

## IX.—THE FISHERIES ON THE WEST COAST OF SOUTH AMERICA.

By H. G. KRUSE.\*

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Although the following communication leads us far away from those countries which are generally spoken of in our journal, I hope that it will prove interesting, as giving us an insight into the fisheries on a portion of the great Pacific coast. They will be doubly interesting to those of our readers who are personally acquainted with the author, whose upright character commanded universal respect, and whose genial temperament gained him many friends.

Our countryman, *Hans Gunner Kruse*, originally a fisherman, later captain of a vessel and owner of a factory in Korsör (island of Zealand, Denmark), was, in the spring of 1877, by the force of circumstances, compelled to leave his home, and, with his numerous family, emigrated to Callao, Peru, which place he had often visited in former years, believing that his knowledge of the country and its customs would enable him to earn a living. He was not successful, partly on account of local difficulties, partly owing to want of capital; and he was obliged again to become the captain of a vessel. His constant activity on the western coast of South America, however, gained him an intimate acquaintance with the fisheries in those distant regions; and, with his consent, I give the following extract from a recent letter of his. His clear insight into all matters pertaining to the fisheries, and his general trustworthiness, will be sufficient guarantees for the correctness of his descriptions.

H. V. FIEDLER,  
*Editor of Tidsskrift.*

RUSSIAN BARK RURIA,  
*On the Atlantic, July, 1879.*

When leaving Denmark in the spring of 1877, I promised you to write from Peru and give you some idea of the fisheries on the west coast of South America. Various causes have, so far, prevented me from fulfilling my promise; but during the two years which have elapsed since it was made I have seen a good deal, and visited a large number of places on the coast. I shall, therefore, be able to give you a fuller and more reliable account than if I had written soon after my arrival.

Before describing the fish of this coast and the way in which they are

\* H. G. KRUSE, *Nogle Meddelelser om Fiskeriet paa Vest-Kysten af Sydamerika.*  
[Translated by HERMAN JACOBSON.]

caught and used, I think it proper to give a short description of its nature. My personal observations were confined to the coast of Peru, nearly every point of which I visited, from the 3d to the 22d degree southern latitude; but my remarks will, in a great measure, also apply to the coast of Chili, Ecuador, and Colombia as far as the Isthmus of Panama.

This whole coast is bounded on the west by the South Pacific. The mountain range of the Andes follows the coast-line in its whole extent, and at a distance of only seventy miles reaches its greatest height, 15,000 to 20,000 feet. A great deal of water flows from these high snow-clad mountains, especially during summer, but on account of the very steep incline no rivers have been formed. The little stream and brooks, of which there are a great many, rush so violently over their stony beds towards the coast, that no plants can thrive and no fish live in their waters. There are, consequently, no fresh-water fish, and all the fish which occur in Peru are salt-water fish.

The Pacific is richer in fish than any other sea, and this is caused by its peculiar natural conditions. A current runs along the entire coast, from south to north, beginning as a surface-current on the west coast of Patagonia, near Cape Horn, and bringing the cold waters of the Antarctic Ocean as far as the northern boundary of Peru. At this point the current leaves the coast and runs in a westerly direction to the Gallapagos Islands, where it loses itself. This cold current, which has a temperature of not more than 12° to 14° Réaumur, produces the remarkably temperate climate on these coasts which lie within the tropic zone, but which have seldom any greater heat than we have in Denmark during summer; and as the air is drier the heat is not near as oppressive. But what is of more interest to us is the circumstance that this cold current of the sea contains an almost incredible wealth of fish. The fish which occurs in the most surprising numbers is the herring; but the coast waters swarm with innumerable other fish, *e. g.*, the mackerel, the cod, and others. Rich oyster-beds are found in many places, and oysters of the most excellent quality are so plentiful that they sell for 18 to 26 cents a barrel in Callao and Lima.

The enemies of fish, however, are just as numerous, especially among the aquatic animals. An incredible number of seals, sea-lions, porpoises, sharks, and other large fish chase the schools of smaller fish; and the seals particularly gorge themselves among the dense schools of herrings. Seals and sea-lions are found everywhere at a distance of about two miles from the coast, rarely farther out; their places of retreat are inaccessible rocks on the coast or out at sea. Here they lie or sit sunning their enormous bodies, when they are not engaged in hunting fish. They are so tame that scores and hundreds of them will follow a boat at a distance of only 2 to 3 fathoms and often closer, and hold their inquisitive heads close up to the side of the boat. As they are of no special value, no one chases them.

