Work Practices and Building Organisation

By Joe Nunan

In his work on building history in England, Malcolm Airs (1995) charts the change from the medieval system of direct labour to the division of labour or piecework method. He also, describes the primary means by which workmen were paid:

- The direct method - the builder agreed to supply all the material, equipment and the labour was hired on a daily basis to carry out tasks under the direction of a supervisor.
- The contract method - this included some elements of the direct method but in general contracts were with a master craftsman who often hired men to work for him.
- Payment by measurement - A craftsman would be paid for each unit of work carried out.

It would seem that the methods used in England were also prevalent in Ireland. Jane Fenlon, (1998) outlines the contracts and building practices employed by The Ormond Lordship in county Kilkenny and by Laurence Parsons, who took over Birr castle from the O'Carrolls in 1620. Both embarked on extensive building and maintenance campaigns, incorporating combinations of all three work practices, mentioned above.

Who were employed on building projects and where did they come from?

In a preliminary list of craftsmen and others employed at Birr there are several references to workmen with English and Irish names. According to Fenlon (1998), the pool of craftsmen working in Ireland must have been fairly small, and that the same workmen may have moved about from site to site as they did in England. In 1611, 527 work men were engaged in Ulster, English and Irish workmen were involved in felling timber for the construction of timber frame houses and other buildings (Curl 1981). In the 1620s a distinct group of 'architects' entered the Dublin scene, when 12 of them were admitted to the freedom of the city (Loeber 1979). We also know that Vincent Gookin, the author of a pamphlet against the transplantation of the Irish; highlights the building trade in early 1650s county Cork, by saying that there were five or six carpenters and masons among every hundred Irishmen, who 'were

more handy and ready in building ordinary houses and much more prudent in applying the defects of instruments and materials than English artificers' (Loeber 1973, 4).

A few years later, Daniel Thomas was employed by Henry Cromwell, at Portumna. He proposed to build a bridge across the Shannon, for which he needed

> *Sayers, especially English, both in Dublin and all ye nation over are very rare and scarce to bee hadd'*, apart from this his supply of labour was curtailed by the oath of abjuration for *'ye Irish workmen ar runn away from mee, for since the oath abjuration is come amoungst them, they had rather doe any man's worke then build places of strength where they may subdue and keepe them in obedience and have skattered thems lves some 10, some 20, some 40 myles from mee* (Loeber 1973, 4).

It is very clear that both Irish and English craftsmen were employed on building projects throughout the country and that there was an amount of mobility with craftsmen moving from site to site. Craftsmen and their families also moved to and settled into an area, suggesting constant and continuous employment within certain localities. As more information becomes available it may be possible to ascertain how many were transient, settled, Irish, British and their trade or skill.

Timber

Oak was the wood of choice, it was plentiful and a very durable building material; it was the most common variety of wood used for construction. Oak was employed for the structural timberwork, usually unseasoned for roofing and seasoned oak was used for interior features such as, floorboards, stairs and panelling. Seasoning was expensive and time consuming. It required a degree of organization and pre-planning on behalf of the owner/builder to calculate the amount of seasoned timber initially required for the construction process. It has been estimated a trunk of oak requires a year's seasoning for each inch of thickness plus an additional year for every three inches of total thickness. Few builders would have been able to plan their complete timber supply that far in advance.

In addition, unseasoned oak was much easier to work, and as it dried out it became harder (Airs 1995). In 1621 Sir Laurence Parsons, while building at Birr castle was paying 7d per tree for the felling of forty oaks and 8d for 'barking' each. Cutting, debarking and transporting wood for building was a time consuming, expensive and labour intensive task (Fenlon 1999). Irish forests were depleted during the seventeenth century, as a result of the need to produce timber for iron works and tanning. In addition, much timber was destroyed for shingling, which was used regularly for roofing in the seventeenth century. To control the use of shingling, in 1667 the manufacture of pantiles (a tile curved transversely to an ogee shape) was promoted by the administration (Loeber 1973). During the production of timber the trees were cut, sawn and roughly shaped on the spot as they were easier to work with in a fresh green state. The worked timber would have been easier to transport to the building site. Saw pits, may have been constructed and used on some sites.

