Comp. Physiol., 1942) these changes could be prevented by the administration of atropine. These changes in renal clearances with diving reveal that the renal circulation is envolved in the arterial constrictor response instead of representing a separate phenomenon of diving in the seal.

Function of Inferior Vena Caval Valve of the Seal (Phoca Vitulina)

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Assumptions have been made in the past that the inferior vena caval valve (IVCV) of the seal constricts during diving to pool blood in the hepatic sinuses and abdominal veins as a reservoir to use while submerged. This would seem not to be an advantage to the seal since most of the cerebral blood flows must return via the extradural vein to the abdominal veins. In order to evaluate the timing of constriction of the IVCV a cannula was threaded up the extradural vein to the level of the neck of the seal. Albumin I-131 administered into a foreflipper vein appeared from the cannula in 20 to 25 seconds whether the seal was diving or not. When the isotope was administered into the renal venous plexus it appeared from the cannula in 25 seconds when diving but was delayed in appearance when the seal was out of water. The data indicate that the IVCV constricts when the seal is out of water. This would fit the suggestion that the IVCV serves to prevent pulmonary congestion when the head is above water.

Observations on the Arterial Constrictor Response To Diving in the Seal (Phoca Vitulina)

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Young harbor seals were trained to dive on a teeter board with the cephalad portion of the body submerged during the diving periods. They learned to dive in this manner for 10 minute periods without struggle or other evidence of fright. Changes in extradural vein blood lactic acid concentrations and oxygen content at 4 minutes of diving, and observations of small webb arteries were used as indices of function of the arterial constrictor response to diving. At 4 minutes of normal trained dive there was no increase in blood lactic acid concentration and little decrease in oxygen content. After I.M. atropine or I.V. tetraethylammonium chloride there was no reflex bradycardia to diving and blood lactic acid concentration increased with the blood oxygen content markedly reduced at 3 minutes of diving. Pilocarpine, given I.V. after the tetraethylammonium chloride but

before the dive, prevented the rise in blood lactic acid concentration or fall in oxygen content at 4 minutes of diving. Pilocarpine was found to cause a severed small webb artery to stop bleeding. The data suggest a cholinergic form of control of the arterial constrictor response to diving.

Plasma Protein Patterns of the Hagfish and Certain Elasmabranchs

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The plasma proteins of one marine cyclostome and a number of marine elasmabranchs were studied by paper electrophoresis. The Spinco Durrum type electrophoretic apparatus was used. Ten to 40 μl of plasma were applied. The paper strips were run for 18 hours in barbital buffer, 0.075 ionic strength, pH 7.8. The miliamperage was held constant at 2.5. They were stained with bromphenol blue.

The single cyclostome (M. glutinosa), the hagfish, showed an electrophoretic pattern smiilar to that which we have reported for the lamprey. The component which moved the farthest appeared to resemble an alpha globulin. Separation of the other components between the origin and the alpha globulin was poor.

The dogfish (S. acanthias) showed a pattern similar to that which has been reported before. There is a sharp alpha globulin peak, there is a peak near the origin, and another peak migrating in the opposite direction. The second two peaks may be gamma globulin fractions. Plasma from young dogfish during various stages of development were studied. "Candles" are embryo dogfish less than 1 year after fertilization. The pups are virtually mature fish in second summer of gestation. Plasma protein patterns from the candles indicated a faint alpha globulin peak and a very small amount of homogeneous protein from the alpha globulin back to the origin. The pups showed a strong alpha globulin peak and a lack of the usual gamma globulin peaks. Also in a number of specimens the pup plasma showed a peak in the beta globulin region.

Two other elasmabranchs were studied, the barndoor skate (R. laevies), and the little skate (R. erinacea). The plasma proteins of both of these elasmabranchs showed patterns somewhat similar to the dogfish, but with the addition of a small but definite concentration of protein which appeared to be albumin.

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