

return, and other recaptures of those tagged at Bonavista do not help us since they were on the Labrador coast to the north as well as on both Newfoundland and Canadian coasts. That return may not be direct is evidenced by double recaptures of salmon tagged on the Norwegian coast,⁴ which revealed a to and fro movement of even more than fifty miles. That return was probably not direct is shown by marked Margaree fish tagged on the Margaree coast in 1941 moving only (so far as definitely revealed) away from the river, even past other salmon rivers.

Such maturing salmon have been proved to move in one direction or another as much as 28.9, 35 and 62 miles per day.^{5,6,7} Also it seems quite definite that they tend to remain in river water,⁸ and their usual tendency to ascend the home stream when a choice is presented where two estuaries fork⁹ may be due to their remaining in water from the home river—rather than in that from another river.

Is this case to be taken as representing a regular precise migration of Margaree salmon to the waters east of Newfoundland and back, or did this fish wander from the others and get back a distance of 550 miles in 96 days or less by more or less random movements and by tending to remain in river water, particularly from its home river? The facts for our salmon do not harmonize with the conception of a somewhat precise mass migration to a distant feeding ground, but they give no indication as to the degree of success in return from distant places. Much more work needs to be done.

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HATCHING OF THE BLUE CRAB, *CALLINECTES SAPIDUS* RATHBUN¹

SINCE 1940 efforts have been made to devise a method for hatching eggs of the blue crab, *Callinectes sapidus* Rathbun, in the laboratory and in nature on a large scale. The egg mass or "sponge" contains upward to two million eggs. When once it was found possible to hatch large quantities of eggs to the first true zoea stage, attempts were made to induce further normal development of these zoeae.

In 1940, positive hatching results were obtained by removing masses of eggs, about one cubic inch in size,

⁴ Knut Dahl, *Salm. Trout Mag.*, 88: 229-234, 1937.

⁵ D. L. Belding and G. Préfontaine, *Contr. Inst. Zool. Univ. Montr.*, 3: 1-58, 1938.

⁶ W. J. M. Menzies, *Fisher. Scotl. Salm. Fish.*, 1937, No. 1: 1-17, 1937.

⁷ K. Dahl and S. Sømme, *Norsk. Vid.-Ak. Oslo, Mat.-Nat. Kl.* 1935, No. 12: 1-27, 1936.

⁸ A. G. Huntsman, *Bull. Biol. Bd. Can.*, 51: 1-20, 1936.

⁹ H. C. White, *Jour. Biol. Bd. Can.*, 2: 391-400, 1936.

¹ Contribution Number 8 of the Virginia Fisheries Laboratory and the Department of Biology, College of William and Mary.

from a single "sponge" and placing them in large well-aerated tubs, in some of which the water circulated slowly while in others the egg masses were moved through the water so as to simulate natural conditions. Considerable numbers of eggs were hatched under these conditions, but numerical counts were not made to indicate the percentage that hatched into either the prezoal stage or the first true zoeal stage.

In 1941, it was found that "sponges" may be removed from freshly gathered crabs in the field or from those that have been brought to a commercial crab house, transferred to the laboratory, cut up into small pieces and hatched out in shallow pans. Under favorable conditions, the percentage of eggs that hatched into the first true zoeal stage was 90. When hatching occurred under unfavorable conditions, the larvae usually emerged bearing one or both of the following: inner egg shell membrane and the prezoal skin.

Under laboratory conditions, it was possible to rear the larvae from the first true zoeal stage to the second stage. This provides a positive basis for identifying these zoea of the blue crab in plankton. Reasonably certain recognition of further zoeal stages of this species should be possible by using the characters recently listed by Aikawa.²

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THE PERIOD OF GONADAL ACTIVITY IN THE MARYLAND MUSKRAT

As part of a program to investigate reproduction in the muskrat, an extensive histological study has been made of the ovaries and testes of the adult Maryland muskrat. The following preliminary statement is based on the results of examination of sample 8 μ sections of one testis and epididymis from each of 222 male reproductive tracts and of complete serial 10 μ sections of one or both ovaries from 340 female reproductive tracts. The animals were trapped at frequent intervals throughout several years on the Blackwater Migratory Bird Refuge near Cambridge, Maryland. The principal purpose of the study was to determine the periods of gonadal activity and inactivity in the Maryland muskrat as indicated by the presence or absence of spermatogenesis and ovulation in the specimens studied. This report constitutes a summary of the findings; the details will be published elsewhere.

² H. Aikawa, *Rec. oceanogr. Works Japan*, 9: 87, 1937.