I would like to give you a description of those species of fish which are most common on this coast; but as this will be somewhat difficult, I will endeavor to describe those fish which have some similarity to ours. The specimens which I had collected and preserved in spirits of wine were unfortunately spoiled from some cause or other, and the only kind of fish of which I can this time send you a few specimens are herrings, which put up in brine seem to have kept very well. I shall, therefore, begin my account with the herring.

As to size and looks the *herring* of the South Pacific does not differ much from that found in the northern seas, but it is undoubtedly of a much inferior quality. It is found along the coast and close to the land all the year round, but even at a distance of fifty miles from the coast the sea is full of them, whilst farther out they are not so frequent. On calm, warm days dense schools of them rise to the surface and hold their heads above the water, often covering the surface of the sea for hundreds of fathoms.\* This is the time for the seals to gorge themselves, and they certainly do not neglect their opportunity. As many herrings as you want can then be caught with nets and seines; but as they are hardly ever used as food it seems perfectly useless to catch them. During the night their dense schools may be seen farther out at sea, and the rapidly moving phosphorescent light produced as they fly from porpoises and other enemies presents a beautiful spectacle.

But very few of these herrings are ever used as an article of food, as there is such an abundance of better fish; the only use which is made of them is to serve as bait for other fish. They can be salted, and their flavor is then better than when fresh, but the climate is not favorable to salting. Smoked they form a very good article of food.

The *mackerel* is also found in large quantities, but its quality is inferior to our northern mackerel. In size and shape these mackerel resemble ours, but the color, which is so beautiful in ours, is very faint. They are not as fat, and their flavor is not near as agreeable, having a sort of bitter taste, produced, as some think, by the coppery nature of the bottom. It is but rarely eaten, and therefore does not form an object of fishing. The horse-mackerel also occurs here, but it is absolutely worthless.

The *codfish* is not near as common as the above-mentioned species, but of all the Peruvian fish it resembles our northern fish most, and is considered the best and most valuable fish on this coast. In looks and size it differs considerably from our northern codfish, and rarely weighs more than 8 to 10 pounds. It is fat, has a good flavor, and fetches a good price, both fresh and salted (about 13 cents per pound salted). It lives in deep water where there is a rocky bottom, and is caught exclusively with hook and line. It is really the finest fish found on this coast.

*Flounders* are also found, but not in any considerable number. They

\* The same phenomenon I observed in the North Sea during the summer of 1840, though probably not on such an extensive scale.—H. V. FIEDLER.

vary in size, and sometimes reach a weight of 10 pounds. They have a tolerably good flavor, but nothing like our flounders. They fetch a good price.

*Eel* are often found close to the coast, and between the rocks where the breakers are not too strong. They say that large-sized eel are found near some of the outer islands at a depth of 50 to 80 feet, but I never had an opportunity of seeing any.

These are about the only fish which bear any similarity to ours; but there are a large number of excellent fish which we do not have, and which, to a great extent, form an article of food. It is useless to give their names and to describe them, as long as I cannot send you specimens. One kind, called *Raballes* or *Corobinas*, weighs from 20 to 80 pounds, and somewhat resembles the salmon, but its flavor is not quite as delicate. Owing to the want of fresh-water streams, there are no salmon on this coast, while large quantities of excellent salmon are caught on the coast of California and farther north. These are put up in brine, and sold all along the west coast of South America, and salted, canned, and packed in ice, they are sent to the Atlantic coast of North America. On the west coast of South America the water has often, during calm weather, a brownish color, and it seems at first sight as if the water was shallow. But on closer examination we find that this brown color is produced by another cause, viz, by very diminutive animals, which cover the surface of the sea for many miles. They are so small that they cannot be seen with the naked eye; but when you let this colored water stand for some time in a glass, a brownish sediment will soon form. I have not had the instruments nor the opportunity to observe this matter closer, but I refer you to *Ch. Darwin's* observations, made during Her Majesty's ship *Beagle's* voyage around the world. These little animals are also found on the coast of Norway, and it is interesting to hear what an authority like Darwin has observed in this line during his voyage in the South Pacific:

