

were very numerous in the tubes, when subjected to pressure disappeared, others moved about as soon as taken from the apparatus.

It appears, therefore, that under the conditions which I produced, the effects of high pressure vary not only between the different species but also between the individuals of the same species. It seems, moreover, that it makes a great difference whether the pressure or stoppage of pressure is more or less rapid. It is therefore not impossible that with a stronger pressure continued for a long time no surface organisms would survive, but that they would all indiscriminately die. This should be proved by experiments.

I cannot pass in silence the effect of high pressure on the carbuncled, charred "bacterid." With Dr. Roux we subjected carbonaceous blood to a pressure of 600 atmospheres for a period of twenty-four hours. This blood retained all its virulence, and experiments made with it proved entirely successful.

It will be seen that in none of these experiments had I touched the problem of fermentation or putrefaction. The experiments made by Dr. Regnard with yeast seem to agree with what is already known regarding the sleep of the mycodermic cells which are found in sparkling and sugared wines. At a certain given moment these cells no longer decompose sugar, either because they have become subjected to the paralyzing action of carbonic acid, or because their food gave out, or, finally, because—as Dr. Regnard's experience also seems to prove—the pressure produced by the tension of gas hinders the fermentation. But it may also be asked whether other ferments, especially those possessing much body from great depths, do not obey other laws. This is the problem which at the present time engages my attention, and which I am endeavoring to solve.

211.—ON THE SCARCITY OF MACKEREL IN THE GULF OF SAINT LAWRENCE.

By Capt. J. W. COLLINS.

The results which have been obtained in the mackerel fishery of the Gulf of Saint Lawrence by American vessels during the present season, are clearly and forcibly set forth in the following notes and sworn statements of captains, for which I am indebted to Capt. Fitz J. Babson, collector of customs at Gloucester. These facts, which may well supplement those already submitted concerning the same subject, demonstrate in the strongest possible manner that so far from deriving any benefit from a participation in the fisheries of the Gulf, the vessels of New England have suffered a severe pecuniary loss by leaving our own waters. It is worthy of notice that of the reports obtained from ten vessels *three came out of the Gulf without a single barrel of mackerel*, and of the catch made by the other seven schooners, *only 50 barrels*

of fish were taken within the three-mile limit. It is also noteworthy that the captains who have submitted and sworn to these statements are known to be experts in the mackerel fishery, their vessels are among the finest of the New England fishing fleet, they carried large and experienced crews, and in every instance when they did not come directly home from the Gulf, they succeeded in catching large fares of mackerel in a few days off our own shores. The vessels all belong to the Gloucester fleet.

Taken in their chronological order, we have first a statement from Capt. Stephen B. Cole, master of schooner *Delia E. Norwood* (74 tons, 16 men in crew), who arrived from the bay of Saint Lawrence * July 19, having been cruising for three weeks in the Gulf without catching any mackerel.

"We were in all parts of the bay, and did not at any time see any mackerel. In coming from the bay and while on the coast of Maine, we took 374 barrels of mackerel, [worth] about \$1,500. I consider that we lost by going into the bay \$3,000 at least."

Capt. William W. King, master of schooner *John S. Bray* (79 tons, 16 men), who arrived in Gloucester, July 27, from a six weeks' trip to the Gulf of Saint Lawrence caught only 15 barrels of mackerel in the gulf, none of which were taken inside the three-mile limit. The following, dated Gloucester, July 30, 1884, is the statement of Captain King:

"When I first went into the bay [Gulf of Saint Lawrence], I went to East Point, Prince Edward Island, where there were about 17 American vessels; never got a mackerel or saw one. From there went to North Cape [P. E. I.] with the fleet [but] got nothing there; then to West Cape, Prince Edward Island; got nothing there; came back to Malpec; went down the "bend" of the island; from there to Margaree [Island], Cape Breton shore; got nothing; went to Cape George Bay; went to North Cape [P. E. I.] again; from there to Escuminac; got nothing this time; came back to Cascumpee and got 15 barrels [of mackerel]. One vessel, the *Isaac Patch*, took 35 barrels [of mackerel], which were all that were taken to my knowledge. We were [purse] seining; did not see a vessel looking or hand-lining for mackerel while in the bay. Saw no large bodies of mackerel anywhere. Saw a few mackerel in schools containing from one to five or six barrels. Coming back, off our own shores, saw large bodies of mackerel, and took 250 barrels between Mount Desert and Seal Island.

"It is my judgment, based on an experience of ten years' successive fishing, that the mackerel off our own shores are always moving in large bodies, and are available for seining, but when they go into the Gulf of Saint Lawrence they break up and scatter for food, and in this condition are not available for seining.

* The Gulf of Saint Lawrence is almost always spoken of by the fishermen as "The Bay," or the "Bay of Chaleur," sometimes as the "North Bay," and more rarely by the name of Gulf.

