so incrusted break off, and where there is much gulf weed the sea is studded with these little separate white balls. A short way from the center, toward the end of the branches, the serrated willow-like leaves of the plant begin; at first brown and rigid, but becoming, further on in the branch, paler, more delicate, and more active in their vitality. The young fresh leaves and air vesicles are usually ornamented with the stalked vases of a *Campanularia*. The general color of the mass of weed is thus olive in all its shades, but the golden-olive of the young and growing branches greatly predominates. This color is, however, greatly broken up by the delicate branching of the weed, blotched with the vivid white of the incrusting polyzoon, and riddled by reflections from the bright blue water gleaming through the spaces in the network. The general effect of a number of such fields and patches of weed, in abrupt and yet most harmonious contrast with the lanes of intense indigo which separate them, is very pleasing."

The animal life of this area is characteristic and has certain peculiarities well worthy the attention of the student. It consists of shelless mollusks, as the *Scillœa pelagica*, a short-tailed crab, the *Nautilograptus minutus*, quantities of membranipora, and a peculiar fish, the subject of our illustration, known as the *Antennarius marmoratus*. The writer was fortunate in observing the latter on the outskirts of this vast area. It forms one of the most interesting examples of the many creatures that find safety in protective resemblances. As above mentioned, the weed as it floats assumes all shades of olive, and the fish in color is its exact prototype, flecked with irregular patches of darker and lighter shades. Not only in color does it mimic the weed, but in general appearance, the head and fins being dotted here and there with fantastic barbels of flesh that to the ordinary observer seem bits of weed growing upon it. Even the white polyzoon growing on the algæ is imitated, and a careful examination is necessary to distinguish the fish from its surroundings. It was oftener found lying in among the weed, but where the patches were small, was frequently seen lazily swimming around in clear water. Its nest, seen in the accompanying illustration is, no less a curiosity. It is a round or oval ball of weed, intwined and wound together in a most complicated manner by an invisible viscid secretion from the fish. The pieces of weed are first roughly caught together, and the eggs deposited among the branches; then the invisible bands are wound around, gradually drawing them into the oval form, about as large as a base ball. The instinct, and its peculiar endowment by nature, place this fish among the most interesting of the finny tribe.

A CURIOUS INHABITANT OF THE SARGASSO SEA AND ITS NEST.

The Number of Botanical Species.

Dr. Muller, of Geneva, has recently made the following calculation as to the total number of existing botanical species: We have at present described in our books about 130,000 species; and if we suppose that, in round numbers, 30,000 belong to countries like Europe and North America, where there are hardly any species, excepting some cryptogamic ones, to be discovered, the remainder, or 100,000, representing exotic plants, more or less tropical and southern, we may double the latter for new species, giving 200,000 for these less known regions, and altogether 230,000 for the whole globe, with the exception of countries still quite unknown botanically. Adding only 20,000 species for the latter, we reach a minimum sum of 250,000 species of plants.

SEVRES VASE.

We give an engraving of a vase from the manufactory at Sèvres. It is of the *pâte dure* variety, and has all the

SEVRES VASE.

finish and beauty for which the productions of the Sèvres factory are noted.

The Musk Ox as a Geographical Clew.

Until recently it has been supposed that Wrangell Land—where Lieut. De Long hoped to spend the first winter of the Jeannette expedition—had never been visited by civilized man. It has now come to light that a German trader, Capt. E. Dallmann, made two landings there in the summer of 1866. His neglect to claim public credit for his discovery till now would appear to be due partly to his ignorance of the geographical significance of Wrangell Land, and partly to the fact that he has been away from Europe since that region came into prominence in connection with the Jeannette expedition.

On his first visit Captain Dallmann landed in latitude about 70° 40′ north and longitude 178° 30′ west. The land formed on the southern side a rather deep, wide, open bay, lying west of a ridge about five hundred feet high. To the eastward of this ridge the land stretched more to the northeast. The land, as far as he could see, had a narrow and level beach, like the northeastern coast of Siberia, behind which it rose to heights of from five hundred to one thousand feet, the last named elevation, however, occurring rarely. He saw no signs of human habitations, but found a great many tracks of animals, apparently those of polar bears, foxes, and musk oxen.