Other Materials

Many other materials went to make up the finished house. Stone was bound together by mortar. The mortar mainly consisted of lime and sand. This was mixed with water beaten, covered with sand and left to stand. The standing periods may have been as long as several months. Burning limestone produced lime for the mortar and plaster and it was frequently

manufactured on site. Other binding materials may have been used. Cement made of mixed wax and resin had been utilised in the medieval period for masonry that was exposed to dampness. Another, method designed to produce mortar resistant to the influences of moisture involved the insertion of crushed oyster shells into the mix. Some of the houses in west Cork were built of roughly coursed split stone laid in a heavy gravel and stone-chip mortar with marine shell inclusions.

This was not the only method used to insulate the interior from rainwater seepage and from the damp climate prevalent in Munster, particularly along the Cork coastline. On a few sites in east and west Cork there are the remains of very thin slate-tiles which were attached to sections of exterior wall with iron nails, and gravel or lime mortar. Such features can be found at Kill-St-Anne South on the base of the large rectangular chimney stacks, at Aghadown, on the projecting semi-bastion corner-towers, at Monkstown, as vertical columns below and above window openings, they were both fashionable and functional (Fig. 1).

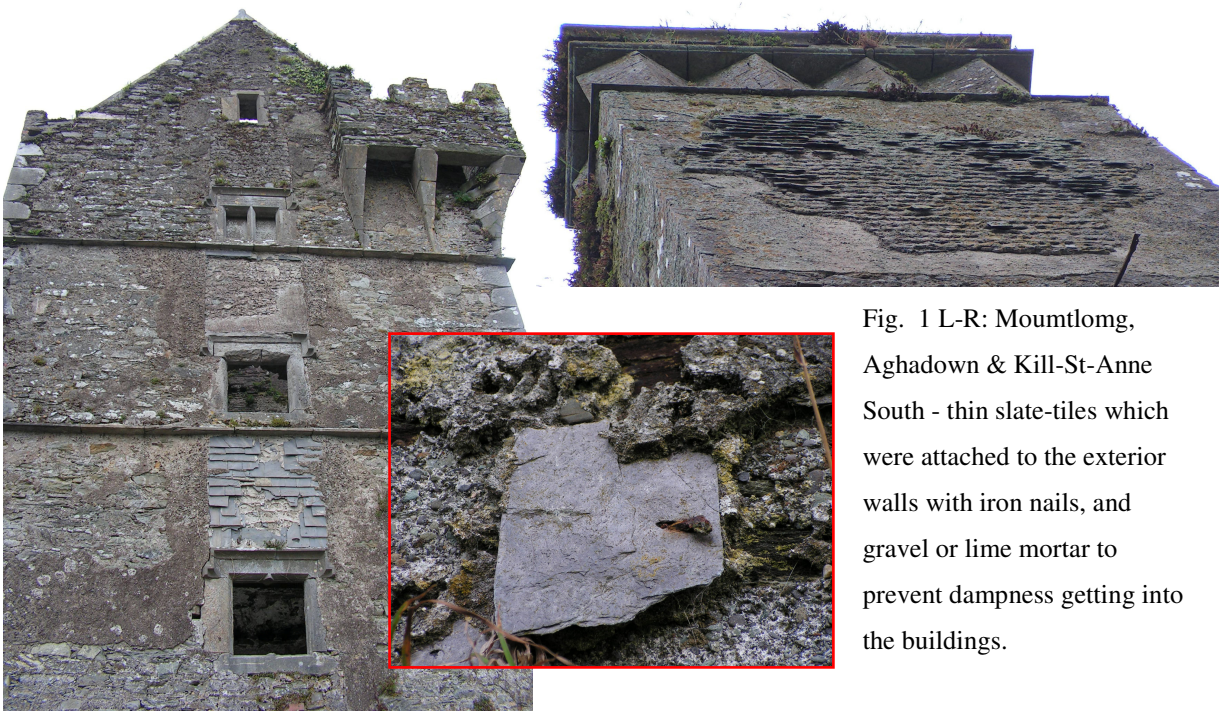

Fig. 1 L-R: Moumtlomg, Aghadown & Kill-St-Anne South - thin slate-tiles which were attached to the exterior walls with iron nails, and gravel or lime mortar to prevent dampness getting into the buildings.

