REPORT

The Aston Log Boat

After the December 1997 meeting of the E.M.G.S., Dr Chris Salisbury made an announcement requesting volunteers to help with surveillance of the Trent gravel pits. Chris, a retired G.P., is also an amateur archaeologist of note and has been studying the palaeochannels and other features of the Trent valley for more than 20 years. His expertise in the identification of trees has led to several publications in this field and at present (1998) he is working with the Sheffield and Nottingham University Dendrochronology labs on a project investigating the Neolithic and Bronze age bog oaks from the Trent gravels. This report recounts my experience as a volunteer. The project has opened up a whole new area of interest which is still keeping me very busy. Having recently retired from a complex job, my knowledge of recent sedimentary geology has a number of gaps, though a series of lectures by Dr Peter Worsley several years ago, supplemented by field trips, has saved me from exhibiting complete ignorance. Chris Salisbury is also a good teacher and very patient. The archaeology has proved to be quite fascinating.

The flood plain of the River Trent is over three kilometres wide, with numerous abandoned channels and oxbow lakes. The underlying gravel deposits extend to a depth of 5-7 metres and contain abundant pebbles derived from nearby outcrops of Triassic sandstone, Carboniferous limestone and sandstone and Quarternary till. The gravels are made up of two distinct layers. The lower is Late Devensian in age and contains ice wedge casts. The upper layer is Flandrian in age, ranging from a few thousand to a few hundred years old. The gravels are extensively exploited for aggregate by numerous pits along the Trent valley, and often reveal artefacts and structures of considerable archaeological importance. Chris Salisbury has a very good rapport with quarry operators who keep him notified of finds. As the gravels are below the water table, constant pumping is required to keep the quarries dry. Because of the rate of extraction of gravel the quarries need visiting on a regular basis. For example, one day a classic ice wedge feature was seen, cleaned, documented and photographed; the next day it had gone.

In Shardlow Quarry (ARC), near Aston-upon-Trent, a 12m wide causeway constructed of vertical oak posts and brushwood was exposed in Autumn 1997. Associated with this structure were groups of large, flat sandstone boulders which, unlike other cobbles and boulders in the gravels, showed no signs of having been transported or worn by flowing water. Most of the boulders appeared to be similar in composition and were identified by Allan Brandon and Keith Ambrose of the BGS as having originated from the Bromsgrove Sandstone. This formation crops out at King's Mill, about 2km upstream. The presence of so many unworn stones was intriguing, suggesting transport by man. We have weighed all the stones of this type — so far amounting to 800 stones weighing a total of 12 tonnes.

The gravels contain clasts of organic-rich muds, some as large as 2m across. They are very numerous in parts of the pit. The quarrymen refer to them as 'muck' because they interfere with gravel production. They are derived from the erosional re-working of the fills of palaeochannels. A palaeochannel near to the causeway contains some of the sandstone boulders described above, together with sharpened oak piles and brushwood, indicating that the causeway was partly swept away by scouring.

Close to the causeway, a large oak log boat was exhumed by quarrying operations. The bulldozer driver first thought that the boat was one of the many large bog oaks that are commonly found in the Trent valley gravels. Some damage consequently occurred to the bow and stern, although the bow was later recovered. Unfortunately, the stern has not been found, though it is possible that it was lost when the boat originally capsized. The boat contained about 500kg of Bromsgrove Sandstone cargo within its hull (Fig. 1), resembling the stones found near the causeway.

The boat was 10.5 metres long even without the stern, and the complete boat may have been 12-13 metres in length. It must have represented a considerable effort and expertise in its construction. It could be considered to be a specialised barge. The

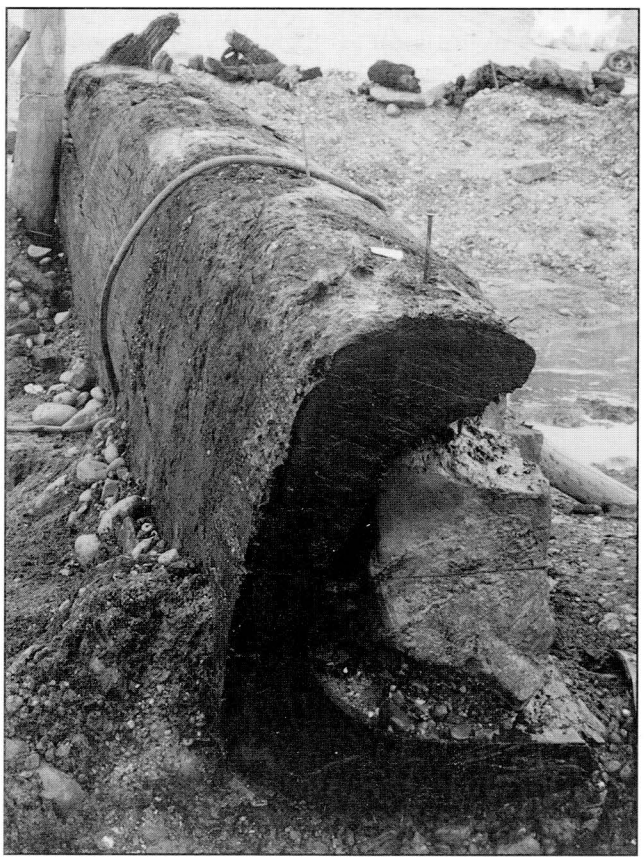

Fig. 1. Bromsgrove Sandstone boulders within the hull.

