

Timber exports in the south east

Niall C.E.J. O'Brien

What will we do now for timber,
With the last of the woods laid low.

Flood, 1999

So open the first lines of the poem on Kilcash in south Tipperary and the disappearance of Ireland's native forests which it portrays. Forestry and the timber trade in Ireland do not seem to figure highly in history books and historical journals, even economic journals. This may be in the belief that all the "woods [are] laid low" and there is little to talk about. This article examines the export trade in Irish timber over the centuries, charting its high point in the 17th century and its low by 1800 to the revival by 1914 with some account of the exports from ports along the south-east coast.

Pre-historic and Medieval times

After the end of the last ice age (about 12,000 years ago), tree cover slowly expanded to cover much of Ireland. The maximum tree cover was probably reached by 6,000 BC, after which a change in the climate and the spread of farming may have caused a decline. Some scholars suggest that Ireland was near treeless by the Bronze Age (c. 2000 BC) while others believe that the country had good tree cover up to the 12th century. The Brehon Laws categorised the different types of trees into four groups and imposed a variety of fines on people who illegally cut a branch off a tree or cut a whole tree down (Quinn 1994).

In 1224, timber was exported from Ireland for the construction of Salisbury cathedral while in 1250, timber was exported to build Marlborough castle. In 1224, Irish timber was exported to Winchelsea to make oars, galleys and long vessels (Sweetman 1974). In the second half of the thirteenth century, Queen Eleanor established timber works in Glencree Wood for the export of timber to build her castle at Haverford. In 1444, timber from around Shillelagh in Wicklow was exported to England to help build the King's College at Cambridge. Henry VIII also imported Shillelagh timber for his chapel at Westminster (Quinn 1994).

16th century

Over the centuries, the forests of Ireland became a place of refuge for Irish rebels and English outlaws. In 1399, Richard II employed 5,000 people to cut a gap through the Wicklow forests so he could overpower the MacMurrough nation, but the forests

helped protect the Irish who wished to flee from the English. In Tudor times the forests of Ireland were still places of refuge and a “nursery of rebellion” (Quinn 1994).

Finding records of timber exports from Ireland in the 16th century is difficult, with the port records in England providing the best information. These records show that wooden boards were exported from Cork to Exeter, Plymouth and Padstow in the first quarter of the 16th century (O’Sullivan 1937). By the time of Queen Elizabeth, exports of Irish timber to England had increased considerably as there was a shortage of timber for charcoal and shipbuilding in England (Quinn 1994).

Not only did Irish timber exports to England increase towards the end of the 16th century but much of the timber was exported in processed form, ready to be made into oars, hop staves, ship planks and other products (Longfield 1924).

In the second half of the 16th century, coal exports to Ireland increased. In many cases southern Irish ports such as Wexford and Waterford exchanged this coal for timber, which was exported to Milford, Carmarthen and Cardiff (Longfield 1924).

A considerable amount of Irish timber was exported to Scotland in the 16th century, which was used to make ships that were subsequently used during military expeditions to Ireland (Longfield 1924). Such was the level of exports from some parts of Ireland that in 1579, Galway Corporation placed a ban on timber exports, largely because a scarcity of timber was driving up prices in the Galway area (Historic Manuscripts Commission 1885).

17th century

A vast quantity of hardwood timber was exported from Cork and Youghal by the New English settlers during the late 16th century and first half of the 17th century. This timber came from the river valleys of the Blackwater, Lee and Bandon and went into the manufacture of barrel-stave, charcoal and ship timber (Dickson 2005). Many of the Munster undertakers were reported to have destroyed large areas of woodland (Treadwell 2006). The destruction of the ancient woodland resulted in a reduction in the area used for refuge by outlaws and instead filled the pages of the poet’s hand “Cad a dhéanfuid feasta gan adhmaid. Tá deire na gcoillte ar lár” (MacLysaght 1969).

The Nine Years War had a large impact upon trade. In 1603, an observer noted that New Ross was “A poor ruined town, out of trades”, Dungarvan was “Only a very poor fisher town”, while Kinsale was “A poor town ruined by the late rebellion”. Of the southern ports, only Youghal received a favourable comment as “In slightly better position as the Munster undertakers carried on most of their traffic (especially wood) from here” (Peterson 1962).

Forestry as industrial fuel

In the 1580s, George Longe, among other people, came to Ireland to establish glass

factories. The ancient forests helped provide the fuel for this new industry while at the same time “The project would allow the superfluous woods of Ireland to be cut as they were being now a continual harbour for rebels”, as George Longe told Queen Elizabeth (Walsh 2001).

Pipe staves

Near where George Longe had his glass works at Curraglass, Co. Cork, a partnership was formed between Henry Pyne (local farmer), Veronis Martes (a Dutch merchant living in London) and Edward Dodge for the “working and making of pipe staves and other cask boards in various woods in Ireland” (Quinn 1966). In the 1590s, pipe staves were exported to Madeira, the Canaries, Bordeaux and La Rochelle. The trade was interrupted by the Nine Years War but resumed after 1601 with higher volumes being exported (O’Brien 2008).

From 1603 to 1633, pipe staves sold on average for £6/1,000 (c. €7.62/1,000¹) in the southern ports with cutting and processing costing about 30s/1,000 (c. €1.91/1,000). An export duty of 6s 8d/1,000 (c. €1.69/1,000) was imposed in 1611 but the trade was still profitable (Treadwell 1998). By 1619, Sir Richard Boyle, a substantial landowner, had exported 400,000 pipe staves from Youghal. In the years 1616-1625, the port of Wexford (426,500 units) alone exported more pipe staves than Youghal (299,500 units) (Treadwell 2006).

The large quantities of pipe staves exported from Ireland to wineries in France and Spain must surely have displaced staves normally supplied from other countries. In 1591, a Dutch ship carrying pipe staves from Amsterdam was attacked by English pirates and her crew was put ashore on the west coast of Ireland. Many more Dutch vessels supplied pipe staves without incident. France and Spain were not the only destination for Irish pipe staves; in 1637, the *Whale* of London carried 63,000 pipe staves and 10,000 barrel staves from Ross to London (Appleby 1992).

Just as the destination of timber exports differed, so did the quality. The captain of the *Susan and Ellen* of London remarked in 1638 that 1,000 of the larger pipe staves loaded at Waterford and New Ross would take up as much cargo space as 1,100 of the smaller staves from Cork. The Cork pipe staves were also more crooked than those being exported from other ports, so care had to be taken during loading to minimise the amount of space they occupied in the vessel. A ship that could carry about 115 tons of wine could carry about 38,000 pipe staves while 1,000 staves roughly equalled three tons (Appleby 1992).

In 1615, a temporary ban on the export of pipe staves was imposed as the woods were being cut at an alarming rate, but Sir Richard Boyle got his friends in high places

¹ Monetary values have been converted to Euro equivalent, but not adjusted to real value.

to lift the ban and the trade continued. In the period 1616-1628, Boyle exported over four million staves or about 18,500 tons of timber. Much of this timber came down the River Blackwater in lighters and was reloaded at Youghal onto ships going to England, France and Spain. In April 1619, Richard Smyth, a lighterman, was paid £5/1,000 (c. €6.35/1,000) for carrying the staves to Youghal (Casey and O'Dowling 1964).

The large quantity of timber that was exported from Youghal in the 1620s and 1630s was done at a time when the local iron industry was developing. The timber was also used for making charcoal to fuel the furnaces. This large clearance of the ancient woodlands must have caused profound changes to the visual landscape.

