THE RÔLE OF SUPPLY-CHAINS IN THE DEVELOPMENT OF CROSS-CHANNEL EXCHANGE IN THE ROMANO-BRITISH PERIOD

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ABSTRACT

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by

Graham J Barton

This thesis explores the early phases of marketing activity in Britain by investigating the supply-chains through which imports arrived during the Roman period. The study adopts a cross-disciplinary approach which draws on archaeological evidence, as few written records survive from this era.

The investigation commences with a review of the structure of the Roman economy, after which the characteristic features of a traditional supply-chain are presented and the rôles and relationships of its key members examined. The empirical evidence relating to cross-channel exchange in the Romano-British period (*c.* 120 BC-AD 410) is reviewed by means of four product-based case studies; two of which relate to *amphorae*-borne commodities (olive-oil and wine) and two involve types of ceramic pottery (samian ware and Rhenish-beakers).

The contribution of this thesis is to combine methodologies from apparently disparate fields such as archaeology and marketing to enable new questions to be asked of existing data to enhance understanding in each discipline. In addition to using archaeological evidence to trace the evolution of marketing practices in the Romano-British period, the reciprocal aim of the study was to explore ways in which archaeologists may be able to utilize economic and marketing models to offer new insights into their own subject area.

Supply-chain analysis forms the central focus of this thesis. Its main insight is to recognize that through their contacts with clients in both Britain and Gaul, Romano-British and *Gallo*-Roman merchants must inevitably have gained asymmetric knowledge of market conditions in each location, thus enabling them through their choice of cargoes to control the vital 'choke-point' of the channel-crossing. In addition to the principal theme of supply-chain analysis, the inclusion of economic and marketing models such as industrial location criteria (Weber, 1929; Ohlin, 1933) and product-cycle analysis (Vernon, 1966; Wells, 1968) all represent new applications of business theories to the archaeological domain and add to the uniqueness of this research.

AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of the University of Gloucestershire and is original except where indicated by specific reference in the text. No part of the thesis has been submitted as part of any other academic award. The thesis has not been presented to any other educational institution in the United Kingdom or overseas.

Any views expressed in this thesis are those of the author and in no way represent those of the University.

Signed  Date 2/2/2016

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Finally, special thanks are due to my wife Cathy, for both her patience and forbearance while I have been engaged in this study and the practical help she has provided in carefully proof reading my finished thesis. Any errors or omissions which remain are clearly my own.

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INTRODUCTION

1.1 RESEARCH CONTEXT

1.1.1 Contemporary Research in Marketing

The focus of much contemporary business research, particularly in subjects such as marketing, is frequently directed towards areas of either immediate or potential commercial interest. This approach is perhaps understandable, given that any advances in theoretical or practical knowledge gained in this way may eventually lead to significant economic benefits for the individuals concerned or society as a whole. The overwhelming emphasis on research themes which happen to be 'in vogue' suggests that researchers in relatively new fields like marketing may instinctively feel that topical issues hold more interest than a study of man's past achievements. This dominance of current themes is unlikely to be reversed any time soon, given the enormous range of research opportunities generated by today's dynamic commercial environment, where the forces of globalization and technological change may rapidly render historical experiences redundant.

The impact of external influences of this kind requires us to consider whether the complexity of modern business has fundamentally changed the nature of marketing *per se*, or merely requires practitioners to develop more elaborate responses to keep pace with the needs of our increasingly sophisticated and cosmopolitan society. To answer this question, our starting point must be to establish precisely what we understand the verb 'marketing' to mean, in order to determine how this practical activity has influenced the development of long distance exchange.

Numerous definitions have been proposed; indeed, it has been suggested that almost every academic textbook now offers its own version (Baker, 1996:7). A broad consensus emerges, however, which recognizes marketing to be a 'customer oriented' activity dedicated to identifying and responding to clients' needs. Thus:-

> "Marketing is the way in which any organisation or individual matches its own capabilities to the wants of its customers."
>
> (Christopher *et al*, 1980:9)

1.1.2 Researching Marketing's History

While the notion of tracing the development of marketing back through time may initially seem fairly simple, we immediately encounter problems when we try. These stem from the fact that different research traditions have developed in the empirically oriented 'history of marketing practice' and the theoretically based 'history of marketing thought' (Jones & Shaw, 2002:39).

Proponents of 'the history of marketing practice' choose to approach the idea of marketing from its contextual usage as a 'verb'. They therefore base their epistemological stance on the argument that 'marketing' as a construct is defined by 'action'. Consequently anyone engaging in any of marketing's constituent parts will generate marketing outputs, irrespective of whenever or wherever such activities occurred (Dixon, 1979; Shaw, 1995).

Conversely, to advocates of 'the history of marketing thought', marketing is a 'noun' and the subject was therefore only created at the moment marketing was recognized as an 'idea' rather than an 'activity' (Bartles, 1965).

