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**Assessment Report: The fish bone from Bon Accord, Aberdeen (site
code 20215)**

By

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Summary

This report provides an assessment of the hand-collected and sieved fish bone from Bon Accord, a site of medieval, late medieval and early modern date from urban Aberdeen. The assemblage is of considerable size, with about 2000 fragments identified to species. Cod family fish dominated the assemblage, including cod, ling, haddock and saithe, while a few other taxa were found in small quantities, including flatfishes and herring.

There is considerable scope for investigating fish sizes and measurements in this large assemblage, which will enable an understanding of fishing types and methods through time. There is already an indication of changing preferences in the varying proportions of cod, ling and haddock through time, with cod becoming less common in the later phases. An initial assessment of butchery marks and element proportions indicates some fish may have been imported as a preserved product; this should be investigated in detail to understand the role of medieval Aberdeen in the well-recognised North Sea medieval fish trade.

KEYWORDS: ABERDEEN, FISH BONES, ZOOARCHAEOLOGY, MEDIEVAL

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Introduction

Fish remains were recovered from excavations and test pits of medieval to modern date from Bon Accord, Aberdeen. Recovery included both hand collection and sieving. Four archive boxes of fish were produced, each box approximately 25 x 18 x 45cm; three of these contained hand collected bone and the fourth contained sieved and 'special' samples, including some that were waterlogged. Overall, the bone was in very good condition, with moderate degrees of fragmentation. This assessment describes the range and quantities of species present, the probable dates of the material, and its potential for further analysis.

Over 2,500 bones were counted from the hand collected portion, of which just under 1650 were identified to species for the purposes of this assessment. These were derived from six major phases, plus an additional category termed 'unstratified/other'. Phases, dates and deposit types are summarised in Table 1. The final category includes contexts that were unstratified, that straddled two or more phases, or that were not in the literature provided by the excavators. In the case of the latter, the context details recorded on individual bags will be double checked for accuracy prior to full analysis.

The sieved portion was less substantial, with only 374 bones recorded to species out of almost 2000 fragments. Quantities will still be sufficient to examine changes through time, particularly when viewed in conjunction with the hand collected material.

Methods

Assessment reporting for fish remains follows a simplified version of the York System, our in-house recording method for fish technical reports (Harland *et al.* 2003). All bones were identified and quantified by taxa at the context level. Elements were not fully recorded but were grouped by quantification code (QC), related to the position in the skeleton and the potential information that could be gleaned from the results. Eighteen cranial and appendicular elements (those from the head and shoulder region) are classed as QC1 and should be recorded in full during the technical reporting. Approximate fish sizes will be recorded for each of these QC1 elements, which will provide an indication of the fish populations being exploited, and the likely methods used for fishing. Full preservation and texture information is also routinely recorded for these elements during full recording; no taphonomic data are recorded during assessment. A select subset will be routinely measured, and using published regression formulae, it will be possible to ascertain the exact total fish lengths. The quantity of measurable bones will also be presented below.

Specimens from the vertebral column are classed as QC2. During the full technical recording, the approximate position in the vertebral column will be recorded using eight separate element definitions. Although sizes are not usually recorded for vertebrae, previous work on medieval fish remains from the North Sea and North Atlantic regions have indicated the value of recording the vertebrae to size. This is particularly relevant when assemblages are dominated by large cod family fish – as is the case at Bon Accord – because cod, ling, haddock and related species were often processed to create a preserved, storable and tradable product (Barrett *et al.* 2008; Harland *et al.* 2008). During this process, the cranial elements were often left at the

producer site, while the vertebrae, with the attached flesh and often with a few elements from the appendicular region, were exported to their final destination. Recording the vertebrae to size greatly helps in the identification and interpretation of this fish trade.

A further five elements are classed as QC4, and these are exceptional or rare. These include otoliths, the calcium-carbonate 'ear-stones' that are useful for reconstructing fish sizes, but which can survive very differently from bone. QC0 elements are those not usually recorded or that are unidentifiable, unless modified in some way by butchery or pathology.

