

company, showed his extraordinary qualities of race; the persistence, through so many hundred years, of the ancestral traits which, in the attrition of a democratic society like our own, must have been obliterated long ago, was held to be a peculiar triumph of aristocratic civilization. One distinguished gentleman had proved himself much better versed in the Rainford pedigree than Lord Rainford himself. "Talked to me about my great-grandmother," said the nobleman afterward to Ray, "and my maiden step-aunts."

"Good-bye," said Helen once more; and nodding, she turned away, and went down the rocks.

Lord Rainford bowed, and said "Good-bye," too, following her with his eyes, but not otherwise pursuing her.

"You're back soon," he said to Mr. Ray, when the latter presently joined him.

At Salem that afternoon he came into the car where Helen sat. The place beside her was the only vacant one, and he stood leaning against the seat while he explained that he had been left by his train at that station in the morning. He looked as if he would like to be asked to take the vacant place, Helen thought; but she was perturbed and preoccupied. She could not endure the thought of talking all the way to Boston, and she made no sign of invitation. She was sorry, but she could not help it. He hesitated an instant, and, bidding her good-bye once more, said he was going forward into the smoking-car, and she did not see him again.

She went first to the post-office, where she had never been before, and which was so vast, and looked so hurried and careless with those throngs of people sweeping through its corridors, that she began to question whether it could be safely intrusted with a letter for Robert. Through one of the windows opening in the long façade of glass above the stretch of brass drawers which people were unlocking and locking up, all about, she saw a weary-looking clerk toss a little package into the air for relaxation and then throw it into a distant corner, and she thought, with a shudder, what if that had been her letter, and it had slipped under something and been lost! Besides, now that she had come to the post-office, she did not know in which of the many letter-holes to trust, and she studied the neighboring inscriptions without being able to make up her mind. At last she asked an old gentleman who was unlocking his box, and he showed her. She feigned to drop her letter according to his instructions, but waited till he went away, and then asked the clerk at the nearest window. He confirmed the statement of the old gentleman, and Helen had almost allowed her letter to go when she bethought herself to say to the clerk that it was to the care of the Navy Department. He smiled—sarcastically, Helen fancied—and said it was quite the same thing. Then she dedicated a final blush to the act, and posted her letter, and found herself quite at a distance from the post-office, walking giddily along, with a fluttering heart full of delicious shame. She was horrified to think she had done it, and was so glad it was done.

(To be continued.)



THE PRIMITIVE FISH-HOOK.

I HAVE before me an illustrated catalogue of modern fish-hooks and angling implements, and in looking over its pages I find an *embarras de choix*. I have no need for rods, for mine, like well-kept violins, have rather improved by age. A lashing may be frayed, or a ferrule loose, but fifteen minutes' pleasant work will make my rods all right

again. Lines are sound, for I have carefully stretched them after use. But my hooks! They are certainly the worse for wear. I began my season's fishing with a meager stock. Friends borrowed from me, and in replenishing my fly-book in an out-of-the-way place, the purchase was unsatisfactory. As I lost more than one fish from badly tempered

or worse fashioned hooks, I recalled a delightful paper by Mr. Froude. Rod in hand, he was whipping some pleasant trout-stream, near an historic site, the home of the Russells, and, breaking his hooks, commenced from that very moment to indulge in the gloomiest forebodings as to the future of England.

Fairly familiar with the general character of fishing-gear, either for business or amusement, I see in my book, Kirby, Limerick, Dublin, O'Shaughnessy, Kinsey, Carlisle, Harrison, Central Draught, as somewhat distinct families of hooks, used for sea or river fishing, and from these main stocks there grow many varieties, with all conceivable twists, quirls, and crookednesses. I discard all trap-hooks, infernal machines working with springs, as only adapted for the capture of land animals. Somehow I remember an aggressive book, given to me at an early age, which, containing more than one depressing passage, had one of extraordinary malevolence. This was couched nearly as follows: "Suppose you were translated only some seven hundred years back, then pray what would you be good for? Could you make gunpowder? You have, perhaps, a vague idea that sulphur, saltpeter, and charcoal are the component parts, but do you know where or how they are procured?" I forget whether this dispiriting author was not equally harrowing in regard to the youthful reader's turning off a spectroscope at a minute's notice, or wound up with the modest request that you should try your hand among the Crusaders with an aneroid barometer of your own special manufacture.