Yet it seems that much of this timber came from upland areas and the actual area of farmland only increased slowly (Dickson 2005). Some arable farming was practiced up to 1685 in areas that had once being covered by forests. One of the reasons for the use of ploughing was to minimise the risk of breaking the plough on tree stumps. For the most part farming in the deforested upland only began in the 18th century, mainly in response to population pressure (MacLysaght 1969).

General timber exports

A large proportion of the timber in Ireland was exported from Wexford port in the early 17th century. In 1616-1625, some 476 tons were exported from Wexford, compared with 216 tons from Tralee and Dingle, the next largest exporters in the rankings. Smaller amounts were exported from other ports, with ports such as those in Dublin, Galway, Dungarvan and Waterford recording no exports of general timber (Treadwell 2006).

Shipbuilding

Shipbuilding was another market for Irish timber exports in the 17th century. One of the first recorded vessels, the *Seaman* of Camphire², to navigate the Munster Blackwater came upriver in February 1609 to load timber for the ship yards of Woolwich and Deptford. Local boatmen got 10 d (10 pence or c. 5 cents) per day for six days to load the vessel from lighters in mid river. There were no stone quays by the river bank then, unlike modern ports of the 21st century (O'Brien 2008). The abundance of oak, elm and beech (*Quercus*, *Ulmus* and *Fagus* spp., respectively) suited the shipbuilders, and the amount of timber of these species was running low in England. Yet sometimes the shipbuilders had to compete with those who used timber for making pipe staves. Several orders were made over the century to halt tree felling for pipe staves in order to increase the availability of timber for shipbuilding (Quinn 1994).

The Royal Commissioners in 1622 recommended a ban on tree felling within

² Camphire is the name of an ancient port in Zeeland, the western and least populous province of the Netherlands. This part of the Netherlands no longer exists due to land reclamation but Camphire operated as a port until at least 1710.

10 miles of the sea, a suspension of the pipe stave licence and an increase in the export duty on pipe staves in an effort to conserve timber for use by the navy. Some landowners like Calcott Chambers got around the 10-mile rule by promising his best trees for the navy. To help alleviate pressure on landowners within the 10-mile zone, it was suggested that commissioners would mark trees for the navy's use and allow the landowner freedom to cut the other trees (Treadwell 2006).

The tanning industry

A large part of the increase in tree mortality that occurred in Ireland in the 17th century was attributed to the tanning industry. The bark of both young and old trees alike was stripped, leaving the standing trees to die (Treadwell 2006). In the mid-1700s, Charles Smith suggested that the tannery industry in Cork was far smaller than it could be because of shortage of oak bark. This he attributed to the felling of large areas of forests in earlier years (O'Sullivan 1937). Nothing much happened after 1750 to increase the supply of native Irish oak and by the 1830s, considerable amounts of oak bark were imported into the country (Second Report of Railways 1837-38).

The iron industry

Another industry which consumed a lot of timber was the iron industry. The iron industry was established in the early 17th century on the Bandon River, in west Waterford and in Wexford. The industry was located in these places to take advantage of the great forests situated there at that time. Although there were local sources of iron, much of it was imported. The iron works, like the one illustrated in Figure 1, used large quantities of charcoal for fuel and many trees were cut down to satisfy demand. In 1626, it was said that only stubs of trees were left in the Tallow area and that by 1633, there was insufficient timber in the Bandon River valley to support the iron works. Sir Richard Cox, writing in about 1690, reported that "no care was taken in cutting down the timber to preserve a sufficiency for the carrying on of these works ... all was destroyed here and a universal havoc made of root and branch in relation to west Waterford" (Cowman 2005).

In contrast to this, Professor Oliver Rackham's study into the iron industry in England concluded that, far from causing the destruction of the medieval forests, the industry fostered the retention and good management of these forests. Professor Rackham stated that "In all Ireland there was only one big wooded area which was just as extensive in 1840 as it had been in 1650, namely western Co. Waterford". In non-industrial counties like Limerick, Tipperary and Clare almost every scrap of woodland was lost (Rackham 1986). This area of western Co. Waterford was at the centre of a thriving iron industry from 1606 to 1640 and into the 1750s in some parts (O'Brien, 2008).

Thus, two different impressions of the forests of west Waterford are given

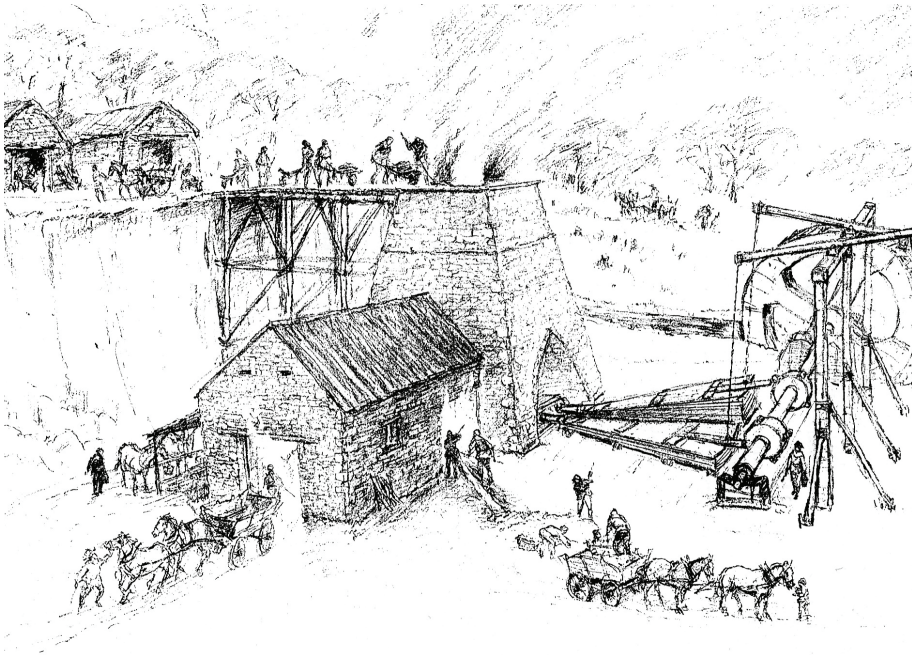


Figure 1: Image of a typical 17th century iron works in Ireland. Drawing by Paddy O'Sullivan of Bandon (Cowman 2005). The iron ore and charcoal from the trees were loaded into a funnel in the centre of the tall stone structure inside which was the furnace. The water wheels at the side worked the bellows to generate a high-enough temperature to smelt the iron ore. The annexed building contained the casting area where the molten iron ran down channels creating iron bars. These iron bars were sent to forges nearby or exported to make all kinds of iron products.

and both could be true and untrue at the same time. It seems that the demand for iron from Ireland after 1630 had decreased and the destruction of the iron works during the Confederate war (1641-1653) caused the decline of the iron industry (Power 2001). Thus, there was a decrease in the need to fell trees and the tree stubs of 1626 were just left to regrow naturally because there was little demand for charcoal.

Yet even the most conscious landowners could see that the forests of Ireland were being cleared at a rate beyond the level of regrowth. In 1673, Sir William Petty estimated that, even with the help of imports of Norwegian timber, the forests of Ireland would only last another 50 years (MacLysaght 1969). Yet even with the intense tree planting of Petty's descendants (c.1809-1817 and 1860s-1873) and the establishment of a tree nursery (c. 1800), much of the countryside between Kenmare to Derreen consisted of bare hillsides due to poor continuity management (Lyne 2006).

