

SCOTTISH WOODLAND HISTORY CONFERENCE NOTES XIX

Woodland Products and Processes



NINETEENTH MEETING

TUESDAY 28TH OCTOBER 2014

A K BELL LIBRARY, PERTH

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Edited by Mairi Stewart

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INTRODUCTION

Chris Smout

The nineteenth annual conference of the NWDG Scottish Woodland History Discussion Group took place in the AK Bell Library, Perth, on Thursday 28th October 2014, with about 65 people attending. The subject was "Woodland Products and Processes", and the day began with a reminder of the ubiquitous use of wood before the advent of cheap metals in the nineteenth century and plastics in the twentieth. Woods themselves were (and are) far more than merely sources of raw material, but wood products were essential in the home and on the farm, to a degree that we tend to forget now, and the interests of local domestic users could conflict with those of woodland owners anxious to make profits from external sales of charcoal, bark and timber.

Nick Dixon then led us back to prehistory, before the market existed and when wood was still plentiful, with a study of the excavated crannog on Loch Tay and its associated, partly submerged, woodland. Alder, though not as long-lasting as oak, was easier to work and extensively used for frames and also for piling, but oak (sometimes of immense length) was important for the log boats and for some of the piling, while pine was used by the family in the crannog to make resinous tapers for lighting. Hazel panels were especially important for making the sides and subdivisions of the crannog, and was the only wood likely to have been managed by coppicing.

Jonathan Wordsworth discussed the archaeology of charcoal burning, based on his extensive surveys of Rahoy and Arienas in Morvern, arguing that the abundance of recessed platforms was too great for them all to be accounted for by prehistoric or medieval domestic structures, and that many of them must have been constructed by the charcoal burners for manufacturing their fuel. Though some had carbon-dated medieval charcoal fragments, the majority of platforms may be quite late, from the age of the Cumbrian-owned furnaces in the eighteenth and nineteenth centuries.

During the lunch interval we had an opportunity to inspect traditional wood-working tools and implements, in the Mackenzie room, brought by Steve Hunter along with two of his Darvel chairs.

After lunch, Donald McWhannell gave us a fascinating account of the construction in Argyll of birlinns and related boats of the Norse tradition, from the middle ages down to the eighteenth century. Some of the boats were enormous, of up to 40 oars and with keels of 15-18 meters, and demanded huge, high oaks. Trees like this were in very short supply in Scotland by the end of the medieval period, and from 1568 the earls of Argyll were stopped from cutting them in Ireland by the authorities there. But smaller boats were still made by families of traditional hereditary shipbuilders using such resources as were available locally, by methods which went back to Viking times, such as cleaving the green oaken planking without recourse to steam bending.

Archie McConnel then spoke of the woodland history of the south-west, emphasizing availability. How much timber might be available at any one time was affected not only by how much was growing in the glens. It also depended on the possibility of transporting it to the point of consumption, in the face of geographical and political obstacles that might be overcome in due course. Thus the purchase of 1100 tons of timber at Sanquhar for use in Leadhills, by the owner of the lead mines in the early seventeenth century, could not have taken place without the prior pacification of the Borders and the availability of horses. And as big trees grew scarcer, the size of traditional tower houses contracted and more use was made of stone in their construction, but when better communications arrived lairds' houses became bigger again.

Jacob O'Sullivan spoke of the use of wood and woodland as a heritage resource, with particular reference to the Highland Folk Museum at Newtonmore. He had pictures of some of the objects there, especially chairs and agricultural implements that made ingenious use of natural crucks and bends in the tree to maximize strength. Steve Hunter showed us during his talk an actual Darvel chair of surpassing beauty of form, one of a relatively small number made by a handful of wrights in the nineteenth century but now sought after by

dealers and collectors. Superficially they resembled Windsor chairs with a straight head rest, but never enjoyed the commercial success of the latter and are consequently now much rarer.

As usual, the audience left well satisfied. Now we have to find a good theme for our twentieth meeting next year. .

THE USES OF WOOD BEFORE THE TWENTIETH CENTURY

CHRIS SMOUT

The best way to introduce a day conference devoted to the uses of wood is through the handout (see Table I below) that lists the purposes to which people put woodland produce in the past. It cannot hope to list them all, but at least it gives a sense of the extraordinary variety of uses to which wood was put, especially in those centuries before the Industrial Revolution gave us cheap iron, and the modern age gave us plastics. But of course wood is by no means redundant in everyday life today, as we all know and value. Very few uses of wood have become completely redundant.

But it is best to begin by reminding ourselves that woods have always been about much more than woodland produce. Before the nineteenth century, woods were often the main refuge for shelter for stock in winter, and, if they were at all open in structure, as in a wood pasture or a park, they were also important for grazing. Less use seems to have been made of leaf fodder for animals in winter than in some European countries (like Norway) or in parts of England (like the Lake District) but some foddering did occur, especially with holly.

If they were not used by farmers, woods were probably used for sport by the lairds (who might well expel the farmers to give themselves unhampered access). The wealthy leisured might be interested in keeping pheasants or in shooting wild game like woodcock or roe deer, or they might value woods as shelter for red deer in winter time.

Woods have also always had important non-material uses for recreation, romantic and aesthetic appreciation, and religious or folkloristic belief. Nature conservation is also a major use of many woods today, and through regulation it is often the main determiner of woodland management over wide swathes of countryside-- but that is a modern use, hardly valid before 1900. It can be classified as a non-material human use that trumps other uses, though it seldom completely excludes them.

This leaves for our consideration the manifold uses of woodland produce on which humanity has depended for so many centuries. There was always a division between using wood locally and sending woodland produce to market, but before 1800, and more emphatically before 1700, local use in the home, on the farm or on the shore normally outweighed external sales.

Though Scotland is often regarded as a country of stone-built houses, even the most formidable castle used great amounts of wood in its construction, and some medieval fortresses (along the Borders at least) were entirely wooden. Medieval provincial towns like Perth, too, had houses of wood and turf, probably sourced locally. In the west and central Highlands, "basket houses" made of withies and saplings were common down to the end of the eighteenth century, and (particularly in well-wooded areas like Speyside) lavish use was often made of wood in turf houses, or in turf and stone houses, as crucks, battens, beams and doors, window frames, panelling and so on. Upper-class houses of more than one story would have additional use for wooden floor boards. Even in remote and unwooded areas, wood was needed (and treasured) for the roof trees, which is why sometimes in Sutherland and elsewhere those responsible for clearances went to such lengths to burn the timbers to prevent the tenants from easily re-erecting homes that had been emptied.

Within the house, the use of wood was ubiquitous for furniture, like box beds, chairs and tables, and cupboards. Industrial equipment in the home, like looms or spinning wheels, containers like baskets and cogs or buckets, and kitchen ware, like bowls, cups and dishes, even lantern frames, were made of wood before cheap china and metal ware began to replace 'treen ware' in the eighteenth century. Less wood was used for fuel than in most other countries because of the abundance of peat or coal in most of rural Scotland, but some places (like Loch Lomondside) were remote from alternatives, and kindling twigs or pine-cones were everywhere needed to start the fire. Illicit stills made use of juniper where available, because it gave out very little smoke that might reveal them to excise officers. Fir candles (made from pine) provided an alternative

to tallow or rush lights in many Highland homes. If there were musical instruments, such as fiddles, they were made of wood, as were the chanters of bagpipes.

On the farm, wood was no less ubiquitous. Even stone or turf walls needed gates and stiles. 'Stake and rice' fencing was made of woven wattle and used to defend cut-over woods and small areas of vulnerable crops, or to fold animals overnight. When the enclosures came, especially in the nineteenth century, wooden fencing was used where barbed wire might be used today, but even the latter needs wooden stakes. In agricultural equipment wood was everywhere, obviously in barrows and carts (or in the sledges that preceded them in many places) and in ladders, but also in heavier equipment where iron replaced wood from the late eighteenth and nineteenth century-- like ploughs (except for a small metal ploughshare) and harrows with wooden teeth that quickly wore away. All tools still had wooden handles as most do today, often ash-- axes, hoes, rakes, the Highland cas-chrom, and so on. Packaging and containers that today might be made of metal, plastic or paper--barrels, buckets, baskets and boxes-- were invariably wooden. Less obviously, before the days of cheap hemp, ropes and horse harness might be made of roots or twisted withies.

Settlements on the shore or river bank built their fishing boats of wood, especially oak and pine, or larch for the planking in the nineteenth century, and used withies for coracles on the Spey, and more widely for fish traps and creels. Tanbark (from oak or birch in particular) was used for preserving netting and ropes, and if the catch was cured it was generally with wood smoke.

Then there was the question of cutting wood and making wood products for the market outwith the local community. It had happened since medieval times— such as timber being cut in Rothiemurchus for use in Tain, or on the upper Tay for use in Perth, and at Darnaway for royal ships and palaces at Edinburgh and Stirling. But by the eighteenth century it had become much more general, and was likely to cause tension between the land-owner who sold the wood and local people who were affected by the consequent and limitations on their own use of the woodland environment. Thus tenants all over the Highlands found themselves having to buy wood from the estate, where previously they had gathered it for free, or for payment of a small fine. Worse, they might find their sheep, cattle, ponies and especially their goats excluded from grazing or sheltering in the wood, if the laird wanted to use it for timber sales or for the manufacture of charcoal—this might lead to better management of regeneration and growth of the woodland, as over much of Argyll, Stirlingshire and Perthshire, but it was hard on the farmers.

At least in the period 1750-1850, the value of sales of materials manufactured from hardwood greatly exceeded the sales of the timber itself. This was the heyday of the charcoal iron industry. Though only a handful of works were ever in operation, their demand for fuel (particularly from the Bunawe furnace) impacted on the woods throughout the western Highlands wherever there was reasonably close access to transport by sea: the friability of the material meant that it could not be taken far overland without degenerating into useless dust. Overall it was probably at least equalled by the impact of the tanbark industry, which was centred in Perthshire, Loch Lomondside and Stirlingshire, as well as in Argyll, and which could easily endure transport of its product overland by horseback and cart to the urban tanneries. Other products, like pyroligneous acid distilled from hardwoods, were manufactured near the textile districts, and continued on Loch Lomond after the tanbark industry had declined in the mid-nineteenth century, and in Ayrshire until after the second world war. It was a fierce chemical with several applications, widely used in linen and cotton printing. Gunpowder mills also operated throughout the nineteenth century, using alder wood in particular, and mixing the charcoal with saltpetre and sulphur in a dangerous concoction: there were four or five in Argyll and others at Gorebridge (the earliest in Scotland, from 1794) and at Penicuik and Roslin in Midlothian.

By contrast, the manufacture of tar, pitch, resin and turpentine from pine, though important internationally, is rarely mentioned in Scottish woods (though it is in Speyside briefly in the seventeenth century), because of overwhelming competition from Sweden and America, and after 1787 from the manufacture of coal tar within Scotland.

Then there was the sale of timber produce itself. It, too, was restricted in scope by foreign competition, so that from the second half of the sixteenth century onwards very little Scottish wood can be traced in most

Scottish burghs within easy reach of the sea; Adam Smith went as far as to say that there was not a stick of Scottish timber in the new buildings of Edinburgh, but the same had been true for a long time, there and elsewhere as well. Even inland towns worried whether they would not be better off using Norwegian and Baltic timber, and remote places like Stornoway and Inveraray found that imports were both of better quality and cheaper than Scottish pine. The exceptions were places like Inverness and Aberdeen where pine from local sources could be floated down the rivers, but even here it was often used only where quality did not matter. Scottish-grown pine had the reputation for being short, knotty and brittle compared to that from Norway, Sweden and Riga. Rothiemurchus and Abernethy tried to market water pipes for London, made out of bored pine logs, but with understandably limited success.

The best time to be the owner of a pinewood was probably between about 1780 and the 1850s, when war until 1815 disrupted imports and was followed by a period of customs protection for home-grown and imperial timber. These better market conditions for home growers came to an end in a series of steps beginning in the 1840s and culminating in 1866 with the eventual abolition of all duties on imported timber. In the decades up to about 1850 there was a significant demand for timber for ship-building at the mouth of the Spey, and more widely for industrial and domestic buildings where quality was less important, combined with a big market for pit-props in the burgeoning coal mines of the industrial revolution. Many ancient pinewoods were devastated at this point, though they quickly regenerated.

By now the native woods had been joined with the first of the commercially important non-native trees, European larch, introduced by the dukes of Atholl in the eighteenth century and by 1800 the tree of choice for improvers all over the Highlands. Though it did not fulfil the more extravagant expectations of the time, it remained a significant source of profit even after free trade had flooded the market. Foreign imports were made even more competitive by falling transport costs that came with the railway and with improved roads, but they did not totally extinguish the profitability of larch. Railway sleepers were a main market (as indeed still locally for pine) but even more significant for larch was the mining industry, and construction and fencing uses in an age of agricultural enclosure and rural rebuilding. The Scottish fishing fleet-- the biggest in the world in late Victorian times-- was very largely built with home-grown larch planking. We know little of the sources of wooden scaffolding, consumed in huge quantities particularly by the ship-yards of the Clyde, but it could be that they were more often made from cheap Canadian conifer than from Scottish softwood.

