

This triangle was therefore probably known to the Egyptians as early as the fifth millennium B.C., as the ostrakon is ascribed to the Third Dynasty.

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<sup>1</sup> *Annales du Service des Antiquités de l'Égypte*, 26, 197-202 (Cairo, 1926).

<sup>2</sup> "Ancient Masonry", 52-53 (London, 1930).

<sup>3</sup> *Ancient Egypt*, 103 (Sept./Dec., 1933).

<sup>4</sup> "Egyptian Art", 156.

## Function of the Kidney in Dehydration

ONE of the minor consequences of total war is the resurgence of classical physiological problems, such as the effects of hæmorrhage and of dehydration. Although pure dehydration, in the sense of a deficiency of water but not of salt, is rarely met with clinically, it is precisely this disturbance which presents itself in desert warfare, and in lifeboats or on rafts. One aspect of dehydration which has received much less attention than it deserves is the function of the kidney. Very little urine is formed, and it might have been anticipated that there would have been interesting changes in its composition, and possibly in its mode of secretion. There was the possibility, for example, that a shortage of water in the organism might lead to a diminished blood flow to the kidney, or a diminished glomerular filtration rate.

The urea, inulin and diodone clearances have been determined in four men who had abstained from all water for three or four days, while taking a dry diet supplying adequate protein, calories and salt. They had lost 4 per cent to 7.2 per cent of their body weights. The results are shown in the accompanying table.

Subject	Volume of urine (c.c./min.)	Inulin clearance (c.c./min.)	Diodone clearance (c.c./min.)	Urea clearance (c.c. min.)
A Normal	5.70	124	570	66
Dehydrated	0.66	96	550	20
B Normal	1.70	119	473	52
Dehydrated	0.64	99	508	38
C Normal	1.10	121	470	66
Dehydrated	0.52	107	615	35
D Normal	0.95	130	670	77
Dehydrated	0.55	128	765	39

As was to be expected, small volumes of urine were passed during dehydration, and the urea clearances were correspondingly reduced. Three of the men showed a fall of about 20 c.c. per min. in the inulin clearance; but to appreciate this fall in glomerular filtration rate in its proper perspective, one must compare it with the much greater reductions in inulin clearance which have been found in diabetic coma<sup>1</sup>, alkalosis<sup>2</sup>, hæmatemesis<sup>3</sup> and in the dehydration of young infants with gastroenteritis<sup>4</sup>. The diodone clearance, which may be taken to measure renal plasma flow, is much more variable, even in normal subjects, than the inulin clearance; but our figures did not give any evidence of a reduction in the amount of blood flowing through the kidney. In

harmony with this, it has been observed by Nadal *et al.*<sup>5</sup>, and confirmed in the present investigations, that there is no hæmo-concentration in dehydration of this degree, so that there can be little alteration in blood volume.

One must therefore consider the kidneys of a dehydrated adult as essentially normal with regard to the amount of blood supplied to them, and in the amount of glomerular filtrate formed. Consequently, the very striking changes in the volume and constitution of the final urine must be determined by tubular activity, stimulated no doubt by pituitary, suprarenal and possibly other hormones.

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<sup>1</sup> McCance, R. A., and Widdowson, E. M., *J. Physiol.*, 95, 36 (1939).

<sup>2</sup> McCance, R. A., and Widdowson, E. M., *Lancet*, 2, 247 (1937).

<sup>3</sup> Black, D. A. K., Powell, J. F., and Smith, A. F., *J. Physiol.*, 99, 344 (1941).

<sup>4</sup> Young, W. F., and McCance, R. A., *Arch. Dis. Child.*, 17, 65 (1942).

<sup>5</sup> Nadal, J. W., Pedersen, S., and Maddock, W. G., *J. Clin. Invest.*, 20, 691 (1941).

## Use of Desiccated Chick Embryo in Tissue Culture Technique

THE successful use of desiccated 9-11-day chick embryo as a source of growth-promoting factor was reported in 1940 (Peacock and Shukoff). Since then, repeated tests have been made with desiccates stored for periods up to 2½ years at 4° C. All the samples tested were equally effective and retained their growth-promoting potency and their capacity to coagulate plasma. Apart from the advantages of essential economy in war-time, the use of dried embryo greatly simplifies the technique of tissue culture and helps to standardize results, as it tends to eliminate any individual differences between embryos, and one batch of desiccate can be used for a long series of experiments. Freezing at 0° C. does not appear to affect the desiccates, but storage in a refrigerator at 4° C. has proved quite satisfactory.

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## Potassium, Fermentation and the Cell Membrane

IN a letter in *NATURE*<sup>1</sup> and subsequent communication to the *Journal of Physiology*<sup>2</sup> there was described, with experimental verification, the principles controlling the accumulation of potassium in isolated muscle. This accumulation could occur to a considerable extent without volume change, and the theoretical position established led naturally to an explanation of the potassium content of the original muscle. Further aspects were considered in later communications<sup>3, 5</sup>, Prof. F. G. Donnan also contributing<sup>4, 7</sup>.

Viewed in the light of this theoretical development, Pulver and Verzar's description of experiments showing the accumulation of potassium in the initial