Still this question arises: Suppose you were famishing, though fish were plenty in a stream, and you had neither line nor hook. What would you do? Now, has a condition of this kind ever occurred? Yes, it has, and certainly thousands of times. Not so many years ago, the early surveyors of the Panama route suffered terrible privations from the want of fishing implements. The rains had rendered their powder worthless: they could not use their guns. Had they only been provided with hooks and lines, they could have subsisted on fish. Then there are circumstances under which it would be really necessary for a man to be somewhat of a Jack-of-all-trades, and to be able to fashion the implements he might require, and so this crabbed old book might, after all, act in the guise of a useful reminder. There was certainly a period, when every man was in a condition of comparative helplessness, when his existence depended on his proficiency in making such implements as would catch fish or kill animals. He must fashion hooks or something else to take fish with, or die.

Probably man, in the first stage of his existence, took much of his food from the water, although whether he did or not might depend upon locality. If on certain portions of the earth's surface there were stretches of land, intersected by rivers, dotted by lakes, or bordering on the seas, the presence of shell-fish, the invertebrates or the vertebrates, cetaceans and fish, to the exclusion of land animals, might have rendered primitive man ichthyophagous, or dependent for subsistence upon the art of fishing. But herein we grapple at once with that most abstruse of all problems, the procession of life. Still it is natural to suppose, so far as the study of man goes, when considered in relation to his pursuits, that in the early dawn of humanity, animals, birds, and fish must have been synchronous.

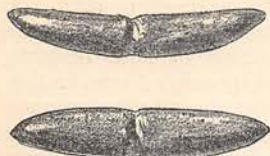
After brute instinct, which is imitativeness, then came shiftiness and adaptiveness. The rapid stride of civilization, considered in its material sense, is due solely to the use of such implements as are specially adapted for a particular kind of work. With primitive man this could never have been the case. Tools of the Paleolithic or Neolithic age (which terms indicate stages of civilization, but are not chronological), whether they were axes, hammers, or arrows, must have served river-drift or cave-men for more than a single purpose. People with few tools do manage, by skill alone, to adapt these to a variety of ends. The Fijian and the Russian peasant, one with a stone adze, the other with a hatchet, bring to their trades the minimum of tools. The Kafir, with his assegai, fights his battles, kills cattle, carves his spoons, and shaves himself. It was only as man advanced that he devised special tools for different purposes.

According to our present acquaintance with primitive habits, if man existed in the later Miocene age, and used a lance or spear for the killing of land animals, he probably employed the same weapons for the destruction of the creatures—possibly of gigantic form—inhabiting the seas, lakes, and rivers. The presence of harpoons made of bone, found in so many localities, belonging to a later period, may not in all cases point to the existence of animals, but to the presence of large fish.

Following, then, closely the advance of man, when his fishing implements are particularly considered, we are inclined to believe that he first used the spear for taking fish; next the hook and line; and lastly, the net. There might have been an intermediate stage between the spear and the hook, when the bow and arrow were used.

Interesting as is the whole subject of

primitive fishing, we are, however, to occupy ourselves principally with the form of the primitive fish-hook. To-day there are some careful archæologists who are not willing to accept that particular form which is presented below. I believe, from the many



STONE FISH-GORGE, FROM THE VALLEY OF THE SOMME. (NEW YORK MUSEUM OF NATURAL HISTORY.)

reasons which can be advanced, that this simple form was the first device used by man in taking fish with a line. The argument I shall use is in some respects a novel one. These illustrations, exactly copied as to size, represent a small piece of dark, polished stone. It was found in the valley of the Somme, in France, and was dug out of a peat-bed twenty-two feet below the surface. The age of this peat-bed has been variously estimated. M. Boucher de Perthes thought that thirty thousand years must have elapsed since the lowest layer of peat was formed. The late Sir Charles Lyell and Sir John Lubbock, without too strict an adherence to date, believed that this peat-bed represented in its formation, "that vast lapse of time which began with the commencement of the Neolithic period." Later authorities deem it not older than seven thousand years B. C.

