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A Brief Sketch of the Breeding Habits
and Embryology of Percina caprodes

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A Brief Sketch of the Breeding Habits and
Embryology of Percina caprodes

Percina caprodes, of the family Percidae, is a small fish about four inches long, with transverse markings on the side. The males may be distinguished from the females by the darker color of these markings. They appear in schools at spawning time, coming in to the shallow windswept shores of lakes from the vegetation zone and deeper waters. When the water is quiet and warm, they move to the very edge of the lake and spawn in a few inches of water; this always takes place in the daytime, probably because of the higher temperature of the water. Breeding occurs in July.

The fish congregate in small groups made up of both males and females, the males being more numerous, in the ratio of about five to one. At intervals a female leaves the group, and is followed by four or five males. If, however, she is not ready to spawn, she returns to the group. If ready, she swims out to one side, pauses on the bottom, and waits for the male, who follows her and rests above her. Then both fishes begin to vibrate the bodies so as to make a depression in the sand. Into this the eggs and sperms fall, to be covered by the sand. This precaution protects the eggs from being eaten by other fishes, among which are the males of Percina.

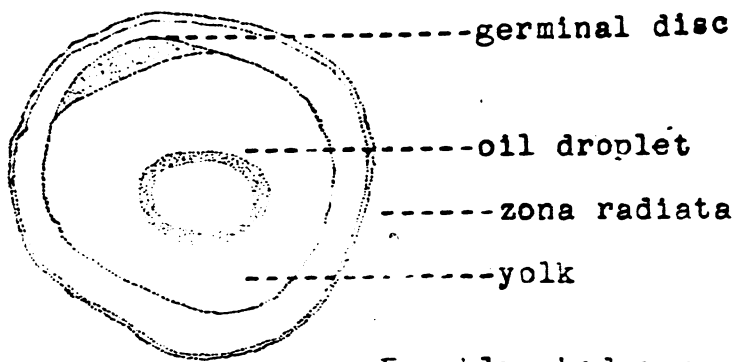
The eggs of Percina are excellent for laboratory study, and for this purpose may be collected with a twenty-five or thirty-foot minnow net. They should then be stripped and the eggs and sperm put into finger bowls

or Syracuse watch glasses. This method is the Russian dry method, so called because a minute or two is allowed to elapse before water is added. The water must be changed each day .

The first cleavage occurs in about an hour, depending upon the temperature. Other cleavages follow at shorter intervals. The higher the temperature, the more rapid and irregular the cleavages. At the end of six hours, the cap of cells projects noticeably above the yolk sphere. At twenty hours the yolk is entirely surrounded. At this time the neural plate is visible. By the forty-eighth hour, the brain is developing, the olfactory area is marked by a depression, the optic vesicles, the optic cup, and the choroid fissure are visible, and the cerebellum has folded up. The first sign of movement is seen in the tail, which is now delimited from the embryonic disk. Chromatophores may be seen, and the heart begins to beat slowly.

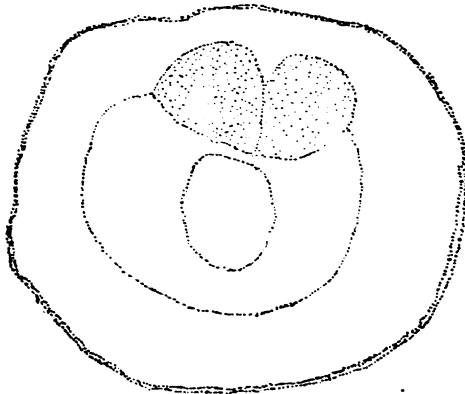
At seventy-two hours, the embryos move frequently and vigorously; the circulation is well-established. A little later, the parts of the heart may be easily studied. Pectoral fins are visible at about the fifth day; the yolk is now considerably reduced and is contained in an elongated sac behind the pericardial cavity.

Hatching occurred on the sixth and seventh days. The tail broke out first. The oil droplet, so prominent in the newly stripped egg, is reduced in size, but still present. About thirty-nine body somites are present. A median fin extends from the anus to the caudal end, then along the dorsal side almost to the head. After hatching, the young fishes swam actively.



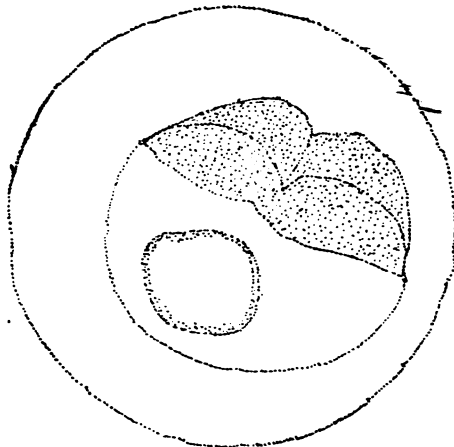
Sperm cells

Freshly shed egg

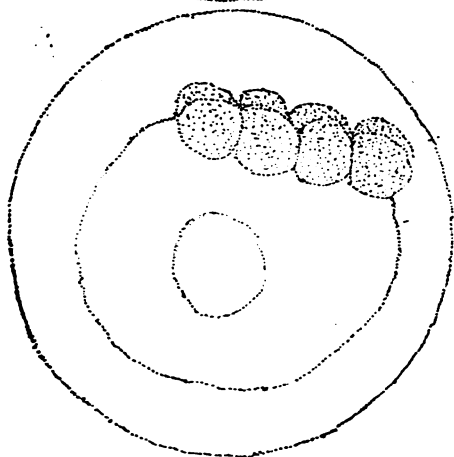


First cleavage.