“On the coast of Chili, a few leagues north of Concepcion, the *Beagle* one day passed through a large extent of muddy water, and the same phenomenon appeared, in a still more marked degree, a few days later south of Valparaiso. We were more than fifty miles from the coast, but still I believed at first that this muddy water might possibly come from the river Maypo. But Dr. Sullivan, who had collected some of this water in a glass, thought he could see little spots moving about in it. The water looked as if a quantity of reddish dust had been put into it, and when left undisturbed this dust collected at the bottom. Through a magnifying-glass these little spots could be seen moving about very rapidly, and quite frequently they would burst. When placed under the microscope, it appeared that their form was oval, and surrounded by a ring, from the middle of which small fibers protruded, which served as means of motion. One end of the body was narrower than the other. It was very difficult, however, to observe them, for suddenly the motion

would cease, and the body would burst. Sometimes one end broke off, and then the other; often both ends would break off at the same time, and a dark brown substance would ooze out. The ring with the fibers would, for a few moments after the body had burst, keep up a wriggling motion. It took about two minutes to extinguish all life in a drop of water poured in a saucer. The motions of the little animals were exceedingly rapid, and could not be seen with the naked eye, as each animal only measured  $\frac{1}{100}$  of an inch in length. Their number was prodigious, every drop of water containing vast quantities. One day we passed through two places where the water was colored, one of them extending over several square miles. What an enormous number of microscopic animals! The color of the water, seen from a distance, was like that of a river which has a red clayey bottom, whilst nearer the ship it was dark brown, like chocolate. The line of demarkation between the brown and the blue water could be traced very distinctly."

I will only add that the largest quantity of these microscopic animals which I observed was farther north, in the 6th and 7th degree of southern latitude, but there is no doubt that they are found all along the coast.

The bottom of the sea has scarcely any vegetation. The vast ocean rolls its strong waves towards the coast over a stony or sandy bottom, and this character of the bottom extends far out. How different from the bottom of the sea on the colder coasts farther south, *e. g.*, of Patagonia and the Falkland Islands. But where the gigantic algæ grow, the coasts, like those of Norway, are surrounded by many rocky islands, which moderate the violence of the breakers; but there are scarcely any such slands on the coast of Peru, and the sea breaks against the shore with such violence that it is always difficult to land in boats.

I shall now say a few words regarding the *fishermen*, their *apparatus*, and *method of fishing*. Fishing is carried on almost exclusively by two classes, the native population, the so-called "cholos"—a mixed race of Spaniards and old Peruvians—and by Italians, who are a thrifty and energetic people. The "cholos" go out fishing in their canoes, and nearly always use hooks and lines. Only for catching shrimps and small fish for bait they use a small net. The Italians, on the other hand, always fish with nets, and, according to the custom of their native country, in well-built boats with lateen sails. The natives generally go fishing early in the morning, either far out at sea or close to the rocky coast, where their boats may often be seen tossed about by the terrible breakers. Bottom lines form their principal apparatus, and they certainly know how to use it. They often catch a very considerable number of cod-fish, mackerel, and other fine fish during the forenoon. About noon they go on shore, and their day's work is done. Floating lines with a number of baited hooks cannot be used, as the seals would disturb them. But when the above-mentioned fish of the salmon kind, the *Raballes* and *Corobinas*, come near the coast, the natives employ another method of

fishing. They row out to sea early in the morning, before the sea wind arises, and go a good way to the leeward, and when there is sufficient wind they go with it, having a long, stout line floating about a fathom behind the canoe. This line is furnished with hooks and glittering tin floats; and as the above-mentioned fish are very greedy they soon bite. As soon as the man in the boat notices a bite he quickly hauls in the line and endeavors to bring the fish close to the canoe, where it is secured with a large hook.

The *boats* used by the natives deserve some mention. I have already mentioned that the breakers on this coast are very violent, and with the exception of a few sheltered landing-places, it is impossible to land anywhere with a boat or even a canoe. In order to meet this difficulty to ferry people from the coast to ships or for fishing, the natives use the so-called *balzas*. In some localities, especially in Southern Peru and Chili, these *balzas* consist of two sea-lion skins, joined by two boards, on which there is a little platform; each skin is furnished with a tube through which it can be filled with air. On these *balzas* the *cholos* cross the most terrible breakers, which throw the *balzas* high on the coast; the very moment where the breakers recede, the *cholos* leap up out, and standing on the dry land firmly hold their fragile vessel. They possess an extraordinary dexterity in handling these vessels. In many places the cargoes of ships must be taken on *balzas* to and from the boats which are at anchor outside the breakers. On other parts of the coast five, seven, and nine boards, of light wood, measuring 8 to 12 inches in diameter, joined lengthwise and furnished with a similar platform, are used, and on the northernmost coast of Peru the *balzas* only consists of a bundle of reeds tied together in the shape of a cigar, 10 to 12 feet long, 2 feet broad at the stern, and with a pointed prow slightly inclined upward. This *balza* the fisherman takes on his back, after it has been used, and dries it in the sun. It must be borne in mind that it never rains in these latitudes. On the board *balzas*, which are often of considerable size, the native fishermen go far out to catch codfish, frequently out of sight of land.