Here and there in the jungle of Victorian competition there were local concerns that competed successfully by adding value, manufacturing wood in some specialised way. Such was the bucket mill at Finzean in the Forest of Birse in Aberdeenshire that made wooden buckets for the powder magazines of the Royal Navy where it was feared that a spark from a metal bucket might lead to an explosion. Commoner were the bobbin mills that made bobbins and shuttles for textile mills throughout Britain, and also sometimes exported them to the Indian empire. There was a famous one at Gateside in Fife, that used both local beech and imported persimmon, but there were more mills using birch in the Highlands. Commonly these mills (and the profession of wheelwright) also used their turning skills to make other objects, like wheel spokes and other parts, chair-legs, clogs for the English cotton mill workers and birch brooms and broom handles for the steel industry. The hope once expressed that the new motor cars would revitalise the demand for wooden wheels was disappointed when they were manufactured in metal instead, and by 1903 the flood of cheap imports had spread to turnery ware and deepened the crisis—two thirds of wheelwrights in the east of Scotland were said to have gone out of business. Even golf clubs were now manufactured from persimmon and American dogwood. Ammunition boxes, barrels and buckets were still made at home.

That was not much compensation for what had been lost in this early foretaste of globalisation. But the First World War was in the offing, and with it came a realisation that despite all the technological changes that had been made, wood was still indispensable to national survival. The arrival of the Forestry Commission followed, and the woodland world was never to be the same again.

TABLE I

THE HISTORICAL USES OF WOOD and WOODS

USES OF WOODS

- Grazing, fodder and shelter for stock
- Sport for the lairds
- Non-material human use: -romantic, aesthetic, religious etc.
- Source of materials for local use and external sale

LOCAL USES OF MATERIALS

1. IN THE HOME

- Building timber: -structural members like crucks, battens, roof trees, 'basket houses' internal features like doors, window frames, and panelling.
- Furniture: bed frames, chairs, tables, stools, cupboards
- Industrial equipment: -spinning wheels and rocks, handlooms, bobbins, shuttles
- Kitchen ware, etc.: cups, dishes, cogs, flagons, spoons, lanterns, baskets
- Fuel—kindling and logs

2. ON THE FARM

- Fencing: 'stake and rice' and modern fencing
- Agricultural Equipment: ploughs, harrows, tool handles, carts and sledges, ropes, harness
- Containers: barrels, baskets, boxes, buckets

3. BY THE SHORE

• Boat building: - planks, masts, structural frames, oars

EXTERNAL SALE OF MATERIALS

- Fuel: charcoal
- Tanbark
- Tar and pitch
- Gunpowder
- Pyroligneous acid
- Building timber for near-by provincial town houses
- Boat-building and ship-building timber
- Pit props
- Railway sleepers
- Bobbins and shuttles for big mills
- Scaffolding
- Wheels
- Containers: barrels, ammunition boxes, buckets

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EVIDENCE OF EARLY SCOTTISH WOODLANDS THROUGH UNDERWATER ARCHAEOLOGY

Nick Dixon

Introduction

Scotland has an immensely rich underwater heritage. Although it is a small country it has more than 30,000 large and small lochs, 10,000 river and stream systems and 69% of the UK coastline (Lyle & Smith 1994).

Underwater surveys and excavations by The Scottish Trust for Underwater Archaeology (STUA) over the last 35 years have shown that these wet environments provide massive evidence for painting a picture of the woodland history of the country. Discoveries include natural timbers in submerged woodlands and structural timbers in the remains of settlements of past communities. Many of these settlements offer clear evidence of how people in the past understood and utilised the woodlands around them.

PAST AND PRESENT TREE COVER

In the past, particularly in the Neolithic Period and the Bronze Age, Scotland had a significantly different woodland cover as the climate was warmer and dryer than during the Iron Age and later. Around 1,000 BC, the climate began to deteriorate and by c. 600 BC had reached conditions similar to those that prevail today. The rise in peat bogs and changes in tree cover can be seen in many parts of the country and particularly in the Highlands.

An example of a site inhabited after the climatic deterioration is a 2,000 year-old island dun in Loch Bharabhat near the village of Cneep on the Isle of Lewis. Excavations carried out there by the STUA produced evidence of a landscape similar to that in the area today, relatively barren with large areas of heather and few trees. The circular dwelling on the small island is built in stone and is typical of the brochs and duns seen elsewhere in the north and north-west of Scotland.

Underwater excavation was carried out adjacent to the island to supply information about the economic basis and way of life of the inhabitants. Surprisingly, a small circular structure was uncovered from the soft silt that surrounds the island. It was complete with superimposed organic floor layers down to almost 3 metres under the water. The walls of the structure were similar to the house on the island, built of stone. It had subsided into the silt and had been rebuilt on a number of occasions until finally it was abandoned.

There was evidence of a doorway in the tips of 2 small wooden doorposts but otherwise there were no other substantial timbers on the site. The use of wood was seen in a large number of small artefacts but there was no evidence of large scale woodlands surrounding the site.

A superficially similar site, Eilean Domhuill a small island in Loch Olabhat in North Uist, sits in a landscape similar to that around Loch Bharabhat in Lewis. However, the site turned out to be Neolithic some 3,000 years earlier than Bharabhat, when the climate was different in the area. A small trench dug underwater for the same reasons as in Lewis showed a range of evidence indicating a very different landscape in the past.

There were the remains of a fallen fence or other structure with about 25-30 timbers, in some cases with evidence of joints. There were bundles of birch twigs with the shiny bark still attached and there was a small hurdle probably of birch or hazel. The trench was 4 square metres in size but the number of timber remains was far more than found on the whole of the Bharabhat site. Clearly the landscape when the site was inhabited was very different from today. No further underwater excavation has taken place on the site but the mass of evidence that is still preserved in the silts will give a clear picture of the environment there in the Neolithic Period.

Other sites were recorded around the coast of Lewis where layers of timbers from Mesolithic woodlands were protruding from the edge of peat bogs that were being eroded by the sea. Clearly the peatbogs were formed above sea-level and the remains of willow and birch woods are being eroded out because of a rise in

sea-level. On the mainland, in the freshwater loch of Lochindorb the same situation can be seen as Neolithic pine tree stumps are being eroded from the edge of the loch in a relatively barren landscape compared to the forest that existed 5,000 years ago.



Neolithic pine stumps eroding from peat bog at Lochindorb

SUBMERGED TIMBERS IN LOCH TAY

Introduction

In 2004, as part of the Ben Lawers Historic Landscape Project initiated by the National Trust for Scotland, members of the STUA discovered an area of fallen trees and stumps in Loch Tay. It consists of a strip of submerged land, c.160 metres long and c.15 metres wide, with tree stumps projecting up through the lochbed and with other timbers at different angles that appear to be the remains of fallen trees.

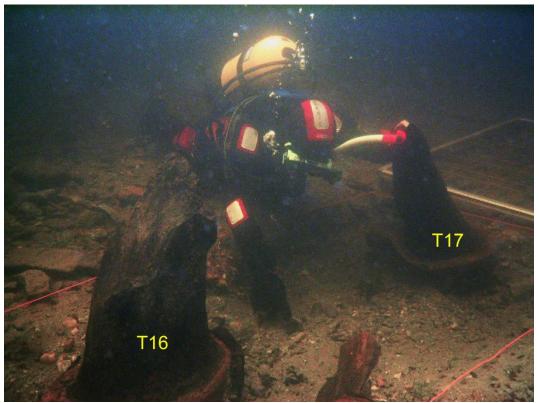
Baseline survey

Initially, 56 timbers were observed embedded in the lochbed but a shallow sondage around two of the larger, upright stumps showed that there were other tree remains, both upright and at an angle, underneath the lochbed silts (Dixon & Andrian 2005). Nearby, fallen trunks several metres long lie on, or protrude from, the lochbed. The best preserved remains are oak, but other species represented include alder, elm and pine.

Two timbers, T12 and T45, produced radiocarbon dates calibrated to 2480BC – 2280BC, and 3540BC – 3370BC (see table), placing them in the Neolithic period. The difference in the dates suggests an area of Neolithic woodland that existed on the edge of the loch for over 1,000 years. The water level in the loch would have had to have been about 4 metres lower than today for the trees to have grown where they lie.

A further 10 radiocarbon samples were taken (see table) and, surprisingly, showed that the timbers covered a range of about 6,500 years, from The Mesolithic to the Dark Ages but with nothing in the Bronze and Iron Ages. The oldest sample dates to c. 8,000 years ago and the latest is from c. 1,500 years ago.

The complexity of the situation is characterised by two very large oak stumps, T16 and T17, close together but almost 2,000 years apart in time with the one closest to the shore being the earliest sample. If the shoreline is collapsing into the loch it is hard to see how the later tree can end up further into the loch than the earlier one and still appear to be in an upright rooted position.



Examining 2 Neolithic timbers 2,000 years apart in time

Timber T1 is an alder tree that appears to have fallen towards the shore. It is still projecting above the lochbed even though it is a very soft timber and is about 7000 years old. It should be completely flattened by erosion and be protected under a layer of lochbed silt. Alder timbers at Oakbank Crannog, further to the east, are eroded completely flat after 2500 years.

Timber T34 is pine and it is the oldest timber dated so far at c. 8000 years old. It is notable that it is one of the samples closest to the shore while others that are 3000 - 4000 years younger are further out into the loch and up to a metre deeper under the water. Timber T48 is the latest sample dating from c.1,500 years ago.

Excavation

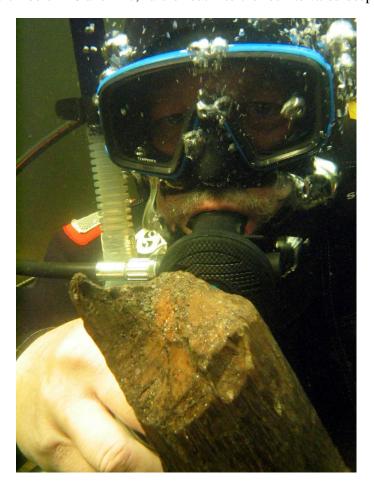
A small trench encompassing a number of tree remains, including T16 and T17, was excavated with the main aim of establishing the depth under the lochbed of the root systems of the two upright timbers. It was hoped that this would produce a base level for the old land surface in which they had grown. However, with excavation to 1.5 metres there was no evidence of a root system and it appears that the timbers are possibly large branches fallen from trees rather than rooted stumps. The deposits in which the timbers now lie may be the result of land slippage in the past.

Removal of the uppermost silts showed that the two large stumps, that appeared to be of hard black heartwood, were complete with sapwood and in some cases with bark where they had been protected by the lochbed silt. The sapwood is relatively soft and would have eroded away if this part of the trunks had been exposed for a long period of time. Therefore, it appears that there has been no significant build-up of silt around the timbers since they were initially buried.

Beaver

During the excavation, a number of branches with cut marks came to light. The marks were quickly recognised as being teethmarks made by beaver. According to early references, beaver were hunted to extinction in Loch Tay about 500 years ago. A radiocarbon date showed that the beaver-cut branches in the submerged timber area dated to the end of the Neolithic Period, c. 4,100 years ago.

It is not clear whether the area of beaver-cut wood is the remains of a dam or a lodge and it is also not clear why the remains are in the location where they were found. They are less than 2 metres to the south of the large timbers T16 and T17, further out into the loch towards deeper water sloping down from the shore.



Wood with beaver teethmarks

However, both T16 and T17 are considerably earlier than the beaver-cut remains, by about 2,000 years in the case of T17. Since beaver do not build their dams or lodges below water level, the implication is that T16, T17 and many other timbers, would have been above the water when the beaver lived there. If that had been the case, they would have rotted away in the dry conditions above water.

Human evidence

While so far no evidence of human activity has been discovered, it is notable that three Neolithic stone axes, two of them decorated, and a carved stone ball were discovered nearby and Scotland's only stone axe factory site is nearby at Killin.

A sample of earth-like material was taken during the excavation and contained evidence of both barley and wheat, some of it carbonised. The deposit has not been dated and the origins of the material are therefore not clear but the sample

was directly adjacent to T17 and it is hard to understand how they could be so close together but deposited at significantly different times. If the deposits are chronologically similar, they would suggest evidence of Neolithic farming in the area.

Conclusions

The range of timbers on the bottom of Loch Tay in such a restricted area and with such a wide range of dates is very difficult to explain. The method of deposition over a period of 6,500 years is not clear although it appears to be the same for all of the samples. However, it is even more difficult to explain how earlier timbers are shallower and closer to shore than those which are much later. While it is possible for timbers to randomly collect in an area, the beaver lodge or dam cannot have just floated in.

The spread of radiocarbon dates is hard to explain. The range of dates is from Mesolithic to Dark Age, but with no examples from the Bronze or Iron Ages, so far. It is interesting that the adjacent shore is a site of special scientific interest (SSSI) made up of natural oak woodlands.

The shore is very steep and rocky and it is hard to see how it might have been exploited in the past except for foraging for nuts and berries and other plant products. It would not be possible to carry out any form of agriculture in the direct vicinity and even exploitation for charcoal would be difficult because of the rugged terrain.

Much more research through excavation and the analysis of the wide range of timbers on the site by dendrochronology and species analysis is needed to help to clarify this strange area. Relevant research areas

include loch level variations, climate change and geological activity in Loch Tay and it is hoped to interest specialists in the different subjects to lead to some understanding of the situation.

Loch Tay Submerged Woodlands. Dating Table.

