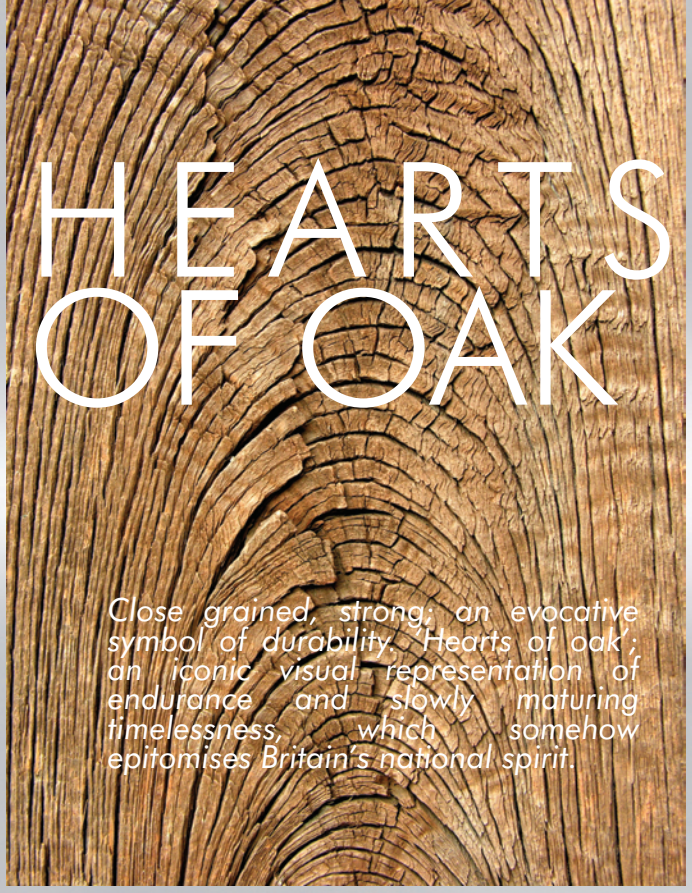
HEARTS OF OAK



Close grained, strong, an evocative symbol of durability. 'Hearts of oak'; an iconic visual representation of endurance and slowly maturing timelessness, which somehow epitomises Britain's national spirit.

Worldwide there are between 300 and 500 different species of oak, but here there is only one indigenous 'quercus robur', with its nut enclosed in a tight nipped bud, volucral scales and single ovary. This is the celebrated dark brown variety which we identify with so closely, known as 'Ac' in early times, somewhat later as 'Ok', but now proudly called English Oak. It has been discovered spread from the Caucasus to the Urals and nearly as far as the Arctic circle, being one of the larger specimens of the genus, native to the Northern hemisphere. It is made remarkable by massive thick trunk and stout bows, so obligingly in old age to adopt the gnarled form oft depicted in painting and mythology.

Many are truly ancient growths, such as Gloucester's highly celebrated 'Newland Oak', the Winchester 'Conqueror', New Forest's 'Knightwood', Bristol's 'Domesday' and the Burnham 'Druid' oaks, which dwarf the human life span into insignificance. Why, the Welsh 'Pontfadog' is said to

have been growing since the reign of King Egbert in 802 and so massive that in the 1800's a missing bull was finally discovered hiding in its hollow trunk. Other specimens date to distant Saxon times. Sherwood's 'Major' is reputed to be 800 years old with an estimated 23 tonne weight and 33 foot girth, even then dwarfed by 'Fredville' in Kent, purported to have a 40 foot bowl. Hertfordshire's 'Great Oak was planted by Queen Elizabeth I and Winston Churchill pronounced it 'the finest and most stately oak growing in the South East of England'. Leicestershire's 'Bowthorpe' is believed to predate William the Conqueror and its hollow trunk large enough for meals to be served to dining parties inside the bowl.

