Table 1

DISTRIBUTION OF ^{14}C-DDT IN THE LOBSTER*

Organ	1 Hr	4 Hr	24 Hr	48 Hr	7 Day
Plasma	5.2	2.2	1.7	0.7	0.3
Liver	16.0	52.9	118.6	145.1	171.5
Green gland	41.0	27.3	6.0	4.9	4.6
Stomach	6.2	6.6	2.2	1.6	2.4
Intestine	7.0	7.6	8.1	5.4	4.6
Male gonad	8.1	18.1	6.3	6.5	2.2
Egg mass	7.5	10.9	6.7	21.0	1.4
Brain	8.7	8.4	3.2	3.9	2.4
Gills	9.3	6.2	2.4	1.1	.8
Claw muscle	2.7	4.7	2.6	1.1	.7
Tail muscle	2.6	3.2	2.7	1.5	.6
Heart	85.8	17.9	18.6	1.9	1.8

*Mean disintegrations/ml or g x 10^3 for 3-6 animals for each time period. Each lobster received 0.1 mg/kg (7 x 10^6 d/kg) of ^{14}C-DDT by injection into the pericardial sinus.

plasma at all times studied; and furthermore, the 48-hr levels of this tissue were greater than all other organs except the liver. The male gonad levels at 4 hr were maximum and about equal to the 48-hr egg mass levels. These results have important ecologic and economic significance since they suggest procedures for coping with an acute exposure of lobsters to DDT. Ecologicall the rather persistently high levels of DDT and/or its metabolites in gonadal tissue could affect the reproductive performance of these important marine animals. Economically, it may be feasible to hold lobsters that have been exposed to DDT for more than a week to allow their levels to decrease to relatively harmless levels, but each animal would be rendered safer for consumption if liver were removed.

1970 #16

THE RELATIONSHIP OF DORSAL AORTIC TO RENAL VENOUS PORTAL HYDROSTATIC PRESSURE IN THE SKATE, Raja erinacea

John P. Hayslett, Departments of Internal Medicine and Pediatrics, Yale University School of Medicine, New Haven, Conn.

Forster et al (Bull. MDIBL 9:10, 1969) found increased fractional excretion of urea, chloride and TMAO in Squalus acanthias following injection with epinephrine. The authors suggested that this agent reduced tubular reabsorption by raising hydrostatic pressure in both the dorsal aorta and peritubular capillaries, since elevation of capillary pressure is known to decreas proximal tubular reabsorption in the mammal. In the present study the effect of epinephrine on hydrostatic pressure changes in dorsal aorta and peritubular capillaries was studied in another elasmobranch. Raja erinacea, the common skate.

Seven fish, weighing 0.9 to 1.7 kg, were anesthetized with pentobarbital (18 mg per kg) and curare (0.3 mg per kg). The gills were continuously perfused with sea water (13-15° C) at 21/min. The dorsal and ventral surfaces of the kidney were exposed through a longitudinal incision and the fibrous capsular material was carefully removed. Hydrostatic pressure was measured in peritubular capillaries through micropipettes, using the Landis technique, and in the dorsal aorta via PE 50 polyethylene tubing and a water manometer. In 4 fish the renal arterial and renal venous portal system were injected separately with microfil (Canton Bio-Medical Products) in order to determine the anatomical relationship of the dual vascular supply to surface nephrons.

The peritubular capillaries on the surface of the kidney were found to be derived exclusively from the renal venous portal system. During control conditions the mean dorsal aortic pressure was 14.4 ± 2.1 cm HOH and the capillary pressure was 1.9 ± 0.1 cm HOH. Epinephrine administered intramuscularly as Adrenalin chloride 1-1000 in doses of 100 μg to 1000 μg per kg caused a one-fold rise in dorsal aorta pressure to 30.1 ± 4.6 cm HOH ($p < 0.01$) which was sustained for periods exceeding 2 hours. Despite the marked increase in aortic pressure, there was no apparent change in peritubular capillary pressure during experimental periods, which averaged 2.0 ± 0.2 cm HOH ($p < 0.5$).

This study suggests that alterations in dorsal aortic pressure are not transmitted to the renal venous portal system, from which peritubular capillaries are formed. The effect of epinephrine in the elasmobranch, to reduce renal tubular reabsorption is therefore apparently not related to an elevation of intrarenal hydrostatic pressure.

This study was supported by USPHS Grant, TIAM 5015 and the American Heart Association.

1970 #17

EFFECT OF INTRARENAL HYDROSTATIC PRESSURE ON SODIUM REABSORPTION IN THE PROXIMAL TUBULE OF Necturus maculosus

John P. Hayslett, Departments of Internal Medicine and Pediatrics, Yale University School of Medicine, New Haven, Conn.

Recent studies in the mammal have shown that several extra-epithelial factors, such as renal blood flow and the oncotic and hydrostatic pressure of peritubular capillaries, influence the rate of net fluid reabsorption from the proximal tubule of the kidney. A reduction in oncotic pressure or an increase in hydrostatic pressure results in reduced removal of interstitial fluid, formed by the isotonic reabsorption of tubular fluid. These factors are thought to decrease net outflux either by increasing sodium concentration in expanded lateral cellular channels and basal infoldings to a value which exceeds the gradient established by the sodium pump or by increasing backflux into the cell or across the wall of the tubule into the lumen. In the present experiments the mechanism responsible for decreased net outflux, when capillary hydrostatic pressure is increased, was studied in Necturi using micropuncture analysis.

Adult Necturi, maintained at 15-18° C, were anesthetized with tricaine methane-sulfonate (0.6 g/liter) and prepared for micropuncture. Amphibian Ringer-bicarbonate solution was infused continuously throughout the experiment into a superficial liver vein at 0.04 ml/min. The flux of fluid was estimated in an early portion of the proximal tubule, under conditions of stopped flow, using the split-droplet method of Gertz. The length and diameter of the droplet were mea-