Biology Curators Group Newsletter

Title: Otoliths - and my father (Allan Frost)

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Source: Frost, G. (1986). Otoliths - and my father (Allan Frost). *Biology Curators Group Newsletter*, *Vol 4 No 4*, 93 - 98.

URL: http://www.natsca.org/article/1235

OTOLITHS - AND MY FATHER (Allan Frost)

It must be seventy-nine years ago that, after a bathe off Charmouth Beach, in Dorset, my father and I went along the coast towards Lyme Regis to what is known locally as the Landslide. It had other names, such as Black Ven and was even then semi-active.

The Lias - the lowest series of rocks of the Jurassic system - covered the beach towards the sea in the form of light grey nodules. Further back, towards the cliff, which in earlier years had erupted and slid into the sea, it was black and semi-liquid, being volcanic.

It was in this area that my father was deeply interested. He was a geologist, a Fellow of the Geological Society and an F.L.S. - and I, a boy of ten.

At his suggestion I tapped many of the light grey nodules on the beach and, to my delight, many of them split beautifully, revealing near-perfect Ammonites. There were. too, many Belemites scattered on the shore. My father later called my attention to a large rock which, on being rolled over, showed a bone-like protrusion. Working on this with a cold chisel, a tooth with a piece of bone began to appear. After further work during the following days, the jaw bone and some teeth of an Ichthyosaurus became excitingly clear.

While I was absorbed in this, my father was quietly making a discovery which was to bring a unique advance, not only in knowledge of the world's fishes but one which was to prove of deep interest to doctors and surgeons engaged in the study of the human ear.

In that soft Lias, while I was chopping out the teeth of the Ichthyosaurus, he came across a fossil fish's head and his study of Otoliths was to absorb his interest for years to come and make his name, not only in Harley Street but in the British Museum.

It is only in recent years that I have come to realise what a remarkable man my father was. His book 'Otoliths' was published in 1934 and his unique collection, taken from all corners of the globe and from innumerable species of fish, all classified, was a most absorbing task for any one man to undertake.

I did not realise it then, but now that I have limitless time, the whole setting has been brought vividly alive to me again.

While he must have been totally engrossed in this study, he was suddenly called to sit daily by my bed in No. 8 General Hospital, Rouen, climbing in the most atrocious weather up the hill to the monastery, which must have been taxing enough, without having to watch me fighting for my life after multiple wounds on the Somme on the 4th March 1917.

Thereafter I made a life for myself until the burden of the many wounds breaking down has made it imperative that I reside in a Home. I have a room to myself and seem alone for endless hours. A month or two ago, I must have been half awake, lying in my bed and still on my back on account of both ankles being extremely painful, when I imagined that my father was actually sitting by my bed in the same position that he occupied in Rouen.

It may have been momentary, but it brought home to me how costly that time must have been to him and really why I feel even now, that I at last appreciate his generosity with that time, which appeared to me to be given without thought of his great work left temporarily incomplete.

I must now explain that the fossil fish he found led to his study of Otoliths, which are floating bones at the back of a fish's skull - and indeed in the inner ear of all vertebrates. They are different in shape and fluting in all species of fish and my father discovered through all the many classifications, that they have not altered in many thousands of years.

I have had a couple of pages of the author's copy photographed, together with some relevant letters that he had left in the book, which illustrate adequately what a task he undertook. I also append a photograph of him, taken before he became old.

Gerald Frost

November 1985

Aprox. 720 words

St. Mary's Home
New Buckenham
Norfolk.

TELEPHONE
WELBECK 2349.

The nineth of June. 1938.

130, HARLEY STREET,
W.1.

Dear Mr.Allan Frost,

I was delighted to see in the Times that the Natural History Museum has secured your fine collection for this country. It would have been dreadful to contemplate their loss.

I wonder if you would offer your Retzins books to the Librarian at St.Bartholomew's, and mention my name.

Also tothe Director of Ferens Institute, Middlesex Hospital.

With kind regards,

Yours sincerely,

2. Those of the division Labriformes are specialized, the most generalized form being that of *Labrus mixtus*, distinguished by the prominent rostrum and antirostrum, the large excisura, the ovate shallow cauda, and the hinged appearance of the inner side. In some species the latter feature is absent and there is a straight anterior part to the cauda, and the excisura is smaller and rounded (e. g., *Cheilinus*). An aberrant form occurs in *Iniistius*.

3. The otoliths of the Scaridæ generally resemble those of the Labridæ, differing in their greater height and more rectangular appearance. In certain species the anterior rim is modified, and a narrow triangular excisura is present at the antero-dorsal point (e. g., *Pseudoscarus viridis*).

4. In the division Trachiniformes in those species examined the sulcus is sigmoidal, uniform in width, and is not divided, the cauda being upwardly inclined; an exception is *Parapercis*, in which the otolith is of the Percid type.

