It is noted that they had a very uneven inner surface, causing ... in cutting blanks; the tips of the shells were too thin for buttons. The colour and nacre were not as bright as the usual run of the species found in the Mississippi river; but it nevertheless makes a good button and, with proper care, the material could be worked up with profit. As the Button Company of Trenton works up tons and tons of these shells their statement as to the comparative value of the shells must also receive due consideration.

With regard to the propagation of the former species (*Q. plicata*), Dr. Howard, of Fairport, Iowa, makes the following statement:—

> "Several factors favour the artificial propagation of this species upon a practical scale. It is common and at present one of the most used shells in the button industry. It seems to be a form not narrowly restricted as to hosts, and these are indicated to be among the commonest and most readily obtainable fishes. Although a river form, its habit as a dweller in stiller water and on mud bottom makes it susceptible to propagation or control under conditions readily imitable in artificial lakes or ponds. A continuous water supply is desirable; my observation has been, however, that it will survive rather adverse conditions in this respect. I have collected many live specimens from a slough which had gone dry to the extent that only mud remained. Under these conditions the majority of the pond mussels, *Anodonta corpulenta*, had died. I would cite also the finding of this species accidentally introduced in the parasitic stage into an artificial pond at Fairport, Iowa. The pond had gone dry, and I found a specimen still alive buried in mud barely moist. It is evident, I think, from these observations that the species is hardy, at least as regards some of the more common vicissitudes to which mussels are naturally subjected."[1]

In his experimental work with this species he found that *P. annularis* (crappie), *P. sparoides* (speckled bass), *P. flavescens* (yellow perch), and *L. pallidus* (blue sunfish) were successful carriers. The spawning period is short, being confined chiefly to the month of July. In the last fiscal year 147,000 glochidia of this species were set free in the parasitic stage at Fairport.

At present the safe-guarding of the beds against depletion is more urgent than experimental work in artificial propagation of this species. As experience and equipment are obtained, work on the more difficult *Quadrulas* should no doubt be proceeded with.

I have so far not obtained any data of experimental work done on *Q. undulata*. In general appearance the two forms are similar. In *plicata*, the umbones are more elevated and inflated than in *undulata*.

PROTECTION OF FRESH-WATER MUSSELS.

For the protection of the present mussel beds the following methods may be considered of sufficient importance to merit discussion.[2]

(*a*) A closed season in each year.
(*b*) Restriction as to the methods of fishing.
(*c*) Restriction as to size of mussels retained by fishermen.
(*d*) Closed regions for specified number of years.
(*e*) The imposition of licenses.

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[1] Experiments in propagation of Fresh Water Mussels of the Quadrula group. By Dr. A. D. Howard, Bureau of Fisheries, Document No. 801.

[2] See also, Protection of Fresh Water Mussels, by R. E. Coker, Ph.D., Bureau of Fisheries, Document No. 793.