Centre for Archaeology Report 2/2001

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Summary
The identification of organic material preserved by metal corrosion products from excavations at the castle, dates range from C15 – C17th. The objects examined include a large group of arrowheads, some with shaft remains, several knives and tools, as well as a set of jackplates. One of the most interesting items is a knife with a mother-of-pearl handle and a contribution on the distribution of this material by S Payne. Electron micrographs of this material have been included as they may prove diagnostic in identifying this material at a microscopic level.

Keywords
Mineral preserved organic

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Around 40 iron objects were selected with possible organic materials preserved in the corrosion layers, the largest group being arrowheads. All the objects were examined using a low-powered binocular microscope in order to distinguish between the different materials. In several instances samples had to be examined on the scanning electron microscope (SEM) to confirm the wood species (Watson, 1988), and where this technique has been used the sample numbers are indicated in the catalogue.

Arrowheads

31 arrowheads were examined, but less than a third of these contained traces of their original haftings which could be identified. Where the hafting is present, willow or poplar has consistently been used with the exception of CC75 IQ sf5 which was made from whitebeam or maple. Traditionally poplar was used for medieval arrowshafts (Morris, 1997) and this can be seen by the vast numbers of poplar arrows recovered from *The Mary Rose*. Unfortunately willow and poplar cannot easily be separated on microscopic grounds and it has not been possible to confirm the exclusive use of poplar for the haftings. Similar arrowheads have been examined from Holm Castle (Morris, 1997) and they also were hafted with willow or poplar. In many instances it could also be seen that the arrowshafts were made from trimmed mature timber rather than young stems (with the exception of CC75 IQ sf5), and it has been suggested that arrowshafts made from mature wood give a more accurate flight (Urbon, 1991).

753711	CC75?IQ sf 5	Wood in socket, probably *Sorbus* sp. (whitebeam or mountain ash) or *Acer* sp. (maple). As pith is present in the centre it must have been made from a young stem.
753777	75 JQ (*)	No wood remaining in the socket.
753778	75 JQ (4)	No wood remaining in the socket.
753779	75 JQ (5)	No wood remaining in the socket.
753781	75 JQ (7)	No obvious wood remains in the socket, just a few fragments of plant stem at the top.
753782	75 JQ (8)	No obvious wood remains in the socket, just a few fragments of plant stem.

753785	75 JQ (11)	Fragment of *Quercus* sp. (oak) charcoal in the socket, but this may not be part of the hafting.
753786	75 JQ (12)	Two warped slivers of wood in the socket, but not sufficient to identify and possibly not part of the original hafting.
753787	75 JQ (13)	Wood in socket *Salix* sp. (willow) or *Populus* sp. (poplar) made from mature timber. SEM B767.
753790	75 JQ (16)	No wood remaining in the socket.
753791	75 JQ (17)	No wood remaining in the socket.
753792	75 JQ (18)	No wood remaining in the socket.
753793	75 JQ (19)	No wood remaining in the socket.
753794	75 JQ (20)	No wood remaining in the socket.
753805	75 JR (4)	There are no wood remains in the socket, but there is a fragment on the outside, however this is too small a piece to identify
753806	75 JR (5)	Wood in socket *Salix* sp. (willow) or *Populus* sp. (poplar), fashioned from mature timber and represents just over one years growth.
753807	75 JR (6)	Wood in socket *Salix* sp. (willow) or *Populus* sp. (poplar), fashioned from mature timber. SEM B768
753808	75 JR (7)	Wood in socket *Salix* sp. (willow) or *Populus* sp. (poplar), fashioned from mature timber.
753829	75 JV (1)	Thin layer of wood on the outside of the socket, but not enough to identify.
753830	75 JV (2)	Thin layer of wood on the outside of the socket, but not enough to identify.
753831	75 JV (3)	No wood in socket.
753898	CC75?JI sf 46	Piece of arrowshaft, *Salix* sp. (willow) or *Populus* sp. (poplar). The chisel shaped end appears to be covered in a resin-like material, which had possibly been used to attach the iron arrowhead.
791010	78 NBii (1) sf 85	No wood in socket.
791051	79 CT I (20)	Fragments of wood in the socket, but probably not part of the original hafting.
825625 [new nos]	CAM 82 G V (96)	Three flattened arrowheads, but with no visible organic material remaining in the sockets.
825631	CAM 82 CT V (108)	Wood in socket, *Salix* sp. (willow) or *Populus* sp. (poplar) made from mature timber.