There is very little information on interior plasterwork available, information obtained can be derived from what remains on the buildings. Plaster was used in large quantities for walls and ceilings. The plaster was made on site; much of the plaster was simply composed of lime and sand strengthened with chopped straw, hair, woodchip and dung. The Birr Castle accounts of 1626 record the following ithems:

> *136 barrels of lime for plastering £5. 2s, hayer for the plastering 11s. 6d* (Fenlon 2003, 67).

It is unlikely that the raw materials to make plaster were purchased outside the immediate building locality. This would have involved considerable expense along with administrative and organizational effort in their transportation to the site. The remnants of a decorative plasterwork scheme can be identified at Mountlong, east Cork, described as figures representing scriptural subjects and field sports (Fuller 1907) (Fig. 2). Bits and pieces of interior wall plaster can be found on some of the sites in county Cork. Where there is sufficient plasterwork surviving it may help identify rooms (size & layout), partition breaks, stairs (their position & construction-type) and floor-levels.

Fig. 2 The remnants of a decorative plasterwork scheme, Mountlong, east Cork

It appears to have been difficult or expensive to obtain glass and other specific building materials in Ireland in the early half of the seventeenth century. In 1672, Sir George Rawdon wrote the following to Lord Conway:

> *Gabriell is as good a glasier as can be had anywhere' and that 'glass may be gott as well in Ireland.* (Loeber 1973, 37-38).

The implication being that before this date imported glass from England was not uncommon. From one of the earliest references after the end of the Cromwellian campaign, it appears that not only glass but also window frames were to be sent over from Chester, (England) in 1653 for John Perceval's buildings.

Other materials like iron were used for clamps, glazing bars, workmen tools, nails, hinges and clasps and fire backs. The importation of materials from England covered a wide array of items, from 'linseed and colours', elm-planks to nails. The functional metal good may have been produced locally at any one of the large number of forges established in the 1620s close to the Blackwater and in mid Cork by Boyle and various London merchants due to the high international price for manufactured iron.

Transport

The majority of fortified houses were built of local materials; stone and wood being the principal materials used in the building process. The property owners who were usually the builders were restricted to the materials close at hand. The choice of construction material was dictated by the raw materials available on the land. Outside resources were utilized but transportation by land of heavy, bulky and large amounts of building material was generally difficult given the infrastructure of the day. Over-land carriage was slow and expensive; it added great cost to any building enterprise. Water transport was easier and less expensive; the vast majority of house were situated close to or at a water source (river or sea).

No matter how well placed a building site was in relation to waterways some land carriage was always necessary, if only to transport the building material from riverside to the site. Glass, lead, some slate or carved stone may not have been produced locally and would have been transported to the site. In Ireland during the early half of the seventeenth century the transport of materials was a major charge on building work. During the modification carried

out at Birr Castle in the period 1620 to 1628, various payments were made for the transport of sand, stone and gravel from nearby quarries. Numerous payments were made during the initial stages of the building operation to hire men and horses to transport the materials from source to site. Due to the increasing high cost involved in transportation, instructions were given by the builder to salvage and reuse stone and mortar from earlier buildings on the site (Fenlon 1998).

In county Cork a marked improvement in inland transport began a revolution in freight traffic, allowing the wheeled wagon to challenge the primacy of the pack-horse in the lowland regions of the county this was mainly a New English initiative. The first stone bridge over the Blackwater was constructed before 1600 at Mallow, and Boyle underwrote the cost of a bridge at Fermoy, county Cork in 1620s. Sir John Jephson opened up the Blackwater at Mallow for navigation, allowing small vessels to make the 40 mikes downstream to Youghal and one can assume that Old English and Old Irish were also involved in infrastructural improvements within their own spheres of influence (Dickson 2005).