Wonderful changes have come to pass since this bit of polished stone was lost in what must have been a lake. Examining this piece of worked stone, which once belonged to a prehistoric man living in that valley, we find it fairly well polished, though the action of countless years has slightly "weathered" or disintegrated its once smooth surface. In the center a groove has been cut, and the ends of the stone rise slightly from the middle. It is rather crescent-shaped. It must have been tied to a line, and this stone gorge was covered with a bait. The fish swallowed it, and, the gorge coming crosswise with the gullet, the fish was captured.

The evolution of any present form of implement from an older one is often more cleverly specious than logically conclusive; nevertheless, I believe that, in this case, starting with the crude fish-gorge, I can show, step by step, the complete sequence of the fish-hook, until it ends with the perfected hook of to-day. It can be insisted upon even that there is persistence of form in the descendants of this fish-gorge, for, as Professor Mitchell writes in his "Past in the Present," "an old art may long refuse to disappear wholly, even in the midst of conditions which seem to be necessarily fatal to its continued existence."

In the Swiss lakes are found the remains of the Lacustrine dwellers. Among the many implements discovered are fish-gorges made of bronze wire. When these forms are studied, the fact must be recognized at once that they follow in shape and principle of construction the stone gorges of the Neolithic period. Now, it is perfectly well known that the early bronze-worker invariably followed the stone patterns. The Lacustrine gorges have had the name of *bricole* given them.



BRICOLE, FROM THE LAKE OF NEUFCHATEL.

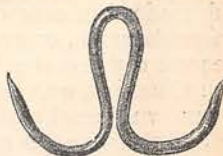
This is a faithful copy of a bronze bricole found in the Lake of Neufchatel. It is made of bronze wire, and is bent in the simplest way, with an open curve allowing the line to be fastened to it. The ends of the gorge are very slightly bent, but they were probably sharpened when first made.

The bricole below varies from the rather straight one found in the Lake of Neufchatel, and belongs to a later period. It is possible to imagine that the lake-dweller, according to his



BRICOLE OF A LATER PERIOD.

pleasure, made one or the other of these two forms of fishing implements. As the double hook required more bronze, and bronze at first was very precious, he might not have had material enough in the early period to make it. This device is, however, a clever one, for a fisherman of to-day, who had lost his hook, might imitate it with a bit of wire. Had any member of the hungry Isthmus party mentioned above known of this form of Lacustrine hook, he might have twisted some part of a suspender buckle, providing there were no thorny plants at hand, and have caught fish.



DOUBLE HOOK, FROM THE LAKE OF NEUFCHATEL.



PREHISTORIC FORMS.

When we compare the four forms, showing only their outlines, the evolution of the fish-hook can be better appreciated. Returning to the stone fish-gorge, the work of the Neolithic period, it is evident that the man of that time followed the shape handed down to him by his ancestors; and as this fashioned stone from the valley of the Somme is of a most remote period, how much older must have been the paleolithic fish-gorge of rough stone? It might have been with a splinter of

flint attached to some tendril in lieu of a line, that the first fish was taken.

It is very curious to learn that in France a modification of this gorge-hook is in use to-day for catching eels. A needle is sharpened at its eye-end, a slight groove is made in the middle of it, and around this some shreds of flax are attached. A worm is spitted, a little of the line being covered with the bait.

Not eels alone are taken with this needle, for M. de la Blanchere informs us that many kinds of fish are caught with it in France.

