Trees and Woods: Myths and Realities[1]

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It is always a rather daunting prospect to have to write an essay on something that you know your audience is much more familiar with than you are. Yet those studying the history of trees and woodlands are often not themselves historians and it may not be appreciated just how much my own discipline, archaeology, has changed our understanding of the long and complex inter-relationship between people and trees. This essay will highlight some of the new discoveries relating to trees and woodlands, and tackle some of the common misconceptions about woodlands that are prevalent among the general public at least, if not in the profession. These notes are also intended to amplify the PowerPoint of the same title that is to be found on the CFA website and the slide numbers used there are referred to in brackets here.

It has long been known that early humans must have used wood for their first tools; the problem has been proving it. The oldest surviving tools are, of course, of stone ones but early people must have used other materials too. Wood tends to decay without trace and thus the discovery, in a lignite (brown coal) mine in Germany of three spears was something of a surprise (3). They dated to 400,000 years ago, during the last Ice Age, and were almost certainly made by Neanderthals rather than modern man. The 2m long ash shafts have been spoke-shaved and the tips are fire-hardened, both techniques that demonstrate good awareness of the nuances of woodworking at a remarkably early date. The discovery of Otzi, the ice mummy, on the Austrian / Italian border is much later in date at 5,600 BC (4). The fortunate preservation of all of his associated artefacts, in a context that was clearly not a burial rite, allows us an extraordinary glimpse into a remote past when people had only natural materials to shelter and clothe themselves. What is extraordinary about Otzi is the wide variety of plants and trees represented by his everyday equipment. His use of leather argues for a knowledge of tannin in oak bark, he has a birch-frame rucksack and birch-bark container, a lime wood-hafted knife and bast sheath, an unfinished yew bow with a quiver full of flint-tipped arrowheads held onto their cornel-wood shafts by birch-bark glue. Altogether seven different tree species are represented, a clear indication of the sophisticated understanding that Otzi and his kin had of their world.

A growing sophistication in structural timberwork is demonstrated by the survival in waterlogged conditions of timber trackways throughout Europe, including Britain (5). These led into marshy environments from the dry land and are clear evidence for the manipulation and exploitation of wetland resources in prehistory. On analysis it has been clearly demonstrated that the corduroy trackways of the Bronze Age were built using coppice woods. This and similar discoveries enabled archaeologists to argue for a woodland management system to produce these resources, a coppice. Recently, genetics have been able identify a small-leafed lime copse (*T. cordata*) in Westonbirt, Glos in which all the stems are from the same tree (6). This coppice has not got a central stool – just a ring of the pry formed ultimately from the cambium of the stool. This tree is thought to be at least 2000 years old, given the known rate of growth for this tree type.

Archaeological excavation of many sites throughout Britain and Europe has found evidence for the use of timber, often coppiced, in the construction of timber houses. Occasionally, where conditions are suitable, timbers from such houses survive and allow assessment of woodworking technology (7). As our understanding of the settlement of Britain has become more comprehensive, through the use of aerial photography and geophysics to discover new sites, so it has become plain that the population of Britain was much greater than had been thought in the 1950s. The perception then was that prehistoric peoples lived only in hill forts and the valleys were full of dense virgin woodland, a view which W.G. Hoskins famously propounded in his *Making of the English Landscape* (1955). We now know that the primeval woods were felled quite early on – in the mid Bronze Age (1500-1000BC) – and that the uncontrolled felling of the woods led to erosion of soil, and the consequent alluviation of river valleys (8). This has been demonstrated in many places in Britain, including the Severn Valley. The proof of this can be seen in the analysis of various strands of evidence. For example the radiocarbon dating of the stumps of trees buried under the river silts of the Severn or, more dramatically, the mapping of enclosures in the Severn Valley plotted against *-leah* Anglo-Saxon place names (9). These place names refer to a clearing in existing woodland for settlement, a *leah*, which in modern English becomes –ley, as in Madeley, Dawley, Broseley, etc. The juxtaposition of these two pieces of evidence demonstrates that the woodland extant in the Anglo-Saxon period did not coincide with Iron Age or Roman settlement: the land had already been largely cleared. At the centre of this map lies Wroxeter, which has no major woodland around it for a radius of 8km. This is hardly surprising since the town was a major consumer of wood, both in the form of structural timber for housing and fuel for cooking and its baths houses (10).

The structural timbers in Wroxeter's public buildings must have been of immense size – the roof beams in the great basilica for example were at least 1m square – and this sophistication of woodworking carried on into the so-called dark ages. As before, however, it is difficult to prove this but careful excavation of Anglo-Saxon houses at Yeavering in Yorkshire, for example, or at West Stow in Suffolk, have enabled detailed reconstructions of Anglo-Saxon houses guided by surviving manuscript illustrations and, in some cases, surviving timbers (12). These include a massive king-post for a hall in the city of London of the time of Alfred, and the stave-built church at Greensted in Essex which has been tree-ring dated to this period. It is a simple version of the great stave-built churches of Norway which are slightly later in date and which demonstrate the immense sophistication that wooden buildings can achieve (13). Given this understanding of timber and woodland management during the Middle Ages it is no surprise that woodlands and forests were heavily managed, as is demonstrated by Forest Law and by the surviving documents relating to their ownership and management (14). Careful examination of many existing medieval woodlands have located evidence for much earlier woodland management, backed up by the recent discovery in London of a 2nd century Roman deed of sale for a Kentish woodland. The forests, and especially the Royal Forests, served a slightly different purpose. They were for the production both of timber and of animals in that they contained a mixture of woodland and pasture on which game, and especially deer, could feed. Ditches, known as park pales, kept the deer from young coppice growth, although other strategies could be employed for keeping tender

shoots out of the mouths of livestock, such as pollarding (allowing coppice growth from the top of a truck about 2m high) (15). Coppice woodlands, and trees in general, had an important role in livestock management at this time, providing fodder during difficult times through lop-and-top.