The distribution of stone built houses correlate to reliable water transportation. According to Airs (1995) the availability of good transportation routes by water seems to have been a critical element when considering the use of quarries more than a few miles from the building project. Most houses were built of local stone, from quarries opened up on the owner/builders land. If the quarries were opened on the owner/builders' estate, the expense to the owner/builder was the organization of the work force. Stone is used when and where it is available; the stone would have been a combination of quarried stone, re-used stone and purchased stone. Houses reflect the geological distribution of available stone within a given region. The principal masons selected suitable building stone; some stonework would also have been imported. There are examples of finished stonework being sent to Ireland in 1637, when Sir Richard Boyle, was preparing to build a house for his son at Gill Abbey in Cork and

> *'employed Robert Belcher, into England, to supplie me with free stone chymnies, doores, and lightes, readie made at the free stone quarries at Donderry Hill, near Bristoll'* (Airs 1995, 114).

Brick was rarely used as a main building material in Irish fortified house construction. A limited quantity was used at Mallow to frame some of the window-lights in the relieving arches and in a bread-oven. At Aghhadown, west Cork and at Ballyannan in east Cork brick was used as a fire-back lining and on sections of both garden walls. At Ballyannan it is also used in an ornamental garden viewing platform (Fig. 3 & 4).

Fig. 3 Left: Aghadown, west Cork fireplace originally lined with red brick. Right: ornamental viewing platform constructed of scored brick, Ballyannan, east Cork.

Fig. 4 Left: Red brick incorporated into a garden wall at Ballyannan, east Cork. Below: Aghadown, west Cork, red brick used on a garden wall.

