Research Repository UCD

Title	The Economy of Early Medieval Ireland
Authors(s)	Kerr, Thomas, McCormick, Finbar, O'Sullivan, Aidan
Publication date	2013-12-31
Publication information	Kerr, Thomas, Finbar McCormick, and Aidan O'Sullivan. "The Economy of Early Medieval Ireland." Early Medieval Archaeology Project (EMAP), UCD School of Archaeology, and School of Geography, Archaeology and Palaeoecology, Queens University Belfast., December 31, 2013.
Series	Early Medieval Archaeology Project (EMAP 2) Reconstructing the Early Medieval Irish Economy EMAP Report 7.1
Publisher	Early Medieval Archaeology Project (EMAP), UCD School of Archaeology, and School of Geography, Archaeology and Palaeoecology, Queens University Belfast.
Item record/more information	http://hdl.handle.net/10197/10939

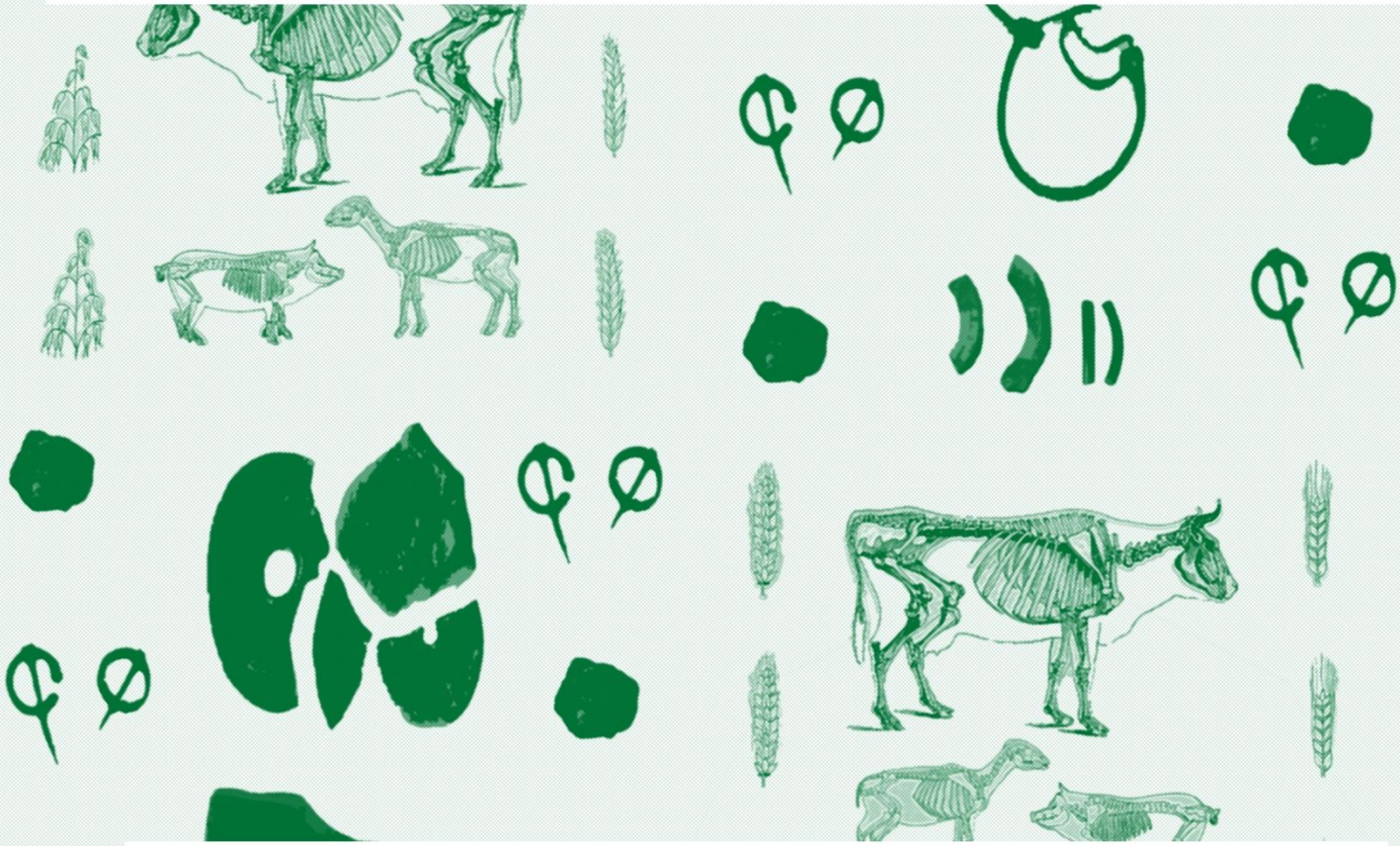
Downloaded 2026-10-30 01:28:11

The UCD community has made this article openly available. Please share how this access benefits you. Your story matters! (@ucd_oa)

© Some rights reserved. For more information

Early Medieval Archaeology Project (EMAP 2)
Reconstructing the Early Medieval Irish Economy
EMAP Report 7.1

The Economy of Early Medieval Ireland



Thomas R Kerr; Finbar McCormick & Aidan O'Sullivan

December 2013

Grant No: AR03743

An Chomhairle Oidhreachta
The Heritage Council

Irish National Strategic Archaeological Research
(INSTAR) Programme 2013

The Early Medieval Archaeology Project (EMAP): Project Report 2013

The Economy of Early Medieval Ireland.

By: Thomas R Kerr, Finbar McCormick & Aidan O'Sullivan

Early Medieval Archaeology Project (EMAP 2) Report 7:1

December 2013

Report submitted for:

Irish National Strategic Archaeological Research (INSTAR) programme 2013

Ref: AR03743

Table of Contents

Foreward: 1

Chapter 1: Documentary Evidence for Economic Activity in Early Medieval Ireland 2

Dóer céilsine Relationships: **3**

Sóer céilsine Relationships: **6**

Other Economic Relationships: **7**

Discussion: **8**

Chapter 2: Archaeological Evidence for Economic Activity in Early Medieval Ireland 12

Livestock Farming: **13**

Cattle: 13

Pigs: 14

Sheep: 15

Cereal Production: **15**

Macrofossils: 15

Barns: 16

Cereal-Drying Kilns: 16

Water Mills: 17

Industrial Activity: **17**

Iron-working 17

Textile Making 23

Non-Ferrous Metal-Working 25

Glass, Enamel and Milliefiori-Working: 28

Bone, Antler and Horn-Working: 29

Leatherworking: 31

Stone-working: 32

Woodworking 34

Pottery Manufacture: 35

Conclusion **37**

A.D. 400-600: 38

A.D. 600-800: 38

A.D. 800-1000: 39

A.D. 1000-1150: 40

Chapter 3:Economic Theory 41

Introduction: 41

Substantavism vs Formalism 41

Critique: 43

Archaeological Economic Models for 'Dark Age' Europe: 44

Conclusion: 46

Chapter 4: Evidence for 'Trade' in Early Medieval Ireland.....47

Imports: 49

Wine: 49

Olive Oil: 50

Glass: 50

Salt: 51

Grain: 51

Exports 52

Example 1: Slaves 52

Example 2: Leather Goods and Textile 55

Example 3: Butter 57

Trade Ships: 58

Internal Trade 59

Example 1: Cereal-Grinding Stones: 60

Example 2: Iron Ore 63

Conclusion 64

Chapter 5: A Model Irish Economy 65

Conclusion 69

Glossary of Old Irish Terms 72

Bibliography: 74

Foreward:

The excavation boom in the early twenty-first century has created a substantial archaeological database for early medieval Ireland. The *Early Medieval Archaeology Project* (EMAP) was established to synthesise and publicise the results of these excavation. Funded under the *Irish National Strategic Archaeological Research* programme (INSTAR) of the Heritage Council, RoI, EMAP has produced a broad overview of the subject area (O'Sullivan *et al*. 2013), as well as specific monographs on the agricultural and industrial economies (EMAP 2011; EMAP 2012). This current work represents an attempt to pull together the various strands of the early medieval Irish economy and to create a synthesis of current understanding of economic activity during this period.

As such this work is divided into five chapters. Chapter 1 examines the documentary evidence for economic activity in Ireland. This is largely found in the, mainly eighth-century law tracts, which are predominantly preoccupied with the farming economy, especially pastoral farming and its relationships with the wider social structure. These works have had a major impact on the later interpretations of archaeological sites. Chapter 2 looks at the archaeological record for productive activity in Ireland. Unlike most other studies, this chapter combines both farming activity and industrial, or craft-working, activity, since it is clear that there was a substantial amount of inter-relations between these sectors during the early medieval period. Chapter 3 provides a summary of the competing economic theories for primitive commerce, and also examines the applications of these theories to the specific examples of 'Dark Age' Europe. Chapter 4 then considers the archaeological and documentary evidence for trade in early medieval Ireland. This is divided into imports and exports, but also considers the probable internal trade in utilitarian objects such as grindstones and iron ore. The final chapter, Chapter 5, attempts to pull together the various strands of evidence presented in the preceding chapters and to present a coherent and viable model for the early medieval Irish economy.

The contemporary written sources and the various theoretical frameworks, combined with a substantial database of archaeological evidence, has allowed for a reinterpretation of the way in which the economy of early medieval Ireland functioned. Future research in this area must continue to reconcile these three sources of evidence.

Chapter 1:

Documentary Evidence for Economic Activity in Early Medieval Ireland

The Old Irish law tracts have been the subject of many serious studies. In the early twentieth century the forensic philology of the great European Celticists, such as Rudolf Thurneysen or Kuno Meyer, prepared the ground for later philologists, such as Daniel Binchy and Liam Breatnach. For archaeologists, the applied works of Fergus Kelly (1988; 1997) have become a vital mainstay for subsequent research in this field.

Studies on the social obligations and hierarchies of this time period are dominated by a small number of surviving legal tracts: *Uraicecht Becc* – 'The Small Grammar' (Mac Néill 1923); *Cáin Aicillne* – 'The Law of Base-Clientship' (Thurneysen 1923); *Cáin Sóerraith* – 'The Law of Free Clientship' (Thurneysen 1925); *Críth Gablach* – '*recte* 'Branched Purchase' but more often called 'The Law of Status' (Binchy 1941); and *Dligid Raith ⁊ Samaíne la Flaith* – 'The Right of a Fief and the Renders of a Lord' (Crigger 1991). These have been reproduced in six edited volumes (Hancock *et al*. 1985-1901) of the *Ancient Laws of Ireland* (*ALI I-VI*), and Binchy's (1978) six volume *Corpus Iuris Hibernici* (*CIH I-VI*).

These texts, however, come from specific geographical areas, and may also have chronological differences. The majority are derived from the '*Senchas Már* School' of the northern midlands (Kelly 1988, 242-4), with *Críth Gablach* also being composed in a similar area (e.g. Patterson 1994, 38). In contrast, the Munster-based *Uraicecht Becc* indicates 'strikingly different' (*ibid*.; Kelly 1988, 28) aspects between the legal tracts produced in different 'jurisdictions'. While specific terms may differ between geographic regions, however, these texts all describe a highly hierarchical society, potentially well-homogenised across Ireland. These tracts represent some of the earliest written examples of Old Irish, but indisputable evidence for them is chronologically bounded by a *terminus post quem* of the mid-seventh century (e.g. Koch 1995, 40-1), and a *terminus ante quem* of the mid-eighth century (e.g. Binchy 1973, 86). It has, however, been argued that individual texts 'show linguistic archaisms which are nowhere found in eighth-century material, so that they must all belong to the seventh century, if indeed some of them do not go back even further' (Thurneysen 1973, 56). Thus it is

possible that there may be a slight chronological difference between texts such as *Críth Gablach*, which dates to the first quarter of the eighth century (Binchy 1941, xiv), and other status tracts such as *Cáin Aicillne*.

The hierarchies defined in these texts generally fall into three classes – royal and noble (*flaith*); freeman farmer (*féni/bóaire*); and 'craftsman' (*nemed*). The majority of these texts are concerned with the socio-economic relationships between the landed classes of the *flaith* and *féni*. Two of these relationships, *dóer céilsine* and *sóer céilsine*, are discussed in greater detail below. In contrast, the exact nature of the *nemed* within the wider socio-economic sphere is less clearly defined. *Uraicecht Becc* (MacNeill 277-80) contains a list of these craft-workers, and this will also be discussed in more detail later.

Dóer céilsine Relationships:

Early medieval Irish society, as represented through the law tracts, has been famously described as 'tribal, rural, hierarchical and familiar' (Binchy 1954, 54). The relationships that are perceived to be most important in the socio-economic structures of early medieval Ireland tend to be defined by two types of contract between the noble classes and farming classes – *dóer céilsine* and *sóer céilsine*. Of these, by far the best understood is *dóer céilsine* (base-clientship/dependant clientship), and has constituted the bulk of modern writings on clientship in early medieval Ireland (e.g. Mac Niocaill 1972; Ó Corráin1972; Kelly 1988, 29-35; Patterson 1994, 150-80; Soderberg 1999). These studies have had a formative influence on subsequent interpretation of the archaeology of this period. For example, it has been stated that: 'if no ringforts had survived in Ireland it would still be possible to reconstruct this settlement form from contemporary sources, and more importantly, the society which built them' (Stout 1997, 110).

Under *dóer céilsine*, a member of the noble class enters into a fixed-term contract for seven years with a member of the farmer class. The noble advances a loan of cattle (*taurchrecc* – lit. 'fore-purchase', often translated as 'fief') to the farmer, along with the 'chattels of subjection' (*séoit taurchluideo*) (Kelly 1988, 29). In return the farmer repays the noble with an annual food rent (*bés*), manual labour (*drécht gíallnae*), and military service (*fubae* and *rubae*) (*ibid*. 30-1). The actual terms of this contract, i.e. the value of the *taurchrecc* and the amount of the *bés*, are strictly regulated by the concept of *sét* (honour price) that pervades the laws of this period.

In order to reflect correctly the value of an individual's honour price (i.e. the value to be paid an individual for a major offence committed against him), the basic classes of *flaith* and *féni/bóarig* are subdivided into numerous constituent grades, each with their own *sét* values. For example, in increasing levels of importance, *Cáin Aicillne* lists the *féni* as being composed of five grades: *Fer domum*; *Óenchiniud*; *Fer Midboth*; *Ócaire*; *Bóaire*; *Uraicecht Becc* has seven grades: *Inol; Flescach; Garid; Fer Midboth; Mruigfer; 2nd Bóaire; 1st Ócaire*; while *Críth Gablach* has eight grades: 1st *Fer Midboth*; 2nd *Fer Midboth*; *Ócaire*; *Aithech*; *Bóaire*; *Mruighfher*; *Fer Fothlai; Aire Cosring*. There are clearly differences between these legal tracts at the lower end of the class, although this seems to be due to the incorporation of land-less under-age males, for example *inol; flescach;* and *garid* in *Uraicecht Becc* (Mac Neill 1923, 270) and the 1st *fer midboth* in *Críth Gablach*. At the high end of the class there are also differences with the 'nobles-in-waiting', such as the *fer fothlai* and *aire cosring*, only appearing in *Críth Gablach* (*ibid*.).

It is clear that these texts have shared terminologies – *fer midboth*; *ócaire*; *bóaire* – but there are also notable differences. In both *Cáin Aicillne* and *Críth Gablach* the *ócaire* is seen as a lower grade than the *bóaire*, however in *Uraicecht Becc* it seems that these terms are used interchangeably (Mac Neill 1923, 270). Even where there is agreement in the order of the grades between the texts, there are differences between the values of the *séts* for each individual grade. This is further complicated by the fact that a *sét* in *Críth Gablach* equates to 0.8 milch cows, while in *Cáin Aicillne* a *sét* seems to equate to 0.5 milch cows and/or 1.0 *samaisc*, i.e. a three-year old dry heifer (Kelly 1997, 649).

Gerriets (1983) has produced a comparison between the property requirements discussed in various legal tracts. These have been equalised by the comparative values of the sets, rather than the grade terminologies, however it seems disingenuous to ignore the titles givent o the various grades, especially when there are a number that are common to all tracts. Table 1 shows the various *féni* grades in *Críth Gablach* and *Cáin Aicillne*, and it seems clear that the grades given in *Cáin Aicillne* tend to correspond with a grade higher in *Críth Gablach*, for example an *ócaire* in *Cáin Aicillne* is the equivalent of a *bóaire* in *Críth Gablach*. Binchy (1941, 101-2) interprets the *ócaire* as a new grade inserted into the hierarchy 'some time before the compilation of *Críth Gablach*' when the 'increased numbers of the "freemen"…made it more difficult for each of them to secure the property qualification of a *bóaire*.' In this he is followed by Mytum (1992, 133), who has argued that the creation of the *ócaire* grade 'was an adaptation of the

social system to alleviate the strain of maintaining freeman status with an expanding population in a now-filled landscape.'

Cáin Aicillne			***Críth Gablach***		
Grade	*Taurchrecc**	*Bés*	Grade	*Taurchrecc*	*Bés*
fer midboth	12 *séts* (12 *samaisci* = 6 cows)	1 *dartaid* (yearling heifer)	*fer midboth*	5 *séts* (4 cows)	1 *molt* (wether)
ócaire	16 *séts* (8 cows and 8 *samaisci*)	1 *colpach* (two-year old bullock)	*ócaire*	10 *séts* (8 cows)	1 *dartaid* (yearling heifer)
bóaire	30 *séts* (18 cows and 12 *samaisci*)	1 cow	*bóaire*	15 *séts* (12 cows)	1 *colpach* (two-year old bullock)
			mruighfher	2 *cumala* = 25 *séts* (20 cows)	1 cow

*(These values are given as 6 cows; 8 cows and 15 cows in Patterson 1994, 366-7).

Table 1: Comparison between *Cáin Aicillne* and *Críth Gablach.*

It is equally possible that *Cáin Aicillne* and *Críth Gablach* describe legal status at different times. The dating of *Críth Gablach* to the first quarter of the eighth century means that, for this theory to remain valid, *Cáin Aicillne* must be earlier in date. Therefore, the property requirements for a *bóaire* in *Críth Gablach* match the property requirements for an *ócaire* in *Cáin Aicillne* because of devaluation in these grades. This may have been the result of population expansion, but there may well have been other economic or social factors at work. Thus an individual's grade may well change over his lifetime by promotion through the hierarchies, but equally the status of the grade itself may have changed over the span of a couple of generations. This has a major impact on the way in which archaeological societal models from this period may be produced.

These subtle differences are important when dealing with the role of the nobility in *dóer céilsine*. For example, based on the food renders due to a *flaith* from their dependent clients, Gearóid Mac Niocaill (1981) was able to work out the composition of each noble grade's clients, according to *Críth Gablach*. Thus an *aire désa*, the lowest grade of nobility, had one *mruighfher*, one *bóaire* and three *ócaire* clients; the next grade up, the *aire ard*, had two,

three and five respectively; while the *aire forgill*, the highest grade that could be calculated, had five *mruighfhers*, six *bóaires* and nine *ócaires*.

Sóer céilsine Relationships:

Dóer céilsine, however, only provides a partial view of early medieval Irish society. *Críth Gablach* portrays *sóer céilsine* (free-clientship/independent clientship) as an equally important part of contemporary socio-economic framework, for example a noble is required to have the same number of independent clients as he has dependent clients. The problem with understanding *sóer céilsine* is exacerbated by the fact that the main text on this subject, *Cáin Sóerraith* (Thurneysen 1925), only survives in a partial state. It seems clear that this form of clientship is fundamentally different from *dóer céilsine*, and may have functioned more as a social or political mechanism, rather than an economic one. The contract between patron and client again lasts for seven years, but may be broken at any time by either party. Payment from the patron to the client is standardised to three cows, and there is no indication that this changed in relation to the respective grades of the parties involved. In return the client provided his patron with six cattle over the seven years, and the equivalent of three cattle in foodstuffs; he was also required to perform homage (*aireirge*) and provide manual labour (*manchuine*) for his patron (Patterson 1994, 155-7). At first glance the duties and payments required under *sóer céilsine* appear draconian, especially when compared to *dóer céilsine* (e.g. Mac Niocaill 1972, 61; Kelly 1988, 32), however *Dligid Raith ⁊ Samaíne la Flaith* describes *sóer céilsine* as 'the best fief' (Crigger 1991, 32), and the second paragraph of *Cáin Sóerraith* states that the worst aspect of *sóer céilsine* is the manual labour requirements, not the food or cattle payments.

The economic duties entailed under *sóer céilsine* were not considered onerous, and this seems to lie at the heart of who was entitled to enter into this relationship. Although this is not defined in the *Cáin Sóerraith*, it is generally accepted that *sóer céilsine* was practised amongst the nobility (e.g. Ó Corráin, 1972, 42; Simms 1986, 44-5; Kelly 1997, 446 n.56), and the requirement to perform homage suggests that free clients should be seen as 'honoured figures to be found in the company of kings' (Hughes 1966, 136). A gloss in *CIH* 2010.37: 'No one is *sóer* whose *cenél* is small, who(?) has not five raths of a hundred [*raith cetaich*]', has been argued to show that, while nobility may not have been a prerequisite to being a free client, the possession of lots of family members and lots of cattle were (Patterson 1994, 159-60). An interesting analogy is drawn between early medieval *sóer céilsine* and a later Gaelic system known as 'commyns' (OI *commain* – 'mutual

wealth') (*ibid.*). The example given (Hill 1877; Graham 1972) dates to the start of the seventeenth century and describes how the O'Donnells of south Donegal lent out cattle (in batches that ranged from two to five cows) to smaller independent families (predominantly the O'Moilans), in return for political security. It is possible that *sóer céilsine* acted in a similar way, by both strengthening the genetic stock of the original herd, as well as by binding a smaller family grouping into the political, social and economic framework of a larger neighbour. In the vast majority of cases it could therefore be envisaged that having large cattle herds, many raths and a big extended family would equate with being a noble, but a couple of the upper *féni* grades in *Críth Gablach* - the *fer fothlai* (a commoner on the verge of being a noble) and the *briugu* (hospitaller) - may have been able to satisfy these requirements. This may explain a major difference between Simms' original model of an early medieval *túath* (1986, 45), and Stout's updated version (1997, 124) in which he shows *sóer céilsine* operating between king and a member of the *féni* class.

Other Economic Relationships:

The workings of *sóer céilsine*, however, are better understood than the status of the 'semi-free' (Kelly 1997, 440-2). Both the *botach* and the *fuidir* received land from a lord, in exchange for unspecified services (e.g. Ó Corráin, 1972, 42; Mac Niocaill 1972, 67-8), and in both cases their descendants could descend to the level of a *sen-chléithe*, a hereditary serf, if they were still on the same piece of land ten generations hence (e.g. Mytum 1992, 132). These individuals, and the male (*mug*) and female (*cumal*) slaves that occupied the bottom social rank, may well have constituted the majority of the population in early medieval Ireland, and yet their existence is barely noted in the archaeological record (e.g. Kinsella 2009).

Alongside the agricultural community, there also is a detailed list of professional 'craftsmen' in *Uraicecht Becc* (MacNeill 277-80). This defines the various social requirements and honour-prices for the *dóer-nemed*, a class that includes craftsmen, doctors and jurists. The texts suggest that blacksmiths (*gobaind*), bronze-workers (*umaide*), gold-smiths/silver-smiths (*cerda .i. imrid in t-or*) and wrights (*saer*), along with physicians, are all equivalent in status to the *aire déso*, the lowest grade in the noble class. There would appear to be a further four specialisations of *saer*, i.e. the 'wright of oaken houses' (Kelly (1988, 61) follows the gloss in *ALI V* to imply someone who builds wooden churches); the shipwright (*saer lér long*); the millwright (*saer muilind*); and the 'master in yew-carving' (Kelly (1988, 61) interprets this as being a bowl-maker; it was glossed in *ALI V* to imply

someone who builds brewing-houses). Next in status are the chariot-wright (*carpat saer*) and the 'house-carpenter (*ailtire*), along with cloth-figurers (*gebeic*), relief-carvers (*rindaigi*) and shieldmakers (*tuathait*). These all have the status of a second *bóaire* (*Uraicecht Becc*) – which equates to an *ócaire* in *Críth Gablach*. The lowest graded craftsmen – turners, fettermakers, leather-workers, [wool?]-combers, and fishermen – are all ranked the same as a *fer midboth*. *Uraicecht Becc* is fragmentary and contains a list of 'entertainers', such as jockeys, jugglers and clowns. The gloss seems to suggest that these are slaves, and mostly foreign slaves (*ndaercaib tairis*). Many of these craftsmen had similar status to the middle ranks of the *féni*/farming classes, yet they are significantly less likely to be identified in the archaeological record.

Discussion:

The early medieval society that emerges from studies on *dóer céilsine* is a strict, almost pyramidal, hierarchy. It is paradoxically complex, yet simple; stratified, yet egalitarian. At the same time economic activity was embedded in this society, with 'each one tied to its neighbours by the circulation of goods and services' (Comber 2001, 76-77). A further problem with relying too heavily on the tracts on *dóer céilsine* for an overview of the socio-economic and political frameworks of early medieval Ireland is that these texts are time-specific. It is generally agreed that these legal tracts were crystallised in the period from the mid-seventh century through to the mid-eighth century (e.g. Binchy 1941; 1989; Kelly 1988). Radiocarbon dates from early medieval sites make it unlikely that the rath-building society depicted in these documents extended much further back in time than the mid-sixth century (e.g. Kerr and McCormick 2014), and this society seems to have undergone a change in the ninth/tenth century. This is supported both by the radiocarbon dates (e.g. Kerr 2009) but also through documentary evidence, although the exact nature of this change, or the reasons for it, is still unclear (Ó Corráin, 1972, 43-4). It is tempting to portray the arrival of the Vikings in the ninth century as a *deus ex machina* for social change, although Mytum (1992, 133) suggests that a short lifespan was inevitable for this system, due to a combination of population increase through the seventh and eighth centuries, concomitant lack of land, and the strict application of property qualifications.

During the first part of the twentieth century, early medieval Ireland was adopted as the poster image for a new nation. It was recent enough to be emotionally accessible, and it also felt sufficiently similar to the Irish Free State in the 1920s and 1930s, i.e. predominantly rural, self-sustaining and Catholic (e.g. Tierney 1998; O'Sullivan, J. 1998). There was a wealth of data

from the early medieval period, both documentary and archaeological, that helped feed the 'Golden Age' myth of a 'Land of Saints and Scholars'. This narrative was strongly rooted within a culture-history archaeological paradigm, and influenced by a surge in nationalism in the first half of the twentieth century, which emphasised the distinctive archaeological cultures of 'historic' peoples (e.g. Celts, Saxons, Slavs, etc.). It was also philosophically dependent on empiricism – the belief in the primacy of the discovery and presentation of facts by a supposedly neutral observer (Tierney 1998). Tierney (*ibid*.) credited this philosophical direction to a conservative Irish commercial and landed bourgeois class, who after the Easter Rising (1916), usurped control of the direction of the 'war of independence' and the policies of the newly founded Irish Free State.

Certain political elements at this time, such as James Connolly, founder of the Irish Labour Party, represented early medieval Ireland as: 'a kind of primitive socialist utopia, with the Irish people knowing nothing of absolute property in land' (quoted in Boyce 1995, 302). The native system, which established a 'nation of scholars and students', was subsequently destroyed by 'individualistic English feudalism' (*ibid*.). This 'tedious nineteenth-century misconception' (Ó Cróinín 1992, 24) on communal property ownership still resurfaces on occasion (e.g. Mytum 1992, 46, 106, 171).

