

Occurrence of *Elminius modestus* (Darwin) in British Waters

THE observations on the existence of *Elminius modestus* on British coasts reported by Mr. M. W. H. Bishop¹ have been confirmed and extended in an independent investigation commenced by Messrs. Blacklock and Macarthur, Glasgow, in January 1946.

Some of our records of this species are listed below. It will be noted that *Elminius* is widely distributed and abundant on the south-east coasts of England, and, in fact, has been taken at every point which we have visited, where a suitable substratum exists, between Norfolk and Dorset. It occurs intertidally, mainly below mean tide-level, but may be found higher in protected situations, and also at depths down to at least 5 fathoms. Its habitat and settling behaviour appears to be in British waters exactly as described by Moore in New Zealand². In the Essex Rivers it competes very successfully with *Balanus balanoides* in the lower part of the intertidal zone, but the latter has the advantage of slightly earlier settlement and longer life; under water it is rather less successful in competition with *B. crenatus* and *B. improvisus*. *Elminius* ranks as a dominant littoral organism in the estuaries of the Colne, Blackwater, Crouch and Thames.

We have also considerable data suggesting that this species is mainly confined to the south and east coasts of Britain. Careful examination of the foreshore and of underwater exposure panels has failed to reveal any *Elminius* at our stations at Brixham, Devon; Pierhead, Liverpool; Port Erin, Isle of Man; and Portree, Isle of Skye, though a sparse settlement has recently been recorded at Neyland, Pembrokeshire. Less rigorous examinations of material from Conway and the Blyth Estuary, Northumberland, suggest its absence from these localities.

Elminius modestus has a longer season of reproduction and continuous settlement than any other barnacle in British waters, and the spat has been observed to reproduce early in the same season in the Rivers Blackwater and Crouch³. Indeed, it seems theoretically possible from our growth-rate and breeding data that two complete generations may occur during summer in such an estuary, since fully developed nauplii may be found at any stage after a rostro-carinal diameter of 4-5 mm. has been attained.

RECORDS OF *Elminius modestus* (Darwin)

| Locality | Occurrence | Earliest record |
|------------------------------------|------------|---|
| Brancaaster, Norfolk | Not common | August 1947 |
| Lowestoft, Suffolk | Frequent | August 1947 |
| Rivers Colne and Blackwater, Essex | Abundant | Settlement, April 1 to October 10, 1946 |
| N. Fambridge, Essex | Abundant | October 1945 |
| Thames, below Gravesend | Common | September 1947 |
| Thanet coast, Kent | Occasional | September 1947 |
| Brighton, Sussex | Frequent | October 1947 |
| Poole, Dorset | Common | June 1947 |
| Neyland, Pembrokeshire | Occasional | August 1947 |

The present distribution of *Elminius* does not indicate clearly a recent dissemination from one or more centres, but appears to be that of a well-established species. It is abundant in the favourable environment of shallow muddy estuaries with high summer temperatures, rarer on sandy and chalky foreshores and absent where there is considerable wave exposure⁴. The very intense barnacle-fouling experienced in these muddy estuaries is due in considerable degree to *Elminius*, and in view of the frequent coastal traffic, its absence from ports in the south-west and west of England may indicate an unfavourable

environment. It is possible that lack of interest in the Cirripedia until recently, the paucity of faunistic work on the south-eastern shores of Britain, and a superficial resemblance to *B. balanoides* have combined to give the immigrant freedom from recognition for some years. The simultaneous records of Bishop and ourselves in 1945 at places as distant as Fambridge and Chichester support this view.

A comparison between the introduction of *Elminius modestus* and the invasion of the Essex rivers by *Crepidula fornicata* in about 1880 may be of interest. The latter species has succeeded in colonizing submarine levels of the same environment and, spreading rapidly at first, achieved a similar distribution over a period of forty-fifty years⁴.

A fuller account of its distribution, development and breeding habits in British waters will be published at a later date.

D. J. CRISP

P. N. J. CHIPPERFIELD

Messrs. Blacklock and Macarthur, Ltd.,

Glasgow.

Oct. 17.

¹ *Nature*, 159, 501 (1947).

² Moore, L. B., *Trans. and Proc. Roy. Soc. New Zealand*, 73, 315 (1944).

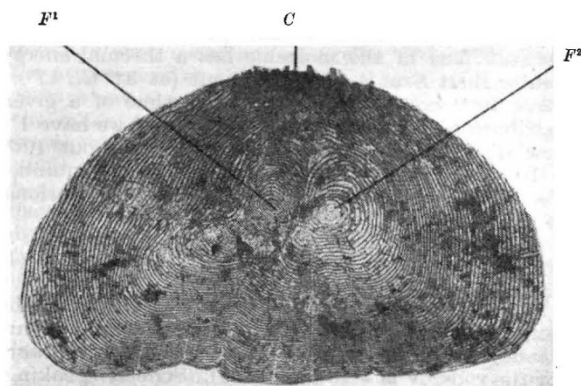
³ Cf. Darwin, "Monograph on Cirripedia", 348 (1854).

⁴ Orton, J. H., *Proc. Roy. Soc.*, B, 81, 468 (1909).

An Atypical Scale of *Sciæna coitor* (Hamilton)

IN the course of studies of the structure and development of ctenoid scales of certain Indian fishes¹, an atypical scale was encountered (see accompanying illustration). It was found on the body of a male *Sciæna coitor* which measured 20 mm. in length. It was located in the middle region of the trunk on the fifth row below the lateral line. The neighbouring scales and those belonging to the other regions of the body were also critically observed but none of them showed any breach of normal development.

The most interesting feature of this scale was the presence of two foci instead of one. Both the foci lie in the middle zone of the scale. The focus of the right-hand side (F^2) was circular, while that of the left-hand side (F^1) was more elongated. The focus of the right was bounded by more or less complete concentric circuli. The circuli encircling the corresponding focus were extremely longitudinal and consequently incomplete. Of the two foci, the right



PHOTOMICROGRAPH OF THE ATYPICAL SCALE OF *S. coitor*
 F^1 and F^2 , foci of the left-hand side and right-hand side respectively; C, common ctenii region. ($\times 150$)