Speaking of the reference to the last named animal, and of the statement made elsewhere by Captain Dallmann, that he purchased the horns of musk oxen from native hunters in Northern Siberia, Mr. George Keunan (who is soon to lead a government expedition to the north coast of Alaska) says:

"The musk ox is a native of Arctic America and Greenland, and is entirely unknown in Siberia. If, therefore, that animal exists on Wrangell Land, the fact points to an extension of that land across the Pole, or to its junction with Arctic America at some point north and east of Point Barrow. The fact, so far as it goes, tends to corroborate other evidence, or at least indications, which we have, that the Arctic Ocean north of Behring Strait and east of Wrangell Land is a partially inclosed sea, with Wrangell Land and perhaps a chain of islands for its western and northern boundaries. The fact that natives of the North Siberian coast were in possession of the horns of musk oxen is significant in still another way, since it shows that those natives must have crossed Long's Strait and hunted the animals where Captain Dallmann saw their tracks, viz., on Wrangell Land. Finally, Captain Dallmann's statements, taken in connection with that of Captain Long, of the bark Nile, prove that during two consecutive seasons—1866 and 1867—the southeastern coast of Wrangell Land was easily accessible, and the adjacent sea entirely free from ice."

Lethe and the Gardens of the Hesperides.

At the recent meeting of the American Geographical Society in this city, Lieutenant Commander Gorringe read an entertaining paper entitled "A Cruise along the Northern Coast of Africa." Describing a trip from the Gulf of Gabe to the site of the proposed "Inland sea"—a desert area of about 3,000 square miles, which the French talk of flooding by means of a canal, over a hundred miles long, through the Chotts of Algeria—the reader said:

"In the neighborhood of Benghazi the surface of the ground is frequently broken by precipitous chasms, fifty or sixty feet in depth; at the bottom there is invariably a surface of rich soil, and also an abundant supply of moisture. The change from the arid and barren surface of the surrounding desert to these spots of luxuriant vegetation is very striking. The gardens of the Hesperides are believed to have been in the vicinity of Berenice, and many are of the opinion that these fertile spots at the bottom of the chasms are what remains of them. In one of the chasms, about seven miles from Benghazi, is the entrance to a cave which leads to an extensive sheet of water, believed to be identical with the river Lethe. I transported a boat across the desert on the backs of two donkeys side by side, and launched it on the waters of this famed river, which we found clear and cool and fresh as if constantly supplied by springs. It appears to run through a series of chambers, with very narrow passages connecting them, in which we observed a sensible current. The walls of the chambers are in part at least artificial, and on them are engraved many inscriptions. No extended exploration of this curious subterranean stream has ever been made; no one knows where it comes from or where it goes to, and it would be very interesting to find out, and instructive to copy the inscriptions, some of which are believed to be in Punic characters. I can very well understand the extravagant terms in which the ancients described the Lethe. In the spring there prevails along this coast a hot air blast—it cannot be called a wind—that comes from the great desert further south. The air is laden with insects and fine particles of sand, and is hotter and drier than any one who has not experienced it can conceive of. I have observed a temperature of 131° Fahr. in the shade during one of these blasts, called by the natives *oibleh*.

On one occasion I was indiscreet enough to wet my head with salt water, in my efforts to allay the intense suffering caused by necessary exertion. In a few moments my head was covered with a crust of salt, so rapid had been the evaporation. These winds rarely last through the night, and usually return each day for three or five days. My theory in regard to the Lethe is that it was an artificial subterranean retreat from the discomforts of these hot winds for the inhabitants of the ancient city, who were certainly wealthy enough to create it, if we may judge from their other works on the surface. The temperature of the air in the cavern keeps uniformly at about 65°, and that of the water about 55° Fahr. The waters of the Lethe are famed in ancient poetry for preserving youth and life; in contrast with the dry, hot blast of a gibleh, with its depressing influences on body and mind, the cool and moist atmosphere of the cavern justifies almost any assertion.

The Official Examination of Patents.