The realisation of this close and careful management of woodlands makes the myth surrounding the adoption of coke as a fuel for blast furnaces by Abraham Darby in 1709 all the more patently untrue (17). This alleges that the adoption happened due to the scarcity of charcoal to fuel the blast furnaces (16). To demonstrate that this was not the case requires us to look at the reasons underlying the industrial revolution. Two major factors to take into account here are the dissolution of the monasteries after the 1540s, which in effect nationalised vast tracts of landscape and encouraged the entrepreneurs who purchased the estates to maximise their returns from them, and the English Civil War a century later which began the technological changes and period of experimentation that led to the explosion of development in the 18th century.

To return to the production of iron, the use of charcoal in furnaces was ideal because it is pure carbon (17). It had been used as a fuel from the very earliest times but, used in a simple bloomery furnace did not melt the ore and thus did not extract the iron efficiently. The introduction of the blast furnace in Britain in 1496 brought in an advance in technology, bringing higher temperature and thus melting the ore (18). The furnace was charged with ironstone, charcoal and limestone (as a flux) but the amount that could be smelted was limited by the properties of charcoal which, being fragile, could be crushed by the weight of the charge if too much raw material was introduced into the furnace (19). It was this, rather than shortage of fuel, that limited production. The introduction of coke as a fuel had a dramatic impact, as can be seen by examining the records of the charcoal fuelled furnace at Charlcotte, Shropshire (20). This furnace was in use for much of the 18th century and in the first half was in steady production. However in the 1740s-1750s, the price of charcoal increased dramatically and forced production to become intermittent (21). This was almost certainly due to the price of charcoal which was created fresh for each season from coppice wood. As the mineral fuel alternative became cheaper, and production of cast iron increased dramatically so furnaces like Charlcotte, which were remote from the coal fields, became too expensive to remain in production. Some idea of the problem can be gauged from examination of the quantities required to produce each ton of iron (22) and the amount of woodland that was needed to produce enough charcoal to keep furnaces like these in production (24). The charcoal itself was produced annually under contract to the ironmasters, the price covering the cutting of the coppice, the building and burning of the stack, the packing into bags and the porterage on mules or horses to the furnace (23).

Although the use of charcoal in iron production never quite ceased (it is still used today since it is ideal for small-scale forging), as the 18th century progressed, those managing woodlands had to turn to other industries to exploit their products. Ironically, one major growth area was mining since coppice poles were ideal for pit-props (15). The stripping of bark for tanning was a huge industry since British tanneries continued to use the old methods of leather production rather than the new chemical processes favoured on the

continent (25; 26). The bundling of wood for fuel and other purposes remained important with mule trains still remaining in use in some areas into the 20th century (27). However, the First World War wrought a great change in the British landscape since woodland management was very labour intensive. The loss of so many men meant that the coppice woodlands were neglected and were increasingly grubbed out so that what survives today is only a fraction of what was there a hundred years ago (28). While coppicing has declined until recently, timber is still a valuable and important commodity. From the mid 16th century, it became a vital strategic material through its use in the Royal Navy. As the 'wooden walls' became heavier, larger and more sophisticated, so the need for timber, especially grown in particular circumstances to produce selected elements of a fighting ship, became more important (29). This was the real cause in the decline of the great woods of the medieval period as they were stripped of huge oaks and other major trees to provide a fleet large enough to hold on to an Empire. Timber was felled and floated downstream, if the woods were inland (30), while on the great rivers, specialist timber craft plied their trade, trows on the Severn, barges on the Thames. These were usually built on the river bank itself. From the mid 19th century, the demand for timber for ships declined as iron took over as the main constructional element for first battleships and then smaller craft.

As we have seen timber had always been an important element in housing and this use continues to this day. However, the heyday was in the 16th and 17th century when timber-framed houses abounded. The majority of surviving examples date to this period, the flamboyance of their decoration being more to do with conspicuous consumption rather than structural necessity (31). The survival of timber buildings is more dense in some areas than others and only becomes understandable when one realises that the lack of timber-framed houses running from Bath to York maps exactly the occurrence of readily available high-quality limestone. Timber was still a prestige material but during the 18th century brick took over as the staple building material in all areas, aided by the improving transport systems. Epitomising this improvement is the Iron Bridge itself. Cast on the banks of the River Severn, the bridge is an iconic masterpiece of the industrial revolution yet, ironically, its method of construction betrays only too clearly that it was envisaged as a wooden bridge (32). Its joints are all woodworking ones – dovetails, mortice and tenon, the use of wedges and treenails, etc (33). This is not to say that it was intended to be built in wood but they then decided to use iron instead. It reflects the fact that no-one knew how to build a bridge in iron and thus they turned to a method of construction that they really knew about: timber. The Iron Bridge thus fossilises the complex timber bridge of the 18th century. Very quickly, designers realised that iron bridges were stronger and thus did not need as much material in them. Bridges became more lightly designed and more elegant, as is demonstrated by the early 19th century Coalport bridge downstream from the Iron Bridge.

The last myth deals with the Ironbridge Gorge itself, as well as other industrial areas. Our picture of these places is formed from images showing the glowing furnaces and polluted landscapes of the gorge (34-36). What one is conscious of visiting today is the softening effect of woodlands on these much-worked slopes, woods which hide today within them the evidence for a remarkable period of human history: the industrial revolution.