

Archaeology

Much rowing for fish

Daniel Pauly

A thousand years ago, there was a shift in the fish diet in England from freshwater to marine species. The relevant case history, derived from picking through leftovers, has a contemporary resonance.

Aelfric (AD 955–c. 1020), the Abbot of Eynsham, near Oxford, has in his *Colloquy* a master asking a fisherman why he does not fish in the sea. The fisherman answers, “Sometimes I do, but rarely, because it is a lot of rowing for me to the sea”¹. Yet, in spite of all the rowing this transition required, Aelfric lived during the period when the fish that the English ate changed from mainly freshwater species to mainly marine ones — principally herring (*Clupea harengus*) and representatives of the cod family, the ‘gadids’, with cod (*Gadus morhua*) dominating. We know this from a study by Barrett and colleagues, just published in *Proceedings of the Royal Society*², which documents the contents of 127 ‘assemblages’ (of old fish bones) from settlements around England, covering a period from the seventh to the sixteenth century.

There is a large community of archaeologists and historians working up the material that was left over (in middens, old latrines and so on) from the meals taken by our ancestors. But this literature seems rarely to be used to draw inferences about the historical exploitation of natural resources, at least in the fisheries literature, which is a pity. Using such remains, Barrett *et al.* have identified the origin of intensive marine fishing, and hence a period that should serve as a baseline when evaluating the present state of marine ecosystems — at least in the waters around England.

The transition towards marine species, they suggest, was due to a decline in freshwater species. This decline was perhaps caused by pollution from mills and from agricultural run-off (farming was expanding during that period), and by overfishing of what are, after all, limited resources, relative to the demand

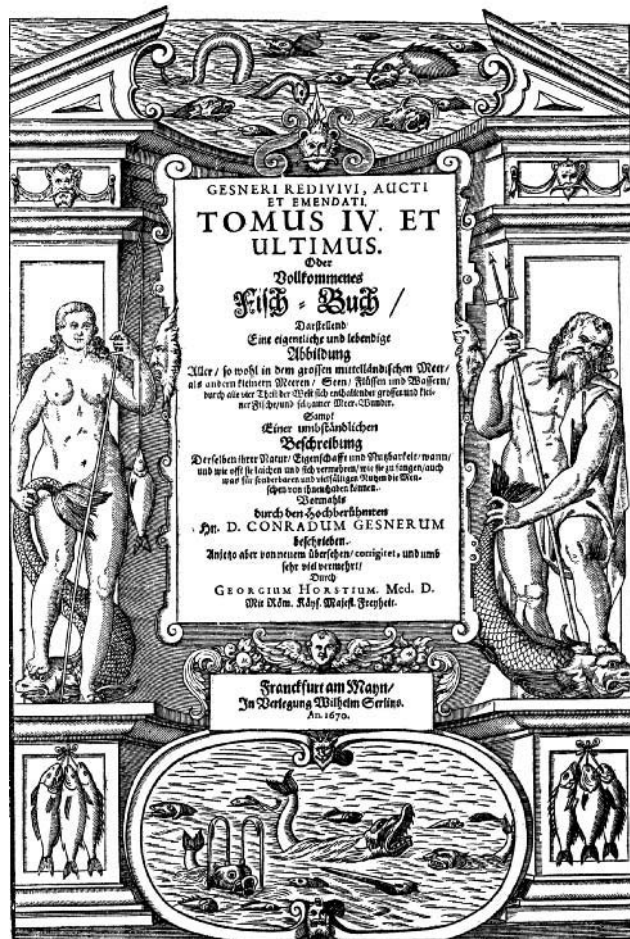
from a then-growing urban population.

Barrett *et al.* also point out that the period between 950 and 1050, which brackets the transition from freshwater to marine fishes in the English diet, was relatively warm. Such

conditions were not favourable to herring or cod in the seas around England, where both species are near the southern end of their ranges. Hence, only a massive (and historically undocumented) increase of trade with Norway, where the abundance of cod and herring does tend to increase with temperature, could link the observed dietary transition to shifting abundances resulting from environmental change.

In addition, Barrett *et al.* identify a group of ‘intermediates’ between strictly freshwater species and marine species. These are the flatfishes, which include species that migrate between marine and freshwater environments. And indeed, two flatfish species are mentioned by Aelfric’s fisherman, when he lists, upon being asked what he catches in the sea: “Herring and salmon, porpoise and sturgeon, oysters and crabs, mussels, winkles, cockles, plaice and flounders and lobsters and many similar things.”

There is another aspect of this study² that the authors themselves don’t raise, but that I can’t resist mentioning here. This is that the analyses not only confirm and narrow down a freshwater-to-seawater transition previously known, though with less precise dates, from other parts of northwestern Europe (see ref. 1 for references), but they deepen our understanding of the last global transition towards the consumption of marine fish. This



Fish for all. Several centuries after the time of Aelfric’s fisherman, Conrad Gessner vividly described and depicted various species of European fishes in his *Fisch-Buch*, published in Frankfurt. It was part of the encyclopaedia that encompassed the zoological knowledge of his time.

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transition, in a sense, sent us back to where we were tens of thousand of years ago, before the invention of agriculture, when many (most?) humans were living and migrating along coastlines, relying on shellfish and, starting from Africa, gradually reaching islands as far flung as Tasmania and Tierra del Fuego³.

These migrations, which brought our African ancestors to Europe and Asia, and thence to Australia and Oceania, and to the Americas, were in most cases followed by migrations inland, driven by hunting of larger animals, and later by agriculture. And interestingly, there is documentation, also from Britain, of a change in diet some 5,200 years ago, at the start of the Neolithic and of British agriculture, from marine animals to inland animals and plants⁴.

The transition from eating freshwater fish to eating marine fish, documented by Barrett *et al.*, is thus part of a secondary transition. Marine fisheries catches are declining worldwide⁵, and the global demand for fish is increasing. So will another transition back to freshwater fish and inland species occur? Or will we be able to 'row' even more, and maintain our present level of marine fish consumption? ■

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3. Erlandson, J. M. in *The First Americans: The Pleistocene Colonization of the New World* (ed. Jablonski, N. G.) 59–92, Mem. Calif. Acad. Sci. No. 27 (Calif. Acad. Sci., San Francisco, 2002).
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