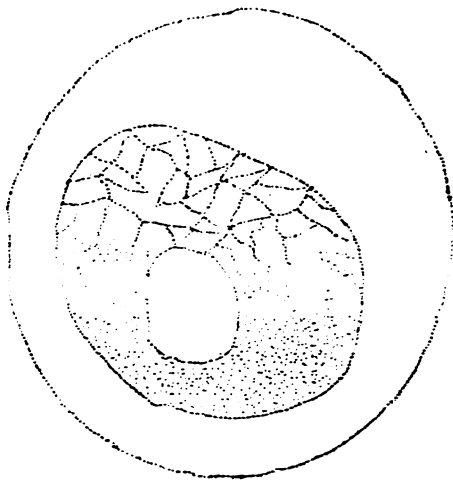
One hour



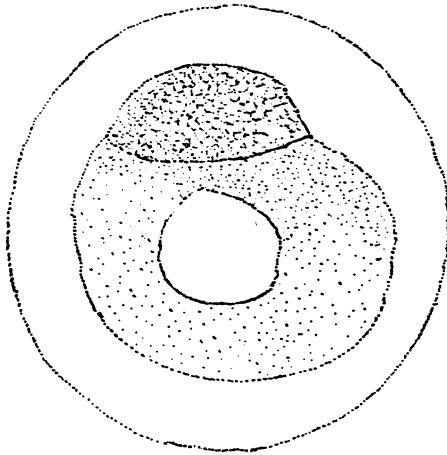
2 hours



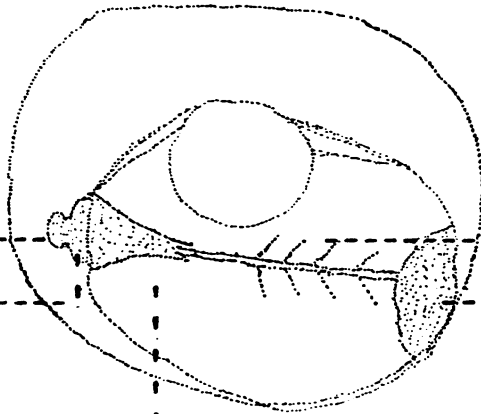
4 hours



24 hours.



50 hours



72 hours

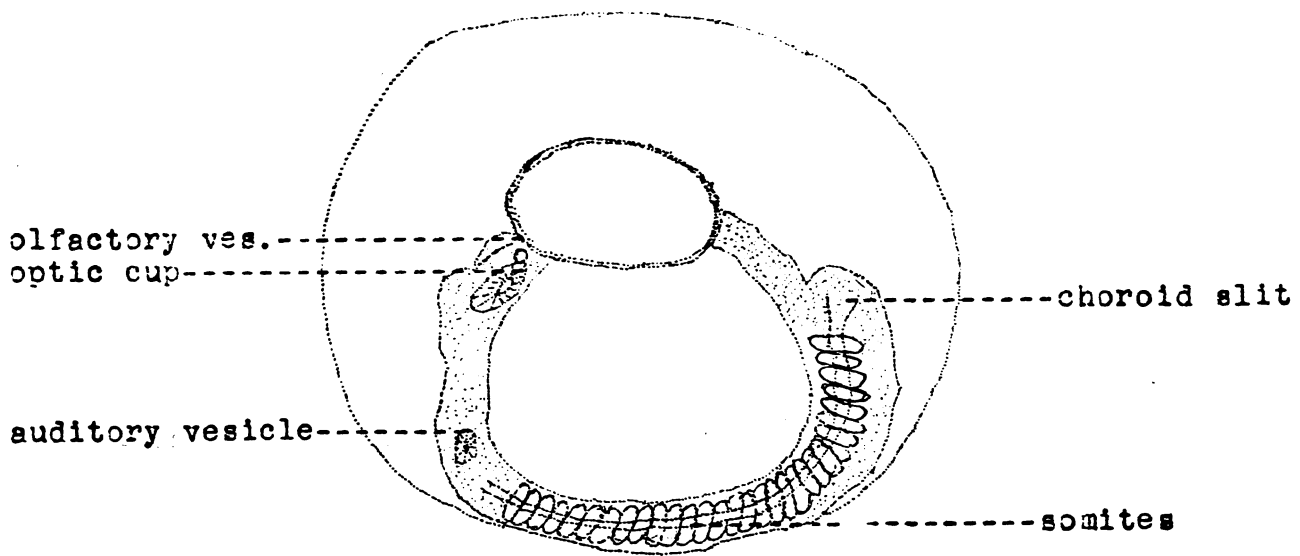
brain-----

-----somites

optic ves-----

-----caudal plate.

choroid slit'



Embryo at Six Days.