

Research Reports: 1956

When nestlings and young adult birds in captivity were fed on fresh fish, the water content of the food was much higher than necessary for the renal excretion of the salts of the food, as well as for nitrogen (uric acid) excretion. Birds feeding on marine fish would therefore seem to be independent of drinking water, and ingestion of sea water would impair an otherwise favorable water and salt balance.

However, during experimental salt loads imposed orally or by infusion of hypertonic NaCl solution, it was found that cormorants react to an osmotic load in an unexpected way. Under such load they secrete a highly hypertonic fluid from the nose, the secretion dripping out from the internal nares and collecting at the tip of the beak, from which the bird shakes the drops with a sudden jerk of the head.

The concentration (500-600 mN NaCl) and the rate of secretion (up to 0.15 ml/min in a 1.5 kg bird) are so high that with continuous secretion the entire NaCl content of the body could be eliminated in roughly 10 hours. The secretion contains practically only sodium and chloride in nearly equivalent amounts.

The production of the nasal secretion is stimulated not only by NaCl, but also by a non-electrolytic osmotic load (sucrose). The secretion obtained in response to such stimulation is similar in composition to that obtained by stimulation with NaCl, indicating that the mechanism responds to general osmotic conditions, rather than specifically to NaCl concentration.

The physiology of this mechanism as well as the anatomy of the nasal region are being further investigated.

Transpulmonary Passage of Leukemia Cells

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Experiments were designed to determine if cells, capable of producing leukemia, could pass immediately through the pulmonary circulation. The answer to this question is necessary to an understanding of the pathogenesis of leukemic infiltration. The transplantable B W 5147 lymphatic leukemia was used in A K R mice. Leukemia cells were injected intravenously and simultaneously the aortic blood was collected. This aortic blood was then injected intravenously into a second normal animal. If the second animal developed leukemia, this would indicate that cells capable of producing leukemia had passed through the lungs of the first animal. The mice used were 2 months old, and the second animals were sacrificed 1 month after the intravenous injection of aortic blood.

In one set of experiments the test cells were derived from a subcutaneous implant of B W 5147, and about 2 million leucocytes were used in each intravenous injection. In 6 out of ten such experiments, leukemia cells passed immediately through the lungs. In another set of experiments, diluted leukemia blood was used. The total number of leucocytes in each

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test injection was 80,000. Seven out of 10 experiments were positive, in that the second animal, which received aortic blood from the first animal, subsequently developed leukemia.

It is concluded that cells capable of producing leukemia can pass unarrested through the pulmonary circulation.

A Quantitative Analysis of Time Relationships in the Early Cleavage of Normal Fertilized Eggs of *Echinarachnius parma*, and the effect of Photodynamic Action.

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Quantitative studies of the time relationship in the early cleavage of *Echinarachnius parma* were done according to Method 2 of Blum and Pierce (Jour. Gen. Physiol. 33: '50). In normal fertilized eggs the time from fertilization to first cleavage was 115-130 minutes. The interval from first to second cleavage was 40-43 min. and the second to third cleavage interval was 39-42 minutes. The temperature maintained during the study was $16^{\circ}\text{C} \pm 0.5$. A scatter plot for each egg counted from a single female was made. This plotted the time of the interval, fertilization to first cleavage, against the time from fertilization to second and/or third cleavage. The plot indicates no correlation in the order of eggs cleaving for any given cleavage. However, the average time interval between cleavages is fairly constant when taken from different animals.

When sperm were placed in a $1.1 \times 10^{-7}\text{M}$ solution of toluidine blue in sea water and exposed to light for two minutes the interval, fertilization to first cleavage, was extended about 25 minutes. Subsequent cleavages were not affected, neither was there any detectable effect on later development. However, if the time of exposure to light was 10 min. cleavage was abnormal. Sodium sulphite would reverse both of the above effects. A dark reaction was not detectable at the concentrations used for the photodynamic action.

Transfer of Drugs From Blood to Brain, Muscle and Cerebrospinal Fluid of *S. Acanthias*, *Gadus Callarias* and *R. Catesbiana*

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It has previously been established (Zubrod 1953) that the "barrier" to the transfer of sulfanilic acid from blood to the central nervous system of *S. acanthias*, excluded the drug from brain but not from cerebrospinal