'53 were continued. The following neoplasms were grown as intraembryonic and allantoic grafts in the chick embryo: mouse (E0771, T241L, MA387, C-63); hamster (Hs6, Hs4); rat (Walker carcinosarcoma, Sarcoma 6, Lewis fibrosarcoma, Flexner-Jobling carcinosarcoma); human (Hs#1, H. Ep.#3). Mouse (E0771, T241L, C-63), rat (Lewis fibrosarcoma) and human (H.Ep.#3, Hs#1) tumor grafts grow excellently and can be kept in the laboratory as transmissals on the allantois.

Approximately 1000 transplants have been completed (1953, 1954) from which approximately 400 specimens were obtained. Careful studies on this material have shown that only the mouse sarcomas have the extraordinary properties of stimulating excessive growth in spinal and sympathetic ganglia.

Mouse carcinomas were found to lack this property. Human and hamster tumors were negative. Although rat sarcoma 6 and Walker carcinosarcoma produced mild positive growth responses in spinal and sympathetic centers, the response was not at the same high level as observed with mouse sarcomas.

Experiments were done to explore the effects of nitrogen mustard on the development and maintainance of the induced excessive nerve growth. Chicks with 180 allantoic grafts (implanted at 4 days of incubation) were treated with 0.1 mg. of nitrogen mustard at 11 days of total incubation and sacrificed at 18 days. There was definite evidence of destruction of 180 cells. However, excessive growth in nerve centers (sympathetic and spinal) as well as hyperneurotization of the viscera persisted and was not influenced by the treatment.

Excretion in the Lobster, Homarus: III

J. Wendell Burger
Trinity College

With the method of Martin Rubin it was found that the gills and carapace are relatively impermeable to Mg; that Mg is absorbed from the stomach; that Mg is concentrated by the nephridia; and that the blood level of Mg is fairly strictly regulated. With lobsters placed in dilute sea water, blood Mg remains near normal levels and the U/P ratio may fall below 1. Normal blood mg averaged 6.8 mM/1. (range: 8.6-5.4) with an average plasma/sea water ratio of 0.13. The average U/P ratio was 1.7 (range: 2.6 - 1.05). The gross Mg cycle is uptake from the gut and excretion by the nephridia.

The average level of blood Ca was 15.6 mM/1. (range: 18.6-13.1). The average U/P ratio was 0.81 (range: 0.53- 0.98). The combined values for plasma Mg and Ca were quite uniform averaging 22.4 mM/1. (range: 25.6- 20.0). It would appear that Ca is conserved by the nephridia.

By the Fiske-SubbaRow method, normal urine is free from phos-

phate. Plasma phosphate was about 1.6 mg %. Exogenous inorganic phosphate which raised blood level to about 8 mg %, resulted in phosphate appearing in the urine. Urinary phosphate disappeared before plasma phosphate fell to control levels. Like glucose then, the nephridia totally retain phosphate at normal levels, but permit it to spill over into the urine at higher levels. Since phosphate can disappear from the blood without urinary excretion, it seems likely that the carapace which contains phosphate serves as a dynamic reservoir.

Analyses made by Dr. Alvin Rieck for trimethylamine oxide, showed substantially more of this substance in the urine than in the blood, but not enough to account for the total urinary NPN.

The Mechanism of Acidification of Dogfish Urine and the Effects of 6063 Injections on the Blood and Urine of Fishes*

H. O. Heinmann, J. E. Hodler (1952-1953)
J. Block, and A. P. Fishman
Columbia University and New York University

Several years ago, it was reported (W. W. Smith) that the urinary pH in both dogfish and sculpin is fixed at about 5.7 and cannot be changed by the intravenous administration of a variety of substances. It was suggested that the fixity of the urinary pH might be related to the fact that in marine fish the urine contains large quantities of magnesium which precipitate as $Mg(OH_2)$, $Mg(NH_4)PO_4$, or $MgHPO_43H_2O$ if the urinary pH exceeds 6.0. The mechanism of acidification was, by a process of exclusion, related to exchange of H ions for cations as previously hypothesized (H. W. Smith, 1937). Support for this mechanism was subsequently adduced by others in mammals, using either sulfanilamide, or the sulfonamide derivative "Diamox" (6063) to inhibit the carbonic anhydrase involved in the hydrogen ion exchange mechanism.

Studies were conducted during the summers of 1952-1954 on acidification mechanisms of the urine of marine dogfish (*Squalus acanthias*), sculpin (*Myoxocephalus scorpius*), and fresh water catfish (*Ameirus nebulosus*), and on the effects of "Diamox" on blood and plasma composition.

In the dogfish and catfish, urine was collected from a rubber balloon attached to an indwelling urinary catheter. In the sculpin, the urinary papilla was ligated and urine was collected by direct puncture of the bladder. Whereas each dogfish and catfish served as its own control, separate groups of sculpins were used for control and experimental periods.

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