Sample no.	Lab code	Sample	Yrs BP	δ ¹³ C (‰)	Cal 2 sigma
		mat		·	
NW07 T48	SUERC-15548	Quercus	1570±35	-26.5	410–570AD (95.4)
NW07 T20	SUERC-15541	Quercus	3760±35	-25.8	2290–2120BC (80.1)
NW07 T16	SUERC-15539	Quercus	3780±40	-26.4	2350–2120BC (87.4)
NW07 T12	SUERC-6489	Quercus	3905±35	-26.1	2480-2280BC (95.4)
NW07 T27	SUERC-15545	Quercus	4470±35	-26.8	3340-3020BC (95.4)
NW07 T31	SUERC-15546	Quercus	4535±35	-26.5	3250-3100BC (60.9)
NW07 T45	SUERC-6490	Quercus	4705±40	-26.4	3540-3370BC (70.8)
NW07 T17	SUERC-15540	Quercus	5335±35	-27.2	4270–4040BC (92.4)
NW07 T9	SUERC-15538	Quercus	5405±35	-26.0	4350-4220BC (87.9)
NW07 T50	SUERC-15549	Quercus	5780±35	-24.8	4720–4540BC (95.4)
NW07 T1	SUERC-15537	Alnus	6180±35	-25.2	5230–5010BC (95.4)
NW07 T34	SUERC-15547	Pinus Sylv	7080±40	-24.7	6050–5880BC (95.4)

CRANNOGS OF SCOTLAND

Crannogs, or artificial islands, are found in most parts of Scotland. They were built in the water and have been underwater for the greater part of their existence. The dark, peaty anaerobic conditions in Scottish lochs means that the preservation of organic material, including both natural and structural timbers, is excellent when they are embedded in the loch bed or in the organic mound of material that makes up a crannog. Underwater archaeologists from the STUA, have examined many of the crannogs in Scotland and have noted substantial organic structural remains on a great number of them (Dixon 2004).

Use of wood at Oakbank Crannog, Loch Tay

Excavations began in 1980 at Oakbank Crannog in Loch Tay. The site is radiocarbon dated to c. 500BC, and almost 2,000 preserved timbers from the platform and the house that stood on it have been recorded so far. The remains range from 5 cms to 50 cms in diameter and include both cut and uncut timbers. There are also many much smaller twigs and branches which do not show evidence of cutmarks but did not arrive on the site by accident. They would have been used for flooring, animal fodder and other household purposes.

Alder (*Alnus glutinosa*)

The larger timbers that show clear evidence of having been cut for use as part of the structure were mainly alder which grew abundantly around the shores in the Iron Age, as it does today. Alder timbers were used as piles and posts for supporting the platform, house and internal walls and were laid parallel to each other to make the main house floor.

Oak (Quercus)

Oak timbers were also present throughout the site although they were less abundant than the alder. The largest were used as piles for supporting the main structure. The oak heart is very hard and black and is so durable that it is often seen projecting up through the site or the lochbed while other softer timbers are eroded flat. Oak was particularly noted in the remains of a walkway that led from the crannog to the shore and on a deeper, earlier, collapsed section of the site.

Elm (*Ulmus*)

A number of large elm piles were recorded as supports for the walkway that led to the shore, particularly near the entrance to the crannog house where wear and tear meant that piles had to be regularly replaced. The heart of the elm was almost as hard as that of the large oak piles.



Excavating among elm piles at the junction of the walkway and the crannog

It is likely that once the large oaks and elms were cut down for major piles, they would have taken so long to regenerate that the much more available, faster growing alder were used. A useful oak or elm was 60-70 years old when used for piles, whereas, alder will grow to the same size in 20-25 years. The alder is also much easier to acquire as they grow on the very edge of the loch and could be felled straight into the water.

Hazel (Corylus avellana)

The most common wood on the crannog was hazel. The greatest number of hazel samples from Oakbank were long thin branchs, withies or wattles, used in the construction of hurdles for making the walls and partitions in the house. In some cases, the rods were lying in bundles and others were the remains of hurdles. Similar hurdles were used in Scotland up until the early 20th century and they are found throughout the world still as the main part of wattle and daub walls in houses as well as for animal enclosures and fences in farms.



Excavating hazel rods used for making the hurdle walls of the house

Pine (Pinus sylvestris)

Many splinters of roughly-split wood, found throughout the site, exhibited evidence of having been burnt at one end, and sometimes both ends, and had been used as tapers. They were from 3 - 10 cms long and were cut from pine, a resinous wood which burns well when dry. Pine trees would have grown further from the loch edge than alder and other species as the pine likes better drained soil. It seems that the crannog inhabitants understood this and deliberately went to where the pines grew and collected pine branches to make the tapers.

The species of other small artefacts has been identified, for example, a small whistle was made of dog rose (*Rosaceae*) and a small piece of basketwork was made of ivy (*Hedera helix*).

While most of the abundant types of wood on the site are easily recognisable during excavation, others have been identified through laboratory analysis. For example, birch (*Betula*) is well represented by pollen and macro-plant analyses, and can also be seen as charcoal, suggesting that it was valued as firewood. Ash (*Fraxinus*), willow (*Salix*), yew (*Taxus*), raspberry (Rubus), cherry (*Prunus*) and elder (*Sambucus nigra*) were also present.

Conclusion

Underwater archaeology is still not seen as an integral part of the mainstream subject in Scotland. The range of evidence outlined above shows clearly that the woodland history of the country can be uncovered through the examination of the many submerged sites that abound. So far, little real research work has been carried out looking specifically at the timbers discovered as opposed to the archaeological elements. It is hoped that the underwater cultural heritage can benefit through more extensive underwater archaeological survey and excavation in the future.

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THE ARCHAEOLOGICAL EVIDENCE FOR CHARCOAL BURNING IN SCOTLAND - WITH PARTICULAR REFERENCE TO ARIENAS & RAHOY, MORVERN

Jonathan Wordsworth

With an introductory study on prehistoric and medieval production of charcoal this paper focuses on the 18th & 19th century production of charcoal from Morven, relying on both archaeological survey evidence and surviving documentary evidence from the Lorn Furnace letters books and the estate records of the 5th Duke of Argyll and his chamberlains. In this study I want to acknowledge particular reference to the work of the late Elizabeth Rennie of the Buteshire Archaeological and Natural History Society who spent 9 years recording the Recessed Platforms in Argyllshire & Inverness-shire with co-workers like Jim Kirby, Robin Callander and Frank Newall. While I disagree with her contention that most of these were not primarily constructed for the 18th century charcoal industry, I still applaud the work of her and her colleagues in studying these structures. I also want to thank Dr Jennie Robertson from Ardtornish for allowing me to copy details from her woodland surveys in Glencripesdale, Laudale and Arienas. The latter study is particularly instructive as to how the oak woodlands were managed by the charcoal workers.

Though there has been considerable work by metallurgists and archaeologists to study furnaces, slags and other debris from prehistoric and medieval metal working the processes for producing charcoal for these industries is poorly recorded. There has been some work done on the iron slags found as bloomery mounds around Scotland dating to the early iron age and continuing into the late medieval period and the introduction of more modern furnaces starting with Poolewe and Loch Maree in the early 17th century. As with earlier bronze and copper smelting, charcoal would be needed to produce consistent heat to smelt the ores, in preference to dry wood with concomitant risk of wood tars and other residues contaminating the smelted ores. The presumption has always been that charcoal was used as fuel for these early industries though no charcoal-burning platforms or pits have to date been recorded adjacent to these smelting sites. Macadam did describe possible charcoal-burning platforms near Poolewe in the 19th century though Rennie (1992) identified no visible platforms and has suggested that only possible charcoal-burning pits survive. No excavation has been done on these pits to confirm this.

Archaeologists are undeniably obsessed with charcoal because of its value as a dating medium for archaeological deposits through the decay of radioactive C14 contained in all living matter. As a stable product, there is even an International Institute of Anthracologists devoted to its study, though this is still primarily devoted to the material itself than its production. One of the problems with finding charcoal in a pit or other archaeological deposits is in distinguishing the remains derived from deliberate production sites rather than as a residue from waste hearths. The main distinction is that in an area of charcoal production the size of surviving fragments and the extent of their distribution in the archaeological deposit should be overwhelming.

There is some evidence that in earlier periods charcoal was primarily made in pits, as from a recent excavation report (Pit 063) from Laigh Newton, Ayrshire (Toolis, 2011).

The pit measured 1.7m long by 1.1m wide with rounded corners and a steep-sided but gently rounded bowlshaped base. Several small rounded cobbles were pressed into the base of the pit which had been affected by heat and reddened in places. The primary fill (270) was composed almost entirely of round wood charcoal 'apparently branches with clearly visible grain, bark and arranged in a coherent north-west/south east orientation as though laid in bundles ... mainly birch with lesser amounts of alder ... The branches were less than 100mm in diameter but predominantly intact roundwood, rather than split timbers. There was evidence for tool marks on the ends of some charcoal pieces, with the ends having been diagonally cut, rather than having broken ends'. It dated to between 380-540AD (95% probability).

There are references to charcoal pits in England & Wales including 16th century pit kilns in Garth Maelwg Forest, Llantrisant and these apparently measured up to 4.5m diameter by 1.2 to 2.4m deep (Rippin). Bettie

Rennie suggests that pits she excavated at Fearnoch, Colintraive and Dunloskin were used for this purpose and this seems plausible, as large pieces of charcoal were found in the fill of these pits. Unfortunately, these features were not dated. Dingwall mentions records from the Atholl Estate in 1757 (*AP: 70.II.C.30* in Smout 1997 p167) allowing timber merchants to 'make pitts for burning of charcoall' suggesting pit charcoal was still being made in 18th century Scotland.

The earliest reference I have found to a platform used for charcoal-burning in the UK was excavated at Llanelen on the Gower Peninsula, Wales in 1996 (Kissock). The platform measured c5 metres in diameter with a central pit c3m by 2m by 0.3m deep and it was interpreted as a charcoal-burning site from large fragments of wood charcoal distributed across the platform. The site dated to between 1413 and 1669 (SWAN 294).

John Evelyn in his 'Silva' of 1664 mentions the making of 'Small coals' from brushwood in open bonfires which are then dampened quickly with water and these were sent to London 'where they use them amongst diverse artificers, both to kindle great fires and to temper and anneal their several works'. Such fires would leave little archaeological trace and may possibly have been used for some of the small furnaces used for bloomery mounds, like the sites that have been dated to the 15th century in central Ross-shire and where no other evidence of charcoal production is evident. Though extensive bloomery mounds for iron production are known in late medieval times and there was even a market for iron workers recorded in Callander in the 15th century, Scotland was not a major producer of iron until the 18th century. It is therefore possible that charcoal was only produced in Scotland in pits or Evelyn-style 'small coal' bonfires until the main industrial period.

It is interesting that Evelyn makes no mention of pit charcoal and describes instead the production of platforms from 20 to 40 foot in diameter. This may argue that he was one of the main stimuli to a move to producing charcoal from pits to platforms having seen examples of such activity during his extensive travels through continental Europe before the Restoration of 1660. It is likely that the major iron industry in Cumbria would speedily adopt this practice and transfer it to their later 18th century production in Argyll. Evelyn describes the construction of a platform as follows 'having thus marked out the ground with mattocks, hoes and fit instruments, bare it of the turf, and of all other combustible stuff whatsoever, which you are to rake up towards the periphery, or outside of the circumference for a use afterwards to be made of it, planeing and levelling the ground within the circle'.

This would be necessary for the production of charcoal on an industrial scale such as recorded by Norden in the 17th century 'I have heard ther are or lately wer in Sussex neere 140 hammers and furnaces for iron ... which spread each of them in every twenty-four houres, two, thre or foure loads of charcoale, which in a year ammounteth to an infinite quantitie' (quoted in Edlin 1974).

In the records of the Royal Commission on the Ancient and Historical Monuments of Scotland I have found no mention of platforms for making charcoal outside of the catchment of the Argyll iron works of Furnace and Bonawe, except for a single reference to a platform on the SE side of Loch Katrine, a site already visited by the NWDG in the 2010 excursion to Loch Katrine. Charcoal was visible on the surface of this site which formed part of the Earl of Menteith forests. It would be interesting to date this site as the only reference I have so far found to charcoal burners in the census records is to five charcoal burners in Stirlingshire in 1871. This is surprisingly late and may already refer to the production of charcoal in iron retorts as is customary today.

Rennie (1995) has argued vehemently from the excavation of 10 platforms where only one had not been originally used as a structure with postholes supporting a roof, that these were all primarily constructed as domestic settlements sites. One of these platforms produced medieval pottery and two had C14 dates that could date these putative structures back to c1000 AD. Only five had clear secondary evidence of re-use as charcoal platforms. In addition, Rennie also argued that the effort involved in building these platforms was disproportionate to the efforts needed by colliers who might be only carrying out a single cut of the woods and that other open spaces could be used. She also suggested that charcoal hearths should be bowl-shaped and makes great emphasis of the term pitstead as implying an excavated pit rather than a platform, though

this would seem to contradict Evelyn's recommendations. She therefore has argued that none of these platforms was primarily constructed for charcoal burning. This remains contentious as most professional archaeologists still interpret these platforms as primarily constructed for the 18th century and later charcoal industry on the basis of the topographic situation of these sites and the sheer density of them. There are just too many of them to support extensive medieval settlement in situations that were fortuitously available for later use by charcoal burners.

Certainly the dates she obtained and the probable evidence of roof supports does suggest some of these were constructed at an earlier date and not originally for charcoal burning. There are also early dates for other platforms excavated at Colintraive (Kendrick 1979) and recent work by Clare Ellis in 2014 (Ellis *pers comm*) near Loch Doilean, Sunart which does suggest that some of these may have been originally been earlier domestic house sites dating back to medieval times or earlier.

Rennie's work was primarily carried out on the southern group of the 2000 plus platforms she and her coworkers have recorded, though this did include Ardery, part of the Sunart Oakwood Research Group area and Arienas as discussed below. 228 of the platforms recorded were in Muckairn Woods which was the primary source of charcoal for the Lorn Furnace due to a 110-year lease drawn up between Campbell of Lochnell and the Lorn Furnace company, who must have cut this woodland four or five times in the lifetime of the Lorn Furnace which ran from 1753 to c1861.

Though I accept that the platforms excavated elsewhere may have had an earlier domestic use, I remain firmly convinced from their location and situation that the bulk of the platforms recorded in Morvern were constructed in the 18th century or after for the Lorn Furnace. This can only be confirmed by excavation.

