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¹ Grubb, R., and Morgan, W. T. J., *Brit. J. Exper. Path.*, **30**, 198 (1949).

² Andresen, P. H., Callender, S., Fisher, R. A., Grubb, R., Morgan, W. T. J., Mourant, A. E., Pickles, M. M., and Race, R. R., *Nature*, **163**, 580 (1949).

Effect of Posterior Pituitary Extract and its Fractions on Renal Electrolyte Excretion

It seems to be generally accepted that, in addition to its antidiuretic effect, posterior pituitary extract has a chloruretic action. All workers appear to have found an increase of chloride concentration in the urine; but there is by no means unanimity whether the actual amounts excreted are increased, results varying with the species and experimental conditions (see, for example, Shannon¹ and O'Connor²). Furthermore, it is not clear which of the posterior pituitary fractions is mainly responsible for the chloruretic effect, and which ions are excreted with the chloride.

Some observations on this subject have been recently published by O. Schaumann^{3,4}, who investigated the action of oxytocin and of vasopressin on the renal excretion of chloride, sodium and potassium ions in rats. We have been engaged in similar experiments. The effect of small doses (3 milliunits/100 gm. s.c.) of 'Pitocin', 'Pitressin' and 'Pituitrin' on the chloride excretion of hydrated rats was first investigated. It was found that the changes in the rate of chloride excretion obtained with 'Pituitrin' and 'Pitressin' coincided—as might have been expected—with the antidiuretic effect. The duration of the antidiuretic effect was therefore used to determine the urine-collecting period. The effect of the injection of posterior pituitary extracts on the rate of chloride, sodium and potassium

ion excretion was then studied in rats on standard and sodium chloride-enriched diets.

It will be seen from the accompanying table that both 'Pitocin' and 'Pitressin' increased the rate of potassium excretion, but that 'Pitressin' depressed the excretion of sodium. The effects of the posterior pituitary fractions on chloride excretion appeared to depend on the chloride content of the diet. It will also be noted that the effect of 'Pituitrin' on our rats resembled that of 'Pitocin' rather than that of 'Pitressin'. Schaumann⁴ used doses more than ten times greater than ours, and it is difficult, therefore, to relate his results to ours, particularly as even the small doses used by us are known to have marked effects on the glomerular filtration-rate in rats (Dicker and Heller⁵). Our experiments are being extended to determine to what extent changes in glomerular filtration-rate produced by the posterior pituitary principles bear on renal electrolyte excretion.

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¹ Shannon, J. A., *J. Exp. Med.*, **76**, 371 (1942).

² O'Connor, W. J., *Proc. Physiol. Soc.*, July 1-2 (1949).

³ Schaumann, O., and Schmidt, L., *Arch. Exp. Path. u. Pharmacol.*, **205**, 367 (1948).

⁴ Schaumann, O., *Experientia* (in the press).

⁵ Dicker, S. E., and Heller, H., *J. Physiol.*, **104**, 353 (1946).

Effect of Hæmagglutinating Viruses on the Electrophoretic Mobility of Human Erythrocytes

THE enzymic activity of influenza viruses, recently characterized in chemical terms for the substrate ovomucin¹, was first suggested by Hirst², who showed that, following the agglutination of erythrocytes, the virus was eluted spontaneously, leaving the cells inagglutinable by the same strain. Burnet, McCrea and Stone³ found that cells from which one strain had become eluted were still agglutinable by certain other strains. The arrangement of influenza *A* and *B*, mumps and Newcastle disease viruses in the order of their progressive action on cellular receptors was termed the 'receptor gradient'. Elucidation of this unique enzyme-substrate relationship, characterized by the varying extent of interaction, is limited by the qualitative nature of the biological method. The finding of Hanig⁴ that, following treatment with the *PR8* strain of influenza virus, the electrophoretic mobility of human erythrocytes was markedly reduced, suggested a biophysical approach to the problem.

Human cells were incubated at 37° C. with excess amounts of the viruses shown in the accompanying table for periods sufficient to allow the reaction to proceed to completion, as judged by changes in agglutinability and electrophoretic mobility. Except in the case of Newcastle disease and mumps viruses, cells were stabilized with immune serum before testing⁵. Microelectrophoresis was carried out at 25° C. in an *M*/15 phosphate buffer of pH 7.35 after the method of Moyer⁶.

The results show that with each virus the loss of agglutinability is accompanied by a reduction in mobility, corresponding, in most cases, with the position of the virus in the receptor gradient. New-

	K		Na		Cl		Unknown ions	
	<i>a</i> *	<i>b</i> **	<i>a</i>	<i>b</i>	<i>a</i>	<i>b</i>	<i>a</i>	<i>b</i>
Controls (micro-mol./100 gm. rat/min.)	0.13	0.22	0.24	0.15	0.19	0.13	0.18	0.24
Ratio 'Pitocin'/controls	2.4	2.1	1.0	1.0	0.9	2.1	2.1	1.4
Ratio 'Pitressin'/controls	1.7	1.2	0.4	0.7	0.5	1.2	1.2	0.8
Ratio 'Pituitrin'/controls	2.2	1.7	1.2	1.6	1.6	3.3	1.4	0.9

*. Rats on standard diet. ** Rats on sodium chloride-enriched diet.