18th century forests

The heavy exploitation and felling of the Irish forests during the 17th century for iron, pipe staves, shipbuilding and tanning industries, with little in the way of substantial planting, meant that by 1711, Ireland was a net importer of timber (Quinn 1994). Even in the Irish Sea trade routes Irish timber was absent. By the mid-18th century, Waterford City was importing about 7,000 tons of coal per year but few pit props were exported. Many vessels bringing coal from Cumbria to Waterford returned empty (Mannion 1993). This was in contrast to the second half of the 19th century when Irish pit props were carried in exchange for British coal.

Yet there were other factors which contributed to the decline in the forest cover after the 17th century. Bad management of forest plantations was nearly as bad as not planting any new trees. In 1801, Frazer in his *Statistical Survey of County Wicklow*, blamed absentee landlords for the wholesale bad management of the forests of his day (Quinn 1994).

Others reported that it was the illegal cutting of trees by tenants and sometimes by the wood-ranger, along with the illegal tannery enterprises, that caused the destruction of trees by the stripping of the bark from oak trees. By the end of the 18th century, the demand for timber was so high that the looting of timber became a major problem (Crawford 2001). To combat this, trees were planted in groups rather than principally in hedgerows. But Arthur Young observed that the “stealing” of timber by tenants to make walking sticks, spade handles, cart shafts and roof rafters was nothing compared to the large amount of timber that was felled without any replanting (Quinn 1994).

Yet international competition (cheap New England timber in the 18th century) and internal competition for more grazing land contributed greatly to the decline in the forest cover in Ireland (Dickson 2000). Even in the 17th century, Dutch vessels were bringing in Baltic timber to Ireland (Dickson 2005). By the 1730s, the port of Cork and several ports in Ulster were importing timber from the American colonies in exchange for linen and butter (Dickson 2000). Yet Baltic timber was still popular and many Cork registered vessels travelled there for timber in the 1780s, while Norwegian vessels were often seen in Cork harbour during the Napoleonic wars. Elsewhere, there are plenty of references to Scandinavian vessels importing timber to Waterford in the 18th century (Mannion 1993). But after 1815, the vast bulk of imported timber came from North America (Dickson 2005).

In 1900, Professor Fisher of the Royal Engineering College stated that Irish farmers were short sighted, leaving over two million acres (809,371 ha) of waste land uncultivated when, if planted with trees, it could generate local employment and could be substituted for the nine million pounds (c. €11,427,643) of imported timber coming to England from such countries as Sweden, Norway and Russia (Agricultural 1900).

Yet much of the responsibility for land improvement was left to the tenant farmer

while the landlord concentrated on infrastructure development like roads, fairs, flour mills etc. (Dickson 2000). As the farmers, even those who possessed a large holding, were mere tenants of the land, they tended to concentrate their efforts on livestock and tillage farming to earn a living. In contrast, the farmers would have to wait up to 30 years for the trees to grow large enough to generate a sufficient living income, by which time their land might have been confiscated. One writer, commenting on the short-term thinking among the people and the governments over many decades, dismissed forestry as a “long-term undertaking which can have no place in a [economic] programme which must be expected to reap immediate returns” (Clear 1949).

Rebuilding Ireland’s forests in the 18th century

From 1634 to 1785 there were twenty-one acts of Parliament passed to preserve existing woodlands and encourage new plantings (Quinn 1994). But these seem to have done little to arrest the decline in forest cover. Paintings of various parts of the country, showing images of the same scene from different times, display the landscape full of trees in earlier paintings and a marked absence of trees in later images.

From 1765, a tenant with a lease of 12 years or longer could own his/her tree plantings. Western counties didn’t take advantage of this provision while some positive reaction to the measures was registered in eastern and northern counties. However, tenant tree planting took off with gusto in Munster (except in Co. Waterford). There was a boom in tree planting from c. 1765 to 1815, but the amount of planting fell sharply in the agricultural depression of 1815 to 1820, and then resumed from then on (Smyth 1993).

Timber trade in late eighteenth century

The mixed management of Irish forests in the 18th century (varying between those who just chopped every tree in sight without replanting and those few who tried to replace the cut trees), coupled with international competition meant that by the end of the century Ireland was importing far more timber than it exported. Trade figures compiled in 1823 show increased volumes of imports between 1772 and 1817. The drop in imports in 1809 may be attributed to the 1807 Embargo Act passed by the United States of America which stopped trade with both Britain and France. Such was the small volume of exported timber that the custom officials didn’t compile separate figures for timber, but instead included this information in the general trade data (see Table 1).

19th century plantations

At the start of the 19th century, numerous accounts in words and paintings were generated that leave us in little doubt that Ireland was nearly cleared of tree cover. The

Table 1: *Selected figures for imported timber from 1772 to 1817.*

Imported material	1772	1774	1793	1807	1809	1812	1817
Deals per hundred	10,030	10,828	15,840	21,712	1,753	18,377	6,985
Staves per hundred	43,594	23,445	43,448	56,648	24,323	71,069	54,886
Timber (tons)	6,064	14,277	29,651	10,582	8,775	32,829	32,400

Sources: Imports and Exports (1823) and Exports and Imports (1823). The parliamentary reports don't define what was meant by deals.

Statistical Survey of County Dublin, and similar publications for Wicklow, describe the rise of timber prices because of the scarcity of native trees (Quinn 1994).

Yet the times were changing and, as shown in Table 2, the area of tree cover increased considerably from 1791 to 1840, but still the amount of tree cover in Ireland was small by 1841. Some parts of the north midlands had 2% tree cover but other areas were barren. Many of the planted trees were in hedgerows and shelter belts rather than in plantations (Freeman 1957). Modern Co. Wicklow then had about 3% of its land in managed forestry with other areas, like steep valleys, having natural tree cover (Freeman 1957). Some of these trees were part of the 1821 planting by William Acton of 15,000 ash trees (*Fraxinus excelsior* L.) and 15,000 "Scotch fir" at Ballygannonmore in the parish of Dunganstown (Ainsworth 1967). Waterford had 5% of its land covered in forest, more than any other county (Freeman 1957).

Imported timber in early 19th century

The increase in forest cover made a slow impact on the timber trade and the first half of the 19th century saw Ireland import more timber than export. In 1814-1815, some 9,538 tons of timber was imported with Dublin (4,294 tons) and Cork (2,256 tons) dominating the trade with additional imports of deals and staves (Timber trade 1814-1815). In 1804, the port of Waterford exported bacon, salted meat and cereals using about 310,000 barrels with similar amounts and more in other years between 1800 and 1823 (Cowman 1993). This provided good employment in the cooperage industry, with the number of firms increasing from five in 1820 to 39 by 1839, but it provided questionable support to the native timber industry. Instead, around the same

Table 2: *Areas of tree plantings from 1791 to 1840.*

Planting period	Oak	Ash	Elm	Beech	Fir	Mixed	Total
Previous to 1791	9,220	1,083	201	380	652	30,994	42,530
1791-1800	604	375	55	155	503	9,065	10,757
1801-1810	537	279	54	138	1,089	12,580	14,677
1811-1820	564	275	53	113	2,224	17,352	20,581
1821-1830	543	179	57	295	3,110	20,824	25,008
1831-1840	484	254	154	243	2,636	22,537	26,308
Total	11,952	2,445	574	1,324	10,214	113,352	139,861

Source: Agricultural Statistics (1900).

time, large quantities of imported staves were imported into Ireland (Exports and Imports 1823). For example, in the 1760s, Walter Mullooney imported oak bark from Bideford in Devon for the tannery industry in Waterford. Devon merchants appear to have been the main exporters of oak bark to Waterford (Mannion 1992).

