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## Speculations on the Immigration of the Barnacle *Elminius modestus* in France\*)

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The literature on the recent immigration of the Australian barnacle *Elminius modestus* to West European coasts is rather exhaustive. The present author has given details on the exact centre of immigration on the Dutch coast. The spreading from this centre has been followed in subsequent years (DEN HARTOG, 1953).

From the French coast only few data are known. The localities where it first established itself are unknown. Speculative though it may be, therefore, it seems useful to try a reconstruction of the immigration of *Elminius* in France as exact data are still available. In July 1951 the author found *Elminius* on the Boulonnais coast (Pas de Calais: Le Portel, Boulogne sur Mer, Wimereux, Ambleteuse, Audreselles, Cap Gris Nez). On account of our findings on the Dutch and Belgian coasts, they seemed to us to belong to a population radiating from Holland. BISHOP'S (1954) observation however, in the same region, Wimereux, a year earlier (September 1950) did not exactly fit in with this supposition. Real doubt as to the Dutch descent of these specimens arose after finding *Elminius* in Brittany.

In 1952 Professor P. DRACH found the species in several spots in the littoral belt of Roscoff—Finistère. These by no means could be associated with the Dutch population; a second centre of immigration, on the French coast, had to be considered. Its exact localization is not possible any more. The author's supposition is that the first settlement of *Elminius* in France took place in Normandy, during the invasion of 1944. From the communication of STUBBINGS (1950) it appears that some ships plying between the English southern coast and Normandy had been infected by *Elminius*. Many ships were sunk near the Norman coast in this period. If among the wrecked vessels only one had been infected by *Elminius*, it may have become a centre of dissemination.

If we suppose the spreading from this centre taking place with the same velocity as along the Dutch coast, the French population could have reached the southern border of the Dutch population in 1950 or 1951,

\*) Received January 1956.

just there on the coast of the Boulonnais. BISHOP's specimens from near Wimereux can thus be explained as advanced outposts of the French population. In 1951 French and Dutch populations have surely mixed.

To the West, the French population reached Roscoff in 1952. In 1953 *Elminius*, according to BISHOP (1954), appeared to be very common in northern Finistère; South of Morgat the species occurred only scarcely, as far as L'orient—Morbihan. In the Côtes du Nord, *Elminius* was not found by BISHOP. This might be used as an argument against our hypothesis. However, Dr. FRANC informed me in March 1952 already that he found numerous *Elminius*-larvae in the plancton near Dinard; only once a barnacle was collected by him in the river Rance. In this region it seems, actual settlement did not result for some unexplained reason, the species occurring only in the Nauplius stage. Such irregularities in the distribution were found in England too, as is shown by the map published by CRISP (1948).

I am much indebted to Prof. Dr. P. DRACH, Dr. M. W. H. BISHOP, Dr. D. J. CRISP, Dr. M. A. FRANC and Dr. A. G. SOUTHWARD for their personal communications.

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