

chromogen'. No amino-acids could be found in paper chromatograms of an acid hydrolysate. The receptor-destroying enzyme of *V. cholerae* attacked this lipid to a slight degree, effecting the detachment of 7 per cent of the total chromogen.

The presence of the 'direct chromogen' clearly is not the only requisite for inhibiting activity<sup>10</sup>. One gains the impression that the lipids discussed here may belong to a series of substances of increasing complexity and molecular size, leading from the monomeric cerebrosides to the gangliosides and then to mucolipids in which the presence of a polypeptide moiety is necessary for the inhibitory activity to become noticeable.

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### Levels of Thyroid and Thyrotrophic Hormones in the Blood of Rats at Various Stages of the Œstrous Cycle

A COMPARISON was made between the levels of thyroid and thyrotrophic hormones in the blood of female albino rats during the four stages of the Œstrous cycle. The procedure used was that adopted by D'Angello and Gordon<sup>1</sup>, namely, 'the stasis tadpole method'. Serum was obtained from the blood of the rats, which were divided into four groups of five or six each according to the vaginal smear reading. These groups were of pro-Œstrous, Œstrous, metŒstrous and diŒstrous rats. The tadpoles were divided into five groups, one of which was the untreated control. The others were injected with seven injections of 0.01 ml. of serum obtained from the four groups of rats on alternate days. Twenty-four hours after the last injection the tadpoles were killed with chloroform, fixed in susa and stored in 80 per cent alcohol. Their hindlimbs were then measured with a micrometer; this was used as a criterion of thyroid hormone activity. The height of the epithelial cells of the thyroids of tadpoles was used as an indication of the level of thyrotrophic hormone in the blood of the different groups of rats. The results are shown in Table 1.

Table 1. THYROID AND THYROTROPHIC HORMONE-LEVELS IN THE BLOOD OF RATS AT THE STAGES OF THE ŒSTROUS CYCLE

Phase of cycle	No. of tadpoles	Mean increase of hindlimb above control (mm.)	Mean increase of height of epithelial cells above control
Pro-Œstrous	17	1.02 ± 0.12*	0.69 ± 0.14*
Œstrous	13	1.58† ± 0.11	1.89† ± 0.15
MetŒstrous	15	1.07 ± 0.08	0.64 ± 0.07
DiŒstrous	22	0.84 ± 0.06	0.66 ± 0.07

\* Standard error. † Significantly higher than other groups.

It appears clearly that thyroid activity increases during the Œstrous phase when compared with the other three stages of the cycle. The rate of metamorphosis of the tadpoles injected with the serum obtained from this group of rats was the greatest. The increase of hindlimb above the control was 1.58 ± 0.11 mm. The rate of metamorphosis was at its lowest in the tadpoles injected with the serum obtained from diŒstrous rats.

The level of thyrotrophic hormone in the blood of these animals parallels closely the state of the thyroid. Thyrotrophic hormone was found to be produced at its highest level during Œstrous. These findings agree with previous observations which indicated that the uptake of iodine-131 by rat thyroids is at its highest during Œstrous<sup>2</sup>, and that the level of thyrotrophic hormone in the rabbit is higher during Œstrous than during pseudopregnancy<sup>3</sup>.

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### Amino-Acid Metabolism of *Nicotiana* Leaves after Removal from Plant

VICKERY *et al.*<sup>1</sup> have shown that after removal from the plant, *Nicotiana* leaves show a marked increase in the total soluble nitrogen (ammonia, amide and amino-nitrogen) whereas the insoluble protein nitrogen decreases. An attempt has been made in the present work to study, in detail, the amino-acid metabolism in such leaves using the technique of horizontal migration paper chromatography<sup>2</sup>.

The free amino-acids originally present in the leaves, at 0 hr., show interesting variations after plucking. Though the content of tyrosine ( $R_F$  0.66) does not show any notable increase, alanine ( $R_F$  0.59) and glutamic acid ( $R_F$  0.52) increase up to 120 hr. in the dark, after which they show a marked decrease. In light alternated with twelve hours of darkness, alanine and glutamic acid go on increasing until 144 hr., after which they show a slight decrease at 168 hr. Proline ( $R_F$  0.63) shows interesting variations under conditions of both light and dark. Proline starts disappearing from the detached leaves when the latter are kept in the dark and becomes untraceable at 144 hr.; but in light alternated with darkness, it persists even up to 168 hr. without decreasing.

The content of aspartic acid ( $R_F$  0.47) shows marked variations with time after removal from plant. It increases considerably during the first 72 hr. in the dark, after which it starts decreasing,