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**Color inheritance in *Fundulus* hybrids.****By FRANK W. BANCROFT.***[From the Rockefeller Institute for Medical Research.]*

In the hybrids of *Fundulus heteroclitus* and *Fundulus majalis* it was found that, in general, wherever the color characters were not concerned with the rate of development, the *F. heteroclitus* characters were dominant over those of *F. majalis*. These dominant characters were:

1. Red yolk chromatophores large and abundant.
2. Black yolk chromatophores large and usually polygonal in shape.
3. An early first crop of head chromatophores is present, in addition to a later crop which is found in both pure species and both hybrids.
4. There is a row of red chromatophores on the lateral line shortly before and immediately after hatching. As soon as the fish hatch the red chromatophores begin to fade, and within a few days disappear entirely.

On the other hand, when the characters were concerned with the rate of development, the Mendelian dominance was partly or entirely obscured. These characters were:

5. In *F. heteroclitus* there are no or very few black chromatophores on the lateral line at hatching; but they increase rapidly during the first few days after hatching. In *F. majalis* there are 50 or 60 black lateral line chromatophores at hatching. The hybrids are intermediate.

6. In *F. heteroclitus* when the yolk chromatophores first appear they are uniformly distributed over the whole yolk; while in *F. majalis* they are confined to the hemisphere containing the embryo. The hybrids are intermediate.

7. Both with respect to time, and with respect to the stage of development of the embryo the yolk chromatophores appear first in *F. heteroclitus*, next in the *F. heteroclitus* egg hybrid, next in the *F. majalis* egg hybrid, and last in the pure *F. majalis*.

An apparent case of blended inheritance in the time of the

first appearance of head pigment was found to be really a case of the combination of two crops of head chromatophores, one of which did not develop in the recessive species *F. majalis*.

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### **A note on the relation of the semi-circular canals of the ear to the motor system.**

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The work on the semi-circular canals was undertaken with the object of studying: (1) The results of stimulation of the end organ of the vestibular nerve; (2) the immediate and remote results of destruction of the labyrinth or of the eighth nerve on one or both sides; (3) the effect of removal of various parts of the brain on phenomena which have been observed to follow stimulation or destruction of the labyrinth, and (4) the paths of nervous connection between the labyrinth and the eye muscles — the optico-acoustic path. Later it is the intention to study anatomically the degenerative processes occurring in various parts of the central nervous system after destruction of the labyrinth or eighth nerve.

*Method.*—The mastoid bone is exposed by a skin incision and the separation of the muscles from their attachment at the linea nuchæ superioris and the anterior inferior border of the pars mastoidea. A trephine opening is made through the outer table and diploe of the mastoid bone. The hard portion of the otic bone, in which the semi-circular canals are imbedded, can be removed with a mastoid gouge and the labyrinth destroyed without direct anatomical injury to the cochlea. Dogs, cats and tortoises were used. The results here given apply to dogs, unless otherwise stated.

*Results.*—Immediately following recovery from the anesthetic after removal of one labyrinth, there is marked torsion, particularly of the anterior part of the body, of the animal toward the injured side. The animal is unable to walk and falls over toward