

showers of meteors every thirty-three years little doubt can now be entertained. The confirmation of these forecast last November, with the fine opportunity afforded in England for observing the phenomenon, will, it may be hoped, assist science in further unravelling the mystery in which these erratic bodies have been shrouded, from the ages of ignorance and superstition when they were looked upon with terror as portents of coming evil, to the present day, in which they are better understood; but whatever may be the addition to the knowledge already possessed of these wonderful bodies to be obtained from the numerous simultaneous observations taken on the night of the 13th—14th Nov. last, man will find himself still, as it were, only at the very threshold of the Great Creator's sublime works, the amazing profundity of which time itself will prove too short, and the most powerful human intellect too feeble, entirely to fathom.

ART. VIII. OBSERVATIONS ON THE FISHING GROUNDS AND FISH OF ST. MARGARET'S BAY, N. S.,—*Continued.* BY REV. JOHN AMBROSE.

(*Read March 4, 1867.*)

IN resuming my account of the Fishes of St. Margaret's Bay, I shall commence with the pollack. These fish—the full grown ones—strike into the Bay in June, and leave about the last of November. The young ones come much earlier. Their food is the same as that of the cod, but the most taking bait is something white and shining, such as a strip cut from the belly of the herring or mackerel. In the summer months they delight in the rough shoal water off the points or promontories where different currents meet. In such places a dexterous angler with strong salmon-gear and a whitish fly, may in the month of July kill many more fish in a given time, and enjoy very nearly as good sport, as among the salmon in our best streams. There is one of these “pollack-rips”—as they are called—within a mile of my residence, and in passing in my boat I often rest on my oars or lay-to to watch the gambols of those lively fish, as on all sides they leap out of water in pursuit of their insect prey. In rowing down through a narrow channel between Dover and Blind

Bay, on one occasion, I saw a middle-sized pollack chasing a whiting whose air-bladder was filled and could not be discharged, so that the poor fish—(as is often the case with this species in the month of September)—was obliged to skim along the surface with its head partially out of water. It made wonderful progress, however, in its endeavours to escape from its would-be murderer, but all in vain, for despite the shouting of my little boys who sympathised with the weaker party, the pollack at length made a vigorous jump at the fugitive, and all was over.

In all the coves and harbours around the lower parts of this Bay, where much garbage is thrown into the water, large numbers of young pollack are always to be found throughout the fishing season, varying from one to three or four pounds in weight. They are very voracious,—always ready for the bait thrown to them by the boys, and not at all squeamish at the sight of hook or line. Numbers of them are caught by the children and boiled for the pigs. These small pollack are famous scavengers, and with the help of the sea-fleas (a minute kind of shrimp) rid the coves of much offensive matter which would otherwise prove detrimental to the health of the fishermen. He who “openeth His hand and filleth all things living with plenteousness” is, as of old, careful that nothing be lost, providing at once for the health and sustenance of all His creatures.

There are “logy” fish among pollack, but as they are always full-grown and show no signs of organic disease, it may be presumed that old age is the cause of their sluggishness.

Pollack are caught here for the West India market, but—although very palatable when fresh and properly cooked—they are, like the spotted codling and haddock, very little used as food by our people. The mode of curing them adopted here is the same as that for cod, haddock, &c. They spawn in this Bay in October. The liver of the pollack is large and fat.

The lordly halibut next claims our attention, though he can scarcely be said any longer to belong to this Bay. Within the memory of our oldest fishermen, halibut were caught on the “gravelly ground” off the settlement of “sandy beaches,” now called Bayswater,—as also off Peggy's Cove,—but for many years they have been but very rarely taken anywhere near the

mouth of the Bay. The "bank," thirty miles broad off Aspogogan, is now the ground where our people seek the halibut. Here—on clear, sandy bottom, in deep water, he lives and fattens by minding his own business and avoiding society; for except when the company of his species is a necessity, he is by no means gregarious in his habits. He feeds as well by night as by day, and haddock is his favourite food when he can get it. His interested friend, the fisherman, having discovered his weakness on this point, suspends the coveted tit-bit as near the bottom as possible, for like all flat fishes the halibut seeks the lowest levels.

There are logies among halibut, both old and young, but these are mostly wounded fish. The liver in this, as in all other sick fishes, shrinks and turns of a dark colour.

Halibut nine feet in length have been taken by our fishermen.