Early archaeological excavations (e.g. Ó Ríordáin 1940; 1941-2, Macalister 1943; Rynne 1956) revealed a rural, pastoral society, focused on archetypal self-sufficient, small farming households that inhabited raths. These both confirmed the normative ideas about early medieval Irish society that had been produced from the contemporary written material, but also ensured that pre-Norman Ireland could be usefully portrayed as similar to rural Ireland during the 1930s and 1940s (O'Sullivan J., 1998, 182-84). The dominance of this 'Golden Age' model ensured that early medieval archaeological research in twentieth century Ireland continued to be bound up with recording data and amassing information, rather than exploring how the past could be mobilised in the interest of the dominant social, economic and cultural interests in the present. The de Paors' *Early Christian Ireland* (1958) was the only major synthesis of the archaeology of early medieval Ireland to be published till the 1990s. It was written largely within this 'Golden Age' narrative with notable attention accorded to raths, crannogs and church sites and with good cognisance of and special attention to the contemporary historical sources.

The 'Golden Age' narrative finds regular repetition as a short-hand for early medieval Ireland in works drawing on a wider European study. 'Only the

Irish…remained almost impenetrable to foreign custom. For unaccounted reasons, probably rooted in social custom, they continued to cherish isolated farmsteads and to raid one another's cattle. Thus they missed almost entirely the economic growth sweeping the rest of Europe, and ultimately they lost even their rugged independence' (Lopez 1998, 35-6). In most cases this lack of advancement seems to have been subliminally linked to a lack (or perceived) lack of urbanism, which had traditionally been viewed as an imported trait, first with the Vikings and latterly the Anglo-Normans (but see Doherty 1985; Swift 1998; Valante 1998 for discussion on native 'proto-urbanism'). As a direct result of this lack of centralisation, early medieval Ireland has been argued as the larger constituent part of an 'abortive' Far West Christian Civilisation, which was ultimately subsumed by its neighbour (Toynbee 1934, 322-40).

The 'Golden Age' narrative has primarily been highly influential in dictating how archaeologists have interpreted the early medieval period in Ireland. 'The engagement of fieldworkers with documentary sources somehow deepens the perception of [raths] as being familiar and "already explained" and the satisfying sense of closure and repletion this offers may exclude some alternative lines of enquiry' (O'Sullivan, J. 1998, 183). The 'Otherness' (*sensu* Moreland 2000) of the hierarchical society outlined in the various legal texts dominates every aspect of the culture-history approach to this time period. Soderberg (1999, 400), however, rightly points out that 'depending on one's view of clientage, one's view of early medieval society changes profoundly'. He divides current thinking into two categories – one that stresses the fact that 'clientage relationships tend to collapse distinctions between different social strata' (e.g. Ó Cróinín 1995; Jaski 2000); and a second camp that 'views clientage as coercive and a tool for deepening divides between social strata' (e.g. Gerriets 1983; Patterson 1994; Kelly 1997). These interpretations are also a reflection of one's own political views, or the political views imputed to someone by subsequent commentators (which frequently reveal that person's particular stance). For example, in his review of Mytums' *The Origins of Early Christian Ireland*, Ó Cróinín excoriates the author (*inter alia*) for adopting 'Thatcherite economic theory' (1992, 24), and the same work is attacked by Tierney (1998), for being 'too neo-liberal' and not progressive enough.

Unlike the majority of authors in this field, Gerriets (1981; 1983; 1985) wrote on early medieval clientship from the position of an academic economist. She points out three key points which sometimes get overlooked in literary reconstructions of early medieval Irish society: 'the laws assume social mobility' (Gerriets 1983, 49), a position followed by Mytum (1992, 133); 'the

laws do not assume that clientship was universal among commoners and nobles' (Gerriets 1983, 56); and a client 'could have as many as three lords' (*ibid*. 59; see *CIH*, ii, 488, 1-3; Thurneysen 1923, 368; Kelly 1997, 446). The result of this is a 'dynamic society in which each individual made choices influencing his positions in society' (Gerriets 1983, 60), as opposed to the more rigid structure often ascribed to this period; a society in which, according to *Uraicecht Becc* (ALI V, 21), a man is able to improve his lot in life (*'fearr fear a ciniud'*).

There is clearly a fundamental need to acquire property built into *dóer céilsine*. On numerous occasions *Críth Gablach* stresses the necessity of property ownership in order to progress through the ranks of the *féni*. For example the *taurchrecc* of the *fer midboth* increases when his property qualifications equal those of a *bóaire* or higher (Binchy 1941, 4); and a *fer fothlai* may ascend to the noble ranks when he has twice the property of a *bóaire* (*ibid*. 10). This double requirement in order to progress is repeated in other works such as *Bretha Nemed Dédenach* (Jaski 2000, 173). While property ownership was needed in order for an individual to progress up the grades – it could theoretically be possible for a successful (and long-lived) *fer midboth* to end his life as an *aire déso* (the lowest ranked noble) – it was equally necessary to ensure that one's current status was maintained.

There are therefore two competing versions of how economic activity was regulated in early medieval Ireland. The first suggests reciprocal rights and duties originating through bonds of kinship and clientship; while the second focuses on individual agency and social mobility (although 'the results of this rational behaviour would be very different within clientship from those within a market economy' (Gerriets 1983, 60)). This is in microcosm a summary of the debates on the emergence of 'primitive economies' that have been raging for over a century. In order to understand better the economic situation in early medieval Ireland, it is necessary to recognise the productive activities that were pursued at this time; to identify certain aspects of 'commerce' or 'trade'; and finally to develop a theoretical stance based on current thought. These aspects will be considered in the subsequent chapters.

Chapter 2:

Archaeological Evidence for Economic Activity in Early Medieval Ireland.

Excavations in Ireland have produced a vast range of evidence that has allowed archaeologists to identify the industrial activity and farming being conducted on early medieval sites. In recent years a number of attempts have been made to synthesis the current state of play of the archaeological knowledge, for example McCormick & Murray (2007), Doyle (2012); Dolan (2012). These studies have tended to have a rather narrow focus on specific aspects of production in early medieval Ireland, e.g. livestock farming; textiles and ornaments; and iron working respectively. It is clear, however, that these activities were all interlinked. Take, for example, the production of a staple of medieval Irish clothing, the *brat* (or woollen cloak). In order to produce the yarn, a farmer must shear his sheep (using iron shears) and spin the wool (using clay/stone or bone spindle-whorls). The yarn must then be dyed to colours regulated by status - the sons of kings may wear purple and blue; the sons of nobles may wear red, grey and brown; and commoners' sons may wear clothes of yellow, black, white or dun-colour (Kelly 1997, 263). These colours would largely be obtained from botanicals such as woad (*Isatis tinctoria* – a blue dye), which was found at Deer Park Farms, Co. Antrim (Kenward *et al*. 2011) or madder (*Rubia tinctorum* – a red dye) which was found at Carn, Co. Fermanagh (Morrison 1953, 54). Purple seems to have been obtained from the hypobranchial gland of the dog whelk (*Nucella lapillus*), and middens of these shells have been found on early medieval costal sites such as Dooey, Co. Donegal (Ó Ríordáin & Rynne 1961) and Doonloughan, Co. Galway (Murray & McCormick 2012). The yarn could then be woven into cloth (using stone loomweights, and wooden/leather pattern tablets), and then stitched (using iron/bone/antler needles) into the final product. This example shows the various different types of craftworking skills and access to raw materials that are required to produce a simple, and ubiquitous, piece of clothing. When the sourcing and production of iron tools is also taken into consideration, this highlights the interconnectivity of many activities at this time.

The general presumption seems to be that the majority of industrial activities were carried out on site by members of the wider household. This work also seems to have been divided along gender lines, e.g. men were responsible for shearing and smithing, and woman took on the duties of spinning and weaving. While some industrial activity seems to have been broadly practised, for example just over 60% of excavated early medieval sites have evidence of iron-working and 40% have evidence for textile working, it is also clear that there was a degree of craft specialisation. This is most noted in the perceived 'high-status' industries, such as bronze-working or glass-working. While these activities are found on all site types, there is a higher concentration on the perceived 'high-status' sites, thus 50% of excavated crannog and 30% of excavated multivallate raths have evidence for bronze working, as opposed to just over 10% of univallate raths. Evidence for early medieval glass-working is scanty outside the ecclesiastical sites, but shows a similar pattern (although with lower percentages). Both of these activities, however, also appear to have been practised on 'settlement-cemetery' sites. These sites are generally not considered to be high-status, but they clearly seem to have functioned as some sort of industrial centre.

Over 3,500 excavations have been conducted on early medieval Irish sites, with almost 3,000 taking place in the first decade of the twenty-first century. These excavations have vastly added to the material knowledge of this period, summaries of which are included below.

Livestock Farming:

Cattle:

Cattle were the dominant feature in the livestock economy of the period and are generally the most numerous species present in early medieval assemblages. Cattle, or more specifically cows, were of exceptional importance in the lives of the Early Irish (Lucas 1989). The principal value of the cow lay in its ability to provide milk and other dairy foods, and as such the Irish laws note that a 'dry cow' has only half the value of a milk cow (Kelly, 1997). Cattle metrical data confirms that the majority of adult cattle present in early medieval assemblages are female (e.g. McCormick & Murray 2007). Relatively few calves were slaughtered and virtually none of these were less than five or six months of age (McCormick & Murray, 2007). This runs contrary to Payne's (1973) dairying model for prehistoric sites which requires a high kill-rate among young animals. Contemporary documentary evidence, however, suggests that Irish dairy herds may have retained young calves since cows would not give down their milk without the calf being

present (McCormick 1992). A similar apparently primitive trait in Irish cattle is found when the age of sexual maturity is compared to contemporary Welsh examples. In Ireland the law tracts indicate that cows were not expected to produce their first calf until they were four years old (Kelly 1997), while Welsh medieval law indicates that the first calf was produced a year earlier.

There is a general uniformity to the MNI (Minimum Numbers of Individuals) distribution from early medieval sites, with cattle accounting for 40% - 50% of the main domesticates on most sites. The almost universal predominance of cattle in the economy differs from contemporary England (O'Connor 2011, 367) or France (Rodet-Belarbi 2011) where sheep tend to be the dominant species. Despite the advantageous grazing available in Ireland the metrical analysis indicates no significant difference in cattle size with those present in Anglo-Saxon England (McCormick and Murray 2007).

Pigs:

Pigs are generally the second most important domesticates on settlement sites of the period, comprising between 20 and 30% of the MNI. The early documentary sources complement the zooarchaeological evidence for pigs, for example 'white', 'grey', 'black', 'reddish brown' and possibly 'blue-black' animals are referenced in various writings (Kelly 1997, 79-88). Farrowing occurred annually, in spring, with litters of up to nine recorded (*ibid*.). The piglets were kept near the farm until August after which there were let loose in the woods where a swineherd, who was often a slave, looked after combined herds of pigs belonging to more than one owner. Sows only tended to be slaughtered after they have produced two or three litters, or if they were dry.

The age-slaughter patterns generally indicate a distinct peak when the pigs were roughly between 18 months and two years old. It can be assumed that this represents the time when the animals were reaching full size and at the optimal stage for slaughter. On urban sites, such as Viking Dublin, there are also peaks in killing younger animals. The high incidence of slaughtered piglets here probably reflects a situation where a shortage of suitable food, combined with difficulties in controlling large numbers of such animals within a congested urban environment, made it difficult to rear more of the animals to a more economic size. The rural site of Castlefarm, Co. Meath has a similar slaughter pattern to the urban sites. This site produced the highest incidence of pig numbers on a rural site in early medieval Ireland, and may well represent a farm dedicated to pig-rearing.

Sheep:

The documentary sources provide valuable information to complement the faunal evidence. Except for the few kept for breeding all males were castrated after they were weaned and it is specifically noted that wethers were considered to be summer and autumn food (Kelly 1997, 69). Only a small number of sheep were white in colour, with the majority being dun-coloured or black, and as a consequence the law tracts indicate white sheep were considered much more valuable than the others (*ibid*. 70). Female lambs were considered to be of more value than male, presumably because of their breeding abilities and potential to produce milk, although this was regarded as inferior to goat's milk (*ibid*. 75-6).

Sheep and goats are difficult to distinguish anatomically unless skulls are present, and as such they tend to be grouped together as 'ovicaprines' or 'caprovines'. Very few goats have been noted on early medieval rural sites so it can be presumed that the great majority of the caprovines present are sheep. They generally comprise between 20% and 30% of the MNI totals. Especially low values were noted in Viking Dublin (*c*. 11%), although there was also a higher incidence of goat noted in urban sites than in rural ones (McCormick & Murray, 2007). There were occasional high instances of sheep, such as Phase 2 at Raystown, Co. Down (Lynn 1981-2), and high incidence of sheep has also been associated with sites located in environmentally marginal areas such as Dún Eoganachta, Arranmore, Co. Galway, where sheep comprised 40% of the MNI (Murray 2012), and Larrybane, Co. Antrim where they comprised 50% of the MNI (Jope 1961-2). The faunal evidence indicated that the majority of sheep are killed off before the age of 28 months, with only between 20% and 35% of the assemblages older than this.

Cereal Production:

Macrofossils:

Evidence for cereal production in early medieval Ireland is derived from documentary sources, tools used in cereal production and processing, structures associated with cereal processing, in particular drying kilns and mills, and finally in the macrofossil remains form excavated sites. McClatchie (2011) has compiled a detailed review of available published and unpublished macrofossil evidence from early medieval excavations. Oat and barley are present on the great majority of phases from the 60 sites investigated, while rye is infrequently encountered. In terms of regional distribution, the only difference noted was that wheat was more commonly found in the east and

west of the country rather than in the north and south. This distribution is difficult to understand as it would have been expected that wheat would have been more difficult to grow in the wetter western regions of Ireland. The early texts rank the perceived status of cereals with bread-wheat followed by rye at the top and oats at the bottom (Kelly 1997). The archaeological record, however, has not demonstrated that wheat was encountered more often on high status sites than low.

Analysis of the relative dominance of cereal types in cereal assemblages, however, indicates temporal changes during the early medieval period. In order for a cereal type to be deemed dominant it had to represent 50%+ of an assemblage, and be recorded at a level at least 10% higher than the next nearest cereal type. Analysis of these assemblages indicates an increase in both oat-dominated and mixed assemblages during the later period, accompanied by increasing incidence of other cultivars such as flax, pea and bean remains (McClatchie 2011).

Barns:

The early texts make frequent reference to the barn (*sabhall*) which might more correctly be described as a granary. The laws state that a prosperous farmer was to have his own located near his house, while the less wealthy farmer merely had a share of a barn held in communal ownership (Kelly 1997). Two potential 'barns' have been identified by recent archaeological investigation. The 'four poster' and 'nine poster' structures found at Sallymount, Co. Limerick (Clarke & Long 2009) may represent the foundations of granaries that were raised off the ground. These are similar to structures commonly found on Iron Age sites in north-west Europe which Waterblock (2009, 12) interprets as being the remains of covered platforms where 'grain, hay or other produce could be stored'. A circular clay and wicker structure, some 2m in diameter, found at Drumadoon, Co. Antrim (McSparron & Williams 2009, 122-3) is almost certainly an early medieval grain store as it contained nearly 20,000 charred oat grains.

Cereal-Drying Kilns:

The dampness of the Irish climate made it especially important that grain was dry before it was stored. Wet grain spoils easily and is difficult to mill. Monk (1981, 217-8) notes that experiments have shown that drying grain speeds up the process of grinding even when using a hand rotary quern. A direct response to climatic conditions, corn drying kilns are a north-western 'coastal' European phenomenon and are scarce, for instance, in Anglo-Saxon England

or southern Continental Europe. Drying kilns are very rarely present on raths but are found more commonly on complex enclosure sites and settlement cemeteries. At Sallymount, for instance, two kilns are located outside the site enclosure. This was a typical location since kilns were a fire hazard and needed to be kept separate from dwellings. As a consequence of extensive road-construction projects, several hundred kiln sites have been excavated in the last two decades. Their use seem to increase until the beginning of the eighth century after which their numbers appear to decline, at least in some areas of the country (Monk & Power 2012).

Water Mills:

Water mill construction, reconstructed through dendrochronological records, surprisingly shows the opposite trend to that noted in the case of corn drying kilns as their use increases from the eighth century onwards, with the highest concentration being built between A.D. 750 and 850. The earliest dendrochronologically-dated mill, Nendrum, Co. Down (A.D. 619), is a monastic site (McErlean & Crothers 2007), suggesting that innovative technology was introduced by the church. Both vertical and horizontal mills are constructed in the seventh century but the vertical type was soon abandoned and only re-introduced in the later medieval period. Mills have an uneven distribution being found for the most part in the south and south east part of Ireland (Brady 1996, 46), areas which include some of the best arable land in the country.

Industrial Activity:

Iron-working

Scott (1991, 101) described five levels of iron-working on Irish sites; specialist smelting and bloom-smithing sites; occasional smelting and smithing sites; sites forging artefacts from imported stock for local use; sites forging artefacts from imported stock for wider communities; and sites engaging in occasional artefact repair and production. This model was simplified by Carlin into three levels of ferrous metallurgy (2008, 108-10). Carlin's first level saw local farmers undertaking iron-working at a very low non-specialist subsistence level. It was probably imperative for small self-sufficient farmsteads to possess a basic knowledge of the technology repair iron artefacts (Edwards 1990, 86; Mytum 1992, 235). His second level and third levels were high status ecclesiastical and secular sites which patronised blacksmiths alongside other specialist craftsmen (Carlin 2008, 109-111).
Other theories have been advanced about the organisation of early medieval iron-working. Mytum (1992, 234) interpreted the evidence of the law-tracts as

meaning that smiths worked in permanent forges for a surrounding community of farmers and has argued that each *túath* had one head blacksmith who was a major figure in the territory at these sites. However, Carlin (2008, 111) has criticised this model, noting that the archaeological evidence is not consistent with this centralised approach, but is instead replete with 'isolated' iron-working features and 'examples of high-quality, small-scale, localised "do-it-yourself" smithing that was being undertaken by independent farmers'. The focus of the early literary sources on high-status sites might explain why these sources failed to account for, or mention the importance of, the iron-working activities at smaller, ordinary farmsteads in early medieval Ireland.

Although knowledge of the basics of iron-working was probably widespread in early medieval society, excavations have revealed considerable variability in the extent and character of evidence at various forms of settlements. The slag assemblages from most excavated early medieval sites typically range from 30-200kg. There are, however, a growing number of sites with assemblages over 1000kg, perhaps indicative of specialised iron-working sites (Wallace & Anguilano 2010b, 73). No simple equation may be made between the type, or perceived status, of a site and the scale of iron-working carried out within it, and equally it is very difficult to estimate how much activity archaeometallurgical waste represents. Young gives the example of Parknahown, Co. Laois, a settlement-cemetery which operated over approximately six centuries, and which produced 100kg of waste representing a minimum of a single smelting episode and 150 smithing sessions (Young 2009a, 3). Likewise at Killickaweeny, Photos-Jones commented that the 86kg of metallurgical waste generated within a possible 100 year temporal window could not have been seen as industry but as part of the annual calendar of activities for a farming community (Photos-Jones 2008b, 53).

A range of settlements appear to have had specialised smithing workshops. The palisaded enclosure at Lowpark, Co. Mayo produced four smithing workshops dating from the sixth to the tenth centuries A.D. Three of the iron-working areas were within sunken sub-rectangular structures – both inside and outside the enclosing palisade – and the fourth workshop was located within a partly silted-up enclosure ditch. The site produced 1,364.5kg of metallurgical waste in the form of iron slag and smithing slag cakes and it was suggested that four large stones with concave surfaces were used for crushing ore (Gillespie 2011; Wallace & Anguilano 2010b, 75-80). At the bivallate settlement enclosure of Lisanisk, Co. Monaghan, the metallurgical remains of smithing and bloom-smithing (827 kg) dominate the excavated remains, although there is evidence that some smelting also took place

(Photos-Jones *et al*. 2010). This activity was carried out in two separate sunken areas within the ditches, with postholes and a large charred wooden beam indicating windbreaks and work surfaces dated to the late seventh to ninth century AD. The multivallate rath at Lisleagh II, Co. Cork produced 1000kg of metallurgical waste (Monk 1988; 1995), and it has been identified as another upper tier iron smelting specialist site (Scott 1991, 101). Further significant evidence comes from Gortnahown 2, Co. Kerry (158kg) where a univallate rath contained a series of iron-smithing hearths and smelting furnaces close to a series of structures (Young 2009b). A further oval structure contained two furnaces and two hearths dated to the late sixth to seventh century A.D. Textile imprints in clay fragments have been interpreted as the remains of 'brazing shrouds', which had originally wrapped the iron bells in order to apply a copper alloy to the surface of the object. This constitutes the earliest Irish evidence for bell manufacture, although it is suggested that these may have been designed to be worn by livestock, rather than having some ecclesiastical function.

Archaeological evidence for the production of iron comes in the form of slags, metallurgical ceramics, fuel waste, vitrified fuel ash and ore (Photos-Jones 2011, clxi). Direct evidence for iron-working comes from around 200 of the excavated early medieval secular sites, almost 2/3 of the dataset. The increase in knowledge created by the excavations of the early twenty-first century can be clearly seen in the fact that a relatively recent earlier synthesis gave this figure as 44 secular sites (Comber 2008, 181).

There are few examples of iron-bearing minerals found on site, e.g. limonite was identified at Oldcourt, Co. Cork (Murphy & Ó Cuileanáin 1961, 90), and the principal source of iron in early medieval Ireland is generally believed to be bog iron ore (Scott 1991; Wallace & Anguilano 2010b, 70). The problems with sourcing iron-ore in early medieval Ireland will be dealt with in greater detail in Chapter 3. The iron smelting process also required access to charcoal, for example *Críth Gablach* lists 'a sack of charcoal for irons' as one of the household possessions of the *mruighfher*-class farmer (Scott 1991, 100). A total of 61 charcoal production sites have been identified in a recent survey (Kenny 2010), with 32 radiocarbon-dated to the early medieval period, predominantly the period between A.D. 800 and 1200. While there has been no synthesis of charcoal specialist reports, oak appears to dominate as a chosen species.

The primary stage of iron-working is to convert the ore into a useable form by using a smelting furnace. Since these structures were dismantled to remove the iron bloom, it is difficult to reconstruct the original form of early medieval

smelting furnaces. It was traditionally thought that the simple bowl furnace was the only type used in Ireland during this period (Scott 1991, 159) and these have been identified as shallow hemispherical burnt depressions in the ground (Edwards 1990, 87). Both Mytum (1992, 231) and Young (2003, 1-4), however, have suggested that smelting in early medieval Ireland occurred within more efficient shaft furnaces, known interchangeably as 'slag-pit furnaces' or 'low-shaft furnaces'. Possible tapped slag was noted at Bofeenaun crannóg, Co. Mayo (Keane 1995, 178–9; McDonnell 1995, 183), but the only definite published tapped slag seems to be from Farranastack and Ballydowney, both in Co. Kerry, and Shandon, Co. Waterford (Dowd & Fairburn 2005). These sites are later medieval in date, although Farranastack produced an eleventh- to thirteenth-century radiocarbon date (Dowd & Fairburn 2005, 116–19). Furnace technology does not seem to equate with intensity of production; for example, there was no attempt to progress from the bowl furnace to the more efficient 'tapping' shaft-furnace at Johnstown, Co. Meath, a site that produced two tonnes of iron slag (Photos-Jones 2008a). Definitive evidence for the use of the shaft furnace in the early medieval period in Ireland is thus still inconclusive.

During the smelting process, the iron ore was reduced to form an iron bloom (a spongy mass of metallic iron mixed with slag impurities) and liquid waste slag. The latter ran into the basal pit to form distinctive bowl-shaped blocks of slag, known as 'furnace-bottoms', which were frequently broken up when the furnace was dismantled. The raw 'bloom' remained within the shaft above ground level near the blow-hole of the bellows and required further refinement, reheating and hammering in a smithing hearth to remove excess slag and impurities. The bloom was either removed through the top of the shaft or the clay superstructure had to be broken to get at it (Carlin 2008, 93). These 'bowl' furnace bottoms can easily be confused with the 'smithing hearth bottoms'. In general these are differentiated on the basis of size, with the larger being associated with the smelting process (Scott 1991, 155–60). On this basis Scott re-identified the furnace bottoms from Ballyvourney as representing smithing rather than smelting activity, and thought that the same applied to the material from Garranes (*ibid*. 161–2). He also cast doubt on the identification of 'furnace bottoms' on several other sites.

The most common evidence for iron-working comprises the waste slag, produced in the smelting, bloom-smithing and forging processes (Scott 1991, 151). Microscopic analysis of the slag can inform about the iron-working process and whether smelting or smithing occurred in a particular context. It is, theoretically, possible to differentiate between the slag mainly created in 'bowl' furnaces or slag-pit furnaces and the tapped shaft furnaces. The

tapped slag from shaft furnaces has a 'characteristic drop like surface texture' (Photos-Jones 2008a, 193) while the non-tapped slag, characteristic of the slag-pit bowl furnace, tends to form into rounded 'furnace bottoms'.

There is also significant evidence of smelting from analysis of metallurgical debris on sites which do not have excavated furnaces. A good example of an isolated smelting site including a very large dump of slag was found at Cloonafinneala, County Kerry (up to 520kg of metallurgical remains of which approximately 5% was sampled). It had no evidence for bloom refining and appears to be related to fifth/sixth century primary smelting (Young 2012, 4). Once the smelting was completed, the iron 'bloom' produced in the furnace was refined in a bloom-smithing (primary-smithing) process which involved reheating it in a hearth and hammering it in a molten state on an anvil to remove excess slag and other impurities and to consolidate the iron prior to shaping. This was an important necessary step as the furnace did not achieve high enough temperatures to completely remove the slag and other impurities. A block of wrought iron referred to as the stock or billet was produced in this process. Secondary smithing (blacksmithing), or forging, was then undertaken to produce or repair metal objects. Evidence for all these processes can be present in the form of features such as smithing hearths, ceramic tuyères, metallurgical smithing waste and other features such as anvils and a range of artefacts used in the manufacturing process.

Young (2008, 4) notes that, while sub-rectangular or circular hearths of 0.8 in diameter would be too small for blacksmithing, bloom-smithing may not have required the same size. Photos-Jones (2008a, 194) states that metal-working hearths of 1.2m – 2.5m in size cannot be associated with smelting and must have been used for smithing, and thus suggests that the hearths identified at Killlickaweeny and Johnstown were associated with the bloom-smithing process. Smithing hearths cannot be definitively identified without analysis of associated metallurgical residues. Many sites did not reveal smithing hearths within the excavated area, but analysis of metallurgical residue suggests smithing was carried out on site. Micro metallurgical debris known as hammerscale is an important indicator of smithing. This is an oxidised film of metal produced as bloom is hammered and indicates the presence of the anvil (Wallace & Anguilano 2010b, 71). Different types of smithing produce different shapes and flakes are thicker during bloomsmithing and thinner where artefacts are being forged (Young 2012, 3).

A growing number of anvils have been identified on Irish early medieval settlements. A stone-built clay-lined smithing hearth was found at Clogher, Co. Tyrone associated with two 'bowl' furnaces and a flat rectangular

limestone block, interpreted as an anvil (Edwards 1990, 88). Another large stone with a flat working surface was found in close proximity to an iron-working furnace at Rathgurreen, Co. Galway and was identified as having a similar function (Comber 2008, 118), as well as in a recent excavation at Dunlo, Co. Galway (Young 2010). The most signficant example from Lowpark had a bowl shaped depression on one side and a small circular depression which in turn contained a square socket on the other which is likely to be for an iron anvil (Higgins 2010, 3-4). It is possible that large flat stones were generally utilised as anvils in this period and many of these have probably been overlooked during excavations (Comber 2008, 118).

