

and all of them completed the change into the *Amblystoma* inside of six weeks, while I have had but three changes of those kept in the cauf (sixty of them) in three months. During that time they have not been fed at all. The *Siredon mexicanus* is said to never undergo the transformation in its home, and Professor Marsh doubts that it ever makes it here. This doubt I can put at rest. They do make the change here, and in large numbers. During the latter part of the month of July and the entire month of August, if the day is rainy or misty, they come from the lake in to the shore in large numbers, and secrete themselves under some piece of wood or rock where they can keep moist. Sometimes they venture out in a shower, and the sun catches them before they can obtain shelter either in the lake or under cover, and in a few minutes kills them. They can be found dried hard anywhere about the lake, on the shore or in the grass. While catching *Siredon* I have seen and caught a number of *Amblystoma* in the lake, with the metamorphosis, as far as I could see, as complete as those we find half a mile from the lake. They cover the ground by thousands during a warm summer rain, coming from every conceivable place where they could have found shelter, from under rocks, boards, old ties, and out of gopher holes. I have a cat that eats them greedily. She has fished several out of jars on the table and devoured them during the night when there was no one to watch her; and I am told by a resident that the numerous skunks that live around the lake live principally on them. They are of two colors, a blackish green and a yellowish green color. I have had two of the blackish green complete the change in sequence, while one of the yellowish green was completing it under the same circumstances of change of water and food. I think this will be found to be the result in all similar cases. I have caught them in all stages of growth and in all stages of their changes into the *Amblystoma* state. During the months of July and August they lie close to the shore of the lake, where it is shallow; but after the first frost they disappear completely, or at least I have never been able to find them. I think they must bury themselves in the mud at the bottom of the lake, as I have stirred up the grass often and have not seen them issue from it.

ON THE DESTRUCTION OF FISH BY POISONOUS WATER IN THE GULF OF MEXICO.

By JOSEPH Y. PORTER, Assistant Surgeon, U. S. A.

UNITED STATES ARMY HOSPITAL,
OFFICE OF POST SURGEON, KEY WEST BARRACKS, FLA.,

January 21, 1879.

PROFESSOR: I forward you to-day by express a small box containing a quart of Gulf water, procured 20 miles from this port. I enclose you a slip of paper taken from the "Key of the Gulf," a local of this place, which in its turn clipped it from the "Forest and Stream." It seems to be

the general opinion in this section among non-scientific men that the destruction of fish has been due to the saturated condition of the water with dogwood (*Cornus Florida*). I am informed that the shores of Lake Okheechobee abound in this vegetation, as well as the country around it; and as the land was completely overflowed last year—summer—some couple of hundred miles in that vicinity, water 4 and 5 feet deep, it is thought, as it remained some little while before running off, that some of the properties of the *Cornus* may have been imparted to the water, and this in its turn contaminated the Gulf water. However, this is a mere conjecture, and may not be any nearer the truth than a theory advanced by a "Partington" of this place, viz, that the fatality of the fish was due to a *vulgar corruption* (volcanic eruption) of the Everglades. The fishermen have suffered terribly in consequence of this calamity, returning to port trip after trip with their "wells" full of dead fish. They say that they meet with good success in catching the fish above Pine Island, Charlotte Harbor, and are able to keep them alive until returning, preparatory to going to the Havana market. They meet with this belt of poisoned water between this port and Punta Russa, and immediately on entering or attempting to cross it their fish come to the surface, gasp, and die.

I trust that as soon as the water I sent you shall be analyzed you may be pleased to inform me; for which favor I shall be deeply grateful.

I am, Professor, very respectfully, your obedient servant,
JOSEPH Y. PORTER,

Assistant Surgeon U. S. A., Post Surgeon.

Prof. SPENCER F. BAIRD,
Washington; D. C.

THE FISH MORTALITY IN THE GULF.

JACKSONVILLE, FLA., *December 26, 1878.*

EDITOR FOREST AND STREAM:

In reply to your communication soliciting information regarding the mortality among the fish on the coast and ocean near the Keys, I can only say that from personal observation I have none to communicate. Through the public press I have noticed that fish have been dying in immense quantities for some time.

By some the mortality is attributed to the freshness of the water as a consequence of the heavy rains of the past summer and autumn. But in my opinion this explanation will not suffice, as the main outlets of the Okheechobee empty into the ocean north of Pavillion Key, and that sheephead, tarpon, channel bass, and mullet visit and live in brackish and even fresh water. By some it has been attributed to volcanic action, and by others to the breaking forth of a subterranean stream, the waters of which are poisonous. One fact is positively known, and that is that fish in enormous quantities are dying over a large extent of the

Gulf from the effects of something contained in the water—be that something deleterious gases, mineral substances held in solution, or fungi.

The fishing interest of Key West is an important one, for it supplies thousands with the means of subsistence, and if the fish mortality should continue it will bring privation and suffering to many a family.

It appears to me that the existing mortality among the fish is a matter of scientific importance, and should be thoroughly investigated. I would suggest the advisability of the Revenue Department or the Smithsonian Institution sending a commissioner to investigate the cause of the mortality. The government has a dispatch boat at Key West which could be spared for the purpose, and the expense would be trifling. As a matter of scientific interest, independent of its commercial importance, this subject demands investigation.

I remain yours, truly,

C. J. KENWORTHY.

We warmly second Dr. Kenworthy's suggestion, and hope the government will permit the use of facilities for investigation which it appears to have in readiness at Key West. We have already hinted that the use of fluoresceine in those waters of Florida which empty into the Gulf might serve to indicate the origin of the boiling spring, whose discovery somewhere off the Gulf coast was announced two months ago. If such a volcanic spring exists, the poisoning of the water can easily be accounted for; though the remedy to prevent continued mortality of the fish is not so readily found. The locality of this boiling spring was given by the Key West Key of the Gulf, of November 6, or thereabouts, as "along our bay coast from two to ten fathoms out." This is not very definite, but it is the most positive designation that we have seen. No authentic information seems to have been derived from any other source. The fishermen whose occupation has been cut short so suddenly should devote their leisure time to efforts to determine the locality of the obnoxious cause, wherever or whatever it is, and report at once to the revenue station at Key West, thereby seconding the efforts of the government to remedy the evil. It will be a direct way of putting bread in the mouths of their now starving families. The polluting substance, whatever it may be, is evidently most subtle, for its influence is seen for a distance of 200 miles, dead fish covering the surface of the ocean wherever the eye rests. One proof of its volcanic origin is that the water so polluted is of a "red brick color," at a distance of less than a mile from the shore, while the interval of water along the land is natural in color and taste. Of its subaqueous origin there can be no doubt, but whether it has connection with waters in the interior of Florida by subterranean passages, or has a deeper and independent source and seat, is what we wish to know. The phenomenon in itself is not wonderful or incomprehensible, being only a reproduction of boiling springs in all parts of the globe, both in land and ocean. Off Matanzas there is an immense spring, not hot, but of clear, cold, pure water.—*Forest and Stream.*