Any doubts as to the use of the Neolithic form of fish-gorge must be removed when it can be insisted upon that precisely this form of implement was in use by our Indians not more than forty years ago. In 1878, when studying this question of the primitive hook, I was fortunate enough to receive direct testimony on the subject. My informant, who in his younger days had lived among the Indians at the head-waters of Lake Superior, said that in 1846 the Indians used a gorge made of bone to catch their fish. My authority, who had never seen a prehistoric fish-gorge, save the drawing of one, said that the Indian form was precisely like the early shape, and that the Chipewas fished some with the hook of civilization, others with bone gorges of a primitive period.

In tracing the history of the fish-hook, it should be borne in mind that an overlapping of periods must have taken place. By this is meant, that at one and the same time an individual employed tools or weapons of various periods. To-day the Western hunter lights his fire with a match. This splinter of wood, tipped with phosphorus, the chlorates, sulphur, or paraffine, represents the progress made in chemistry from the time of the alchemists. But this trapper is sure to have stowed away in his pouch, ready for an emergency, his flint and steel. The Esquimau,

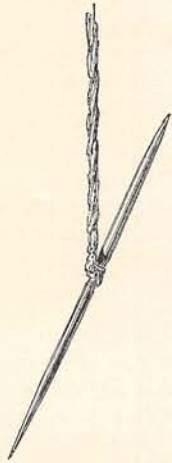
the Alaskan, shoots his seal with an American repeating rifle, and, in lieu of a knife, flays the creature with a flint splinter. The net of the Norseman is to-day sunk with stones or buoyed with wood,—certainly the same devices as were used by the earliest Scandinavian,—while the net, so far as the making of the thread goes, is due to the best modern mechanical appliances. Survival of form requires some consideration apart from that of material, the first having much the stronger reasons for persistence. It is then very curious to note that hooks not made of iron and steel, but of bronze, or alloys of copper, are still in use on the coast of Finland, as I have quite recently obtained brass hooks from Northern Europe, such as are commonly in use by fishermen there.

The origin of the double hook having been, I believe, satisfactorily explained, to make the barb on it was readily suggested to primitive man, as he had used the same device on fish-spears and harpoons.

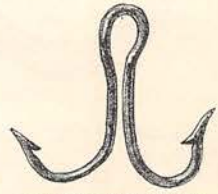
This double-barbed hook from the Swiss lakes is quite common. Then, from the double to the single hook the transition was rapid. Single bronze hooks of the Lacustrine period sometimes have no barb. Such differences as exist are due to the various methods of attaching the line.

In Professor A. A. Mayer's collection there is a Lacustrine bronze hook, the shank of which is bent over parallel with the stem of the hook. This hook is a large one, and must have been used for big fish—probably the trout of the Swiss lakes.

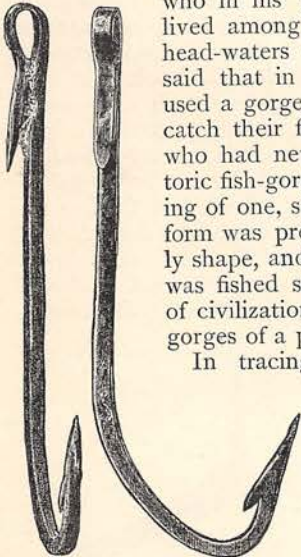
Hooks made of stone are exceedingly rare, and though it is barely possible that they might have been used for fish, I think this has not been conclusively shown. Wilson gives,



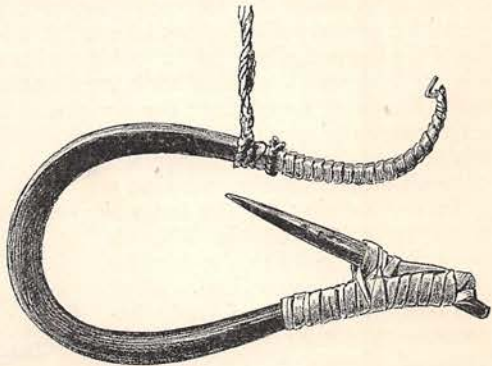
SHARPENED NEEDLE USED FOR CATCHING FISH IN FRANCE.