Many persons who suggest improvements in the patent law of Great Britain propose that patent specifications shall be officially examined for novelty before a patent shall be granted. A very high value is set upon this scheme; and it is commonly held that by carrying out the examination system thoroughly it would be found possible to eliminate nearly all the existing defects in the working of our patent law. Only the examination would not reduce the cost of a patent. Given low fees and efficient examination, and nothing more would be demanded by hosts of grateful inventors. It is not to be disputed that the theory of prior examination has something to recommend it. It seems at first sight to be clear that the state has no right to grant a worthless patent to an inventor in return for his fees; and it also seems to be right that the state should, in granting a patent, give the world a kind of guarantee that the invention patented was a new thing. But when, instead of glancing hastily at the matter, we carefully consider the bearings of the questions involved, and the whole theory of patent law as practiced in this country, we soon find reason to doubt that prior examination is a good thing; and if we turn to the United States, where examination is practiced, we shall find nothing to encourage the belief that the system can ever be made to work well.

The arguments in favor of official examination are very few, however cogent they may be. They are, as we have said, that the state ought not to sell to any one that which has no value, and that by stopping the intending patentee at the very outset from protecting an old invention, much trouble will be saved to manufacturers, an enormous amount of litigation will be got rid of, and the patents which pass the necessary ordeal will acquire a hitherto unknown value. As a minor consideration patentees and their agents will save the cost and time spent in making searches. If anything else can be urged in favor of the official examination it has escaped our notice. It will be seen that the examiners can do nothing more than say that a given invention is new or old. The value of the verdict when the invention is pronounced to be old is comparatively small. It is represented probably by the fees which the inventor will not spend under the circumstances. Its value as regards the invention pronounced to be new may be very great indeed. It may give a man an indefeasible title to a property worth many thousands of pounds. But it is obvious that, in order that this may be the case, the verdict of the examiners must not admit of being questioned. If they say that Mr. John Smith's invention for improvements in penny whistles is new, then it must not be open to Mr. James Brown to say that the examiners were mistaken as to the scope of the invention; nor must Mr. Green be permitted to refuse to pay Mr. Smith a royalty on the ground that he had made whistles of the kind patented for years; nor may Mr. Robinson assert that the specification is so badly drawn that the only whistles which it really covers cannot be made at all. If the verdict of the examiners is open to revision, then it is quite clear that it does not give an indefeasible title.

It is said now that no patent in Great Britain is really valid that has not been proved to be so by the result of an action at law. There is no doubt a substratum of truth in this statement. But assuming that the verdict of official examiners is not sufficient to keep patentees out of the law courts, then it is evident that the value to be attached to their verdict is much reduced; and it is easy to see that if the result of a little litigation was to overset the examiners' verdict in, say, half a dozen cases in the year, that verdict would almost cease to have any value whatever. In other words, if the verdict of the examiners is to give an indefeasible title, then the examiners must be infallible, in fact or by law. It is clear that no mortal can comply with the first condition, and it is equally clear that if it was enacted by Parliament that the verdict of examiners should invariably be regarded as final, a very wide door indeed would be opened for the entrance of injustice. It appears, therefore, that there must be in all cases a power of appeal. In other words, the verdict of the examiners as to the novelty would be taken for what it was worth, and we should have trials by jury just as we have now when disputes arise about priority of invention.

In the United States an attempt is made to get over the difficulty. There is a large number of examiners; so many, we believe, that it is possible for each to give quite half an hour to ascertaining whether an invention is or is not new. The rule is not to give the inventor the benefit of a doubt, but to refuse a patent on the ground of want of novelty. Then the inventor can apply to a higher grade of examiners, and counsel can be heard in his favor. In other words, the patentee begins with something very like a lawsuit to prove the novelty of his invention. If the verdict is in his favor, then the value of his patent is, no doubt, augmented; but the cost of the trial is very considerable. It may amount, and sometimes does, to several hundred pounds. If the case is not of such importance, the patent examiners will send for the patentee or his agent, and call on him for explanations, and in the end will grant him either the whole or part of what he claims.