It has long been known that the survival of oak woodlands on the west coast of Scotland has been due to the economic importance of oak bark to the tanning industry and charcoal to the new iron furnaces established in the 18th century at Bonawe and Furnace. Looking back over past papers given to the Woodland History Discussion Group and through the work of the stalwarts of the group like Chris Smout and Mairi Stewart, there has been a consistent emphasis on the importance of the economic value of historic woodlands contributing to their sustainable management with substantial documentary evidence to back this up. Again this has been known in detail since Jim Lindsay's PhD thesis in 1973 and subsequent papers, as well as from publications like Cregeen's *Argyll Estate Instructions* published by the Scottish History Society in 1965.

The cycle of cutting at Muckairn required additional sources of charcoal and Lindsay's work shows where some of these were obtained from. We are fortunate in that a portion of the letters sent from the Lorn Furnace survive in manuscript in the National Library of Scotland. The wood cutters and coaliers who did the charcoal burning were independent of the company, though supplied by the company to the woods to be coaled, so there is likely to have been a consistent practice followed in the different woods cut. I consider it likely that the Lorn Furnace managers and the woodland owners anticipated repeated cuttings and coalings of the same woods in cycle. Certainly Harriman the manager of the Lorn Furnace instructed the owners of the woods that the coaliers should be treated well, being paid at the substantial rate of 12s a week in 1807. The 5th Duke of Argyll who maintained a close eye on his estates certainly thought the management of woods was significant because he was prepared to expend considerable sums on protecting his woods from both grazing animals and tenants (Cregeen, 1965). Following a survey in 1771, the Duke commissioned his chamberlain Campbell of Airds to enclose these woods.

Contractors started work in July 1786 to build both stone and turf (feal or fale) walls on Rahoy and in subsequent years Glencripesdale, Laudale and Liddiesdale. The total cost for Rahoy was agreed at £137 19s 5d with 660 falls (a now obsolete Scots measurement of approximately 18 feet) of stone dyke, 52 falls of turf dyke and 335 falls of ditch. They agreed to complete the work by the 1st January 1787 building 'the stone dyke four foot high and three foot broad at the foundation and 18 inches at the top and to cop it with two rows of fale. The ditch to be seven foot wide at the top by seven foot in height and 21/2 foot wide at bottom and well backed in the side next the wood. The fale dyke to be made seven foot high, well cop'd at the top and the green side of sod outmost' (Cregeen 1967 p135)

These walls and the enclosures surrounding these woods can still be traced as shown on both existing and earlier Ordnance Survey maps and from aerial photographs. The surviving line of these was confirmed by archaeological survey carried out by Headland Archaeology (Lowe & Wordsworth 1998).

As can be seen from the plan (see online link <u>EHG 262</u>) the platforms were extensive and were particularly noticeable lining in sequence up the hill at Carn Glas and alongside the Allt Ard Charn, perhaps reflecting the greater quantity of timber obtainable from the gorge woodlands. There was some evidence that the platforms were spaced around 50 metres apart. The survey was not in sufficient detail to record tracks and distribution points, though a possible charcoal bank was recorded at the North East on the shore of Loch Sunart where larger sloops might be able to load up with filled charcoal sacks.

The platforms at Rahoy were generally recessed into the hillside. Many of them had stone revetments on their front edge and it is partly their substantial construction that led Rennie and others to doubt their transient use as platforms. However, I think their substantial form is deceptive and that these were constructed to this consistent shape by the colliers in the belief that they would be returning to these woods on a regular cycle. Stone revetment is only required where the break of slope is too severe to produce a platform from levelling the ground. Considering the effort involved to enclose the woods it is not unreasonable to build platforms for repeated cuttings of the wood.

No platforms were recorded in the areas adjacent to Rahoy House and it is quite possible these woods were reserved for timber. It must be remembered that bark and timber were considered as equally saleable by the Lorn Company with their manager arranging for these items to be shipped to a variety of customers. It is also worth noting that Cregeen recorded the wood ranger for Loch Sunart supplying between May and July 1788 to the Duke of Argyll's tenants in Tiree

'148 Car-poles, 312 couples, 316 pantrees, 6440 kebbers, 62 ploughs, 22 harrows, & 24 spade shafts'

This timber is likely to have been obtained from further East in Laudale and Liddiesdale as Rahoy woods, at least at the south, were already cut in 1785 when Airds, the factor for Argyll surveyed the woods for the 5th Duke before new boundary dykes and walls were built.

No definite sawpits or timber worker huts were identified, but it is possible that structures, such as Site 14 consisting of two rectangular stone footings 8m by 4m and 11m by 5m could represent such temporary houses or for storage of tools or materials like bark. The coaliers had the right to build cabins in the woods using timber from the woods and it is more probable that these were timber frame structures like the reconstructions recorded from the Lake District. These tended to be more robust than the turf wigwam structures known from the Weald and elsewhere in southern England (Armstrong 1978). In contrast to the oaks which needed to be cut in early spring when the sap was rising to aid the stripping of the bark (a commodity generally more valuable than the timber and the charcoal until the introduction of chemical tanning methods), the barren woods like birch ash and alder, were generally cut in the winter when the sap was low. The coaliers would need robust structures to keep themselves warm at night when cutting through the autumn and winter months.

The possible coaling station recorded at Site 1 at Camas Glas, is reminiscent of a similar bank recorded as part of the Sunart Survey. Other such loading bays may have been located along the shore of Loch Teacuis on the west, though the shallowness of the bay may have inhibited boat access.

A survey in 1779 recorded nine families on Rahoy (Cregeen 1963) including two headed by grasskeepers and two cottars. The latter may be represented by the houses at Caol Charna and Camas Glas. Following the bankruptcy of the 6th Duke of Argyll the estate was sold in 1821. It remained in the Stewart family until 1871 when it became part of the Newton families vast Glencripesdale Estate. There is likely to have been at least a second cut of these woods before they passed out of the Argyll family, as a rental of 1807 insists that the tenant 'uphold the wood fences when the woods are cutt' (Gaskell p125). Further accounts of these Argyll woodlands may be forthcoming once the projected scanning of the Argyll Archives has been carried out. I have not traced any records of the Stewart family, but it seems likely that the woods would have been

cut at least for the oak bark during their ownership. By the 1841 census 6 families were on the estate and this had reduced to 2 in 1871 though roofed buildings are evident at both Camas Glas and Carnliath, as well as Rahoy on the 1872 OS Survey map.

The sales prospectus for the Glencripesdale Estate in 1904 records that 'the woods have not been touched for 30 years', the Newton family having inherited 'a quite absurdly large fortune' from their father a prosperous Birmingham industrialist.

Glencripesdale, Liddiesdale and Laudale to the north east along shore along Loch Sunart have also been surveyed by Jennie Robertson and though the original wood boundary can be partly traced, only a few charcoal platforms have survived more recent forestry plantation. These and the Rahoy surveys can all be accessed online from the Highland Council Historic Environment Record.

Arienas, unfortunately, did not form part of the Argyll Estate so has no surviving 18th or early 19th century records. However, it did become part of Ardtornish Estate from 1860 where excellent records do survive and Langlands plan from 1815 does survive showing an extant wood with an enclosing dyke similar to that recorded for Rahoy. Arienas has also benefited from a much more thorough archaeological survey by Jennie Robertson carried out in 2005. As with Rahoy, platforms varied from levelled areas to stone revetted sites where the slope and terrain was steepest. There is a record in the Lorn Furnace Letter book dated 14th April 1792 to John Mclean of Inverscaddle, then owner of Acharn Estate.

'I have here Inclos'd you my draft on Glasgow for £280 Payable at Lammas as agreement being the Amt of woods Purchasd from you, now Manufacturing in Morvane'

Robertson convincingly argues that this is likely to refer to woods at Arienas rather than Inverscaddle. It therefore seems likely that the majority of these platforms were first constructed c1791/2. The platforms are spaced approximately 50m apart as at Rahoy and are likely to have been built according to the same methods by the Lorn Furnace coaliers. Again there was no certain evidence of saw pits and the structures found were rectangular and possibly unrelated to charcoal production. Unlike Chris Lowe and myself, she photographed and recorded in great detail every platform and in particular noted four tracks leading along the contours from the platforms towards Arienas point. It would seem the charcoal and bark being produced was transported by skiffs along the river to be shipped out at Lochaline. Jennie has said her daughters have kayaked down the river when the water was high enough so this seems plausible. Alternatively, the charcoal sacks were transported by pack pony to Lochaline.

Unlike at Rahoy several of the platforms have evidence of later rig cultivation and a couple have structures built over them. Rennie (1996) has suggested that this is additional proof that these were not built for charcoal-burning. However, I think the answer is just that these were only used for one or at most two cuts and that the crofters were taking advantage of the rich potash on the platforms to use as fertiliser for crops. There is a reference in the Lorn Furnace letter book in 1798 to Knapdale where the agent complains

'the tenants on the farm where we are cutting the woods ... are plowing all the ground that can be plowed ... they have likewise plowed ... on twelve pitsteads which was made use of in the former cutting ... you may depend on that we must make use of them this season, for what we are now to manufacture even if a crop of grain be upon them and will not be accountable for the damage.'

Arienas was cleared of its inhabitants in 1838 when Patrick Sellar purchased the Estate of Acharn and evicted 44 families. Donald Mckichan's *Memories* from 1944 (as transcribed in Gaskell pp240-41) record:

About the year 1868-70, soon after the late Mrs Campbell Paterson became propertrix of the Lochaline Estate and that part of Kinlochaline Estate from Achaforse burn to the match at Larachbeg, the whole of the young oak from the shore to the foot of the rocks, along the embankment from the head of the Loch to Lochaline, was cut down and after a good beating the bark was ripped off. This work was done by contract during the summer months when the young oak was full of sap by men, women and boys. The bark and the dressed oak was put in separate heaps along the seashore ready for shipment to the southern markets. The bark was largely used in the tanning of leather, and the dressed oak in the process of

smelting iron. At a much earlier date, the oak on Acharn Estate on the north east side of Locharienas was cut down for the same purpose, and I was told that bark to the amount of 60 tons was got from the cutting of the oak there. The work was done by contract, by a man the name of Malcolm Sinclair.'

Donald Mckichan was born in 1858 and his father Charles had moved to Ardtornish as a woodkeeper in 1853 so it is likely that this is a reference to the 1840s or earlier and is likely to have been the last time the Arienas woods were cut. However, if most of Arienas was cleared in 1838 then perhaps this is a much earlier reference. Certainly they would have been ready for a second cut c1815, though perhaps Langlands plan of this year showing extensive woodland within the enclosure suggests this had not yet happened. Even if it was as late as 1820 it would still give the crofters of Arienas 18 years to exploit the platforms for other uses.

Charcoal was also produced for the gunpowder industry notably at Stobs Mill near Gorebridge and at Roslin Glen, using the motive power of the North Esk to grind the charcoal. The latter opened in 1804 and only closed in 1954. At their peak in the mid-19th century both mills were employing c60 people, though apparently, from records of Roslin Glen, half of these were coopers. I believe the wood was obtained locally.

Charcoal was also obtained as a by-product from other 19th century industries, in particular the pyroligneous acid works. Here the charcoal was combusted in iron retorts and the distillate used particularly for the bleaching of linen and cotton cloth but also for other industrial processes. The most famous was at Camlachie Street in Glasgow but works have also been recorded at Balmaha, Crinan Harbour, Loch Rannoch (where the name is still perpetuated as Chemical Cottage) and at Kilkerran near Maybole in Ayrshire. There is a very interesting article on the latter site by David Maclure available online. Lindsay (1974) also records works on Loch Awe, two in Falkirk by 1845 as well as a large works in Perth. Monteath (1824) makes reference to portable boilers, presumably of cast iron similar to those used by modern charcoal burners, to produce this acid liquid.

Finally, the one product I have not found any trace of in the archaeological record or indeed any reference in the historical record is of tar production as a by-product of charcoal burning. This would have been needed to caulk boats and preserve fishing nets and cannot only have been available as an imported item of trade.

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THE LYMPHADS, GALLEYS, BÌRLINNEAN AND BOATS OF ARGYLL

D C McWhannell

INTRODUCTION

The design and construction of West Highland and Island galleys appears to have been similar to Scandinavian vessels of the Viking era other than in the area of the stern post and rudder. In 1615 the official Scottish Crown's view of what constituted a galley was "Ane galley is ane veshel of xviij airis and abone to xxiiij airis: ane birling is ane veshell of xij airis and abone to xviij airis. The birth of ane galley and birling and the number of men of weir quhilk they are able to carye is estimat according to the number of their airis, compting three men to every air" (Register, 1891). Since no Scottish galley wreck sites have yet been identified details of the construction of these medieval vessels must be inferred from sculptured stones, graffiti, seals, heraldic devices, documentary evidence, language and literature. The word "lymphad" which is also used to describe a galley derives from Gaelic *long fhata* where *long* (f. noun) = ship and *fata* (adj.) = long. Typically the forty oared, fully manned, ship service galley required by the Crown from Colin Campbell for his Argyll lands in 1315 would have been a *long fhata*. This name relates to the Scandinavian "langskip" and to the Roman "navis longa". The word birling, Gaelic *bìrlinn*, possibly derives from Middle English "berling", a pole, spar or tent sill and first occurs in a maritime context in Middle Irish (Sayers, 2006). Any vessel of 12 oars or less may be considered to be a boat.

LOGBOATS AND CORACLES

The remains of some 155 logboats have been found in Scotland of which around 27 were found in Argyll, Perthshire and the West Highlands. Scottish logboats, Gaelic *coit*, a small boat or *amar*, a trough, were formed from both oak and pine trees. The logboats were dugouts, some with transoms and occasionally with washstrakes. The average length of a Scottish logboat is just less than 5 meters. Surviving examples are predominately made from oak logs. Logboat use in Scotland continued until the mid to late seventeen hundreds. The demise of the logboat may be linked to the loss of suitable great trees (Cheape, 1999).

