

## 162.—A DESIRE FOR FISH-CULTURE IN MALACCA.

By LEONARD WRAY.

[From a letter to Prof. S. F. Baird.]

You may be somewhat surprised to find that the subject of fish-culture is of considerable importance even to this small Malay state, but such is really the case; I refer, however, solely to those fish which will live and breed in the many rivers and mountain streams of this peninsula; to freshwater fish, in fact. Personally I am more interested in mountain streams and sheets of water, at from 2,000 to 3,000 feet above sea-level, which have a temperature ranging from below 50° Fahr. up to 75° Fahr. in the middle of the day.

Among the many fish that I wish to establish in this state, if possible, are the American whitefish (which I see are now being incubated in England) and the shad, of which I perceive you have bred and distributed over 30 millions of young fry. We have in Calcutta an abundant supply of a shad termed "hilsa," which seems, if not identical, at least nearly so, with the United States variety. I have eaten numbers of them, both in America and in India, and I fancy your shad is the thicker fish. The questions arise: Can we in any way manage to get the fecundated ova of this delicious fish? And will they breed and thrive in our streams? If any competent person in India would undertake the matter, no doubt we could get any amount of ova sent down here in ice; but at present I know of no one in India who even dreams of fish-culture. Must the shad of necessity go periodically to the sea or can it be "educated" to put up with a freshwater life altogether?

Have you in the grand rivers and lakes of the United States any true mullet which will thrive wholly in fresh water? I fancy that there are purely freshwater mullets in the upper rivers of India; but it is now so many years since I lived in those parts that I cannot be certain. One of the great delicacies of Jamaica is the mountain mullet, but I cannot imagine how to get the ova here in good condition, as a letter just received took 42 days in transmission from that island to this place. I must try to accomplish it by the aid of the National Fish Culture Association of England, and they may be able to send me the American shad also.

STRAIT OF PERAK, via PENANG, MALACCA, *June 25, 1885.*

## REPLY OF PROFESSOR BAIRD.

Although it is not entirely impossible, with a suitable expenditure of money, yet it would involve much uncertainty of a satisfactory result to attempt to transfer a fish from the United States to Malacca. The two difficulties in the way are the distance to be traveled and the temperature to be encountered. The shad is very difficult to transport,

being very delicate and sensitive to extremes of temperature. In the present state of our knowledge, it would be impossible to carry the eggs that distance; and until we can succeed in transporting the eggs or very young fish to England, we may safely give up any more ambitious attempt. There would be no great difficulty in transporting the eggs of the trout from England to India. They could be packed in ice, which, if renewed from time to time on the journey, would keep them in proper condition. We have several times sent salmon eggs to Australia and New Zealand with excellent results. Whitefish eggs, also, could be sent; but this fish will survive only in deep lakes of cold water, where the temperature does not rise above 50 or 60 degrees Fahr.

We have no purely freshwater mullet in the eastern United States. There are, however, several species in the West Indies, and one in the Sandwich Islands, which are strictly freshwater in their character; although I doubt whether they would be better than those you can obtain nearer home.

WOOD'S HOLL, MASS., *August 13, 1885.*

### 163.—THE USE OF THE ELECTRIC LIGHT IN FISHING.

By LIEUT.-COMMANDER Z. L. TANNER, U. S. N.

[Reply to Oscar Hatfield, U. S. Consul at Batavia.]

I have received the letter from the American consulate at Batavia, dated July 10, 1885, with reference to the use of electric lights for fishing.\* In reply I beg to say that electric lights are in constant use on board the Albatross in our work of investigations. We have used an arc light hung near the water, but the form in use at present, which has been most successful, is an Edison incandescent lamp attached to an insulated cable. Although certain species of fish in rivers, and near the coast, are attracted by a bright light, sea fish, as a rule, are rather repelled by it than otherwise. We do not use the light for the capture of edible fish, but only in collecting minute forms of crustaceans and surface specimens which we could not procure by any other means. My opinion is that the electric light would be of very little service in sea fishing.

WOOD'S HOLL, MASS., *August 25, 1885.*

\* The letter was as follows:

"Some time ago a company was started here for the purpose of fishing by electric light. A variety of apparatus, &c., was ordered and received from Europe, a steamer was especially constructed, &c., but the company cannot catch any fish. The result is an apparent failure and the loss of the funds invested.

"It appears, however, that at home your department maintains a steamer called the Albatross, on which an electric fishing apparatus is in good working order, and I have been asked by the company here to ascertain if this is so, and if so, they would be very much indebted for information regarding it. What system or patent is worked? Where can it be purchased? Any hints upon the subject will be thankfully received."