Fish butchery can be used to determine fishing methods, consumption patterns, and are important indicators of the fish trade, along with element proportions and sizes. During assessment, note will be made of all butchery marks by recording species and element; full recording, sketching and photography should take place during technical recording to examine these in full detail.

Species

Full quantification by species was undertaken during the assessment. These data are available in Table 2 and Table 3 by phase, recovery method and element type, and the total NISP data are presented as percentages by phase and recovery method in Table 4 and Table 5. The assemblage is of considerable size: about 1650 bones were identified from the hand collected material, and a further 374 were identified from the sieved material. Cod family fish, including cod, ling, haddock, saithe and whiting, dominate the assemblage and represent over 90% of all identified bone. Other species present include flatfishes, herring, dogfishes and rays, and a few gurnards. These are all to be expected, given the date and location of the material.

Within the large hand collected assemblage, subtle variations between the proportions of the various cod family fish suggest changes through time. Cod represent three quarters of the assemblage in phase 1, decreasing to just under 50% by phase 3, while ling correspondingly increase during this time. In phase 5, haddock become much more common, as do saithe, while flatfishes become much rarer; together these suggest a change in fishing strategies and fish consumption, perhaps linked to changing deposit types. The sieved assemblage is smaller but is still very informative, particularly as it is less biased than the hand collected material. In the sieved portion, haddock is much more common than cod in phases 3 and 5 than in the earlier phases 1 and 2, again indicating a change through time. Element proportions and sizes will be investigated during the full analysis in order to investigate these possible changes in more detail. Changes to site and deposit types will also be correlated with these potential changes in fishing strategies and consumption patterns.

Element proportions, sizes and measurements

Broad size categories will be recorded for each QC1 and QC4 element during the full technical analysis, based on comparison with reference material. As seen from Table 2 and Table 3, there are a considerable number of such elements for most phases. The hand collected assemblage will naturally be dominated by larger animals, but even within this fraction, it will be possible to study size variation – which could be linked to fishing in different habitats at different times, or to increasingly intensive exploitation through time. Initial qualitative observations indicate the cod family fish

are of substantial size, including many ling and cod of over 1m total length that must have been fished from deep waters of the North Sea. Quantities are less from the sieved material, but within the cod family, it should be possible to examine whether sizes change through time or not in this unbiased material, and whether there are any correlations with the hand collected sizes.

In addition, selected measurements will be recorded during the full technical analysis, and using available regression formulae, exact fish lengths can be determined. Table 6 summarises the 167 measurable elements for the assemblage – a considerable quantity. The earlier phases are well represented, and it will be possible to contrast phases 1 and 2 in detail. Most are from the hand collected portion, and with the exception of a flounder, all are from the cod family. These will produce accurate fish lengths, which will be used in conjunction with the general size categories to produce a detailed analysis of fish size changes through time.

Butchery

About 60 elements were noted as butchered during the initial assessment, as summarised in Table 7. Species and elements were noted during the recording, but full analysis of the butchery marks will await full recording. All butchered fish were from the cod family, and most were large cod or ling. This type of butchery is typical of medieval assemblages from urban English sites (e.g. Harland 2007; Harland 2008; Harland *et al.* 2008; Harland and Parks 2008; Harland and Jones In prep.), but is less well known from Scottish sites. Very small quantities of butchered fish have been found in medieval sites in the Northern Isles, where large cod family fish were caught, cured, and prepared for export (Harland 2006).

Butchery marks were predominantly found on the vertebrae, the appendicular skeleton (including the cleithra and supracleithra), and the elements around the mouth. The appendicular skeleton is particularly important for recognising the fish trade, as these elements commonly travel with the preserved product to the consumption site. Based on qualitative assessment only, appendicular butchery marks appear more common in phase 2 than in other phases, although this could also reflect the large quantity of material found in this phase. Further investigation of butchery types, element sizes, and the proportions of various element types will allow this hypothesis to be investigated in more detail in the full technical analysis.

