

The results obtained with norepinephrine, epinephrine, phenylephrine, ephedrine, *d*-l-amphetamine, *d*-amphetamine, and mephentermine confirmed that reserpine potentiates or leaves unchanged the motor effects of catechol or phenolethanolamines, but inhibits those of phenylethanolamines reversibly and those of phenyl or phenoethylamines irreversibly<sup>1</sup>.

I found, however, that reserpine in some instances transformed vasoconstrictor effects into vasodilatation. Thus, in animals treated with reserpine, mephentermine produced vasodilatation, instead of vasoconstriction. After similar pretreatment, ephedrine also occasionally produced vasodilatation (3 animals among 20). This effect might be due to an unmasking and/or potentiation of actions on  $\beta$  receptors. In fact, it was found that reserpine not only potentiated the motor effects of norepinephrine but also the inhibitory actions of *isoproterenol*. Pretreatment with reserpine enhanced the vasoconstrictor effect of naphazoline and reduced that of *cyclopentamine* (without statistical significance). Therefore, these drugs seem to act directly on vasoconstrictor receptors, adrenergic or not.

Acetylcholine in high concentration produces vasoconstriction instead of vasodilatation, by releasing an epinephrine-like substance<sup>2</sup>. I have confirmed this effect and found that it disappeared in animals treated with reserpine.

For comparison I also studied the influence of pretreatment with cocaine on the vascular action of some sympathomimetic amines. In Jackson's toad preparation, the effects of phenylephrine, *isoproterenol*, ephedrine, *cyclopentamine* and naphazoline, are influenced by cocaine in the same way as by reserpine.

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<sup>1</sup> Maxwell, R. A., Povalski, H., and Plummer, A. J., *J. Pharm. Exp. Ther.*, **125**, 178 (1958).

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### Proportion of Noradrenaline to Adrenaline in the Adrenal Glands of Litter-mate Cats

It is well known that the proportion of noradrenaline to adrenaline in the adrenal glands of cats varies considerably from cat to cat. Butterworth and Mann<sup>1</sup> have obtained a range of 13–91 per cent of noradrenaline in the adrenal glands of a group of 38 cats of both sexes. This animal-to-animal variation is in marked contrast to most other laboratory animals, where the proportion of noradrenaline to adrenaline is constant for a given species.

To investigate this variability, litters of healthy, young cats were used. All animals were of such an age as to obviate any factor concerned with an increased noradrenaline content in early life<sup>2</sup>. Each cat was given 120 mgm./kgm. of pentobarbitone sodium, intraperitoneally. Two minutes later both adrenal glands were rapidly removed and an extract prepared in *N*/10 hydrochloric acid. The nor-

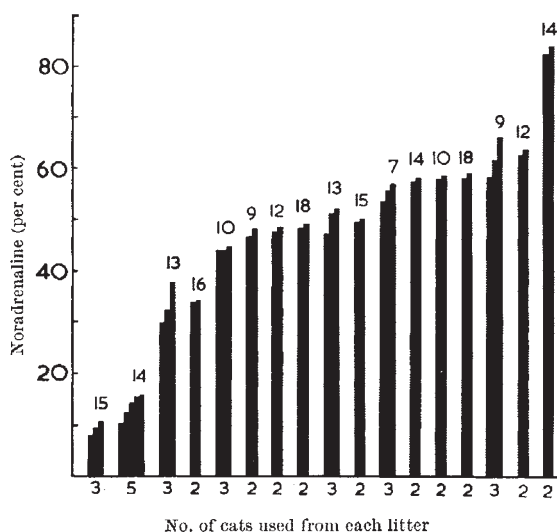


Fig. 1. To show the percentage of noradrenaline in the adrenal glands of litter-mate cats. The numbers at the head of each set of columns indicate the ages in weeks of the cats at the time of removal of the adrenal glands

adrenaline and adrenaline contents of the extracts were determined by different biological assay techniques, using the cat nictitating membrane and blood pressure as separate test preparations.

Fig. 1 shows the percentage of noradrenaline in the adrenal glands of litter-mate cats. 43 animals from 17 litters were used and a range of 8–84 per cent of noradrenaline was found in their glands. This variation was independent of the ages, weights and diets of the animals. However, although there was a wide variation in the percentage of noradrenaline between litters, there was little or no variation within a litter. This is true in every litter studied, and is independent of the size of the litter, the sex and general appearances of the animals.

It appears therefore that, although there is this considerable variability in the percentage of noradrenaline in cat adrenal glands, there is little variation within a litter. Previously it has been necessary to compare the catechol amine content of the adrenal glands of an individual cat, one gland being removed as a control before the experiment is begun. The application of the above observations is that now it is possible to divide litters of cats into test and control groups, in the same way as many other laboratory species are used.

A detailed account of this work, together with information concerning the relationship between the adrenal glands of the parents and their offspring, will be published elsewhere.

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