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THE PANAMA CANAL
c. Coll. vol. 59, no. 18,

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THE NAUTILUS.

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No. 6

THE MUSSEL SHELL BEDS NEED PROTECTION.

BY WILLIAM T. BARRET.¹

I began in the mussel shell business in the season of 1902 on the Ohio river at Henderson. Ky.; have been in it ever since that time, and have done practically all of my work on the Ohio. The first five years I never worked above Louisville, finding all the shells that we could sell in that territory, that is, from Louisville down. The beds were large and very productive. I have known from 50 to 60 boats to work on one bed, and some beds produced from 3000 to 5000 tons of shells before they were whipped out. What I mean by being "whipped out" is, that there are not enough shells left to pay wages for catching them. A mussel catcher could work faithfully for 10 hours and not catch over a box of shells on these beds. The price for catching is from 25 to 40 cents per box. The price depends on the quality of shells caught. These boxes will hold about 100 pounds of cooked shell.

In the early days the mussel catchers caught from 10 to 15 boxes per day on these beds. As this territory became less productive, it was necessary for me to find new territory where shells were more plentiful. I came to the upper Ohio, and with camps scattered along the river, have worked it from Louisville, Ky., to Parkersburg, W. Va., the last four years. There may be some wild beds left, but there are very few, if any.

¹From a memorial addressed to the General Assembly of Kentucky.

The Ohio has been worked hard from one end to the other, and if the present system of working the beds continues, in two or three years, they will all be "whipped out." Under the present system you can work where you like, so naturally everybody likes to work where the mussels are the thickest, and the catchers keep right after them until they whip the bed out.

I remember when the bed at Shawneetown, Ill., was found, and it was one of the best ever found on the river. The mussel catchers working on the Wabash river in Indiana heard what a fine bed it was, and came out of the Wabash, floated down the Ohio to Shawneetown until there were over 100 boats at work on that bed. They worked it out in a few weeks. Since that time it has been worked some each year, but has produced very little. It was found seven years ago and produced that season about 2000 tons of shells, and the total production since that time will not exceed 200 tons in the seven years.

Over 25 per cent. of the mussel shells caught in the Ohio river today are practically wasted—they are so small that the cutters in the blank factories, who work by the piece, can't make anything cutting them, so naturally they throw them in the waste shell if the foreman of the shop isn't standing right by looking. In most shops they work as many as 100 cutters, and one foreman; so you see he can't see many.

My idea is that the State, through its Legislature, should take control and regulate the number of boats per mile that work these beds. I think that four boats to the mile would be about right and only allow them to catch 15 tons to the boat. In other words, confine the production to 60 tons to the mile of shell beds per year.

There are about 90 miles of shell beds in the Ohio river in Kentucky's boundary from Cattlettsburg to Cairo, and equally as many in her tributaries. This would mean a production of from 5,000 to 10,000 tons per year. This production would save the mussel beds, and they would continuously consume the sewerage, thereby purifying the water, and would insure from 5,000 to 10,000 tons of raw product annually for the button factories of this country.

The Legislature could pass a bill granting the State the right to protect the beds by license for a term of years, say on a royalty basis of \$1.00 per ton for all workable shells produced. This would give the state a revenue from this source of from \$5,000 to \$10,000 per

year, and it would be paid to the State Auditor. The State Auditor would check the lines mentioned above, and could be required to check together with check the State any expense. A bond given the State out to the letter.

The Legislature should embody in it all the mussel beds, viz.: The bed is all that can be less than a mile per half mile, 30 tons, should be allowed— an individual. An mussel beds when the government gauge. is much stronger and often catch into the shell entirely. I have pull up as many as 2 ruinous to a mussel bed.

The catchers like food in the water for mussels come to the State. There should be a fine and 30 days in jail for these laws. Each catch

First Step Toward enforcement with the mussel beds started at Muscatine a few years ago from the upper Mississippi. A sufficient quantity there to it became necessary for continued to do this until button factories have been worked the mussel beds.

The button industry

year, and it would be handled without any expense to the state. The State Auditor should be given the power to make a contract along the lines mentioned for their protection. The contracting party could be required to send an invoice of each shipment monthly, together with check for royalty to the Auditor, thereby saving the State any expense. The books to be always open for inspection, and a bond given the State that will guarantee this contract to be carried out to the letter.