The fish trade

Elements were not recorded in full during the assessment, but initial qualitative assessment indicates preserved fish may have been imported during phase 2. Cleithra from large cod family fish were noted in higher than usual quantities in this phase. However, elements from all regions of the body were also noted, which probably indicates most of the fish found at Bon Accord were eaten fresh, with perhaps a few imports consumed on occasion. Further investigation of the proportions and sizes of elements present, together with a full analysis of the butchery marks and comparison with other assemblages of like date will provide further insight into these possible imports.

Comparative material

Some animal remains were published in a synthesis of medieval Aberdeen sites excavated in the 1970s and early 80s. In particular, the Queen Street site was noted as

“rich in fish bones”, but no attempt was made to quantify or even list the fish species present in the publication (Hodgson and Jones 1982, 232) – suggesting that this current assemblage will be of great importance for understanding fishing practices and fish consumption in medieval Aberdeen. More recent publications, including Cameron and Stones (2001) will be consulted for comparative material from Aberdeen itself. Medieval English material offers the best comparative assemblages for the butchery observed at Bon Accord, although the few contemporary examples from the Northern Isles will be included in the comparative literature.

Conclusions

The fish assemblage from Bon Accord is of substantial size. Full analysis of this important assemblage will allow a much better understanding of Scottish medieval fishing strategies and fish consumption, bridging a geographical gap between the intensively studied fish assemblages from the Northern Isles and from urban English sites. Initial assessment indicates that large cod and ling were consumed in quantity, along with other species from the cod family including haddock and saithe. Some of the cod and ling caught were very substantial in size, at over 1m total length. A variety of other species were exploited, including flatfishes, herring, rays and gurnards, but cod family fish represent over 90% of the identified material.

Some indication of temporal changes was noted, with major differences observed between the earlier phases 1, 2 and 3 of 13-14th century date and phase 5 of 15-18th century date – including an increase in the proportion of haddock and saithe and a corresponding decrease in cod and ling. Fishing methods or areas of exploitation may have changed during the intervening century, or changes in demand for fish may have been responsible for the different types noted. Full analysis will provide information on fish sizes and element proportions, which will help to investigate these changes. This will also help to ascertain the types of ecosystem exploited. The large cod and ling were most likely caught in the deep waters of the North Sea, but if the later material proves much smaller, there may have been a change in the methods or areas fished through time.

There is some initial suggestion that preserved cod family fish were imported and consumed on site in phase 2, although most of the fish found at Bon Accord probably represent freshly caught meals. Butchery patterning needs to be studied in detail, along with element proportions and sizes in order to fully understand the possible extent of importation. Any conclusions will in turn be interpreted with respect to deposit type and temporal changes.

Full analysis should include thorough comparison with other published material from medieval Aberdeen and other sites in Scotland. Initial surveys of the literature suggest this assemblage is of considerable importance because of its large size and its potential to understand changing patterns of fish consumption, fishing strategies, and the fish trade. Finally, comparison with the mammal and bird assemblages from Bon Accord should be undertaken to determine the relative importance of fish to the diet of medieval Aberdonians.

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Tables

Table 1: Phasing summary

Phasing from report		Approximate dates	Description
Phase 1	A1, B1 and C1	Probably 13-14 th century	Often waterlogged, with several pits with good preservation and survival of organic material and some evidence of leather working industrial function; some pottery tentatively of 13-14 th century date
Phase 2	A2, C2	Probably 13-14 th century	Occupation dumps, waste disposal, drainage, industrial functions (including leather working), and clearly marked activity areas and boundaries [the phasing documentation lists B1 as also belonging to this phase, but for simplicity and until details have been resolved, B1 has been included only in Phase 1]
Phase 3	A3, C3	Probably 13-14 th century	Occupation, structures and levelling episodes, as well as waste disposal and industrial function
Phase 4	A4, C4	Probably 14-15 th century	Increased structural activity, boundary evidence, drainage features, occupation and dump deposits, floor deposits
Phase 5	A5, C5, C6	Probably 15-18 th century (late- and post-medieval)	Occupation deposits, structures, surfaces, floors, drainage, refuse disposal
Phase 6	A6, B2, C7	19-20 th century	Brick and rubble structures, drainage, cellars, floors, probably of large industrial function
Unstratified/ other			Includes a number of contexts that were unstratified, that extended across multiple phases, that were not in the phasing documentation, or that may have been wrongly recorded and that will be checked prior to main analysis

