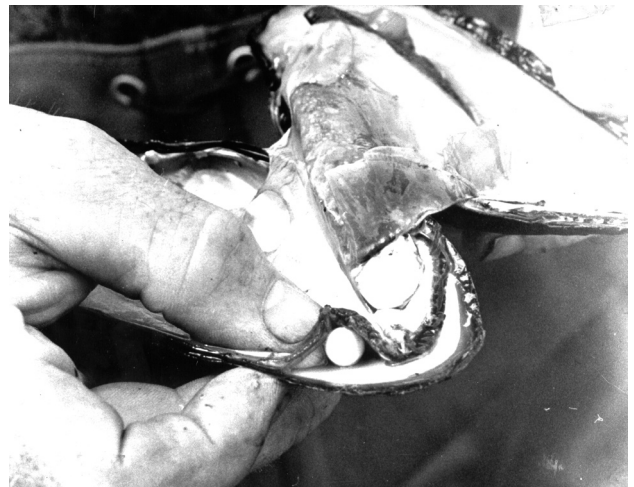


Table 34 Numbers of mollusc shells identified.

common name	species	number of shells
oyster	<i>Ostrea edulis</i>	6393
mussel	<i>Mytilus edulis</i>	3158
limpet	<i>Patella cf vulgata</i>	29
freshwater pearl mussel	<i>Margaritifera margaritifera</i>	314
buckie/whelk	<i>Buccinum undatum</i>	21
cockle	<i>Cerastoderma cf edule</i>	27
periwinkle/wulk	<i>Littorina littorea</i>	276
dog whelk	<i>Nucella lapillus</i>	10
Iceland cyprina	<i>Arctica islandica</i>	4
trough shell	<i>Spisula solida</i>	2
screw shell	<i>Turritella communis</i>	1
top shell	<i>Gibbula cineraria</i>	1
scallop	<i>Pecten maximus</i>	2



Illus 42 Oyster shells and animal bone from the site.
(Copyright Perth Museum and Art Gallery)



Illus 43 Pearl mussel (*Margaritifera margaritifera*)
from the Tay, containing pearl, 1960s. (Copyright
Perth Museum and Art Gallery)

The mollusca

David Heppel, Catherine Smith and David McKay

Notes on the identification

The molluscan material was initially sorted and listed by William Finlayson and Kathleen McSweeney and identified by David Heppel at the Department of Natural History, National Museums Scotland, then known as the Royal Scottish Museum, Edinburgh.

For all bivalve species, that is, shells composed of two halves called 'valves', it is the number of single valves, not complete shells, which have been counted, and which appear in Table 34. In the case of fragmented mussel shells, only the hinges of the valves were counted; if no hinge was present, the presence of mussel fragments was noted but not enumerated. Thus, by counting both valves separately, the relative abundance of the bivalves has been over-estimated by a factor of two compared to the univalves. It should also be noted that marine bivalve shells vary considerably in their resistance to mechanical damage: scallops and oysters are the most resistant, while cockles and mussels are the least.

Species present

Marine bivalves which were identified at the site were oyster (*Ostrea edulis*) (Illus 42), mussel (*Mytilus edulis*), cockle (*Cerastoderma edule*), trough shell (*Spisula solida*), Iceland cyprina (*Arctica islandica*) and scallop (*Pecten maximus*). Other marine mollusca recovered were limpet (*Patella* sp), whelk or buckie (*Buccinum undatum*), periwinkle (*Littorina littorea*), dog whelk (*Nucella lapillus*), screw shell (*Turritella communis*) and top shell (*Gibbula cineraria*).

The most commonly occurring marine species, found in relatively large numbers at the site, are all edible, and must have been deliberately collected, while those species occurring in small numbers in only a few contexts, such as top shell, screw shell and dog whelk, may have been deposited accidentally by other means. Only one freshwater species, the pearl mussel (*Margaritifera margaritifera*) was recorded at the site.

Discussion

Of the marine species, all except the screw shell, Iceland cyprina and scallop are associated with intertidal or immediately subtidal waters. Scallops could be collected on the west coast of Scotland at one time, but there are no such records for the east coast. All the species recovered from the excavation require almost fully salt water for survival and therefore could

not have occurred naturally at Perth. Although small mussels can be collected from most rocky shores, large mussels are obtained from beds in semi-sheltered areas. In order to accommodate the development of ports, many changes have been made to sheltered coastal areas on the east coast of Scotland, with detrimental effects on the mussel beds. At the present day, the nearest large concentrations of mussels occur at Tayport, the Montrose Basin and in the Eden estuary. Mussels were widely collected as food for humans, as well as for baiting hand- and set- lines used to catch cod and haddock. Rights to collect mussels have been jealously guarded in the past: a charter of James VI in 1612 confirms the privileges of the royal burgh of Tain on the Dornoch Firth, granting sole rights over the collection of mussels: *concharum petram conchasque lie mussi-scape et mussillis in conspectu dicti burgi et territorii ejus nuncupat. Sanct-Duthois-scape* (the rock of the mussels and the mussels, the 'mussi-scape' and 'mussillis', in sight of the said burgh [of Tain] and its territory called Sanct-Duthois-scape) (RMS, vii, no 768). The rights conferred by this charter govern access to this fishery up to the present day and are administered through the former burgh of Tain's Common Good Fund.

Perth is some 24km (15 miles) from the open sea, a distance equivalent to some two or three hours each way travelling by boat. It is thus unlikely that Perth would have been the base for a fishing fleet, and therefore improbable that mussels would have been transported to Perth for use as bait. It seems more likely that they were intended as food for humans.