Myth and legend

Oak is so indelibly ingrained in our culture that it is celebrated widely in myth and history. Once when commonly known as the 'Sussex weed' its deep dark forests were the realm of bandits and places best avoided. It was remarkably easy to become hopelessly lost within the mighty forests, spread far and wide across the land, particularly in the Midlands and the Weald (being an Anglo Saxon name for forest). Roman construction demands eroded the resource and the Normans thinned it significantly so as to permit hunting, but it was not until the 16th and 17th Centuries that real depletion began in earnest. This was when reckless, urgent felling prevailed to create mighty Victory and Mary Rose ships of the line, as Britain strove to 'rule the waves'.

It was sacred to the Druids who deemed it housed the power of their god Esus, with mistletoe cropped from its boughs deemed to be in its most sacred form. It is thought that the 'henge' at Drew Somerset, dating to 3000 BC was formed in it and that massive trunks were formed as monoliths to flank the sides of Neolithic burial chambers. Some believe the mighty vertical holding pits of Stonehenge would originally have accommodated oak trunks, only much later to be replaced by stone pillars. The German Chatti tribe worshipped it and this is the symbol of the ancient Greek god Zeus.

Oak is sacred to the Roman lightning god Jupiter (possibly because it is struck more than other trees), the emblem of Northern Ireland's Londonderry, the name of the Romanian rugby team, the 'portal', or 'entry port' between worlds in Celtic mythology (duir meaning door) and often simply called the 'father of the woods'. 'Big Belly' in Wiltshire is where the devil purportedly appears to those dancing round its bowl naked in the midnight witching hour and possibly, once, the 'Royal oak', truly did hide King Charles II from pursuing Roundheads. It was the stuff of Merlin's wand, as was the round table, Thor's chariot, and medieval doors - held to protect the householder from evil. The most famous Scottish whiskies are aged in oak casks and who does not know that Roman military leaders were crowned with laureates of oak tree leaves on returning home in triumph?

Oak also happens to be one of the most durable natural materials ever used in construction and extremely difficult to destroy. Put it to the test. You will have undoubtedly viewed pictures of a fire gutted oak framed building with nothing remaining other than charred mainframe timbers, which refuse to burn under temperatures that would reduce steel RSJs to molten pools. Now, take a moth eared, weathered, decrepit section of soggy, weather beaten, cragged foot square oak and see how long it takes you to cut it in half using a sharp bow saw! You will not find it easy.

With the exception of earth and stone, oak is probably our oldest building material and takes third place only because a good proportion of both the former lie free to use upon the land. In primitive times, the difficulty of cutting down oak trees must have presented a virtually impossible task for our very distant ancestors - that is at least until they learned how to fashion sharp saws and axes.

Shipping times

It has been estimated that in 1500 this Country possessed about 4 million acres of woodland (about twice the size of East Anglia) and earlier, more than that again. Such was its importance for the building of English fighting ships, that when Phillip II of Spain dispatched his Amada in 1588, he gave instructions that after invasion his men were to lay waste the Forests of Dean. The supply had however been greatly over estimated by the Spanish Monarch. A survey of the Royal Forests by King

James Ist revealed that it had been reduced to a mere 350,000 trees and only half of these were deemed suitable for the burgeoning ship building demands. By the 1780s this had fallen by 4/5ths, prices soared and Henry VIII even introduced statute to protect straight specimens. This left the curved ones for building and probably one of the main contributing reasons that the 'cruck' form of construction was so widespread. The 1510 Mary Rose alone required a staggering 1200 trees, the majority of which were oak. These would have been enough to cover 40 full size football pitches, being the equivalent of 75 acres.

Felling the mighty oak

Traditionally oak was 'straight' felled with an axe. The woodsman estimated the line of fall dependent upon topography, slope, wind and natural lean. A main cut was formed to one side being either v notch birdsmouth, conventional or Humboldt undercut, with a rear cut to the other. Virtually nothing was wasted. Branches made good firewood, faggots to fire a furnace, the fibrous layers beneath the bark made rope, pannage tax was paid for the right to graze and fatten swine on fallen acorns (though poisonous to cattle and ponies) and even the bark provided tannin for curing leather from raw hides. From about the 17th Century onwards it was agreed that the best bark was from trees felled in spring when the sap is rising so it is much easier to peel. This alone would pay for the cost of felling the tree, although the ideal age of the specimen was only about 20 years. It was dried, shredded and mixed with water, to be held in pits where the raw pelts were 'dunked' for about a year.

