

Table 2. INFLUENCE OF ALDOSTERONE AND VASOPRESSIN ON ACTIVE SODIUM TRANSPORT BY THE TOAD BLADDER AND ON TISSUE LABELLING WITH SODIUM-22

Untreated animals		Paired membrane exposed to vasopressin		Animals treated with aldosterone		Paired membrane exposed to vasopressin	
Control membrane μ amp*	labelling†	μ amp*	labelling†	Control membrane μ amp*	labelling†	μ amp*	labelling†
55	8.3%	136	9.9%	80	10.4%	145	15.3%
25	4.8%	63	8.0%	83	13.2%	136	14.3%
95	12.2%	215	25.8%	80	14.2%	121	15.1%
				144	13.1%	224	18.1%

* Mean short-circuit current during the last 30-min period.

† Concentration of sodium-22 in tissue water relative to that on the mucosal side of the membrane. The total concentration of sodium on that side was 25 mM./l. for this series of incubations.

rate of transfer of sodium across the epithelial cell layer. In this respect, the influence of aldosterone resembles that of antidiuretic hormone, and both hormones actually combine their effects on this presumably passive albeit carrier-dependent⁶ transfer of sodium across the cell mucosal border. How aldosterone facilitates this transfer and whether it acts in addition on the 'pump' directly are still unanswered questions.

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Mesial Surface of the Brain and Genital Function

WORK ON the mesial surface of the cortex has produced conflicting observations on the part played by the cingulate gyrus in behaviour. Smith^{1,2}, Ward³ and Glees *et al.*⁴ reported that cingulectomy produces profound changes in the social and emotional behaviour of monkeys and similar observations have been made by Kennard⁵ on the cat. In contrast, Pribram and Fulton⁶ and Mirsky *et al.*⁷ have observed little or no permanent effect following bilateral ablation in the monkey and this conclusion has been supported by investigations on the cat⁸.

Our observations have been restricted to sexual behaviour. Adult rhesus monkeys (*Macaca mulatta*), two males and two females, were used in the investigation and were observed over a period of eighteen months. They were caged individually and their sexual activity was assessed by caging the mating pairs together for half an hour each day for thirty consecutive days. In the pre-operative control phase copulation occurred daily for the period of the assessment in each pair and was unaffected by the female cycle.

Cingulectomy (areas 23 and 24) was performed through a fronto-parietal craniotomy. The dura was reflected toward the midline and the gyrus was approached by retraction at the sensory cortex. The ablations extended to the sensory cortex of the mesial surface, particularly in the second animal.

In the first male the operation was carried out in two stages. No impairment of locomotion was produced by the right-sided ablation but an inability to grip with the right hind-limb followed the left-sided craniotomy. The sexual activity of the animal was assessed from the third

post-operative day of each operation. Copulation occurred daily for a period of thirty days in each case, although the animal had some difficulty in maintaining the position due to the impairment of grip. Bilateral carotid angiography was normal. The female gave birth to a normal healthy monkey twenty-nine weeks after the first stage and eighteen weeks after the second stage. Copulation continued to within twelve weeks of the delivery.

In the second male the ablation was carried out in a single stage; a total paraplegia was produced. The female was caged regularly with the male from the third post-operative day. During the stage of total paraplegia erection was not impaired; but as the animal was unable to adopt the copulatory position ejaculation did not occur. With some recovery in the paralysis, daily copulation occurred and was maintained for a period of thirty days even though a considerable motor deficit was present.

These investigations suggest that the cingulate gyrus is not essential for sexual performance in the monkey and would support the observation of Pribram *et al.*^{6,7} that the gyrus is not intimately concerned in emotional behaviour. The paralyses of the hind limbs, produced by the lesions extending to the somatic area 1, were accompanied by normal sexual activity. This observation would be in accord with the conclusions of MacLean and his associates⁹⁻¹¹ from work on the squirrel monkey (*Saimiri sciureus*), that the somatic and autonomic aspects of genital function may be integrated by subcortical systems.

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Uptake of Tritiated Aldosterone by Rat Tissues

As Tait *et al.*¹ have pointed out, the half-life of aldosterone in plasma does not reflect metabolism alone. The calculated 'volumes of distribution' for the body compartments exceed that of total body water, suggesting that aldosterone is selectively taken up by some region of the body². The work recorded here shows that injected tritiated aldosterone is unevenly distributed in the various tissues, that the rate of its disappearance from the tissues varies, and that in the liver the radioactivity is found predominantly in the supernatant fraction.

Male Holtzman rats, 275-300 g, maintained on a synthetic diet with a constant daily intake of sodium and potassium were used throughout. Four microcuries of chromatographically pure 1,2-³H-*d*-aldosterone (100 mc./mg) in 2 ml. of 5 per cent glucose were injected into the tail vein. Groups of rats, consisting of four animals, were killed by decapitation at intervals after injection of 5, 15, 30, 60 and 90 min. A sample of blood was collected. The tissues (heart, lung, muscle, spleen, intestine, aorta, brain, adipose tissue, kidney and liver) were immediately