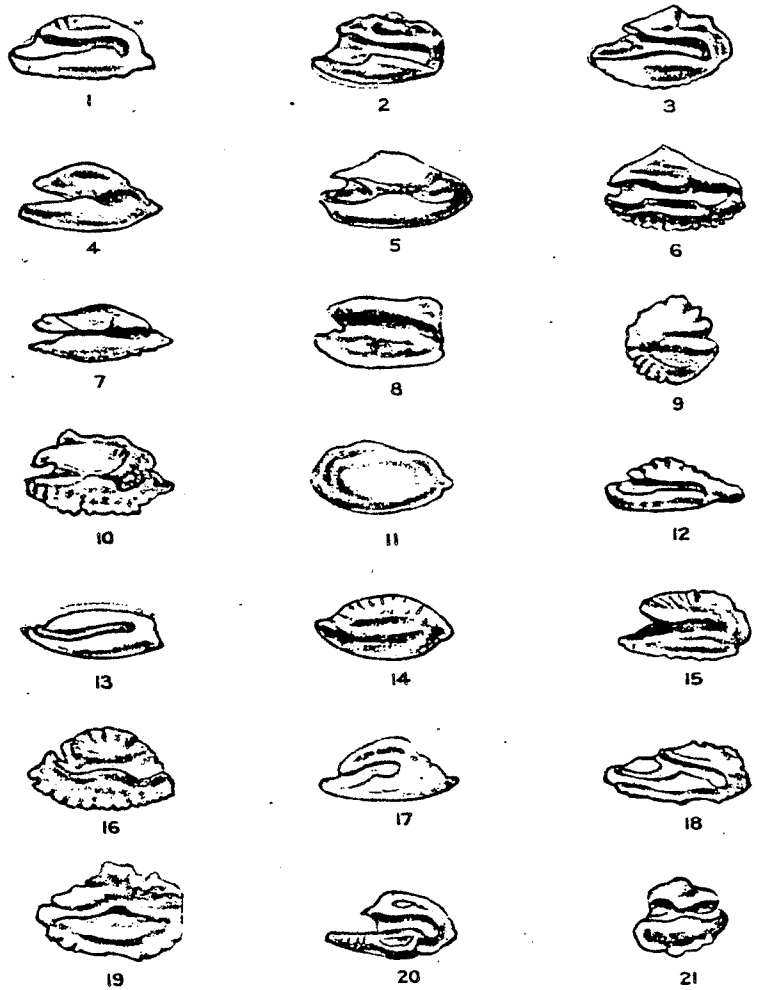
5. The otoliths of *Notothenia* are of the Labrid type.

6. In *Callionymus* the sagitta combines features of the otoliths of the Labridæ and Trachinidæ.

7. In *Trichodon* the shape resembles that of *Iniistius*, but differs in the sulcus.

EXPLANATION OF PLATE XVII.

Fig. 1. *Chironemus marmoratus*, × 3.
Fig. 2. *Ditrema temminckii*, × 3.
Fig. 3. *Chromis chromis*, × 3.
Fig. 4. *Labrus mixtus*, × 3. — wrasse
Fig. 5. *Cheilinus fasciatus*, × 3.
Fig. 6. *Epibulus insidiator*, × 3.
Fig. 7. *Lachnolaimus falcatus*, × 1¼.
Fig. 8. *Julis lunaris*, × 4.
Fig. 9. *Iniistius niger*, × 3.
Fig. 10. *Scarus abildgaardii*, × 3.
Fig. 11. *Ammodytes tobianus*, × 7. — sand eel
Fig. 12. *Parapercis colias*, × 2½.
Fig. 13. *Trachinus draco*, × 1½. — weever
Fig. 14. *Uranoscopus scaber*, × 1¼.
Fig. 15. *Notothenia maoriensis*, × 3½.
Fig. 16. *Pseudoscaris viridis*, × 3.
Fig. 17. *Callionymus lyra*, × 4.
Fig. 18. *Embiotoca jacksoni*, × 2.
Fig. 19. *Champsodon guentheri*, × 5.
Fig. 20. *Hypsypops rubicundus*, × 2.
Fig. 21. *Trichodon trichodon*, × 6.



G.Allen Frost, del.