Once down the large logs were split using wedges driven home with a heavy mallet. Later again heavy froe blades were utilised to split along the grain. Basic 'shaping' was performed with hand axes and adzes (an arched blade set at right angles to the handle used with the artisan straddling the timber). However an axe creates chips and wastes wood. 'Saws' were therefore sought after implements, but these were scarce and expensive. Indeed the Doomsday book listed only 13 in the entire realm.

New technology

Extensive working of oak probably came into its own with the invention of the 6 foot long, serrated bladed saw that had a handle either end, the design of which is thought perfected in medieval times. Its use by village carpenters was to continue long into and through the Edwardian era. The oak section was laid on trestles above the saw pit, with the Master Sawyer straddling it on top to guide the blade. His 'man', the under sawyer' had the miserable job of standing in the trench below, holding the other handle, in order to provide the majority of the force required. This must have been back breaking labour, as every thrust of the saw blade showered him with sawdust and chippings.

An oak tree can live for a thousand years, although for construction purposes it is superior when harvested between 90 and 120 years of age. The wood is best if winter felled, when the sap is not rising, to create grain perfection. Heartwood varies in colour from a dark brown to pale rich yellow. It is dense, closely knit and so if not used correctly is liable to split along the heart grain. Usually it was used within 2 to 3 years of felling and therefore the oak for the vast majority of our traditional timbered buildings was 'green', as it takes between 8 and 10 years to dry properly. As the moisture content would still therefore be high and wet in the heartwood itself, it was much easier to work and far less likely to split, especially if quartered. Indeed it was common to actually soak the oak trunks, stripped of bark, in a mill stream pond (or similar) for up to a year, to deplete the acids and enhance this element. Later, when used in building, it dries to lock what were (most commonly) mortice and tenon joints, fixed with pegs, true and tight. Sometimes joints were strengthened further by adding fox tail wedges driven beneath the tenon joints or by a method known as 'drawboring' peg holes (setting the holes slightly out of alignment so the joint pulls tight when the peg is forced home).

Although it increases in thickness, oak grows in length at the tip and the oldest parts therefore are the base and bowl. One of the main differences between hard and soft wood varieties is the presence of water conducting tubes, known as 'wood

vessels', which in section, can be seen with the naked eye. The concentric rings cut through the trunk indicate the growing seasons and can therefore be used to date the tree - known as Dendrochronology. 'Knots' in the basal part of braches, embedded in the bark, give indication of a change of direction in the fibre.

Cottages and castles

Construction of our much loved oak cottages and period housing stock was to all intent and purposes done by prefabrication. That is not to suggest there was any element of mass production in ancient times. Indeed, once a house had been designed, trees were carefully selected so as to configure to the form as well as possible. No, it was rather that the frames were most often assembled off site, in a framing yard. As there were a large number of individual pieces, all were given a carpenters assembly mark, most based on the Roman numeral system. Early wood workers marks would be made with a race knife, but later gouges formed with a chisel became common. Today these marks are still clearly visible on the tie beams, bressumer, post, truss and braces of most old oak structures.

Buildings were divided into 'bays' dictated by the major cross frames and roof trusses. Each section was formed with the facing side upwards. Every tenon was carefully shaped, dozens of oak pegs cleft to fit snugly into bored auger (or wimble) holes and each mortice cut with a narrow bladed 'mortising' axe. Studwork (from old English 'stuthu' meaning a post), was added between, generally, though not always of inferior quality. This was all done prior to the 'raising' on site, for ease of assembly. Imagine then how exacting and precise the carpentry master's art!

