

of the Southern States, vol. i, is an account of its occurrence in remarkable numbers in the Southern States in 1834.

It is an interesting fact concerning this insect that it also occurs in the Eastern and Middle States, but that in these States we rarely hear of its injuries to man or to domestic animals.

Carbolic soap is considered an excellent preventive in the Southwest, and, according to Prof. J. Parish Stelle, who made the experiment for me in 1880, pyrethrum blown upon the sores will induce the worms to issue forth and leave them.

Respectfully,

C. V. RILEY,
Curator of Insects.

Prof. SPENCER F. BAIRD,
Secretary, Smithsonian Institution.

FISH MORTALITY IN THE GULF OF MEXICO.

By S. T. WALKER.

[Letter to Prof. S. F. Baird.]

Knowing your interest in everything connected with fish, &c., I take the liberty of giving you all the facts I have been able to collect in reference to the late mortality among the fishes in Tampa Bay and adjoining coasts. Had I known before I began my cruise of the extent of this mortality and splendid opportunities afforded of collecting specimens of strange and perhaps unknown species, I might have gone better prepared for collecting specimens, but I had only heard a few vague rumors, and I was little prepared for anything further than a collection of facts in regard to the matter.

On leaving Clear Water, November 20, I sailed south through Boca Ceiga Bay, and encountered the first dead fish floating on the water near Bird Key, a little southeast of Pass A'Trilla. These were mullet, and as we progressed to the south and east I began to encounter toad-fish, eels, puff-fish and cow-fish, in immense numbers, and, on attempting to land on the extreme point of Point Pinellas for the night, I was driven to my boat by the stench of thousands of rotting fish upon the beach. The next morning I went ashore and found the dead fish drifted ashore in countless numbers. The eels appeared most numerous, followed by puff-fish, cow-fish, sailor's choice, and small fish of every shape and variety. After these followed groupers, mangrove snappers, jew-fish, gar-pike, spade-fish, sting-rays, and sharks. Other varieties, unknown to me, were mixed among these, together with vast numbers of catfish. I saw very few mullet here.

At Gadsden Point about the same species appeared, while at Tampa I saw but few dead fish, and they were principally gars and catfish. From Tampa I proceeded to the mouth of the Little Manatee to obtain

some information from Mrs. Hoy concerning her theory accounting for the death of the fishes. I subsequently visited the towns of Manatee, Palmetto, Bradentown, and proceeded thence to Hunter's Point, in Sarasota Pass, Longboat Inlet being the farthest point south visited. Returning, I spent several days on Anna Maria Key, where I collected the skulls of several kinds of fish; thence, passing northward by way of Passage Key, Egmont, Mullet Key, and so on back to Clear Water. From Longboat Inlet round to Mullet Key, the dead fish were principally mullet, catfish, eels, and groupers, the mullet preponderating at least ten to one. Puff-fish, toad-fish, cow-fish, and frog-fish were still extremely plentiful; indeed, I saw no diminution in their numbers, though the numbers of dead mullet had increased very greatly.

I saw many fish in every stage of sickness, from the first attack to the end. All were affected in nearly the same manner. The fish, apparently active and healthy, would be swimming along, when suddenly it would turn on its side and shoot up to the top of the water, gasping as though out of the water, apparently unable to control its motions, often lying on its side on the bottom for five or ten minutes motionless, then suddenly shooting hither and thither without aim or object, and finally ending the struggle on the surface and floating off dead. Whole schools of mullet would suddenly stand upright on their tails, spouting water and die in five minutes. Gars would run for a long time with their snouts above the water, and then lie motionless, as if dead, for ten or fifteen minutes. These generally lived an hour or more after being attacked. I obtained specimens of water from various localities, which I send herewith, marked to show whence obtained.

Before giving the statements of others in regard to the matter, I will give you the results of my own observation in a very brief manner:

1. The dead fish were most numerous on the outside beaches and on the inside beaches of the outer line of keys.

2. That dead fish were least numerous about the mouths of creeks and rivers, decreasing gradually as one approached such places.

3. That the poisoned water was not diffused generally, but ran in streams of various sizes, as proven by fish dying in vast numbers instantly upon reaching such localities.

4. That the fish were killed by a specific poison, as proven by the sickness and death of birds which ate of the dead fish.

5. The fish began dying on the outside beaches first, as Mr. Strand, assistant light-keeper at Egmont, reports them coming up first on the 17th of October, while Mrs. Hoy observed them first on the 1st or 2d of November, at Little Manatee River.

6. The examination of many hundred recently-dead fish revealed no signs of disease. The colors were bright, the flesh firm, and the gills rosy. The stomach and intestines appeared healthy.

In my haste I have neglected to state that I saw a good many dead birds during the trip. At Tampa, ducks were dying. I saw dead vul-

tures at Anna Maria Key, and at Passage Key, large flocks of cormorants were sick and dying. I also saw the carcasses of terns, gulls, and frigate birds. The cormorants sat on the beach with their heads under their wings, and could be approached and handled.

It might be also proper to state that on Monday morning, December 14, about one hour before day, I heard a roaring southwest of Passage Key, apparently far out at sea, resembling the "blowing off" of a steam boiler. The noise continued some ten minutes and ceased. After daylight I heard a similar roaring, which lasted about five minutes. There was no steamer in sight in the direction of the sound, and I observed no swell in the sea following it. After I got under sail I heard the noise a third time. Whether this was followed by the death of fish I am unable to say, as I did not stay to see. I mention this incidentally as a corroboration of Mrs. Hoy's statement, which is hereto appended. Whether or not either of these disturbances of the water had any connection with the mortality among the fishes, the theory of sub-aqueous eruptions of poisonous gases is extremely plausible and reasonable.