Table 2: NISP for hand collected taxa by phase and quantification code (QC1=cranial and appendicular elements; QC2=vertebrae; QC4=unusual elements; QC0=unidentified)

Taxa	QC	Phasing							Total
		1	2	3	4	5	6	Unstrat./ other	
Ray Family	4		1		1				2
Cod Family	1		1	1		2		1	5
	2							1	1
	0							1	1
	Total		1	1		2		3	7
Cod/ Saithe/ Pollack	2					13			13
Cod	1	58	268	28	2	11	7	94	468
	2	159	228	21	2	20	7	86	523
	Total	217	496	49	4	31	14	180	991
Haddock	1	9	24	2	1	6	1	11	54
	2	1	4			10	1	1	17
	Total	10	28	2	1	16	2	12	71
Ling	1	23	99	22	1	2	1	58	206
	2	30	142	24		5	1	100	302
	0	4							4
	Total	57	241	46	1	7	2	158	512
Saithe/ Pollack	2	2	2			4		2	10
Pollack	2					1			1
Saithe	1		1			5			6
	2	1	1			7			9
	Total	1	2			12			15
Gurnard Family	1					1			1
	0	1							1
	Total	1				1			2
Turbot Family	2		1						1
Turbot	1	1							1
Halibut Family	1		1						1
	2		6						6
	4		4	1					5
	Total		11	1					12
Flounder/ Plaice	1		1					1	2
	4			1					1
	Total		1	1				1	3
Plaice	1		4						4
	4		3						3
	Total		7						7
Total identified to taxa		289	791	100	7	87	18	356	1648
Unidentified fish		119	441	39	4	76	37	164	880
Grand total		408	1232	139	11	163	55	520	2528

Table 3: NISP for sieved taxa by phase and quantification code (QC1=cranial and appendicular elements; QC2=vertebrae; QC4=unusual elements; QC0=unidentified)

Taxa	QC	Phasing							Total
		1	2	3	4	5	6	Unstrat./ other	
Dogfish Families	2					1			1
Ray Family	4				1	1			2
Herring Family	2					1			1
Atlantic Herring	2	1	7			4			12
Carp Family	2		1						1
Salmon & Trout Family	2					2			2
Cod Family	1					2			2
	2	3	2		2	5	4	1	17
	Total	3	2		2	7	4	1	19
Cod/ Saithe/ Pollack	2	1				2			3
Cod	1	4	4	1	1		1		11
	2	8	30	3	6	3	2	1	53
	Total	12	34	4	7	3	3	1	64
Haddock	1	1	6	14		19	4	1	45
	2	8	7	57	2	46	12	18	150
	4			3					3
	Total	9	13	74	2	65	16	19	198
Ling	1	1	2						3
	2	4	22	1				1	28
	Total	5	24	1				1	31
Pollack	2					1			1
Poor-cod	1				1				1
Whiting	1					1		1	2
	2	1	1	7	1	8	1	4	23
	Total	1	1	7	1	9	1	5	25
Gurnard Family	1					1			1
Halibut Family	2	2			1	3		1	7
Flounder/ Plaice	4	1							1
Flounder	1	1							1
Plaice	1	2							2
Sole Family	2	1							1
Total identified to taxa		39	82	86	15	100	24	28	374
Unidentified fish		255	301	409	34	463	42	43	1547
Grand total		294	383	495	49	563	66	71	1921

