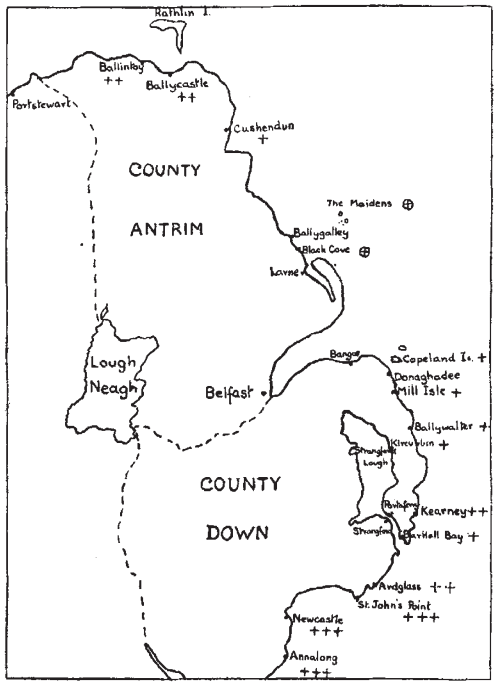
Distribution of *Chthamalus stellatus* on the Shores of North-East Ireland

In a paper discussing the distribution of *Chthamalus stellatus* in British waters, H. B. Moore and J. A. Kitching[1] attempted to link up the distribution of this barnacle with that of Atlantic water. Recently, Kitching[2] suggests that air temperature may be the limiting factor, abandoning to some extent the Atlantic water theory, but adding "although from the known facts the latter is equally possible". Southward[3] has recently recorded the general occurrence of *Chthamalus* in the Isle of Man, and he too points out that there appears to be some correlation between air temperature and the distribution of the species. In the map of Moore and Kitching, *Chthamalus* is unrecorded between Howth and Belfast Lough and given as absent from the east coast of Antrim but as present at Portstewart on the north coast. It was also recorded as absent from the Isle of Man.

Since 1938 I have known of the occurrence of *Chthamalus* in County Down, and it was later recorded by MacDonald[4] from Portlehan near Ardglass. Within the past three months, I have obtained specimens from the following places in Down: Annalong, Newcastle, St. John's Point, very abundant; Ardglass and Kearney, abundant; Bar Hall Bay and Kircubbin (in Strangford Lough), less numerous; Ballywalter, Mill Isle and the Copeland Islands, rather scarce. Although a careful search was made, I have been unable to find *Chthamalus* on the coast of Down north of Mill Isle; but much of this part of the coast is unsuitable for such a high water mark species. A recent examination of County Antrim shows that *Chthamalus* is abundant at Ballintoy and Ballycastle on the north coast, less abundant at Cushendun and present in very small numbers at Black Cove between Larne and Ballygalley. It also occurs on both the larger islands of the Maiden group, but is not at all abundant.



Coastline of Counties Down and Antrim to show the relative abundance of *Chthamalus stellatus*

+++ = very abundant. ++ = abundant. + = present, but not abundant. ⊕ = present, but very scarce

At all the localities where I have found *Chthamalus stellatus* to be abundant, it is commonly found on fairly exposed surfaces above the *Balanus* zone; but at the Copeland Islands, Ballywalter and Mill Isle in northern Down and at Black Cove in Antrim and at the Maidens, it is encountered mixed with the *Balanus* population and is not distinctly above this zone. Furthermore, in these localities it seems to favour the corner of a small crevice or the flat surface of a deep narrow fissure the width of which is just sufficient to allow the barnacle to grow. Such relatively protected sites are commonly found, however, in the narrow upper ends of gullies subject to good wave action. In the Ballycastle and Ballintoy localities it is again abundant on exposed surfaces in the splash zone above the *Balanus* zone.

My observations do not support the theory that it is Atlantic water which favourably influences the distribution of *Chthamalus*, for the colonies at Newcastle, Annalong, Ardglass and Kearney, where *Chthamalus* is abundant, are much less subject to the influence of Atlantic water than are those at Cushendun, Black Cove and the Maidens, yet it can be found in the last two localities only after diligent search. Since the east coast of Antrim is subject to a lower winter air temperature than the coast of Down, it seems more probable that the air temperature is the chief factor controlling the distribution of *Chthamalus*. Moreover, a fluctuating distribution is much more indicative of a variable limiting factor such as air temperature than the degree of Atlantic water, which presumably is approximately the same each year.

I am glad to acknowledge discussions of the question with Prof. R. A. R. Gresson and Mr. R. V. Gotto.

G. Williams

Department of Zoology,
Queen's University,
Belfast. May 31.

[1] Moore and Kitching, *J. Mar. Biol. Assoc.*, **23**, 521 (1939).
[2] Kitching, *Nature*, **165**, 820 (1950).
[3] Southward, *Nature*, **165**, 408 (1950).
[4] MacDonald, *Ann. Mag. Nat. Hist.*, (11), **7** (1941).

Breeding and Distribution of *Chthamalus stellatus*

Recent suggestions have been made relating the distribution of *Chthamalus stellatus*[1,2] to low-temperature isotherms. It may therefore be of value to put on record some new observations on its breeding made over the past three years, which have a bearing on present distribution.

Chthamalus is much more widespread in the Irish Sea than is suggested either by Moore and Kitching[1] or by Southward[2]. It has been found to be present along the whole Ayrshire, Galloway, Cumberland and Lancashire coasts as far south as New Brighton (1950). The settlement, even at Blackpool, is not a casual one but contains individuals of large and small sizes (0·2–1·4 cm.) representing probably at least three years settlements. It reappears just south of Holyhead at Porth Dafarch in considerable numbers. The main area of absence on the English coast is thus sharply defined, and limited to the north coast of Wales and Anglesey. Whether this present distribution is the result of two recent warm summers (1947 and 1949) followed by mild winters (since