Ground Plan and Basic Layout

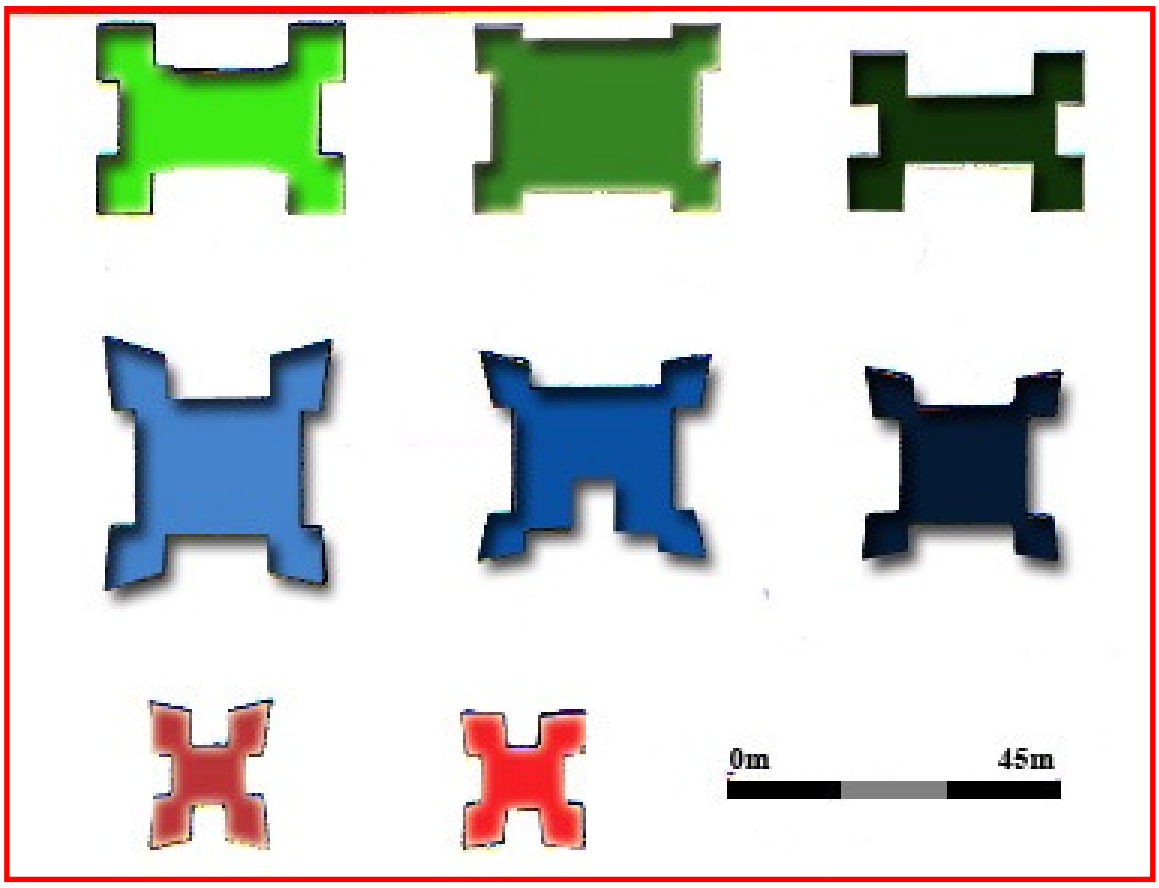

Fig. 5 A comparative outline plan of fortified houses (adapted from Kerrigan 1995).

Most fortified houses are structured around a broad central plan consisting of a central or rectangular block with square or angle-bastion shaped towers at the corners (Fig 5). These buildings are of two or three storeys with attics, the corner-towers usually raising a floor higher. Most have a semi-basement and from the common occurrence of baking-ovens and fireplaces, would have contained the kitchen. Where a semi-basement is found, the main entrance floor is raised a few feet above ground level and reached by steps.

While the central-plan is often rectangular, other variations exist including: U-shape, L-shaped, X-, Y- and Z-plans. The earliest identifiable X-plan was Rathfarmnam Castle, county Dublin, however Kanturk Castle, county Cork, is a better known example. Coppinger's Court

in West Cork is Y-shaped in plan. The Z-plan was most prevalent in Ulster, a likely influence from the second phase of the 'Scottish tower-house' tradition (Fig. 6). Many of the rectangular planned houses have projecting or flanking towers at two or all opposing corners; this simple feature was a serious military arrangement, providing flanking fire along all sides of the building (Kerrigan 1995). Ballyannan in east Cork is the only surviving fortified house in the survey area with an original Z-plan layout. The illustrated plans identify some of the building shapes along the Blackwater river valley in north Cork (Fig. 7).

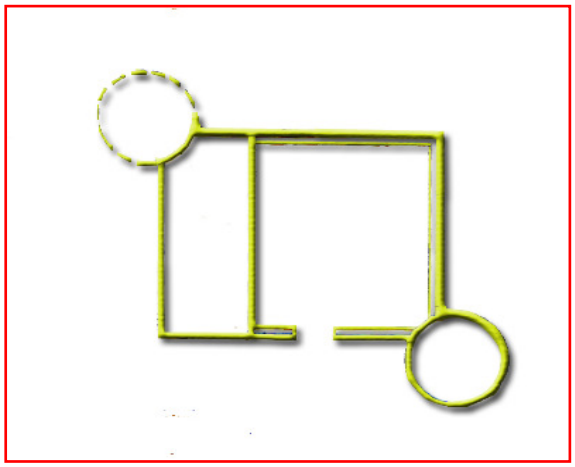

Fig. 6 An outline plan of Salterstown: Salters' Company plantation castle (adapted from Kerrigan 1995).

None of the six fortified house in west Cork were built using the same ground plan. All of the plans varied. In north Cork there was no predominant plan type, while this situation was similar in east and south Cork. The house plans in west Cork were the most varied, followed by east Cork and finally north Cork. Overall, the X-shape was most prevalent, the T-, U- and Z-plans were least common. Why a particular shape was chosen is difficult to ascertain. Whatever a builders reason for choosing a shape we can only speculate. Was it? an architectural fashion, a display of power, of wealth, an embrace of the new, a break with the past or a security issue. It was possibly a combination of all of the above.

