Excavations in Poole 1973 - 1983

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THE LATE-SAXON AND CONQUEST-PERIOD OYSTER MIDDENS

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Introduction
Although the investigation of coastal middens is an established aspect of prehistoric archaeology, the investigation of similar middens in medieval, sometimes urban, contexts is a relatively neglected field. The discovery of an extensive midden beneath 13th-century urban Poole led to a research programme by the authors to investigate the date and the nature of the deposit.

Attention was first drawn to massive oyster middens on the foreshore of the medieval port of Poole and on the Hamworthy peninsula opposite in 1981 (Horsey 1981). The positions of the sites from which oyster shells were recovered are shown in Fig.3. The excavated sites include the interior of the Town Cellars building (PM11); the area of Paradise Street immediately in front of the Town Cellars (PM21 and PL24); Thames Street leading off Paradise street (PM9); nearby Pex Marine (PM24); and a borehole at the Shipwrights’ Arms in Hamworthy (PM32). Watching brief observations also recorded oysters at Poole Pottery, whilst other observations have provided negative evidence.

Location of Deposits
The Town Cellars is a medieval warehouse built directly on top of the shell midden which was sealed by layers securely dated by pottery to c.1300. The shell deposit covered the whole of the excavated internal area of the building and extended outside in all directions. It consisted entirely of discarded oyster shells, thickening from 0.2m at the back of the building to 0.5m at the front and increasing as the shells deliberately or inadvertently reclaimed the sloping foreshore beneath Paradise Street, where it was not possible to determine the full thickness of the deposit.

At adjacent Thames Street, the shells occupied a similar stratigraphic context to those from the Town Cellars but appeared as a discrete accumulation. On the Pex Marine site, only the top of the shells, below late 15th/early 16th-century foreshore reclamation, was sampled. Another borehole (Fig.3) through the foundations of the Shipwrights’ Arms in Hamworthy revealed an oyster midden 3.4m thick.

Quantity of Shell
Because of insufficient data it is not possible to estimate accurately the full extent of these oyster deposits, but the archaeological evidence coupled with that from boreholes and observation sites suggests that the midden near the Town Cellars on the Poole waterfront was continuous along the foreshore for a minimum of 100m. Its width is also difficult to estimate but 40m may be average. Although the maximum depth of the deposit has not been determined, it would seem to average c.1m. There is also a cluster of oyster observations, some on reclaimed land, in the Poole pottery area. These require further study although some may correspond to the oyster bank marked on the 1774 map.

The quantity of oyster shell represented by the Poole midden near the Town Cellars, based on the above size approximations, is enormous. Using the minimum and maximum estimates of length, and the number of individual oysters found in a measured volume of the midden (228 MNI oysters in jm³, PM21 502.206 sample 19), it is possible to calculate that the midden might contain between 3,808,000 and 7,616,000 oysters. The Ministry of Agriculture, Fisheries and Food (Lowestoft) have provided unpublished data giving an average wet weight of 7.5g for oysters. A Medical Research Council Report on food values gives a value of 50 calories per 100g of oyster meat. Therefore, the midden could represent between 28,56 and 57.12 tonnes of raw oyster meat. If the average consumption in calories per day for a man is standardised at 2,000, then the Poole midden would have provided from 7,140 to 14,260 man/days (19-38 man/years) of food. A man would have to eat 532 oysters a day to obtain the required energy level. Clearly these calculations should not be taken literally but they do give an indication of the food value involved.

Dating of the Oyster Shells
Six samples of oyster shell were sent to the Harwell Laboratory for radiocarbon dating. The problem of obtaining reliable radiocarbon age determinations from calcitic shells has been discussed by Burleigh (Preece et al. 1983). The major problem is that the original carbon may have been replaced by more recent carbon either by mechanical contamination where particles or solutions have entered the interstices and become absorbed, or by carbon isotope exchange between the shell and the environment. This recrystallisation by solution and reprecipitation (Craig 1954) can have an important effect on radiocarbon dating.

Shells from the samples PM11 (141) and PM32 (1D) examined by Mr T. Yates using acetate peels and a low-power petrological microscope showed them to be unaltered calcitic structures in which recrystallisation was unlikely to have occurred. There were, however, cavities in

Plate 24. Site PM23. Section showing Town Ditch. Looking west. Scale 2m. (Copyright: Poole Museums).
the samples, in one case occupying nearly twenty per cent of the section, and the growth layers were visible as deeply incised grooves immediately below the shell surface via which mechanical contamination could have taken place. The sample from PM24 (12) which came from immediately below levels high in organic acids was considered likely to have been recrystallised (it was not examined microscopically).

The calculation of radiocarbon dates and the way in which results are expressed may vary at different laboratories (Mangerud 1972; Gillespie and Polach 1979). The Harwell figures were presented without the correction for 'apparent age' but this has been calculated using the formula presented by Harkness (1981) and added to the results given in Table 1. Unlike terrestrial organisms which mainly utilise carbon containing relatively new carbon isotopes from the atmosphere, marine organisms tend to incorporate older, recirculated carbon from the oceans so that molluscs such as oysters have a C14 age at death that can vary from 200-300 years to more than 2,500 years according to the region of origin. In the United Kingdom the apparent age correction involves the subtraction of 405±40 (Harkness 1981) from the age given by the conventional radiocarbon dating for marine molluscs.