Timber at the ports

From 1825 to 1830 no timber was exported from Waterford port, but the import books reveal that oars, spares, staves, fir timber and oak timber were imported during the same period (Waterford Imports and Exports 1825-1830). Similarly, the port of Cork also reported that no timber was exported, but large quantities of timber were imported during this period (Cork Imports and Exports 1825-1831). The records for trade on the canals in Ireland showed a similar pattern for the first half of the 19th century, with much more timber being imported than exported. In 1845 for example, 1,386 tons of timber was carried on the Grand Canal to Dublin, yet 4,364 tons of timber was carried from Dublin port into the heart of the country (Delany 1966).

The 1835 and 1837 Report of the Railway Commissioners is often cited as a benchmark on the condition of Ireland's import and export trade at that time (Freeman 1957). These reports reveal little information in relation to timber trade in Ireland. The vast majority of timber was included under the category "other articles", so the level of timber trade was not specifically stated. Most of the recorded timber was imported oak bark for the tanners and mahogany for furniture (Second Report of Railways 1837-1838). In 1814, Ballymanus wood in Wicklow generated income of £1,255 (€1,419) from the sale of oak bark for the tanning industry but by 1835, this and other oak forests provided insufficient wood to satisfy domestic demand, so the remaining amounts had to be imported. The great oak forests of Shillelagh were becoming a memory (Quinn 1994).

Timber does not feature much in Irish exports before 1850, but there are a number of references to Irish-owned vessels carrying timber from Canada to England after taking passengers to the New World in the 1840s (Irish 2002). In the second half of the 19th century, timber features in the export figures for Irish ports. In 1834, Dungarvan exported no timber according to the records but in 1850, the schooner, the *Ruby*, exported timber from Dungarvan to Barry, Llanelly and Swansea in return for culm (Morris and Cowman 2014).

Internal timber trade

While timber was an insignificant item of trade according to civil servants in the 19th century, there was a gradual increase in the amount of timber traded within Ireland. In 1801, the Grand Canal Company carried 1,431 tons of timber, which had increased to 5,751 tons by 1845 and 16,850 tons by 1912. This increased demand for timber occurred even when the amount of building materials carried on the canal declined from 74,795

tons in 1845 to 36,721 tons by 1912 (Delany 1966). In 1812-1814, the Lismore Canal only carried about 8.5 tons of timber per year but by 1862-1865 this had risen to 146 tons per year and to 171 tons per year in 1866-1869 (O'Brien 2008). The competition between railway companies (and schooners on the River Blackwater) would have had an impact of these figures, but an increase in demand for timber occurred at this time.

Unfortunately, it seems that much of this timber was imported rather than native grown. In 1835, 12 tons of timber was carried up the River Boyne, but no timber went down river for export (Delany 1966). In 1847, over 28,000 tons of timber was carried inland from the ports of Dublin and New Ross on the Grand Canal system with only 1,329 tons of timber being carried to the coastal cities at this time (Delany 1973). The Lismore Canal in 1812 to 1814 carried an average of 8.5 tons per year from Youghal, but the record books do not indicate if this was native timber or imported timber (O'Brien 2008). This is unfortunate as the Blackwater valley was, and still is, an area rich in forest cover. Evidence from the River Slaney navigation records suggests that much of this timber could have been imported. In 1835, timber imports were the principal cargo on boats on the River Slaney, a heavily forested area (Delany 1966).

Late 19th century revival of forestry

It was estimated in 1884 that of the twenty million acres of land (809,371 ha) in Ireland, about a quarter could be used for forestry. To plant 100,000 acres (40,468 ha) with trees in 1884 would have cost about £4 per acre (c. €5.08/0.4 ha), with maintenance costs over the thirty years of about £20 per acre (c. €25.40/0.4 ha). The income from this forest, excluding intermediate cuttings, would, after thirty years, be about £50 per acre (c. €63.49/0.4 ha) (Howitz 1884). In 1885, Dr. Schlich conducted a report on the afforestation of Ireland and concluded that over two million acres (809,371 ha) was suitable for forestry at a time when 330,000 acres (121,405 ha) was in woods and plantations (Agricultural statistics 1900).

Rather than leave the development of Irish forests solely to private enterprise, it was suggested in 1884 that the government should establish a forestry department to develop nurseries and plant forests (Howitz 1884). Little was done to implement this recommendation.

In 1908, a committee of the Irish Department of Agriculture observed that "To conduct her agriculture and her industries and to maintain the life of her people at a normal level of efficiency and comfort, a nation requires to consume a certain quantity of timber" (Clear 1949).

The debate as to how much land should be devoted to forestry relative to the total land area of a country, or compared the area of agricultural land, had been ongoing since the second half of the 19th century, particularly in countries that had suffered from severe deforestation (Howitz 1884).

The English trade

The industrial revolution in England generated great demand for timber as pit props in the coal mines and for other uses. The construction trade accounted for about 36% of imported timber. In the 1870s, England was by far the biggest importer of timber in Europe with a demand of 290 million cubic feet (8.21 million m³) compared to France in second place with 70 million cubic feet per year (1.98 million m³) (Howitz, 1884).

In May 1870, Stewart Jameson of Whitehaven, Cumbria sought tenders in Ireland to supply 80,000 yards (73,152 m) of larch pit props to the ports of Dublin, Waterford or Cork. These were to be delivered at a rate of 8,000 yards (7,315 m) per month with free carriage to the ports (Waterford Chronicle 1870).

Forestry in the 1890s

In 1890, about 1.6% of the land area of Ireland was under forests. This amounted to 327,461 acres (132,519 ha) out of 20,328,753 acres (8,226,754 ha) and an increase of only 825 acres (334 ha) on 1889 compared to an increase of over 213,000 acres (86,198 ha) under pasture (Agricultural statistics 1890).

This was an increase on the acreage under forests of 304,906 acres (123,391 ha) in 1851, yet the increase was not uniform, fluctuating over the years. For example, in 1880 the area under forestry amounted to 339,858 acres (137,536 ha) (Agricultural 1900). In June 1890, about 1,400 acres (567 ha) were planted with trees, with larch trees accounting for a third of this. At the same time over 1,250,000 trees were felled (Agricultural statistics 1890).

In 1894, the counties with the largest proportion of forest cover were Waterford (4.6% of total land area), Wicklow (3.4%), Laois (2.5%), Down (2.3%), Tipperary (2.2%), Louth (2.2%) and Kilkenny (2%) with other counties below two per cent and Donegal (0.5%) with the lowest amount of forestry (Agricultural statistics 1894).

By 1900 the area under woods and plantations amounted to 311,648 acres (126,119 ha) or 1.5% of the land area. This was against a background of an increase in the land area covered by pasture and a decrease in the tillage area and a decline of 28,200 acres (11,412 ha) compared to the 1880 acreage for forestry. In contrast, England had 5.1% under forest, Scotland 4.5% and Wales 3.8% (Agricultural statistics 1900).

In 1900, the Irish Civil Service recorded that of the total forest cover in Ireland, larch accounted for 46,948 (18,999 ha), fir 34,677 (14,033 ha), spruce 16,478 (6,668 ha), pine 2,760 (1,117 ha), oak 24,711 (10,000 ha), ash 7,663 (3,101 ha), beech 10,052 (4,068 ha), sycamore 3,255 (1,317 ha), elm 3,048 (1,233 ha), other species 3,768 (1,525 ha) and 158,288 acres (64,057 ha) under mixed plantations (Agricultural statistics 1900).