Hide covered wickerwork boats of currach and coracle form existed in Scotland. Coracles were used on both the Tay and Spey. Records for the Spey indicate the use of one man coracles for logging and fishing until at least 1822.

EARLY SHIP SERVICE

The Picts were in possession of significant naval power as indicated by the loss of a Pictish fleet of some one hundred and fifty ships in 729. It is recorded that the Picts used sails as well as oars to propel their ships and it appears that the Picts may have possessed both hide covered and plank built vessels. The only known illustration of a Pictish vessel is the depiction of an apparently clinker built vessel with a steering oar that appears on the late ninth century St. Orland's stone in Angus.

The large hide covered sailing and rowing currachs (*curaichean*) of the Gaels were seagoing vessels. Currachs engaged in trade, raiding, voyages of exploration and missionary voyages. A mid fifth century trading fleet of fifty *curaichean* was, it seems, overwhelmed in the tide race between Rathlin and the Antrim coast. The *curach* remained in use for transporting warrior bands until the first half of the seventh century.

SHIP SERVICE IN ARGYLL

Ship service in Argyll is first documented in the levy of the naval forces of *Dál Riata* detailed in the *Senchus Fer n-Alban* (Tradition of the Men of Scotland) compiled in the mid-seventh century.

The three Dalriadic kindreds together with their *Airgialla* vassals had the capability of deploying a sea-borne host of around two thousand men (Steer & Bannerman, 1977). Although the exact form of vessels used by the Dalriadic peoples is not known it is of significance that *Adhamhnán* in his "Life of St. Columba" refers to both wooden and skin covered vessels (Reeves, 1871). The seven benched ship service vessels may have been constructed using wooden, possibly clinker construction.

It is likely that Scandinavian forms of ship service and maritime technologies progressively modified or replaced the indigenous systems during the period of Norse and *Gall-Ghàidheil* lordship in the western islands and highlands of Scotland from approximately 795 to 1266.

FEUDAL SHIP SERVICE IN ARGYLL

Documentary evidence of feudal ship service arrangements in Argyll exists from the reign of Robert I onwards. Crown and other ship service charters were issued for lands in Argyll during the period 1312 to 1593 AD. Ship service charters and related documents were issued by the Argyll Campbells from 1396 to 1762 AD. There were at least twenty Crown ship service charters for lands in Argyll while some sixteen ship service charters issued by the Campbells have been identified.

HEREDITARY SHIPBUILDERS IN ARGYLL

During the seventeenth century naval activity was a necessary support to the military campaigns of the Earls of Argyll. The vessels employed were mostly galleys and *bìrlinnean*. The Earls of Argyll had two families of hereditary shipbuilders among their retainers, the *Clann Mhic Gille Chonaill* and the *Clann Mhic Gille Lùcais*. The Earldom of Argyll existed from 1475 to 1701.

Two c. fifteenth century grave slabs, one at Kilmarie, Craignish and one on the island of Inishail, Loch Awe may be associated with members of the *Mac Gille Chonaill* family. Both slabs display a typical west highland sword with depressed quillions, a boat with high prow and stern and a shipwrights axe and adze or hammer (Fig.1).

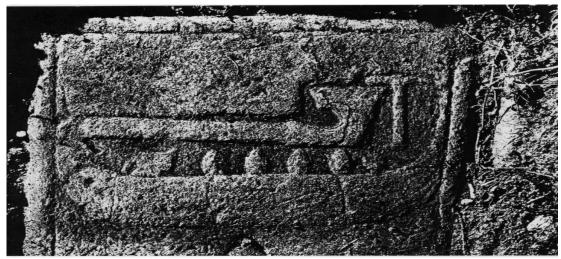


Fig. 1 (photograph copyright of Ian Fisher)

Documents exist relating to the boatbuilding activities of the *Mac Gille Chonaill* family during the late seventeenth century. Somewhat later in 1764, "a retainer John McIlchonnel, a boat carpenter", is on record at Inveraray (Campbell of Airds & McWhannell, 1995).

THE LAST CAMPBELL NAVAL EXPEDITIONS

During the fifteen and sixteen hundreds one of the main uses for galleys was to transport both mercenary and regular troops to Ireland. A particular expedition planned in April 1642 by Archibald Campbell, Marquis of Argyll, required that Inverliever's Company be transported to Ireland in Sir Robert Campbell of Glenurquhay's *birlinn* (Inveraray Texts).

A notable event involving a galley occurred on 2nd. February 1645 when the Earl of Argyll withdrew from the battle of Inverlochy onboard his galley.

In 1678 a significant naval expeditionary force was organised by the Earl of Argyll against the Macleans of Duart. The Campbell fleet on this occasion appears to have consisted of the Earl's twenty oared galley, his

fourteen oared *bìrlinn*, Barbreck's fourteen oared *bìrlinn*, Auchinbreck's two *bìrlinnean*, Kilberry's three boats, some nine boats belonging to the following persons, MacNeill of Gallochyle, MacAlister of Tarbert, Campbell of Kinloch, MacMillan of Knap, MacNeill of Taynish, MacIver Campbell of Asknish, and MacAlister of Loup and possibly five boats described as "scouts", carrying in all a total of around seven hundred men (Inveraray Archives).

THE 1635 CAMPBELL OF GLENORCHY BÌRLINN. BUILDER'S ACCOUNT

This vessel was clearly of high quality. It was constructed of oak throughout and was created, starting from growing trees, all within one month, by a team of eight or nine men and three boys led by the "principal wright" who was in turn supported by his father Duncan Odhar (National Archives 1).

In Scandinavia the "principal wright" was the "stem wright". His carving of the stem and sternposts, setting up the keel and end posts and laying the lower planking and floors determined the unique form of the vessel being built. With such a person assisted by his father and aided by his "man" plus five or six skilled wrights, three boys, (likely apprentice wrights), a smith and the "unskilled" labour of the local tenants it is entirely possible that this *bìrlinn* was constructed in one month and was of at least sixteen oars, the size of galley required of Glenorchy in relation to his Argyll lands.

John L. Ferguson, a well-known builder of traditional clinker built Scottish fishing cobles and loch boats constructed from locally felled Perthshire trees, confirmed that the estimated size was realistic. It is also believed that two skilled men would have been capable of felling and converting a sufficient number of suitable trees to have produced at least eight pairs of sound oars in eight days, using only axes, hafted wedges, draw knives, ordinary knives and scrapers.

It is estimated, based on the number of clench nails and roves made by the smith, that the *bìrlinn* was probably eight strakes high, double ended and of "Scandinavian" or "Viking" form, around 14 metres long and 3.4 metres beam. Such a run of planking at this size and shape with clench nails set at the traditional distance apart, approximately a large hand span, is compatible with the number of clench nails made.

It would appear that the floors of the *bìrlinn* were treenailed to the planking as no "great nails" are mentioned. The use of treenails for such fastenings is representative of good early Scandinavian practice. It is also striking that the number of "seam and ruife" listed matches closely the number of clench nails used in the Skuldeley, Wreck 3 replica, "Roar Ege".

Indeed, it seems that a vessel close to the form of Skuldelev 3, but equipped with eight or nine pairs of oars and with stern sections, stern post and rudder similar to those illustrated on the Rodel galley, would be a highly plausible representation of Glenorchy's 1635 *birlinn* (Fig.2).

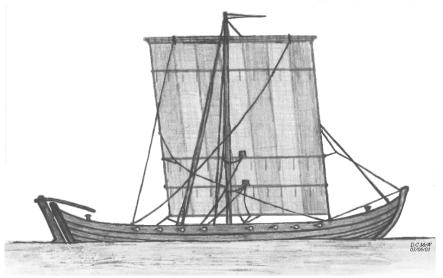


Fig. 2 The conjectural appearance of the 1635 Glenorchy Birlinng

THE 1695 CAMPBELL OF GLENORCHY TWELVE OARED BOAT, BUILDER'S ACCOUNT

Considering the number of clench nails mentioned, together with the number of large nails or spikes, (great garrowe nails), and the fact that six pairs of oars were made for this boat, leads to the conclusion that the 1695 boat is likely to have been "six strakes high" and approximately 12 metres long by 2.5 metres beam.

It is possible that the use of spikes in Breadalbane's 1695 boat, together with fir planks and oak boards, most likely to have been pit sawn, indicates changes in the construction and style of this vessel compared to the *bìrlinn* of 1635. It appears that the twelve oared boat was intended as a "work boat" with a lower life expectancy than the *bìrlinn* of 1635. It is also likely that this boat was of greater burden and so would have had a larger beam to length ratio than the *bìrlinn* (National Archives 2).

The 1695 twelve-oared boat may be the actual "great boat" that "McLechonell boatwright" took to "Izdeall", (Easdale, south west of Oban, Argyll), for "scleat" (slate) in 1697. From 1690 to 1698 Breadalbane was engaged in a major reconstruction of Kilchurn castle, Loch Awe, Argyll

THE REALISATION OF A GALLEY

The late Ole Crumlin-Pedersen calculated that between 50 and 80 m³ of oak was required to plank the hull of a 20 to 25m. "langskip" (Crumlin-Pedersen et al, 1997). This timber is made up of about eleven trees, each of 1m diameter and 5m in length of straight trunk together with a very special oak tree able to provide the 15 to 18m.keel. The hull of a forty-oared Campbell galley, if of slender "langskip" form, would have been around 26m.long. It is therefore likely that some 20 oak trees 1m.in diameter and with 5m. of straight trunk plus an enormous oak able to provide the approximately 17m.keel would have been needed. Additional curved and branched oaks would have been required to provide the stems and other hull timbers such as knees and floors. A very large straight pine without low branches would have been employed for the around 14m.long mast. A similar good quality but smaller pine would have been needed for the around 12m.long main spar. A further twenty plus good straight knot free pine trunks each around 8m. long would have provided the bearing out spar and the oars. Significant amounts of timber would also have been needed for treenails, the rudder and tiller, rigging blocks, gangplanks and bailers. Wood was also needed for the building stocks, launch ways, skids and temporary framing and shoring.

MASTS, SPARS AND OARS

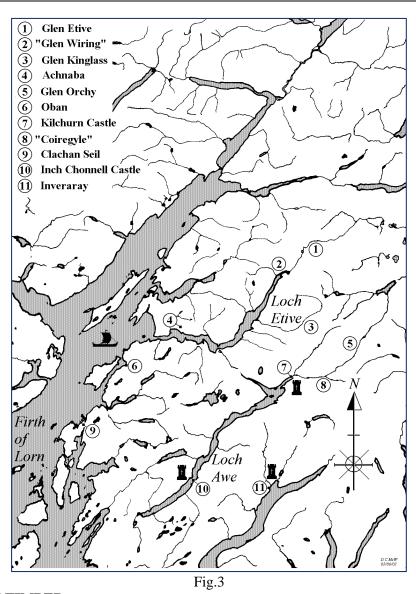
The tasks of manufacturing effective and reliable oars, mast and rudder suited to the needs of the galley and its crew have been found to be difficult by those involved in constructing and testing a reconstruction of a *bìrlinn* (Clark 1995). Scandinavian experience with replica Viking Age vessels has shown that getting correctly proportioned and balanced oars is central to achieving effective performance when rowing. In a west highland context it is known from documents in the Argyll Archives that oars for the Earl of Argyll's *bìrlinn* were cut by the *Mac Gille Chonaill* shipwrights from timber in Glen Etive. The *Mac Gille Chonaill* wrights are also known to have made masts (McWhannell, 2003).

There were other boat-wrights in Argyll and Perthshire, apart from those belonging to the *Clann Mhic Gille Chonaill* and *Clann Mhic Gille Lùcais* hereditary shipwright families. Individual boat-wrights whose surnames were Ure (possibly Gaelic *Mac Iomhair*), *Mac an t-Saoir*, and *Mac Gille Thomhais* are mentioned in various Argyll and Perthshire related documents held in the National Archives Scotland.

It should also be emphasised that there will have been many other, presently unknown boat-wrights in Argyll producing small craft, fishing craft, work boats and ferries for use on rivers, fresh water lochs and the sea.

LOCALLY FELLED TIMBER FOR THE BIRLINN OF 1635

Places where timber was felled for the *birlinn* of 1635 are indicated by locations Nos.1, 2, 3, 5 & 8 on Fig.3 below.



SHORTAGE OF TIMBER

It is almost certain that over time a growing shortage of boatbuilding oak will have restricted its use to stems, keels and bow and stern planking while old growth heartwood pine will have been used for the rest of the planking with possibly an uppermost side plank of ash.

Large-scale wooden shipbuilding always results in a local shortage of suitable prime timber for planks and crooks. This typically results in the reuse of sound timber from old ships, the importation of timber and the substitution of oak planking by pine planking. Inferior species of tree may need to be used and planks tend to get shorter. Throughout Europe the monarch or the major local landowners generally introduced laws to control and manage their woodland.

In 1568 the Lords Justices of Ireland "restrained the export of boards from Carrickfergus to impede the Earl of Argyll in making galleys". Argyll was also forbidden access to Arklow, Wicklow and Dublin to prevent him obtaining oak for galley building.

The Campbell of Breadalbane family are known to have developed regulations for woodland management. Timber was also obtained from outwith Breadalbane's estates, notably from Cameron of Locheil's woods.