DOUBLE HOOK, BARBED. FROM SWISS LAKES.

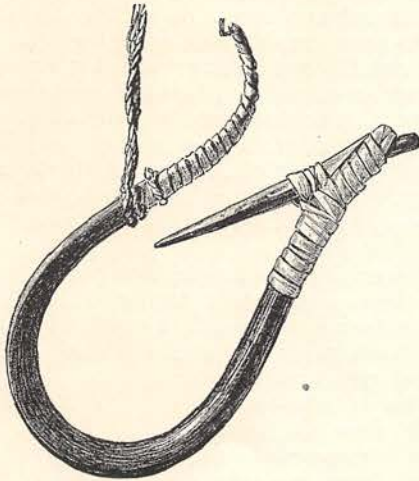


BRONZE FISH-HOOK. (MAYER COLLECTION.)



ALASKAN HALIBUT HOOK.

in his work, drawings of two stone hooks, which were found in Scandinavia. Though the theory that these stone objects were fashioned for fishing is supported by so good an authority as Mr. Charles Rau, the archæologist of the United States National Museum at Washington, it does not seem to



ALASKAN HALIBUT HOOK.

me possible that these hooks could have been made for fishing. Such forms, from the nature of the material, would have been exceedingly difficult to fashion, and, even if made, would have presented few advantages over the primitive gorge.

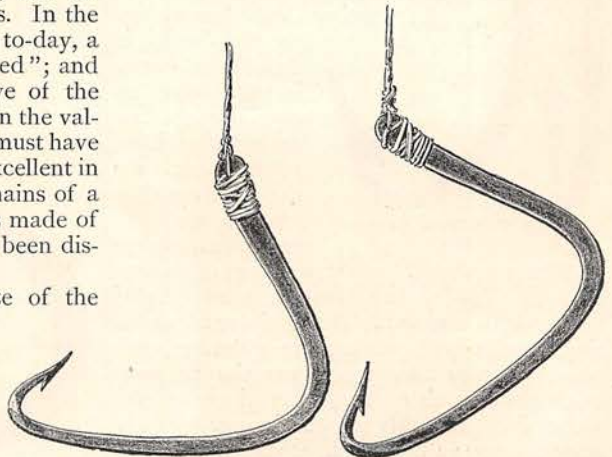
This, however, must be borne in mind: that, in catching fish, primitive man could have had no inkling of the present curved form of fish-hook, which, with its barb, secures the fish by penetration. A large proportion of sea-fish, and many river-fish, swallow the hook, and are caught, not by the hook entering the jaws of the fish, but because it is fastened in their stomachs. In the Gloucester fisherman's language of to-day, a fish so captured is called "poke-hooked"; and accordingly, when the representative of the Neolithic period fished in that lake in the valley of the Somme, all the fish he took must have been poke-hooked. A bone hook, excellent in form, has been found near the remains of a huge species of pike (*Esox*). Hooks made of the tusks of the wild boar have also been discovered with Lacustrine remains.

In commenting on the large size of the bone hook figured in Wilson's work, its proximity to the remains of large fish was noticed. When the endless varieties of hooks belonging to savage races are subjects of discussion, the kind of fish they serve for catching should

always be cited. In the examples of hooks which illustrate works of travel, a good many errors arise from the simple fact that the writers are not fishermen. Although the outline of a hook be accurately given, the method of securing it to the line is often incorrectly drawn.

In THE CENTURY MAGAZINE for July, 1882, an Alaskan halibut-hook is represented. The form is a common one, and is used by all the savage races of the Pacific; but the main interest lay in the manner of tying the line to this hook. Since the fish to be caught was the halibut, the form was the best adapted to the taking of the *Hippoglossus Americanus*; but, had the line been attached in any other way than exactly as represented, this big fish could hardly have been caught with such a hook.