"When the hand-line or hooking process was the only means used for taking mackerel there were five or six hundred vessels in the Gulf in one fleet, and by the large amount of bait thrown by them the mackerel were brought together in large quantities. But under our present means [system] of taking, viz., seining, no bait is used, and consequently the gulf mackerel fishing is worthless and useless to the American fisherman.

"WILLIAM W. KING."

Capt. George H. Martin, master of the schooner Ethel Maud (77 tons, 16 men), of Gloucester, arrived home July 30 from the Gulf of Saint Lawrence, where he spent a week without having taken any mackerel at all. Captain Martin made the following statement:

"I, George H. Martin, master of the schooner Ethel Maud, of Gloucester, do hereby say on oath that I have just returned home from a mackerel trip to the Gulf of Saint Lawrence; that I was unable to procure a single barrel of mackerel in the bay, but on my way home I secured a full trip off Mount Desert. I gave the gulf a full trial for the taking of mackerel, and from my own personal observation, and from all that I could ascertain, I do not consider the fishery of any value whatever to our people."—GEORGE H. MARTIN.

"Sworn and subscribed before me this 30th day of July, 1884."—F. J. BABSON, collector.

Capt. George McLain, master of the schooner Henry Dennis (91 tons, 16 men), arrived at Gloucester, July 30, from a six weeks' cruise in the Gulf of Saint Lawrence. He brought home 138 barrels of mackerel, of which none were taken inside the three-mile limit. Captain McLain says, "I do not consider the gulf fishery of any value whatever to our people."

Capt. William P. Gray, master of the schooner Commodore Foote (61 tons, 16 men in crew), who arrived July 30 from a trip to the Gulf of Saint Lawrence, makes the following statements:

"I, William P. Gray, master of the schooner Commodore Foote, of Gloucester, do hereby on oath depose and say that I went from Gloucester on a mackerel trip bound for the Gulf of Saint Lawrence; that I took 180 barrels of mackerel 15 miles off Cape Sable, which I landed at Halifax, Nova Scotia, and sent home; thence I proceeded into the Gulf of Saint Lawrence, where I passed six weeks; that I went all over the bay, giving it a complete trial for the taking of mackerel, and only succeeded in taking 30 barrels of mackerel. I consider that I am \$3,000 stock out by going into the bay for mackerel, and I do not regard the gulf fisheries of any value whatever for this season. On the contrary they have proved a big outset."—WILLIAM P. GRAY.

"Sworn and subscribed before me this 30th day of July, 1884."—F. J. BABSON, collector.

Capt. Merrill B. King, master of schooner M. S. Ayer (76 tons, 16 men in crew), arrived at Gloucester July 30 from a cruise in the Gulf of Saint Lawrence, where he spent four and one-half weeks seeking for mackerel, but without taking a single barrel. Captain King makes the following statement:

"Coming home, off Mount Desert, Maine, took 370 barrels of mackerel. The going to the Gulf of Saint Lawrence was a great damage to me, my loss of time and failure to take any mackerel making a loss of \$3,500."

Capt. Joseph I. Tupper, master of the schooner Jennie Seaverns (107 tons, 16 men), arrived in Gloucester August 15, from the Gulf of Saint Lawrence. He caught only 55 barrels of mackerel during the eight weeks spent in the gulf, none of which were taken inside the three mile limit. Capt. Tupper says:

"On returning from the bay, and on the coast of Maine, we caught 400 barrels of mackerel in six days; value of which is \$1,800. I regard the pecuniary damage to me by reason of going to the bay at \$4,000."

The schooner Landseer (94 tons, 16 men in crew), Capt. James McDonald, arrived in Gloucester August 21, having spent two months in the Gulf of Saint Lawrence, during which time 105 barrels of mackerel were caught, 50 barrels being taken within the three-mile limit. The value of these fish caught within 3 miles of the shore, exclusive of the cost of barrels, salt, packing, and inspection, was \$250. Captain McDonald tersely sums up the results of his trip to the gulf in the following sentence:

"I regard my loss by reason of going into the bay at \$2,000."

Capt. James L. Anderson, master of the schooner William H. Jordan (86 tons, 18 men), who arrived in Gloucester August 20, stated that he spent four weeks in the bay, but caught only 30 barrels of mackerel. On his way home he took 300 barrels of mackerel in ten days' fishing off the coast of Maine. He owns another vessel, which remained on this coast, and he says of her:

"My other vessel caught 1,030 barrels of mackerel while I was in the bay."

Capt. John P. Aiken, master of schooner Bartie Pierce (90 tons, 17 men), returned to Gloucester August 25, from a five weeks' trip to the Gulf of Saint Lawrence, where she took only 20 barrels of mackerel.

When it is understood that statements similar to those given above might be multiplied by taking the testimony of almost every fisherman that has been engaged this year in the mackerel fishery of the Saint Lawrence, it will be easy to comprehend the fact that while the method of taking mackerel with purse seines remains in vogue, we can count on deriving little or no benefit from a participation in the in-shore fisheries of the British provinces.

GLoucester, MASS., *September 9, 1884.*