S U M M A R Y

1. Throughout this investigation eighty nine albino rats of different age groups ranging from one week to twenty four months and of both sexes were utilised.

The animals were sacrificed, then the adrenals removed, fixed immediately in buffered potassium dichromate (pH 4.2) solution. Paraffin sections were cut serially at six microns, and subsequently stained with eosin yellow-aniline blue mixture.

The cortex appeared bluish in colour, while the adrenomedullary cells appeared to be of two types : The adrenaline secreting cells formed the majority and appeared brownish to purple in colour with a granular cytoplasm and bluish nuclei. The minority were of the noradrenaline secreting type and appeared yellow in colour with coarsely granular cytoplasm and bluish nuclei.

2. Applying the methods of Dornfeld et al. (1942), Abercrombie (1946) and Boseila et al. (1971), the number of the two adrenomedullary cells and the adrenal medullary volume were estimated.

3. When comparing the results for left and right-sided adrenal glands of the same animal, they were found to differ, but the difference was statistically non-significant.

Concerning the sex of the animal, there was no statistically significant difference in the number of adrenaline and noradrenaline cells, except at the age of three months.

As the adrenal medullary volume is concerned, the difference in both sexes was only marked at the ages of three months and at senility.

4. At the age of one week, there was no differentiation between the two types of adrenomedullary cells nor between the cortex and medulla.

5. At the age of one month, distinct differentiation of the cortex from the medulla was obtained, while the differentiation between the two types of the adrenomedullary cells was still out of our approach.

The mean volume of the adrenal medulla for the female was greater than in the male but the difference proved to be statistically non significant.

6. At the age of three months distinct differentiation of the two types of adrenomedullary cells, enabled us to count them and the medullary volume could be determined as well.

The mean numbers of adrenaline and noradrenaline cells were higher in the female than in the male rats and the difference proved to be statistically significant. However, the mean adrenal medullary volume in the female was greater than that of the male, also this difference proved to be statistically significant.

7. At the age of six months, the mean number of adrenaline cells in the female was less than that of the male, although the mean number of noradrenaline cells in the female was greater than the male, but these differences proved to be statistically non significant.

The mean adrenal medullary volume for the female was greater than the male, the difference proved also to be statistically non significant.

8. In the rats aged one year, the mean numbers of adrenaline and noradrenaline cells in the female were

greater than in the male, but the difference proved to be statistically non significant.

The mean adrenal medullary volume of the female was greater than in the male and such difference proved also to be statistically non significant.

9. In the senile rats (two years old), the mean numbers of adrenaline and noradrenaline cells in the female were greater than in the male, but the difference proved to be statistically non significant.

However, the mean volume of the adrenal medulla of the female was greater than in the male and this difference proved to be statistically significant.

10. Comparing the results of cell counts and adreno medullary volume of rats aged six months, one year and two years to the results of adult rats aged three months. The counts and the volumes showed an increase, and this increase proved to be statistically significant and highly significant ($P = 0.05$ & $P = 0.01$).

The ratio of adrenaline cells to noradrenaline cells increasing upon ageing.

11. In the operated female animals, the number of adrenaline cells increased and that of the noradrenaline cells decreased than in the female controls. The increase in the number of adrenaline cells, however, proved to be statistically non significant, while the decrease in the number of noradrenaline cells proved to be statistically highly significant ($P = 0.01$).

In the operated male rats, the mean number of adrenaline cells increased and that of noradrenaline cells decreased. The increase in the number of adrenaline cells proved to be statistically highly significant, while the decrease in the number of noradrenaline cells proved to be statistically non significant.

The mean adrenomedullary volume of the female and male increased after unilateral adrenalectomy, such an increase in the size of the adrenal medulla in the operated female rats proved to be statistically significant, while for the operated male, it was proved to be statistically highly significant.