

# TRANSACTIONS

OF THE

## Nova-Scotian Institute of Natural Science.

ART. 1. ON THE FOOD FISHES OF NOVA SCOTIA. BY J  
BERNARD GILPIN, A.B., M.D., M.R.C.S.

No. III.

(Read November 6th, 1865.)

### THE MACKEREL.

SCOMBER—SCOMBER—(*Gunther, Catalogue B. Museum.*)

SCOMBER—VERNALIS—(*Dekay, Storer.*)

SCOMBER—GREX—(*Mitchell.*)

Dr. Gunther, from actual comparison of English and American specimens, considers them identical. The American authorities consider them different. Dr. Gill, Smithsonian Institute, 1865, gives as typical "finlets, 5—6." This is not true as regards any Scomber I have identified in Nova Scotia as *Vernalis* or *Grex*, and must refer to some southern species.

IN my two former papers, I have endeavoured to give to the Society all the facts I could collect, relating to the common Herring and to the Gaspereaux, and their habits. I shall this evening, still following up the subject, read a paper upon the Mackerel. Thus in time we shall have the natural history of all what I may term the Food Fish of Nova Scotia. A true knowledge of the nature, habits, food, spawning time, and localities of our fish, has been a long *desideratum* in our Province, as the success of our fisheries must be based upon it.

The description of a fresh Mackerel, bought in the Halifax fish market on the 27th October, 1865, is as follows:—

Length 17 inches; girth in front first dorsal  $7\frac{1}{2}$  inches, head one-fourth of body to root of tail, diameter of eye five-eighths of an inch, about two diameters from tip of nose. As the fish lies dead, a membrane from the posterior part of the orbit half closes the eye. The lines of the opercle and preopercle are nearly at right angles with the line of body—the margins of sub and interopercle like a V, with its apex pointing for-



ward, the gill rays are entirely covered by the lower edge of the opercle, and the upper labials concealed within the jaw. Very minute teeth upon upper and lower labials, and in this specimen on palatine arch, though wanting in others.

The shape of the fish is long for its breadth, and very round, tapering gradually to the root of a very small deeply cleft tail. Two dorsal fins, the rays of the first hard, and five finlets, adorn the back. The pectoral fins commencing one-third of an inch from opercle, and ventral opposite posterior edge of pectoral, anal opposite anterior insertion of second dorsal, with sharp ray or prick in front, and fine finlets below. Two fleshy keel-like processes nearly parallel, are on either side of the root of the tail. Both caudal and all the fins are very small for the size of the body. Colour—top of head and ridge along the back, dark blue; sides, to an inch below the lateral line, when just from the water a deep green with about 27 to 30 deep blue horizontal zig-zag bars or stripes from opercles to tail; a little below the lateral line a number of indefinite dark spots or lines, extending from pectoral fin nearly to tail, below yellowish white, with opalescent reflections; tips of both jaws black, tongue and inside mouth black, cheeks green above, yellowish white below, with pink and opal reflections, and covered with numerous purple spots; sides silvery; fins, dorsals and finlets dusky, rays showing black; caudal greenish dusky, base and tips dark; pectoral dusky, base dark; ventral tips dusky with reddish tinge; anal white with a reddish tinge; and finlets below white. These colours are very fleeting, the green turning to blue on the sides very soon; scales very minute, gill-ray 5, D. 11, 2nd 11, P. 17 or 18, V. 7, A. 10 or 11, C. not counted; finlets V. above and below.\*

In studying this fish we have a very large round body, a thin and compressed head, labials and gill-rays compressed and covered, and we are impressed with a certain inflexibility or stiffness in him. He is evidently formed to give little opposition in passing through the water, but the propelling power, the tail and fins, is very small. It is doubtful if the sharp anterior dorsal is not used for defence, as unless excited the fish usually carries it flat. He cannot be called a swift fish. Like all gregarious fish which feed in large numbers, the food must be ready spread in quantities for their use. Thus no individual instinct is called out in each fish to pursue or capture its prey. Moving in large masses also, the whole must blindly follow a few leaders. We are not disappointed then if we find our fish low in the order of intelligence, if we find in his pouty and greedy mouth a certain resemblance to the batrachians or frogs. His asserted torpidity during winter, and blindness, both which conditions

\*A very rare variety is found perhaps two or three times during the season at Halifax. These have the zig-zag bars one-half the size and double the number. In some the bars are reduced down almost to lines and spots, and resemble a figured variety in Couch's British Fishes, 1865.



happen to the batrachians, favour these views, though I do not think we have yet sufficient proof to assert them as facts.

