that SU-4885 acts on thyroid gland function directly as well as by influencing pituitary thyrotrophic activity in enhancing $I^{131}$ uptake.

*Zusammenfassung.* Die Goitrogen-Wirkung des Metopirons (SU- 4885, CIBA) wurde in Feld- und Wüstenmaus mittels radioaktivem $I^{131}$ untersucht. Das radioiodingebundene Protein (Pb $I^{131}$) war nach SU- 4885 vermindert. Die Zunahme der gesamten Radioaktivität in der Schilddrüse lag bei 49%. Metopiron wirkt als Schilddrüsen-Hemmer.

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## Effect of Light and Darkness on the Hypothalamo-Neurohypophyseal System of the Garden Lizard, *Calotes versicolor*

The stimulating effect of light or the inhibitory effect of darkness on the hypothalamic neurosecretory system (HNS) have been reported in fish[1], amphibia[2–5], birds[6] and mammals[7–10]. This investigator is not aware of any report dealing with the effects of light and darkness on the reptilian HNS. Such effect, however, has been studied on the intermediate pituitary lobe of a number of reptiles[11,12] including the garden lizard *Calotes versicolor*[12]. This investigation reports on the effect of light and darkness on the HNS of the same garden lizard, *Calotes versicolor*.

Freshly collected adult garden lizards of both sexes, acclimated to laboratory condition for 3 days, were used. 18 lizards were kept in 2 cages ($8 \times 8 \times 6$ inches) in equal number under continuous illumination at room temperature (31 °C average) for various periods. Illumination was done by a 100 W bulb from a vertical distance of 3 feet from the central base of each cage. Another 18 lizards were kept in continuous darkness while 16 others were maintained as controls at room temperature under natural light and darkness. At least 3 lizards from each experimental as well as control group were sacrificed by quick decapitation at the selected intervals of 1, 3, 5 and 7 days. 6 µm thick sagittal paraffin sections of the aqueous Bouins fixed brain with hypophysis were stained with chrome

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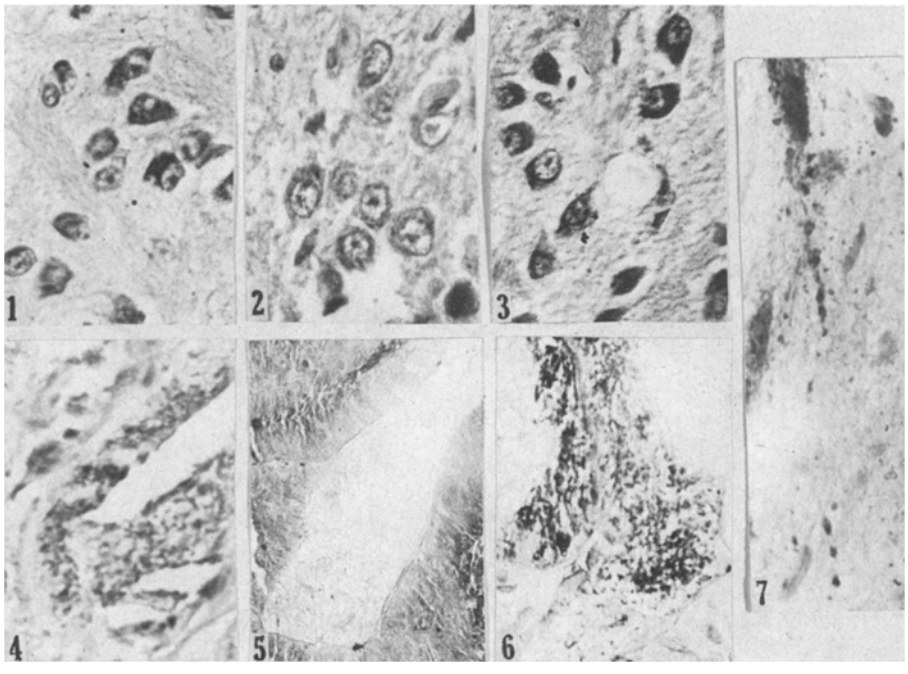


Figs. 1–6. Showing the paraventricular cells and pars nervosa of the control[1,4], illuminated[2,5] and light-obscured[3,6] *Calotes* on day 5. × 315 for Figures 1–3 and × 100 for Figures 4–6.
Fig. 7. Showing the 'beaded' axons in the light-obscured *Calotes* on day 5. × 200.