Whiting come into the Bay about the first of September, and are then in fine condition. Last year they were more plentiful than for a long time before, and came into the Bay in June. They are not very plenty here, and are becoming more scarce. No special endeavour is made to catch them, as our people have a prejudice against them, fancying them unfit for food. They mesh in the mackerel and herring nets,—sometimes as many as a dozen in a net. Mr. James S. Kizer caught one with a hook, when fishing for cod, as have also several others. As they are frequently cast back into the water when taken half-strangled out of the nets, this may account for the numbers of them which are seen skimming along on the top of the water, unable to descend to more agreeable depths.

As my design is to give our edible fishes the first place, I must now pass by a large class of interesting fishes of a larger size, and take up the king of our barrel-fish.

THE MACKEREL. This fish is caught, more or less, in all the harbours and coves in and around the Bay,—*i. e.*, when it is caught at all, for of late years mackerel fishing here has proved very disastrous to all connected with it. In days gone by, fortunes were rapidly made by the seining of these fish, and our people, especially those of French descent, can scarcely be persuaded to enter upon the more slow but sure net and line fisheries. Various reasons are alleged for the very irregular

and scanty visits of the mackerel to these, their old haunts. One is the practice of catching them with the hook until late in the autumn in the Gulf of St. Lawrence. There thousands of barrels of choice bait are daily thrown to the expectant schools of mackerel by the many crews of American and other fishermen, and thus like flocks or herds of shore animals, the immense schools of these fish are detained by choice and plentiful fare until very far beyond the old time in autumn, when their custom was to leave the Gulf of St. Lawrence and trim along these shores on their western course. When they do come now, their arrival is so late, that the frequent storms of autumn, in many cases, prevent the seining of them at the outer and more favourable stations. In support of this theory our fishermen affirm that in the year 1856, when H. M. S. *Styx* prevented the Americans from fishing in the Gulf of St. Lawrence, the mackerel ran out of the strait of Canseau and along these shores at their old season, a much earlier period than usual, trimmed the shores much closer, and were caught in far larger quantities and of a better quality than common, all owing to the earlier and therefore calmer season at which their visit to this Bay occurred. At all events, I am credibly informed that in that autumn mackerel were taken here with their mouths torn by the hook before the *Styx* interfered with their would-be captors.

The first run of mackerel strike in here about the 15th of May, and in one night will strike the shore for over a hundred miles in extent, where not one was seen the day before. From this fact some of our fishermen infer, that this first run comes in directly from sea, and not coast-wise from the westward. After striking the shore, they run eastwardly in immense schools, and for several days in calm weather the whole surface of the ocean outside of the mouth of the Bay, as far as the eye can reach, is blue with the "break" of them, running with the mouth open and partially out of water, in pursuit of "britt," a semi-transparent fish, about an inch long, with eyes very large in proportion to the size of its body, and thence called "eye-bait" by most of our fishermen. At this season those britt swim along the surface of the water. This first run of mackerel, which are No. 3's,

has of late years never struck in very plentifully, and in the needy time of spring, when with their winter stores spent, our fishermen with hungry eyes watch these swarming millions sweeping past their shores, I have often stood on the cliffs at Peggy's Cove and Dover and thought that some sort of net, with widely stretched arms and a net-work floor, might be moored off by our people in calm weather. Into this the fish might unwarily enter, like the wild animals of Africa, into a gradually contracting enclosure, where a dexterous manœuvre on the part of the watchers suddenly shuts them in. In consequence of running open-mouthed at this season, the fish will not mesh in a net.

The second run of mackerel strike in about the middle of June or first of July, still running eastwardly. They are No. 3's, and trim the shore when the wind is southerly. June and July are their spawning months, and it is not unlikely that their old spawning grounds are the smooth bottoms along these shores, whence, like the herring, they may have been driven by the sweeping of the seines. But as the wanderings of fish are largely influenced by the movements of food, and as the food of one sort seek for an entirely different food for themselves, it may be discovered that causes little suspected may in a remote but sure way influence the run of our sea fish. It may eventually appear that it is not the salmon, the cod, the hake, the haddock and the pollack alone that are suffering diminution, or are kept from their old haunts by the damming of our streams. It is not, in the end, profitable to disturb the arrangements of a beneficent and all-wise Providence.

The third run of mackerel takes place about the first of August. These have no spawn in them and are running westwardly. It is the opinion of many that these are not returning from the Gulf of St. Lawrence but from sea, and it may be that a portion of the immense schools passing eastwardly in spring strikes off to some favourite bank outside, to deposit the spawn. Or there may be a sort that never go as far east or west as the others, but winter along our shores, for mackerel have been brought up from the muddy bottoms of some of our outer coves by persons spearing for eels through holes in the ice. Or again,

as there are exceptions to all rules, and as there are many individuals among migratory birds which separate from the main flocks and remain here for the winter, so it may be with their cousins* the fishes. There is yet much to be learned by careful observation,—and a record of apparently trifling circumstances, such as is often found in the transactions of Natural History Societies, may in the end lead to discoveries of great value to commerce.