In the drawing, the halibut-hook hangs but slightly inclining toward the sea-bottom, the weight of the bait having a tendency to lower it. In this position it can be readily taken by the fish; but should it be suspended in a different way, it must be at once seen how difficult it would be for the fish to swallow it. In this Alaskan hook must be recognized the very first idea of what we call to-day the center-draught hook. A drawing is also given of a steel hook of a peculiar form, coming from Northern Russia. The resemblance between the Alaskan and this Russian hook is, at first, apparently slight, but they both are, nevertheless, constructed on the same principle. When this Russian hook is seized by the fish, and force is applied to the line by the fisherman, the point of the barb and the line are almost in one and the same direction. Almost the same may be said of the Alaskan hook. Desirous of testing the capabilities of this hook, I had a gross made after the Russian model,



RUSSIAN FISH-HOOK.



THE BEGINNING OF A SHELL-HOOK. (WEST COLLECTION.)

and sent them to Captain J. W. Collins, of the United States Fish Commission, stationed at Gloucester, requesting him to distribute them among the fishermen. While writing this article, I am in receipt of a letter from Captain Collins, informing me that these hooks are excellent, the captains of fishing-smacks reporting that a great many deep-sea fish were taken with them.

A study of these hooks—the Alaskan and Russian—with reference to the method of attaching the line, explains, I think, the peculiarity of certain shell-hooks of great antiquity found in California, which have puzzled archaeologists. These hooks, the originals of which are to be found in the National Museum, at Washington, are shown in accompanying engravings. The notch cut in one of the hooks seems to show that the line was attached at that place. Hang the hooks in any other position and they would catch no fish,—for one could hardly suppose that the blunt barb could penetrate the mouth of the fish.

If there be some doubt entertained by American archaeologists as to the use of these shell-hooks (page 904), there can be none in regard to their having barbs. The barbs turn outward, in which respect they differ from all the primitive European hooks I have seen. In confirmation of the idea advanced as to the proper place of attaching the line, Professors C. C. Abbott and F.

W. Putnam, in a chapter entitled "Implementations and Weapons made of Bone and Wood," in the United States Geographical Survey, west of the hundredth meridian, write, referring to these hooks: "These hooks are flattened, and are longer than wide. * * * The barbs in these specimens are judged by fishermen of to-day to be on the wrong side of a good fish-hook, and the point is too near the shank. By having the line so fastened that the point of tension is at the notch at the base of the shank, instead of at the extreme end of the stem, the defect of the design of the hook would be somewhat remedied, as the barb would be forced down, so that it might possibly catch itself in the lower jaw of the fish that had taken the hook." The summing up of this is, I think, that in an imperfect way the maker of this Santa Barbara hook had some idea of the efficiency of a center-draught hook. As the first step in manufacturing this hook, a hole was drilled in the shell, and the hook finished up afterward by rounding the outside. Dr. West, of Brooklyn, has a whole series of such primitive work in his collection.

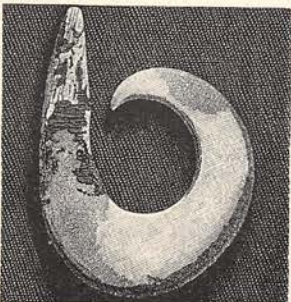
It is quite obvious that, in a study of this



SHELL-HOOK. (NATIONAL MUSEUM, WASHINGTON.)

character, it becomes necessary to understand the implements now in use by uncivilized man. To advance the idea that in all cases hooks have been improved by slightly increased culture among semi-civilized races, would be a source of error. It is quite possible that, in many instances, there has been retrogression from the better forms of fishing implements once in use. This relapse might have been brought about, not so much by a decrease of intelligence, as changes due to fortuitous causes. A fishing race might have been driven away from a shore or a river-bank, and replaced by an inland people ignorant of fishing.

