

and they were found to be in an active state, except for the thyroid gland in which the epithelium was found to be flattened.

The conclusions drawn from these observations are:

(1) The lack of an obvious polyuria or polydipsia was due to the fact that the hypophysial stalk was sectioned at the level of the diaphragma sellæ, and that sufficient neurohypophysial tissue remained innervated in the upper part of the stalk to prevent the onset of diabetes insipidus.

(2) Regeneration of the hypophysial portal vessels can occur in Primates in a manner similar to that seen in rats.

(3) The nerve fibres of the hypophysial stalk, which do not regenerate after stalk section, are not essential for normal gonadotrophic and adrenocorticotrophic functions of the anterior pituitary gland. It is unlikely that the quiescent state of the thyroid gland was due to interruption of these nerve fibres; it is probable that the state of this gland may be correlated with the constant, warm environment in which the animal was kept for the eighty-nine days after operation.

(4) Probably the normal spermatogenic and testosterone-secreting activity of the testis and the normal structure of the adrenal cortex, observed after pituitary-stalk section, are to be correlated with the vascular regeneration that occurred between the median eminence and the adenohypophysis.

We wish to thank Dr. A. R. Hunter for advice and help with the anaesthesia.

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¹ Harris, G. W., *Nature*, **163**, 70 (1949).

² Harris, G. W., *J. Endocrinol.*, **6**, xvii (1949).

Distribution of the Littoral Barnacle *Chthamalus stellatus* around the British Isles

THE barnacle *Chthamalus stellatus* Poli is found on the shores of the British Isles west of a line running from Dunnet Head (Caithness) to Swanage in Dorset. It penetrates the Irish Sea northwards as far as Dublin and Anglesea, but is reported as absent from the Isle of Man, as well as from the eastern part of the English Channel and from the North Sea coast¹. Its occurrence appeared to be connected, in some unknown way, with Atlantic as opposed to North Sea water¹. It is, however, possible to suggest tentatively a simple explanation.

Chthamalus stellatus, although of world-wide distribution², is at the northern edge of its range in the British Isles. It is therefore reasonable to expect that its distribution around these shores may be sensitive to low temperature. The limitation of the distribution of marine animals by low temperature, which may either kill them outright or prevent them from breeding, has been discussed by Hutchins³. The possibility that the distribution of *Chthamalus stellatus* around the coasts of Britain could be explained in terms of temperature was rejected by Moore and Kitching⁴ because of poor agreement with surface-water isotherms. A reconsideration of the conditions under which *Chthamalus* lives in relation to recently published meteorological information

has now suggested that the original conclusion may not be justified.

Chthamalus stellatus, being a littoral barnacle, must endure not only the variation of temperature of the coastal water but also the much greater extremes imposed on it during exposure to air. A study of meteorological records and charts, supplemented with data kindly supplied by the Director of the Meteorological Office and by the Director of the Irish Meteorological Office, has shown that a reasonably satisfactory correlation between temperature and the distribution of *Chthamalus stellatus* occurs during the winter months. Both the February surface-water isotherm⁴ for 7° C. and the February mean daily minimum air temperature isotherm⁵ for 38° F. (3.3° C.) follow fairly closely the limit of distribution of *Chthamalus stellatus* on the coasts of England, Wales, Ireland and northern France, but not on the west coast of Scotland, where *Chthamalus* apparently persists in spite of low temperature. The 15° F. (-9.4° C.) isotherm⁶ of the absolute minimum air temperature recorded over the period 1901-40 also shows a striking concurrence with the limit of *Chthamalus stellatus* in all parts of the British Isles except the north-west of Scotland. It was this discrepancy which led Moore and Kitching to reject temperature as a controlling factor.

Meteorological records for north-west Scotland are derived from a very small number of stations, mostly inland or at high altitude, and so unsuitable for the purpose under consideration. There are no stations between Cape Wrath and Wick. Moreover, local variation between close and apparently similar situations may be considerable. Conditions at coastal meteorological stations can only give a relative idea of those on the shore, and then only where stations are plentiful. Present meteorological records are therefore consistent with the hypothesis proposed, subject to the reservation that not enough is known about conditions in the west and north of Scotland.

Limitation by low temperature (as a predominant factor) provides a working hypothesis which is simpler and easier to test than the 'Atlantic water' theory, although from the known facts the latter is equally possible. There is one difficulty: towards its northern limit *Chthamalus* becomes restricted to a narrow zone at the upper margin of the littoral region; one might have expected it to survive better at lower levels, where it would be less exposed to cold air.

Considerations of this sort suggest that experiments might be carried out on the ability of *Chthamalus* to withstand cold under conditions representative of those at the upper and lower levels of the shore. Not until simple and direct explanations have been excluded will it be necessary to invoke the more complicated and inaccessible influence of 'Atlantic water'.

I am glad to acknowledge discussions of this question with Dr. H. B. Moore and Dr. D. J. Crisp.

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Jan. 18.

¹ Moore and Kitching, *J. Mar. Biol. Assoc.*, **23**, 521 (1939).

² Darwin, "A Monograph of the Cirripedia" (1853).

³ Hutchins, *Ecol. Mon.*, **17**, 325 (1947).

⁴ Deutschen Seewarte Hamburg, Atlas für Temperatur, Salzgehalt und Dichte der Nordsee und Ostsee (1927).

⁵ Air Ministry, Meteorological Office. Monthly and Annual Maps of Average Temperature over the British Isles (1943).

⁶ Air Ministry, Meteorological Office. Variation of Temperature over the British Isles (1944).