It has been suggested that primary iron production took place in peripheral locations close to woodland and fuel and timber sources (Carlin 2008, 108). There are now frequent examples of isolated sites where metallurgical residues suggest smelting and bloom-smithing werer carried out, such as Dollas Lower, Co. Limerick (Dowling & Taylor 2007, 273-4), Kiltenan South, Co. Limerick (Dennehy 2007, 291) and Ennisnag, Co. Kilkenny (Jennings 2008). Some of these are located close to woodland and bog with several including charcoal making pits. These may represent specialised bloom-smithing and/or smelting sites. The apparent absence of secondary smithing, i.e. the forging/blacksmithing of objects, was contrasted with evidence from settlements like the monastic enclosure of Clonfad, Co. Westmeath (Stevens 2010) which was primarily engaged in bloom-smithing and artefact production. The crannog at Bofeenaun could be regarded as an 'isolated' specialised iron-working site (O'Sullivan 1998, 122) as it produced evidence primarily for the processing and smelting of iron ore. Two iron-smelting furnaces, furnace lining fragments and a large volume of slag were recovered and the only finds consisted of two crushing stones or stone mortars (for the ore), a saddle quern, a hammer stone, an iron spade and two gouge-type tools (Lawless 1992, 14-21).There was no structural or occupational evidence, except for a revetment palisade and an area of stone paving (*ibid*.). Bofeenaun was located in an apparently marginal landscape and it has been suggested that 'crannogs like Bofeenaun should be interpreted as the island workshops of blacksmiths, seen as semi-mythical personages in early medieval mythology on the edge of society' (O'Sullivan & Van de Noort 2007, 74) which were visited periodically by local farmers to meet their subsistence needs.

These 'isolated' industrial features may represent evidence for 'itinerant' ironworkers (Comber 2008, 124), however, although they are mentioned in the Invasion-Cycle *Cath Maige Tuired* (The Battle of Moytura), itinerant smiths appear to be a rarity in many small-scale societies (Hall 2011, 313).

Carlin (2008, 107) suggests that these sites were more likely the product of local farmer-ironsmiths, exploiting their surrounding natural resources, probably on a seasonal basis. It could also be argued that these represented places where specialised ironworkers produced bloom for use in larger workshops at settlement sites.

Iron artefacts have also been found on 55% of early medieval excavations in Ireland. These typically included industrial tools (knives, awls, chisels, hammers, punches, axes, saws and tongs); agricultural tools (sickles, shears, bill-hooks, plough-socks and plough shares); and military objects (swords, spear-heads, arrow-heads and shield bosses). Some of these tools, such as hammers, tongs, files and punches, were used in the final stages of iron-working, although they could also be used for several other industrial activities. There is a relative absence of such tools on early medieval settlement sites, but this could be because they were regularly recycled when broken (Carlin 2008, 109).

The archaeometallurgical examination of early medieval iron artefacts rarely takes place in conjunction with the analysis of residues. A number of key studies have looked at the evidence for the hardness and durability of the objects produced. A knife and a chisel found at Killickaweeny, Co. Kildare were subject to investigation and it was demonstrated that, while the knife may have been imported, the chisel had the 'fingerprint' of being made on site. The chisel analysed was made with phosphoric iron with an even carbon content and indicated the smith chose an appropriate bloom for manufacturing based on the objects intended use (Photos-Jones 2008b, 53-54). A knife from Johnstown, Co. Meath was also studied. The hilt and the blade were found to be made from two different blooms containing phosphoric iron, a low carbon alloy which matched the slag samples from the site (Photos-Jones 2008a, 262). As a result of a study of fifteen iron artefacts from Deer Park Farms, Co. Antrim, it was suggested that they could have been made by seasonal smiths with limited knowledge of carbonisation or highly skilled smiths who deliberately made harder wearing but not fully hardened objects (Hall 2011, 314).

Textile Making

After iron-working, the most widely represented industrial activity in early medieval Ireland is textile making. The manufacture of textiles is strongly associated with women in the written texts (e.g. Kelly 1997, 451), and their importance in textile-working is also highlighted in the ninth-century *Triads*, where 'the slender thread over the hand of a skilled woman' is one of the

'three slender things that best support the world' (Meyer 1906, 11). The association of women and sheep/wool also appears in *Cáin Lánamna*, where the division of property in a divorce gave a wife one-sixth of any fleeces, but one-third of combed wool and half of any woven cloth (Kelly 1997, 449). Similar proportions apply in the division of flax, again rising from one-sixth of the flax in sheaves to increased shares of the processed fibres and finished cloth (*ibid*.).

There are few surviving examples of early medieval textiles, mostly from waterlogged conditions in the Viking towns of Waterford, Dublin and Cork (Heckett 1997; 2003; 2010). Most of the textiles found on early medieval excavations in Ireland have been made of wool, or occasionally hair, with small fragments of cloth made of vegetable fibres (probably linen) found at Deer Park Farms, Co. Antrim (Heckett 2011) and Ballyvass, Co. Dublin (Clarke & Doyle 2011). The most reliable archaeological evidence for textile making, however, comes in the form of spindle-whorls, often made of durable materials such as stone or pottery (Comber 2008, 69–78, 99–104; O'Brien 2010; Doyle 2012). Spindle-whorls were found on just over 25% of excavated early medieval sites. Around half of these, however, only produced a single whorl. This can be contrasted with sites such as Garryduff and Knowth which produced around 20 spindle-whorls each. These sites, however, also produced evidence for the manufacture of stone spindle whorls, usually in the form of rough-outs, unfinished examples and those broken during the drilling of the central perforated hole. The largest concentration of spindle-whorls was found at Cahercommaun, Co. Clare, which produced 48 bone whorls, 13 stone ones, and an antler spindle-whorl (Cotter 1999, 71).

Dye production can also be regarded as an indicator for cloth-manufacturing, although the two activities may not have occurred on the same site. Sites dedicated to the extraction of purple dye from dog whelks have been identified by the large numbers of shells found in places such as Dooey, Co. Donegal (Ó Ríordáin & Rynne 1961, 61); and Doonloughan, Co. Sligo (McCormick & Murray 1997:197). Evidence for the production of other forms of dyes has also been recovered on Irish sites, such as woad pods from the raised rath at Deer Park Farms, Co. Antrim (Lynn & McDowell 2011, 520, 584), and madder seeds from a ringfort at Carn, Boho, Co. Fermanagh (Morrison 1953, 53–4). The documentary sources indicate that the red and purple cloth produced by some of these dyes could only have been legally worn by high-status individuals (Kelly 1997, 263).

Non-Ferrous Metal-Working

The evidence for non-ferrous metal-working has recently been reviewed by Craddock (1990) and Comber (2004; 2008, 133-49), and an earlier review of metal-working from monasteries was produced by Ryan (1988). The non-ferrous metals in early medieval Ireland comprised copper-alloy, lead, tin, silver and gold and were almost exclusively used in the production of luxury items. In the early medieval period, copper-alloy was usually in the form of bronze or gunmetal, an alloy of copper, tin and lead (Edwards 1990, 90). Some of the best known early medieval non-ferrous metal objects consisted of copper-alloy pins, brooches, latchets, buckles, strap-ends, rings and studs, as well as bowls, wooden buckets or relics covered in copper-alloy sheets. The ninth century witnessed the beginning of a decline in the Irish fine-metal-working as non-ferrous metal objects became coarser and plainer with amber replacing the use of millefiori and enamel and both filigree and *kerbschnitt* disappearing (Comber 2008, 134-35).

The early documentary sources indicate a clear distinction between blacksmiths and craftsmen involved in working bronze and other precious metals (Scott 1991, 184). The latter are further subdivided into *umaige* (coppersmith) and *cerd* (silversmith) (Kelly 1988, 63). The differentiation between these smiths and blacksmiths is noted on most large settlement sites where there is clear evidence for a physical separation between both activities (Comber 2008, 146-8). For instance, the bronze-working area at Knowth, Co. Meath was found in the southern half of the site and the iron-working evidence was found in the northern portion (Eogan 1977, 73-4); while the northeast quadrant at Dunmisk, Co. Tyrone was used for non-ferrous and glass-working with iron-working undertaken in the southwest area (Ivens 1989, 57-8).

Excavations have revealed that non-ferrous artefacts were found on approximately 50% of rural secular early medieval sites, with about 20% of the sites producing direct evidence for non-ferrous metal working. Bronze and copper-alloy working has been identified at a range of ecclesiastical site, from small western monasteries (e.g. Reask and Illaunloughan), to established important centres such as Armagh, Downpatrick, Clonmacnoise, Nendrum and Movilla. Fine metal-working can be regarded as a consistent feature of the large monasteries (Ryan 1988). Some enclosure sites with settlement and burials, such as Dooey, Co. Donegal (Ó Ríordáin & Rynne 1961, 61-62) also seem to have been important in fine metal-working with evidence for the making of brooches and other objects.

Archaeological evidence for non-ferrous metal-working comes in the form of rare indications of extraction and smelting, processed materials like ingots, artefacts such as crucibles and moulds and rare residues such as slag. In comparison to ironworking, however, relatively few of these sites have been the subject of specialist archaeometallurgical study. Analysis of silver from objects found in Ireland and hoards from Wales, England and Scotland (Kruse & Tate 1992, 295-328) indicated some similarities in chemical composition between these regions and advocated the potential of examining lead isotopes to provenance the source of the silver. While this technique has had huge success in examining the significance of the Ross Island copper mine in Bronze Age metal-working (O' Brien 2004) its potential to identify origins for early medieval metal sources in Ireland is yet to be achieved.

Although a wide variety of objects were made of copper-alloy, there is substantially less evidence for the production of copper-alloy than for iron. The first stage involved sourcing metal ores from their primary contexts. Copper ore has been found at Lagore, Co. Meath (Hencken 1950, 240-41), and lead ore has only been noted at Ardcloon, Co. Mayo (Rynne 1956, 208). Smelting slag containing copper has been found at Cooltubbrid East, Co. Waterford along with a copper smelting hearth which the excavator identified as 'experimental copper-smelting' (Tierney 2008, 208). The recent discovery of two early medieval smelting furnace pits at the Ross Island copper mines is the first evidence for the extraction and processing of copper ores from their source in this period (O'Brien 2004). Three slag deposits were radiocarbon dated to the late sixth/early seventh century. Bronze or copper ingots are found on a number of settlement sites as well as at the monastic sites of Armagh and Clonmacnoise (Ryan 1988, 43; King 2009, 341-43).

Non-ferrous metal-working furnaces can be difficult to interpret when all that survives is a spread of burnt clay and charcoal and it can be easy to confuse this evidence with domestic hearths (Comber 2008, 135). A metal-working area on the west side of Moynagh Lough produced a bowl-shaped furnace associated with five clay-nozzles fragments, 67 crucible sherds, three heating tray fragments, an antler motif and over 600 clay mould fragments and 1kg of slag (Bradley 1993, 77-80). The excavator believed that it was used for *melting* copper rather than *smelting* copper, on the basis that there was very little slag on the site (*ibid*.) though Comber (2008, 138) has cautioned that 'a relatively pure ore does not produce a large amount of slag, while the melting of smelted and refined metal should produce very little'. A furnace at Movilla Abbey, Co. Down may also have been used for *melting* as it was found in association with crucibles and scrap copper alloy (Ivens 1984, 77). There is

also evidence for a 'bronze working furnace' from another ecclesiastical site – Iniscealtra, Co. Limerick (De Paor 1997, 62).

The presence of *tuyère* fragments (the clay end of the bellows) and crucibles can also be used to identify the presence of non-ferrous metal-working furnaces. Estimating the number of crucibles per site is difficult as they are often given in publications as sherds or fragments rather than a minimum number of individual vessels. Therefore the numbers represented by fragments depends on the degree of fragmentation. Most crucibles were made of clay though stone examples are also known. Many crucibles have an internal glassy glaze that was created when the hot contents combined with silicates and alumina in the wall of the vessel cool rapidly (Wallace 2009, 9). Relatively little Irish work has been undertaken on the analysis of these glazes and residues since the initial overview by Moss (1927), although the subject has most recently been summarised (Comber 2004, 33-6; 2008, 139-41). The most extensive study on crucible residue remains is for Lagore (Hencken 1950, 237-9). While a few of the crucibles revealed iron residue but not copper, most tended to show traces of iron along with copper (*ibid*.). Hencken, however, concluded that the traces of iron 'would have come into the crucibles as impurities in the crudely smelted copper' (*ibid*. 239). The use of Scanning Electron Microscopes and X-Ray Fluorescence has allowed more detailed analysis of crucible sherds. Analysis at Coonagh West revealed that the crucible contained copper and tin alloy along with traces of zinc, silver and gold (Wallace 2009, 8); crucibles from Moynagh Lough and Borris, Co. Tipperary both revealed copper alloyed with tin (Wallace & Anguilano 2010a, 22); and significant residues of copper, silver and smaller amounts of gold have been found at Knowth (Barton-Murray & Bayley 2012, 527) and Clonmacnoise (King 2009, 338).

Both stone and clay moulds were used in early medieval Ireland though the latter were more popular and easier to shape than their stone equivalents. Stone moulds were most commonly used to produce bar or oblong-shaped ingots. These were easily carved into a stone block and may have often been manufactured in 'open' stone moulds though bivalve examples are also known. A copper-alloy ingot from Garranes actually fitted into an ingot mould found at the site (Ó Ríordáin 1942, 100, 108-9) and a soapstone ingot mould from High Street, Dublin, contained a matrix for casting Thor's hammer symbols (Ó Ríordáin 1984, 137). Clay moulds were used for producing finer objects such as ringed-pins and penannular brooches and it appears that only bivalve or 'two-piece' clay moulds were used to produce these (Comber 2008, 141).

There is very little archaeological evidence for gold-working in early medieval Ireland and this either comes from ecclesiastical sites (Movilla Abbey and Clonmacnoise) or high-status sites (Moynagh crannog and Clogher). A possible exception is Lowpark, Co. Mayo, where a folded piece of filigree gold was found within a pit and was presumably intended for re-working (Gillespie 2009, 166-167). The arrival of the Vikings in the ninth century brought a massive influx of imported silver into Ireland in the form of objects and coin and bullion hoards (Edwards 1990, 92). Sources of silver of the pre-Viking Age remain to be identified though native ores may have been exploited.
Lead was important for alloying with other metals, although little is known about the sourcing of this metal in the early medieval period. Lead models for objects were found at the crannogs of Lagore and Moylarg (Comber 1997, 107), and small lead bars have been found on a number of sites including Glebe, Co Dublin (Seaver 2011, 150), Ratoath, Co. Meath (Wallace 2010, 304) and Woodstown, Co. Waterford (O'Brien & Russell 2005, 119-22). Tin was also vital as the principal alloy for use with copper in the production of bronze. The mechanics of the sourcing of tin are unknown and it is often thought that the majority of it was imported through contacts with south-western Britain.

Glass, Enamel and Milliefiori-Working:

Evidence for glass-making in early medieval Ireland is extremely limited (Henderson 1988a; 1988b), and glass-workers do not feature in any of the early Irish literary sources, which might suggest either a limited industry or, more likely, the manufacture of glass by craft-workers of other disciplines, such as the fine metalworker (Comber (2008, 131). Evidence for reworking glass, i.e. producing an object by melting scrap glass or cullet (Harden 1956, 151-2), has however been found on a number of predominantly ecclesiastical or high-status sites. It is possible that glass vessels, such as the two complete phials recovered from a seventh-century context at Moynagh Lough (Bourke 1994, 168), were imported to Ireland as 'luxury items' and it was only when they broke over the course of time that they were recycled.

While Irish-manufactured glass has been discovered in the form of studs, beads and artefacts described variously as 'bangles', 'bracelets' or 'armlets', there is little evidence for their production. Glass rods or canes have been found on various sites, and these represent a stage of production before the glass object is finally formed. With the exceptions of Garryduff, Co. Cork (O'Kelly 1963, 72, 77) and Movilla Abbey, Co. Down (Henderson 1984, 98), there is meagre evidence for bead-making; and stud making has been located at Lagore, Co. Meath, where a small amount of blue glass was found in a stud

mould (Hencken 1950, 132), and at Nendrum, Co. Down, where a, now lost, clay mould contained a matrix for either a glass or metal stud (Bourke 2007, 407, 419).

Enamel also circulated in the form of lumps and rods. The enamel was ground into a fine powder with the use of a mortar and pestle and the powder was then fused onto the metal object by firing in a clay crucible or heating tray. A flame directed on the surface of the object would affect an adhesion between the metal and enamel and create a smooth, durable, vitreous coating. Once cooled, the enamel was finished by polishing with an abrasive (Bateson 1981; Harden 1984, 135-6). A stick of opaque-yellow enamel was found at Cathedral Hill, Armagh (Harden 1984, 136) and other blocks of enamel are known from Moynagh Lough (Craddock 1990, 201) and in a stray find between Tara and Kilmessan (*ibid.*). Garranes produced several pieces of decayed enamel and two fragments of crucibles with droplets of red enamel still attached (Ó Ríordáin 1942, 121).

Millefiori was produced by fusing several different coloured glass canes or rods together to form a pattern. These were rolled and drawn out to form a single long thin rod preserving the pattern while they were still hot and pliable. A thin slice was then cut off the end of the rod and was either fused directly into a metal object (similar to enamelling) or was laid in a bed of enamel that was held in position when fused to the metal (Edwards 1990, 93). Rods of millefiori have been found at Lagore, Garranes and Scotch Street, Armagh (Craddock 1990, 202-3). Two fragments of a blue glass cane at Lagore could either indicate the manufacture of millefiori rods though they may have also been used for glass insets or for ornamenting beads (Hencken 1950, 132). A small millefiori rod with a blue and white chequer pattern was also found and confirms that the decoration of metalwork with millefiori was definitely taking place at the site (Edwards 1990, 93). One decorated millefiori rod at Garranes was found *in situ* inside a copper-alloy tube which securely held the glass while slices were cut off (Ó Ríordáin 1942, 120).

Bone, Antler and Horn-Working:

Skeletal materials in the form of bone, antler and horn were widely used in the early medieval period to produce domestic, personal and craft-working objects. The bone- and antler-worker was a lowly individual, warranting an honour price of only a ½ *sét*. The almost despised skills of the comb-maker is described thus by the author of *Bretha Nemed Toísech*: 'three things confer status of the comb-maker: racing a dog in contending for a bone, straightening the horn of a ram by his breadth without fire, chanting on a

dunghill so that he summons (?) on top what there is below of antlers and bones and horns' (Kelly 1988, 63). Items of bone included spindle-whorls, needles, beads, pins, knife handles and motif-pieces; antler was also used for knife handles and combs and evidence for the working of horn comes in the form of drinking horns (Edwards 1990, 83). Bone is a by-product of animal husbandry and was therefore readily available when required but antler tines were gathered when red deer shed their antlers in the woods in the late winter and early spring. The late-eleventh-/twelfth-century deposits from Waterford suggest that antlers may also have been imported into Ireland, since these were from roe deer, a non-native animal (McCormick 1997, 837).
Both bone- and antler-working are frequently found in the same sites and may have been undertaken in conjunction with each other (Edwards 1990, 83). The early literary sources suggest that the worker of skeletal material did not hold a very high social position. *Uraicecht Becc* mentions a craftsperson, identified as a 'wool-comber' by MacNeill (1923), and a 'comb-maker' by Kelly (1988, 63) with an honour price of just half a *sét*. The tools used by these bone- and antler-workers were probably similar to those used in woodworking and included axes and saws for cutting; hammers, knives, draw-knives, punches, chisels, gouges, awls, lathes and drills for effecting the incised or carved decoration and abrasives for the polishing of the completed object.

As bone and antler are organic materials, Comber (2008, 94) has noted that it is difficult to identify craft-working areas due to the relatively few known workshops or concentrations of working debris (unfinished artefacts and waste) within early medieval settlements. She has suggested that bone- or antler-working was not undertaken on a large-scale nor confined to any particular designated areas within a settlement (*ibid.*). At Raystown, Co. Meath, the working of pig fibulae for needles largely took place in one area to the north of the cemetery (Seaver 2010, 35-36); while at Illaunloughan incomplete and finished bone and antler objects were recovered from a midden outside a hut (D) on the southwestern side of the island away from the ecclesiastical structures (Marshall & Walsh 2005, 149-51, 186-7). At Cahercommaun, Hencken (1938, 67-9) noted that most of the evidence for comb-working and a range of bone and antler artefacts (spindle-whorls, spear-heads, pins, points) were found in the northeast quadrant in 'the part of the fort occupied by its owners' though most worked fragment of bone and antler and the primary ironworking features were found in the southwest quadrant area described by the excavator as 'a poor area'.
Just over 33% of excavated sites contained evidence for bone artefacts, and a further 10% had antler objects. Almost 25% of the excavated sites had direct evidence for the manufacture of bone objects, while a further 20 sites had direct indications of antler working. The most common bone and antler

objects comprise pins and bone combs, and a wide diversity of polished and shaped pins, with decorated heads and occasionally decorated shanks, has been noted.

Probably the best recorded objects are bone combs, and a scheme for the different types has been produced (Dunlevy 1988 341-422; Laing 2006, 83-4). A collection of intact antler combs from Lagore (Hencken 1950, 184-90) demonstrates the different types available in pre-Viking Ireland and included a small one-piece, single-sided comb with rounded back and simple ring-and-dot ornament and a number of single- and double-sided composite combs frequently decorated with ring-and-dot motifs or more occasionally complex fret, spiral or interlace designs (Edwards 1990, 84-5). In the Viking Age, Scandinavian types become more prevalent and primarily comprised long single-sided composite combs, sometimes in bone rather than antler.

There is less evidence for ivory-working. A collection of walrus ivory pins (including the butchered skull of a walrus) was found in Dublin at Essex Street West/Lower Exchange Street (Simpson 1999, 26) and walrus skull fragments were found at Fishamble Street (Wallace 1987, 216). Whale-bone objects have also been found on a small number of sites, most recently a whalebone sword handle from Collierstown (O'Hara 2009); a whalebone plaque from the rural Viking site at Cherrywood (Ó Néill 2006); and a perforated whale tooth found at Knowth Site M (Stout & Stout 2008, 64).

Leatherworking:

Leatherworking, like bone-working, was regarded as a low level skill in *Uraicecht Becc*, warranting an honour price of only a ½ *sét* (Kelly 1988, 63). As with other organic-based artefacts, direct evidence for leatherworking in early medieval Ireland is confined to sites with waterlogged deposits. Such evidence largely takes the form of off-cuts (e.g. Neill 2011), although wooden shoe lasts have been found at Lagore, Co. Meath, and Deer Park Farms, Co. Antrim (Earwood 2011). Extracts from the roots of the plant tormentil (*Potentilla erecta*) have been used in the tanning process, and traces of this plant were found at Deer Park Farms (Allison *et al*. 1999). The most striking evidence for leather production on an industrial scale in medieval Ireland comes from Dublin, where a deposit of leather waste (18m x 6m and 1m deep) was discovered in High Street (Anon. 1973, 16). This material dates from the twelfth/thirteenth century, so it may represent post-Norman leatherworking in Dublin. A dump of leather scraps and off-cuts was also found at Insula North, Waterford (McCutcheon & Hurley 1997, 161), again indicating the importance of leatherworking in urban centres. Leatherworking

may have been practiced on some rural sites: discarded shoes, worked scraps of leather and a wooden shoe-last were found at Lagore, while iron leather-scoring tools are known from Lagore and Ballinderry I. Over 250 fragments of leather from the crannóg at Ballinderry II, Co. Offaly (Hencken 1942), indicate that leatherworking on a moderate scale could be undertaken away from the urban centres.

Stone-working:

As one of the most basic raw materials, stone was widely exploited in early medieval Ireland. The earliest sources make no reference to specialised stone-masons, stone-cutters and sculptors, however, the evolution of the *sáer* from primarily describing a carpenter in the earliest, original eighth century texts of *Uraicecht Becc* into a stone mason in later texts and other sources, indicates the increasing importance of the stone sculptor around the turn of the first millennium A.D. (MacLean 1995, 125, 129). While the technical ability was probably available to most people to manufacture simple everyday domestic items, the sculptors and masons who carved the high crosses and supervised the construction of stone structures must have been highly experienced. A range of tools such as stone axes, hammer-stones, iron hammers and wooden mallets used in conjunction with chisels, punches and wedges were part of the stone mason's tool-kit and Comber (2008, 63) has discussed the finds of these tools at early medieval settlement sites. Ornament could also be inscribed on stone monuments such as the carved high crosses, stone lamps and quern stones. Iron dividers were found at Garryduff (O'Kelly 1963, 47) and these may have been used as a form of a compass for achieving this decoration (Comber 2008, 64).

Around half of the excavated early medieval sites have evidence for the use of stone artefacts while around 100 were associated with objects of lignite/shale/jet. Jet, lignite and shale were widely used for the production of early medieval bracelets, rings and pendants. Excavations at Armoy, Co. Antrim produced evidence for a specialised lignite working or dump area (outside) a largely in-filled ecclesiastical enclosure ditch (Nelis *et al*. 2007). The truncated remains of a number of structures were recovered in association with several hundred fragments of shale, entirely comprised of cores or bracelet centres and broken bracelets which related to the final stages of bracelet production. There were no finished pieces and no shale was recovered that was unrelated to the final stage of completion of curated rough-outs.

Whetstones are one of the most common early medieval artefacts and have been recorded on the majority of excavated early medieval domestic sites (O'Connor 1991). These can vary greatly in size with some consisting of narrow pebbles or stones, barely worked but smoothed through use but others were more carefully-shaped, rectangular objects with a perforation at the top to hold a copper-alloy ring for suspension, perhaps at the waist (Edwards 1990, 96). Large numbers of whetstones are known from a small number of excavated sites (O'Connor 1991, 45-6), most notably Cahercommaun, Co. Clare (524).

Amber was used to produce beads, studs and other decorative features on brooches and other metal objects. It appears to have become popular as decorative settings on brooches and other metal artefacts from after the eighth century and replaced the more ornate and intricate polychrome glass studs in this period (Comber 2008, 126). The vast majority of the amber found in Ireland comes from the excavations at Fishamble Street in Dublin – over 4,000 pieces were recovered from workshops in this area (Wallace 1987, 215) – and this may represent the source of much of the rest of the amber found in Ireland. As such, it would be tempting to interpret the presence of amber in Ireland as either evidence for Viking trading, or even as evidence for Hiberno-Norse settlement. However, amber beads have been found on a number of rural sites which may pre-date the arrival of the Vikings. It must, therefore, be assumed that there was some low level importation of amber into Ireland from the Baltic area before A.D. 800 but this may have been accomplished through middle-men in Saxon England.

Porphyry has been found on a number of Irish ecclesiastical sites (Lynn 1984). With the exception of a single piece of red porphyry from Armagh sourced to Egypt, all other examples were green in colour, and were sourced to Greece (*ibid*. 19). Generally, they were found in contexts that post-date A.D. 1000.

Soapstone (steatite) vessels are known from a number of sites at Beginish and Scandinavian Dublin (Wallace 1987, 218); part of a steatite ring was recorded at Dalkey Island promontory fort (Liversage 1968, 117) and the habitation sites at Inishkea North produced soapstone spindle-whorls (Henry 1951, 75). The presence of soapstone vessels, walrus ivory (available only in the Arctic Circle) and amber (Baltic area) indicates that trade was maintained with Scandinavia and the Scottish islands, particularly in the Viking-Age period.