961298 [part of 791001]	sf 76	Wood in socket, *Salix* sp. (willow) or *Populus* sp. (poplar) made from mature timber.
961910 [part of 832179]	CAM 83 CT III 282 sf 1463	Two arrowheads both with wood in the sockets, but one is too poorly preserved to identify. The other is *Salix* sp. (willow) or *Populus* sp. (poplar) made from mature timber.

Armour

Four sets of armour in the form of jackplates were examined and only one group (78 NB i (23) sf 205) had any organic remains that seemed to be part of their construction. This group of iron plates were originally sewn onto textile, and will be reported on separately. In among these jackplates is a nailed iron sheet that was mounted on wood, and may be part of a wooden box that could have contained the armour - context depending! The surface orientation of the wood could be indicative of sawn or tangentially split timber, which along with the choice of ash would fit in well as a side of a box. Unfortunately the plate did not cover any joint which might have helped in positioning it on the wooden structure.

961385 [part of 791094]	78 NB ii (23) sf 199	Iron plate covered in various random organic material including plant stems.
791098	78 NB ii (23) sf205	In among the jackplates is a piece of iron plate mounted on *Fraxinus* sp. (ash) with a tangential surface.
791850	78 NB i (2) sf253	Plates of armour with no recognisable organic material, just very powdery corrosion.
825615	CAM 82 G I (74) sf560	Iron sheet covered with random fragments of charcoal and stems.

Knives and other objects

Two knives were examined, but only one had the remains of its handle, which was made from Mother-of-pearl scales (WB (i) 274 sf 1339) and comes from a C16 - 17th context. Mother-of-pearl is made from the nacreous lining of shells in particular pearl oysters of genus *Pinctada* (*pers comm.* S.Payne). The genus has many species in tropical regions all round the world including the Red Sea, Zanzibar, India, the Caribbean and the Pacific. Mother-of-pearl is also widespread in other shells, including fresh-water mussels, ormers and top shells which are native to Britain and the Channel Islands, but most of these are considerably smaller and thinner than *Pinctada* and are unlikely to be of a sufficient size to produce the handle scales for this knife. The tropical shell may have been available in Tudor England but to my knowledge no handles made from Mother-of-pearl scales have been recorded for this period - there are certainly no examples from any of the periods covered in the Museum of London's Medieval Knives and Scabbards volume (Cowgill *et al*, 1987). The microscopic structure of this material can be seen in figs. 1 and 2.

