affect incorporation of amino acids into the ganglion cells (Maraini et al, Expt. Eye Res, 6:299-302, 1967). To check this possiblity proline was injected i.p. into two groups of tadpoles, eye-patched and control. Nine hours later no difference in radioactivity was found between the right and left eyes of the deprived animals or between the right eyes of the deprived animals versus the control animals, suggesting that a lowered incorporation rate does not explain the deprivation effects seen in this study.

These preliminary results suggest that visual deprivation in these developing animals affects the amount of newly-synthesized proteins delivered to the axon terminals of the retinal ganglion cells. Further experiments are required to distinguish between changes in amount and rate of transport. The materials transported with the fast component are largely destined for the synaptic terminals (Droz et al, Brain Research in press 1973) and are constituents of cell membranes (McEwen et al, J. Neurobiology, 2:361, 1971). The lability of fast transport in immature animals may be one portal through which the environment can mold the development of synapses and associated membranous structures. (The author thanks Dr. Marion Murray, of the University of Chicago, for the many helpful suggestions, much encouragement, and the use of her facilities.)

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EFFECT OF RECTAL GLAND EXTIRPATION ON PLASMA SODIUM IN THE SPINY DOGFISH *Squalus Acanthias*

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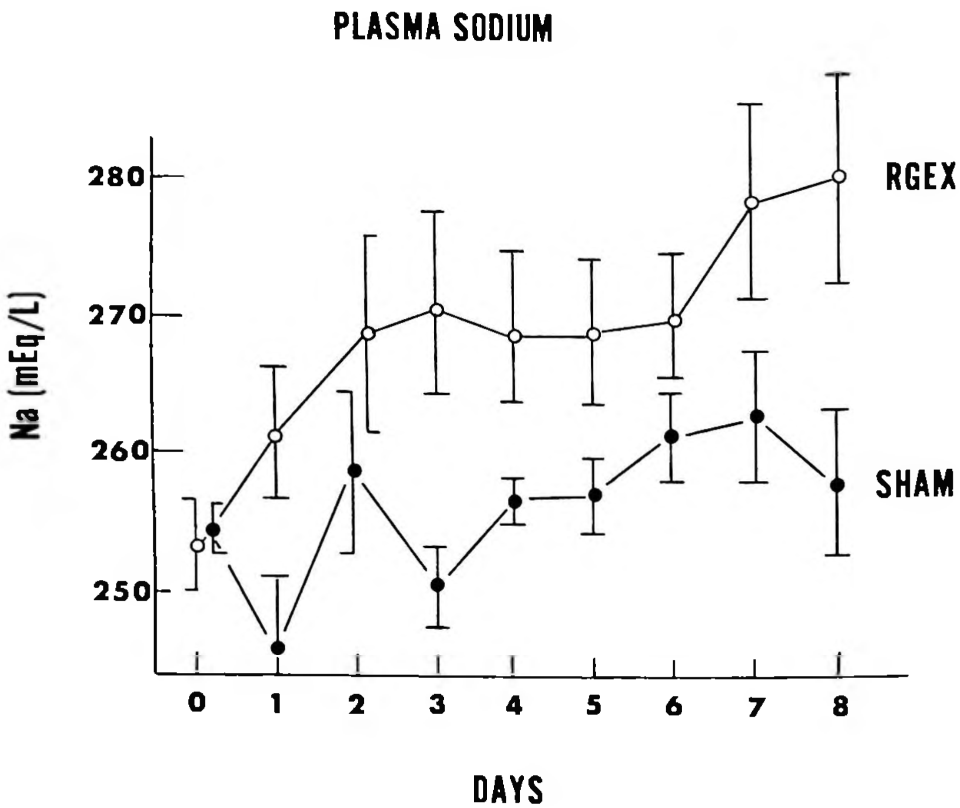
The chemical composition of the plasma in *Squalus acanthias* appears to be regulated by the interactions of the kidney, rectal gland, and gill. The rectal gland secretes a fluid highly concentrated in sodium with a volume flow of approximately the same magnitude as the urine. Nevertheless it has been suggested that the rectal gland is not essential to homeostasis under resting conditions since in early experiments serum chloride was not consistently elevated after the gland had been extirpated (Burger, J.W., Physiol. Zool. 38, 191, 1965).

The rectal gland of seven dogfish was removed via a small abdominal incision. Seven control animals were sham operated including exteriorization and reinsertion of their rectal glands. All animals were kept in a running sea water tank. Plasma sodium, potassium, and urea were measured daily starting immediately prior to the operation.

The daily postoperative evolution of the plasma sodium is depicted in Figure 1, each dot represents the mean±SE. After removal of the rectal gland there was a rapid and sustained increase in the level of plasma sodium that was significantly different from the control animals. No return towards normal values was observed during the entire experiment lasting eight days. Plasma potassium did not change throughout the experiment nor did plasma urea. All animals eventually died due to reopening of the abdominal incision which was apparent an average of four days after the operation in both experimental and control animals.



The present series of experiments emphasize the importance of the rectal gland in the maintenance of a normal serum sodium in *Squalus acanthias*. It is apparent that homeostasis requires the presence of both the rectal gland and kidney and that in the absence of the rectal gland the kidney is not capable of excreting the normal daily load of sodium without the development of hypernatremia.

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TRANSPORT OF FLUID AND ELECTROLYTES BY URINARY BLADDER OF THE AGLOMERULAR MARINE TELEOST ***Lophius americanus***

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This study is a continuation of preliminary investigations of the osmoregulatory role of the urinary bladder. We showed that Na is actively extracted from bladder urine in stenohaline marine teleosts and that its transfer to plasma is coupled with the reabsorption of a solute-linked essentially isosmotic fluid from which free water presumably is generated eventually by the excretion of univalent ions at the gills (Bull. MDIBL 12:35-37, 1972). The model to be tested in our current experiments on aglomerular goosefish calls for the formation of a tubular urine that is hypertonic to plasma