reported for ducks laying eggs with 20 percent thinned shells (Peakall, et al., J. Gen. Pharmacol. 4: 305, 1973). In addition we have surveyed shell gland ATPase and calcium binding protein activities in DDE-fed ducks laying thin-shelled eggs and found that only the Ca-ATPase activity was significantly reduced in vivo (Table 1). The results of preliminary experiments with chicken, *Gallus domesticus*, shell gland mucosa show the Ca-ATPase to be less sensitive to DDE inhibition in vitro than the duck enzyme (Figure 2). The chicken is generally regarded as a species that does not lay thin-shelled eggs in response to DDE feeding.

In conclusion we have found a Ca-activated ATPase in duck shell gland mucosa which is inhibited by DDE in vivo as well as in vitro. Since calcium transport across avian shell gland is known to be an active process (Ehrenspeck et al., Amer. J. Physiol. 220: 967, 1970; Pearson and Goldner, Amer. J. Physiol. 225: 1508, 1973) this Ca-ATPase may function as a "Ca^{++}-pump" similar to the pumps already described in other tissues -- muscle sarcoplasmic reticulum. If so, partial inhibition of the enzyme by DDE would result in reduced calcium transport across the shell gland to the calcifying egg.

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EFFECTS OF MAGNESIUM ON POTASSIUM EXCRETION IN *Squalus acanthias*

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Earlier studies of cation excretion in *Squalus acanthias* in our laboratory focused attention on attempts separately to induce natriuresis or urea

diuresis and to assess the effect of increase in sodium excretion on the excretion of other cations. Both furosemide and ethacrynic acid increased sodium and urea excretion without change in inulin clearance. Epinephrine resulted in an increase in inulin clearance, and sodium and urea excretion. Phloretin increased urea excretion with lesser change in sodium excretion. Phloretin however resulted in a decrease in inulin clearance and a decrease in renal reabsorption of both sodium and urea. Accordingly attempts thus far to change sodium or urea reabsorption by the kidney of *Squalus acanthias* have all resulted in a qualitatively similar change in both.

Excretion of other cations in response to natriuresis was different in the dogfish to the response reported in mammals. Although in the mammal natriuresis is associated with parallel increases in calcium and magnesium excretion there was no increase in magnesium excretion in the dogfish in response to natriuresis. Potassium excretion showed no consistent change following either furosemide or ethacrynic acid administration.

The effect of magnesium loading on cation excretion in the dogfish has now been examined. Recently trawl captured female dogfish were studied using renal clearance techniques similar to earlier studies reported (Bulletin M.D.I.B.L. 11:71, 1971 and 13:88, 1973). A minimum of two control urine collections of approximately 120 minutes were obtained following which magnesium was given intravascularly in the form of $MgCl_2$ in distilled water, and urine collections were continued. The fish showed no evidence of toxic effects of the magnesium administration.

As previously noted potassium excretion in the urine of freshly captxred dogfish is highly variable, ranging in this study from 7.7 to 188 mEg/Kg/hr. Regardless of the amount of potassium excreted during control periods there was a decrease in potassium excretion after magnesium loads ranging from 4.8

POTASSIUM EXCRETION, mEg/Kg/hr., BEFORE AND AFTER $MgCl_2$ LOAD

Magnesium Load, mEg	Control Mean	After Magnesium Load		
		1st Collection	2nd Collection	3rd Collection
4.8	7.7	3.0	0.9	
4.8	33.2	13.1		
4.8	36.8	20.7	18.0	
7.2	19.4	1.3	1.2	1.5
7.2	27.6	9.4	2.5	6.6
7.2	69.4	36.7	33.0	
10.	37.6	14.0	30.9	27.5
10.	8.0	2.0	1.6	
10.	18.4	10.1		
10.	48.4	22.8	4.9	
10.	187.8	64.3	37.5	
10.	161.9	57.5	8.6	10.0
10.	117.2	26.9	5.5	5.6
10.	33.0	10.3	3.7	7.7

to 10 mEg. Control fish studied for similar periods of time but receiving dogfish Ringer instead of $MgCl_2$ showed no decrease in potassium excretion with time.

These results demonstrate an interesting relationship in cation excretion in the dogfish. This decrease in potassium excretion occurred without change in inulin clearance and without consistent changes in sodium or urea excretion.