The Legislature in making a law giving the State this right should embody in it all the things necessary to protect the mussels and mussel beds, viz.: That 60 tons of button shells to one mile of mussel bed is all that can be taken out in one year; this to apply to beds of less than a mile proportionately, one-quarter of mile, 15 tons; one-half mile, 30 tons, etc. No dredges of any kind, or oyster tongs should be allowed—nothing but the hook that catches the mussel as an individual. And the hook should not be allowed to work on any mussel beds when there is more than 20 feet of water on the nearest government gauge. When there is more water than this, the current is much stronger and drags the hooks over the beds so fast that they often catch into the mussel itself, thereby killing it and losing the shell entirely. I have seen boats working in high water that would pull up as many as 25 of these mussel meats at one time. This is ruinous to a mussel bed.

The catchers like to work on high water because there is more food in the water for the mussel at that time, and consequently more mussels come to the surface to feed, and they can catch them faster. There should be a fine of not less than \$25.00 nor more than \$50.00 and 30 days in jail for each offense for any one violating any of these laws. Each county should have legal jurisdiction to prosecute.

First Step Toward Protection.—Iowa is the oldest state in experience with the mussel-shell button industry. The first factory was started at Muscatine about 16 or 18 years ago. They got the shells from the upper Mississippi river, and for several years found sufficient quantity there to run their plants. As the business increased, it became necessary for them to hunt new fields. They have continued to do this until to-day the Mississippi river and all its tributaries have been worked and worked without any idea of protecting the mussel beds.

The button industry has made tremendous strides—9 years ago

H. U. S.

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consumption of shells by the button factories was from 10 to 12 thousand tons—to-day the consumption of a normal year will exceed 100 thousand tons. The State of Iowa has seen how necessary it was to do something to insure the raw product for the button factories. To this end through their Congressmen they got the Federal Congress at Washington to appropriate money for the protection of the mussel. With this money they have established at Fairport, Iowa, a mussel hatchery, where they are experimenting and trying to raise the mussel in ponds. They realize the necessity of producing the shells.

Instead of working the mussel beds until we are forced to hatch, cultivate and raise them, why not protect the wild beds that we have, and harvest the crop that they produce annually?

There is no doubt but this is the better way; and Kentucky has in its boundary the major portion of the Ohio river with 90 miles of shell beds. Protect them and save this raw product for the button industry. It is valuable to Kentucky and to the whole world. This is the right way—take the lead, and the other states will follow.

FRESH-WATER MOLLUSCA LIVING OUT OF THE WATER.

BY V. STERKI.

Aplexa hypnorum (L.) and *Sphærium occidentale* Pme. are well known examples of mollusks living at places where water stands only during part of the year, often for short periods in spring, and occasionally after heavy rains. The last named species appears to be especially well adapted to that kind of habitat, and even recently discharged young mussels have often been found living on apparently quite dry soil under a thin layer of dead leaves. It is also known that small *Lymnaea*, and *Pomatopsis* are often found crawling out of water.

Fresh-water mollusks of almost all groups bury themselves in the soil, with the disappearance of surface water, and survive for shorter or longer periods. But quite a number of pulmonates and branchi-ates appear to remain not only alive but active and propagating for long periods or permanently. How much this fact has to do with

the evolution of terrestrial life fit and eventually anatomical and must be left to the scientists.

The following observations in connexion.—In low woods, north of (Say) were found alive in company the same woods *Physa gyrina* where they could not have been body of water.

In damp woods at Kenmore, of various terrestrial mosses, (*A. parva*?), living and of various and with them a few puerile. No water was standing in the moreover these snails or their p exceptionally hot and dry summer.

In July of that summer, in a had been dry as a bone for weeks and I found several dozen specimens Gld., living and in good condition sedges (*Carex* and *Scirpus*), several is hardly a doubt that they had been could from dew at night.

In woods of that vicinity with *tundum*, typical, full-grown to young spot. Other *Pisidia* have been found swamps among mosses, out of which water could never be standing.

Small *Lymnaea*, apparently propagating houses, on mossy flowerpots, some doing well and propagating.

Similar observations have been made by malacologists.