In 1914, the counties with the largest forest cover by acreage were Cork (25,367 / 10,255 ha), Tipperary (23,910 / 9,676 ha), Galway (23,100 / 9,348 ha), Wicklow (19,121 / 7,738 ha),

Waterford (18,159 / 7,349 ha), Kerry (14,271 / 5,775 ha), Down (12,472 / 5,047 ha), Laois (10,012 / 4,052 ha), Wexford (9,766 / 3,952 ha), and Kilkenny (9,678 / 3,917 ha). The county with the least tree cover was Leitrim with 2,908 acres (1,177 ha) (Agricultural statistics 1914). Currently (2017), Leitrim is more associated with forestry than any other county. In 1914, some 814 acres (329 ha) was planted with about 1,826,000 seedlings (Agricultural statistics, 1914).

Tree felling in forestry operations in Ireland accounted for about 1,250,000 trees in 1890, about 933,021 trees in 1894, about 1,156,959 trees in 1900 and about 725,268 trees in 1914. The breakdown in the sales of these trees is shown in Table 3 (Agricultural statistics 1890, 1894, 1900, 1914).

A large proportion of the trees were used to make carts, wagons and farm implements in 1914, possibly reflecting the new tenant owners getting new carts and implements for their farms following the Land Acts. In 1914, larch trees made up the majority of timber going for pit props (179,274), paling (41,126) and cart and wagon making (60,485) and was the chief timber (11,321) used in the furniture and building trade (Agricultural statistics 1914).

Timber trade on the Blackwater during the 1880 and 1890s

From 1880 to 1889, over 21,000 tons of timber was exported directly from the rivers Blackwater and Bride using schooners and ketches and/or sailing vessels (O'Brien 2008). Local merchants, such as Michael Murphy, David O'Keeffe and Thomas Jacob, were the main timber traders on the River Bride (O'Brien 2008). From 1912 to 1916, David O'Keeffe owned a sailing vessel called the *Claggan* which was used to export timber and corn and to import coal (O'Brien 2008).

Local merchants such as John Stanley of Cappoquin, local landlords such as Villiers Stuart of Dromana, merchants from Cork such as Matthew McMahon and merchants from England such as Blood, Woolf and Company accounted for most of the timber trade on the River Blackwater in the 1880s (O'Brien 2008). Many of the

Table 3: *The usage of Irish timber in 1890, 1894, 1900 and 1914, expressed as numbers of trees felled.*

Year	1890	1894	1900	1914
Pit props	793,805	397,889	458,089	371,455
Sleepers	64,104	12,651	2,715	9,512
Palings and gates	23,238	56,322	29,277	61,977
Spools	23,000	1,252		9,368
Furniture and house building	30,806		10,411	22,785
Fuel		13,920	15,588	8,028
Carts and wagons	19,346	2,860	7,488	102,807
Clogs/shoes	10,574	2,088	2,170	3,510
Ship-building	11,590	1,015		1,525
Telegraph poles	5,750			

Sources: Agricultural Statistics (1890, 1894, 1900).

local and international traders exported timber and imported coal (O'Brien 2008). The two commodities suited each other. Timber was sent as pit props to England and Wales, which allowed the coal miners to dig deeper and extract more coal which was exported in return for more pit props. Pine forests were the best for pit props and railway sleepers (Howitz 1884). Of course, as often happens in the story of Irish forestry, not all pit props left Ireland. In 1886, the brigantine, the *Elizabeth*, imported 145 tons of pit props from Poole in Dorset to Limerick (Greenhill 1951). It is not known where in Limerick these pit props ended up.

In the 1890s, over 17,500 tons of timber was exported from the Blackwater and Bride rivers. Again, the Bride exporters were local merchants while a mixture of local and English merchants traded on the Blackwater (O'Brien 2008). The introduction of steamers onto the River Blackwater occurred in the 1890s, but these mainly engaged in the coal and grain trade. The sailing merchant vessels still carried most of the trade such as the *Dei Gratia* (the vessel that found the famous ghost ship, the *Marie Celeste*), the *Mary Haunsell* and the *William Edward* (O'Brien 2008).

Timber imports and exports at start of 20th century

In 1905, the value of imported timber was £1,152,025 (c. €1,462,738), compared to £227,802 (c. €289,249) for exported timber. Over the subsequent years the value of imports continued to far exceed that of exports as outlined in Table 4. Most of the imported timber was delivered to the ports of Belfast and Dublin, and to a lesser extent Cork, in the form of cut boards and finished furniture. The port of Dublin exported the most uncut timber and finished furniture (Report on Trade 1905).

In 1912, most of the timber imported was in the form of processed timber, whereas nearly 90% of the exported timber was rough timber, which the civil servants of 1912 stated was “an uneconomic condition of affairs”. This was also true for other raw materials like hides, skins and wool for which Ireland exported the raw materials and imported the manufactured goods made from many of these same materials (Report of Trade 1912).

Similar to the situation for the use of raw timber, Ireland used very little timber from home-grown sources to manufacture goods in the early 20th century. Manufactured timber imports far exceeded Irish manufactured exports, as Table 5 below shows (Report of Trade 1912).

In 1912, Belfast accounted for the largest quantity of imported sawn timber,

Table 4: *The value of imported and exported timber from 1908 to 1912.*

	1908	1909	1910	1911	1912
Imported timber	£1,185,950	£1,360,665	£1,841,204	£1,735,953	£1,937,159
Exported timber	£237,173	£245,022	£240,851	£251,452	£259,131

Source: Report of Trade, 1912.

boards and deals and furniture. Dublin exported the most in the way of furniture and clog blocks while Cork exported more rough timber. The southern ports of Waterford, New Ross, Dungarvan and Youghal dominated the pit props trade (Report of Trade 1912).

In 1914, an estimated 329,399 tons of timber was felled of which 215,380 tons was exported and the remainder used in Ireland. Sales of larch trees (112,245 tons) formed the majority of exports (Agricultural 1914). In 1914, Cork supplied the majority of larch trees while Limerick was first for the number of fir and spruce trees felled (Agricultural 1914).

Free State

The two World Wars took a great toll on the Irish forests. In 1938, it was estimated that only 1% of Ireland was covered by forests but by 1947, over half this area had been cleared (Quinn 1994).

Following the formation of the Irish Free State in 1922, the new Cosgrave government had the task of building a country and repairing an economy disrupted by years of war. The development of agriculture and ensuring the prosperity of the farmer were seen as important measures of success (Johnson 1974). Following the demise of landlordism, the state was the only organisation in the country that was actively managing forests in Ireland (Quinn 1994).

The new state didn't have it all its own way and faced strong competition from other countries in the export trade. For example, the export of pit props to England in return for coal imports was something that was not unique to Ireland. After 1918, France often became a destination for English coal in return for French pit props. A merchant at St. Brieuc offered Captain Shaw of the schooner, the *Kate*, to take pit props at 52s 6d (c. €3.34) per ton. The freight of coal was at a rate of 17s (c. €1.08) (Shaw 1972).

Timber exports from the River Blackwater in the 1930s

William Slade, a sailing merchant captain and ship owner from Appledore, remarked that after 1920, there was little trade available for the merchant sailing vessels except to Ireland. For the most part, this trade was one way, with coal to Ireland but returning light with an occasional cargo of scrap iron or potatoes (Slade 1959).

Table 5: *The value of manufactured timber imported and exported from 1908 to 1912.*

	1908	1909	1910	1911	1912
Imported manufactured timber	£1,130,446	£1,051,690	£1,141,529	£1,158,691	£1,272,372
Exported manufactured timber	£364,175	£310,376	£337,703	£333,193	£357,648

Source: Report of Trade, 1912.