Whereas mussels may still be collected from the Firth of Tay at the present day, oysters are absent. However, it is notable that very rarely has an archaeological investigation been carried out in the medieval burghs of Dundee, Perth and Arbroath which has not recovered oyster shells. Although a sizeable proportion of these oysters were probably imported from the Forth, which supported a thriving oyster fishery up until the 19th century (Yonge 1960, 156), it is possible that some derived from now extinct local beds in the Tay. Fossil oysters are found in the upper layers of the Arctic clay deposits, formed during the period of the last glaciation, at Inchcoonans near Errol in the Carse of Gowrie (Walker 1961, 52; Davidson 1932, 60). There is no evidence as to the date at which oysters became extinct in the Tay, but archaeological evidence from coastal burghs on the Firth may be construed to imply that they continued to survive until the medieval period. Their final extinction may have been due, at least in

part, to over-fishing, as shown by the example of the Forth oyster beds. These were at one time extremely bountiful, and in the 18th century supported a fishery based in Prestonpans, Cockenzie and Newhaven (Yonge 1960, 157). In the late 16th century the beds yielded, according to Fynes Morison, 'plentifully . . . (among other fish) store of oysters and shel fishes' (Hume Brown 1978, 85). A sense of the rate at which the Forth beds were depleted is indicated by the record of exports from the port of Leith: in the year 1666, 721,000 casks went out through the port, yet in 1690, the number had fallen to 10,000 (Mowat nd, 219). In the latter quarter of the 18th century, the intensity of the fishing increased leading to a serious decline in the oyster beds. Although temporary measures were taken to restrict fishing in the early part of the 19th century, the decline continued until the fishery was eventually abandoned around 1920 (Millar 1961, 10–11).

Both mussels and oysters can survive for several days after collection, especially in periods of cooler weather, and it is more likely that in the medieval period they would have been eaten in the winter months.

As regards the relative abundance of mussels and oysters, mussels live in the intertidal area and may be easily collected from the shore at low tide. However, in the historic period, the available evidence indicates that the oyster beds in the Firth of Forth were all located below low water mark, and their exploitation would have required the use of boats and the development of rakes and dredges to recover them. This may account for the higher relative abundance of mussels in the earlier phases of the excavation, since they could perhaps have been obtained with less effort.

Cockles are also widely eaten, but although they currently occur on the east coast of Scotland, are nowhere present in abundance. The small number of cockle shells found probably reflects this natural scarcity rather than any dietary preference.

Periwinkles and limpets are also widely eaten. As a food, periwinkles are more highly valued than limpets, which tend to be eaten mainly in times of food shortage, and this would account for their relative abundances at the site. Top shells and dog whelks occur in areas where periwinkles are abundant, and may have been collected with them from the shore. Iceland cyprina and screw shell, however, are only rarely found on the shore since their natural habitat is in deep water. It is probable that these species were brought to Perth as a by-product of fishing operations, either as a by-catch on fishing vessels, or in the stomach contents of some of the larger target species such as cod. Accidental importation on to the site in building sand intended for use in mortar is also possible. It is also worthy of note that human beings the world over appear to be fascinated by the variety of form of seashells and their deliberate collection cannot be ruled out.

Early evidence of exploitation of shellfish in the Tay estuary comes from a 'kitchen midden' of Mesolithic

date, located about 2km from the burgh of Dundee, in the Stannergate. This midden, along with a number of cist burials which overlay it, was discovered during extensions to Dundee Harbour in the 19th century, and the finder noted the shells were 'principally' those of mussels, periwinkles (known locally as 'wulks'), whelks (known locally as 'buckies'), cockles and limpets. Oysters are not mentioned in this list, although this does not necessarily mean they were absent, given the circumstances of the hurried recording which it was necessary to make before the site was destroyed (Mathewson 1879, 303–7).

Two specimens of the scallop, *Pecten maximus*, found at the site, were of interest. Although this is an edible species and occurs abundantly in the waters off the east coast of Scotland, all currently known beds are in deep water at some distance from the coast. Occasional scallops may have been caught as a by-catch in the line fishery, but no commercial scallop fishery is known prior to the 1980s. Modern dredges towed by clam-boats on the west coast of Scotland consist of a triangular iron frame with a toothed crossbar used for raking the shells out of the seabed (Martin 1995, 52).

Both of the scallop shells from the site were found to have been deliberately bored through, the more complete specimen (A07–0574; Context 7296–7; M9a; Phase IVc, IVcc; Rig VII) having two holes, while the smaller example (A5190; Context 2462A–3; M1.4c; Phase IIIa–IVcc; Rigs V and VI) showed evidence of having been treated in a similar way. It is possible that these shells were pilgrims' badges obtained at Santiago de Compostela in Spain. This may account for the pink colouration observed in these shells, a feature not normally found in British specimens. A similarly bored scallop shell interpreted as a pilgrim's badge has also been noted at a site in Va in Sweden (Stockholm, Statens Historika Museum no. 23785, Spencer pers comm). Further evidence from Scotland of the use of scallop shells as a religious symbol has been found at the medieval burial site on the Isle of May, where the body of a young man was excavated still containing a shell placed in the mouth. Presumably the body was that of a pilgrim who had made the journey to the shrine of Saint James the Great at Compostela (James and Yeoman 2008, 180–1 and Illus 5.24).

Besides the marine species, one freshwater mollusc was also fairly abundant, the pearl mussel *Margaritifera margaritifera* (Illus 43). This species, too, is edible, and has been used by the cod and ling fishermen of the Ythan estuary in Aberdeenshire for baiting lines, but it is also the source of freshwater pearls (Goodwin 1985, 28). In recent times the pearl mussel has become much less abundant and in danger of extinction due to over-fishing and has since 1991 been protected under the Wildlife and Countryside Act 1981 (Statutory Instruments 1991/367 and 1998/878).