Nuclear volume (in $\mu m^3$) in the SON and PVN cells of control and experimental *Calotes*

| Animal group | Day 1 | | Day 3 | | Day 5 | | Day 7 | |
|---|---|---|---|---|---|---|---|---|
| | SON | PVN | SON | PVN | SON | PVN | SON | PVN |
| Control 1 | 295.75 | 345.96 | 277.83 | 337.86 | 281.89 | 368.82 | 334.72 | 390.34 |
| 2 | 347.38 | 307.58 | 293.92 | 322.53 | 267.77 | 377.60 | 317.43 | 382.86 |
| 3 | 317.98 | 441.23 | 313.40 | 389.44 | 243.36 | 324.96 | 272.70 | 334.72 |
| Mean avg. | 320.37 | 364.92 | 295.05 | 346.61 | 264.34 | 357.12 | 308.28 | 369.30 |
| S.E. | 18.19 | 33.99 | 10.29 | 17.01 | 11.26 | 11.36 | 18.50 | 17.44 |
| Illuminated 1 | 421.20 | 428.32 | 377.60 | 483.50 | 374.01 | 411.54 | 453.44 | 452.18 |
| 2 | 364.19 | 417.40 | 319.33 | 402.44 | 334.72 | 423.63 | 398.13 | 480.82 |
| 3 | 402.44 | 465.90 | 361.25 | 381.26 | 357.79 | 409.05 | 404.31 | 493.05 |
| Mean avg. | 395.94 | 437.20 | 352.72 | 422.40 | 355.50 | 414.74 | 418.62 | 475.35 |
| S.E. | 25.95 | 14.58 | 17.36 | 31.19 | 11.41 | 4.50 | 17.51 | 12.12 |
| *P* | >0.05 | >0.1 | <0.05 [a] | 0.1 | <0.01 [a] | <0.01 [a] | <0.02 [a] | <0.01 [a] |
| Light obscured 1 | 283.35 | 351.52 | 381.26 | 374.01 | 253.02 | 357.79 | 331.24 | 300.20 |
| 2 | 264.76 | 317.43 | 256.27 | 317.98 | 284.51 | 336.23 | 349.84 | 381.26 |
| 3 | 307.58 | 472.04 | 282.09 | 367.74 | 308.89 | 347.90 | 305.76 | 377.86 |
| Mean avg. | 285.23 | 380.33 | 306.54 | 353.24 | 282.14 | 347.30 | 328.94 | 353.10 |
| S.E. | 12.41 | 46.94 | 38.13 | 17.73 | 16.19 | 6.23 | 12.78 | 26.49 |
| *P* | >0.1 | >0.8 | >0.7 | >0.8 | >0.4 | >0.4 | >0.4 | >0.6 |

S.E., standard error; *P*, probability; [a] significant.

alum haematoxylin phloxin (CAHP) stain after permanganic oxidation[13]. The method of PALKOVITS[5] was applied for caryometric study of nuclei of the supraoptic (SON) and paraventricular (PVN) cells. 50 cells from each of the SON and PVN in a lizard were selected at random for measuring the nuclear volume. Students' *t*-test was used for statistical analyses of the data.

Individual variations with regard to the concentration of neurosecretory substances (NSS) in the SON, PVN and pars nervosa (PN) were noted in both the control and experimental groups. However, comparison of the neurosecretory picture in the control and experimental lizards revealed that continuous illumination led to a depletion while darkness led to an accumulation of NSS (Figures 1–6) in the HNS in varying degrees. Such depletion or accumulation of NSS, however, was first noted in the PN on day 1 and subsequently, in both the SON and PVN. 'Beaded 'axons were observed only in the hypothalamic area of some lizards kept in darkness (Figure 7).

Caryometric analyses (Table) revealed that statistically significant alteration in nuclear volume occurred in both the SON and PVN in the illuminated lizards. Here, the first increase in nuclear volume was noted in the SON on day 3, and in both the SON and PVN on days 5 and 7. No statistically significant alteration in the nuclear volume could be noted in the case of lizards kept in darkness.

Histomorphic and caryometric findings indicated activation of the HNS in form of enhanced synthesis, transport and release of neurohormone(s) in the illuminated group. Lizards kept in constant darkness showed, on the other hand, an accumulation of NSS in the HNS, and like in amphibia[5] and unlike in bird[14] there was no decrease in nuclear volume in the neurosecretory cells. Absence of significant alteration in nuclear volume and presence of NSS in the axons and their increase in concentration first in the PN and subsequently in the SON and PVN seemed to suggest that constant darkness did not remarkably affect the normal production and transport but reduced the rate of release of the neurohormone(s) from the PN.

It is on record that dehydration leads to the selective depletion of NSS from only the PVN cells in the ring-necked snake, *Diadophis punctatus*[15] and the lizard, *Calotes versicolor*[16]. Here, however, both the SON and PVN cells reacted similarly to illumination or darkness. Although the PVN is suggested to be the source of antidiuretic hormone in *Calotes*[16], the nature of the substance elaborated by the SON is yet to be ascribed, It is interesting to note in this connection that identical reactions by both the SON and PVN have also been observed in the starved *Varanus griseus*[17] and *Calotes versicolor*[18].

*Résumé.* Nous avons étudié l'effet d'une l'illumination continue ou d'une obscurité de 7 jours sur le système hypothalamique neurosécréteur (HNS) du lézard des jardins *Calotes versicolor*. L'illumination a stimulé le HNS par activation de la synthèse, du transport et de la libération de la neurohormone(s) tandis que l'obscurité a fait diminuer la quantité libérée de neurohormone de la pars nervosa.

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