Yet on the River Blackwater in Munster, there was considerable two-way traffic in the 1930s. In 1936, there were 15 sailings by various merchant sailing vessels carrying about 1,730 tons of timber and this increased to 21 sailings in 1937 and 2,349 tons, as detailed in Tables 6 and 7 below. In 1938, a total of 15 sailings left the River Blackwater after loading a total of 1,664 tons of timber. The vessels involved were the *Happy Harry*, the *Camborne*, the *Kathleen & May* (Figure 2) and the *M.A. James* (Youghal Harbour book 1936-1941).

In 1939, two vessels, the *Camborne* and the *Happy Harry*, accounted for the 14 sailings from the River Blackwater, with 1,535 tons of timber for the coal mines of Britain (Youghal Harbour book 1936-1941).

In 1940, there were 15 sailings from the River Blackwater with 1,735 tons of timber, mostly pit props. The vessels involved were the *Happy Harry*, the *Windermere*, the *Agnes Craig* (Figure 3), the *Eily Park*, the *J.T. & S.*, the *Frem* (Dutch vessel), the *Camborne*, the *Kathleen & May*, and the *Purbeck* (Youghal Harbour Book 1936-1941).

In 1938 and 1939, most of the timber was delivered via the River Blackwater but in 1940, a number of cargos of timber originated on the River Bride, a tributary

Table 6: Two-way trade in coal and timber on the River Blackwater, 1936.

Sailing date	Vessel	Entering	Sailing cargo	Load (tons)
11 th Mar	<i>Harvest King</i>	Came light	Exported timber downriver	81
7 th Apr	<i>Happy Harry</i>	Coal upriver	Timber from upriver	80
5 th May	<i>Happy Harry</i>	Imported 5 tons timber to Youghal	Sailed light downriver	80
10 th Jun	<i>Happy Harry</i>	Came light	Timber from upriver	80
18 th Jul	<i>Happy Harry</i>	Coal upriver	Timber from upriver	80
19 th Jul	<i>Kathleen & May</i>	Coal to Youghal	Timber from upriver	92
11 th Aug	<i>Kathleen & May</i>	Coal to Youghal	Timber from upriver	92
12 th Aug	<i>Happy Harry</i>	Coal upriver	Timber from upriver	80
3 rd Sep	<i>Kathleen & May</i>	Coal to Youghal	Timber from upriver	92
12 th Sep	<i>Happy Harry</i>	Coal upriver Imported timber to repair Youghal Bridge	Timber from upriver	80
25 th Sep	<i>Kathleen & May</i>	Coal to Youghal	Timber from upriver	92
13 th Oct	<i>M.A. James</i>	Coal to Youghal	Timber from upriver	87
14 th Oct	<i>Kathleen & May</i>	Coal to Youghal	Timber from upriver	92
17 th Oct	<i>Happy Harry</i>	Came light	Timber from upriver	80
24 th Nov	<i>Kathleen & May</i>	Coal to Youghal	Timber from upriver	92
	Extra tonnage		30 tons by 15 sailings	450
Total	15 sailings			1,730

Source: Youghal Harbour book 1936-1941.



Figure 2: *Kathleen and May bound for Newport with the last cargo of pit props from Ballinacurra to the Bristol Channel in June 1960. Note the holds are full and the remainder of the cargo is on deck, making work for the crew difficult, and the temporary safety line rigged between the shrouds offered little protection. The long spar on top of the timber is a heavy gaff, specifically for cargo work. Photograph courtesy of the National Maritime Museum.*

of the River Blackwater. In 1940, three sailings with about 342 tons of timber were carried on the *River Bride*. Thus in 1940, some 1,393 tons of timber were loaded on the *River Blackwater*. The vessels, which were loaded on the *River Bride*, were the *Agnes Craig*, the *Happy Harry*, and the *Frem* (Camphire Bridge Log Book 1929-1956).

Timber exports from Ballinacurra after 1940

During World War Two, the small ports of Ireland mentioned above played an important role in the export of pit props to keep the British coal fields working, largely in return for coal. The scarcity of diesel curtailed road transport and the sailing merchant vessels could travel up rivers where the larger steamships could not go and collect timber from forests adjacent to the river. In 1940-1941, Mr. O’Keeffe, a coal, grain and timber merchant from Tallow, Co. Waterford, sent a number of vessels to Ballinacurra to collect pit props. Ballinacurra, on Cork Harbour, was better known for exporting grain and silica clay but as Table 8 shows, a considerable trade in timber was conducted over the 1942 to 1952 period. In 1940-1941, the *M.E. Johnson*, *Gaelic*,

Table 7: Two-way trade in coal and timber on the River Blackwater, 1937.

Sailing date	Vessel	Entering	Sailing cargo	Load (tons)
2 nd Jan	<i>Happy Harry</i>	Coal upriver	Timber from upriver	80
3 rd Feb	<i>Happy Harry</i>	Coal upriver	Timber from upriver	80
6 th Feb	<i>J.T. & S.</i>	Coal upriver	Timber from upriver	83
9 th Mar	<i>Happy Harry</i>	Coal upriver	Timber from upriver	80
15 th Mar	<i>M.A. James</i>	Coal to Youghal	Timber from upriver	87
	<i>Kathleen & May</i>	Coal to Youghal	Timber from upriver	92
10 th Apr	<i>Happy Harry</i>	Came light	Timber from upriver	80
19 th Apr	<i>Kathleen & May</i>	Coal to Youghal	Timber from upriver	92
16 th May	<i>Happy Harry</i>	Coal upriver	Timber from upriver	80
9 th Jun	<i>Happy Harry</i>	Coal to Youghal	Timber from upriver	80
13 th Jun	<i>J.T. & S.</i>	Came light	Timber from upriver	83
19 th Jul	<i>J.T. & S.</i>	Coal to Youghal	Timber from upriver	83
24 th Jul	<i>Happy Harry</i>	Coal upriver	Timber from upriver	80
18 th Aug	<i>Happy Harry</i>	Coal upriver	Timber from upriver	80
11 th Sep	<i>J.T. & S.</i>	Coal to Youghal	Timber from upriver	82
15 th Sep	<i>Happy Harry</i>	Coal upriver	Timber from upriver	80
5 th Oct	<i>Camborne</i>	Came light	Timber from upriver	79
14 th Oct	<i>Happy Harry</i>	Coal upriver	Timber from upriver	80
28 th Oct	<i>Camborne</i>	Coal to Youghal	Timber from upriver	79
18 th Nov	<i>Happy Harry</i>	Coal upriver	Timber from upriver	80
19 th Nov	<i>Camborne</i>	Coal to Youghal	Timber from upriver	79
	Extra tonnage		30 tons by 21 sailings	630
Total	21 sailings			2,349

Source: Youghal Harbour book, 1936-1941.

and the *J.T. & S.* left Ballinacurra with pit props while in 1942, Mr. Hyde of Fermoy exported pit props from Ballinacurra on the *Teasel*.

It should be noted that not every cargo of timber or pit props exported from an Irish port went directly to a British port. In 1948, Mr. O'Keeffe loaded the *De Wadden* with pit props at Ballinacurra for transport to Dublin (Figure 4). What became of the pit props once they reached Dublin is unknown (Ballinacurra Harbour Book 1934-1952).

In the earliest formation to pool resources, the Arklow shipowners acquired a 12-year-old German ship. The vessel had been taken as a war prize in 1945 by the British Admiralty and was sold in 1947 to the Arklow families and renamed *Tyrrell*.