Today, we tend to overlook that even forming the cleft oak pegs was a skilled craft. A drawknife was utilised to shape the peg while held in place on a shaving horse. The English patterned drawknife was a straight bladed implement (sometimes bevelled) with right angled handles at either end, while the curved bladed Continental design had handles in a straight line with the cutting edge. The pegs were fashioned to be roughly octagonal in shape and faceted along the length to increase grip once driven home. Pegs were not the only fixings known, although they were ever the first choice where oak was concerned. The difficulties inherent in attempting to drive either screws or nails home in iron hard oak simply made the very idea ridiculous.

Skilled craftsmen

Nails were used with the softwoods though and the most common was formed from iron ore heated with carbon to make wrought rods. A blacksmith would then re-heat these in his forge, cut nail lengths and insert the hot slivers into the anvil nail header. A skilled artisan could fashion the tapered sided shank fixing with four glancing blows, finishing with a rose topped pyramid shaped head. Whilst an understanding of the screw principle is ancient, use was rare and only really began in the 16th Century. Units for woodworking purposes were forced home by a tool, perhaps not unsurprisingly, known as a 'turn-screw', usually being a bit attached to a carpenters brace. Even then they were basically a modified round shafted nail. Mass use finally came in the 1840's with George Nettlefield's Birmingham machined threaded units.

Old versus new

On site, a massive piece of timber was laid horizontally along what was normally a shallow foundation of perhaps brick and flint at best, but sometimes merely the earth itself. As such the 'sole plate', unlike modern construction where we firmly anchor houses firmly to the ground, was not fixed to the foundation in any way other than by weight alone. The house could accommodate movement, at least to an extent and therefore literally moved with the earth. Indeed, although I have mixed opinion on the subject, I have seen it argued that this is much more sensible than rigid construction and I really do wonder how much of our modern housing stock will remain standing in (say) another four hundred years time!

The preformed frames were then hauled upright with rope, and later, learning lesson from the ship farer, with block and tackle – this was known as the 'rearing'. Square, level, plumb line and bob were the precision implements. Because the rearing of larger structures required many hands, it often involved a good proportion of the community taking part. In America, such as rural Amish communities, a 'raising bee', is still reasonable common and they are deemed to be important social events.

As the structure took shape and the holding pegs had to be hammered home at height, so scaffolding was required. Commonly this was poles lashed together, with 'wattle' (hazel strip matting) platforms. Two storey building, or even more, was achieved by laying horizontal beams to support the upper lift. Usually the panel spaces between the timbers, which in most average cottages were invariably of different sizes by necessity, were filled as construction commenced. In early dwellings, thin split lengths of willow stick, withes, osiers, ash or hazel were interwoven between the upright oak staves, ready to take the 'cats', being workable clamp mud ball daubs. These were subsequently pressed hard in place, to take their

'holding key', from the intricate and painstakingly formed latticework behind. The word 'daub' is thought to derive from the Roman 'dealbare', ('dauber' in French), later becoming 'dauben' in the English Middle ages. A good builder placed damp Hessian sacking over the panels, to prevent them drying too quickly and so limit cracking.

Later again, these supporting timbers were often 'jettied' (extended) out further than the foot print of the ground floor, particularly in crowded towns, so that more space was created on the upper levels. As weight of the higher lifts was supported primarily on the ends of the 'oversail' timbers, this helped to prevent floor sag created as a result of imposed weights internally, such as heavy furniture and indeed human beings themselves. If the building was 'jettied' on more than one side, increased support was required and a large 'dragon beam' horizontal anchor timber was usually incorporated.

This cantilevering of structures also offered the crowded City dweller the fringe benefit of being able to throw the bed pan 'night soil' away from the building and not smear the façade in the process. The householder, purportedly, first had to shout 'garde `a l'eau' (beware the water), to warn unsuspecting 'passer bys' of the oncoming noxious deluge. The British invariably seem to bastardise French words and this quickly become 'gardyloo', especially in Edinburgh – is this perhaps the reason why the slang water closet term 'loo' is used so often today? Perhaps it is just as well that the use of jettied storeys fell out of fashion in the reign of Elizabeth the First.