Woodworking

The early legal tracts provide limited information on woodworking from this period. According to these laws a wright (*sáer*) who was 'skilled in church-building *or* mill construction *or* boat building *or* manufacturing articles in yew wood' had an honour-price of 7 *sét*s which was similar to that of a physician or a lower grade judge (Kelly 1998, 52, 57, 61). If he was an expert in all four of these skills, the honour-price of the *sáer* (15 *sét*s) was equal to the highest grade of judge. The ability to build a bridge was regarded as an exceptional skill and commanded an additional honour price of two cows (Kelly 1997, 393). Not all woodworkers, however, were regarded so highly. The chariot maker only commanded an honour-price of two *sét*s while the lathe turner, a maker presumably of wooden bowls, commanded and honour price of only a ½ *sét*.

There is indirect evidence for woodworking in the early medieval period, represented by the presence of woodworking tools, such as axes, saws, gouges, adzes and draw-knives on some Irish sites. As wood is perishable, however, the evidence for early medieval wood-working is largely confined to sites with waterlogged deposits. Thus, there is a clear bias towards crannogs, but some raths with waterlogged ditches have occasionally produced wooden items, and waterlogged urban deposits also have excellent assemblages of wooden objects. Even on these sites, the scale of woodworking activity may be under-represented, as the raw materials and craft-working waste such as discarded worked pieces or wood-chips may not have been recorded during excavation.

Horizontal watermills represent the peak of the wright's craft. These not only required a substantial wood-framed building to hold the millstone suspended above the paddle wheel, they also required a range of wooden chutes, flumes, paddle wheels and shafts or axles to move with the water jets and turn the upper stone of the quern. Horizontal watermill excavations, particularly at Nendrum, Co. Down, and Kilbegly, Co. Roscommon, have revealed the skilled use of axes, adzes, chisels and gouges to make the various elements for the mills (McErlean & Crothers 2007; Jackman, 2007, 2009). Watermill parts have also been found away from the mills, however, most notably at Deer Park Farms, where a wheel hub and paddle were recovered from occupation levels (Lynn & McDowell 2011, fig. 22.12). The carpentry from horizontal water mills is not particularly impressive, consisting mainly of some elementary joints, but the production of the mill machinery is undoubtedly accomplished.

There is abundant evidence from the waterlogged deposits of crannogs for the on-site manufacturing, use and discard of wooden artefacts (Earwood 1993). There is evidence for the carving of wooden tubs, troughs, bowls and domestic equipment (spoons, ladles, dippers), and for the manufacture of coopered vessels (buckets). There is also evidence from sites like Lagore crannog, Co, Meath, in the form of roughouts, finished bowls and waste material for lathe turning (Earwood 1993, 198–200). Several crannogs (including Lagore and Moynagh Lough) have also produced lathe-turning wastes (the wooden 'cores' left after the bowls are complete). This suggests that bowls were being manufactured on-site using pole-lathes that required both some specialist tools and a lathe that could be assembled on site (Earwood 1991–2; 1993). Earwood (1991–2, 154) has noted the similarity between some Irish lathe wooden bowls and imported E-ware pottery, and it is possible that the latter influenced the design of the bowls. While some simple tasks, such as carving a wooden trough for kneading dough, could be done by most people, some woodworking crafts required particular equipment and learned skills. The production of stave-built buckets and the carving of lathe-turned bowls were probably done by those trained at the craft (Earwood 1991–2). In particular, those 'wet-coopered' buckets required to contain liquids (e.g. water, milk, or alcohol) would have had to have been cleft from oak planks and carefully carved and bound with hoops to produce a watertight fit. Bucket stave blanks found at Moynagh Lough suggest that some element of coopering was being carried out on the site (Bradley 1982). At Viking Dublin, there is also abundant evidence for early wood-working and suggestions there too that cooperage and lathe-turning were specialist crafts (Wallace 2005).

Pottery Manufacture:

Pottery manufacture is very restricted in early medieval Ireland, with the exception of the north-east, where there was extensive use of a hand-built coarse pottery known as souterrain ware (so named because it was typically found in souterrains in early excavations). Souterrain ware pots are typically bucket-shaped, with flat-bottoms and straight, flaring or nearly vertical sides. Most show evidence for having been coil-built by hand. Impressions of cut grass and other organic matter on the bases and up along the sides are a characteristic feature of the pottery (Edwards 1990, 73). For the most part, souterrain ware was confined in its distribution to the modern-day counties of Antrim, Down, and northern Co. Louth.

Souterrain ware has been dated from the seventh/eighth century to the twelfth century (Ryan 1973, 626; Edwards 1990, 74), and it has been suggested that there is a stylistic development from the initial plain pot towards increasing decoration in the form of applied cordons, 'apple tart crust' grooves along the rims, or thumb marks (Ryan 1973, 626; Armit 2008, 8). Although souterrain ware has been recovered from the same sites as seventh-century E ware, the two types have yet to be found together in the same contexts. Where stratigraphical contexts are known, the souterrain ware appears to have been deposited at a later date (Armit 2008, 8). A sherd of souterrain ware from a mill in Drumard, Co. Londonderry, appears to pre-date the emplacement of timbers felled in A.D. 782 (Baillie 1986, 106), suggesting that souterrain ware was in use by the late-eighth century. This date is supported by a calibrated radiocarbon date of A.D. 530–780 (UB-2002 1380 ± 65 BP) from the pre-rath B levels at Dunsilly, Co. Antrim, which contained undecorated souterrain ware (McNeill 1991–92, 100–6). The evidence suggests that souterrain ware first appeared in the period from the mid-seventh to the mid-eighth century, with decorated assemblages appearing during the ninth century at the earliest (Armit 2008, 8). Souterrain ware may have originated as a southern expansion of the Hebridean pottery-making tradition during the mid-seventh/eighth-century, with a developed form of souterrain ware spreading from Ulster back to the Hebrides after A.D. 1000 (Armit 2008, 14). It should be acknowledged, however, that this is a very simple, even crude type of pottery and there may be no great diffusion of styles or pottery-making knowledge involved.

The lack of consistency in the fabric may have been 'caused by primitive firing techniques using a clamp or bonfire kiln which usually leaves little trace in the archaeological record' (Edwards 1990, 74); and lumps of burnt clay found in association with souterrain ware, for example at Ballyutoag and Ballintoy, Co. Antrim, and Nendrum, Co. Down, is likely to be a by-product of manufacture on a particular site (Comber 2008, 81). The best candidate for a kiln for the manufacture of souterrain ware is at Ballintoy Cave, Co. Antrim (Jackson 1934, 107; Plate 6). A collapsed stone-built flue was found in the same level as souterrain ware and some 'baked clay' with thumb prints, although if there was an associated bowl this does not appear to have survived. Edwards regards the identification of this structure as a pottery kiln as 'doubtful' (1990, 74); and it is equally unlikely that the kilns discussed by Comber (2008, 83) at Reask, Co. Kerry, Ballycatteen, Co. Cork, and Rathbeg, Co Antrim were used for pottery manufacture.

Although souterrain ware sherds dominate early medieval native pottery finds, there is evidence that other locally-made pottery was being used during

this period. A single piece of dark-red pottery with grit inclusions identified at Ballycatteen, Co. Cork (Ó Ríordáin & Hartnett 1943, 37), does not appear to match the other imported types found there because it is not wheel-thrown; and similarly, sherds of 'a coil-built pottery vessel of poorly fired white clay' (Bradley 1991, 18) were found at Moynagh Lough crannog, Co. Meath. A single sherd of black coarse pottery from an un-stratified context at Lagore crannóg, Co. Meath, also differed from the imported pottery found on the site (Hencken 1950, 126). The largest assemblage of putative native pottery from outside the souterrain ware area is from Reask, Co. Kerry. Around 100 sherds were recovered. These were subdivided into two groups: a light, porous, grass-tempered type; and a heavier type containing grits (Fanning 1981, 112). Both pottery types are different from the souterrain ware typical of north-east Ireland, and, as with the finds from Ballycatteen and Lagore, further petrological work needs to be done to identify the provenance of these, although there is a strong possibility that they result from the particularities of local clay sources.

Conclusion

Over 3,500 excavations have been conducted on early medieval Irish sites, with almost 3,000 taking place in the first decade of the twenty-first century. Increasingly precise radiocarbon dates from these excavations have greatly increased our ability to identify chronological or regional changes. This approach has already been applied to early medieval farming practises (McCormick *et al*. 2011), where regional patterns have been noted in both livestock and arable farming. Farming, however, is more amenable to this method than industrial activity in Ireland. Especially with the advent of accelerator mass spectrometry, radiocarbon dates may be obtained from animal bone collagen and seeds, both of which necessarily come from short-lived events, and which can therefore produce a reliable date range. In contrast radiocarbon dates for industrial sites, such as kilns or hearths, generally rely on dated charcoal. Charcoal is an imprecise dating material, due to the 'old-wood effect' (*sensu* Warner 1985), but equally, unlike bone or seeds which refer to a single event, for example the death of the animal, charcoal from a kiln may refer to one of a large number of events, i.e. the use and reuse of the kiln. Typologies of material culture could be used to identify regional or chronological changes in industrial production. The Irish material, however, rarely lends itself to such use. While there are typologies of bone combs (e.g. Dunlevy 1988) or ringed pins (e.g. Fanning 1994), these tend to be dominated by objects produced in the Viking towns, and are thus of limited use in identifying change in the wider rural economy.

It is possible, however, to produce a broad chronological trend based on the farming radiocarbon dates, and using the site occupation radiocarbon dates as a proxy for the industrial activity. This will be considered in three bicentennial bands – A.D. 400-600; 600-800; 800-1000 – and a smaller band of 1000-1150.

A.D. 400-600:

These two centuries contain the traditional arrival of Christianity in Ireland with Patrick in A.D. 432, and also coincide with the emergence of the various early medieval site types. These centuries also produce evidence for external contact in the form of fragments of East Mediterranean and North African pottery amphorae (see Chapter 3).

Livestock farming in these centuries is dominated by cattle (just over 40% MNI), with sheep and pigs roughly equivalent at around 25%. Although there are slight variations, this general pattern seems to be repeated across the island. Arable farming seems to be focused on barley production, with over 60% of sites from this time dominated by this cereal, as opposed to oats, which dominated less than half this number.

Between 15% and 20% of the radiocarbon dates from sites that have evidence for industrial activities fall within this period. The most obvious outlier to this is bone-working, where just over 25% of the radiocarbon dates from sites which have produced evidence for this industrial activity fall within these two centuries.

A.D. 600-800:

This period constitutes the main phase of early medieval occupation and construction in Ireland. The great legal tracts discussed earlier all belong to these centuries, and thus this is the best described period in early medieval Ireland. As with the previous period, there is also evidence for external contact, largely composed of sherds of Gaulish/Frankish pottery (see below for further details).

Farming in these centuries is very similar to the previous period. Livestock farming is still dominated by cattle (just over 40% MNI), with sheep and pigs roughly equivalent at around 25%. Again this general pattern seems to be repeated across the island. This seems to reflect the property qualifications desirable for farmers in the various law tracts. Arable farming is still

dominated by barely production, but there is the indication that oat-farming increased in the latter part of this period.

This period represents the bulk of the radiocarbon dates from sites with industrial activity. Between 50% and 60% of these dates fall within these centuries, and activity seems to be well represented across all forms of industry.

A.D. 800-1000:

This period is possibly best identified with the arrival of the Vikings. While there is a potential to overstress the importance of these events, the establishment of large, permanent urban settlements at Dublin, Waterford, Cork and Limerick must have had a large impact on the politico-economy of the immediate hinterland. Collation of the radiocarbon dates strongly suggests that the typical early medieval site types go out of use during this period (e.g. Kerr & McCormick 2014).

Farming in these centuries seems to go through a change from the previous centuries. Livestock farming is still dominated by cattle, but this has now fallen below 40% MNI. While sheep still make up just over 20% of the overall total, pigs now comprise almost 30%. There is, however, suggestion of a more regional pattern, with sheep being the second most dominant species in Ulster during these centuries. It seems that the, arbitrary, livestock requirements of the law tracts has now been replaced by a farming practise that is best suited to the local environment. This seems to be mirrored in arable farming, where barley now dominates on just over 40% of the sites, and oats on just under 40%. Rye also seems to become more dominant at this time. This may be linked to climatic change, but there are also noticeable regional trends, for example oats make up the dominant cereal type in Ulster (with over 70%, although based on a very small sample of seven sites), and, to a lesser extent, in Munster (with 50% of eight sites).

Between 20% and 25% of the radiocarbon dates from sites that have evidence for industrial activities fall within this period. The most obvious outlier to this is bone-working, where under 15% of the radiocarbon dates from sites which have produced evidence for this industrial activity fall within these two centuries. The locations of crafty-working activity, especially in eastern Ireland, appears to be increasingly concentrated in the emerging Viking towns, with significantly less evidence for industrial activity on individual domestic sites.

A.D. 1000-1150:

This represents the final period of early medieval Ireland before the arrival of the Anglo-Normans. The radiocarbon dates suggest that very few settlements have been identified from this period (e.g. Kerr & McCormick 2014). This is reflected in the evidence relating to economic activity from these centuries. Evidence for livestock farming is limited to Leinster, and this shows continuity from all the previous time periods. The regional patterns identified in Ulster, and to a lesser extent in Connacht, cannot be verified because of lack of dated material. There is similar issue with the arable evidence.

The lack of dated archaeological evidence from this period also causes difficulties when trying to deal with industrial activity. This period includes less than 5% of the radiocarbon dates from sites that have evidence for bone-, bronze- and glass-working; around 7% of the radiocarbon dates from sites that have evidence for textile-making fall within this period; and about 10% of these have evidence for iron- and pottery-making. In comparison, there is substantial evidence for industrial activities being practised in the Viking urban centres.

Excavation on sites from the early medieval period in Ireland have shown a great spread of productive activity, whether that is pastoral farming, arable farming or craft-working. These activities have often been interpreted as being predominantly based in a self-reliant and self-sufficient economic structure. The next chapter, however, will examine archaeological and documentary evidence for the existence of a form of putative trade networks existing both between Ireland and the wider world, but also within Ireland itself.

Chapter 3:

Economic Theory

Introduction:

The development of trading networks in post-Roman Europe has been the subject of much study among historians and archaeologists. Many successful European towns owe their existence to these early medieval trade networks. Commerce revived moribund Imperial Roman cities (e.g. Tours), and new towns, such as Southampton (Hamwic), developed on the sites of *emporia* (trading posts).

Much of the work on the early medieval economy can be divided into three broad maritime zones - the Mediterranean Sea region (e.g. McCormick 2001; Wickham 2005; Gelichi & Hodges 2012); the North Sea region (e.g. Hodges 1989; Naylor 2012; Thomas 2012); and the Baltic Sea region (e.g. Callmer 2007; Bogucki 2010). Although Viking commerce in the Irish Sea region has been broadly discussed (e.g. Griffiths 2010), studies on the wider early medieval Irish economy tend to focus predominantly on agricultural activity (e.g. McCormick & Murray 2007).

Substantavism vs Formalism

The theoretical discussions on the emergence of the economy fall into two broad camps – the 'Substantavists' or 'Primitivists' and the 'Formalists' or 'Modernists'. The Marxist school is sometimes included as a third camp (e.g. Dale 2010, 127-32), but it is more often seen as a subset of the Substantavist argument and will be treated as such here.

An early example of Substantavist thinking can be found in Karl Bücher's *Die Entstehung der Volkswirtschaft*. In this work he declaims that, until the year A.D. 1000, the economy never passed beyond the stage of closed domestic economy (*geschlossene Houswirtschaft*) (1893, 345-6) where production was solely for one's own needs, involving no exchange between the household units. The concept of isolated, self-sufficient households (or *οικος*) existing cheek-by-jowl in the crowded cities of Classical Athens or Rome, was clearly an strawman fallacy, and was rapidly debunked by Edouard Meyer's 1895 talk '*Die wirtschafflichen Entwicklung des Altertums*' (1924). Nevertheless Bücher's

work indicated that it was not necessarily valid to apply modern concepts of economic society to earlier time periods.

This 'Otherness' (*sensu* Moreland 2000, 3) of early societies forms a core aspect to the Substantavist theory, which draws on the works of cultural anthropologists, such as Bronisław Malinowski or Marcel Mauss. Malinowski's work among the Trobriand Islanders of Western Micronesia in the 1910s (e.g. Malinowski 1920; 1922) and Mauss' *Essai sur le don* (1924) [The Gift (1954)] were highly in 'the outstanding discovery of recent historical and anthropological research' which showed that 'man's economy, as a rule, is submerged in his social relationships' (Polanyi 1957, 46). This concept was further supported by Paul Bohannon's work among the Tiv of southern Nigeria (Bohannon 1955).

These anthropological studies all have in common the concept that gifts are not 'free'. 'The performance of all acts of exchange as free gifts that are expected to be reciprocated though not necessarily by the same individuals…should in itself explain the absence of the notion of gain or even of wealth other than that consisting of objects traditionally enhancing social prestige' (Polanyi 1957, 47). In this theory the exchange of rare and exotic goods is tied to attaining and maintaining high status within society, and it is this rationale that has been suggested as a basis for the emergence of external trade (e.g. Grierson 1959).

The Substantavist position may be summarised by the statement that 'all economic systems known to us up to the end of feudalism in Western Europe were organised either on the principles of reciprocity or redistribution, or householding, or some combination of the three' (Polanyi 1957, 54-5).

In contradistinction to the 'Substantavists/Primitivists' are the 'Formalists' (Polanyi 1944) or 'Modernists' (Pearson 1957). These draw on a long history of liberal economic theory, such as Adam Smith and David Ricardo. While the Substantavists accentuate the role of society and status in creating *Homo sociologicus* (or *H. mass-psychologicus*) (Dale 2010, 97), the Formalists focus on *Homo economicus*, 'a being who desires to possess wealth, and who is capable of judging the comparative efficacy of means for obtaining that end' (Mill 1836; see Persky 1995 for evolutionary etymology of this term). This theory believes that primitive economies may be analysed by the methods of contemporary micro-economics (Hughes 1989, 14). Moreland (2000, 3) describes this school of thought as emphasising the 'Same', i.e. they hold the belief that earlier economies are simply less complex versions of modern economies. As such, he sees this theoretical group as fulfilling a 'desire to

provide a precocious early development for present national economies' (*ibid*.).

When dealing with early medieval economies, the works of Henri Pirenne (1925), a Belgian economic historian, are highly influential. These focused on the emergence of commercial communities in the Frankish empire, especially in the aftermath of the Muslim conquests of north Africa and the closure of the old Mediterranean trade routes. While his understanding of the chronology of events has subsequently been seen to be faulty (e.g. North & Thomas 1973, 25), the application of modern economic theories to medieval societies is still seen as a valid approach. While Marxist thought identifies technological change as the 'disequilibrating force from which all else flowed' (*ibid*.), these theories are founded in the assumption that 'a growing population created the basis for trade; the resulting expansion of the market economy caused the medieval economy to react, if slowly, precisely in the manner Adam Smith would have predicted' (*ibid*. 1973, 26). Such interpretations, however, are highly influenced by Western Europe feudalism. In contrast to the regimented feudal structure of the later middle ages, early medieval Europe is often depicted as being composed of 'small, isolated settlements…surrounded by wilderness' (*ibid*. 11). It is this 'wilderness' that allows for population expansion, and, ultimately to the establishment and development of trading networks driven by a growing populace.

Critique:

These two theoretical groups are in direct conflict. To the Formalists, the Substantavists are embedded in the nineteenth-century concept of the 'noble savage', while the Substantavists counter by highlighting the 'economistic fallacy' of the primitive man who only acts through the motive of measurable profit (Hodges 1989, 14).

There are many divergent points between the two theoretical groups, but it could be argued that the fundamental difference revolves around the nature of exchange. In the Formalist theory there is an exchange for value, i.e. an item is bought (whether by coin or barter), and is owned outright. This is a form of exchange which is replicated millions of times every day in the modern world. There are, of course, variations to the exchange for value. A 'money-back guarantee' or 'warranty' could be argued to create an obligation for a period of set time on the behalf of the vendor. Such forms of exchange are supported by a combination of self-interest (e.g. goodwill), and state regulation. There are other examples, such as the 'luck-penny', which have no legal standing and instead are based on an unspoken convention. This is the

practice, predominantly in farming communities but also in various cash-based deals, of the vendor handing back a small sum of money (or monetary equivalent) to the purchaser. In all these cases, however, the purchaser retains complete ownership of the purchase, and is not beholden to the vendor for any future obligations.

Many anthropological examples, however, show that future obligations are implicit in the transfer of an item from one person to another. These are largely covered by redistribution or/and reciprocity. Many Substantavist theories, however, refer to a relatively small number of anthropological examples – predominantly Malinowski's work on the Trobriand Islanders (1922); Bohannon's work on the Tiv (1955); and Polanyi's work on Dahomey (1966). This may have led to a tendency to cherry-pick anthropological examples to suit the preferred theory. More recent anthropological work, for example, has questioned the assumption that gift giving in primitive cultures was *always* accompanied by external obligations. Laidlaw (2000) provides the example of *dan* (alms-giving) in the Jain culture as a form of gift-giving that is *free* of reciprocal obligations or threats of moral turpitude, largely because the *dan* is effectively anonymous.

Archaeological Economic Models for 'Dark Age' Europe:

It seems that, for now, the Formalist theory is dominant (Naylor 2012, 238). Indeed, it has been stated that, from the 1980s onwards, Formalists have felt 'not the slightest need to refer to the other's argument' (Dale 2010, 132). It is in this post-1980s academic environment that we find the first serious recent application of economic theories to early medieval Europe (Hodges 1982). Thirty years later, Richard Hodges (2012, 209-10) was able to identify three economic models which have been developed to describe the rise of urbanism in post-Roman Europe:-

(1): *The trade model*. This is the original theory expounded by Hodges (1982; 1989), and as such is the most critiqued. The theory stresses the fifth-/sixth-century trade of small-scale prestige goods from the Mediterranean into northern Europe, presumably to the exchanged for bulk goods such as slaves and leather (Hodges 1989, 33). This trade was manipulated by the leaders of tribal societies in order to accumulate wealth through gift exchange of prestige goods (rather than redistribute the wealth). The ultimate result of this competition between neighbouring lords was a more centralised authority.

This theory has been criticised both for being too market-orientated, and not market-orientated enough. In the mid-1980s Hodges was accused of ignoring 'recent anthropological works on exchange in pre-market societies [which] show that several levels of exchange existed and did not mix' (Astill 1985, 223). More recent archaeological investigations, however, suggests that royal control may have been less influential than previously thought, and 'it seems more likely that this was limited to the levying of tolls by the local elite' (Naylor 2012, 239).

(2): *The peasant mode of production*. This theory is based on a number of criteria, including relative aristocratic weakness, peasant autonomy, and increased regionalism (Wickham 2005). In these systems status was impermanent and depended on consent and reciprocal gift-giving (*ibid*. 571), and, as such, there was little need to accumulate surpluses. Wickham's hypothesis draws explicitly on Substantavist theory, stressing the 'Otherness' of the economic systems that existed outside the old Roman Empire, or which emerged from it (*ibid*. 695). He recognises regional, sub-regional and micro-regional variations in the socio-political power structures of contemporary Europe and uses the analogy of leopard spots to envisage areas of aristocratic control in regions that largely followed the 'peasant mode of production'. While stressing the relative autonomy and power of the peasantry between A.D. 400-800, however, Wickham admits that 'in the context of exchange, it was aristocratic demand that mattered most' (*ibid*. 823).
Although Wickham's work covers the whole of Western Europe from A.D. 400-800, it is predominantly grounded in the Mediterranean Sea region. More detailed studies of contemporary peasant-based societies in northern Europe have shown that they did not adopt Wickham's peasant mode of production. For example, it has been argued that societies existed 'in which the early-medieval peasant bought and sold land, paid tolls and dues and participated in markets – all through the use of coinage' (Moreland 2000, 3). The idea of an economically-powerful coin-using peasantry seems to be supported by metal-detector finds of 'Dark Age' coins in areas of eastern England that were remote from the trading emporia on the coast. These finds mean that 'earlier models, heavily influenced by Substantivist economic anthropology, have been seriously challenged, and as a result, market elements in the economy can be clearly defined' (Naylor 2012, 238).

(3): *The entrepreneur model*. Due to their reduced capacity to control the transport of goods, political elites are seen as 'passive profiteers' in this model. The initiators and active operators of the *emporia* were those individuals who could control and organise the shipments, i.e. the merchants, traders and speculators (Callmer 2007).

Both Hodges' and Wickham's models predominantly focus on areas which had, at some point, been part of the wider Roman trading networks. Thus there is an underlying element of continuity or a desire to re-establish trade into a given region. Callmer's model, based on the Scandinavian emporia of Northern Europe, seems to have greater relevance to early medieval Ireland.

Conclusion:

The various theories and economic models all tend to ignore, or down-play, one of the most important aspects of the trading cycle – production (Moreland 2000, 18). Early medieval society is still largely seen as being predominantly self-sufficient (the ghost of Bücher's *oἰκος*), and even where there are examples of industrial activity (e.g. the large number of sites with iron-working in Ireland), these are generally interpreted within this broader framework. It is, however, abundantly clear that, even in a barter economy, items must be 'produced' in order to be exchanged. This can be as simple as breeding excess livestock, or specialising in certain animals (for a discussion on the varieties of dogs mentioned in early medieval Irish literature see Kelly 1997, 114-20), or as complex as producing pieces of fine metal-work. It also entails a certain degree of organisation to exist in the agricultural hinterland to ensure the transportation of bulky products such as grain or slaves to or from the trading site. Examples of these will be discussed in greater depth in the next chapter.

Chapter 4:

Evidence for 'Trade' in Early Medieval Ireland

It seems clear from the archaeological evidence and the documentary sources that early medieval Ireland was not a monolithic socio-economic entity. Regional, chronological and functional variations have been noted in Chapter 2, and it is clear that some mechanism must have existed by which goods and services could be moved around the island. This may be described as 'trade' or 'commerce', but, as is clear from the previous chapter, modern economic concepts may not be strictly applicable to early medieval society. It is also obvious from the archaeological finds that Ireland did not sit outside contemporary European trade routes. Coastal emporia are known from the sixth/seventh centuries, and trading ports were well-established during the Viking era. The Dublin Bay islands of Lambay and Dalkey (Liversage 1968; Doyle 1998), and Dunnyneill Island in Strangford Lough (McCormick & Macdonald 2004), played a substantial role in the import trade in the pre-Viking period. Based on the distribution of imported pottery, it is highly likely that another, un-located, *emporium* existed in the vicinity of Cork harbour, and it is possible that the area around Bettystown or Ninch, both on the Irish Sea shore in Co. Meath, was also the focus of international trade.

These Irish sites may be compared to contemporary *emporia* across northern Europe, such as the Anglo-Saxon *wics*. It has been suggested that the *wics* were established by the local aristocracy, largely to facilitate the importation of exotic goods that could be used to develop and extend their prestige (e.g. Hodges 1989). The Irish sites have been generally interpreted within this paradigm. While Doherty (1980) favours the model of the 'monastic town' with a subsidiary coastal port, Valante (1998) draws on the Anglo-Saxon model and suggests the *emporia* were subject to secular rulers. The archaeofaunal assemblages from Anglo-Saxon sites are dominated by older animals (e.g. Naylor 2012). A similar 'urban' slaughter pattern was found at Dunnyneill Island where 80%+ of the seventh-/eighth-century cattle bone assemblage came from animals older than two years old (Beglane 2005). When they were first established, therefore, these sites all appeared to produce similar 'urban', or at least 'consumer', patterns. There are, however, two significant differences between the Irish *emporia* and the Anglo-Saxon *wics*. While many of the English sites developed into successful medieval

towns, for example Ipswich, Norwich, and Hamwic (Southampton), the excavated Irish examples quite clearly failed to do so. The failure of the Irish sites to continue to develop has been taken to indicate that there was 'insufficient economic or social capacity to sustain a major trading centre' (Doyle 2009, 35).