Thus, to return to Mr. Smith and his penny whistle; he perhaps claims the use of a vulcanite instead of a wooden block in the mouthpiece, the making of a ninth hole, to give an extra note, and the introduction of a rivet at the lower end of the whistle, because solder sometimes does not flow well to the end of a lap joint, and ripping ensues. The examiners, after hearing all that Mr. Smith has to say, grant him a patent for a whistle with a vulcanite mouthpiece; but they will not grant one for the ninth hole, because flutes have more than nine holes; nor will they grant a patent for the rivet, because the ends of cask hoops make a lap joint and are secured with rivets. Mr. Smith has to be content with what he gets; but some one else subsequently obtains a patent for the ninth hole, and a third man secures the rivets, much, of course, to Mr. Smith's satisfaction. In saying all this we exaggerate not at all.

Every American who has had experience at the Washington Patent Office will bear witness to the truth of our statements. In all this we have really a desperate, but legitimate, effort to make examination a genuine thing, and not a farce; and it is not to be denied that if the system was properly carried out it would prove of great use. But let us consider what doing this means. As it is, the American examiner carries, no doubt, a great deal in his memory, and is able to say at once that certain inventions are not new; but this does not prevent the patenting every week of old ideas to a surprising extent. He is also able to say that certain parts of other inventions are not novel; so can every respectable patent agent in Great Britain. The American official must, however, be in doubt again and again, and he satisfies his official conscience by giving an inventor in such cases only one-half or one-third of what he asks for. But this is a very defective system. It means an indirect pleading guilty to a charge of incompetence as an examiner. It can, however, only be got rid of by making the examination really perfect, and it is impossible to do this. An examiner may know what has been patented before, but no board of examiners can be supposed to know all the devices which are and have been in use for years without being patented, any one of which would suffice perhaps to render half a dozen patents invalid.

Let us bear in mind that almost every week cases are tried in which all the skill of counsel, the acumen of a judge, and his power of analyzing the evidence of an army of "expert" witnesses, barely suffice to settle whether a certain invention is or is not new, and consider what it is that an examining tribunal must be expected to perform. Is it not obvious that the examiners must discharge the combined functions of judge and jury, and is it not evident that the value of their verdict will depend largely on the fullness and accuracy of the evidence set before them? This being so, the whole machinery of a law court, now resorted to only as a last resource and with comparative rarity, would have to be used before more than at most one-half the patents now granted could be confirmed.

It may be urged that this is going much too far with the thing—that it will suffice if the examiners are moderately diligent and careful. To this we reply that unless the verdict of the examiners is to be regarded as practically final, it possesses little or no value. Under the supposed conditions the entire system may do more harm than good by leading to the summary rejection of really valuable and novel inventions on very frivolous grounds. This is the grand objection to the scheme. If it is not perfect it is worse than useless; and to make it even nearly perfect it must be enormously expensive in its working.

The objections, on the other hand, which can be urged against the existing British system are very few. It is true that patents which are worthless are granted, and that pretty freely, but the mischief done thereby is not very great. It will be found, as a rule, that no two inventions are really identical, although there may not be any legal distinction between them. If an old thing is patented it can do no harm to any one else, unless it possesses sufficient merit to make it worth while to work it. It will then usually be found that the patented invention is really better than that which anticipated it, and the world is not the loser by the patent.

A case in point occurred some years ago. An invention for cleaning grain was patented; on inspection, however, it appeared that the new thing was neither more nor less than the old winnowing machine. As a matter of fact, however, the new grain cleaner had within it a board so set that it divided the current of wind, and did what the old machine did not, make a clean sample. The specification was beyond question bad as it was drawn, but no one was the worse of its existence.

The owners of a patent, valid or invalid, cannot prevent a man from using a machine or a process which he had used previous to the date of the patent, and any attempt to compel the payment of royalties would end in a discovery of prior user. We suspect that the instances in which royalties are paid on patents for inventions absolutely old right through are very few indeed, and that when a royalty is paid the owner of the patent has some substantial claim to it. But whether this be the case or not, and even if we concede that it is not the case, and that thousands of pounds are paid every year in royalties on worthless patents, we cannot see at all that a crude and insufficient examination would help to set matters right, even though it have official sanction.