Many mackerel in August are found to have a strong coppery taste, and to produce symptoms of poisoning in those who eat them. Our fishermen attempt to account for this by the supposition, that somewhere off at sea the fish have been feeding on the sides of submarine hills containing copper ore. This reminds me of an anecdote in the *London Guardian* of January 17, 1866. "In the aquarium of the Liverpool Museum are several live soles. The bottom is covered with an abundance of the pretty little variously coloured pebbles found in the Isle of Wight, the forms and parti-colours of which those soles have so completely adopted, that when one is lying quite flat and still upon the surface, it is with the utmost difficulty the mere looker-on can distinguish the back of the creature from the strata on which he is reposing. He is, in fact, spotted all over with the colour and form of the pebbles." So far the *Guardian*. Cod and many other fish are also well known to be dark, light, or parti-coloured according to the deep, shoal, or rock and sand bottom to which they resort. It is not, therefore, altogether improbable that either from their situation or their food, mackerel at times obtain this peculiar coppery taste. They are at any time unwholesome for pigs if eaten raw, and in this they differ from the common sort of fish. Fishermen attribute this unwholesome quality when eaten raw to the blood of the fish.

The third run of mackerel are mostly No. 2 fat, with some No. 1's among them. They trim close to the shore when the wind is north-west or north, and sometimes run up as far as Mill Cove, thence running out along the west side of the Bay.

About the first of October the large, fat No. 1 mackerel begin to arrive, heading westwardly, coming from the Gulf of

* Gen. i. 20.

St. Lawrence. The first arrivals are generally but small detachments of the main body, which passes along from the first to the last of November. As the mode of capturing these fish is vividly described by Dr. Gilpin in the last year's Transactions of this Society, I need not dwell upon this part of the subject further than to remark, that attempts are very seldom made here to catch mackerel with the hook. When this system is tried it is only with No. 3 fish in June and July. The best bait is a piece of the belly of the mackerel, for these fish are terrible cannibals, and will in a moment tear to pieces and devour an unfortunate wounded companion. When in a seine for any length of time, all that mesh are eaten by the rest. Here also another peculiarity is observed. During and immediately after a heavy shower—unless frightened by thunder—the mackerel in a seine will rise to the surface to drink and bask in the fresh water, which, of course, for a little time, remains on top. For the same reason these fish sometimes “show” or break water better in rainy than in fine weather.

It is also observed by our fishermen, that in time of drought in the early part of the summer, mackerel trim the shore better than in a rainy season, and from this they infer that they are seeking the fresh water of the brooks and rivers.

The food of these fish is sea-fleas, young herring and alewives, britt, or eye-bait, &c. As young alewives are a favourite bait for them, the damming of our rivers, by which the propagation of these fishes is prevented, is no doubt one cause of the scarcity of mackerel in our bays of late years.

The possibility of making large hauls and speedy gains invests mackerel fishing with a charm, which like an ignis-fatuus leads many a fisherman to his ruin. Many have already left the Bay, deprived of house and home by their creditors; but others remain, encouraged by an occasional instance of great success, like that which a few years ago befel one of my parishioners. Year after year had this man been sinking deeper and deeper in debt, until one autumn his merchant in Halifax, wearied out, refused to credit him with winter supplies for his family. Bursting into tears, the poor man turned homewards to meet his needy and helpless wife and children, but on his

way called at Dover to superintend the storing of his fishing-gear for the winter. Casting his desponding eyes over the Cove in front of his stage, he was delighted to see a large school of mackerel entering the passage. An eager crew sprang into the seine-boat, and in a few minutes our poor fisherman found himself the owner of eight thousand dollars worth of prime No. 1's. In a few days he presented himself again to his merchant, again craved supplies, was again refused, and then suddenly changing his tone demanded his bill, paid the astonished merchant in full, and ordered and paid for a plentiful supply for the winter. One of the prettiest cottages in the parish is pretty much all that remains to him now of that famous haul, succeeded as it has been by many years of failure.