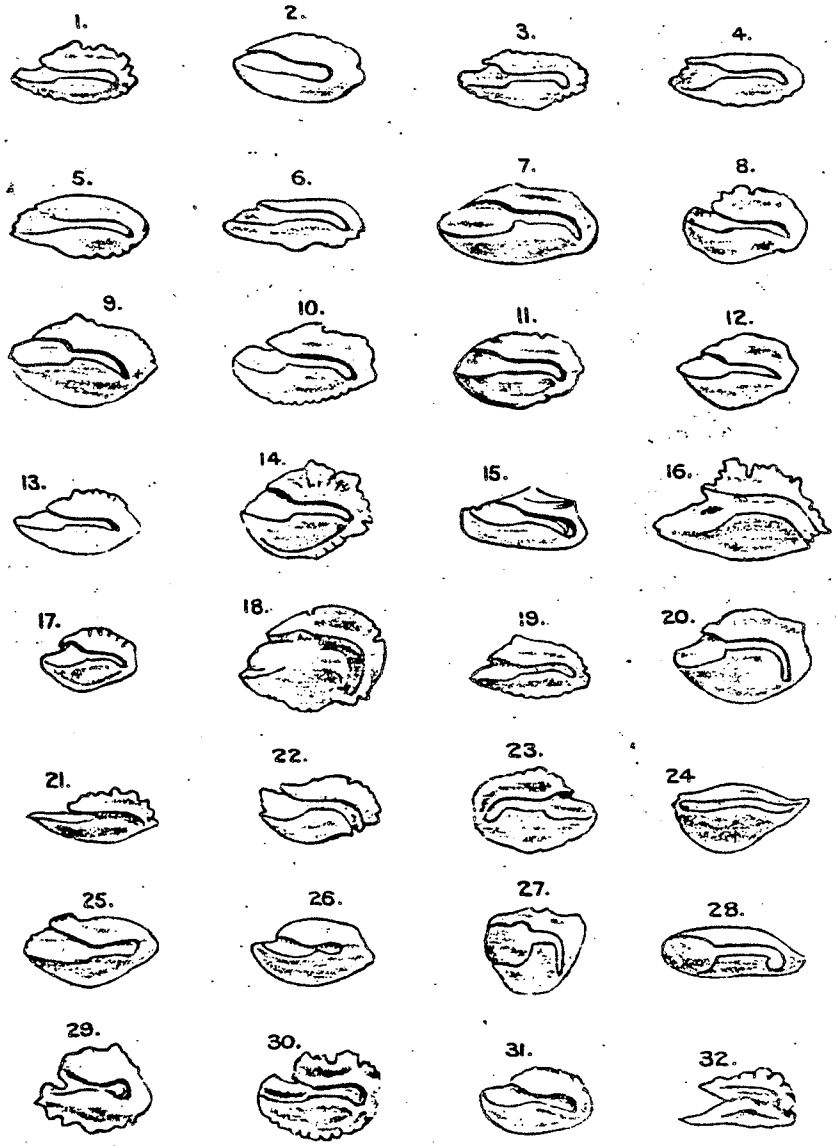
OTOLITHS OF THE SUBORDER PERCOIDEA.

being large and ponderous, without rostrum, antirostrum, or excisura, and the ostium is flush with the surrounding parts.

Aberrant forms: *Sillago*, *Brama*.

EXPLANATION OF PLATE V.

Fig. 1. *Perca fluviatilis*, × 1½. — perch
Fig. 2. *Acerina cernua*, × 2. — ruff
Fig. 3. *Morone labrax*, × 1½. — bass
Fig. 4. *Kuhlia marginata*, × 2½.
Fig. 5. *Arripis georgianus*, × 2.
Fig. 6. *Pomatomus saltatrix*, × 1½.
Fig. 7. *Centropomus undecimalis*, × 1¼.
Fig. 8. *Drepane punctata*, × 1½.
Fig. 9. *Lutianus chirtah*, × 1¼.
Fig. 10. *Gerres rhombeus*, × 2.
Fig. 11. *Smaris australis*, × 1½.
Fig. 12. *Mæna vulgaris*, × 2.
Fig. 13. *Pagellus centrodontus*, × 1½. — bream
Fig. 14. —— *erythrinus*, × 1½.
Fig. 15. *Sargus vulgaris*, × 1½.
Fig. 16. *Dentex undulosus*, × 1.
Fig. 17. *Cantharus lineatus*, × 2½.
Fig. 18. *Pagrus pugicephalus*, × 1.
Fig. 19. *Micropterus salmonoides*, × 1½.
Fig. 20. *Hæmulon elegans*, × 1½.
Fig. 21. *Trachurus trachurus*, × 1½.
Fig. 22. *Trachurops crumenophthalmus*, × 2.
Fig. 23. *Tilapia zillii*, × 2.
Fig. 24. *Sillago sihama*, × 1½.
Fig. 25. *Apogon melanotænia*, × 2.
Fig. 26. *Cepola rubescens*, × 2.
Fig. 27. *Aplodinotus grunniens*, × 1.
Fig. 28. *Cynoscion nebulosus*, × 1.
Fig. 29. *Mullus barbatus*, × 4.
Fig. 30. *Ephippus faber*, × 1½.
Fig. 31. *Psettus argenteus*, × 2.
Fig. 32. *Brama raii*, × 3.



6. Allan Frost del.

OTOLITHS OF THE DIV. PERCIFORMES.