LETTERS TO THE EDITORS

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IN THE PRESENT CIRCUMSTANCES, PROOFS OF "LETTERS" WILL NOT BE SUBMITTED TO CORRESPONDENTS OUTSIDE GREAT BRITAIN.

Night-Shining Eyes

SPELEOLOGISTS have perhaps rather exceptional opportunities for observing 'night-shining' in human eyes. I have seen it on three occasions with different individuals, and once was accused of exhibiting the phenomenon myself.

On all occasions the observer was below the object and the illuminant was the concentrated beam of a focused electric torch. The glow from the eyes is a most uncanny tawny orange, causing exclamations of horror.

Once only have I seen night-shining by a human outside a cave. An Indian woman, who was bending low down, looked back from that position at the headlights of my car—a momentary gleam from her eyes, which ceased as she stood up and faced the light. Hence the incidence of the light on the eyes on this occasion was similar to that on the previous occasions in caves. Is it possible that the normal individual only exhibits the phenomenon when, with dilated pupils, he is caught by a concentrated beam of light coming from this rather unusual direction?

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THE explanation of "night-shining eyes" is well known. The retina and choroid act as a mirror. In the emmetropic eye the light reflected from the fundus emerges in a parallel beam; hence none of it can enter an observer's eye unless this is placed in the comparatively narrow beam of light—the principle of the ophthalmoscope. In highly hypermetropic eyes the emergent beams are widely divergent, and therefore an observer's eye can see a reflex from the pupil over a considerable area. Glioma of the retina in a baby is usually discovered by the mother noticing a yellow reflex from the pupil, as the so-called "amaurotic cat's eye".

The eyes of most lower mammals are usually highly hypermetropic, and many of them are provided with a special reflecting membrane, absent in man, the tapetum. This occurs in two forms, a fibrous and a cellular, sometimes provided with crystals. The tapetum causes iridescence in the reflected light—hence the variety of colours investigated by Mr. E. D. Walker (see NATURE, March 30, p. 506).

The rareness of the observation of "night-shining" in human eyes is due to the facts that the observed eye must be highly hypermetropic (or still more rarely very highly myopic), the incident light must be bright, and the observing eye must be so placed that some of the reflected rays enter it.

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Influence of Temperature on Osmotic Behaviour of Some Crustacea and its Bearing on Problems of Animal Distribution

A SEASONAL cycle in the osmotic concentration of the blood of some amphipods, isopods and decapods has been reported by Widmann¹ and Otto². Both these authors observed a higher value for blood in winter than in summer; the animals examined included marine, freshwater and air-breathing species. In Eriocheir, Otto² was able to correlate these changes directly with the temperature of the external medium. Krogh³, reviewing the subject, mentions that the ecological significance of these facts is unknown.

Working on the osmo-regulation of Palaemonid prawns, I find that *Leander serratus* and *Palaemonetes varians* show a similar behaviour in having slightly higher osmotic values in winter than in summer. Both these prawns normally maintain their blood concentrations at a steady state hypotonic to the environment when in sea water^{4,5}. During summer, the mean values for osmotic pressure of blood of the two prawns were about 2.3 and 2.6 per cent NaCl respectively; the corresponding values for last winter were 2.4 and 2.8 per cent NaCl. These differences are not insignificant when it is remembered that both these prawns are more or less homoiosmotic, and especially *P. varians*, which shows only a difference of about 0.5 per cent NaCl in internal osmotic pressure for a change in environment of 3.5 per cent NaCl. It may also be mentioned that neither of the species shows any appreciable osmotic change in response to changes in salinity of sea water between 3.3 and 3.5 per cent NaCl, the normal limits of variation of Plymouth tank water.

Experiments under temperature control which are in progress show that the above-mentioned seasonal variation is independent of other factors like starvation and moulting. When prawns are transferred directly from normal to dilute sea water the mortality is higher in winter than when the temperature is high. The data so far obtained also indicate a lower dilution curve for blood of animals kept at a higher temperature, in substantial agreement with the observations of Otto² who found that Eriocheir transferred from sea water to tap water showed after four days an osmotic pressure of $\Delta 1.355^\circ \text{C}$. (2.32 per cent NaCl) at 13°C ., but only $\Delta 1.27^\circ \text{C}$. (2.18 per cent NaCl) at 23°C . These results show that (a) the optimum osmotic pressure of homoiosmotic species falls with rise in temperature of the medium; (b) in diluted media the minimum osmotic pressure of blood compatible with life is lower the higher the temperature, and hence the osmotic work required in maintaining hypertonicity is less at higher temperatures. It follows, therefore, that in euryhaline species where the mechanism of