The second significant difference between the Irish emporia and the Anglo-Saxon *wics* relates to the positioning of the sites. The Anglo-Saxon sites 'were not randomly located but rather were situated at strategic points such as junctions on communication routes and on boundaries between environmental zones' (Naylor 2012, 239). While similar criteria could be applied to the location of the Irish emporia, it is equally clear that these sites were often placed on islands that are physically isolated from the mainland. This physical isolation may have played a large factor in explaining why the Irish sites did not continue to develop into medieval commercial centres. The location of the Irish emporia may also have been an attempt to avoid local political authority. An early medieval annalistic reference to a royal encounter on *Inis na Righ*, an island off the north Dublin coast, is described as being usefully 'neither sea nor land' (O'Sullivan & Breen 2007, 154) and thus capable of being used for negotiating political agreements.

Following the Scandinavian entrepreneurial model suggested by Callmer (2007), it is possible that the Irish emporia were established and maintained by merchant-venturers, perhaps acting in co-operation with local elites or the church (O'Sullivan & Breen 2007, 119). In this interpretation the local magnates would have profited from trade tariffs and gifts/bribes of exotic imports, but would not have dictated the nature of trade, and could not have enforced its continuation. The main problem with definitively applying Callmer's model to Ireland is that the emporia established under his model show evidence for allochthonous building types and burial practices brought in by the traders (Callmer 2007, 241). There is, however, very little evidence for building types from any of the Irish emporia, and the presumed similarity in burial customs between Ireland and the putative trading partners render such distinctions moot. Isotopic analysis of a skeleton from Bettystown, Co. Meath suggests that the individual may have come from North Africa or southern (Wilson in www.mappingdeath.ie), and analyses of other skeletons from this area showed that they came from Britain, Scandinavia or continental Europe (*ibid.*). It is possible that these represent the remains of trading communities, but equally they may be the bodies of slaves or putative colonists.

While the early medieval Irish emporia may not have survived beyond the arrival of the Vikings, and it is possible that these events were connected, it is obvious that 'trade' of some form, both import and export, was carried on in the existing rural 'subsistence economy'. It is equally clear that a range of materials was traded at these sites. The theories advocated by Hodges (1989) and Wickham (2005) focus on small, high value imports, such as wine or jewellery, which were traded with the local aristocracies. Where there are imports, most noticeably represented in the archaeological record by exotic pottery, it is fair to assume that there would have been reciprocal exports. Archaeological evidence and contemporary literary evidence predominantly focus on the movement of exotic goods, particular pottery, glass and imported metalwork. This is not a peculiarly Irish phenomenon, however, and Wickham (2005, 701) notes that, of the 32 pages dedicated by Dietrich Claude (1969) to trade in the western Mediterranean, cloth and linen get one page; iron gets 15 lines; 'but spices, silk and brocade, gold and jewels, and marble together get thirteen pages'.

Imports:

Wine:

The system of early medieval Irish imports/exports is still implicitly modelled on the works of H. F. Zimmer (1909). These identified the wine trade as the prime motivator for exchange in Ireland during the latter half of the first millennium. Archaeological finds of sixth-/seventh-century north African and east Mediterranean pottery, and seventh-/eighth-century Gaulish or Frankish pottery dated to the (e.g. Campbell 2007; Doyle 2009; Kelly 2008; 2010) seem to corroborate this theory. Wine is a fundamental element in the Eucharist, and thus it is unlikely that the end date for the importation of E ware pottery marked the cessation of the wine trade. It is therefore assumed that wine was subsequently imported in wooden casks without attendant paraphernalia (Wooding 1996). These have left no trace, and so the discussion of the archaeology of the early medieval wine trade in Ireland is almost entirely focused on the period between *c.* A.D. 500 and A.D. 800.

The change of trade focus from the Mediterranean to north-west Europe has been recognised in other European contexts, most famously by Henri Pirenne (1925). It is possible that Ireland was the ultimate destination of wine trader's ships sailing from Tyre or Carthage, but these Mediterranean ships would have called at numerous ports *en route* and may have only arrived in Ireland with a small proportion of the original cargo. These Mediterranean goods may also have arrived in Ireland after having passed through numerous different

owners. In this scenario Ship A arrives in Port A and sells/exchanges the wine; Ship B takes some of these amphorae to Port B where they are traded on; and so on until eventually one or two amphora of Levantine or African wine arrives in Ireland. It is highly possible, under this scenario, that the same trader could be responsible for the importation of both Mediterranean and Frankish wine into Ireland.

Olive Oil:

Wine is not the only import trade for which there is documentary and/or archaeological evidence. Thomas (1959, 92) has suggested that the globular LR1 amphorae (Bii), a product probably made in southeast Asia Minor and/or Cyprus (Empereur & Picon 1989; Doyle 2009, 19-20), were used for olive oil containers. It has been argued that LR2 (Bi) amphorae, which have a Peloponnesian/Aegean origin (Megaw & Jones 1983; Munn 1985; Vroom 2003, 143), and LR2 amphorae were used to transport both wine and olive oil (Karagiorgou 2001, 148-49; Decker 2001, 80). This is based partly on the results of the excavation of the late Roman shipwreck off Yassiada island which showed that some of the amphorae recovered had evidence for being used to carry various materials at different times (Bass & van Doorninck 1982).

Olive oils were used in baptisms, inaugurations and other liturgical rites, and as such it would be expected that they were of almost equal value to the Church as wine. Nevertheless it appears that the Irish church adapted its liturgies so that such oils were not needed, for example, in a letter to Toirdelbach Úa Bríain in 1074, Lanfranc, Archbishop of Canterbury, criticises the Irish practice of baptising children without chrismation (Ó Carragaín 2010, 206).

Glass:

Complete imported glass vessels have been found, for example two complete glass phials were recovered from a seventh-century context at Moynagh Lough, Co. Meath (Bourke 1994, 168) and a similar phial was recovered from an undated context in a souterrain at Mullaroe, Co. Sligo (Harden 1956, 154). It is possible that broken sherds of glass that have been found, may actually represent cullet (i.e. broken bits of glass) imported for re-working in Ireland. There is chemical evidence from at least eleven sites in Ireland to show that imported broken glass was melted and reworked into 'glass bosses, millefiori rods, cables and beads' (Henderson & Ivens 1992, 57). Euan Campbell (2007) has identified glass sherds from the 'Germanic tradition' (Group B) and the

'Atlantic tradition' (Group C), suggesting importation of items from a wide area.

Salt:

Although salt is mentioned in the early eighth-century *Críth Gablach* (Binchy 1941), there is no evidence for native salt production prior to the late twelfth century, and all Irish place-names associated with salt production are ultimately English in derivation (Scott 1981, 115-16). An example of one of the earliest references to 'salt pans' in Ireland is found in the *Calendar of Documents Relating to Ireland* for June 1258, where a land dispute is mentioned between John de Verdon and the Abbot of Mellifont over 'three carucates of land in Mulygadaveran and Thulachalyni, and five carucates excepting three acres used in salt works' (Sweetman 1877, 95).
Noirmoutier, the *emporium* at the mouth of the Loire River, was well-known for its salt pans, and 'Baiesalt' was widely distributed along the Loire valley and the interior of the Frankish empire (Hodges 1989, 128). This emporium appears to have been the centre for the Irish trade to continental Europe (see exported goods below), and as such it would be highly unlikely that trading ships would return to Ireland without a cargo of salt.

Grain:

Imports into Ireland during the early medieval period have largely been seen as being small-scale, high value products which were often not otherwise available. The '*Letter to Waldebert and Bobolenus*', which appears at the start of the '*Life of Abbot Columbanus and His Disciples*' (Krusch 1902, 97), however, mentions a cargo of: 'one hundred measures [*modii*] of wine, two hundred of grain [*frumentum*], and one hundred of beer' being shipped from Nantes, in northwest France, to Ireland. This shipment was as a parting gift for Columbanus, and has been interpreted as implying that wheat and beer were regularly exported to Ireland from Gaul in the seventh century (Doehaerd 1978, 153; Doherty 1980, 77). The fact that beer was imported into Ireland from Gaul is rather intriguing, since 'Columban[us] certainly introduced its use throughout what is now France' (Nelson 2005, 93).

Based on the conversion of one *modius* into approximately 8.75 litres (Smith 1851), this equates as 3.5 metric tonnes of imports. Wine and beer, however, should not be seen as being mutually exclusive commodities, i.e. wine was for the upper class and beer for the lower classes. Beer was seen as being a hallmark of a good noble or kingly house, and there are whole sections of law tracts devoted to malt and beer-making (e.g. Kelly 1997, 245-7). If the grain

(*frumentum*) was wheat, then this strengthens the impression that this was a high status gift, since *cruithnecht* (bread wheat) is given as the most valuable of the grains in *Bretha Déin Chécht* (*ibid*. 219-20). Ireland was completely rural at this time, with the possible exception of the larger monastic sites, and there is copious evidence that cereals were being grown at this time. This makes the importation of bulk cargoes of grains rather interesting. It is possible that the cereal was being brought in for a specific purpose, for example beer-making, because the local product was not of high enough quality. An alternative interpretation is that it was brought in to augment the local diet, which raises the shocking suggestion that Ireland was not self-sufficient in foodstuffs at this time. Without documentary sources grain imports would likely never have been identified, since the assumption is that all cereals are local. Regardless of the purpose of the grain imports, it provides a stark contrast to the small, high value products which are often seen as constituting the mass of the imports at this time. The recognition of imports of bulk goods also pose problems about how these items were subsequently moved on from the original point of entry.

Exports

While there is a degree of recognition of imported goods, what is less well understood is the nature of goods being exported in exchange. Discussion of these goods often refers back to Classical authors, such as Strabo (Jones 1969, 255), who wrote of 'hides, slaves and hunting dogs' being the prime exports of Britain and Ireland. This general statement has been widely applied to the early medieval period (e.g. Hodges 1989, 33), although, with a possible change of focus: 'over the centuries it was undoubtedly slaves which were the most important merchandise in this trade' (Doehaerd 1978, 200). There are major difficulties in identifying Irish exports from the early medieval period. The majority of the exports are perishable, i.e. hides and slaves, and thus unlikely to leave identified remains, and any other more durable export is, by definition, located in another jurisdiction.

Example 1: Slaves

The institution of slavery fulfils two economic ends – firstly the labour of the slaves can be put toward some productive purpose; and secondly the slaves themselves are a fungible asset. Slavery is highly important in early medieval Ireland, and the legal tracts are replete with references to slaves (e.g. Patterson 1994 *passim*; Kelly 1997, 438-40). This importance is underlined by the fact that '*cumal*', the term for a female slave, is taken as a standard value of worth, and as a land unit (see Kelly 1997, 591-2 for discussion).

Slavery, from any era and of any form, is a naturally contentious subject, and this may explain why attempts have been made by later historians to portray slaveholding as something 'alien to the Irish way' (Ó Croínín 1995, 268-9). As such, the bulk of the research on slavery in Ireland tends to focus on the Viking slave trade (e.g. Holm 1986), while the origin, role and ultimate fate of slaves in pre-Viking Ireland is less well understood. This attitude to slavery in Ireland is surprising, not only because of the legal references already referred to, but also because most school children in Ireland know that their patron saint was captured in a slaving raid and served his early life in Ireland as a farm slave. Indeed one of the few authenticated works by St Patrick, the '*Letter to the Soldiers of Coroticus*', explicitly condemns those who practise slavery: 'Far from the love of God is a man who hands over Christians to the Picts and Scots' (Hanson 1971). There is little, if any, unequivocal archaeological evidence for slavery in Ireland. Two iron collars from Lagore, Co. Meath (Hencken 1950, 115-17) although potentially of Anglo-Saxon make (Scott 1978), share physical similarities to a slave collar from Staré Zámky, Czech Republic (McCormick 2001, 742-43). These items have been interpreted as collars for large dogs (Scott 1978, 228-9), yet this reinterpretation has subsequently been rejected as 'anachronistic and misleading' and belonging to a tradition of revisionist attempts to Bowdlerise unsettling aspects of earlier medieval European societies (Wyatt 2009, 7). Other possible slave chains and shackles have been identified at Knowth, Co. Meath; Oldgrange, Co. Kildare; Corcreevy, Co. Tyrone; Lough Sheelin, Co. Cavan; and Coagh, Co. Sligo (Barton 2000, 22). These appear similar to other contemporary slaving artefacts from central Europe, such as the slave shackle from Krvina, Slovenia (McCormick 2001, 742-43).

The documentary sources tend to focus on two main ways in which slavery was maintained in Ireland – raiding and trading. Interestingly there is little, if any, discussion on 'slave farming', i.e. the production of generations of slaves from previous slaves. As the example of Patrick shows, raids by sea-borne slavers were a risk for any maritime community. This was still a danger into relatively modern times, for example the 1631 'Sack of Baltimore', Co. Cork that removed the inhabitants of the town to North Africa (Ekin 2008). Raids could also be carried out overland, and there are examples in the Irish annals of the powerful over-kings bringing back hostages (*giallnae*) from enemy territory from the eighth century onwards (e.g. AU 720; AU 778). There seems, however, to have been a change in the nature of warfare in Ireland in the tenth and eleventh centuries, which was accompanied by an intensification in slave-taking. Holm (1986, 335-38) notes that hundreds or even thousands of captives were taken by, firstly the Cenél nEóghain kings of

the Uí Neill, and latterly the Ua Conchobair of Connaught and the Uí Briúin of Munster. While he finds that there is no definite proof to 'substantiate the hypothesis that Irish captives were sold to Norse slave dealers' (*ibid*. 339), he also concludes that 'Dublin's slave market was supplied not only by its own activities, but certainly also by Welsh kings, probably by the Irish hinterland, and possibly by Scottish Kings' (*ibid*. 342). In these examples, however, slaves predominantly appear to have been a net 'import' into Ireland, presumably for domestic use. The establishment of the Dublin slave market by the Vikings undoubtedly increased the value of slaves as it opened up a substantially larger market across Atlantic Europe, but this did not happen until *after* the trade period associated with the importation of wine vessels from the Mediterranean and northwest France.

A trade in slaves seems to have occurred in Ireland during this period. Such activity, however, is not inconsistent with slave-raiding, and many of the slaves traded on in such places may have been a result of previous raids. Slavery was accepted as a common alternative to the death penalty (Kelly 1988, 216), and children were sold into slavery in straitened times (e.g. AU 964). The *Lebor na Cert* ('Book of Rights'), which has been suggested to date sometime after A.D. 900 (O'Donovan 1847, xi) or to the eleventh/twelfth century (Dillon 1962), points out a difference between native slaves and 'foreigners who do not know Irish' or 'women from over the great sea' (Holm 1986, 339). In the late eleventh century, St Wulfstan of Worcester castigated the traders of Bristol for their participation in slavery. Slaves were drawn from all over Britain – some undoubtedly as war captives, but others had fallen into slavery because of poverty – and these were shipped out of Bristol for sale in Ireland, and thence, presumably Iberia or North Africa (Mason 1990, 184-6). The sale of English Christian slaves overseas had been outlawed under the reign of King Cnut (1016-1035), and this trade was thus illegal during Wulfstan's reign as bishop. The English slave trade, however, carried on for another century and Giraldus reports that in 1170 the Council of Armagh finally passed a decree that any English slave anywhere in Ireland was to be emancipated (Dimmock 1867, 258). It is possible that a number of the foreign slaves in Ireland may have arrived there through 'official' trading networks, rather than as a result of raids.

While there is substantial written evidence for Irish and non-Irish slaves in Ireland during the early medieval period, there is significantly less evidence for Irish slaves found outside of Ireland. When the Viking sources are removed, this becomes even less. Thus, the slave exports from Ireland that are presumed to have played a major role in the wine trade through the sixth to eighth centuries, are only noted in a very few sources. For example the

sixth-century '*Life of Germanus*' (§LXXII (193)) mentions Scottish (i.e. Irish) slaves being sold in Marseilles, and there is no corresponding reference found in the Irish sources to a slave raid on Ireland at this time. Marseilles was a major slave port at this time, with predominantly Greek, Syrians and Jewish merchants all making a living from the slave-trade serving Muslim North Africa (Doehaerd 1978, 172). These slaves seem to have come from all over northwest Europe, as the '*Life of Germanus*' (§XLI) mentions slaves of various nationalities who received their freedom from Germanus: Spanish, Irish, Britons, Gascons, Saxons and Burgundians i.e. '*Hispanus, Scottus, Britto, Wasco, Saxo, Burgundio*' (Henschenio & Papebrochio1866, 776).

It seems possible, therefore, that the role of slave exports as a trade resource from early medieval Ireland has been greatly exaggerated. Slavery was present at this time but, based on most of the documentary sources, Ireland seems to have been a mass *importer* of slaves during the first millennium, rather than an exporter. It is, however, possible that some of the slaves that were brought into Ireland at this time were merely processed there and then traded in exchange for other goods. Such activity would necessitate strongly defended slave quarters, and no evidence for such structures has been found on the excavated *emporia*.

Example 2: Leather Goods and Textile

Alongside slaves, leather (or hides) is often traditionally given as a major export from Ireland during the first millennium. This is partly due to forward projection of classical Roman texts on Britain (see above), and also partly due to a backward projection of recorded medieval exports from Ireland. Giraldus Cambrensis, writing in the late-twelfth century, mentions that 'the hides of animals and the skins of flocks and wild beasts' were traded from Ireland in exchange for wine from Poitou (O'Meara 1951, 15). He also comments on the abundance of martens in Ireland: '*Martinarum copia abundant hic silvestre*'. The trade in marten pelts can be traced farther back than Giraldus as a charter of Rouen dated to 1150-51 states that: 'Whenever a ship should come from Ireland…and come to Rouen, I [i.e. Duke Henry of Normandy] shall have from every ship one "timber" [i.e. a parcel of 40 skins] of martens, or ten Rouen pounds' (quoted in Round 1909, 467). There appears to have been a marten trade between Chester and Dublin ('*Dunelina*'), dating back to the reign of Henry I (1100-1135) (Round 1909, 465), and there is a 'curious allusion' to Chester's Irish marten trade in Domesday Book (*ibid*. 467). The Irish trade in pelts and hides was still very important three centuries later. Written between 1436 and 1438, '*The Libelle of Englyshe Polycye*' lists: 'Skinnes of oter, squerel and Irysh hare/Of shepe, lambe, and fox is her

chaffare/Felles of kydde and conyes grete plentie' (Warner 1926; O'Neill 1987, 98). Given the repeated references to the importance of this trade, with the exception of the introduced rabbit, it is possible that an export trade in similar furs and pelts took place in the first millennium.

Archaeological proof for such a trade, however, is almost impossible to find. Organic materials such as fur and leather very rarely survive, and while it may be possible to use isotopic analysis to identify that an object is from another geological region, this has so far not yielded any supporting evidence for this trade. It is necessary then to rely on documentary sources, which tend to project a more sophisticated export trade than simply hides and tanned leather. The seventh-century '*Life of Philibert*' of Noirmoutier (Krusch & Levison 1910, 603) mentions the arrival of an Irish ship which supplied the brethren with ample quantities of 'shoes and clothes' (*calciamenta ac vestimenta*). There were other items aboard the ship, but these, unfortunately were not described beyond 'varied merchandise' (*diversis mercimoniis*). The tenth-century *Liber Eliensis* also mentions a trade in early medieval Irish clothes, and states that Irish traders brought cloaks and 'other wares' to Cambridge at this time (Fairweather 2005, 130).

The implication of these exports, however, goes far beyond the actual objects themselves. In order for there to be a significant export in clothing or shoes it means that there has to have been the capacity to produce more of these items than were required for domestic consumption. This challenges the idea that *all* industrial activity and craft-working was conducted in a self-sufficient context. *Uraicecht Becc* (MacNeill 1923, 280) lists the 'cloth-figurer' and '[wool?] comber' as craft workers that warranted an honour price. In the case of the 'cloth-figurer', this equated to that of the *ócaire* grade in *Críth Gablach*, while the 'wool-comber' was equal to the farming grade below this. The implication is that these textile workers were seen as roughly equivalent to a land-holding class, implying that they were not merely part-time farmers, but a full-time profession.

In order to produce a cargo of clothes and shoes, there must have been some way to co-ordinate the effort of the textile workers and shoemakers. Presumably there must have been some form of quality control, to ensure that the items produced are to a desired and required standard; and there must also have been an element of design control, so that the products looked reasonably uniform. There are three main potential models for how such large-scale production may have occurred. The first option is that this remained a 'cottage industry', where individual farmsteads produced another cloak or an extra pair of shoes. This model is the closest to the traditional

self-sufficiency model of production, but it has significant flaws. If production is spread over a large number of sites producing a very low volume of goods, this creates major logistical problems. These include not only the collection of the finished goods, but also the movement of them to a redistribution site, or the *emporia*. There are also practical problems about how to ensure uniformity of production, about who provides the raw materials, and also about how the workers are recompensed for their industry. While it is possible that an entrepreneurial master weaver may have set up such a scheme, it seems an unwieldy and impractical way of producing these items.

The other models suggest that the labour was concentrated on one site – either a noble site or an ecclesiastical one. Evidence for high status sites functioning as foci for textile production has been seen at Lagore crannog, Co. Meath and the multivallate rath at Garryduff, Co. Cork, both of which produced 28 spindle-whorls, as opposed to just four stone spindle-whorls that were found in the six centuries of occupation at Deer Park Farm, Co. Antrim. The potential role of the Church in these industrial activities, however, may have been limited by prevailing attitudes to trade. For example in his study on Psalm 71, St Augustine of Hippo draws the conclusion that 'trading is a sin' (Coxe 1888, 320), and there is a general assumption by the Church at this time that trade, like usury, was something best left to unbelievers (Irwin 1996, 17-18; Pirenne 1967, 423). As in many other matters, however, this may have been a stance better kept in its breach rather than its observance.

Example 3: Butter

Another unexpected bulk export from Ireland is mentioned in the '*Letter to Waldebert and Bobolenus*'. This is found in the prologue of Jonas' '*Life of Columbanus*', which can be internally dated to the 640s (Krusch 1902, 63). Jonas compares the ascetic conditions at Bobbio, in northern Italy, to the more luxurious conditions at other monastic sites by contrasting the imported materials. The Byzantine coastal monasteries have 'tears of balsam from Engaddi', 'aromatic flowers from Arabia' and 'pepper and nard from India', while the monks at Bobbio have hardly enough Irish butter ('*ex Hibernia…butyrum*'). The rhetorical counterpoint of these items suggests that, in contrast to expensive, exotic goods, Irish butter was seen as being cheap and plentiful. Butter was, and still is, an important Irish export. In the nineteenth century unrefrigerated ships transported Irish butter to the other side of the Atlantic Ocean (Solar 1990, 138), so it is feasible that early medieval ships could have carried butter to the Mediterranean. As was the case with the reference to shoes in the *Life of St Philibert*, this throw-away line has wider implications on the nature of economic activity in Ireland.

Cattle had a dual role in early medieval Ireland – they were, at the same time, both an economic and an agricultural entity. The importance of cattle in maintaining the hierarchical structure is well discussed (see Chapter 1), and there is a tendency to 'over-monetarise' their importance during these centuries (see Gerriets 1985 for detailed discussion of 'currency' in early medieval Ireland). Zooarchaeological work has pointed to the importance of dairying in early medieval Ireland (e.g. McCormick 1992; McCormick & Murray 2007), but this practise still tends to be subsumed by the social implications of cattle. The acquisition of cattle herds was seen as being an end in itself, supported by hierarchical requirements, and devoid of any farming utility beyond the reciprocal giving of *bés tige*. If butter, and potentially other processed dairy products such as cheese, had an implicit economic value, then there would have been a non-status related reason to maintain large dairy herds. For a modern cow, it is estimated that 25lbs of milk is required to make one pound of butter (Ryder 1981, 314-5). The mean daily yield of a modern Kerry cow, an ancient Irish cattle breed similar in size to the early medieval examples, is 28.6lbs (Curran 1990, 71), meaning that effectively one Kerry cow could provide enough milk daily to produce one pound of butter. *Crith Gablach* supposes that the independent upper grade of the farming class, the *fer fothlai*, would have at least 20 cows, and presumably many more. Assuming that half of these cows were not in a productive stage, for example they were dry or in-calf, this size of a herd could produce enough milk to make 10lbs of butter per day, and still have milk left over for drinking, cooking and cheese-making. It is possible that a small number of such farms could have quickly produced a tradable quantity of butter, but, as with textile production, large-scale butter production may have been a feature of high-status or ecclesiastical sites.

Trade Ships:

One aspect of the quote from the '*Life of Philibert*' that tends to be overlooked, however, is the reference to an 'Irish ship' (*Scottorum navis*). There seems to be a general assumption that Ireland was a passive partner in early medieval trade. In the pre-Viking period international trade is largely seen through the prism of foreign traders (whether Frankish, Frisian, Anglo-Saxon or other) arriving at the coastal emporia; and after *c*. A.D. 800, external trade is dominated by the Vikings. Most of these trading partners are renowned boatsmen and also had a reputation for being sea-borne raiders – just like the Scotti in late Roman literature. There is, however, a tendency to envisage Irish sea-going vessels as the small coracle-like boat that adorns illustrated versions of the *Navigatio Sancti Brendani* (e.g. O'Meara 1981). While the Vikings largely controlled the Irish Sea through the ninth century,

the Cenél nEóghain were still able to defeat a Hiberno-Norse fleet during this period (FrA 856). Contemporary sources contain very little reliable information on Irish ships from this time. There is little idea what they looked like, where they were built, how they were financed, or who captained them. *Uraicecht Becc* does, however, describe a 'diligent wright of ships and barks and hide-covered boasts and vessels', who has the equivalent status of an *aire déso*, the lowest of the noble grades (MacNeill 1923, 279). While a ship may have been built and outfitted by the ecclesiastical or secular magnates in order to carry out external trade, it is equally possible that trading ships were built and operated independently of central authority.

Discussions on the impact of international trade on early medieval Ireland tend to focus on the objects exchanged. The lack of references to a mercantile class in the seventh-/eighth-century Irish law tracts may indicate that 'there was insufficient economic capacity to support the development of large-scale trade' (Doyle 2009, 35-36). This section has attempted to go beyond the simple nature of the trade goods and examine their implications on the production cycle. These examples suggest that certain industrial activities formed an integral aspect of the economic framework of early medieval Ireland.

Internal Trade

There exists little archaeological evidence for the international export trade, although it is possible to identify some aspects of it from the contemporary documentary sources. In contrast there is almost no evidence for trade between the various polities of Ireland, for example there is an early ninth-century reference to a 'merchant' who traded between Munster and northern Leinster (Ó Corráin 1972, 40). The *Lebor na Cert* (Dillon 1962) gives examples of goods being moved around Ireland, but this is in the context of reciprocal tribute exchange. These lists are dominated by livestock, but they also include drinking horns, hounds, clothing, weapons, jewellery, slaves and '*fithchell*' (lit. 'wood-intelligence' – a gaming board, usually translated as 'chess'). These items tend to be high-status, and presumably of limited availability. The *Lebor na Cert* highlights no identifiable regional speciality, although some objects (e.g. penannular brooches, souterrain ware) have been found far from their putative sites of origin. These exotic sherds of souterrain ware may represent cooking vessels, such as suggested at Moyle Big, Co. Carlow (Kyle *et al*. 2009, 79), or transportation vessels for honey, as suggested at Hiberno-Scandinavian Dublin (Wallace 1985, 125; 1987, 203). The often 'organic' nature of the exchanged items makes it difficult to identify them in the archaeological record, and further work is still required in this

area before it may be possible to disentangle 'tribute goods' from 'trade goods'. Items such as lignite or shale bracelets may provide an insight into trade patterns within early medieval Ireland, but there have been few attempts to identify the actual nature of the material, never mind its original source. This section will therefore examine the evidence for long- and medium-distance trade in early medieval Ireland inherent in two utilitarian materials – grinding stones and iron ore.

