

## 5.3 Assessment of three articulated fish skeletons

*By Jennifer Harland, Fishlab, Department of Archaeology, University of York*

Three fish skeletons were assessed to determine preservation, species, fish size and elements present, using the reference collection held in the Fishlab, Department of Archaeology, University of York. Any butchery marks were noted, but not in detail. No weights or measurements were recorded. A subset of elements were examined and listed, following the standard recording protocol for analytical fish reports produced at York (Harland *et al.* 2003).

### 5.3.1 Factual Data

#### Quantity of material

This report details the assessment of 324 fish bones from Smithfield Carpark, Sheffield. These represent the remains of three articulated fish.

#### Provenance of material

These three fish skeletons date to the 19th century, and were found beside a river during excavations. All were from context 3050. There is no evidence for contamination or residuality.

#### Condition of material

All three skeletons were remarkably intact, and the presence of many small elements that are not routinely identified suggests that recovery was very thorough.

Preservation was variable for fish no. 1 and no. 3, with several of the bones indicating recent damage and distortion. Some of the vertebrae appeared very pale in colour, perhaps indicating exposure, while most of the appendicular elements were a light brown colour. Fragmentation was variable regardless of element size or fragility.

Preservation was generally good for fish no. 2, most bones being a honey brown colour. Fragmentation was generally minimal, with all but the most fragile bones presented whole. Both otoliths (calcium carbonate structures in the ears) and a few teeth survived, indicating preferential burial conditions.

#### Range and variety of material

##### Fish No. 1

All 72 bones were consistent with this being the remains of a single cod (*Gadus morhua*) of about 90-95cm total length.

Eight anterior vertebrae were present, most likely the second through to ninth in the vertebral column. The posterior half of the last vertebra in the sequence was missing, the result of a chop through the vertebral body in the transverse plane. Additional marks were visible on the neural arches of three of the vertebrae, but these appeared to be the result of recent rapid drying and splitting rather than any pre-depositional butchery.

The right cleithrum was present but in three pieces, the result of recent breakage; no butchery marks were noted. Other elements included the right scapula, along with a number that are not routinely identified, all of which were from the appendicular or 'shoulder' region of the skeleton. As these included both the left and right coracoids, it was clear that both sides of this region were represented.

#### **Fish No. 2**

All 194 bones, teeth and otoliths were consistent with this being the remains of a single ling (*Molva molva*) of about 120-140cm total length.

Five anterior vertebrae were present, most likely the first through to fifth in the vertebral column. Evidence for a chop in the transverse plane was visible in the fourth and fifth vertebrae, indicating a chop just posterior to the fifth vertebral body.

A variety of elements from the cranial region were present, including the dentaries, premaxillae, maxillae, vomer, infrapharyngeals, otoliths, articulars, quadrates, hyomandibulars, ceratohyals, preoperculars, operculars, palatines, parasphenoid and basioccipital. Several elements from the appendicular or 'shoulder' region were also present, including cleithra, posttemporals, supracleithra and the left scapula. No butchery marks were observed. Numerous other elements from both the cranial and appendicular regions were noted and two loose teeth were present. Two very small butchery marks were noted on one ceratobranchial, from the gill region.

#### **Fish No. 3**

All 58 bones were consistent with this being the remains of a single cod (*Gadus morhua*) of about 105-110cm total length.

Nine anterior vertebrae were present, most likely the first through to ninth in the vertebral column. The first and final vertebrae were both present in two pieces, and both had been chopped through in the transverse plane. Additional marks were visible on the neural spines, and again these appeared the result of recent rapid drying and splitting. Two vertebrae were pathologically fused together.

The left and right cleithra were present, both in poor condition with recent breakage. One very small butchery mark was noted on the anterior, ventral edge of the left cleithrum. Other elements included the left and right scapulae and a number that are not routinely identified, all from the appendicular or 'shoulder' region of the skeleton.

#### **Summary**

These three fish skeletons represent the remains of two cod and one ling, large marine fish from the cod family (Gadidae). Both cod were about one metre in length, a considerable size and age for cod to reach. They were represented solely by the shoulder region, including about eight or nine of the anterior vertebrae, and both were butchered by chopping in the transverse plane. In contrast, the ling was represented by the entire head, as well as the shoulder region. This fish was also of considerable size, at well over a metre in length. Again, this showed evidence of being chopped in the transverse plane to sever the rest of the vertebral column.