Table 1. Radiocarbon dates for oyster shells.

<table>
<thead>
<tr>
<th>Lab No.</th>
<th>Site</th>
<th>Context</th>
<th>Radiocarbon Age bp with</th>
<th>Estimated Actual Age in</th>
<th>Correction for apparent age in years</th>
<th>Age in brackets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Har-2774</td>
<td>Town</td>
<td>PM11(142)</td>
<td>1260±100 bp</td>
<td>(855±108 bp)</td>
<td>1095±108</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Har-2775</td>
<td>Paradise</td>
<td>PM21(58)</td>
<td>1260±100 bp</td>
<td>(855±108 bp)</td>
<td>1095±108</td>
<td></td>
</tr>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Har-3462</td>
<td>Pex Marine</td>
<td>PM24(12)</td>
<td>970±70 bp</td>
<td>(565±81 bp)</td>
<td>1385±81</td>
<td></td>
</tr>
<tr>
<td>Har-3463</td>
<td>Thames</td>
<td>PM9(6)</td>
<td>1360±70 bp</td>
<td>(955±81 bp)</td>
<td>1995±81</td>
<td></td>
</tr>
<tr>
<td>Har-3464</td>
<td>Shipwrights' PM32(11D)</td>
<td>Arms, Top sample</td>
<td>1280±80 bp</td>
<td>(875±90 bp)</td>
<td>1075±90</td>
<td></td>
</tr>
<tr>
<td>Har-3465</td>
<td>Shipwrights' PM32(11D)</td>
<td>Arms, Bottom</td>
<td>1420±70 bp</td>
<td>(1015±81 bp)</td>
<td>935±81</td>
<td></td>
</tr>
</tbody>
</table>

bp - represents before present defined as 1950 for radiocarbon dating. Years are corrected to the nearest whole number.

The dates for the Poole oyster shells range from a.d. 935±81 for the lowermost layer from the Shipwrights' Arms core to a.d. 1385±81 for the Pex Marine sample - which, as previously stated, could well have been subject to contamination by more recent carbon. The Thames Street sample dates to a.d. 995±81 and therefore is contemporaneous with the middle layers of the Shipwrights' Arms core sample but earlier than the other samples from the Poole side. The top of the Shipwrights' Arms core contained shells dating to a.d. 1075±90 which is slightly earlier than the a.d. 1095±108 dates obtained for both the Town Cellars and Paradise Street samples. The Shipwrights' core deposit of 3.4m depth accumulated over a period of about 150 radio-carbon years.

The above discussion of the dating is all in radio-carbon years. These dates need to be converted to calendar years by using a calibration estimate based on Bristlecone pine. This has not been attempted here and it is intended to recalibrate these dates and review the historical implications later. Recalibrations at this time generally widen the original radio-carbon date ranges by a small amount.

Origin of the Oysters

Preliminary analysis of the shells indicates that the oysters were not washed up naturally on the shore but were deposited after harvesting from the sea (Winder infra). The existence of the midden was fortuitous in providing both a firm foundation for the woolhouse and an adjacent 'hard' for beaching craft. The midden pre-dates the founding of Poole. The group of radiocarbon dates for the Poole and Hamworthy oyster shells [excluding those from Pex Marine] places their deposition in the 10th, 11th and 12th centuries. The occurrence of such large middens in the late Saxon and early post-Conquest periods for this locality is enigmatic.

A parallel for waterside activity leading to a town's foundation could be King's Lynn in the 11th century (Owen 1979) where it is argued that salt-workings encouraged visits by merchants; and the town itself was constructed on the piles of sand left by the salt extraction process.

Oyster shells are frequently found on Roman and Saxon waterfront sites in London, for example the Pudding Lane site where analysis of the size, shape and infestation of the shells suggested improvement of natural stocks by the Romans; and one of the interpretations placed on the location of massive dumps of oyster shells beneath the openwork jetty was that processing of the shellfish may have taken place (Winder 1985).

Post-Roman middens have been recorded elsewhere, e.g. at Bantham, Devon (Silvester 1981, Griffith 1986) and at Burrow Hill, Suffolk (Fenwick 1984). In the investigation of an 11th-/12th-century shell midden in Brauntun Burrows (Smith, Allan, Hamlin, Orme and Wootton 1983) the authors suggest that the midden represented a cooking or processing site for shellfish redistribution. However, there seem to be no middens comparable in scale to the ones at Poole. It is interesting to note that there are unsubstantiated reports of large oyster shell deposits at Wareham. This town on the opposite side of Poole Harbour was in existence before Poole.

The rapidity with which such waste from the exploitation of marine molluscs can accumulate is well demonstrated by modern parallels. Given the magnitude of the evidence from Poole and Hamworthy, and the fact that no other food remains are incorporated with the oyster shells, it could be that the middens do not simply reflect part of the diet of an as yet unlocated local population. It seems possible that the oysters were being harvested on an almost commercial scale, opened, and the meat salted or pickled in brine in the way documented in the 17th century (Philpots 1890).

Acknowledgements

This report is based on a first draft by the late I.P. Horsey and has been prepared and revised by Mrs J.M. Winder who is conducting a detailed study of the Poole oyster deposits.

It is a revised version containing new information of a report published in the third International Conference on Waterfront Archaeology (Horsey and Winder 1991).