CAPITAL COSTS AND CAMPBELL INCOMES

The initial cost of Glenorchy's 1635 *bìrlinn* was £Scots227-8s-4d (+ "free" wood), which appears to have equalled approximately 30% of the net annual income from his Argyll lands, making this *bìrlinn* a prestige

item. The twelve-oared boat of 1695 in its turn cost £Scots181-16s-00d or around 19% of Breadalbane's net income from his Argyll lands.

The Earl of Argyll in 1679 could it seems readily afford to have owned a twenty oared galley, a fourteen oared *bìrlinn*, a twelve oared *bìrlinn* and a new "great *bìrlinn*", probably of eighteen oars. The total initial cost of these four vessels probably amounted to around £Scots1, 000 which was perhaps equivalent to some 20% of the Earl's surplus annual income in the mid to late 17th. Century and probably less than 2.0% of the Earl's gross annual income in 1694. Remarkably the combined original capital costs of these four prestigious vessels which were both useful troop transports and assault craft probably amounted to around only 8.3% of the Earl's personal allowance in 1707.

A particularly interesting comparison of the costs of the boats described above is with the value of the testaments of small farmers in Argyll. Shaw has published a sample of such testaments for the period 1675 to 1708 extracted from documents held in the National Archives of Scotland (Shaw,1980) and this indicates that a small tenant farmer left an average estate valued at £Scots130; approximately two thirds the cost of a *birlinn* or a twelve-oared boat.

SAILS, RIGGING AND ROPES

Clearly Glenorchy had further sources of income from his Perthshire lands, from fines from his heritable jurisdictions, from his fisheries and from his valuable woodlands. He also had significant outgoings apart from monies spent on boats. It is however the case that the £227-08s-04d cost of the *birlinn* plus say £Scots30 for the sail and rigging, together with maintenance costs and the costs surrounding the provision of a crew of warrior-rowers and other seamen would have been significant.

The *bìrlinn*, barring accidental loss, would probably have required replacing at intervals of around thirty years. It is noticeable that the costs of a sail and cordage, which clearly need replacement on a regular and more frequent basis, do not appear in the records other than in the rental for Tiree in 1678 where "a sail and hair taickle to a galley" is valued at £Scots40.

On the question of a general lack of information on the costs of finished sails, sailcloth, rigging and ships' ropes in the Campbell Papers, it may be significant that weavers in Islay in 1729 were paid for their work in meal at "the local rate". The local courts for Seil and Luing, in the late 1600's, set the rates for weaving woollen materials as "a white woollen plaid of twelve ells - one firlot of meal, for a common grey plaid - three quarters of a firlot and for hewit (multi-coloured) cloth- one firlot. If payments in kind to weavers of woollen cloth were the norm throughout Argyll during the 17th and early 18th Centuries this may explain the general lack of data for the cost of sails and also of ropes.

ROPEMAKING

Ropemaking using leather, horsehair, heather roots, tree roots and other materials was a well-known craft in the West Highlands and Islands. Based on Scandinavian evidence three quarters of a ship's ropes were made of lime, oak or elm bast. Horsehair rope appears to have been used for the roping of sails and for sheets. Seal and especially walrus hide "ship ropes" were widely traded. Walrus hide rope was much prized as the best anchor rope.

An indication of the quantities of rope needed is given by the rope inventory for "Roar Ege", the replica small Viking Age trading vessel launched at Roskilde in 1984, which required various ropes varying in diameter from 8mm. to 26mm. with a total length of some 411m. Clearly larger vessels required more rope and ropes of larger diameter. Each 40-oared Campbell galley will have required a total length of around 2500 m. of rope.

METAL TOOLS, FITTINGS, ANCHORS AND CHAINS

The manufacture of iron nails, pintles, gudgeons, anchors and anchor chains and other metallic components for galleys and indeed the metal parts of the shipbuilders' tools would be well within the competence of the families of hereditary smiths known to have existed in the Highlands and Islands.

In Scandinavian shipbuilding a total of around 7000 spikes and clench nails (with roves) were needed to build a 30m. "langskip". The weight of pure iron required being around 240kg. Iron anchors were of the "fisherman" type but with wooden stocks. Viking age iron anchors weighing up to 30kg.have been recovered by marine archaeologists.

Ancient ironmasters, using charcoal fuel smelted limonite (bog iron); about 400kg.of iron being obtained from 30 tonnes of ore. The resulting iron is low in impurities and relatively corrosion resistant. Bloomeries existed in Argyll and may have operated up until the 14th.Century. A trade in soft iron ingots is known to have existed in northern Europe and the early smiths of Argyll may have imported iron from Scandinavia.

In 17th.Century Argyll, clench nails, roves and plain nails were purchased from the lowlands of Scotland. In relation to Argyll at least three families of blacksmiths and armourers are known to historians (i) the Macnabs from Barachastlain by Dalmally (ii) the MacPhederans from Ferlochan by Barcaldine and (iii) the MacEacherns from Morvern and Islay. A medieval gravestone on Oronsay featuring a galley also carries representations of a smith's anvil, tongs and hammer.

CAMPBELL OF GLENORCHY WOODLAND MANAGEMENT

The Baron Court records of the Campbells of Glenorchy, later Earls of Breadalbane from 1681, cover the period from 1571 to the mid 1700's giving a clear indication of active woodland management by the Glenorchy family. A study of these records carried out by Watson indicates that the Baron Courts met up to four times per year and controlled the Glenorchy network of some sixteen baronies reaching from Benderloch in the west to Loch Tay in the east. Control of Breadalbane's estates was operated through the support of cadet families such as the Campbells of Barcaldine, Glenfalloch and Monzie.

Ground officers, tenant foresters, tacksmen and tenant farmers oversaw woodland management. The woodlands were inspected before the Baron Courts met to establish that the condition of the woodlands was to the required standard. Fines were imposed for misdemeanours. Foresters were required to oversee authorised woodcutting and to punish offenders. Park dykes were established to prevent animals eating young trees. Specially prized woodlands were enclosed. Alder, birch, willow and hazel were considered to be common woods while ash, pine and above all oak were seen as prized woods.

Woodland related offences were treated as a serious matter as can be seen from the size of the fines imposed on offenders. The Benderloch Court fines relating to such offences in 1619 reached the considerable sum of £Scots234, an amount comparable to the cost of Glenorchy's *bìrlinn* of 1635. At the dates of building of the vessels described above there is evidence, within the context of the Glenorchy Campbell lands, of disciplined community involvement in woodland resource management (Watson, 1997).

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THE PARTON PULPIT, ADDIS ABABA AND DOCTOR WHO: TIMBER AVAILABILITY IN THE SOUTH-WEST 1544-1810

Archie McConnel

As we all know Dr Who has a TARDIS and oddly enough the acronym (Time and Relative Dimensions In Space) is an excellent description of timber availability. We do not tend to talk about *availability of timber* in an historical context and yet it is the main driver for woodland survival and development.

- Availability is a function of time and space and of the relevant dimension for the timber
- Must get timber to the right place at the right time in the sizes required otherwise it will not be used

Availability is NOT solely dependent on supply as in what is growing in the woods. There are a range of other reasons that allow utilisation to happen or not to happen that can be equally important.

- Legislation/Politics
- War/Politics
- Transport
- Tools
- Design/Fashion/Personal Whim
- Fluctuations in wealth and population
- Disease

They all interact with each other in one way or another but if any of them change in any way the nature of the availability will change as well. The patterns that are woven by all these different facets of availability do not just occur in South West Scotland but all over the globe.

I will try to pull out some of these patterns of availability and hopefully show how they weave in and out through time. Most of this will be illustrated by wood use in larger construction projects as this is what we know more about. But to start we shall look at woodland supplying mines to illustrate the effect that the list above has on a particular area of woodland. It is the story of a goldsmith who, just over 400 years ago (1611) sets out from Edinburgh to sign a contract for timber in Sanguhar.

Thomas Foullis is a big name in the goldsmith world but also had many mining interests including lead. He manages to get James VI to sign an Act of Parliament in his favour that not only gives him the mineral rights in the Leadhills area but also allows him to bring in English and other foreign engineers. The timber contract is for 5430 "hors leids" of timber from a William Crichton of Ryehill. This is probably well in excess of 1000 tonnes of timber. The contract is for "Lathis, Tymber and Chopwood for the fireworks of Leadhills". It would seem that perhaps this woodland had already been cut over and was mainly coppiced. Timber will be, perhaps, for the main constructions of the mine shaft and for the relevant buildings and machinery. This included the wicker riddles that were used at the time and which, as one can imagine, wore out fairly fast.

Thomas Foullis' contract with William Crichton was thus, not just built on the fact that there was a wood somewhere near the mine but on:-

- Acts of Parliament, which must have come from much internal politics
- The Union of the Crowns, which meant peace rather than war
- Local and imported labour availability
- Horse as opposed to transport due to the bad roads
- The tools to cope with the timber
- Designs of the mines and machinery
- Capital to do the job, not just in the wood, but also in the mines as well.

All this and more has a direct effect on what timber is required (both in type and quantity). It is as much these factors above that determine availability as the efforts of the forester. A little later there is a further contract for an area nearby the first now on Elliock estate. One would expect mainly coppice material to supply this and indeed for species not to matter for most of the firewood and lower quality usage. By 1767 we can see the area mapped in detail by Hamilton Leslie complete with woods. However, they do not have the air of coppice managed material and there appears to have been a change in the way that things are being managed. The timber availability has been modified for other uses. Although one cannot tell from the map one suspects from looking at the market place as well as other woodlands that this woodland is perhaps moving slowly towards being pure oak and now focussing on the bark and charcoal markets from further afield. The availability is indeed changing as the markets are with the greater availability of imported pine coming in from the North as well as perhaps a better availability of coal locally.

The Sanquhar mining contracts show commercial logging at perhaps its largest scale for the time and place. The woods have become a commercial proposition rather than just being grown for local consumption. The opposite of this is when one finds timber just being grown for the estate use only. Dalswinton estate in the 18th century is a good example of timber being grown for local needs rather than for the supply of any more distant organisation. Although it has the air of being a throw-back to earlier 16th legislation (every laird "to make enclosures with deer, ponds, rabbit warrens, dovecotes, orchards, hedges and plant trees") the orchards are in fact 18th century while perhaps the wooded areas are indeed throw-backs to earlier times when timber was needed for the previous tower house and fortifications. The map of Dalswinton Mains has an air of self-sufficiency and has overtones of one of those monastic agreements from the Cupar Angus rental books.

It is interesting to compare Scots legislation with that of the continent between the 15th and 18th centuries. Whereas our idea of woodland legislation was to instruct the planting of the odd acre, what was ongoing in Venice and Spain (and to some extent England) was much more sophisticated. They are all requiring naval timbers while attempting to preserve woodland for the local population as well. The legislation is of a much more specific and detailed nature. In places like Venice they were even recording oak trees of a certain size and this sort of detailed legislation begins to spread further afield such as under Peter the Great in Russia. In the UK and in Scotland specifically we take a long time to catch up with the rest of Europe on the forestry front. The law will have been important in some places but not so important in others but one suspects that the quality of adherence to the letter of the Scottish law was poor at best.

Although there are signs that there were commercial areas of woodland (up the Cree, the Dee and the Cairn) for much of Dumfries and Galloway the concentration was on a very localised self-sufficiency. For most there was no great opportunity to be commercial. For commercial activity to take place there needs to be a marketplace. For a marketplace to be serviced we need to have transport. In the South West there is neither large market demand nor a proper transport system. In addition, we seem to be about 100-150 years behind the curve as far as Baltic/Norwegian imports was concerned (first mention of imported pine is into Kirkcudbright in 1660's). The pattern of consumption is to have woodland near the main dwellings and to ensure that replacements for building construction and agriculture/industry continued to grow nearby. Availability is everything in a small and essentially closed system.

Originally the tower house was a wooden construction. We can guess from various extant drawings what they may have looked like but we do not really know. However, there is a very noted change of design in our area in the mid-16th century.

In 1544 Lord Wharton takes a small army and raids into Annandale.

"They burnt Bonshaw, Robgyll and all the houses, peills, steds and corn in their way!"

In 1570 (only 26 years later) the Earl of Sussex made a similar raid but went on up into Nithsdale. This time they used gunpowder to blow up the buildings in their path ...as the towers were stone and not easily burnt as they had been on the previous raid. The change in building construction at this time was very marked.

Another peculiar phenomenon also becomes apparent. The required beam length for tower houses and castles has reduced. I have been looking at building width as the determining factor for the longest timber and the results are very striking. The widths (i.e. the length that a traditional truss would need to span) of around 80 fortified buildings between Gretna and the Dee valley were checked. The results made interesting reading. Simplified slightly, every tower house built before, say, 1550 has a beam length requirement of over 6M and after that date it is under 6M.

This along with the move to stone buildings does raise various questions. Chief among them are:-

What was the reason for the change in fortification styles?

Was there less timber around?

A larger timber would require more effort to get it on site and perhaps a 6M x 200 x 200 section is the maximum that a small horse can comfortably drag from a wood. Was it simply a lack of heavy transport?

By the middle of the 16th century there was definitely a change in availability for whatever reason.

In addition, the widths of all of the tower houses and castles are mostly different. The thinking is that the timber would be collected before building would commence (as it was with the Midsteeple in Dumfries (1704)). The timber length would thus determine what width could be built. Availability is obviously king as far as design is concerned at this time. Whatever the reason the building product had radically changed and the requirement for larger timbers does not appear to have been as great.

Oddly beam length requirement for what we could term elite building increases and begins to rise again by the end of the 17th century. We start seeing beam length requirements of up to 10M again and often in excess of 7M. Drumlanrig Castle is a good example of this. Instead of being close by the logs are hauled two or three miles and probably from further afield as well. They were not just building a small tower and thus the range from where the timber came from would have to be larger especially when the material required is a larger dimension. Looking at the material used in the roof it varies considerably but the larger material is in the region of 300x300.