Example 1: Cereal-Grinding Stones:

There are at least 45,000 sites from the early medieval period in Ireland. The vast majority of these sites were food-production sites of some nature, producing food both for the immediate household, and probably also for between one and three nobles (see Chapter 1). Grain-based products (e.g. Kelly 1997, 330-35) probably played a significant part in the everyday diet of the population, and the processing of grain was of substantial importance to the writers of *Críth Gablach*. An *ócaire* was expected to have a part-share in a mill, and his food payments were to include half a sack of *tarae* (wheat); however the highest-ranked farming grades, such as the *mruighfher*, are expected to have their own mill. Ireland has evidence for some of the earliest watermills in Western Europe (Rynne 2009), and by the early seventh century there must have been a large number of mill sites scattered across the landscape. The dendrochronological dates from excavated sites, however, show a concentration in construction between *c*. A.D. 775 and 825 (O'Sullivan *et al*. 2014; McErlean & Crothers 2007). This coincides with a similar trend in Continental Europe, where it has been associated with growing seigneurial authority, both religious and secular (e.g. McCormick 2001; Lucas 2006; Cattedu 2009), and it is possible that a similar trend was evident in Ireland at this time.

The mills mentioned in *Críth Gablach* appear to have been limited to the kin group (*muintir*) and a visiting retinue (*dáma*). There obviously was an issue with illicit use of cereal-processing structures at this time, since *Críth Gablach* dictates heavy penalties for using a kiln without leave (a cow with a *dartaid* (yearling heifer)) and for the unsanctioned use of a *mruighfher*'s mill (five *séts* [i.e. four cows], forfeiture of the grain, and a further penalty of his honour price if a visiting retinue should be inconvenienced). The severity of these penalties would have made it unlikely that anyone who did not qualify to use a mill would have ground cereal there. Quernstones found on sites indicate small-scale production of flour, whether because the site had no access to a mill, or because there was need for a small amount of extra flour. Not every type of stone is suitable for making grindstones, for example while

basalts are tough and durable, sandstones are relatively soft, and granites can quickly develop a smooth finish unsuitable for breaking down the grain. Unfinished and broken granite millstones have been noted in an area of the Wicklow Mountains (Corlett 2010). These millstones provide important information about the sequence of steps involved in their manufacture from the extraction and fashioning of rough-outs at the outcrop, to the perforation of the central hole and finally the dressing of the grinding surfaces. Corlett has observed that millstones at Kilbeg, Ballynasculloge Upper and Knocknadroose appear to have been manufactured at the source of the granite outcrop itself and not at their intended destinations. Although millstones on excavated sites have not been linked back to this outcrop, it has been suggested that this area of the Wicklow Mountains may have supplied millstones to the wider Leinster region in the early medieval period.

From petrological studies done on a small number of early medieval grinding stones in Co. Down, it is clear that the types of stone used were not necessarily the most readily available. Millstones from the raised rath of Rathmullan Lower (Lynn 1981-2, 136) have been sourced to the Scrabo Hill sandstones at the north of Strangford Lough, over 40km distant. The rath of Ballinarry, less than 10km to the north of Rathmullan Lower, however sourced its granite quernstones from over 40km further south, in the Mourne Mountains (Davison 1961-2, 73). The site that has the longest, and most complex, transportation route between source and final destination, however, is the monastic site of Nendrum. A sea voyage of at least 80km would have been required in order to transport the granite millstones from their quarry site in the Bloody Bridge valley of the Mournes (Meighan 2007, 205) to this early seventh-century tidal mill in the northwest of Strangford Lough.

The three Co. Down examples come from two secular sites, one of which is high-status, and one ecclesiastical one. They all, however, show a connection with production sites that are significantly distant. Under a reciprocal system, it is possible that the local king may have taken grinding stones from a quarry working under his auspices, and redistributed them to the communities in his *túath*. Even if this model were correct, it is unlikely to be applicable in these examples since none of the occupation sites are in the same parish, deanery, diocese or barony (all of which have variously been used as proxies for early medieval polities, e.g. MacCotter 2008), as the production sites. While large monastic sites such as Nendrum may have had access to a wider ecclesiastical network that could have provided information on the best localities for raw materials, it is less likely that humble secular sites would have had this advantage. It seems improbable that stoneworkers would have transported tons of finished grinding stones on the back of ox-drawn carts,

hawking their way from rath to rath on the off-chance of an opportunistic sale.

There are Scandinavian archaeological examples of quarrying of millstones during the Viking period (Baug & Løland 2011, 351). Millstones from the quarry at Hyllestad, Norway were identified in large parts of Denmark, Sweden, northern Germany, and the wider north Atlantic (*ibid*. 352). Both the quality of the stone and the location of the finds suggest that there was already a well-organised distribution network in place by the Viking period, rather than merely casual exchange between quarrymen and farmers (*ibid*.). It is possible that the stone quarries at Hyllestad may have belonged to the church, since most of the neighbouring farms were ecclesiastically owned (*ibid*. 353), and this may explain the scale of this enterprise and how it was able to transport goods around.

The transportation of medieval millstones on southern English manors (Farmer 1992) may also provide a useful analogy. Manorial records contain information on the sourcing of the stone; how long it took to get to site; cost of transportation, etc. Since replacement millstones were usually bought singly, to replace a broken one, it was necessary to ensure a close match between the existing stone and the new one. In the medieval period this was generally achieved by sending the miller (to select a suitable stone) and the manorial bailiff (to negotiate the price and arrange transportation) to the stone quarry (*ibid*. 104). The requested stone would be water-freighted for the most part, with often only the final part of the journey made across country by cart.

In both these examples, there is a clearly defined 'quarry'. In the Scandinavian example it seems that the millstones were transported from quarry to marketplace to be sold; while similar examples are given for southern England (Farmer 1992, 98-101), it also seems clear that a client could go to a quarry, or perhaps a designated market, and chose the ideal stone. With the exception of the Wicklow examples, there are no recognised quarry sites for millstones in early medieval Ireland. It is thus difficult to interpret how stone-workers interacted with the wider community at this time. Quarries may have been under the control of the church, like the Scandinavian examples, but it is equally possible that these were operated as private enterprises. In this case it is possible that early medieval stone cutters may have used local gatherings, such as the *óenach*, in order to advertise their wares and get future orders.

Example 2: Iron Ore

Iron-working is the most widespread early medieval industrial activity in Ireland (see Chapter 2). Recent studies have highlighted the various elements which go into the production of iron, for example slag can be used to differentiate between smelting and smithing furnaces (e.g. Photos-Jones 2008a, 193). It also seems possible that there were dedicated charcoal-production sites to supply fuel for iron-working (Kenny 2010).

One aspect of iron-working that is less well understood is the origin of the iron ore. The principal source of iron in early medieval Ireland is believed to be bog iron ore (Wallace & Anguilano 2010, 70) which was formed under wet conditions when iron-bearing surface waters meet organic material (Tylecote 1986, 125). Bog iron ore and bog iron slag have been found on a number of sites, and Photos-Jones (2008, 186) concluded that the high manganese content in iron ore fragments found on excavated sites on the border of counties Kildare and Meath most likely indicated that they came from bog ore. Iron-bearing minerals, such as limonite, have been identified in Cork at Garryduff (O'Kelly 1963, 103) and ironstone nodules were found at Nendrum (Lawlor 1925, 140).

It is possible that archaeological evidence for the mining of iron ores in early medieval Ireland has been destroyed by turf-cutting or later bedrock mining (Comber 2008, 239). Early Irish laws make reference to the mining of iron. The eighth-century *Tír Cumaile* states that 'land that includes a mine of copper (*uma*) or iron (*iarainn*) adds 5 *séts* to its value' (Mac Niocaill 1971, 82; 85); the Laws of Distraint (*Cethairslicht Athabálae*) also mentions penalties for the illegal digging of someone else's silver mine or excavating iron or copper ore from his cliff (Kelly 1988, 105); and *Dúilchinni*, an eighth-century text on the remuneration of craftsmen, refers to the food payments due to '*clasaigib*' who are defined as 'miners of copper (*uma*) or iron (*iarainn*)' (Ní Ghrádaigh 2007, 112-13). Unlike the other craftsmen dealt with in *Dúilchinni*, miners are allowed food payment from the date they start work, not the completion date (*turcbál*), suggesting the recognition of pre-mining work, such as pit excavation or prop construction (*ibid*. 117).

It is unlikely that every individual iron-working site would have had direct access to sources of iron ore. This must therefore have been some sort of mechanism in place by which the raw resources could have been moved to the production sites. It is usually thought that the primary iron-working activities may have been undertaken close to the ore and fuel resources. The

smelted bloom was then transported to workshops on nearby settlement sites and reheated and refined (bloom-smithing) to produce iron ingot bars. These could then either by forged into artefacts (blacksmithing) on the site or may have been traded further afield where this activity could have taken place (Wallace & Anguilano 2010, 84). It has also been suggested that iron may have been moved as consolidated bloom rather than ingot bars to sites for smithing (Young 2009a, 234).

Conclusion

While it may not be possible to definitively identify 'trade' or 'commerce' in early medieval Ireland, it is clear from the examples given here that raw materials and processed goods were regularly exchanged. There has been a tendency to concentrate discussion on exports, or more realistically, the imports, without taking into consideration the various contacts and exchanges that had to have occurred prior to the final trade event. The mechanism by which these exchanges happened, however, is not fully understood, nor is the role or function of the various agents involved. The final chapter will attempt to construct a model for the early medieval Irish economy, based on documentary sources and the archaeological record, and factoring in the role of craftsmen into what is traditionally seen as a predominantly self-sufficient rural economy.

Chapter 5:

A Model Irish Economy

The archaeological evidence for economic activity in early medieval Ireland augments the documentary evidence to create a picture of a highly complex system. Certain aspects of this seem to fit within the 'substantavist' view of pre-modern economies, while other aspects lend themselves to a more 'formalist' agenda. Land-holding, and especially the socio-economic contract of *dóer céilsine* (Chapter 1), would seem to be best explained by the substantavist argument. *Críth Gablach*, and especially *dóer céilsine*, has had a substantial and lasting impact on modern interpretations of early medieval Irish society and economy. Taken in consideration with ideological imperatives from the early twentieth century, it is not surprising that the 'otherness' of early medieval society is emphasised. Traditionally the Irish early medieval economy has been interpreted as revolving around the distribution and periodic exchange of objects, food, raw materials, slaves and some exotic commodities (Doherty 1980; Doyle 2009, 35). Studies frequently refer to early medieval Ireland operating a 'subsistence economy' (e.g. Mytum 1992; Gibson 2012); and Wickham (2005) highlights Ireland as a key example of his 'peasant mode of production'.

The giving and receiving of food tribute, manual labour and livestock does not appear to have had a strict economic function. While it was possible for farmers to 'make a profit' under these agreements, the main purpose of them appears to have been to create and re-enforce social relationships and political alliances. Patterson (1994, 255) and Charles-Edwards (2000, 89-90) both suggest that *dóer céilsine* applied to individuals within the same kin-group, thereby strengthening the legal and familial bonds by adding layers of economic and social inter-relations. In this way early medieval Irish society closely reflects that of the Nigerian Tiv, one of the foundation studies for the substantavist argument on early economic systems. In the African example services and labour are also 'by and large reciprocal and form part of the age-set, kinship and domestic group structures and moralities' (Bohannon 1955, 63).

There are also elements of a 'command economy' evident in the various law tracts. The drafters of these tracts have attempted to create an immovable set price for goods and services. This is most obviously seen in the *díre*

(honour price) based on an individual's social standing (Chapter 1). There are, however, other examples of 'price-fixing'. *Tír Cumaile* (MacNiocaill 1971, 85) gives the value for six different land types of the same size, ranging from *etham*, i.e. first-class arable land (24 milch cows) to *andomain*, i.e. bog land (eight dry cows). It also lists eleven things that can increase the value of the land, for example a properly-fenced wood adds 10 *séts*, and an old mill adds five *séts* (*ibid.*). Another aspect of the farming economy that appears to have been 'fixed' was the relative silver value of cattle. The eighth-century tract *Breatha im Fuillemu Gell,* equates a milk cow (*bó mlicht*) with one ounce of silver (Kelly 1997, 58); the visitation of Cellach, Archbishop of Armagh (AU 1106), suggests that a milk cow then was worth ¾ of an ounce of silver. Since these figures are reasonably similar in value, it could be argued that a command economy existed in early medieval Ireland, keeping the monetary levels even. It could equally be argued, however, that the monetary value of cattle is a response to the market. In 1800 the cost of a good milk cow in Co. Tyrone was given as being up to 12 guineas; and sheep were recorded as being sold for between 20 and 25 shillings (McEvoy 1991, 63-4). Based on the Retail Prices Index for 2010, these figures convert to £793 and £63-£79 respectively (Officer & Williamson 2013) and are comparable with contemporary values for these forms of livestock. Thus the buying power of a cow in 1800 is relatively equivalent to the buying power for a cow two centuries later, but this does not reflect an attempt to control prices over this period.

While there is a strong case for arguing that the land-holding classes operated in an economic system based on strictly social protocols (i.e. substantavism), there are, however, hints in the texts that it was also subject to the laws of classical liberal economic theory (i.e. formalism). Land-holding was not as hierarchically constrained as it is sometimes portrayed, for example *Críth Gablach* explicitly encourages an attitude of self-improvement. The *fer midboth*, the lowest of the free-farmer grades, can move up the social order when his property equals that of a *bóaire* or higher. This means that he effectively needs to have twice the property required for an *ócaire* in order to be promoted to that grade (Binchey 1940. Doubling-up on property requirements is found throughout early medieval legal texts. *Bretha Nemed Dédenach* states that the family of an individual who is promoted to a new grade is only entitled to half the honour price (*sét*) until the third generation, and thus the only way of achieving the full honour price is by having double the qualifications of an established individual (Jaski 2000, 173).

At the upper end of the *féni* grade in *Críth Gablach*, the *fer fothlai* was permitted to enter into (limited) contracts of *dóer céilsine* with lower graded

farmers if his own land could not sustain his herds, and if he could not buy other land (Binchey 1940, 10). The importance of land-ownership during the early medieval period is often overlooked by the later fetishisation of cattle (e.g. Lucas 1989). Late nineteenth century works, written in the immediate aftermath of the English translations of the various law tracts, focused on the commonalty of land ownership (e.g. Fisher 1877; Montgomery 1889), and were highly influential in developing the image of a pre-Norman pseudo-socialist utopia. While kin-land (*fintiu*) does appear to have been largely inalienable, with something similar to a fee tail requiring that the land revert back to the *fine* (i.e. kin grouping) upon the death of the individual, this land is distinguished from land that an individual had acquired personally (Kelly 1997, 399-401). The assumption in *Críth Gablach* seems to be that an *ócaire* would need to rent the seven *cumals*-worth of land (*tír mbó*) required for his status (Binchy 1941, 4); in the same text the *bóaire* is stated to have land of fourteen *cumals*, and there is no mention of rent repayments (*ibid*. 6). It is possible that land was freely traded, however disposal upon death was subject to certain restrictions. The *Senchus Mór* (*ALI* III, 49) states that a *bóaire* was entitled to freely bequeath land to the value of seven *cumals* from his holdings of personally acquired land (i.e. *tárcud a cuirp fadesin*), as long as 2/3 of this went to the *fine* (Patterson 1994, 273). In other cases it seems that this acquired land may be bequeathed in thirds – 1/3 to the sons; 1/3 to the *fine*; and 1/3 to the church – and, 'where the man's property had been augmented by rent for his land, or payment for his professional skills, the fine's share was reduced, sine their contribution was less' (*ibid*.).

The ability to alienate land was obviously important to the Church, otherwise it would not have been able to develop ecclesiastical estates. As such it is perhaps not surprising that the earliest extant deeds of land transference, found in the eighth-century *Additamenta* to the *Liber Ardmachanus* (Book of Armagh) concern grants to the church (Bieler 1979, 172; Kelly 1997, 411). The most detailed of these is a conveyance of a fifth part of the estate of Caíchán to St Patrick (Gwynn 1913, 33), which describes the bounds of the lands being given to the church. Although it cannot be ascertained whether these various deeds date to the mid-fifth century, it is clear that the concept of written legal transfers of land ownership existed by the eighth century. It may also be relevant that, while the surrounding text was in Latin, the actual wording of Caíchán's grant was in Old Irish. Selling land, however, is seen as a particularly reprehensible thing to do (e.g. *Uraicecht Becc*), and *Triad 165* (Jaski 2000, 171) ranks 'a lord who sells his land' as one of the three free persons who can become unfree. Yet land must have been sold since *Críth Gablach* lists land ownership as among the property stipulations for the farming grades from *ócaire* upwards, and *Uraicecht Becc* states that an unfree

man can become free by purchasing land. This ability (or requirement) to progress socially is summarised in *Uraicecht Becc* which states that '*fearr fear a ciniud*' (a man is better than his birth) (*ALI* V, 21).

The laws also allowed for the fact that, through the purchase of cattle, land, and dependants, a commoner (*féni*) could become a noble (*flaith*). This is potentially problematic when attempting to create a societal model based largely on rural self-sufficiency, where the economy was firmly embedded in political or social gains. 'Only once the economy was disembedded could growth occur without regard to political, social or other costs' (Gerriets 1983, 61).

It is equally unclear how the *nemid* fit into the larger societal pattern. Craft-working appears to have taken place within an economic sphere that had some overlap with land-holding, but which seemed to function on a slightly different economic reality. One of the main criticisms of *Dark Age Economics* (Hodges 1982) was the failure to recognise the possible existence of multiple spheres of economic activity (Astill 1985). The Tiv of Nigeria, for example, had three socio-economic spheres – food/subsistence; prestige goods; and dependents (Bohannon 1955). These were largely mutually exclusive, for example food stuff was traded for food stuff, but equally there was also a degree of exchange between these spheres. The typical example given is where a young man trades up food stuffs in order to get prestige goods (e.g. brass rods or cows), which he then can exchange for a wife (*ibid*. 65). These trades between the spheres of economic activity also have moral overtones, for example, it is 'good (*do kwagh*) to trade food for brass rods, but that it is bad (*vihi kwagh*) to trade brass rods for food; that it is good to trade your cows or brass rods for a wife, but very bad to trade your marriage ward for cows or brass rods' (*ibid*. 64). Similar economic spheres and moral judgments can be applied to the farming economy in early medieval Ireland, thus for a member of the *féni* it is good to trade foodstuffs for cattle and cattle for land, but for a member of the *fliath*, it is bad to trade land for cattle.

While the landed classes were tied into long-term contracts of reciprocal production (*dóer céilsine* lasted for seven years), the craftsman was only employed for a specific task. *Dúilchinni*, a text on payments, makes it clear that, with the exception of miners, craftsmen do not get paid until the completion date, i.e. *turcbál* (Ní Ghrádaigh 2007, 117). The amount paid, consisting predominantly of foodstuffs and occasionally free accommodation, was legally defined by the nature of the work and the level of skill of the craftsman (*ibid*.). It is, however, possible that some of these individuals may have operated as self-employed craftsmen, rather than as craftsmen doing

specific work for a client. A number of these have been highlighted in Chapter 4, including large-scale shoe-making, stone quarrying, and iron ore mining.

As seen in Chapter 1, the *nemid* are potentially high-powered individuals, with many having a social rank equivalent to a minor noble. As such, a master-wright or master-smith could reasonably be expected to live in an archaeologically similar abode to that occupied by an *aire déso*. It is possible that the legal status of a *nemed* was largely honorific, providing an individual with standing in the community, but not requiring the same level of leadership or necessitating the same degree of display of power through the construction of banked enclosures. Perhaps a modern analogy may be drawn with army doctors and padres, who hold officer rank, and are treated accordingly by enlisted men, but who are not required to make strategic decisions or order men into conflict. While these craftsmen were often paid in food, however, *Senchus Mór* also refers to estates (*ferann*) that an individual obtained through his craft-working (*dán*), learning (*léiginn*) or poetry (*filidecht*) (*ALI* III, 51). The *fine* had power over 1/3 of these lands, leaving the other 2/3 free to be disposed of as seen fit. Thus it was clearly, if theoretically, possible for members of the *nemid* grades also to be land-owners. Yet, with the exception of a few crannogs in Lough Gara, Co. Sligo (e.g. Moloney & Keane 1992:0141; Fredengren 2001), excavated early medieval settlements are predominantly viewed through the prism of *dóer céilsine*, and as such are routinely interpreted as the dwelling of an *ócaire* or *bóaire* or some member of the nobility.

Conclusion

The self-sufficiency model of early medieval Irish economy is becoming less tenable. While small farm units during this period may well have been predominantly self-sufficient with regard to foodstuffs, the documented importation of grain suggests that this was not necessarily always true. It is equally clear, however, that many such farms would not have been able to source specific utilitarian items such as iron ore, charcoal, or grinding stones (Chapter 4) from their own lands, and that these resources would necessarily have had to be brought in from outside the property. This has implications on the way in which the economic character of this period has been interpreted over the past century or so. Equally important is the fact that there appears to have been a portion of certain industrial activities that was focused on producing surplus for external trade and exchange, for example cloth-making and shoe-making (Chapter 4).

Archaeologists in particular have focused on the rural farming economy expressed in the various law tracts from the seventh and eighth centuries. Societal patterns and models of settlement are heavily influenced by concepts such as *dóer céilsine*, with the result that 'exchange' from these periods is often relegated to part of this contract. The embedded nature of the economic activity described in these tracts means that early medieval Ireland has generally been interpreted in a substantavist way. Exchanges are seen in the light of social obligations, and there is no incentive or opportunity for individuals to improve their social standing. Except of course, that the same law tracts encourage such activity by allowing for social promotion for an individual, and also his descendants, if sufficient resources (i.e. livestock and land) may be accrued. This appears to tie in with the general ideas of classical liberal economic thought, and thus suggests that these law tracts, and the society that they depict, should be interpreted in a formalist way. Again, however, the situation is further complicated by the fact that, while it is possible for an individual to buy lands, it is not possible for him to alienate the whole of this purchased property upon death, and a significant portion of it returns to the communal whole. The nature of succession laws from this period also mean that it is increasingly difficult to ensure that one of the deceased's sons is able to meet the stated property requirements for the grade, never mind if the estate has to be further subdivided among multiple children.

'Gift'-giving, at least in the form of tribute and food rent, was universal, and much of the economic activity in the farming community appears to have focused around reciprocal social acts. These forms of exchange mean that early medieval Ireland is often interpreted as being very different from modern economic systems. Early medieval Ireland clearly did not have a fully functioning market economy, for example there is no evidence for coinage being used in transactions from the pre-Viking period. Nevertheless there is substantial written and artefactual evidence for craft-activity, which often seems to sit outside the rural economic pattern. There is, however, no clear understanding of how resources were sourced for this industrial activity, or how or where the end product was distributed.

It seems that the economy of early medieval Ireland displays aspects which may best be interpreted by the substantavist theories, but also aspects that are better explained by formalists. Ireland at this time may represent a transitional economy, moving from an earlier stage towards a more market-focused one. Alternatively it could be argued that early medieval Ireland embraced two spheres of economic activity. The first area focused on farming and land-holding, and was largely controlled by the nobility. This seems to

have been dominated by various reciprocal acts, and tight social contracts. The second area focused on industrial activity, and this may have been more dominated by supply and demand. It is likely that the Church may have been a major controlling factor in some of these activities, for example bronze-making or glass-working, but the most widespread industries, such as iron-working or cloth-making, may have primarily been in the hands of individual craftspeople. Thus the rural and the industrial may have existed side by side, with little economic overlay except when goods were exchanged from one economic sphere to the other. This two sphere approach has precedence in anthropological examples, e.g. the Tiv of Nigeria, and may provide the most satisfying resolution to the issue of economic activity in early medieval Ireland.

Glossary of Old Irish Terms

Aire: a member of the noble grade (see *flaith*); often translated as 'lord'.

Aire déso: the lowest member of the noble grade.

Bés (tige): annual food rent provided by base/dependant clients (see *giallnae*).

Bóaire: one of the three main farmer grades (see *féni* or *bóairig*). Most legal tracts place this individual between the *ócaire* and the *mruighfher* (q.v.).

Bóairig: plural of *bóaire* (q.v.); a general term for the farmer grade (see *féni*).

Cumal: lit. 'female slave' but also used as a general measure of value.

Díre: 'honour-price'; a fixed legal tariff based on an individual's hierarchical status.

Dóer céilsine: base or dependent clientage. This is best described in *Críth Gablach*, and involves the transfer of *taurchrecc* (q.v.) between lord and client.

Féni: a general term for the farmer grade (see *bóairig*)

Fer fothlai: the highest member of the farmer grade, this individual is almost ready to move into the noble grade.

Fer midboth: generally seen as the lowest self-sufficient member of the farmer grade (*féni*)

Fíne: the wider kin-group.

Flaith: the noble grade – this includes 'lords' (*aire* q.v.) as well as kings.

Gíallnae: a general term for those within the contract of *dóer céilsine* (q.v.).

Mruighfher: one of the three main farmer grades (see *féni* or *bóairig*). Most legal tracts place this individual above the *bóaire* (q.v.).

Nemed: a member of the professional grade (see *nemid*). This includes craftsmen, lawyers, physicians and poets.

Nemid: pl. of *nemed* (q.v.); a general term for the professional grade.

Ócaire: one of the three main farmer grades (see *féni* or *bóairig*). Most legal tracts place this individual below the *bóaire* (q.v.)

Sáer: a member of the professional grade (also see *nemed*). This is often translated as 'wright' or 'mason'.

Sét: a unit of value, often given in numbers of cows.

Sóer céilsine: free or independent clientage. This is best described in *Cáin Sóerraith*, and involves the transfer of cattle from one individual to another. It differs substantially from *dóer céilsine* (q.v.)

Taurchrecc: lit. 'fore-purchase', this is the amount of property that is transferred from the lord to the client under *dóer céilsine* (q.v.). Often translated as 'fief'.

Túath: the basic political territory in early medieval Ireland. Often translated as 'petty kingdom'.

Bibliography:

Abbreviations:

ALI = Hancock, W. N.; O'Mahony, T.; Richey, A. G.; Hennessy, W. M.; & Atkinson, R (eds.) 1865-1901. *Ancient Laws and Institutions of Ireland*, Six Volumes. Dublin.

AU = Hennessy, W. M (ed.) 1887. *Annals of Ulster*. Dublin. Alex Thom & Co.

CIH = Binchy, D. A. (ed.) 1978. *Corpus Iuris Hibernici*, Six Volumes. Dublin. Institute for Advanced Studies.

FrA = Radner, J. N (ed.) 1978. *Fragmentary Annals of Ireland*. Dublin. Dublin Institute for Advanced Studies.

Allison, F., Hall, A. & Kenward, H. 1999. Technical Report: Living conditions and resource exploitation at the early Christian rath at Deer Park Farms, Co. Antrim, N. Ireland: evidence from plants and invertebrates, part 1: 'Text'. Unpublished report from the Environmental Archaeology Unit. York, University of York.