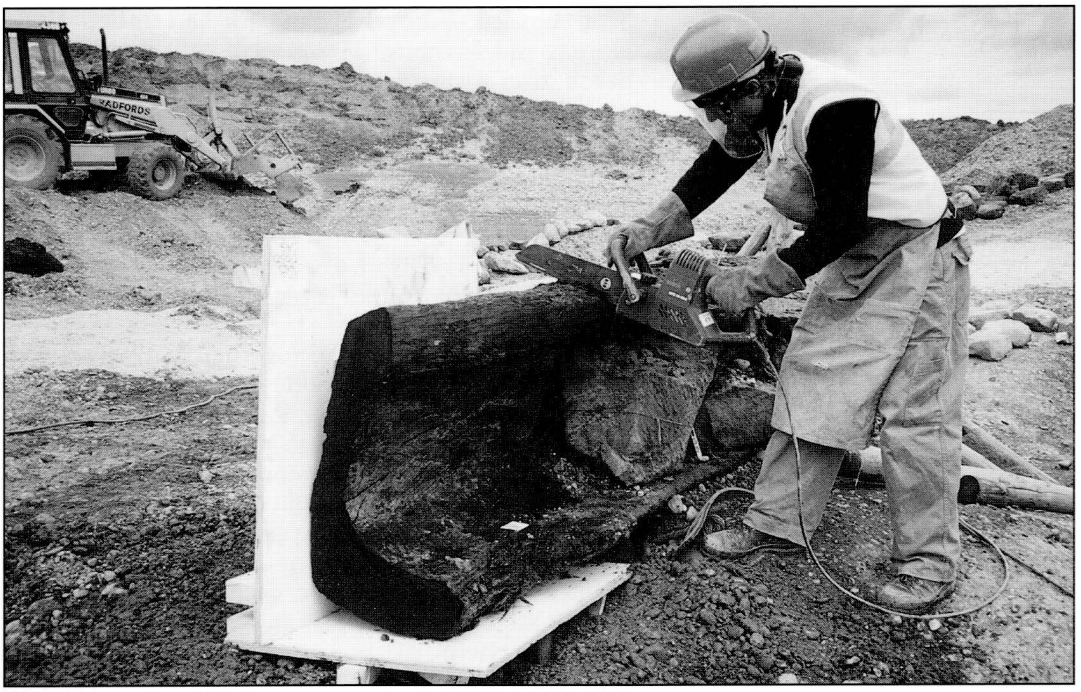

Fig.p107 2. Cutting the hull into sections.

bow has a well-designed integral carved hole or cleat, possibly for mooring or towing. This vessel would have been very difficult to manoeuvre when fully loaded with stone, especially in rough water or currents. It may have been propelled using poles or paddles and was carrying stone when it capsized, possible at the same time as the destruction of the causeway.

This is an important find because of the size of the vessel and the presence of cargo in-situ. Only a small number of such log boats have ever been recovered and properly recorded in Britain. In 1938, two boats were found in the Trent valley which were about 9m in length and flatter and lighter in construction than the Aston boat. Both had sterns bearing slots for a transom. Oak trees often have pre-existing rot in the lower trunk and boat-making thus required a transom of sound wood to add strength and make the boat watertight. Whether or not the stern of the Aston boat had a transom can only be speculated. Despite the damage, the Aston log boat has retained its shape and structure well due to the massive thickness of the timber used in construction and the good preservation resulting from the anaerobic conditions at the bottom of the palaeochannel. The bow is carved and shows a clear understanding of how to reduce water resistance. The boat has a uniform, smooth shape inside and out and a flat bottom for stability when beached. The fact that this was carved from such a large oak log must invoke respect for the craftsmen who built it. The date of the boat has not yet been confirmed but wood and other organic material from the causeway gives a calibrated radiocarbon date of 1300 B.C.

The survival of such a boat is remarkable. It is among the oldest and largest of its type ever found in Britain. The diameter and length of the straight tree trunk used for its construction is also impressive (<80cm by 12m). The tree would have been felled and then carved out within a fairly short space of time because oak becomes very hard as it dries. Although the boat is Bronze Age, shaping of the hull may have been effected using a combination of bronze and stone tools. Other oak logs on the site show very clear tool marks. Bronze weapons have been found in other parts of the same quarry.

The boat was fully excavated by expert archaeologists from the Trent and Peak Archaeological Trust led by Daryl Garton and Lee Elliott. A decision has been made to preserve the hull as it is so exceptional. Waterlogged wood must be kept wet to stop it breaking up and so a boat-watering rota was set up. For storage, the boat had first to be cut into sections (Fig. 2) which fit into special supports. Directed by the archaeologists, I had the responsibility for carefully cutting up the sections using a reciprocating saw. Each section is being immersed in fresh water tanks at the quarry site. Increasing concentrations of a soluble preservative, probably Poly Ethylene Glycol (PEG) will be added to the water to stabilise the wood. Several major wooden vessels have been preserved in this manner e.g. Vasa in Stockholm and Mary Rose in Portsmouth.

Further treatment and reconstruction will be expensive and take up to ten years to complete, but to those of us who have been involved in the project, it will be well worth the wait to see the final reconstruction of this splendid vessel.

My sincere thanks go to Chris Salisbury, Daryl Garton, Lee Elliott and Robin Woolley (the very helpful manager of Shardlow quarry).

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