So how come an increase in size? The design has become the important factor in the building and not directly the material supply. We are not looking at comparatively small buildings but something much larger and thus the investment in the building is colossal in comparison to anything else built in Upper Nithsdale. The only reason that this can be done is because there is now a consolidated land holding which can support the investment and more importantly there is comparative political stability and capital being invested into the area as a result. The preparedness of the Duke to invest thus increases the available area from which the timber can come from. A similar instance occurs in the 1730s when Sanquhar town council buys in imported pine from Edinburgh to build their new Tollbooth.

Money of course can make a difference but the cost of haulage is enormous by land in pre-industrial societies and much less by water. To illustrate this propensity to plant close by the best example is Addis Ababa founded in 1886 by King Menlick II. This capital used to be a "wandering capital" which would simply drain an area of its timber resources and then move on. With populations as high as 100,000 (i.e. 3 times the size of current Dumfries) we are not talking about a small village.

The biggest demand was of course for firewood....and the talk between the foreign diplomats was that the city would not work due to there being not enough to sustain a large population over the long term. Within 20 years the city was nicknamed "Eucalyptopolis" as a new wood had sprung up virtually surrounding and close to the city. Even in the 1970s it exhibited the same pattern identically matching that which the German agricultural economist, Von Thunen, had suggested (The Isolated State 1826). It essentially shows the influence that the cost of haulage has on pre-industrial woodland. Interestingly the supply of firewood into London in the 15th century showed exactly the same profile except elongated due to the Thames being used for transport.

So let us return to the South West and see if similar patterns emerge there. The immediate ones that spring to mind are the woods that are associated with fortified buildings. There is always a requirement for ongoing

repairs as well as some firewood and other ongoing requirements. These small woodlands can often be seen enclosed on the original Timothy Pont maps. Proximity is obviously key to availability and they appear very Von Thunen-esque when we see them mapped.

In the area there are some larger markets that need to be serviced by more commercial woodland. The main one was in Dumfries itself which, before the Union, was burnt down about once every 15 years. This was not just due to English raids but also due to carelessness as well. There is evidence that the Clouden valley, just South of Dunscore, supplied the larger part of the frame material as well as supplying the daily timber needs of the town. This did not include firewood as peat was very much used instead. The Cree, over in Wigton, also has a similar history of timber supply with one late 17th century remark being "oakwood lying upon the water of Cree two miles above the kirk and town (of Monnygaff). This wood will be more than two or three miles of length and hath good timber in it from whence the greater part of the shire of Wigton furnish all timber for building of their houses and other uses." In addition, the Dee/Ken valley also had a long history of supply.

The geography of these areas is very similar. In the first place the land slopes down to the river with steep slopes and little distance to haul the logs to the water. The steepness and stoniness of the slopes ruled against regular agricultural use. The size of the rivers meant that it is convenient to prod or hook logs from either side with a long stick. Medieval Law in England allowed a right of way up either side of a river. Was it the same in Scotland?

Early 17th century contractual agreements for both places are extant proving the commercial nature of the woodland. On the Clouden we also have a reference to sawyers working at Clouden mill around 1660. It appears that these woodlands had a continued availability for construction materials for several 100 years. The Dee, Cree and the Clouden were looked at as potential suppliers for the Midsteeple timbers in 1704. Indeed, there is evidence that some of these woodlands served the same purpose in monastic times as well.

The key here is having woodland that is in the "right place" to fulfil their supply function. If extraction was no good the woodland would have been grazed to death and if in a place where availability was easy then they would remain and be looked after. Although not describing a circle or a sausage shape as in the Addis Ababa and London examples above the woodlands do show themselves as being as close as practicably possible to the end market and making use of the fastest and easiest form of transport: the water.

So we appear to have long term utilised woodland in the region that last well into the 18th century and in many places are still there. What did it look like?

We can actually tell this not just from the buildings created but also from the tools used to shape the timbers. The timber would have been grown to the required size. This was as much a function of architectural demand and how much an individual horse could pull as it was of the tools available to work them. The wood workers tools had not really changed since Roman times or before.

For wood conversion there are two tools: the axe and saw. One would possibly have the same axe for chopping down a tree, hewing a beam, and dressing the timber. Adzes were an optional extra and axes ultimately a more flexible tool. Saws would be of the frame variety that were used from here to China with various slight modifications (pushing or pulling etc.). Most sawing was not done in a pit but using the seesaw method and its variations as it was more versatile. With pit sawing you had to bring the timber to the pit; much easier to simply convert it where it falls. Pit sawing however continued in Wales till the 1920s and the earliest record of it is of a Roman sawing camp on the Danube in the 1st century.

Sawing large timbers one would only saw around 15-20 cuts in a day and obviously with smaller ones you would be sawing a few more; but it is slow! Narrower blades would also cause less friction and thus effort but the frame does cause a problem getting in the way and thus were a bit clumsy. To make a straight saw cut ping lines soaked in a soot mixture were used and a plum line on the ends ensured total accuracy. As much work will have been done in moving around the log and setting it up as it would have been in the actual sawing. There was no real change to the tools until probably the start of the 19th century.

Using an axe or a saw of this kind meant that the larger the tree the more physical labour would be required to break it down for use. Thus the growing of timber was done with an eye on the utilisation just as it is these days. Squaring of timber was done with an axe while further conversion was done with a saw. In most of Scotland the most common large sizes cut after 1550 will have been from around 200x200 and up to 6M or so long or in other words from an oak around 100-150 years old. This means that one would only need a 200mm cut with the saw to split the log. Rafters were often 200X100 while purlins and other roof parts were often 100x100mm. The roof of the 1721 extension at Hills Tower just to the west of Dumfries uses these dimensions (and at the same time shows off the way in which oak construction lasted perhaps rather longer in the South West than it did elsewhere because of the plentiful supply of Baltic and Norwegian softwoods in other areas). The breakdown of timbers show a ready economy in labour as a result of growing the most economical wood dimensions.

We can thus begin to see the sort of woodland that was around. Replacement timbers would have been cut at between 100-150 years old. Anything older than this and too much labour would have been expended. Anything much younger and over a 6M you would not have managed to make anything near a 200x200mm. We can thus begin to start and construct the sort of woodland that would have been most effective for the tools available. Something even aged and fairly close grown would have been best and looking at the knot count on some of these beams that would be born out.

Oddly exactly the same thing happened in Japan around in the 17th century. After a period of civil war, peace had been established and also forests regrown. By the mid-17th century we find the population getting larger and a new form of home construction becomes standard using standard sizes from small round wood. They are a little less substantial than tower house requirements but still adhere to the same cutting patterns. The posts are roughly 4 sun x 4 sun (around 125x125mm). The lower sliding track for the paper screens roughly 4x2 sun and the rafters roughly 2x2. Other sizes are likewise taken from the sections that follow like 2x2/3rds sun for the ceiling frame and a commonly used 1x1.333 for other components. Everything relates to the most economical wood dimensions from the timber to hand.

It should be noted that our conversion of timber prior to sawmilling was also similar to the Japanese in the smaller sections. What few remains of 16th and 17th century joinery there are tend to be made from around a 100mm multiple and appear to be taken from a 100mm x100mm (i.e. the quartered log). Much of extant joinery sticks to narrow boards often made up from a bastard sawn quarter cut that are never very wide. A good example that show this is the Parton pulpit from down on Loch Ken side and now in the National Museum. To show how little things had changed as far as tools were concerned we can look at a Lararium (cupboard for keeping the household gods in) from Pompeii. Both exhibit the same sawing techniques and rely entirely on similar tools to produce the end effect; narrow planking being easier to saw.

From what we see in the way that tools were used both in the South West of Scotland and Japan we can jump to the conclusion of at least partially managed woodland that produced product designed for the tools. The connection is direct from tree to use. It is exactly the same these days with Sitka Spruce grown to fit high performance sawmills in order to produce 50mm sections for house building. The original technology is of course a direct import from Scandinavia resulting in the growing of timber that mimics Scandinavian material.

With the increase in population of the 18th century and the improvement of infrastructure imports start to be commonplace. More importantly pine and silver fir began to be planted from the late 17th century with larger and larger plantations becoming more and more commonplace in the next century. With the changes, dimensions change as timber from elsewhere is broken down by sawmills. A standard of around 200-225 x 62-70 becomes commonplace with the imported material. The result by the start of the 19th century is a move away from crucks and toward an A-frame construction for a roof.

For the woodland the biggest change is in the legislation that begins coming in from Westminster. Essentially we were protectionist before the end of the 18th century given what was happening on the continent and the exchequer also wanted to get in revenue. Duties on bark and other timber product

(especially smaller dimensions in oak baulks and bends) essentially changed the way in which Scotland and the UK viewed forestry and with the improvement of transport commercial forestry became something for nearly everyone and not just those fortunate to be near enough a large marketplace. The plantation sizes steadily increased and were often pine which is more easily converted with a sawmill.

The age of the axe has nearly gone. As availability of one kind morphs into another we find that it is not just design of product that changes but also the design of woodland as well. In many ways understanding the products and how they were made can lead to better understanding of the woodlands that the material used came from. This has been merely a small introduction to the subject of availability as the history of woodlands is actually a history of availability. Availability is indeed about getting the timber of the right dimension at the correct time to the correct place. It should also be noted that the utilisation of the timber is done in a similar manner all over the globe and throughout history. The patterns of production from woodland to final product are universal and those patterns are all to do with availability.

USING WOOD AND WOODLAND AS A HERITAGE RESOURCE

Jacob O'Sullivan

The Highland Folk Museum will have been in existence for 80 years in 2015. From its earliest beginnings, the museum has striven to have a complimentary relationship with its collection, and with the lifestyle that its collection represents. In its present situation, the museum encompasses a variety of landscapes; woodland, glacial hillocks, lochan, an SSSI, farm land and grazing lands. The museum responds to the heritage it represents by making use of landscape and natural features in the same way that people in the past made use of their immediate environs.

BEGINNINGS

The museum's founder, Isabel Grant, was a woman with incredible foresight, and a pioneering attitude to collecting material culture. She was profoundly influenced by a visit to the open-air 'folk museum', Skansen in Sweden. Here she noted how authentically Swedish 'peasant' culture was represented, and was pleased to see how the museum appealed to the people it represented. As she notes in *The Making of Am Fasgadh*,

"I began to notice that among the other visitors, that there were a great many who were obviously of the country- some of them real country people- and suddenly I thought 'Oh! I do wish that there was a Highland Folk Museum for Highland people to see'" (Grant, 2007).

This idea of making a folk museum 'of the people, and for the people' was an idea largely at odds with musiological movements elsewhere in these islands, with similar ideas only popularly emerging elsewhere in Wales and the Isle of Man at the time. Most museums and collections still clung on to ideas of exoticism and even imperialism, whilst Grant realised the importance of preserving and displaying one's own rural culture. By 1935 she had established a significant collection of Highland 'folk' material, and displayed it in a disused chapel on the island of Iona. She then moved the collection to the mainland, and another disused church at Laggan in Badenoch. By 1944 she had moved the collection again, this time to Pitmain Lodge in Kingussie, where there was land enough to build traditional cottages, and thus establish Britain's first purpose built open-air museum.

The founding Isabel Grant Collection is a testimony to her pioneering collecting manifesto to collect 'homely old Highland things'. When she was out in the field, collecting all over the Highlands and Islands, Grant often came across problematic attitudes to the objects she was seeking. As she writes;

"My kindly neighbours were amused at my enthusiasm for what they dismissed as 'old troke' and I haled as deeply interesting treasure trove [...] their attitude was an ambivalent one. They had a rightful pride in their race. They could reel off their own family pedigrees and that of their neighbours, but they were reticent about the primitive ways of the Highlanders" (Grant, 2007).

Happily, Grant recognised that these people were not 'primitive', and that the pre-industrial material culture she collected illustrated a profound ingenuity and knowledge of the natural landscape. Many of the objects she was collecting were constructed using organic materials; wood, straw, moss, and heather, for example, and many people were *ashamed* that they owned such material. With this effective 'denial' of a material culture by a 'native people', parallels can be drawn to the decline of the Celtic languages of these islands. Both were associated with the immediate environment, and therefore inwardness and poverty. We're so lucky that Grant collected when she did or else much of this material culture would have been lost forever.

THE AM FASGADH COLLECTION

Isabel Grant named her collection Am Fasgadh; Gaelic for 'The Shelter'. The name is as apt today as it was in 1935, as the collection has been built upon and continued to be 'sheltered' and preserved for the past 80 years. The museum is now based at an 80-acre site in Newtonmore, where Highland vernacular buildings are preserved and re-erected, and a new collections' facility called Am Fasgadh has recently opened. Within

the collection, what is made starkly clear is the people's ingenuity in the awareness of the properties of natural materials. This is illustrated beautifully in a domestic situation with regards to vernacular furniture and the use of wood; (see figure 1 below).



Figure 1, showing left to right 'unusual Inverness-shire chair', a bog wood stool and a chair of the Ross-shire 'type'. Both of the chairs make use of the natural bend of a branch.

Grant was an early commentator on the regional variations in vernacular construction techniques, and this has influenced folk and ethnological studies to this day. The collection is quite unique in that it covers such a wide geographical area, with much regional vernacular variation. Consider, for example, the contrast in natural environment between the more open and windswept Hebrides, and the central, wooded Highlands around Kingussie (Gealic *Ceann a' Ghiùthsaich* meaning 'Head of the Pinewood'). Therefore, many objects may be understood as survivors of a regional archetype. Figure 2 shows that just how the natural bend of the tree was used for domestic purposes, so too was it utilised in the day-to-day working life of the people.

