obtained from the tail, previously considered arterial (see, for example: Smith, H. W. From Fish to Philosopher. Ciba Edition, 1959, p. 56) was compared with blood taken directly from the dorsal aorta where it emerges as the confluence of the efferent branchial vessels. The latter, in contrast to caudal blood, was found to be almost completely cleared of ammonia. This observation prompted a functional examination of the general plan of circulation in the sculpin.

The chief feature that emerged from these anatomical investigations was that a large venous sinus lies alongside the much smaller caudal artery, and, in addition to the relatively high resistance renal portal and hepatic portal routes, it conveys blood directly to the heart via a large valveless thoroughfare, the posterior cardinal vein. Suction applied after a syringe needle has been inserted midventrally into the caudal vessels results almost invariably in contaminating drawn arterial blood with large volumes of venous blood which, moving retrograde, can empty both the Cuverian duct reservoir and the entire contents of the posterior cardinal vein. This blood, taken in effect from directly behind the heart, is, of course, essentially similar to blood taken from the ventricle.

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PATTERNS OF PIGMENT CELL REPOPULATION DURING WOUND HEALING IN *fundulus heteroclitus*[*]

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Integumentary melanophores in F. heteroclitus constitute an expanding population of cells with definite lifespans in turnover rates. Represented by a graded series of cell sizes and by corresponding increments in the number of nuclei, these cells differentiate from impigmented precursors, become increasingly multinucleate as their cytoplasmic mass grows, and eventually die to be replaced by another.

On the theory that excessive destruction of pigment cells might accelerate the rate of renewal, their response to epidermal injury has been investigated. Circular wounds 0.5 mm in diameter were inflicted in the median head scales of fish maintained at 28°C in running sea water. Within one day, as epidermal migration proceeded, the mature pigment cells at the periphery of the wound extended their processes centripetally but did not otherwise move into the wound area proper. After 24 hours, small attenuated melanophores appeared *de novo* in the outer regions of the healed area and later repopulated the entire surface of the wound. Originally mononucleate, these cells eventually increased in size and nuclear number until a normal population of cells was reestablished. Xanthophore regeneration was not evident until about the fifth day. Observations of healing wounds in fish kept in constant light or in a completely dark environment, revealed that melanophore differentiation and repopulation was accelerated in dark-adapted fish with maximally expanded pigment cells.

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