

# LETTERS TO THE EDITOR

## Methylation in the Suprarenal Medulla

SIR,—It is now well known that extracts of the suprarenal glands of many animals contain, in addition to adrenaline, varying amounts of noradrenaline. More noradrenaline than adrenaline has been found, for example, in glands of birds<sup>1</sup> and whales<sup>2</sup>, in tumour tissue from human phæochromocytomas<sup>3</sup>, and in glands of children under 1 year old<sup>4</sup>. As these results suggest that primitive or embryonic tissue is deficient in part of its methylating system, we have tested the activity of gland extracts of young mammals to detect possible precursors of adrenaline in these species. The assays were carried out biologically using the cat's blood pressure and nictitating membrane, and by paper chromatography, and the results are shown in Table I.

TABLE I

INFLUENCE OF AGE ON THE RELATIVE NORADRENALINE CONTENT IN EXTRACTS OF SUPRARENAL GLANDS OF VARIOUS ANIMALS

Animal	Number of observations	Age of animal	Noradrenaline in the mixture
Rabbit ... ..	4	<i>In utero</i>	per cent.
	19	Under 6 hours	100
	56	Adult	86 2
Guinea-pig ... ..	1	1 week	83
	37	Adult	3
Man ... ..	22	Under 70 days	90
	3	70 to 92 days	52
	31	Adult	13
Cat ... ..	5	1 to 3 days	72
	12	Adult	28

It will be noted that the suprarenal medulla of the young animal contains adrenaline and noradrenaline, the latter comprising over 70 per cent. of the total amines present. No other possible precursor of adrenaline was detected by these tests. Presumably the need of adrenaline at this stage in life is very small; it is certainly of importance that a similar situation in the suprarenal medulla exists in tumour-tissue in adults. Moreover, the result in the young animal does not depend upon the relative amounts of each amine in adult life, for a similar picture is seen in cats (28 per cent. of noradrenaline in adults), rabbits (only 2 per cent.), and calves<sup>5</sup> (about 28 per cent.). However, on the other hand, the rat appears to be an exception; the suprarenal medulla of the young rat<sup>6</sup> contains relatively the same amount of noradrenaline (about 10 per cent. of the total amines) as does that of the adult rat.

The guinea-pig is of great interest, for this animal possesses relatively the largest suprarenal of any animal. Moreover, at birth, its medulla is about one-fifth of the size of the cortex, and attains full development by the end of the first month. In the adult stage, the medulla is about one-sixtieth of the size of the cortex, so that it may well be that methylation in the medulla is

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proportional to the relative size of the cortical tissue. This argument does not hold for man, however, where, unlike some lower animals, degeneration of adrenal tissue occurs during the first few months of life.

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April 25, 1951.

### REFERENCES:

1. Holton, *J. Physiol.*, 1949, **108**, 525.
2. West, *J. Pharm. Pharmacol.*, 1950, **2**, 732.
3. Burn, Langemann and Parker, *J. Physiol.*, 1951, **113**, 123.
4. Shepherd and West, *J. Physiol.*, 1951, *P.* in the press.
5. Holton, 1951, Personal Communication.
6. Crawford and Outschoorn, *Brit. J. Pharmacol.*, 1951, **6**, 8.

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### ABSTRACTS (continued from page 381)

though doses of 2:4:6-tris(ethylenimo)-S-triazine elicited fewer signs of acute intoxication than comparable doses of the nitrogen mustard, and it would appear to have certain clinical advantages in the treatment of human lymphomas. The common pharmacological properties of bis(ethylenimines) and nitrogen mustards are considered by the authors to be related to the presence of chemically reactive 3-membered heterocyclic constituents, namely, tertiary ethylenimine groups in the former agents and quarternary ethylenimonium groups in the *in vivo* transformation products of the latter agents.

S. L. W.

**Senna; Laxative Activity in Mice of the Various Parts of the Plant.** J. W. Grote and M. Woods. (*J. Amer. pharm. Ass. Sci. Ed.*, 1951, **40**, 52.) *Cassia angustifolia* Vahl can be grown successfully in parts of the southern United States (especially the Imperial Valley of California), but plants are killed rapidly by temperatures below 50°F. Both pods and leaflets are comparable in laxative activity to the Indian or Egyptian-grown drug. The pods are slightly more active than the leaflets. The petioles are 75 per cent., the stems, 50 per cent. and the roots, 55 per cent. as active as the leaflets. Several years' storage causes no marked loss of activity.

G. B.

**Streptomycin Salt of Insulin, "Depot" Effect of.** R. D. Barnard and A. N. Saperstein. (*J. Amer. pharm. Ass., Sci. Ed.*, 1951, **40**, 55.) A relatively insoluble insulin-streptomycin compound is precipitated when commercial insulin solution is mixed with a solution of streptomycin sulphate. The streptomycin-insulin is formed in a state of fine dispersion suitable for administration through a 24-gauge hypodermic needle. The blood-sugar curve in a glycogen-depleted diabetic subject receiving 50 units of insulin in the form of the streptomycin salt, is similar to that with protamine or globin insulin. The streptomycin compound and a similar dihydrostreptomycin compound may be of use in patients who show sensitivity to protamine or globin conjugates.

G. B.