The membrane half covering the eye is asserted by the fishermen in early spring to cover the whole eye, hence perhaps the story of his blindness. His small and numerous fins, according to the Agassian theory, inasmuch as he resembles the embryo of all fishes, which have the fins in one narrow continued band from head to tail, also prove him low in the scale of intelligence.

He appears on our coast in early spring, according to Martin Harrigan, Halifax fish market, about May 15; they are then very thin and lean, and are going eastward, the fishermen observing them passing the harbour. The great body are supposed to spawn somewhere to the eastward, but they are never seen like herring during the operation. It is probable they spawn all along our coast, but in deep soundings. During July another run make their appearance, and these the fishermen say are some who have not joined the great spawning schools. About the middle of September they again appear, coming westward; their spawning now over, they rapidly become fat and recruited and remain till the middle of November, when they disappear. Thus from the middle of May to the middle of November they are upon the surface. For the remainder of the year they are hid from us.

Our coast trending north-east and south-west, the terms eastward and westward, must be taken as meaning north and south. Thus the spring opens earlier to the westward, the season is advanced, and the rivers westward are open and free from ice before the eastern. Salmon, herring and gaspereaux make their appearance in the Bay of Fundy—at Annapolis first, then at Yarmouth, Gold River, Chester, and are taken earlier at Halifax than at Cape Breton and Canseau. It would seem that as the sun leaves his winter quarters and low circle on the southern horizon and commences to form his great northern round, he is followed north by the great marine armies surrounding our coast, which ascend to the surface to luxuriate in the calm and warming waters, and to approach our shores. Of the cod family alone we know the winter quarters. All winter long they are taken 10 to 15 miles seaward in about 80 fathoms sounding. Of the rest, with the exception of the herring, which winter in the deep land-locked bays of Newfoundland, and



sometimes make unaccountable winter migrations, we know little. The mackerel are no exception to this rule; whilst on the surface they are very susceptible to stormy weather; a rough November sending them off, whilst they linger on the surface during the whole of a mild Indian summer till December.

Although our fishermen maintain that they perform biannual migrations east and west, that they set their nets facing the west in spring and facing east in fall, that they watch them passing from head point to head point, and doubtless those seen at rare intervals on the Labrador must have migrated there, yet I still think these migrations are but very partial, and that the great body of our mackerel retire to deep soundings, as it were, on our coasts, perhaps to bury themselves in the mud and ooze, in a semi torpid condition. Our fishermen affirm that their stomachs are found empty, very late in November, and the fatter the fish the emptier the stomach, as if they were preparing for hybernation, as our bears and marmots do under very different circumstances. The stomach of the mackerel from which I made my description for this paper, 27th October, was filled with about a table-spoonful of green pul-taceous matter in which was a fish scale. But the later in the year the fatter the fish; no No. 1's are ever branded in spring or early fall. Thus they disappear in November very fat, and re-appear very lean in May. I am still of the opinion that our fishermen's views are in the main correct, and would again bear testimony to their accuracy. When we consider the immense quantities of food consumed by the large schools around our shores, we must at once perceive that a perpetual migration is necessary. They must continually seek new hunting ground. The various tides, currents and eddies, along our coast, must incessantly influence their motions, since these currents sweep down acres and acres of surface food for them; therefore we are prepared to hear of their appearing at uncertain intervals, of their leaving a coast for years, and then returning unexpectedly to it. There is no doubt that by patient observation of all the facts passing around us, and by comparing them with meteorological tables of past years, one might come to predict a good or bad fishing season, but that we could ever control one, would be beyond our highest expectations. For the two last seasons the catch has been very abundant on our coast. For



several seasons before it was very deficient. One reason advanced with some plausibility is, that they range about the mouths of our rivers to feed upon the young gaspereaux, just emerging into their salt water life, and as the dams and obstructions of our rivers are daily cutting them off their spawning grounds, this supply is rapidly diminishing, and therefore they are rapidly leaving us. But we are met with the fact that there are more mackerel than gaspereaux, that the supply is too limited. There is a small crustacean that covers the beaches in wickets, like a shrimp, in July and August. These the fishermen call mackerel bait, and by their quantity or scarcity predict a good or a bad season. One cannot but think the myriads of medusæ which fill our autumnal waters, must serve as food for them. Of their voracity and willingness to take artificial baits, the common saying, "a mackerel will bite at a red rag," is a strong but a true expression; but as this invariably leads us to a history of the mackerel fisheries, we will sum up in a few words our present knowledge of this fish. He appears in May lean and with spawn, and is seen passing eastward, and northward; some few remain passing up and down our shores; he reappears again from the north and eastward, (having spawned in deep soundings,) in September, very lean, rapidly recruits, and disappears during November very fat, to reappear lean again in early spring; that he is uncertain in the place of appearing, and that we need some exact practical facts as regards his food. Mr. Thomas Brackett, Halifax fish market, assured me that he had opened many mackerel this day, November 1st, 1865, and the stomachs of all were empty. He states that he often finds small fish in them earlier in the season.