The coaster *Tyrrell* derived its name from three letters chosen from the family surnames. The co-operative progressed when in 1966, Captains James Tyrrell, Michael Tyrrell and Victor Hall formed an umbrella company, Arklow Shipping, under which together they operated seven ships. Currently, Arklow Shipping is still one of the bright lights of Irish shipping.



Figure 3: Agnes Craig loading pit props at Headboro on the Bride River (near Youghal), August 1948. Note the use of the cargo gaff and tackle to lift the logs on board. Photograph courtesy of Richard J. Scott.



Figure 4: De Wadden loading pit props at Killahala on the River Blackwater c. 1956. She was the last schooner to load there. Photograph courtesy of Richard J. Scott.

400 years of change

After World War Two, timber was still loaded onto sailing vessels on the river Bride, but that mode of transport soon ended as the road transport infrastructure improved - another change in the 400 years of change for the Irish timber exports. The large steamships could only enter the larger ports, areas that were well served by the road network. The last vessel to leave the river Bride in September 1956, before the river was closed to commercial traffic, was the *Kathleen and May* and she carried a cargo of timber downriver (Camphire Bridge Log Book 1929-1956).

Currently (2017), the high ground along the valleys of the Blackwater and Bride rivers is covered with a mixture of farmland and forestry plantations, both privately and publicly owned. But instead of sailing vessels, the felled timber is transported by lorry to the larger ports of Cork and Waterford or to timber processing plants at Castlelyons and elsewhere. Yet the ever-changing nature of the timber trade now sees small ports like Youghal also playing a part in the modern timber trade. At Youghal, there is not only an export trade but timber is also imported, principally from Britain. This imported timber is processed at the Woodfad facility near Castlelyons and most is re-exported in manufactured form.

Table 8: *Timber exports from Ballinacurra, 1942-1952.*

Sailing date	Vessel	Timber load (tons)	Destination	Merchant
1 st Sep 1942	<i>Brooklands</i>	135 tons pitwood	Cardiff	Hyde of Fermoy
23 rd Jun 1948	<i>De Wadden</i>	240 tons pitwood	Dublin	O'Keeffe of Tallow
20 th Aug 1948	<i>Tyrronell</i>	270 tons	Swansea	O'Keeffe
11 th Sep 1948	<i>Tyrronell</i>	150 tons pitwood	Barry	Murphy
13 th Nov 1948	<i>De Wadden</i>	210 tons	Garston	O'Keeffe
29 th Mar 1949	<i>Empire Punch</i>	200 tons	Garston	O'Keeffe
5 th Apr 1949	<i>Ange Ja</i>	110 tons	Garston	Nolan
21 st Jan 1950	<i>Ceo Jean</i>	200 tons	Boston (UK)	O'Keeffe
14 th Aug 1950	<i>Tyrronell</i>	260 tons	Garston	Haughton of Cork
5 th Oct 1950	<i>Tyrronell</i>	220 tons	Garston	Hyde took the cargo from Haughton
21 st Nov 1950	<i>Tyrronell</i>	250 tons	Garston	Haughton
7 th Mar 1951	<i>Eban</i>	220 tons	Shoreham	Haughton
5 th Jun 1951	<i>Tyrronell</i>	240 tons	Garston	Haughton
18 th Oct 1951	<i>Bernard</i>	210 tons	London	Haughton
10 th Jun 1952	<i>Tyrronell</i>	210 tons	Garston	Haughton

Source: Ballinacurra Harbour Book (1934-1952).

In our modern world we sometimes think of timber as an old fashioned raw material, yet demand for timber products is on the increase. The history of the Irish timber trade over the 400 years from 1600 to 2000 has been a picture of great highs and lows. Vast quantities of timber were exported from Ireland in the past, while at other times large quantities were imported. Currently (2017), Ireland exports a large amount of processed timber which is in contrast to the raw timber exported in the 17th century or even in 1912, when 90% of exported timber was described as “rough”. Hopefully in future years the good performance of the Irish forestry sector can be maintained and no poet will have to write about the “last of the [Irish] woods laid low”.

References

- Agricultural Statistics of Ireland for the Year 1890*. British Parliamentary Papers. Available at <http://www.dippam.ac.uk/eppi/documents/18507/page/493007> pp. 5, 25 [Accessed May 2017].
- Agricultural Statistic of Ireland for the Year 1894*. British Parliamentary Papers. Available at <http://www.dippam.ac.uk/eppi/documents/19261/page/519788> pp. 5, 8, 27, 36 [Accessed May 2017].
- Agricultural Statistics of Ireland with Detailed Report for the Year 1900*. British Parliamentary Papers. http://www.dippam.ac.uk/eppi/documents/20147/eppi_pages/552903 pp. vii, xxix, xxx, xxxi [Accessed May 2017].

- Agricultural Statistics of Ireland with detailed Report for the Year 1914*. British Parliamentary Papers. Available at http://www.dippam.ac.uk/eppi/documents/22409/eppi_pages/631029 pp. 132-141 [Accessed May 2017].
- Ainsworth, J. and MacLysaght, E. 1958. Survey of Documents in Private Keeping. In *Analecta Hibernica*, No. 20: 89.
- Ainsworth, J. 1967. Survey of documents in private keeping. *Analecta Hibernica*, 25: 12, 42, 89, 90, 98, 143, 153.
- Appleby, J. 1992. *A Calendar of Material Relating to Ireland from the High Court of Admiralty Examinations 1536-1641*. Dublin. pp. 64, 254, 255.
- Ballinacurra Harbour Arrivals and Sailings Book. 1934-1952* (Manuscript in private keeping).
- Camphire Bridge Log Book, 1929-1956* (Manuscript in private keeping).
- Casey, A.E. and O'Dowling, T. (Eds.). 1964. *O'Kief, Coshe Many, Slieve Lougher and Upper Blackwater*. 15 vols. Wisconsin, vol. 6: 377.
- Clarke, J. 2003. *Christopher Dillon Bellew and his Galway Estates, 1763-1826*. Dublin, p. 46.
- Clear, T. 1949. Irish forestry to-day and to-morrow. *Irish Forestry* 6: 3-12.
- Cork imports and exports, 1825-1831. *Account of Imports and Exports of Port of Cork, 1825-31; Tonnage of Ships, 1816-30*. British Parliamentary Papers. Available at <http://www.dippam.ac.uk/eppi/documents/10619/page/236298> pp. 4, 8-11 [Accessed May 2017].
- Cowman, D. 1993. Trade and society in Waterford city 1800-1840. In *Waterford in History and Society*. Eds. Nolan, W. and Power, T.P., Dublin. pp. 427-458, at pp. 428, 457, 458.
- Cowman, D. 2005. Evidence for pre-industrial mining in Waterford. *Decies* 61: 215-224.
- Crawford, W. 2001. *The Management of a Major Ulster Estate in the late Eighteenth Century*. Dublin. pp. 34, 60-63.
- Delany, V.T.H. and Delany, D.R. 1966. *The Canals of the South of Ireland*. Newton Abbot. pp. 65, 76, 149, 152.
- Delany, R. 1973. *The Grand Canal of Ireland*. Newton Abbot. p. 255.
- Dickson, D. 2000. *New Foundations Ireland 1660-1800*. Dublin. pp. 113, 114, 120, 123, 124, 132.
- Dickson, D. 2005. *Old World Colony: Cork and South Munster 1630-1830*. Cork. pp. 20, 153, 154, 173, 174, 218, 220, 410.
- Dooley, T. 1993. The Decline of the Ormonde Estate, 1893-1950. In the *Old Kilkenny Review*, 1993, Vol. 4, No. 5: 1118-1140, at pp. 1119, 1122, 1138, 1139.
- Exports and Imports: Official Value of all Ireland, 1811-1822*. 1823. British Parliamentary Papers. Wisconsin, http://www.dippam.ac.uk/eppi/documents/9694/eppi_pages/213312 pp. 4, 5, 8, 10 [Accessed May 2017].
- Flood, J. and Flood, P. 1999. *Kilcash 1190-1801: Cad a Dheanfaimid Feasta Gan Adhmad*. Dublin, p. 88.