Some primitive races still use a hook made from a thorn, and in this practice we find to-day a most wonderful survival. On the coast of France hooks made of thorns are still used to catch fish, the fishermen repre-



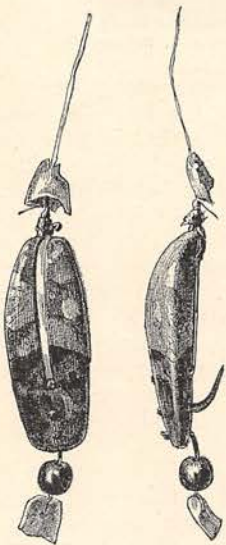
SHELL-HOOK. (NATIONAL MUSEUM, WASHINGTON.)



SHELL-HOOK FROM SANTA BARBARA. (NATIONAL MUSEUM, WASHINGTON.)

sending that they possess the great advantage of costing nothing, and of not fouling on the sea-bottom. The Piutes take the spine of a cactus, bending it to suit their purpose, and very simple barbless hooks of this kind may be seen in the collections of the National Museum at Washington.

Undoubtedly, in primitive times, hooks of a compound character were used. Just as men tipped a deer's antler with a flint, they combined more than one material in the making of their hooks, lashing together a shank of bone or wood with a bronze barb. It would be almost impossible in a magazine article to follow all the varieties of hooks used and the ingenuity displayed in their manufacture. Occasionally a savage will construct a lure for fish which rivals the daintiest fly ever made

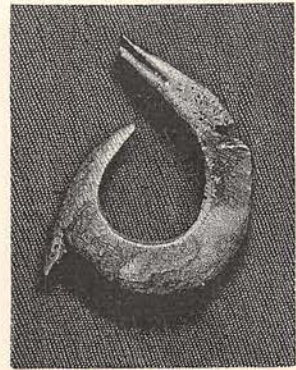


ARTIFICIAL STONE SHRIMP. (MAYER COLLECTION.)

by the most fastidious of anglers. In Professor Mayer's collection there is an exceedingly clever hook coming from the North-western coast, which shows very fine lapidary work. A small red quartzose pebble of great hardness has been rounded, polished, and joined to a piece of bone. The piece is small, not more than an inch and three-quarters in length, and might weigh an ounce and a half. In the shank of bone a small hook is hidden. It somewhat imitates a shrimp. The parts are joined together by lashings of tendon, and

these are laid in grooves cut into the stone. It must have taken much toil to perfect this clever artificial bait, and, as it is to-day, it might be used with success by a clever striped-bass fisherman at Newport.

In this necessarily brief study of primitive fishing I have endeavored to show the genesis of the fish-hook, from the stone gorge to the more perfected implement of to-day. Simple as it may seem, it is a subject on which a good deal of research is still requisite. "It is not an acquaintance with a single series of things which can throw light on any subject, but a thorough comprehension of the whole of them." If in the Swiss lakes there are found bronze hooks of a very large size, out of proportion to the fish which swim there to-day, it is but just to suppose that, many thousands of years ago, long before history had its dawn, the aquatic fauna



SHELL-HOOK. FROM SANTA BARBARA. (NATIONAL MUSEUM, WASHINGTON.)

were then of greater bulk than in 1883. Considerations on the primitive form of the fish-hook must even comprehend examination of prior geological conditions, differences of land and water, or such geographical changes as may have taken place. Then ichthyology becomes an important factor, for by the character of the hook the kind of fish taken, in some instances, may be understood. We are fast coming to this conclusion: that, putting aside what can only be the merest speculations as to the condition of man when he is said to have first diverged from the brute, he was soon endowed with a wonderful degree of intelligence. And, if I am not mistaken, primitive man did not confine himself in his fishing to the rivers and lakes alone, but went out boldly to sea after the cod; and so the fishing instincts of the men of Cape Ann to-day go backward to that indefinite period the exact date of which is so far distant that no human mind has yet been able to fix it.

Barnet Phillips.