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**The General Form of Circulation in the
Dogfish, *Squalus Acanthias****

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An analysis of the general form of the circulation in so-called normal dogfish, *Squalus acanthias*, has been made in terms of blood pressure and heart rate at rest and under various experimental conditions. Heart rates up to 48 per minute have been observed; the usual rate is about 36 per minute. The ventral aortic blood pressure averaged 39/28 mm Hg with a range of 28 to 48 mm Hg systolic, and 20 to 36 mm Hg diastolic at normal heart rates. Dorsal aortic pressures average 30/23 mm Hg with a range of 20 to 38 mm Hg systolic and 16 to 30 mm Hg diastolic. The blood pressure varied directly with body length. It seemed to vary directly with heart rate but showed a marked tendency to level off at heart rates of from 24 to 36 per minute. Venous pressure near the heart was 0 mm Hg; no aspirating mechanisms were found. The intra-pericardial pressure was at atmospheric pressure.

The average decrement in blood pressure during the passage through the branchial "capillaries" from the ventral to dorsal aorta was 9 mm Hg systolic, and 5 mm Hg diastolic. In different fish the diastolic gradient ranged from 1-6 mm Hg. The limits of the transbranchial gradient were not much affected by changes in arterial pressure induced by drugs. Despite the presence of a proximal capillary-sinusoid bed the dorsal aortic pulse pressure ranges from 4 to 14 mm Hg and the dorsal aortic pressure is substantially higher than the oncotic pressure of the blood.

Cardiac output was determined at 0.4 to 1.5 cm³ blood for 1600 gm normal fish, with a maximum output of 3 cm³. Blood volume by the Evans dilution method gave 1 cm³ blood every 15±2 gm of fish. The oncotic pressure was very low, 2-6 cm H₂O.

Addendum: As determined by pharmacologic agents, the circulatory range was 15-50 mm Hg systolic, and 10-40 mm. Hg diastolic but the degree of natural exploitation of this potential, and the quantitative assessment of the balance of the heart and the vascular bed was not entirely clarified.

* A complete report of this work appeared in J. Cell. and Comp. Physiol. 37:389, 1951.