would be ordinarily expected for electrolyte solutions of the usual monovalent type. The alkaline properties of the gland fluid are satisfactorily explained by primary secretion of OH^-, with buffering by CO_2. The process is catalyzed by carbonic anhydrase in two of the species (R. erinacea; R. ocellata) studied but not in R. stabuloforis. If the enzyme is inhibited in the two former species during production of fluid, the accumulation of OH^- and CO_2 is decreased.

Histologic studies show a highly active epithelial surface. There are vesicular nuclei, well developed Golgi apparatus, abundant mitochondria, apical basophilia and brush border. The secretory surface is backed by dense connective collagenous tissue interspersed with smooth muscle. The gland is very vascular.

The function of the gland remains unknown. Its fundamental interest for us lies in its alkaline secretion and anion pump, which also provide a useful analogy to gastric and pancreatic secretions. A final publication is being submitted to Comparative Biochemistry and Physiology.

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1962 #22

ALVEOLAR GAS EXCHANGE IN THE HARBOR SEAL, Phoca vitulina

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Data concerning alveolar gas exchange in the seal are sparse. The use of a rapid acting infrared CO_2 analyzer and a specially designed face mask permitted the determination or calculation of the various gas exchange parameters. Studies were performed in duplicate in 6 young female animals. The mean values obtained were as follows: $PaCO_2$: 49 mm of Hg; V_E: 4.5 liters/min; respiratory frequency: 22 breaths/min; CO_2 production: 174 ml/min; O_2 consumption: 217 ml/min; respiratory exchange ratio: 0.80; alveolar ventilation: 2.6 liters/min; physiologic dead space: 89 ml; calculated alveolar oxygen tension: 100 mm of Hg.

The following conclusions are indicated:

1. The basal alveolar CO_2 tension of the seal is significantly higher than that of the resting human.
2. Minute volume, alveolar ventilation, respiratory dead space, resting oxygen consumption and CO_2 production and alveolar O_2 tensions are in the same range as those found in the human when corrected for the difference in mass of the two species.
3. The resting respiratory exchange ratio is consistent with the high protein intake of this animal.

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1962 #23

INTRACELLULAR ELECTROLYTE PATTERNS IN DOGFISH. I. ERYTHROCYTE

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The composition of plasma and extracellular fluid in the elasmobranch differs markedly

from that in mammalian blood. Plasma Na^+ and Cl^- concentrations are significantly higher while K^+, H^+, H_2CO_3 and HCO^- are significantly lower. No data are available concerning the concentrations of these electrolytes in red cell intracellular water. Simultaneous determinations of plasma and red cell concentrations of Na^+, K^+, Cl^- and H^+ (DMO technique) were performed in 10 dogfish. The ratio of intracellular to plasma concentrations were calculated. Mean values are as follows:

	(RBC) meq/Kg H_2O	Plasma meq/Kg H_2O	$\frac{[C]\ RBC}{[C]\ Plasma}$
Cl^-	141	248	0.566
H^+	6.0×10^{-8} M/L	3.2×10^{-8} M/L	0.530*
Na^+	43	246	0.183
K^+	211	3.3	72.2

*$\frac{[H^+]\ Plasma}{[H^+]\ RBC}$.

These data show that Cl^- and H^+, as is probably true of mammalian red cells, are passively distuibuted obeying Gibbs-Donnan distribution since $\frac{[H^+]\ RBC}{[H^+]\ Plasma} = \frac{[Cl^-]\ Plasma}{[Cl^-]\ RBC}$. The dogfish red cell resembles that of man and differs from the dog red cell in being a low Na^+, and high K^+ cell.

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1962 #24

INTRACELLULAR ELECTROLYTE PATTERNS IN THE DOGFISH. II. MUSCLE AND BRAIN

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The extracellular electrolyte pattern of elasmobranchs differs in striking fashion from that of mammals. No data are available concerning the electrolyte pattern of intracellular water.. Therefore measurements of Na^+, K^+ and Cl^- concentrations in muscle and brain water of the dogfish, S. acenthias, were performed and have been compared with corresponding values in the extracellular fluid.

Measurements were performed on tissues obtained from 10 animals and the following results were obtained:

	Na^+ meq/Kg H_2O	K^+ meq/Kg H_2O	Cl^- meq/Kg H_2O
Plasma	246	3.33	248
"ECF"	234	3.16	260
Muscle	57	162.00	35
Brain	136	146.00	98