A very considerable proportion of the catch of mackerel is annually lost to the Province, by the very careless method of curing and packing too frequently followed on our shores. In the first place they are often left too long exposed to the sun and the air, before salting, and for this cause many barrels of Nova Scotia mackerel are every year condemned in foreign markets. Another evil is the insufficiency of the barrels used by too many fishermen. Two hundred pounds of No. 1. fish, worth from \$12 to \$15, and sometimes even \$20, are too often packed into a barrel costing twenty-five or thirty cents, made of knotty and unseasoned stuff, and therefore dear even at that price. These barrels bear no rough handling, soon shrink and lose the pickle, the contents are spoiled, and the character of our fish is depreciated in comparison with those of other countries.

But time urges me on, and I must close with a few notes on the Herring.

Of these there are several varieties. The first run in the spring after the fishing commences, are called the "Bank herring." They are large and fat, and occasionally come in shore, but are generally caught on the banks and shoals off the coast, about the first of May. These are thought by some of our fishermen to be the sort called Labrador herring, as they come in large bodies from the westward, and are always at this season heading eastwardly, as if returning to their north-eastern home. They are full of "britt" or "eye-bait," and when the

wind sets in southerly, and drives these little bait-fish towards the shore, the herring always follow them. Several years sometimes pass by without a visit shorewards from these bank herring, but they are sometimes plenty, as many as twenty barrels being taken in a single night by a "fleet of nets,"—*i. e.*, two nets fastened together, and making a total length of forty fathoms, with a depth of one hundred and fifty meshes. The north wind causes these fish to seek bottom, and move off the coast. When shrimp are driven on shore by the winds and currents, these herring strike in in large schools. The tide and currents exercise a stronger influence over the shrimp bait than the wind. About the latter part of May, immense quantities of shrimps are sometimes driven ashore in our outer coves.

The next run comes in July, and consists of what are called "shore herring." They are of smaller size than the "bank herring," and are fat. This run heads westwardly. They trim the shore, and a west wind is the most favourable for their visits. In calm weather they generally keep to bottom, depositing their spawn on the smooth sand, but when the weather is rough, they run nearer the surface. By the first or middle of September, their spawning season is over, and the fish are poor. Scattering fish are found all through the year, with spawn in them. In November, about the last of the month, they leave the Bay for a time, but revisit it during the winter. Considerable numbers are taken in nets during winter, in coves with muddy bottoms. In the latter part of January, and throughout February of this year, herring were observed schooling in the bay, and grampuses in considerable numbers, gave sure evidence of the presence of their favourite food.

But in summer the dog-fish appears to be the principal disturber of the herring's designs. These voracious creatures are very gregarious, and are mostly found in a well-arranged host, either inside or outside of the school of herring. Fishermen say that the north wind is poison to a dog-fish. If, therefore, the dog-fish are between the herring and the shore, the north wind will cause both hosts to leave for deep water. And so, on the other hand, if the dog-fish be outside of their prey, a southerly wind will bring both in shore.

It will be unnecessary for me to say anything on the relative modes of dressing the herring, as practiced here where they are frequently spoiled, and in Holland, where the very superior mode of treatment gives them a delicious flavour. This has been fully explained by T. F. Knight, Esq., in his valuable pamphlet. One remark, however, I may venture with reference to the barrels in which our Nova Scotia herrings are too frequently packed. They are not only defective in material, but faulty in size, for many of them are too large, so that the fish working loose, become softened and spoil in long voyages to warm climates.

A good system of inspection of both fish and packages, is a great desideratum in this Province. A Chief Inspector, thoroughly competent to teach our fishermen the best and most improved systems of catching and curing fish, would prove a very valuable officer, if possessed of zeal and tact. His salary should be paid out of the public revenue, and not by the fishermen, who would also be expected to pay the deputy inspectors. I am very glad to see that Mr. Knight's pamphlet strongly recommends the encouragement of Fishing Societies by the Government, in the same way as Agricultural Societies, and for similar ends, viz.: the improvement of implements and modes of labour. By such wise and generous means as these shall a great branch of industry be fostered, which shall not only add vastly to the material wealth and naval importance of this country, but will impart a tinge of manliness, hardihood, and enterprise, which will ennoble its national character for all time.

ART. IX. THE GEOLOGY OF GAY'S RIVER GOLD FIELD.
BY REV. D. HONEYMAN, D. C. L., F. G. S.

(Read Dec. 3, 1866.)

THIS peculiarly interesting Gold Field is situate on either side of the old Gay's river road, and about four miles from Gay's river and Stewiacke river, or intermediate between those two rivers. Approaching it from the west, my attention was first specially attracted by an outcrop of lower carboniferous limestone, containing the fossils characteristic of this horizon. This occurs on the roadside. Advancing, I observed argillite strata