Such are the apparatus, boats, and methods of fishing of the natives. The Italians, however, employ a more rational method of fishing. They all live in or near the large cities on the coast, where they find a good market for their fish, whilst the *cholos* are found everywhere along the coast. The Italians always use boats 16 to 22 feet long, 6 feet broad, and having a deck like our boats in the Great Belt. They always use nets, and fish during the night. Their boat is their home, where they live, cook, and sleep. I have already mentioned that the Italians are thrifty, frugal, and economical, and are far superior to the lazy Spaniards and the mixed race. They always keep their boats and their apparatus in good order; they are out early and late, and shun no trouble to earn a living. They go out early in the evening, when it is nearly always calm, and row many miles till they reach their fishing-places. At dusk

they cast their nets, and are then obliged to keep a constant watch for the seals; when these approach, they haul in the net, take out the fish, and cast again. Thus the night is passed; towards morning the fishermen go on shore, sell their fish, mend their nets, and then first can think of taking a little rest in their small cabin.

This is the way in which these men pass their lives; and it may well be called a hard way of earning one's bread, for, although they generally catch a good many fish, the profits are very small. Some of them, however, have prospered, own several boats, and go in partnership with others. There is never any lack of such, as there are always many Italian sailors in the principal seaports of the west coast of South America; and all of them have a great liking and talent for fishing. Their nets are made of the strong hemp which grows in these regions, and whose threads are almost too thick, according to our notions. The size of the meshes varies according to the kind of fish which they wish to catch. They always make their own nets and furnish them very prettily with round floats. Everything must always be in good order on account of the frequent casting and hauling in, owing to the danger threatened by seals. Everything in the boat is prepared with this view. The ship-board is furnished with rollers over which the lines of the net may be drawn with great ease, and these men possess an almost incredible dexterity in casting and hauling in their nets. They generally have a gun in their boats to shoot or scare off the seals and sea-lions; but this is not of much use, as these animals are too numerous and care very little for shooting. The best way is to haul in the net and take out the fish as soon as seals are in sight. Old people, and those who can only afford to have a small boat, occasionally fish by day-time quite close to the coast, generally with nets having very narrow meshes, which they place in a serpentine line as near as possible to the breakers. As soon as one end of the net, measuring about 60 fathoms in length, has been put in position, they row immediately to the other end and begin to haul it in; and thus they go on a whole day; for the seals come close to the coast and are on the alert both day and night. Near the coast they catch a beautiful little transparent fish, which is in great demand, and which we do not have in Denmark. It is called "*pega-rej*," *i. e.*, "the fish-king," and is so transparent that every bone can be distinctly seen; it has a beautiful shining silver color. Oyster-fishing, as far as I know, is only carried on near the island of St. Lorenzo, which forms the bay of Callao, but there is no doubt that rich oyster-beds are found in many other places along the coast. As I have mentioned before, their number is enormous, but the price which oysters fetch is very small. The Italians continually use long poles, partly for chasing the fish into the nets and partly for keeping off the seals and sea-lions. These poles resemble those which our fishermen use in the Limfjord.

As is the case everywhere these fishermen have to work hard to earn their daily bread, and their enjoyments are few in number. But I must

mention some of them. I lived for some time in a little sea-town which serves as a watering place to the inhabitants of Lima, and which is connected with that city by a railroad of about thirty miles. This town is situated in a very arid part of the coast, but on a beautiful bay which offers a fine opportunity for fishing; consequently a good many fishermen live in this town. In these out-of-the-way places the Roman Catholic priests still exercise a powerful influence, which is decidedly waning in the large cities with a mixed population. On a certain day in July the fishermen have their festival, and on that day about a dozen priests and monks come from Lima to add to the proper observance of the sacred day. In the morning, images of St. Peter and the Virgin Mary, surrounded by banners, are, amid the thunder of artillery, carried through every street of the little town; at the head of the procession are seen the monks and priests, the alcalde, and the harbor-master, followed by all the fishermen with their wives and children, bareheaded in spite of the burning rays of the sun, and carrying lighted candles, all marching with a slow measured step. After the procession has passed through every street they go to the wharf and into gaily decorated boats. The priests solemnly bless the fish and address sermons to them. This ends the religious part of the festival, and the fishermen spend the rest of the day in boisterous merriment, dancing, drinking, cock-fighting, &c. The priests do not fail to make this day as profitable to themselves as possible. They placed the images inside a tent, and by paying a small sum every true believer—I was the only unbeliever in the town—could go in and have the extreme pleasure of kissing the foot of either St. Peter or the Virgin Mary. As far as I could observe, St. Peter had the larger number of worshippers. The festivities were continued till late at night, but on the following day everything went again its usual course.

Respectfully, yours,

H. G. KRUISE.