Anon. 1973. *Viking and Medieval Dublin*: *Catalogue of Exhibition*. Dublin. Elo Press.

Armit, I. 2008. Irish–Scottish connections in the first millennium AD: an evaluation of the links between souterrain ware and Hebridean ceramics. *Proceedings of the Royal Irish Academy*, 108C, 1-18.

Astill, G. 1985. Archaeology, Economics and Early Medieval Europe. *Oxford Journal of Archaeology*, 4(2), 215-31.

Baillie, M. G. L. 1986. A sherd of souterrain ware from a dated context (Drumard, Derry - late 8th century). *Ulster Journal of Archaeology*, 49, 106.
Barton, R. 2000. A possible slave-chain from Knowth, Co. Meath. *Ríocht na Mídhe*, 11(1), 20-23.

Barton-Murray, R & Bayley, J. 2012. 7.4.4.1 Metal-working Equipment, in G. Eogan (ed.) *Excavations at Knowth; The archaeology of Knowth in the first and second millennia AD*. Dublin. Royal Irish Academy, pp. 526-533.

Bass, G. F. & van Doorninck, F. H. 1982. *Yassi Ada, a seventh-century Byzantine shipwreck*. Texas. Texas A and M University Press.

Bateson, J. D. 1981. *Enamel-working in Iron Age, Roman and Sub-Roman Britain. The Products and Techniques*. British Archaeological Reports, 93. Oxford. Tempus Reparatum.

Baug, I. & Løland, T. 2011. The millstone quarries in Hyllestad: an arena of research and education, in D. Williams & D. Peacock (eds.) *Bread for the People: The Archaeology of Mills and Milling*. BAR International Series 2274, pp. 349-56.

Beglane, F. 2005. The Faunal Remains from Dunnyneill Island, Strangford Lough, Co. Down. Unpub'd report.

Bieler, L. 1979. *The Patrician Texts in the Book of Armagh*. Dublin. Scriptores Latini Hiberniae X.

Binchy, D. A. (ed.) 1941. *Críth Gablach*. Dublin. Dublin Institute for Advance Studies.

Binchy, D. A. 1954. Secular Institutions, in M. Dillon (ed.) *Early Irish Society*. Dublin.

Binchy, D. A. 1973. The Linguistic and Historical Value of the Irish Law Tracts, in D. Jenkins (ed.) *Celtic Law Papers*. Brussels, pp. 71-107.

Binchy, D. A. (ed.) 1978. *Corpus Iuris Hibernici*, Six Volumes. Dublin. Institute for Advanced Studies.

Binchy, D. A. 1989. The First Third of Bretha Nemed Toísech. *Ériu*, 40, 1-40.

Bogucki, M. 2010. Viking Age Emporia Around the Baltic Sea – A Cul-de-Sac of European Urbanization? in A. Buko & M. McCarthy (eds.) *Making a Medieval Town: Patterns of Early Medieval Urbanization*. Warsaw, pp. 151-66.
Bohannon, P. 1955. Some Principles of Exchange and Investment among the Tiv. *American Anthropologist*, 57(1.1), 60-70.

Bourke, C. 2007. The monastery of Saint Mo-Choí of Nendrum: The early medieval finds, in T. McErlean and N. Crothers (eds.). *Harnessing the Tide: The Early Medieval Tide Mills at Nendrum Monastery, Strangford Lough*. Belfast. Stationery Office, pp. 406-21.

Bourke, E. 1994. Glass Vessels of the first nine centuries A.D. in Ireland. *Journal of the Royal Society of Antiquaries of Ireland*, 124, 163-209.

Boyce, D. G. 1995. *Nationalism in Ireland*. London. Routledge.

Bradley, J. 1982. A separate-bladed shovel from Moynagh Lough, County Meath. *Journal of the Royal Society of Antiquaries of Ireland*, 112, 117–22.

Bradley, J. 1991. Excavations at Moynagh Lough, County Meath. *Journal of the Royal Society of Antiquaries of Ireland*, 121, 5-26.

Bradley, J. 1993. Moynagh Lough: an insular workshop of the second quarter of the 8th century, in M. Spearman & J. Higgitt (eds.). *The Age of Migrating Ideas: Early Medieval Art in Northern Britain and Ireland: Proceedings of the Second International Conference on Insular Art held in the National Museum of Scotland in Edinburgh, 3-6 January 1991*. Edinburgh. Stroud, pp. 74-80.

Brady, N. 1996. Mills in medieval Ireland: looking beyond design, in S. Walton (ed.) *Wind and water, the medieval mill*. Pennsylvania. Pennsylvania State University Press, pp. 39-68.

Bücher, K. 1893. *Die Entstehung der Volkswirtschaft*. Tübingen, Laupp (1917 edition).

Callmer, J. 2007. Urbanisation in North and Eastern Europe, ca. AD. 70-1100, in J. Henning (ed.) *Post-Roman Towns, Trade and Settlement in Europe and Byzantium. Vol. I: The Heirs of the Roman West*. Berlin, pp. 230-70.

Campbell, E. 2007. *Continental and Mediterranean Imports to Atlantic Britain and Ireland, A.D. 400-800*. York. Alden Press.

Carlin, N. 2008. Ironworking and production (With contributions from Vicky Ginn and Jonathan Kinsella), in N. Carlin, L. Clarke & F. Walsh (eds.). *The Archaeology of Life and Death in the Boyne Floodplain: Findings from the Archaeological Excavations Along the Route of the M4 Motorway*. Bray. Wordwell, pp. 87-112.

Catteddu, I. (ed.) 2009. *Archéologie médiévale en France: Le premier Moyen Âge (ve-xie siècle)*. Paris.

Charles-Edwards, T. M. 1993. *Early Irish and Welsh Kinship*. Oxford, Clarendon.

Charles-Edwards, T. M. 2000. *Early Christian Ireland*. Cambridge, Cambridge University Press.

Clarke, C. & Long, P. 2009. Sallymount Site 1. Final Excavation Report, Unpublished Report, Headland Archaeology.

Clarke, L. & Doyle, T. 2011. *Final report on archaeological investigations at Site E2996, in the townland of Ballyvass, Co. Kildare*. Unpub'd Report, Headland.

Claude, D. 1969. *Die byzantinische Stadt im 6. Jahrhundert*. Munich.

Comber, M. 1997. Lagore crannóg and non-ferrous metalworking in early historic Ireland. *Journal of Irish Archaeology*, 8, 101-14.

Comber, M. 2001. Trade and Communication Networks in Early Historic Ireland. *The Journal of Irish Archaeology*, 10, 73-92.

Comber, M. 2004. *Native Evidence of Non-Ferrous Metal-working in Early Medieval Ireland*. British Archaeological Report. International Series 1296. Oxford. Archaeopress.

Comber, M. 2008. *The economy of the ringfort and contemporary settlement in early medieval Ireland*. Oxford. BAR International Series. 1773.

Corlett, C. 2010. Cracking Millstones in Wicklow. *Archaeology Ireland*, 24(1), 16-9.

Cotter, C. 1999. 1999. Western Stone Forts Project: Cahercommaun Fort, Co. Clare - a reassessment of its cultural context, in *Discovery Programme Reports 5*. Dublin. Royal Irish Academy.

Coughlan, T. 2010. Draft Final Report on Excavations at Kilree 3, County Kilkenny. Unpublished report by Irish Archaeological Consultancy Ltd for Kilkenny County Council.

Coxe, A. C. (ed.) 1888. *Augustine of Hippo: Exposition on the Book of Psalms*. Edinburgh. T & T Clark.

Craddock, P. T. 1990. Metal-working techniques, in S. Youngs (ed.) *The Work of Angels, Masterpieces of Celtic Metalwork, 6th to 9th Centuries AD*. Texas. University of Texas, pp. 170-213.

Crigger, B-J. 1991. *A Man is better than his Birth: Identity and action in early Irish Law*. Unpub'd PhD thesis, University of Chicago.

Curran, P. L. 1990. *Kerry and Dexter Cattle and Other Ancient Irish Breeds: A History*. Dublin, Royal Dublin Society.

Dale, G. 2010. *Karl Polanyi: The Limits of the Market*. Cambridge. Polity Press.

Davison, B. K. 1961-62. Excavations at Ballynarry Rath, Co Down. *Ulster Journal of Archaeology*, 24-5, 39-87.

Decker, M. 2001. Food for an empire: wine and oil production in north Syria, in S. Kingsley and M. Decker (eds.), *Economy and Exchange in the east Mediterranean during late antiquity: Proceedings of a conference at Somerville College, Oxford, 29th May 1999*, 69-86. Oxford. Oxbow.

Dennehy, E. 2007. Kiltenan South, in E. Grogan, L. O'Donnell & P. Johnston (eds.). *The Bronze Age Landscapes of the Pipeline to the West*. Bray. Wordwell, p. 291.

Dillon, M (ed.) 1962. *Lebor na Cert*. Dublin. Irish Texts Society.

Dimmock, J. F. (ed.) 1867. *Giraldi Cambrensis: Opera. Vol. V.* London. Longmans, Green, Reader and Dyer.

Doehaerd, R. E. 1978. *The Early Middle Ages in the West: Economy and Society*. Amsterdam. North Holland Publishing Company.

Doherty, C. 1980. Exchange and trade in Early Medieval Ireland. *Journal of the Royal Society of Antiquaries of Ireland*, 110, 67-89.

Doherty, C. 1985. The monastic towns in early medieval Ireland, in H. Clarke and A. Simms (eds.), *The Comparative History of Urban Origins in*

Non-Roman Europe: Ireland, Wales, Denmark, Germany, Poland and Russia from the ninth to the thirteenth century, Vol. 1. Oxford. BAR International Series. 255, pp. 45-75.

Dowd, M. A. & Fairburn, N. 2005. Excavations at Farranastack, Co. Kerry: Evidence for the use of Shaft Furnaces in Medieval Iron Production. *Journal of Irish Archaeology*, 14, 115-121.

Dowling, M. & Taylor, K. 2007. Dollas Lower, in E. Grogan, L. O'Donnell & P. Johnston (eds.). *The Bronze Age Landscapes of the Pipeline to the West*. Bray. Wordwell, pp. 273-4.

Doyle, I. W. 1998. The early medieval activity at Dalkey Island, Co. Dublin: a re-assessment. *Journal of Irish Archaeology*, 9, 89-103.

Doyle, I. W. 2009. Mediterranean and Frankish Pottery imports in early medieval Ireland. *Journal of Irish Archaeology*, 18, 17-62.

Doyle, M. 2012. Early Medieval Crafts and the Manufacture and Use of People's Dress and Ornament, in Kerr *et al*. *The Archaeology of Industrial Activity on Secular Sites in Early Medieval Ireland, AD 400-1100*. www.emap.ie. pp. 104-143.

Dunlevy, M. M. 1988. A classification of early Irish combs. *Proceedings of the Royal Irish Academy*, 88, 341-422.

Earwood, C. 1991-92. Turned wooden vessels of the early historic period. *Ulster Journal of Archaeology*, 54-5, 154-9.

Earwood, C. 1993. *Domestic wooden artefacts in Britain and Ireland from Neolithic to Viking time*s. Exeter. Exeter University Press.

Earwood, C. 2011. The wooden artefacts, in C. J. Lynn & J. A. McDowell (eds.) *Deer Park Farms; the excavation of a raised rath in the Glenarm Valley, Co. Antrim*. Belfast, Stationary Office, pp. 386-416.

Edwards, N. 1990. *The Archaeology of Early Medieval Ireland*. London. B.T. Batsford Ltd.

Ekin, D. 2008. *The Stolen Village: Baltimore and the Barbary Pirates*. Dublin. O'Brien Press.

Empereur, J. Y. & Picon, M. 1989. Les régions de production d'amphores impérials en Méditerranée Orientale, in A. Hesnard *et al*. (eds.), *Amphores romaines et histoire économique; Dix ans de recherché*. Rome, pp. 223-48.

Eogan, G. 1977. The Iron Age – early Christian settlement at Knowth, Co. Meath, Ireland. V. Markotic (ed.) *Ancient Europe and the Mediterranean: Studies Presented in Honour of Hugh Hencken*. Wiltshire. Aris and Philips, pp. 69-76.

Evans-Pritchard, E. E. 1940. *The Nuer: A Description of the Modes of Livelihood and Political Institutions of a Nilotic People*. Oxford. Clarendon Press.

Fairweather, J. 2005. *Liber Eliensis: A History of the Isle of Ely from the Seventh Century to the Twelfth*. Woodbridge. Boydell Press.

Fanning, T. 1981. Excavation of an Early Christian cemetery and settlement at Reask, county Kerry. *Proceedings of the Royal Irish Academy*, 81C, 67-172. Fanning, T. 1994 *Viking age ringed pins from Dublin*. Dublin. Royal Irish Academy.

Farmer, D. L. 1992. Millstones for Medieval Manors. *Agricultural History Review*, 40, 97-111.

Fisher, J. 1877. *The History of Landholding in Ireland*. London, Longmans, Green & Co.

Fredengren, C. 2001. Poor people's crannogs. *Archaeology Ireland*, 15(4), 24-5.

Gelichi, S. & Hodges, R (eds.) 2012. *From One Sea to Another: Trading Places in the European and Mediterranean Early Middle Ages*. Turnhout, Brepolis

Gerriets, M. 1981. The Organization of Exchange in Early Christian Ireland. *Journal of Economic History*, 41(1), 171-6.

Gerriets, M. 1985. Money in Early Christian Ireland according to the Irish Laws. *Comparative Studies in Society and History*, 27(2), 323-339.

Gerriets, M. 1983. Economy and Society: Clientship according to the Irish laws. *Cambridge Medieval Celtic Studies*, 6, 43-61.

Gibson, D. B. 2012. *From Chiefdom to State in Early Ireland*. Cambridge. Cambridge University Press.

Gillespie, R. F. 2011. An early medieval settlement at Lowpark, Co. Mayo, in C. Corlett & M. Potterton (eds.) *Settlement in Early Medieval Ireland in the Light of Recent Archaeological Excavations*, pp. 181-212.

Graham, J. M. 1972. South-west Donegal in the seventeenth century. *Irish Geography*, 6(2), 136-52.

Grierson, P. 1959. Commerce in the Dark Ages: A Critique of the Evidence. *Transactions of the Royal Historical Society*, 9, 123-40.

Griffiths, D. 2010. *Vikings of the Irish Sea*. Stroud. The History Press.

Gwynn, J. (ed.) 1913. *Liber Ardmachanus: The Book of Armagh*. Dublin, Hodges & Figgis.

Hall, M. 2011. Metallography of Iron Artefacts from Deer Park Farms, Co. Antrim in C. J. Lynn and J. A. McDowell (eds.) *Deer Park Farms; The Excavation of a Raised Rath in the Glenarm Valley, Co. Antrim*, Northern Ireland Environment Agency, The Stationery Office, pp. 303-14.

Hanson, R. P. C. 1971. *English translation of the 'Confession' and the 'Letter to Coroticus' of Saint Patrick*. Nottingham.

Harden, D. B. 1956. Glass Vessels in Britain and Ireland, A.D. 400-1000, in D. B. Harden (ed.) *Dark Age Britain: Studies Presented to E.T. Leeds with a bibliography of his works*. London. Methuen Press, pp. 132-67.

Harden, D. B. 1984. Enamel and glass, in C. Gaskell-Brown & A. E. T. Harper (eds.). Excavations on Cathedral Hill, Armagh. *Ulster Journal of Archaeology*, 47, 135–6.

Heckett, E. W. 1997. Textiles, cordage, basketry and raw fibre, in M. F. Hurley, O. M. B. Scully & S. W. J. McCutcheon (eds.) *Late Viking Age and Medieval Waterford: Excavations 1986-1992*. Waterford. Waterford City, pp. 743-60.

Heckett, E. W. 2003. *Viking Age Headcoverings from Dublin*. Medieval Dublin excavations 1962-81 (Series B). Dublin. Royal Irish Academy.

Heckett, E. W. 2010. Textiles that work for their living: a late eleventh-century cloth from Cork, Ireland. In J. Sheehan & D. Ó Corrain (eds.). *The Viking Age: Ireland and the West: Papers from the Proceedings of the Fifteenth Viking Congress, Cork, 18–27 August 2005*. Dublin Four Courts, pp. 555-64.

Heckett, E. W. 2011. The Textiles, in C. J. Lynn, J. A. & McDowell (eds.) 2011. *Deer Park Farms: The excavation of a raised rath in the Glenarm Valley, Co. Antrim*, 498-547. Northern Ireland Archaeological Monographs, no. 9. Belfast. TSO and Environment and Heritage Service, pp. 353-66.

Hencken, H. O'N. 1938. Cahercommaun, a stone fort in County Clare. *Journal of the Royal Society of Antiquaries of Ireland*, 68, 1-82.

Hencken, H. O'N. 1942. Ballinderry crannóg no. 2, *Proceedings of the Royal Irish Academy*, 47C, 1–76.

Hencken, H. O'N. 1950. Lagore Crannog: An Irish Royal Residence from the Seventh to Tenth Centuries. *Proceedings of the Royal Irish Academy*, 53C, 1-247.

Henderson, J. 1988a. Electron-microprobe investigation of early Irish glass and glass-making practices, in E.V. Sayre, P. Vandiver, P. Druzik & C. Stevenson (eds.). *Materials Issues in Art and Archaeology: Symposium held April 6-8, 1988*. Reno, Nevada, pp. 141-46.

Henderson, J. 1988b. The nature of the Early Christian glass industry in Ireland: some evidence from Dunmisk fort, County Tyrone. *Ulster Journal of Archaeology* (Third Series), 51, 115-126.

Henderson, J. & Ivens, R. J. 1992. Dunmisk and glass-making in Early Christian Ireland. *Antiquity*, 66, 52-64.

Henry, F. 1951. Habitation sites on Inishkea North, Co. Mayo. *Journal of the Royal Society of Antiquaries of Ireland*, 81, 75–6.

Henschenio, G & Papebrochio, D. (eds.) 1866. *Acta Sanctorum Mai Vol. VI*. Paris and Rome, Société des Bollandistes.

Higgins, J. 2010. Appendix 6b: Report on the stone artefacts from Lowpark, County Mayo report published on CD, in R. Gillespie and A. Kerrigan (eds.) *Of*

Troughs to Tuyères; The Archaeology of the N5 Charlestown By-Pass, National Roads Authority Monograph No. 6, Wordwell, Bray.

Hill, G. 1877. *An Historical Account of the Plantation in Ulster*. Belfast, McCaw, Stevenson & Orr.

Hodges, R. 1982. *Dark Age Economics: The Origins of Town and Trade*. London/New York. Duckworth/St Martin's Press.

Hodges, R. 1989. *Dark Age Economics: The Origins of Towns and Trade A.D. 600-1000*. London, Duckworth (2nd Ed.)

Hodges, R. 2012. Adriatic Sea trade in an European perspective, in S. Gelichi & R. Hodges (eds.) *From One Sea to Another: Trading Places in the European and Mediterranean Early Middle Ages*. Turnhout, Brepolis, pp. 207-34.

Holm, P. 1986. The Slave trade of Dublin, ninth to twelfth centuries. *Peritia*, 5, 317-45.

Hughes, K. 1966. *The Church in early Irish society*. London. Methuen Press.

Irwin, D. A. 1996. *Against the Tide: An Intellectual History of Free Trade*. Princeton; Princeton University Press.

Ivens, R. J. 1984. Movilla Abbey, Newtownards, County Down: Excavations 1981. *Ulster Journal of Archaeology*, 47, 71–108.

Ivens, R. J. 1989. Dunmisk fort, Carrickmore, Co. Tyrone: Excavations 1984-1986. *Ulster Journal of Archaeology* (Third Series), 52, 17-110.

Jackman, N. 2007. Kilbegly Mill: Work in Progress. *Seanda*, 2, 34-5.

Jackman, N. 2009. Early medieval food-processing technology at Kilbegly, Co. Roscommon: the miller's tale, in M. Stanley, E. Danaher and J. Eogan (eds.), *Dining and Dwelling: Proceedings of a public seminar on archaeological discoveries on National Road Schemes, August 2008*. Archaeology and the National Roads Authority Monograph Series No. 6. Dublin. National Roads Authority, pp. 9-18.

Jackson, J. W. 1934. Further excavations at Ballintoy Caves, Co. Antrim. *Irish Naturalists Journal*, 5, 104-14.

Jaski, B. 2000. *Early Irish kingship and succession*. Dublin. Four Courts Press.

Jennings, R. 2008. Preliminary Archaeological Resolution Report: Ennisnag 4 Unpub'd Report, IAC Ltd.

Jones, H. L. 1969. *The Geography of Strabo*. Harvard University Press.

Jope, M. 1961-2. Animal remains from Larrybane promontory fort, in V.B. Proudfoot and B. Wilson (eds.), Further excavations at Larrybane promontory fort, *Ulster Journal of Archaeology*, 24-5, 91-115.

Karagiorgou, O. 2001. LR2: a container for the military *annona* on the Danubian border? In S. Kingsley and M. Decker (eds.) *Economy and Exchange in the east Mediterranean during late antiquity: Proceedings of a conference at Somerville College, Oxford, 29th May 1999*, 129-66. Oxford. Oxbow.

Keane, M. 1995. The crannog, in A. Moloney, N. Bermingham, D. Jenning, M. Keane, C. McDermott and E. O Carroll (eds.), B*lackwater survey and excavations; Artifact deterioration in peatlands; Lough More, Co. Mayo*. Transactions of the Irish Archaeological Wetland Unit Vol. 4. Dublin. Crannóg Publications, pp. 167-82.

Kelly, A. 2008. A Turkish import in County Meath:Mediterranean pottery on the M3. *Seanda*, 3, 16-8.

Kelly, A. 2010. The discovery of Phocaean Red Slip Ware (PRSW) Form 3 and Bii ware (LR1 amphorae) on sites in Ireland: an analysis within a broader framework. *Proceedings of the Royal Irish Academy*, 110C, 35-88.

Kelly, F. 1988. *A Guide to Early Irish Law*. Dublin. Dublin Institute for Advanced Studies.

Kelly, F. 1997. *Early Irish farming: a study based mainly on the law-texts of the 7th and 8th centuries A.D*. Dublin. Dublin Institute for Advanced Studies.

Kenny, N. 2010. Charcoal production in medieval Ireland, in M. Stanley, E. Danaher and J. Eogan (eds.), *Creative Minds: production, manufacturing and invention in ancient Ireland. Proceedings of a Public Seminar on Archaeological Discoveries on National Road Schemes, August 2009*.

Archaeology and the National Roads Authority Monograph Series No. 7. Dublin. National Roads Authority, pp. 99-116.

Kenward, H. K., Hall, A., Allison, E. P. & Carrott, J. 2011. Environment, activity and living conditions at Deer Park Farms: Evidence from plant and invertebrate remains. In C.J. Lynn and J.A. McDowell (eds.), *Deer Park Farms: The excavation of a raised rath in the Glenarm Valley, Co. Antrim*. Northern Ireland Archaeological Monographs, no. 9. Belfast. TSO and Environment and Heritage Service, pp. 498-547.

Kerr, T. R. 2009. The height of fashion - the distribution of platform raths in Northwest Ulster. *Journal of Irish Archaeology*, XVIII, 63-75.

Kerr, T. R. & McCormick, F. 2014. Statistics, Sunspots and Settlement: Influences on Sum of Probability Curves. *Journal of Archaeological Science*, 41, 493-501.

King, H. 2009. The economy and industry of early medieval Clonmacnoise: A preliminary view, in N. Edwards (ed.). *The Archaeology of the Early Medieval Celtic Churches*. Leeds. Maney Publishing, pp. 333-49.

Kinsella, J. 2005. Locating the poor and unfree of early medieval Ireland, in C. Lewis (ed.), *Medieval Settlement Research Group*. Annual Report 20, 25-29.

Koch, J. 1995. The Conversion and the Transition from Primitve to Old Irish, *c*. 367- *c*. 637. *Emania*, 13, 39-50.

Krusch, B. (ed.) 1902. *Scriptores rerum Merovingicarum IV*. Societas Aperiendis Fontibus Rerum Germanicarum Medii Aevi. Hannover.

Krusch, B. & Levison, W. (eds.) 1910. *Scriptores rerum Merovingicarum V*. Societas Aperiendis Fontibus Rerum Germanicarum Medii Aevi. Hannover.

Kruse, S. E & Tate, J. 1992. XRF analysis of Viking Age silver ingots. *Proceedings of Antiquaries of Scotland*, 122, 295-328.

Kyle, A., Stewart, K. & Tourunen, A. 2009. Excavating a meal: a multidisciplinary approach to early medieval food economy, in M. Stanley, E. Danaher & J. Eogan (eds), *Dining and Dwelling: Proceedings of a public seminar on archaeological discoveries on National Road Schemes, August*

2008, 73-84. Archaeology and the National Roads Authority Monograph Series No. 6. Dublin. National Roads Authority.

Laidlaw, J. 2000. A Free Gift Makes No Friends. *Journal of the Royal Anthropological Institute*, 6, 617-34.

Laing, L. 2006. *The Archaeology of Celtic Britain and Ireland: c. AD 400-1200*. Cambridge: Cambridge University Press.

Lawless, C. 1992. Lough More, Bofeenaun, Co. Mayo: crannog, fulachta fiadh, deer traps and associated archaeological sites. *Cathair Na Mart* 12, (1), 13–31.

Lawlor, H. C. 1925. *The Monastery of Saint Mochaoi of Nendrum*. Belfast. Belfast Natural History and Philosophical Society.

Liversage, G. D. 1968. Excavations at Dalkey Island, Co. Dublin 1956-59. *Proceedings of the Royal Irish Academy*, 66C, 53–233.

Lopez, R. S. 1998. *The Commercial Revolution of the Middle Ages, 950-1350*. Cambridge, Cambridge University Press.

Lucas, A. 2006. *Wind, Water and Work: Ancient and Medieval Milling Technology*. Leiden, Brill.

Lucas, A. T. 1989. *Cattle in ancient Ireland*, Kilkenny, Boethius.

Lynn, C. J. 1981-82. The excavation of Rathmullan, a raised rath and motte in County Down. *Ulster Journal of Archaeology*, 44-5, 65-171.

Lynn, C. J. 1984. Some fragments of exotic porphyry found in Ireland. *Journal of Irish Archaeology*, 2, 19–32.

Lynn, C. J. & McDowell, J. A. (eds.) 2011. *Deer Park Farms: The excavation of a raised rath in the Glenarm Valley, Co. Antrim*. Northern Ireland Archaeological Monographs, no. 9. Belfast. TSO and Environment and Heritage Service.

Lynn, C. J. & McDowell, J. A. 2011. Literary and Archaeological Contexts, in C. J. Lynn & J. A. McDowell (eds.) *Deer Park Farms: The excavation of a raised rath in the Glenarm Valley, Co. Antrim*. Northern Ireland Archaeological

Monographs, no. 9. Belfast. TSO and Environment and Heritage Service, pp. 580-93.

Macalister, R. A. S. 1943. Two ringforts submerged by the Poulaphuca reservoir (note). *Journal of the Royal Society of Antiquaries of Ireland*, 73, 145-9.

McClatchie, M. 2011. The Plant Remains from Early Medieval Ireland, in McCormick *et al*. *The Archaeology of Early Medieval Farming in Ireland*. http://www.emap.ie., pp. 45-67.

McCormick, F. 1992. Early faunal evidence for dairying. *Oxford Journal of Archaeology*, 11, 201-9.