The North Cork Sites

Fortified Houses	*Shape*	*Location*
Mallow Castle	Y-shape	Castlelands
Dromaneen Castle	L-shape	Dromaneen
Bawn of Kilmaclenine	+-shape	Kilmaclenine
Lisgriffin Castle	unknown	Lisgriffin
Mac Donagh's Castle	X-shape	Paal East
Clonmeen Court	Leveled site	Clonmeen North

The East and South Cork Sites

Fortified Houses	*Shape*	*Location*
White Castle	unknown	Ardcloyne
Ballinterry Tower	unknown	Ballinterry
Ballyannan Castle	Z-shape	Ballyannan
Carrigrohane Castle	I-shape	Carrigrohane
Ightermurragh Castle	+-shape	Ightermurragh
Barrymore or Lyons Castle	I-shape	Kill-St-Anne South
Monkstown Castle	X-shape	Monkstown
Mountlong Castle	X-shape	Mountlong
Demesne Castle	unknown	Demesne
Ronayn's Court	No trace	Monfieldstown

The West Cork Sites

Fortified Houses	*Shape*	*Location*
Aghadown House	X-shape	Aghadown
Coppingers Court	Y-shape	Ballyvireen
Baltimore Castle	I-shape	Baltimore
Coolnalong Castle	U-shape	Gearhameen
Mossgrove Tower	L-shape	Mossgrove
Reenadisert Castle	T-shape	Reenadisert