There remains one argument to be considered, namely, that the state has no right to sell an inventor a worthless patent. It seems to us that the well recognized principle of *caveat emptor* applies accurately to this case. Let the purchaser look to his own interests. The law expects that every man shall use some caution in his dealings with others. Thus, for instance, a general warranty of soundness for a horse will not be taken to cover obvious defects, such as the want of an eye or a tail. The law says that a purchaser must see for himself whether the horse which he buys has or has not a tail. In the same way due facilities are supposed to be provided to enable would-be patentees to ascertain whether their inventions are or are not new. If they do not use these opportunities, and should discover subsequently that they have patented what was not novel, they have themselves to thank for the loss of their money.

Finally, we may add that competent patent agents are always willing to make a search for inventors which will give them quite as good a title as anything done officially in the United States can confer. But most inventors object to the cost and delay, and take their chance. We have shown, however, that if the official system of examination is to be really worth anything, it will introduce elements of cost and delay which would be regarded as intolerable by the great mass of British inventors.—*The Engineer.*

Study of Bones.

Prof. O. W. Holmes has introduced into the Harvard Medical School a decided improvement in the study of osteology. While abroad, during the summer, he purchased for the school ten skeletons, each of which has been divided into parts—skull, thorax, spine, legs, and arms. These parts are each provided with a wooden box with a sliding cover, and a handle to carry it with. The parts are distributed to those students who desire them on a stated day. Each box is lettered and numbered, and the student enters his name with the letter and number of his box in a book kept for the purpose. The parts are kept six days, a fine being incurred for each day beyond the prescribed time.

This plan of circulating bones is of great use to the student, as it enables him while reading to locate and fix various facts by actual observation, about the only way, indeed, in which the facts can be fixed. By the study of the bone a practical working knowledge is obtained, which it is not possible to gain from mere reading. Any one who has studied osteology "by the book," and then gone to the skeleton for confirmation of facts, must have been struck by the great dissimilarity of his ideas of the subject, and the facts as found. No matter how precise and carefully worded the description of an object may be, we fail to fully comprehend it, unless we see the object itself; and by seeing and handling the object we can clinch the facts about it into the memory, so that they will not easily drop out.

A system somewhat similar to this one is in use in the Columbus Medical College of Ohio. Here the bones under discussion are handed to the class during the lecture, and the various points are verified by the students as they are mentioned by the lecturer. The method of the Harvard School seems better, inasmuch as the bones are taken to the room of the student and there studied at leisure, and all their various points seen in their relation to each other.

The Longitude of the Chinese and Japanese Coasts.

Lieutenant-Commanders F. M. Green and C. H. Davis, Lieutenants S. M. Ackley and John Morris, and Surgeon Dale, of the United States Navy, have been detailed by the Navy Department to determine the exact longitude of certain points on the Asiatic coast of the Pacific Ocean. The American officers have permission from the cable companies to establish stations and use the cables at night for this purpose.

English officers are now engaged in a similar work in New Zealand and Australia. The information obtained by the observations will be exchanged by the two nations. English officers have determined the longitude as far as Madras, and Russian officers have made observations on the Siberian coast. All observations have been taken from the Hong Kong Observatory. The American party will ascertain the precise longitude of that place, there being a question as to the accuracy of the standard. The object of this movement by the Navy Department is to establish correct standards, from which true charts for the protection of maritime interests may be produced.

Natural History Notes from West Africa.

A paper on the fauna and flora of the gorilla country, written by Hugo von Koppenfels, at Corisco, West Coast of Africa, was read at a recent meeting of the New York Academy of Sciences. The writer has been exploring a little-known region in Equatorial West Africa, where the gorilla is at home. The range of the chimpanzee is much wider, including all of tropical Africa. The writer stated that it is now proved that crosses occur between the male gorilla and the female chimpanzee; also that the chimpanzee of Northern Guinea differs essentially from that of the southern part of the same country. The names *m'schigo, m'couve, koolo, baboo, soko,* and *koolookambla* are only different designations of the chimpanzee by different tribes.