These fish were clearly imported to Sheffield, from the North Sea region or further afield. Although cod are routinely caught in the central region of the North Sea, large ling prefer cooler, deeper waters of the northern North Sea or North Atlantic (Froese and Pauly 2007). Fresh fish could easily have been brought to Sheffield in the 19th century, although drying or salting was a common method of preservation for the cod family fish throughout the North Atlantic region in the recent past (Starkey *et al.* 2000). When cod family fish are air-dried or salted, the heads are often removed at the production site, leaving only the vertebrae and the cleithra, the pair of elements at the very back of the head – the pattern observed with both cod skeletons from Sheffield. Small butchery marks to the cleithra are very common when fish have been preserved in this way, probably caused during production, storage, transport or subsequent re-hydration of the fish (Harland *et al.* in press). The lack of cranial elements from the Sheffield cod, together with the butchery observed on fish no. 3, would suggest these had been imported as a preserved product.

Stable carbon and nitrogen isotopic testing is proving useful to determine the origin of medieval cod remains from consumer regions in the North Sea region (Barrett *et al.* 2008), and this method could be applied to these skeletons to determine their origins. The ling, in contrast, was more likely to have been imported fresh, as its head was found in almost complete form.

None of these bones represent prime meat, although some edible parts would undoubtedly be present in the shoulder, cheeks, tongue and other regions, and these could have been boiled to produce a nutritious soup. This would not necessarily cause the bones to disarticulate, owing to connective and other tissues present holding the cranium and vertebral column together.

Two explanations could be put forward: these skeletons could be the discarded, unwanted body parts from a relatively affluent kitchen, or, they could be the remains of meals consumed by people with little money to afford the meaty parts of the fish. The latter would be consistent with the poor quality tenement housing found in the area.

### 5.3.2 Statement of potential

Each skeleton has been identified and attributed to a size range, the main elements present have been noted, and butchery has been briefly described. Although in-depth recording could reveal further information about taphonomic patterning and preservation, full analysis would return little further information given the unusual nature of this fish assemblage. That said, full illustration and photography of the butchery marks observed on each skeleton would facilitate their understanding and comparison with other material of similar date.

Isotopic sampling of each cod skeleton could determine their origins within the North Atlantic, enabling trade routes to be reconstructed. This could be compared and contrasted with the historical sources for the fish trade from this period. I am not in a position to quote for isotopic sampling, but Mike Richards, of the Max Planck Institute for Evolutionary Anthropology, has sampled numerous cod for this purpose and could provide a quote if necessary.

The preparation and consumption methods could be better understood with research into 19th century methods of preparing and cooking fish heads and fish shoulders.

Full recording, including illustration and photography of the butchery marks, as well as research into historical and archaeological comparanda from the 19th century, would take about five days. At £190 pounds per day, this would cost approximately £950.

### 5.3.3 Storage and conservation

The bones have an acrid, mouldy smell, so would benefit from rewashing and thorough, slow drying before being packaged for storage.

Storage in bubble wrap in a sturdy box will ensure these skeletons are not crushed by any heavier material.

## Bibliography

Barrett, J, C Johnstone, J F Harland, W Van Neer, A Ervynck, D Makowiecki, D Heinrich, A K Hufthammer, I Enghoff, C Amundsen, J Christiansen, A K G Jones, A Locker, S Hamilton-Dyer, L Jonsson, L Lougas, C Roberts and M Richards (2008). 'Detecting the medieval cod trade: a new method and first results', *Journal of Archaeological Science* 35, 850-861.

Froese, R and D Pauly (eds) (2007). FishBase: World Wide Web electronic publication. [www.fishbase.org](http://www.fishbase.org), version (11/2007).

Harland, J F, J Barrett, J Carrott, K Dobney and D Jaques (2003). 'The York System: An integrated zooarchaeological database for research and teaching', *Internet Archaeology* 13.

Harland, J F, C J Johnstone and A K G Jones (in press). 'A case study from the Medieval Origins of Commercial Sea Fishing Project: Zooarchaeological results from York (UK)' in P. Béarez, S. Grouard and B. Clavel (eds), *Archéologie du poisson. 30 ans d'archéo-ichtyologie au CNRS*. Hommage aux travaux de Jean Desse et de Nathalie Desse-Berset. Antibes

Starkey, D, C Reid and N Ashcroft (eds) (2000). *England's Sea Fisheries: The Commercial Sea Fisheries of England and Wales since 1300*. London: Chatham Publishing.

---

Disclaimer: this report is one of a series produced by staff and colleagues of the Centre for Human Palaeoecology, based in the Department of Archaeology, University of York. It contains material that may eventually be intended for publication and, as such, may represent only an interim statement. When quoting this report, please refer to it in this way:

Harland, JF (2008). Assessment Report: Three articulated fish skeletons from Smithfield Carpark, Sheffield (Sitecode Arcus 1048d). *Reports from the Centre for Human Palaeoecology, University of York* **2008/11**, 4pp.