Plans of three North Cork Blackwater River Valley Fortified Houses

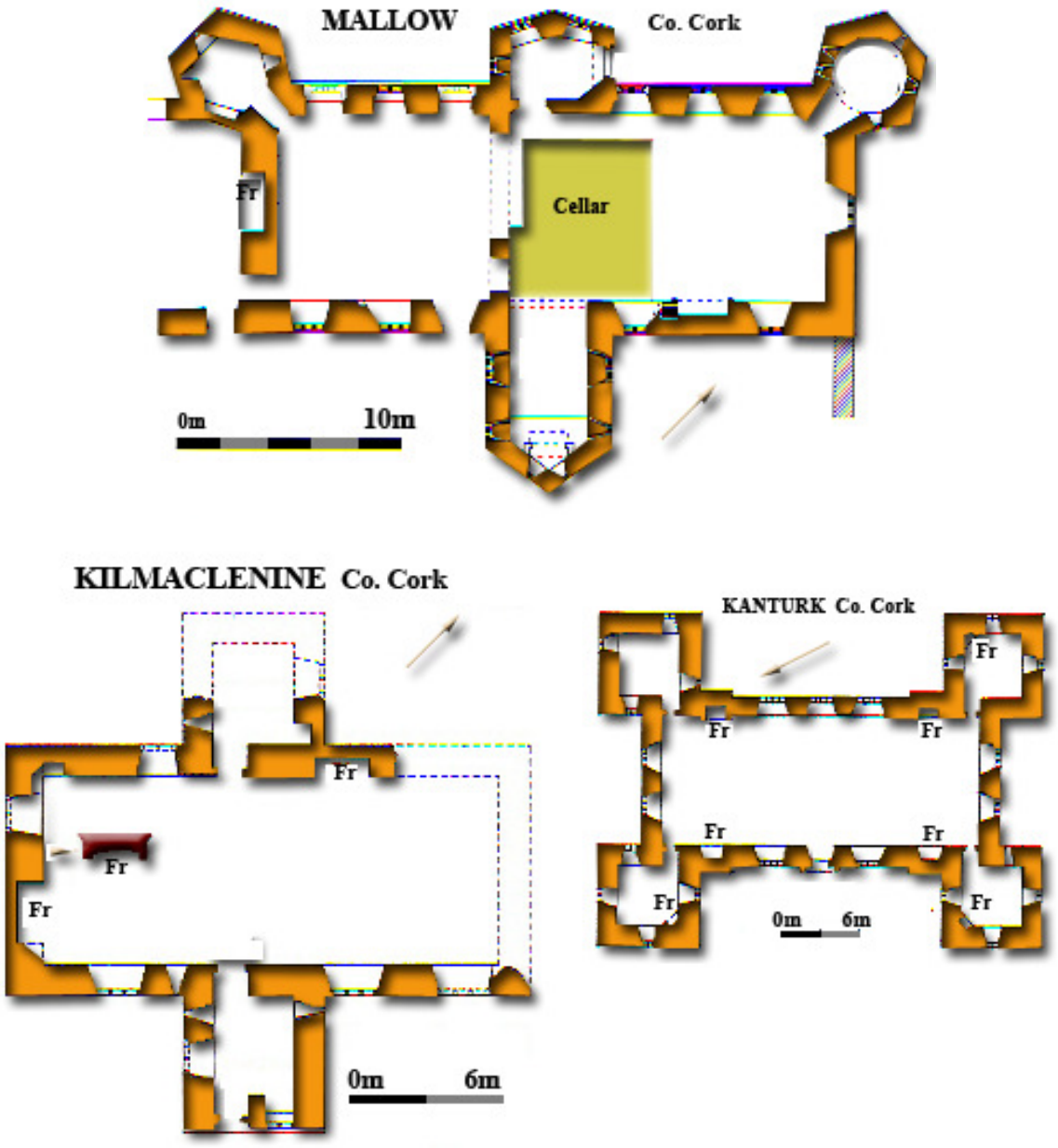

Fig. 7 Outline plans of some north Cork Blackwater River Valley fortified Houses.

Conclusion

It may well prove to be impossible to identify work practices that occurred on individual fortified house sites, as has proved possible from research undertaken by Malcolm Air (1995), on work and the organization of labour in contemporary buildings in England. In Ireland, research has been carried out by Jane Fenlon (1998), who believes that much of the Irish practices were the same as those found in England: contract, direct labour and payment by measurement. Interestingly enough, large numbers of Irish labourers were hired by the New English landowners regardless of the terms of the Plantation scheme. Indeed there was wide spread use of both New English and Irish labour by the Old Irish, Old English and New English elite. The construction of a fortified house was a large scale undertaking which would have brought economic benefits to the surround area. Specialised craftsmen and general labours were required, building materials and general supplies had to be acquired and transported to the site. Within this dynamic work environment, there must have been active exchanges of ideas between craftsmen and builders.

Timber was used at all fortified house sites, for all the internal fittings: floors, roofs, framing, staircase, wall partitions, doors, window shutters and much more, but very little timber survives save that which supports lintels. An analysis of the surviving fragments could shed light on their role in the construction process. While dendrochronology would yield important information on dating and the original type of woodland from which the timber was sourced. Additional information could be gleaned from carpentry techniques, such as saw marks, axe and adze marks. Documentary evidence identifies the Blackwater and Lee river valleys and north Cork, as hardwood forested regions in the early seventeenth century, and it seems likely that much of this was sourced locally.

The other materials used in the construction of the fortified houses, stone, mortar, plaster, roofing and wall slate, are also likely to have been sourced locally. Limestone was the commonly used stone in the construction process. Mortar, of course, would have been manufactured from this but, slate and paint would have come from further afield. Certainly, on some later site of the 1640s the thin blue slate in use was possibly imported.

Regardless of the materials that were produced and purchased locally it was important to have reliable access to the major population and commercial centres. Overland infrastructure was inadequate and thus waterways were important. In consequence many of the sites are not too far from navigable waterways or have access to them. It was reliable and the Irish climate is well suited for this kind of transportation, rain with few extremes. The development and maintance of the waterways associated with fortified deserves further analysis; are there any identifiable remains of landing slips, dry docks and so forth. Of course, overland carriage way always a necessary part of any construction process the Irish use of the pack horse was replaced with the gradual introduced of freight transport by the New English. The likelihood is that overland infrastructure improved as a result of New English initiatives, but the nature of these improvements is difficult to ascertain. Access to and between new settlements was a necessary and vital component of any plantation scheme, but the only inference we can currently draw, is that, the general state of early seventeenth-century overland transportation networks in Ireland were very poor.

Brick was also used on a number of sites but in small quantities. Imported (dark red) brick was located on early house sites in county Cork. It may have been specifically requested or may have come into the country as ships ballast arriving at any of the port towns of Kinsale, Cork and Youghal where brick ballast could be acquired and purchased. More significantly, the absence of the use of brick would suggest that many of the houses were built using an Irish work force; they unlike their English counterparts, were not familiar with building in brick.

The fortified houses plan was often linear/rectangular with corner- or/and centre-towers. They were functional, fashionable as was their layout. In the early decades of the seventeenth century plantation towns were also laid out in similar fashion some were linear, square or rectangular others were cruciform and many were walled with angle bastions. So, it may be suggested that the fortified house layout was a product of late sixteenth and early seventeenth-Anglicization.