parabiotic twin alone. The effects of dietary and other factors on sex-differentiation in unoperated *Amblystoma maculatum* require further investigation in view of Burns's results and of the abnormal sex ratios reported by the writer[6] in laboratory-reared animals of this species.

6050

Influence of Posterior Pituitary Extracts on Mineral and Water Exchange in Children.*

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The influence of posterior pituitary extracts on mineral and water exchange was studied in 2 boys aged 9 and 5 years. The environmental and metabolic conditions, except for changes induced during experimental periods, were kept as constant as possible throughout the study. Each day was divided into 4 six-hour periods beginning at 6:00 A.M. At the beginning of each period, the subject voided, was weighed, and then given an accurately prepared meal of known weight and composition. The 4 meals of the day were identical in every respect and were prepared from simple foods of relatively constant mineral content. Water balances were calculated by the method suggested by Newburgh, Johnston and Falcon-Lesses.[1] On ashed urine sodium was determined by the uranyl acetate method of Barber and Kolthoff[2] and potassium by the chloroplastinate method of Shohl and Bennett.[3] In view of the short periods utilized, mineral excretion in the stool was disregarded and average urinary excretion on control periods was used as a base line for determining fluctuations from normal during experimental periods. The posterior pituitary preparation pitressin was administered in all instances by the subcutaneous route.

The results of the 2 experiments presented in Table I clearly dem-

[6] Humphrey, R. R., *Anat. Rec.*, 1931, **48**, 22.

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[1] Newburgh, L. H., Johnston, M. W., Falcon-Lesses, M., *J. Clin. Invest.*, 1930, **8**, 161.

[2] Barber, H. H., Kolthoff, I. M., *J. Am. Chem. Soc.*, 1928, **50**, 1625.

[3] Shohl, A. T., Bennett, H. B., *J. Biol. Chem.*, 1928, **78**, 643.

TABLE I.
Effect of Pitressin on Water Balance and Urinary Sodium Potassium and Chlorid Excretion. H. D., 5 yrs.

Days	Time	Body* Weight	Pitressin	Total Water Available gm.	Total Water Lost gm.	Total Water Balance gm.	Urine Na m.eq.	Urine K m.eq.	Urine Cl m.eq.
			PART 1.						
1	6 A.M.—6 A.M.	20410		1489	1632	—143	33.7	29.0	47.0
2	6 A.M.—6 A.M.	20325		1488	1614	—126	32.0	30.0	46.0
3	6 A.M.—6 A.M.	20260	0.4 cc./3 hr.	1989	1530	+459	66.0	23.0	75.0
4	6 A.M.—6 A.M.	20795		1489	2206	—717	19.0	24.0	31.0
5	6 A.M.—6 A.M.	20150		1489	1386	+103	10.7	26.0	26.0
6	6 A.M.—6 A.M.	20345		1487	1409	+ 68	26.0	26.0	42.0
7	6 A.M.—6 A.M.	20500		1488	1615	—127	36.0	26.0	48.0
			PART 2.						
	6 A.M.—12 N.	20050		373	375	— 2	10.0	12.5	18.0
	12 N. —6 P.M.	20070		372	484	—102	9.9	10.7	14.9
	6 P.M.—12 Mn.	19975		370	314	+ 56	3.7	4.8	8.0
	12 Mn.—6 A.M.	20060		379	293	+ 76	2.5	4.7	6.4
1	6 A.M.—6 A.M.			1486	1466	+ 20	26.1	32.7	47.3
	6 A.M.—12 N.	20165	0.3 cc./3 hr.	625	344	+281	19.0	12.7	25.0
	12 N.—3 P.M.	20465		355	291	+ 64	14.0	4.3	13.3
	3 P.M.—6 P.M.	20570		19	588	—569	17.6	4.5	10.5
	6 P.M.—12 Mn.	19950		370	446	— 76	3.0	7.2	6.2
	12 Mn.—6 A.M.	19905		369	303	+ 66	1.7	4.7	3.5
2	6 A.M.—6 A.M.			1738	1982	—244	55.3	33.4	58.5
3	6 A.M.—6 A.M.	20000		1488	1431	+ 57	11.2	29.5	28.5
4	6 A.M.—6 A.M.	20135		1489	1505	— 16	34.6	34.0	50.0
Average excretion on 8 control days							32.0	31.0	46.0

* Body weight at the beginning of each period.

onstrate that pitressin has a pronounced effect on mineral as well as water exchange.

The retention of water during the period of antidiuresis is associated with a large increase in urinary sodium and chlorid excretion. Potassium output is diminished in one experiment but is unaltered in 2 other studies. The effect of pitressin lasts about 3 hours after the last injection and is followed by an enormous water loss, exceeding the storage of the antidiuretic period by several hundred grams. The increased sodium and chlorid excretion persists throughout the period of diuresis. During the recovery period, which lasts over several days, appreciable amounts of sodium and chlorid are retained.

The storage of water associated with a loss of body sodium and chlorid under the influence of pitressin is of particular interest in view of the predominating belief that an accumulation of water in the body entails a retention of base. In day 3, part 1 of the table, the body loses 34 m.eq. of sodium and 29 m.eq. of chlorid simultaneously with the storage of 459 gm. of water. If the assumption

is made that the greater part of the water is retained as extracellular fluid, which under normal conditions contains about 15.7 m.eq. of sodium per hundred grams, a total sodium deficit of approximately 100 m.eq. exists. The excessive water loss during the period of diuresis more than compensates for the sodium and chlorid deficit and may represent an attempt on the part of the organism to restore the normal electrolyte composition of the body fluids.

A significant diurnal variation in mineral excretion is noted in day 1, part 2 of the table. It has been noted consistently throughout a long series of unpublished experiments and is independent of diurnal variations in water excretion and metabolic rate.