ABSTRACTS OF MEMOIRS

RECORDING WORK DONE AT THE PLYMOUTH LABORATORY

THE EQUILIBRIUM FUNCTION OF THE OTOLITH ORGANS OF THE THORNBACK RAY

By Otto Lowenstein and T. D. M. Roberts

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In the labyrinth of *Raja* the otolith organs in the utriculus, sacculus and lagena contain sense-endings with equilibrium function. The discharge frequencies from these sense-endings undergo changes when the skull is tilted.

In some endings each position of the skull is associated with a characteristic discharge frequency regardless of the direction from which this position is reached (stato-receptors proper).

In other endings the succession of frequencies and the position of maximum activity was found to be dependent on the direction of tilting, but the discharge activity reverted to some constant value when and wherever the skull was brought to rest (out-of-position receptors). Single functional units were generally found to respond to lateral as well as to fore-and-aft tilting.

The ranges of response types for the utriculus and sacculus overlap. Two types may be distinguished: those with their maximum frequency of discharge in the 'side-up' and 'nose-up' positions, and those with maximum frequency in 'side-up and 'nose-down'. The absence of stato-receptor preparations with a maximum frequency of discharge in the 'side-down' position is unexpected.

In the lagena the maximum frequency was always in or near the normal position, the frequency falling off fairly sharply on either side of the maximum (into level receptors). This organ is thus particularly suited for mediating stabilization around the normal position. O.L.

THE CONTROL OF RETINAL PIGMENT MIGRATION IN *LEANDER SERRATUS*

By Francis G. W. Knowles

Biol. Bull. Woods Hole, Vol. 98, 1950, pp. 66–80.

A study was made of the relative importance of hormonal control and a direct response to illumination in the movements of the distal and proximal retinal pigments in *Leander serratus*. Animals from which the sinus glands had been

removed were studied in darkness and under illumination; in these animals the distal pigment remained in the dark-adapted position both in darkness and under illumination; the proximal pigment of operated animals continued to show normal positional changes in response to illumination.

In one series of animals one eye was covered with modelling clay and the other was exposed to illumination; in another series the animals were maintained in light-proof boxes with one eye only projecting through and exposed to illumination. In these experiments the distal and proximal pigments in the exposed eyes showed a greater light-adaptation than in the covered eyes; the difference was especially noticeable in the case of the proximal pigment. The present work suggests therefore that the proximal retinal pigment in *L. serratus* responds directly to change of illumination and is not controlled by the sinus gland; the distal pigment appears to be under sinus-gland control but the responsiveness of the pigment cells to the sinus-gland hormone seems to be increased by illumination. F.G.W.K.