Ross Noble, himself a former curator of the museum, discusses this natural bend, or fork of the tree; "The forked limb of a mature tree is a far stronger union of timber than any a joiner could hope to make" (Noble, 2006), and indeed, Grant recognised this importance through anecdotal accounts;

"This ingenious use of the natural curves of wood is seen in many examples of Highland handiwork. An old man who I thought was asking rather a high price for a piece of primitive work told me that it might not take long to fashion something out of naturally curved wood but that to find such a piece might take a whole day and to know how to use it a lifetime" (Grant, 1961).

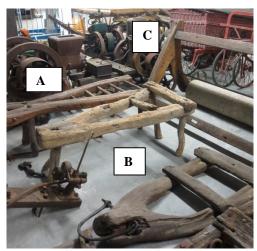


Figure 2, showing (A) sheep shearing stools, (B) a slipe and (C) a stone roller with wooden frame. All show clearly the use of a natural fork in the tree.

The people's awareness of the benefits of using wood in such a way is undisputed. As Noble points out, the natural shape of the wood meant it was more strong and resilient, which made it ideal for the rough work performed by the slipe, for example (see figure 2). As Grant highlights, the natural bend was eagerly sought

after, and it is not too farfetched to imagine the Highlander of old keeping an eye on a young tree, anticipating the day that it is the ideal size or shape to be used for a specific object.

THE OPEN AIR ASPECT

As an open air museum, the buildings are considered exhibits in themselves. In the same way that an object within a glass case at a more 'formal' museum may come under direct scrutiny and be used to tell a wider narrative or 'big picture', so too must the Highland Folk Museum's buildings. Like the smaller objects within the collection, each building displays a distinct vernacular building style, which relies heavily on the immediate natural environment in which it was built, and which clearly highlights the ingenuity and resourcefulness of the people who built the structure.

Throughout the site, there are, for example, many 'Sleeper houses', that is, structures built from recycled railway sleepers. This is a surprisingly common vernacular building style in the immediate area, and although none of the buildings pre-date 1900, they are wonderful examples of resourcefulness and the utilisation of one's own immediate environment and materials. The people who originally built these buildings may have been descended from the people who built using naturally curved cruck frames, and this tradition of seeking out the most appropriate and readily available material is continued with them.

Similarly, the most recently relocated building on site, Lochanhully House (figure 3), was originally constructed as late as 1922, and yet this vernacular ingenuity and awareness of usefulness is clearly realised in its construction. The house was built by Duncan Rose for his family, and an order form for '90 Pine Timber' trees taken from Seafield Estate, just behind the house, still exists.



Figure 3, 'Old' Lochanhully House in situ at Carrbridge, before relocation to the museum.

One of the main goals of an open-air museum is for the visitor to have a multi-sensory experience. The visitor should be immersed in the way of life of the people who are being represented. This is complicated by the need to represent a great variety of regional styles, peoples and even time periods. One of the key interpretive areas of the open-air section of the museum is *Baile Gean* Township. This is an experimental archaeological reconstruction project, based on the archaeological 'footprint' remains of the abandoned 18th century township of Easter Raitts, on the hills above Lynchat. Not only does this area of the museum display a unique and disappeared Highland way of life, but it also allows for us to continue this traditional ingenuity and awareness of the natural environment around us, which has been such an integral feature of vernacular construction and localised way of life.

The buildings are built in traditional styles, using traditional construction methods. This is understood as almost reaching an arm out to the past, and continuing a tradition 'just in time', before it vanishes forever. This allows the museum to be less of simply an institution to show how 'things used to be', and allows us to become an example of a continued tradition, and a very 'green' almost self-sufficient example of a heritage environment.

There is an area of woodland on site, and where possible, fallen trees are used in construction, for example. Similarly, the museum is fortunate in having two full time Craftworkers on site, who are trained in traditional techniques, and are responsible for the upkeep of the constantly evolving township buildings.



Figure 4, Craftworker Hannes Schnell thatches The Stockman's House with broom.

A variety of materials are used for thatch. This not only serves to show the visitor different types of thatch, but also means that on the whole each building is in need of a re-thatch at different yearly intervals. Much of the thatching material, including broom, and to a lesser extent heather grows amply on the museum site, and can be picked directly with little environmental impact. Some buildings are thatched with reed, leading to comments that this is not a traditional Highland thatch, and is far more common in England. Whilst there may be some truth in this, the people would use whatever materials were nearby and available. Marsh reed grows extensively at the Insh marshes, some four or five miles away, and so it is very likely that reed was used as a thatch in this area. This is one of many such discoveries that experimental archaeology such as this can provoke.

THE PINEWOODS

The pinewood at the museum takes up roughly a third of the total site, and is a remnant of a 1920s plantation on the site of a 'lady's golf course'. However, it is an incredibly useful heritage resource, and not only as a semi-natural source of materials. Firstly, the woods are an attractive area. Natural regeneration is taking place at a pleasing level, and rowan and birch are appearing through the blaeberries. Similarly, the wildlife the woodland attracts is quite a visitor attraction within itself, as the Red Squirrels are commonly seen, as are a large variety of birds including Buzzard, Crossbill and Treecreepers.

Similarly, the pinewoods are an ideal place to develop unusual human interpretation, (see figures 5 and 6). Owing to the variety of Highland landscapes, it is appropriate that the story of Highland relationship with woodland dwellings is interpreted, and this is clearly displayed in the Traveller's Encampment (figure 5). The story of Highland travellers is so prevalent and yet so unique to the area, it would be unusual to not represent this story at the museum. Similarly, the replica Newtonmore Curling Club Hut (figure 6), is ideally placed within a woodland setting on the edge of a lochan that freezes in winter.





Figure 5, Traveller's Encampment and Figure 6, Newtonmore Curling Club Hut shown within their woodland settings.

CONCLUSION

The ingenious use of wood by the Highlander is well represented within the Highland Folk Museum's collections. By using this material culture to influence the way the museum is understood to this day, a distinct cultural tradition has been allowed to flourish in an unbroken and continuous way, and both wood and woodland has proven to be an invaluable resource both in the past, and in the present day.

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A SOCIAL HISTORY OF THE DARVEL CHAIR

Steve Hunter

DARVEL CHAIRS can be compared to the Windsor Chair and, in so far as they are constructed on a solid seat base with the parts socketed in, it is. But there are differences which I find quite intriguing.

The Irvine 'Valley' is a fertile glaciated valley at the upper reaches of the river Irvine in Ayrshire. There was a long tradition of flax growing much encouraged by legislation after the union of the parliaments in 1704. By the end of the century there were 13 water-powered mills for waulking the flax, grinding corn or sawing timber. Only one water driven mill still remains in the neighbouring village of Newmilns, although place names like Priestland Mill are evidence of other locations. Rankine's saw mill, originally water powered, existed into 1970 but had long since been converted to electricity

In the 18th century the main industry was weaving, which was carried out in a room in the individual weaver's cottages. As prosperity increased other industries and trades were established. From the early 1800s whole families of tradesmen arose to form the basis of what was to become generations of skilled workers. Some of these families are still operating 200 years later.

Chair making occurred initially in Darvel, [famous for lace and for being the birth place of Alexander Fleming, discoverer of penicillin]

In Ayrshire there exists several examples of 'jointed' chairs dating from the 1500s in, for example Dean Castle, in Kilmarnock. There are also records of furniture and chairs being made in the area obviously to supply local needs. The earliest turned or country chair I know of is 1786. This is a date which is remarkably early for this type of chair. In England the earliest Windsor chair evidence I can find is in a painting of 1760.

A few miles west is Loudon Castle, occupied by the Earls of Loudon. In 1731 John the 4th Earl instigated many agricultural reforms on his estate [which were subsequently copied throughout Scotland] including massive tree planting, drainage and subsequent timber management. He imported many seeds and cuttings from the Eastern Seaboard of America in an attempt to improve the native produce.

The population of Darvel and Newmilns was increasing and sustained by the local textile industry, wealth too was increasing. It is recorded that there were almost 2,000 handlooms in these towns. Fifty years later the Industrial Revolution hit the area and the first Jacquard power looms were installed.

So in a similar manner to the industry in England and for the same reasons, a chair making industry developed in Darvel and Newmilns. There was material, demand, prosperity and skills.

THE CHAIRS

The Early Chairs - 1820 approx.



Figure 1

The turnings are simple, elegant and under stated. The seat slab is 50mm thick and is contoured to the body. The arm is formed from a bent branch split, trimmed to the correct curve and scarf jointed at the back. The back is formed with between 7 and 11 spindles or spars, never tapered, brought through the arm and let into a head rail. The seat is angled back for comfort and the back further angled to provide optimum sitting position. Small pegs are used to ensure the critical joints remain tight. These chairs had an early 'varnish' which over the years has deteriorated to black.

<u>The Intermediate Chairs</u> - 1840

The front arm pillars have more elaborate turnings almost presaging the onset of the Victorian Fashions. The leg turnings remain simple.



Figure 2

The Victorian Chairs - 1860

The ornate front arm pillar becomes the norm and the leg turnings become more complex. The latest finish of a Brazilwood and Alum dye with several coats of Button Shellac becomes the standard. Pegging joints is no longer practiced. The seat slabs are left flat. More and more have arm bows cut from the plank rather than from a branch. The necessary increase in thickness loses some of the original elegance. The number of spars stabilizes at 10.



Figure 3

The Bobbin Chairs

This is the poor mans 'Barley Twist' which judging by the number made was very popular. It seems to have been a common decoration as other pieces of furniture were made using this idiom. One chair actually had the back spars shaped as well.

The High Victorian

The ultimate in Victorian fashion, the decorative turnings become more formal and very well executed. I have come across two of these chairs which were obviously made as a pair, now separated by the Atlantic, which display a much higher standard of turnings than any other. I have not yet got them recorded. I suspect that a specialist "turner" in Newmilns was responsible.

THE MAKERS

Four makers have left autographed chairs, John McMath, JK Black and Hugh Shields and R Mair There are obviously other makers and apprentices over the century but their names can only be guessed.

<u>John McMath</u> was born in Darvel in 1797. His father was a cooper [probably a white cooper] and his grandfather was a wright from the neighbouring village of Galston. John McMath lived in West Main Street, and carrying on the family tradition of working in wood, produced chairs, and other pieces of furniture all his life.

J.K. Black does not feature in any of the returns in Darvel [from 1840] and as the only chair bearing his stamp is almost identical to an early McMath chair we can only assume he started work with McMath and died or left the area before 1840.

<u>Hugh Shields</u> was an Inn Keeper and Cabinet Maker in Newmilns, the neighbouring village. In the survey I carried out I came across a chair that was known as 'Grandfathers Shiellie chair'. The owners did not know why it was so called but it gave me a most original provenance for the chair and the owners were delighted to learn about its maker

The fourth maker was R Mair.

R Mair and Sons were established Joiners from 1810 and functioned up to 2004 Coming from Darvel, I knew 3 generations of the family. I was only able to confirm they made chairs when I got an e-mail from Georgia from a lady who had a couple of chairs stamped R Mair. Unfortunately, Big John Mair died before I could tell him of my find. He would have been so proud.

The significance of Robert Mair and Son being involved is that it provides the premises where McMath worked and the chairs were made.

MATERIAL

The chairs consistently used American Birch for the seat. It had been available from the mid-1700s and was able to give the depth of seat from front to back, required by the makers. Supply was assured with the close connection of the New World via Glasgow, Britain's foremost trading post of the time. Brownlees who imported timber and were in existence in Glasgow until 1980 had a branch in the neighbouring town of Kilmarnock in the 1800s.

Local timber in the form of Ash Oak & Elm were used for the legs and the arm -bow.

FINISH

I am no expert on Victorian finishes and can only guess that the original finish was a kind of varnish, which has now deteriorated to an extremely dark broken surface. However, as the use of 'shellac' became more common the Makers obviously saw the advantages of this 'new' material which was fairly forgiving to the conditions found in a village workshop. Almost all the mid and late Victorian chairs have been finished in 'button shellac' over Brazilwood stain

FEATURES

The differentiating features of the Darvel Chairs highlight the difference in technology available between their makers and their counterparts in England.

- 1. The arm –bow is made from a naturally curved branch, which is halved, opened out and joined at the back, in an excellent scarf joint.
- 2. The headrest is always sawn out of the solid. This, and the way in which the arm-bow was formed, suggest that the Makers were not comfortable with steam bending, unlike the Windsor Chair Makers.
- 3. The finish at the ends of the arm bow is always the same. From 1786 to 1910 this little finial is used to terminate the arm bow. If you come across a chair with these ends to the arm bow it is likely to be a Darvel chair.
- 4. It is also an interesting feature that the back spindles or spars making up the comb are the same diameter and not tapered.
- 5. The obvious distinctive feature is of course the rake of the whole chair. The seat is sloped down towards the back and the back comb has this very steep slope. The Windsor chairs of England are much more upright and as a result appear more formal. The Darvel chair is a very ergonomically successful piece of furniture.

DARVEL CHAIRS

Until David Jones' article in 95/96 neither I, nor I suspect most other people, knew of the Darvel Chair. I lived in Darvel for the first 25yrs of my life and there was in the kitchen a chair known as the Windsor Chair. As it turned out, it was not a Windsor but one of the chairs of which David Jones had written. The history of the chairs was totally unknown.

But the chairs themselves stand out.

The number of chairs made over the years is open to conjecture, but a recent survey I carried out showed more than one hundred chairs still remain. Many must have been destroyed in the intervening hundred years. It is not unreasonable to guess that several hundred were made. The community supported the makers and the chairs were bought by mill owners and farmers, ministers and the common populace, often in pairs. Those that remain are jealously guarded family heirlooms. I have traced them all over the UK, Massachusetts, Georgia, Canada and New Zealand.

If you have a chair or know of one, I will be pleased to hear from you.