INDIAN ROCK, FLORIDA, *December 21, 1880.*

STATEMENT OF MR. ——— WILLIAMS, OF POINT PINELLAS.

The fish began dying about the last of October here. All kinds die except red-fish. Eels and sea-toads are most numerous, though all kinds die. I have seen only a few sheepsheads. I think it is caused by a black scum on the water resembling soot. When a school of mullet get into water covered by this black scum, they die at once. Oysters are affected by this also, and those who eat of them are made very sick.

STATEMENT OF MR. ——— SPENCER, OF THE TAMPA TRIBUNE.

I went out last Sunday (November 28), expressly to see for myself, and, if possible, to account for the dying of the fishes in Tampa Bay. I feel certain, from what I saw, that it is caused by fresh water from the creeks, rivers, and marshes. The water where the fish are dying looks black and slimy, very different from the usual color of the bay water. You see there has been an unusual amount of rain this fall, and this becoming impregnated with the poison of decaying vegetation, is poured into the bay in unusual quantities and poisons the fish. This is my opinion, and I give it for what it is worth. The oyster saloons here were obliged to close, as the oysters came near killing several people.

STATEMENT OF MRS. CHARLES HOY, OF LITTLE MANATEE.

The fish began dying here about the 1st of November. About 8 o'clock on the evening of October 28, or thereabout, I was sitting on my front gallery, the air being perfectly still and the bay calm, when I heard a heavy splashing of the water in the direction of Gadsden Point. This continued for a few minutes and was immediately followed

by a roaring sound, such as might be made by the wheels of a side-wheel steamer near at hand, though the noise seemed to be several miles away. This continued for about a quarter of an hour, as near as I could guess, when it suddenly ceased. Some 25 or 30 minutes afterwards heavy swells began to come up the river, such as come in during a heavy blow from the northwest. These continued for a long time, gradually becoming lighter until I went to bed. In three days the fish began to come up the river dead and dying. I caught several mullet that were standing upright in the water, sick, and each had three black spots on the back, which gradually faded away. I opened the fish and could see nothing the matter with them. The flesh was natural and firm, and the gills were normal.

In regard to oysters I have had a rather rough experience, and can with certainty say that they are poisonous. A few days after the fish began dying I had a quart of fine oysters for dinner. I had a lady visitor on that day, but she did not like oysters and ate none. My daughter and I ate heartily of them, and after dinner I took my gun and went out to a pond to shoot some ducks. I took a colored woman (my cook) along, and before I had gotten half way I began to feel weak, and a mist came before my eyes. I kept on, however, to the pond, and when I reached it was so blind I could not see the ducks, although the water was covered with them. With the assistance of the colored woman I got home, when I found my daughter similarly affected and unable to walk. Neither Mrs. Simms—the visitor—nor my cook were affected, which makes me know it was the oysters. The sickness and loss of vision gradually left us after drinking a cup of strong coffee. I am confident the death of the fish is caused by the discharge of poisonous gases from the bottom of the sea.

STATEMENT OF MESSRS. FORGARTY AND WHITTAKER, SMACKMEN
OF BRADENTOWN.

We own a smack and fish off the coast from Egmont south to Charlotte Harbor. Our business is about ruined by the death of the fish. They are dying off the coast as bad as inshore. Our fish die after we put them in the well, frequently in five minutes. We cannot say what causes it, as we have no means of ascertaining. The poisoned water runs in streaks, for often when three or four smacks are in company one or two will lose all their fish in a few minutes, while the others, a short distance off, lose none. In one instance, three being in company, two lost all their fish, while one lost none, the vessels being only a few hundred yards apart.

STATEMENT OF R. B. STRAND, ASSISTANT KEEPER OF EGMONT
LIGHT.

The fish first came up dead on the 17th of October in the following order: eels, cow-fish, toad fish, small fish, such as sailor's choice, min-

nows, &c.; terrapins, ducks, and other sea-birds followed. The water has the appearance of being very slimy.

INCIDENT RELATED BY MR. HENDRICKS, POSTMASTER AT PALMETTO.

Mr. Dolly threw a cast-net into a school of mullet which appeared active and healthy. Before he landed them they were all dead in his net; and looking back, the whole school was floating dead on the surface.

THE GENERIC NAMES AMITRA AND THYRIS REPLACED.

By G. BROWN GOODE.

I am told by my friend Professor Jordan that the names *Amitra* and *Thyris*, recently proposed by me for two new genera of fishes, are pre-occupied in zoology. I wish to substitute for the former the name *Monomitra*; for the latter the name *Delothyris*. *Monomitra liparina* will consequently be the name for the *Liparis*-like fish noted in the Proceedings (vol. iii, 1880, p. 478), and *Delothyris pellucidus* for the transparent flounder, noticed in the same volume, p. 344. I wish also to express my thanks to Professor Jordan for his act of courtesy.

UNITED STATES NATIONAL MUSEUM, January 10, 1883.

SHELL BEDS IN WESTCHESTER, N. Y.

By MERRITT WILLIS.

Along Pelham Bay bordering on Long Island Sound, in the county of Westchester, State of New York, there are numerous shell beds. On the northwest side of the bay they are from 25 to 30 feet apart—true Kitchen Middens. They line the east side of the bay for some distance. There is one covering two or three acres, from which I have collected arrow-points, spear-points, arrow-scraper, pestles, stone axes, knives, sharpening-stones, pipes, stone ornaments, &c. I also have taken from the shell beds several bones cut off at the joint for some purpose. I think they are the leg bones of deer.

I have collected in the town of Westchester alone some 900 arrow and spear heads, besides axes, balls, pestles, and numerous other implements.

Yours, respectfully,

MERRITT WILLIS.