- Freeman, T.W. 1957. *Pre-Famine Ireland*. Manchester. pp. 66, 79, 168, 185, 211.
- Greenhill, B. 1951. *The Merchant Schooners, Vol. Two*. London, p. 169.
- Howitz, D. 1884. *Forests and Waste lands (Ireland) Report, 1884*. British Parliamentary Papers. Wisconsin, http://www.dippam.ac.uk/eppi/documents/17627/eppi_pages/470427 pp. 1, 2, 3, 4, 11 [Accessed May 2017].
- Historic Manuscripts Commission. 1885. *The Manuscripts of the Marquis of Ormonde, the Earl of Fingal, the Corporations of Waterford and Galway, etc. Tenth Report, Appendix Part V*. London, p. 430.
- Imports and Exports of Ireland, from 25th March 1771 to 5th January 1811*. 1823. British Parliamentary Papers. Wisconsin, <http://www.dippam.ac.uk/eppi/documents/9695/page/213328> pp. 4, 6, 7, 8, 10 [Accessed May 2017].
- Irish, B. 2002. Voyages of some Waterford-built ships for years 1840-1849. In *Decies*, No. 58: 53-60, at pp. 58, 59.
- Johnson, D.S. 1974. The Economic History of Ireland between the Wars. In the *Irish Economic and Social History*, Vol. 1: 49-61, at p. 53.
- Longfield, A.K. 1924. Anglo-Irish trade in the sixteenth century as illustrated by the English custom accounts and port books. In *Proceedings of the Royal Irish Academy*, vol. xxxvi, section C: 317-32, at pp. 326, 327, 328.
- Longfield, A.K. 1946. *The Shapland Carew Papers*. Dublin. pp. 3, 4, 7-9.
- Lyne, G. 2006. *The Lansdowne Estate in Kerry under W.S. Trench 1849-72*. Dublin. pp. 483, 485, 486.
- MacLysaght, E. 1969. *Irish Life in the Seventeenth Century*. Shannon. pp. 8, 110, 136, 138, 139, 174.
- Mannion, J. 1993. Vessels, masters and seafaring: patterns of voyages in Waterford commerce, 1766-1771. In *Waterford in History and Society*. Eds. Nolan, W. and Power, T.P. Dublin. pp. 373-402, at pp. 383, 385, 387, 390, 395.
- Mooney, J. 2012. *The Changing Fortunes of the Headfort Estates, 1870-1928*. Dublin. pp. 14, 21, 38, 56, 59, 60.
- Morris, J. and Cowman, D. 2014. The Dungarvan Ore Ships Part 1: The example of the coaster *Ruby*. In *Decies 70: 35-64*.
- O'Brien, N. 2008. *Blackwater and Bride: Navigation and Trade, 7000 BC to 2007*. Niall O'Brien Publishing, Ballyduff Upper. pp. 36, 40, 41, 43, 44, 152, 156, 157, 205, 217, 221, 222, 271, 397, 451, 459, 465.
- O'Sullivan, W. 1937. *The Economic History of Cork*. Cork. pp. 72, 73, 164.
- Peterson, B. 1962. *Turn of the Tide: An Outline of Irish Maritime History*. Dublin, p. 34.
- Power, T.P. 2001. Waterford's Iron Exports and the 30 Years War. In *Decies 57: 1-2*.
- Quinn, D. 1966. The Munster Plantation: Problems and Opportunities. *Journal of the Cork Historical and Archaeological Society*. Vol. LXXI: 19-40, at p. 32.
- Quinn, M.K. 1994. The evolution of forestry in County Wicklow from Prehistory to

- the Present. In *Wicklow History and Society*. Eds. Hannigan, K., and Nolan, W., Dublin. pp. 823, 824, 825, 827.
- Rackham, O. 1986 and 2000. *The History of the Countryside*. J.M. Dent and Phoenix Press. pp. 91, 116.
- Report on the Trade in Imports and Exports at Irish Ports during the year 1905*. British Parliamentary Papers. Wisconsin. Available at <http://www.dippam.ac.uk/eppi/documents/21099/page/585328> pp. xiv, 38, 39, 40, 41, 68, 69 [Accessed 14th May 2017].
- Report on the Trade in Imports and Exports at Irish ports during the year 1912*. British Parliamentary Papers. Available at <http://www.dippam.ac.uk/eppi/documents/22338/page/629209> pp. viii, ix, xxiii, 40, 41, 72, 73 [Accessed May 2017].
- Second Report of the Commissioners Appointed to Consider and Recommend a General System of Railways for Ireland*. 1838. Dublin, British Parliamentary Papers. Available at <http://www.dippam.ac.uk/eppi/documents/11200/page/258543> appendix B. pp. 69-90 [Accessed May 2017].
- Shaw, H. 1972. *Schooner Captain*. Truro. pp. 93, 97.
- Slade, W.J. 1959. *Out of Appledore*. London, p. 89.
- Smyth, W. 1993. Social, economic and landscape transformations in County Cork from the mid-eighteenth to the mid-nineteenth century. In *Cork History and Society*. Eds. O'Flanagan, P., and Buttimer. p. 659.
- Sweetman, H.S. (Ed.) 1974. *Calendar of Documents Relating to Ireland Volume One, 1171-1251*. Liechtenstein, nos. 1196, 1232, 3090.
- Timber trade. 1814-15. *Account of Quantities of Timber, Deals, Staves and Glass Admitted into Ports in Ireland, and Returns Relating to Suspension of Timber Duties, 1814-15*. British Parliamentary Papers. Available at <http://www.dippam.ac.uk/eppi/documents/8906/page/201785> p. 3 [Accessed May 2017].
- Trant, K. 2004. *The Blessington Estate, 1667-1908*. Dublin. p. 141.
- Treadwell, V. 1998. *Buckingham and Ireland, 1616-1628: a Study in Anglo-Irish Politics*. Dublin, p. 77.
- Treadwell, V. (Ed.) 2006. *The Irish Commission of 1622: an Investigation of the Irish Administration 1615-22 and its Consequences 1623-24*. Dublin. pp. 14, 26, 87, 247, 283, 395, 396, 501, 728.
- Walsh, T. 2001. *Sliabh Rua: a History of its People and Places*. Slieverue, p. 226.
- Waterford Chronicle*, 17th May 1870.
- Waterford imports and exports, 1825-1830. *Account of Imports and Exports of Port of Waterford, 1825-30; Tonnage of Ships, 1827-30*. British Parliamentary Papers. Available at <http://www.dippam.ac.uk/eppi/documents/10620/page/236314> pp. 4, 7 [Accessed May 2017].
- Whyte, T. 2007. *The Story of Woodstock in Inistioge*. Dublin. pp. 57, 62, 68, 169, 322.
- Youghal Harbour Arrivals and Sailings Book, 1936-1941* (Manuscript in private keeping).