Up to the roof

The majority of the first cottages to last the test of time were constructed in what is known as 'cruck' or 'blade' form, with the main weights taken via a transverse frame. In its rudest style, this would simply have been a structure formed from roughly matching pairs of gently curved heavy timbers, tied at the apex, so as to create a triangular shape. Later the practice of splitting trunks to obtain the timbers for the symmetrical arches began to emerge with the use of improved tools. These dwellings were mainly single storey structures, but this disadvantage was soon overcome by incorporating heavy horizontal tie beams at first floor joist height. Even then the first floor space would have been severely restricted by the curvature of the 'cruck' frame. In later examples, by extending the length of the horizontal beams even further, this allowed vertical support posts to be incorporated to take the roof up and above the basic 'cruck' shape and so largely deal with the disadvantage.

'Cruck' construction gradually fell into disuse with the onset of both box frame and post and truss construction. Often timbers were split, leading to what is known as half timbered building. The later is by far the most common in the southern half of the Country, particularly the home Counties and East Anglia. Here there will also be found a fairly high proportion of 'Hall Houses'. Although there are many different styles throughout the Country, they were so named because they were invariably originally constructed around a single story, albeit split level hall. The roof timbers would be open to view from below, with an open hearth for cooking/heating and simple hole in the ceiling to let out smoke. The higher end of the structure would be utilised for dining and the lower probably open into a cross passage running at right angles, which led to the pantry and buttery. If a cross wing was included there would probably be a stair flight. During the 16th and 17th Centuries and the wider advent of brick use, there was a period known as the 'Great Re-Building' when Hall houses were substantially altered, usually by incorporating a large stepped chimney stack built in part of the cross passage. Incorporating these stacks with their excellent load bearing properties also encouraged the addition of first floor areas.

Normally in a post and truss frame the main weight of the roof and the common rafters, is imposed upon horizontally laid timbers known as purlins and then down through the external walls. Meanwhile, cottages with lightweight thatch roof properties did not require much by way of support and it is here that construction differed greatly. The basic form was the same, with heavy timbers required for the frame, but all the stud insets, rafters and roof truss joists were generally whatever wood material could be felled nearby. Often the timbers were split at the road side and fixed with the bark still on. There was little by way of seasoning, probably for simple cost considerations.

Tudor extravagance

In grander properties, particularly those of Tudor extravagance, the exposed heavy first floor heavy timber, supporting the upper floors (not ground level or garrets) was called a bressumer or summer support, supposedly derived from the French word sommier, meaning simply a beam. Today the word bressumer is often used by estate agents selling timbered cottages to describe the heavy timber mantel, supporting the facing breast of chimney brickwork.

Because oak was such an expensive commodity, it was a mark of wealth to have timbers formed close together, such as the studded timber box frame Wealden houses, originally thought to be of Kentish origin. Naturally this was completely unnecessary for more humble dwellings, where a broader spread was

much more economic. Indeed, most of the timbers were going to be covered by render anyhow. It is a mistake to believe that originally the majority of timbered buildings had the timber frame exposed externally, as with picture book Elizabethan and Tudor mansions, although this increasingly became the fashion later on.

Most will also be familiar with the practice of removing the original render and then filling the spaces between exposed frame timbers with patterned brickwork, known as 'nogging'. From the point of view of 'good' construction practice this was probably also a mistake. Bricks tend to be heavier than wattle and daub and their introduction subsequently created stress on the frame, sometimes assisting structural movement. The brick size was also usually greater than the rebate left by the removal of the render and the bricks would therefore protrude slightly in front of the timberwork, creating a useful ledge for the elements to work upon.

