pressure is obviously important. The cardio-inhibitory reflex can be elicited by an increase in gill blood pressure well within physiological limits, and may temporarily decrease the diastolic blood pressure to a significant degree. Such a mechanism might come into play during an ejection reflex when the accompanying rise in ventral aortic blood pressure might cause injury to the thin walled afferent system. Changes in blood pressure which gave evidence of the operation of this reflex were seen during spontaneous ejection reflexes. This mechanism, therefore, being of physiological significance, may be compared with the carotid sinus mechanism in mammals. It is conceivable that in the course of evolution the widespread sensitive areas of the ancestral form, possibly typified by the elasmobranch, were concentrated or delimited until the condition seen in the mammal was reached. The carotid arteries of the mammal are derivatives of the primitive branchial system. The cardio-inhibitory reflex following increase of pressure within the gill vessels in elasmobranchs may exemplify, therefore, the evolutionary forerunner of the carotid sinus mechanism of mammals as it existed in whatever may have been the ancestral form. This is one of the many instances in which it is apparent that physiological as well as morphological factors should be considered in phylogenetic speculation.

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THE EFFECT OF ADRENALIN ON THE BLOOD PRESSURE OF SQUALUS ACANTHIAS

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The distribution and relative preponderance of the components of the autonomic nervous system and the effects of adrenalin on the heart and digestive tract in elasmobranch fishes differs considerably from the same factors in mammals, as pointed out by Lutz (1930, 1931). The well-developed chromaphil system seen in elasmobranchs (Lutz and Wyman, 1927) leads one to believe that it must be of functional significance. The well known effect of adrenalin on the blood pressure of mammals, an effect which is relatively brief and readily duplicated by successive doses, appears to differ from its effect on the blood pressure of cold blooded animals (Bieter and Scott, 1929). Following are the results of a preliminary investigation of the effects of adrenalin on the vascular system of the elasmobranch.

Specimens of *Squalus acanthias* with the spinal cord pithed posteriorly from the level of the sixth vertebra were used. Simultaneous dorsal and ventral aortic blood pressures were recorded by means of two mercury manometers and two cannulas; one inserted in one of the first branches of the ventral aorta (thus leaving the second, third and fourth holobranchs on that side and all the gills on the other side for respiration) and the other inserted in the coeliac artery close to the dorsal aorta. Adrenalin chloride (Parke, Davis & Co.), diluted in urea-saline solution, was injected into the portal vein.

Adrenalin, in doses of one or two c.c. of 1:1000 to 1:500,000, produced long-sustained rises of ventral and dorsal aortic blood pressure, both systolic and diastolic, persisting for 30 minutes or more. Subsequent doses of adrenalin following doses stronger than 1:500,000 produced small temporary increases of systolic pressure due to increase in pulse pressure, with no change in diastolic pressure. Control injections of urea-saline solution gave results which were similar to second doses of adrenaline. It is probable, therefore, that such subsequent doses of adrenalin have little or no effect on the blood pressure. However, after doses of two c.c. of 1:500,000 subsequent doses of adrenalin were effective. The increase of blood pressure following initial doses of adrenalin may be associated with slowing or with no change in heart rate, suggesting a peripheral vasoconstrictor action of adrenalin. Perfusion of the blood vessels of the spiral valve with adrenalin solutions or microscopic observation of the minute vessels of the tail during the injection or direct application of adrenalin gave no evidence of vasoconstriction. Further work is necessary to locate the point of action of adrenalin in producing a rise of blood pressure.

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PHYSIOLOGY OF THE LOWER ORGANISMS

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During the year 1930-31 the following contributions based upon work done at the Mount Desert Island Biological Laboratory were sent to press:

"Locomotion in Amoeba proteus." S. O. Mast, *Protoplasma.*

"Localized Stimulation, Transmission of Impulses and the Nature of Response." S. O. Mast, *Physiol. Zool.*

"Movement and Response in Difflugia with Special Reference to the Nature of Cytoplasmic Contraction." S. O. Mast, *Biol. Bull.*