Table 4: Percentage NISP for hand collected material; minor phases shown in grey

Taxa	Phasing						Unstrat./ other	Total
	1	2	3	4	5	6		
Ray Family		0%		14%				0%
Cod Family		0%	1%		2%		1%	0%
Cod/ Saithe/ Pollack					15%			1%
Cod	75%	63%	49%	57%	36%	78%	51%	60%
Haddock	3%	4%	2%	14%	18%	11%	3%	4%
Ling	20%	30%	46%	14%	8%	11%	44%	31%
Saithe/ Pollack	1%	0%			5%		1%	1%
Pollack					1%			0%
Saithe	0%	0%			14%			1%
Gurnard Family	0%				1%			0%
Turbot Family		0%						0%
Turbot	0%							0%
Halibut Family		1%	1%					1%
Flounder/ Plaice		0%	1%				0%	0%
Plaice		1%						0%
Total	100%	100%	100%	100%	100%	100%	100%	100%

Table 5: Percentage NISP for sieved material; minor phases shown in grey

Taxa	Phasing						Unstrat./ other	Total
	1	2	3	4	5	6		
Dogfish Families					1%			0%
Ray Family				7%	1%			1%
Herring Family					1%			0%
Atlantic Herring	3%	9%			4%			3%
Carp Family		1%						0%
Salmon & Trout Family					2%			1%
Cod Family	8%	2%		13%	7%	17%	4%	5%
Cod/ Saithe/ Pollack	3%				2%			1%
Cod	31%	41%	5%	47%	3%	13%	4%	17%
Haddock	23%	16%	86%	13%	66%	67%	68%	53%
Ling	13%	29%	1%				4%	8%
Pollack					1%			0%
Poor-cod				7%				0%
Whiting	3%	1%	8%	7%	9%	4%	18%	7%
Gurnard Family					1%			0%
Halibut Family	5%			7%	3%		4%	2%
Flounder/ Plaice	3%							0%
Flounder	3%							0%
Plaice	5%							1%
Sole Family	3%							0%
Total	100%	100%	100%	100%	100%	100%	100%	100%

Table 6: Summary of measurable elements

Recovery	Taxa	Phasing						Total
		1	2	3	5	6	Unstrat./ other	
Hand collected	Cod	16	56	4	2	1	20	99
	Haddock	1			1		1	3
	Ling	10	20	4			11	45
	Saithe				2			2
	Total	27	76	8	5	1	32	149
Sieved	Cod	1	2					3
	Haddock		1	4	5	1		11
	Plaice	2						2
	Whiting				1			1
	Flounder	1						1
	Total	4	3	4	6	1		18
Grand total		31	79	12	11	2	32	167

Table 7: Summary of butchered fish bone

Taxa	Element	1	2	3	4	5	Unstrat./ other	Total
Hand collected								
Cod Family	Branchiostegal						1	1
Cod	Basioccipital						1	1
	Cleithrum			4			2	6
	Dentary	1	6	2				9
	Supracleithrum		2				2	4
	Maxilla			1		1		2
	Premaxilla		1					1
	Quadrate		1					1
	Abdominal Vertebra Group 1		2				1	3
	Abdominal Vertebra Group 2	3	1				1	5
	Abdominal Vertebra Group 3	2	3			1		6
	Caudal Vertebra Group 1	1	1				1	3
	Total	7	21	3		2	8	41
	Ling	Basioccipital			1			
Cleithrum		1	3	1				5
Supracleithrum			1				1	2
First Vertebra							1	1
Abdominal Vertebra Group 1		1						1
Abdominal Vertebra Group 2			1				2	3
Abdominal Vertebra Group 3			2					2
Caudal Vertebra Group 1			1					1
Total		2	8	2			4	16
Total hand collected		9	29	5		2	13	58
Sieved								
Cod	Abdominal Vertebra Group 3			1				1
	Caudal Vertebra Group 1			1		1		2
	Total			2		1		3
Haddock	Caudal Vertebra Group 2					1		1
Ling	Abdominal Vertebra Group 2		1					1
	Caudal Vertebra Group 1		1					1
	Total		2					2
Total sieved			4		1	1		6