The Wealden design of timbered house was another matter again. With a high imposing roof, splayed slightly outside the footprint of the building and a roof often covered with hand made clay peg tiles, these were important properties. Medieval in origin, they tended to have a recessed front bay, an exposed oak frame, double height centrally situated open halls and were large. It is thought the average build was approximately 50 by 20 foot. Generally they can be defined by the large central recessed hall formed between large jettied ends. The importance of these structures is perhaps best illustrated by the fact that the first property acquired by the National Trust in 1896, was the thatched 'Wealden Hall House', being the Alfriston Clergy property near Polegate, East Sussex.

Today society again appears to be rediscovering the beauty inherent in oak frame construction and its amazing advantages. It is often now found as a visible framework to modern traditionally constructed Country houses, barns, conservatory extensions, gazebo's and the like. Perhaps the use of this most superior of materials has ever been the privilege of the wealthy, but this resurgence of use is wonderful irrespective. It is chosen because of aesthetics, the sheer simplicity of style and genre associations. It is tactile, distinctive, sturdy, durable, offers great design flexibility and is evocative of real values. Oak frames can be pre-fabricated off site and erected with amazing speed. They are also 'environmentally' friendly and must surely ever be the 'green' choice.

The end of the line

There are many fine, impressive oak buildings which I have inspected during the course of my working career, even one or two built by my ancestors, who have been builders for generations. It is perhaps therefore surprising that my fondest tale about this natural enduring material does not even relate to property. Rather it is about a humble oak Church bier; a cart fashioned to carry bodies to funeral services and this ones rather surprising travelling history.

In 1920 my Great Grandfather Edward Walker, the village builder in Little Shelford, which lies five miles south of Cambridge University City, was commissioned to build an oak bier, by the soldiers who had returned home after the 'Great War', in commemoration of their fallen comrades. It was in use for many years and housed at the back of All Saints Church in a shed near the Vestry. Gradually however it fell into disuse and in 1980 was acquired by a part time caretaker at the 'museum of technology', housed in the old pumping station in Cheddars Lane, Cambridge. The caretaker also repaired flat bottom, squared bowed, keel-less river punts and sometimes used the bier to move the heavy 24 foot long vessels. On one occasion it even transported an inebriated colleague who had imbibed a little too heavily during the re-opening of the Museum, following refurbishment.

In 1987 a steam engine restorer travelled from Sittingbourne in Kent to assist repairing an engine at Cheddars Lane. A pile of waste builder's wood was waiting in the yard ready to fire the boiler for the first time. The restorer noticed some fine oak timbers amongst the pile. Hunting round the yard, he also discovered the great wheels and springs. Realising they had come from an old bier he saved the timbers from the fire and asked permission to take the items back to Sittingbourne for restoration. The painstaking work took three years and during that time revealed a previously illegible inscription plate, cleaned to announce –

'Presented to the village by the ex-servicemen of Little Shelford in memory of their comrades fallen in the Great War 1914-1918.'

The restorer approached the Vicar of his own Church and through his good auspices made contact with All Saints in Little Shelford. He then offered the fully restored ancient oak bier artefact as a gift. Sadly, it was rejected by person unknown as being 'surplus to requirement'. The restorer eventually sold it by auction in a field sale at Tenterden, Kent.

The purchaser was a fruit vendor who utilised it as a barrow to sell produce to tourists near Canterbury Cathedral, until he retired, when it went up for sale again. Near home, a senior citizen in the neighbouring village of Great Shelford saw the item when scanning a web site and subsequently wrote a small piece for the village news. Thus, it finally came to the attention of the Little Shelford History Society who decided it must be saved. Prior to sale, protracted negotiations were entered into and finally a price agreed. A box van was hired and two of the society members drove to collect it from Pembury in Kent. After an absence of twenty-seven years, the oak bier finally returned in triumph to its home.

The information contained in this small anecdote about the travelling bier, is gifted by the Little Shelford Historical Society who rescued their piece of local history. I extend my acknowledgement and thanks. I feel confident that if Edward Walker, my Great Grandfather, the man who crafted the oak bier, somehow knew this tale, there would now be a smile on his face - as indeed there is on mine. Iconic English oak. It is a symbol of timeless endurance, somehow epitomising the very best of our country.

Wonderful is it not?

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