McCormick, F. 1997. The animal bones, in M. F. Hurley, O. M. B. Scully and S. W. J. McCutcheon (eds.), *Late viking age and medieval Waterford: excavations 1986-1992*. Waterford. Waterford Corporation, pp. 819-53.

McCormick, F. & Macdonald, P. 2004. Excavations at Dunnyneill Island. *Lecale Review*, 2, 5-10.

McCormick, F. & Murray, E. V. 2007. *Excavations at Knowth 3: Knowth and the zooarchaeology of early Christian Ireland*. Dublin. Royal Irish Academy.

McCormick, F., Kerr, T. R. & McClatchie, M. 2011. The Archaeology of Early Medieval Farming in Ireland. http://www.emap.ie.

McCormick, M. 2001. *Origins of the European Economy*. Cambridge. Cambridge University Press.

MacCotter, P. 2008. *Medieval Ireland: Territorial, Political and Economic Divisions*. Dublin, Four Courts Press.

McCutcheon, S. W. J. & Hurley, M. F. 1997. Insula North, in M. F. Hurley, O. M. B. Scully & S. W. J. McCutcheon (eds.). *Late Viking Age and Medieval Waterford: Excavations 1986-1992*. Waterford. Waterford City, pp. 154-63.

McDonnell, J. G. 1995. Slag report on samples from Bofeenaun, Lough More, Co. Mayo. In A. Moloney, N. Bermingham, D. Jenning, M. Keane, C. McDermott and E. O'Carroll (eds.), *Blackwater survey and excavations; Artifact deterioration in peatlands; Lough More, Co. Mayo*. Transactions of the

Irish Archaeological Wetland Unit Vol. 4. Dublin. Crannóg Publications, pp. 183-4.

McErlean, T. C. and Crothers, N. 2007. *Harnessing the tides: the early medieval tide mill at Nendrum Monastery, Strangford Lough*. Belfast. TSO.

McEvoy, J. 1991. *County of Tyrone, 1802, a statistical survey*. Belfast, Friars Bush Press (being a reprint of the McEvoy, J. 1802. *A Statistical Survey of the county of Tyrone*).

MacLean, D. 1995. The status of the sculptor in Old-Irish law and the evidence of the crosses*. Peritia*, 9, 125–55.

McLeod, N. 1986. Interpreting Early Irish Laws: Status and Currency (Part I). *Zeitschrift für Celtische Philologie*, 41, 46-65.

McLeod, N. 1987. Interpreting Early Irish Laws: Status and Currency (Part II). *Zeitschrift für Celtische Philologie*, 42, 41-115.

Mac Néill, E. 1923. Ancient Irish Law: The Law of Status or Franchise. *Proceedings of the Royal Irish Academy*, 36C, 265-316.

McNeill, T. E. 1991-92. Excavations at Dunsilly, County Antrim. *Ulster Journal of Archaeology*, 54-5, 78-112.

Mac Niocaill, G. 1971. Tír Cumaile. *Ériu*, 22, 81-86.

Mac Niocaill, G. 1972. *Ireland before the Vikings*. London. Gill and Macmillan Ltd.

Mac Niocaill, G. 1981. Investment in Early Irish Agriculture, in B. G. Scott (ed.) *Studies on Early Ireland: Essays in Honour of M. V. Duignan*. Dublin. Association of Young Irish Archaeologists.

McSparon, C. & Williams, B. B. 2009. The excavation of an Early Christian rath with later medieval occupation at Drumadoon, Co. Antrim. *Proceedings of the Royal Irish Academy* 109C, 105-164.

Malinowski, B. 1920. Kula: the Circulating Exchange of Valuables in the Archipelagos of Eastern New Guinea. *Man*, 20, 97-105.

Malinowski, B. 1922. *Argonauts of the Western Pacific*. London. Routledge.

Moloney, A. & Keane, M. 1992:0141. Bofeenaun, Co. Sligo. www.excavations.ie.

Marshall, J. W. & Walsh, C. 2005. *Illaunloughan Island: An Early Medieval Monastery in County Kerry*. Bray. Wordwell.

Mason, E. 1990. *St Wulfstan of Worcester c. 1008-1095*. Oxford, Basil Blackwell.

Mauss, M. 1924. *Essai sur le don*. [1954 translation by I. Cunnison: *The Gift: Forms and Functions of Exchange in Archaic Societies*. Norton Library].

Megaw, A. H. S. & Jones, R. E. 1983. Byzantine and allied pottery: a contribution by chemical analysis to problems of origin and distribution. *Annual of the British School at Athens*, 78, 235-63.

Meighan, I. G. 2007. Sourcing the Nendrum Millstone Material, in T. C. McErlean & N. Crothers (eds.), *Harnessing the Tides: the Early Medieval Tide Mills at Nendrum Monastery*. Belfast. TSO, pp. 204-5.

Meyer, E. 1924. Die wirtschafflichen Entwicklung des Altertums, published in *Kleine Schriften*. Halle.

Meyer, K. (ed.) 1906. *The Triads of Ireland*. Royal Irish Academy Todd Lecture Series Volume XIII. Dublin: Hodges, Figgis, & Co. Ltd; London: Williams & Norgate

Mill, J. S. 1836. On the Definition of Political Economy, and on the Method of Investigation Proper to It, *London and Westminster Review*, October 1836. Included in J. S. Mill. 1874. *Essays on Some Unsettled Questions of Political Economy*, 2nd ed. London. Longmans, Green, Reader & Dyer. Essay 5, paragraphs 38 and 48.

Monk, M. A. 1981. Post-Roman Drying Kilns and the Problem of Function: Preliminary Statement, in D. Ó Corrain (ed.) *Irish Antiquity: Essays and Studies Presented to Professor M. J. O'Kelly*. Blackrock, Four Courts Press, pp. 216-30.

Monk, M. A. 1988. Excavations at Lisleagh Ringfort, North County Cork. *Archaeology Ireland* 2(2), 57-60.

Monk, M. A. 1995. A tale of two ringforts: Lisleagh I and II. *Journal of the Cork Historical and Archaeological Society*, 100, 105–16.

Monk, M. A. & Power, O. 2012. More than a grain of truth emerges from a rash of corn-drying kilns? *Archaeology Ireland*, 26 (2), 38-41.

Montgomery, W. E. 1889. *The History of Land Tenure in Ireland*. Cambridge, Cambridge University Press.

Morrison, M. 1953. Report on Charcoal and Carbonised Seeds. *Ulster Journal of Archaeology* 16, 53-4.

Moreland, J. 2000. Concepts of the Early Medieval Economy, in I. L. Hansen & C. Wickham (eds.) *The Long Eighth Century*. Leiden, Brill, pp. 1-34.

Moss, R. J. 1927. A chemical examination of the crucibles in the collection of Irish antiquities in the Royal Irish Academy. *Proceedings of the Royal Irish Academy*, 37C, 175–93.

Munn, M. L. Z. 1985. A Late Roman kiln site in the Hermionid, Greece. *American Journal of Archaeology*, 89, 342-3.

Murphy, T. F. & Ó Cuileanáin, C. 1961. A ringfort at Oldcourt, Co. Cork. *Journal of the Cork Historical and Archaeological Society*, 66, 79–92.

Murray, E. V. 2012. Mammal bones, in C. Cotter (ed.) *The western stone forts project: Excavations at Dún Aonghasa and Dún Eoganachta Vol.2.* Bray, Wordwell. pp. 341-45.

Murray, E.V. & McCormick, F. 2012. Doonloughan: a seasonal settlement site on the Connemara coast. *Proceedings of the Royal Irish Academy,* 112C, 1-52.

Mytum, H. 1992. *The Origins of Early Christian Ireland*. London. Routledge.

Naylor, J. 2012. Coinage, Trade and the Origins of the English Emporia, ca. AD 650-450, in S. Gelichi & R. Hodges (eds.) *From One Sea to Another: Trading Places in the European and Mediterranean Early Middle Ages*. Turnhout, Brepolis, pp. 237-66.

Neill, M. 2011. The leather objects in C. J. Lynn and J. A. McDowell (eds.) *Deer Park Farms; the excavation of a raised rath in the Glenarm Valley, Co. Antrim*. Belfast, Stationary Office, pp. 368-83.

Nellis, E., Gormley, S., McSparron, J. C., & Kyle, A. 2007. *Data Structure Report: No. 044 (Part 1) Excavations at St Patrick's Church, Armoy, County Antrim*. CAF report.

Nelson, M. 2005. *The Barbarian's Beverage: A History of Beer in Ancient Europe*. London. Routledge.

Ní Ghrádaigh, J. 2007. A legal perspective of the *saer* and workshop practice in pre-Norman Ireland, in R. Moss (ed.) *Making and Meaning in Insular Art*. Dublin, Four Courts Press, pp. 110-25.

North, D. C. & Thomas, R. P. 1973. *The Rise of the Western World: A New Economic History*. Cambridge, Cambridge University Press.

O'Brien, R. 2010. Spindle-whorls and hand-spinning in Ireland, in M. Stanley, E. Danaher & J. Eogan (eds.) *Creative Minds: production, manufacturing and invention in ancient Ireland*. Proceedings of a public seminar on archaeological discoveries on national roads schemes, August 2009. Archaeology and the National Roads Authority Monograph Series No. 7. Dublin: National Roads Authority, pp. 15-26

O'Brien, R. & Russell, I. 2005. The Hiberno-scandinavian site of Woodstown 6, County Waterford, in J. O'Sullivan & M. Stanley (eds.) *Recent Archaeological discoveries on National Road Schemes 2004: Proceedings of a seminar for the public, Dublin, September 2004*. Bray: Wordwell, pp. 111–24.

O'Brien, W. 2004. *Ross Island: Mining, Metal and Society in Early Ireland. Bronze Age Studies*. Galway National University of Ireland.

Ó Carragáin, T. 2010. *Churches in Early Medieval Ireland*. London. Yale University Press.

O'Connor, L. 1991. Irish Iron Age and early Christian whetstones. *Journal of the Royal Society of Antiquaries of Ireland*, 121, 45–76.

O'Connor, T. 2011. Animal Husbandry, in H. Hamerow, D. A. Hinton & S. Crawford (eds.) *The Oxford Handbook of Anglo-Saxon Archaeology*, Oxford University Press, pp. 361-76.

Ó Corráin, D. 1972. *Ireland before the Normans*, Dublin. Gill and MacMillan Ltd.

Ó Cróinín, D. 1992. Review of H. Mytum: The Origins of Early Christian Ireland. *Linen Hall Review*, 9.2, 23-5.

Ó Cróinín, D. 1995. *Early Medieval Ireland*. New York. Longman Publishing.

O'Donovan, J. 1847*. Leabhar na gCeart or the Book of Rights*. Dublin.
O'Hara, R. 2009. Collierstown 1: a late Iron Age—early medieval enclosed cemetery, in M. Deevy and D. Murphy (eds.) *Places Along the Way: First Findings on the M3*. National Roads Authority Scheme Monograph Series 5. Dublin. National Roads Authority. Wordwell, pp. 83-100.

Officer, L. H. & Williamson, S. H. 2013. Purchasing Power of British Pounds from 1245 to Present. http://www.measuringworth.com/ppoweruk/

O'Kelly, M. J. 1963. Two ring-forts at Garryduff, Co. Cork. *Proceedings of the Royal Irish Academy*, 63C, 17-125.

O'Meara, J. 1951. *The first version of the Topography of Ireland*. Dundalk. Dundalgan Press.

O'Meara, J. 1981. *The Voyage of Saint Brendan.* Dublin, Dolmen Press.

Ó Néill, J. 2006. Excavation of pre-Norman structures on the site of an enclosed Early Christian cemetery at Cherrywood, County Dublin. S. Duffy (ed.) *Medieval Dublin VII: Proceedings of the Friends of Medieval Dublin Symposium 2005*. Dublin. Four Courts Press, pp. 66–88.

O'Neill, T. 1987. *Merchants and Mariners in Medieval Ireland*. Dublin. Irish Academic Press.

Ó Ríordáin, A. B. 1984. Excavations in old Dublin, in J. Bradley (ed.) *Viking Dublin Exposed: The Wood Quay Saga*. Dublin. O'Brien Press, pp. 134-43.

Ó Ríordáin, A. B. & Rynne, E. 1961. A settlement in the sandhills at Dooey, Co. Donegal. *Journal of the Royal Society of Antiquaries of Ireland*, 91, 58-64.

Ó Ríordáin, S. P. 1940. Excavations at Cush, Co. Limerick. *Proceedings of the Royal Irish Academy*, 45C, 83-181.

Ó Ríordáin, S. P. 1941–2. The excavation of a large earthen ring-fort at Garranes, Co. Cork. *Proceedings of the Royal Irish Academy*, 47C, 77–150.

Ó Ríordáin, S. P. & Hartnett, P. J. 1943. The excavation of Ballycatteen Fort, Co. Cork. *Proceedings of the Royal Irish Academy*, 49C, 1-44.

O'Sullivan, A. 1998. *The Archaeology of Lake Settlement in Ireland*. Dublin. Royal Irish Academy.

O'Sullivan, A. & Breen, C. 2007. *Maritime Ireland: An Archaeology of Coastal Communities*. Stroud. Tempus.

O'Sullivan, A., McCormick, F., Kerr, T. R. & Harney, L. 2013. *Early Medieval Ireland, AD 400–1100. The Evidence from Archaeological Excavations*. Dublin. Royal Irish Academy.

O'Sullivan, A. & Van de Noort, R. 2007. Temporality, cultural biography and seasonality: Rethinking time in wetland archaeology, in J. Barber, C. Clark, M. Cressy, A. Crone, A. Hale, J. Henderson, R. Housley, R. Sands & A. Sheridan (eds.) *Archaeology from the Wetlands: Recent Perspectives: Proceedings of the 11th WARP Conference, Edinburgh 2005*. Edinburgh. Society of Antiquaries of Scotland, pp. 67-78.

O'Sullivan, J. 1998. Nationalists, archaeologists and the myth of the Golden Age, in M. A. Monk & J. Sheehan (eds.), *Early medieval Munster: archaeology, history and society*. Cork. Cork University Press, pp. 178-89.

de Paor, L. 1997. Inis Cealtra: report on archaeological and other investigations of the monuments on the island. Unpublished report.

de Paor, M. & De Paor, L. 1958. *Early Christian Ireland*. London. Thames and Hudson.

Patterson, N. 1994. *Cattle-Lords and Clansmen*. Notre Dame.

Payne, S. 1973. Kill-off patterns in sheep and goats: the mandibles from Aşvan Kale. *Anatolian Studies*, 23, 281-305.

Pearson, H. W. 1957. The Secular Debate on Economic Primitivism, in K. Polanyi, C. M. Arensberg & H. W. Pearson (eds.) *Trade and Market in the Early Empires*. New York. The Free Press; pp. 3-11.

Persky, J. 1995. The Ethology of Homo Economicus. *The Journal of Economic Perspectives*, 9(2), 221-31.

Photos-Jones, E. 2008a. Analysis of metallurgical waste from Johnstown 1 (Appendix 6- Part I), in N. Carlin, L. Clarke and F. Walsh (eds.), *The Archaeology of Life and Death in the Boyne Floodplain: the linear landscape of the M4*. National Roads Authority Scheme Monographs 2. CD Excavation Reports. Dublin. National Roads Authority.

Photos-Jones, E. 2008b. The technical examination of metallurgical waste for Killickaweeny (Appendix 2 in the CD Excavation Reports), in N. Carlin, L. Clarke and F. Walsh (eds.). *The Archaeology of Life and Death on the Boyne Floodplain: The Linear Landscape of the M4*. National Roads Authority Scheme Monograph 2. Bray. Wordwell.

Photos-Jones, E. 2011. Appendix 10: Metallurgical Analysis, in S. Delaney (ed.) *M1 Dundalk Western By Pass, Site 121, Balriggan 1, Final Report*. Unpublished Report by Irish Archaeological Consultancy for Louth County Council.

Photos-Jones E., Wilson L. & Hall A. J. 2010. Appendix 2.7 Metallurgical waste analysis report in Coughlan, T *N2 Carrickmacross-Aclint Road Re-Alignment, Final Report,* Unpublished Report by Irish Archaeological Consultancy for Monaghan County Council.

Pirenne, H. 1925. *Medieval Cities: Their Origins and the Revival of Trade*. Princeton. Princeton University Press (translated F. D. Halsey).

Pirenne, H. 1967. Aspects of Medieval European Economy, in G. Dalton (ed.) *Tribal and Peasant Economies: Readings in Economic Anthropology*. Austin and London. University of Texas Press, pp. 418-37.

Polanyi, K. 1957. *The Great Transformation*. Boston. Beacon Press (1st ed. 1944).

Polanyi, K. 1966. *Dahomey and the Slave Trade*: *An Analysis of an Archaic Economy*. Seattle.

Proudfoot, V. B. 1961. The economy of the Irish rath. *Medieval Archaeology*, 5, 94-122.

Richey, A. G (ed.) 1879. *Ancients Laws of Ireland V.4*. London. Longmans, Green, Reader and Dyer.

Rodet-Belarbi, I. 2011. Viandes animales dans le Languedoc-Rouissillon rural médiéval: bilan 2010. *Ruralia*, VIII, 91-112.

Round, J. H. 1909. *Feudal England*. London.

Ryan, M. 1973. Native pottery in Early Historic Ireland. *Proceedings of the Royal Irish Academy*, 73C, 619-45.

Ryan, M. 1988. Fine metal-working and early Irish monasteries: The archaeological evidence, in J. Bradley (ed.) *Settlement and Society in Medieval Ireland*. Kilkenny. Boethius, pp. 33-48.

Ryder, M. L. 1981. Livestock, in S. Piggott (ed.) *The Agrarian History of England and Wales, Vol. I.1*. Cambridge, Cambridge University Press, pp. 301-410.

Rynne, C. 2009. Water-Power as a Factor of Industrial Location in Early Medieval Ireland: The Environment of the Early Irish Water Mill. *Industrial Archaeology Review*, 31, 85-95.

Rynne, E. 1956. Excavation of a ringfort at Ardcloon, Co. Mayo. *Journal of the Royal Society of Antiquaries of Ireland*, 86, 203–14.

Scott, B. G. 1978. Iron 'slave-collars' from Lagore crannog, Co. Meath. *Proceedings of the Royal Irish Academy*, 78C, 213-30.

Scott, B. G. 1981. Some Conflicts and Correspondences of Evidence in the Study of Irish Archaeology and Language, in Scott, B. G. (ed.) 1981. *Studies on early Ireland: essays in honour of M.V. Duignan*. Dublin. Association of Young Irish Archaeologists, pp. 115-19.

Scott, B. G. (ed.) 1981. *Studies on early Ireland: essays in honour of M.V. Duignan*. Dublin. Association of Young Irish Archaeologists.

Scott, B. G. 1991. *Early Irish ironworking*. Belfast. Ulster Museum.

Seaver, M. 2010. Against the grain: Early medieval settlement and burial on the Blackhill: excavations at Raystown, Co. Meath, in C. Corlett & M. Potterton (eds.) *Death and Burial in Early Medieval Ireland, in Light of Recent Archaeological Excavations*. Dublin. Wordwell, pp. 299-319.

Seaver, M. 2011. Interchange: excavations in an early medieval landscape at Glebe and Laughanstown, Co. Dublin, in C. Corlett & M. Potterton (eds.) *Settlement in Early Medieval Ireland in the Light of Recent Archaeological Excavations*, pp. 261-287.

Simpson, L. 1999. Director's Findings: Temple Bar West. Temple Bar Archaeological Report, 5. Dublin. Temple Bar Properties.

Smith, W. 1851. A new classical dictionary of Greek and Roman biography, mythology, and geography partly based upon the Dictionary of Greek and Roman biography and mythology. New York. Harper & Bros.

Soderberg, J. 1999. Clientage and Social Stratification in Early Medieval Ireland: An Archaeological Perspective. *Proceedings of the Harvard Celtic Colloquium*, 18/19, 396-433.

Solar, P. M. 1990. The Irish Butter Trade in the Nineteenth Century: New Estimates and Their Implications. *Studia Hibernica*, 25, 134-61.

Simms, A. 1986. Continuity and Change: Settlement and Society in Medieval Ireland *c*. 500-1500, in W. Nolan (ed.) *The Shaping of Ireland*. Dublin. Mercier Press, pp. 44-65.

Stevens, P. 2010. For whom the bell tolls: The monastic site at Clonfad 3, Co. Westmeath, in M. Stanley, E. Danaher & J. Eogan (eds.) *Creative Minds: Production, Manufacturing and Invention in Ancient Ireland: Proceedings of a Public Seminar on Archaeological Discoveries on National Road Schemes, August 2009*, 7. Dublin. Wordwell, pp. 85-98.

Stout, G. & Stout, M. 2008. *Excavation of a Secular Cemetery at Knowth Site M, County Meath, and Related Sites in North-East Leinster*. Dublin. Wordwell.

Stout, M. 1997. *The Irish Ringfort*. Dublin, Four Courts Press.

Sweetman, H. S. 1877. *Calendar of Documents Relating to Ireland: 1252-1284*. London. Longman & Co.

Swift, C. 1998. Forts and fields: a study of 'monastic towns' in seventh and eighth century Ireland. *Journal of Irish Archaeology*, 9, 105-25.

Thomas, G. 2012. Carolingian Culture in the North Sea World: Rethinking the Cultural Dynamics of Personal Adornment in Viking Age England. *European Journal of Archaeology*, 15(3), 486-519.

Thurneysen, R. 1923. Aus dem Irishen Recht I [1. Das Unfrei-Lehen]. *Zeitschrift für Celtische Philologie*, 14, 335-94.

Thurneysen, R. 1925. Aus dem Irishen Recht II [2. Das Frei-Lehen]. *Zeitschrift für Celtische Philologie*, 15, 238-60.

Thurneysen, R. 1973. Celtic Law, in D. Jenkins (ed.) *Celtic Law Papers*. Brussels, pp. 49-70.

Tierney, J. 2008. Early medieval iron- and copper-smelting: Area 25, Cooltubrid East TD, in P. Johnston, J. Kiely & J. Tierney (eds.) *Near the Bend in the River: The archaeology of the N25 Klmacthomas Realignment: National Roads Authority Scheme Monographs 3*. Bray. Wordwell, pp. 107–9.

Tierney, M. 1998. Theory and Politics in early medieval Irish archaeology, in M.A. Monk & J. Sheehan (eds.) *Early medieval Munster: archaeology, history, and society*. Cork. Cork University Press, pp. 190-99.

Toynbee, A. J. 1934. *A Study of History. Vol. II*. Oxford. Oxford University Press.

Tylecote, R. F. 1986. *The prehistory of metallurgy in the British Isles*. London, Institute of Metals

Valante, M. 1998. Reassessing the Irish monastic town. *Irish Historical Studies,* 31(121), 1-18.

Vroom, J. 2003. *After Antiquity: Ceramics and society in the Aegean from the 7th to the 20th century: A case study from Boeotia, Central Greece*. Leiden.

Wallace, A. 2009. Archaeometallurgical Report on material from Roestown 2, in R. O'Hara, *Report on the Archaeological Excavation of Roestown* by Archaeological Consultancy Services Ltd for Meath County Council. Available at www.m3.ie.

Wallace, A. 2010. Excavation of an early medieval cemetery at Ratoath, Co. Meath, in C. Corlett & M. Potterton (eds.) *Death and Burial in Early Medieval Ireland, in Light of Recent Archaeological Excavations*. Dublin. Wordwell, pp. 335-59.

Wallace, A. & Anguilano, L. 2010a. 9.1 Metallurgical report in Stevens, P and O'Droma M8/N8 Cullahill to Cashel Road Improvement Scheme Archaeological Resolution Final Report E2376 Site AR 33, Borris, Co. Tipperary, Unpublished Report by Valerie J. Keeley Ltd for Tipperary County Council.

Wallace, A. and Anguilano, L. 2010b. Iron-smelting and smithing: new evidence emerging on Irish road schemes, in M. Stanley, E. Danaher and J. Eogan (eds.), *Creative Minds: Production, Manufacturing and Invention in Ancient Ireland: Proceedings of a Public Seminar on Archaeological Discoveries on National Road Schemes, August 2009*. Archaeology and the National Roads Authority Monograph Series No. 7. Dublin. National Roads Authority, pp. 69-84.

Wallace, P. F. 1985. The archaeology of Viking Dublin, in H. Clarke & A. Simms (eds.), *The comparative history of urban origins in non-Roman Europe: Ireland, Wales, Denmark, Germany, Poland and Russia from the ninth to the thirteenth century, Vol. 1*, 103-45. Oxford. BAR International Series, 255. pp.103-45.

Wallace, P. F. 1987. The economy and commerce of Viking Age Dublin, in K. Duwel *et al*. (eds.), *Untersuchungen zu handel und verkehr der vor- und fruhgeschichtlichen zeit in mittel- und Nordeuropa Vol. 4*. Gottingen, pp. 200-45.

Wallace, P. F. 2005. The Archaeology of Ireland's Viking-Age Towns, in D. Ó Cróinín (ed.) *A new history of Ireland. Vol. 1: Prehistoric and early Ireland*. Oxford. Oxford University Press, pp. 814-41.

Warner, G. (ed.) 1926. *The Libelle of Englyshe Polycye*. Oxford. Clarendon Press.

Warner, R. B. 1985. Observations on the Radiocarbon Dates from Rathmullan. *Ulster Journal of Archaeology*, 48, 142-43.

Waterblock, H. T. 2008. *Getimmerd Verleden*. Groningen, Barkhuis Press.

Wickham, C. 2005. *Framing the Middle Ages: Europe and the Mediterranean, 400-800*. Oxford, Oxford University Press

Wooding, J. M. 1996. *Communication and Commerce along the Western Sealanes A.D. 400-800*. Oxford. BAR International Series. 654.

Wyatt, D. 2009. *Slaves and Warriors in Medieval Britain and Ireland, 800-1200*. Leiden, Brill.

Young, T. P. 2003. Is the Irish iron-smelting bowl furnace a myth? A discussion of new evidence for Irish bloomery iron making. GeoArch Report 2003/09. http://archaeometallurgy.co.uk/report_static_index.aspx.

Young, T. P. 2008. Evaluation of Archaeometallurgical residues from the M7/M8 Contract 2: Derrinsallagh 3 (E2179). GeoArch Report 2008/22. http://archaeometallurgy.co.uk/report_static_index.aspx

Young, T. P. 2009a. Evaluation of the Archaeometallurgical Residues from the M7/M8 Contract 1:Parcnahown 5 (E2170). Geo Arch Report 2009/21. http://archaeometallurgy.co.uk/report_static_index.aspx

Young, T. P. 2009b. Appendix 7, Archaeometallurgy report in Kiely, J and O' Donoghue, J Archaeological Excavation Report E2426 - Gortnahown 2, Co. Cork, *Eachtra Journal*, Issue 10, http://eachtra.ie/index.php/journal/e2426-gortnahown2-co-cork/

Young, T. P. 2010. Evaluation of archaeometallurgical residues from Dunlo, Ballinasloe, Co. Galway (08E653). Geoarch Report 2010/06. http://archaeometallurgy.co.uk/report_static_index.aspx.

Young, T. P. 2012. Assessment of archaeometallurgical residues from the N69 Rea to Tullig Road Realignment Scheme, Cloonnafinneela 1, Co Kerry (11E0354). Geoarch Report 2012/01.
http://archaeometallurgy.co.uk/report_static_index.aspx.

Zimmer, H. 1909. Der Wienhandel Westgalliens nach Irland im 1 bis 7 Jahrhundert n. Chr. und sein Niederschlag in irischer Sage und Sprache. *Sitzungsberichte der Preussischen Akademie der Wissenschaften zu Berlin*, *1909*, 430-76.