This valuable fish, though low in the scale of organized beings, is much prized as an article of food, and is deservedly considered our most valuable export. His capture forms the most exciting work of all the wet, toil, and hardships our fishermen endure. There is chance in it—luck as they would express it. By one dexterous cast of net, he may make more than a month's work at the hook and line. Set nets, that is, nets about 30 fathoms long, and 4 deep, are stretched by their head lines between two buoys at the mouth of some inlet, and facing westward, about the middle of May. Many are thus taken. In early spring they are lean and filled with



spawn, but are readily sold in the fish market, or make good No. 2's, or second quality pickled fish.

It is very obvious that no creature should be harrassed during the spawning period, and one would at once say there should be a closed period during the spring for mackerel fishing, and that this is the principal reason for the decline of the fishery. Making rash laws, however, are to be deprecated, and our Legislature should first gain an intimate knowledge of the subject of sea and river fisheries, with all its bearings of food, of habits, migrations of fish, their mutual relations upon each other, and on the currents and tides that sweep our coasts, before they legislate away the summer living of men, often too poor to wait the fall supply.

Extricating himself from the nets and toils strewing his path eastward and westward for many a mile, but leaving many a poor fellow behind, branded prime No. 1, our fish now leaves our coasts, disappearing eastward. By the middle of September, especially if the nights are calm and warm, he comes to us again. Now is the grand sea harvest. The fishermen, those hardy reapers of the sea, are in picturesque groups on every headland or far jutting out point, with practised eye scanning the waters for the wake of the coming school. Inside of a deep bay they have their seine set, (a seine being 10 nets or 100 fathoms of head line, and 9 fathoms deep.) With one end attached to the shore it runs off at right angles, about 30 fathoms, where it is fastened to a buoy, it then makes an angle or L of about 30 more fathoms length, the foot ropes lying upon the bottom. At the end of the L a boat lies with the remainder of the seine, all ready to throw out. The look-out man now gives the word. The school is coming. With their eyes and heads just peeping out of water, their stiff inflexible bodies at an angle of 45, and a long train or wake curling back in the smooth water, there come a thousand greedy mouths and glittering eyes, slowly peering about for food, and following the indentations of the shore. Noiselessly and breathlessly the reapers of this sea corn do their work, for so wary is the fish, that a glint of light, a clap of the hand, or the swash of a rope overboard, or even the thud of an oar falling upon the boat, and the whole school is gone, to break water again far to seaward, and perhaps the \$500,



so nearly bagged, goes with them. In profound silence they watch their prey till it runs quite up far within the bight or elbow of the seine. And then a few rapid strokes of the oars, and as many dexterous tosses of the remaining nets as the boat is rowed to land, and they have secured their prey. This is technically called making a stop. For 36 hours the fish swim in frantic circles, breaking the water every where, they then apparently sulk down to the bottom, and never come up again. These stops are made all around us, and within sight of our crowded streets. Our beautiful Basin is often alive with them, and then in addition, a smart schooner, the floating home of the fishermen now far from the rock hung cottages, adds her tall masts, spread alow and aloft with drying nets, to the pretty confusion of glittering fish, dotted head floats, smart whalers and busy men around.

So close do land and water, the dusty traveller, and the dripping fisher meet in these sweet spots, that I once saw a stop made on the very verge of the rail, and the puffing engine making a back ground to the group, as glittering fish were tossed up and shining dollars cast down, and the farmer returning with the price of the harvest he had watched and toiled over many a weary hour, or of the stock he had fed and folded through many a winter day, was exchanging it with the hardy sea farmer who ploughs no furrows but with his keel, who gives of herds he has never fed, and of harvests that nature has sown broad cast on a thousand rolling hills for him to garner with boat hock and sweep net, rather than reaping knife or bullock-wain.

These stops are made on many parts of our seaboard, in St. Mary's Bay, and Digby Basin, where fish weirs are substituted for nets, and all along the Atlantic coast, and find their way to Halifax markets in lots varying from ten barrels to one or two hundred. As they are included with the deep sea mackerel returns, it is impossible to ascertain the exact number of barrels taken annually by shore fishing; but the whole amount of both shore and sea mackerel fisheries for the year 1865, was somewhat above \$1,000,000.