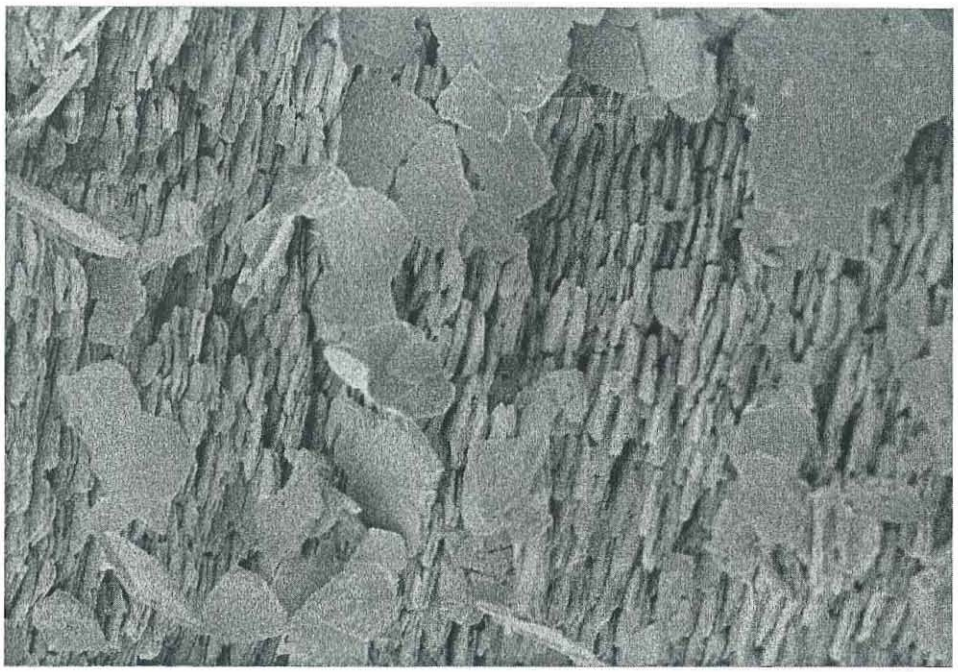

Figure 1. Cross section of the calcite and aragonite platelets which make up the nacrous lining of the shell.

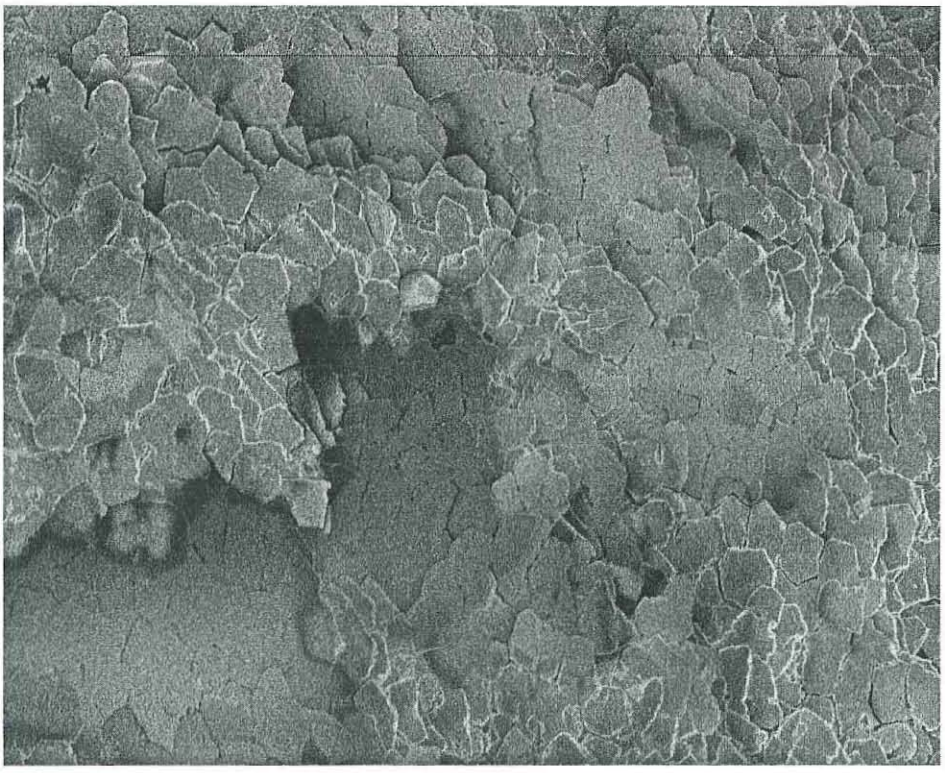

Figure 2. Superimposed layers of platelets which make up the shell.

Two iron tools were found to have wooden handles, willow or poplar, and ash. Through all periods these woods have commonly been used for this purpose.

825626	CAM 82 G V (96) sf574	Iron knife blade with organic material preserved on it - mostly random fragments of plant stems with nothing definitely relating to the handle or sheath.
832099	WB (i) 274 sf1339	Iron knife tang with the remains of Mother-of-pearl scales. SEM B766.
961296 [part of 747033]	CC 73 DA (2)	Iron knife with mineral preserved organic material but not identifiable.
785355	sf55	Iron tool with handle made from *Fraxinus* sp. (ash), using mature timber.
826034	CT II 860 sf153	Iron trowel with wooden handle, *Salix* sp. (willow) or *Populus* sp. (poplar).
961297 [part of 791001]	sf76	Iron buckle with fragments of plant stems and charcoal preserved on it, but no sign of a belt.

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