E. Higgins

tion of the beds that only very young clams are commonly found. A short report of these conditions with recommendation for a size-limit regulation was submitted to the supervisor of fisheries of the State of Washington.

After examining canned samples of *Cardium corbis* and consulting with interested operators, a suitable method of processing this clam has been worked out. By using this species it is possible for the canneries to operate during the winter, when razor clams can not be obtained, and during the late summer, when there is a closed season for razor clams. The supply of this species is quite extensive and the product is of satisfactory quality.

SCALLOPS

The scallop investigations in North Carolina, begun in July, 1925, by J. S. Gutsell, have been continued through 1926. Special emphasis has been laid on spawning, growth, and longevity.

Spawning has been found to begin in the spring (if, indeed, it ceases at all through any season) and to continue to the end of the year. However, there is accumulating evidence, chiefly from the collections of small scallops, that the principal spawning occurs over a shorter period, beginning in early fall or late summer and extending through the fall, perhaps into the winter. New methods of collecting small scallops and of examining the collected material have given greatly improved results for this as for other aspects of the work, so that good evidence throughout 1927 is anticipated.

Growth data that show remarkable homogeneity of size grouping indicate an increase in length from 1½ inches in May to about 3 inches in the next fall or winter. Commercial destruction of scallops at Pivers Island and other known sources of supply in February, 1926, prevented extension of knowledge of later growth and normal longevity. These problems we hope to solve during the coming year.

On advice of the investigator, some modification of the scallop season by the State authorities aready has been made. It is hoped that when the present studies are completed, or sufficiently advanced, detailed recommendations of practical value may be made available to the State board, which has taken an active interest and to which thanks are due for cooperation.

FRESH-WATER MUSSELS

Undoubtedly the outstanding work carried out in 1926 in connection with fresh-water mussels, of value to the pearl-button industry for their shells, was performed at the Fairport (Iowa) fisheries biological laboratory by Dr. Max M. Ellis, of the University of Missouri, a special investigator of the bureau. After working on the problem several summers Doctor Ellis succeeded in developing a nutrient solution that serves as a medium for the development of mussels from the glochidial to the adult stage. This elimination of the parasitic stage in the life history of the mussels promises to simplify greatly the propagation work that the bureau is conducting with a few of the more important commercial species. Doctor Ellis plans to develop the use of this solution during the coming summer.

T. K. Chamberlain, director of the Fairport station, went to Arkansas to represent the bureau in devising more satisfactory

regulations for the mussel fishery than the one in force. In company with representatives of the Arkansas fish commission, Mr. Chamberlain spent over three months in examining the state of the mussel fishery in Arkansas waters. A large number of shellers and shell buyers were interviewed, and tentative recommendations were drawn embodying alternate open and closed sections of the rivers, which were given publicity in the State press. Criticisms and suggestions were invited, which resulted in some minor changes, but the revised recommendations were acted upon favorably by the commission in November and are to go into effect on February 1, 1927.

The new series of sections alternately opened and closed differs from the old, mainly in that the average length per section is a little under 15 miles, as opposed to the 70 miles provided for in the program that failed. It will be possible now for all shellers who live along the river fronts to be within a convenient distance of some open territory at all times.

After completing the work in Arkansas, Mr. Chamberlain began a new series of mussel surveys in certain waters of the upper Mississippi. In these surveys it is planned to develop new methods, based upon those used by Doctor Weymouth in his studies of the salt-water clams of the Pacific coast.

A survey of the mussel beds of certain rivers in Virginia was made by H. O. Hesen, superintendent of fish culture at the Fairport station, to determine the effect of former plantings of commercial mussels taken from the Mississippi River. Mr. Hesen made fresh planting of several thousand young mussels, reared by the trough-culture method, which was employed on a small scale at Fairport during the summer. There was no indication that commercial mussels had become established in Virginia waters.

In connection with the studies of the life history of the more valuable fresh-water mussels, a particular study of the habits of the two species of gar found in the Mississippi in the vicinity of Fairport was made during the past summer by Doctor Ellis. One or both species of gar are the hosts for the glochidia of the most valuable of all the fresh-water mussels—the yellow sand shell (*Lampsilis anodontoides*).

TERRAPIN CULTURE

The experimental work in breeding diamond-back terrapins at the Beaufort (N. C.) fisheries biological station continued to give interesting results. Experiments in hybridizing Carolina and Texas terrapins were started in 1915. It was hoped that in cross-breeding the two species, a fast-growing animal with a flavor scarcely inferior to that of the Carolina terrapin might be produced.

A cooperative arrangement for hatching terrapins, entered into with the fisheries commission board of North Carolina in 1925, has been extended. An additional concrete pound, 125 feet in length and 64 feet in width, was constructed to hold 1,235 breeding terrapins, which the State has supplied. It is purposed to hatch a large number of terrapins and to hold these young animals at the station until they have attained a considerable size and have passed through the most critical stages of life, when they are to be liberated for restocking the sadly depleted waters. Several hundred young animals were liberated in the vicinity of Beaufort from 1914 to 1924, and as