> "Until the **idea** was conceived to which the term **marketing** was applied, the simple **activity** had been called only 'trade,' 'distribution,' or 'exchange."
>
> (Bartles, 1965, reprinted in Sheth & Garrett, 1986:191)

Opinions differ among members of 'the history of marketing thought' school as to when exactly this intellectual breakthrough occurred. Some attribute the event to the late 18th century, when the onset of the 'Industrial Revolution' first enabled marketing and production to operate in tandem (McKendrik *et al*, 1982). Others, such as Keith (1960), place marketing's origins a century later when a three phase evolution began to fundamentally reshape U. S. industry via:-

1/	a production era	(1870-1929)
2/	a sales era	(1930-1959)
3/	a marketing era	(1960-onwards)

(Keith, 1960:36)

Other 'periodization' models have been offered on occasions as students of 'the history of marketing thought' have attempted to link important stages in the subject's evolution to the chronological era in which they first occurred (Hollander *et al*, 2005:32). The most important version is the model offered by Fullerton (1988), which uses a four step approach to place marketing's development in Europe and the USA within its historical framework:-

1/	an era of antecedents	(1500-1750)
2/	an era of origins	(1750-1850)
3/	an era of institutional development	(1850-1929)
4/	an era of refinement and reformulation	(1930-onwards)

(Fullerton, 1988:121-123)

The most commonly accepted date for marketing's inception to followers of 'the history of marketing thought' tradition is provided by Bartles (1962:4). This firmly places the origin of the concept in the early 20th century.

> "Bartles (1962, 4) believed he found the origins of marketing thought, placing it in the United States 'between 1906-1911' with the best approximation 'about 1910'."
>
> (Bartles, 1962; cited by Shaw & Tamilia, 2001:159)

This critical date has subsequently been adopted by leading texts in this branch of marketing, such as Bartles (1988) and Tadajwski & Jones (2008).

1.1.3 Choice of Investigative Framework

The present study covers the period from *c.* 120 BC to AD 270, stretching back well before the Claudian conquest of AD 43 (the date which marks the conventional beginning of the Romano-British period) and extending to the accession of the emperor Aurelian, the era when mass imports to Roman Britain ended. Julius Caesar's cross-channel expeditions in the summers of 55 and 54 BC represent Britain's first direct contact with the Roman world and many important diplomatic and commercial links established between 54 BC and AD 43 helped shape the subsequent pattern of Romano-British exchange.

As the time period under review stretches back into late antiquity, a 'history of marketing practice' paradigm clearly represents a more suitable research framework than one based on 'the history of marketing thought'. Indeed, the 'activity' centred approach of the former school has already been used to demonstrate that marketing's economic and societal rôles were specifically

recognized as early as the 4th century BC by Greek philosophers like Plato (Cassels, 1936:129-130; Shaw, 1995:8-10) and Aristotle (Cassels, 1936:130; Steiner, 1976:2); and by statesmen like Xenophon (Morley, 2007a:55-56). Roman authors appear to have had less to say about marketing however, the principal exception being Cicero, who denounced all trade as vulgar and base (Steiner, 1976:3; Dixon, 1979:40).

The term 'marketing' was not explicitly used by any of these authors to identify the activities they described, although each discussed contemporary issues that would now commonly be regarded as marketing practices. The issue of whether the ideas contained in these early accounts can really be said to amount to a discussion of marketing, or merely represent generic activities such as exchange or trade, remains open to debate. Etymological references to market locations (Latin '*magus*' / Celtic '*venta*') are evident in the place names of several important Romano-British towns however and imply a clear recognition of the significance of this function (Rivet & Smith, 1979:3).

Figure 1.1 Romano-British Urban Market Locations

Modern Location	Latin Name	English Meaning
Caerwent	*Venta Silurum*	Market of the *Silures*
Caistor-by-Norwich	*Venta Icenorum*	Market of the *Iceni*
Chelmsford	*Caesaromagus*	Caesar's market
Chichester	*Noviomagus Regiorum*	New market of the *Regni*
Winchester	*Venta Belgarum*	Market of the *Belgae*

Randall (2001:12) reminds us that while marketing practices will inevitably reflect the local situation in which these activities occur, the fundamental principles involved nevertheless remain the same. Christopher & McDonald

(1995:10) and Palmer (2004:12) share this view, regarding the principles of marketing as being timeless. It is therefore intended to assume in this thesis that, unless it can be shown to be otherwise, the core principles of marketing remain universal, but that marketing practice may be shaped by the context in which it occurs. To explore this idea further a modern framework, in the form of Borden's (1964) list of functional marketing areas was used to identify which of these activities may be seen to have operated in antiquity.

Figure 1.2 Functional Areas of Marketing

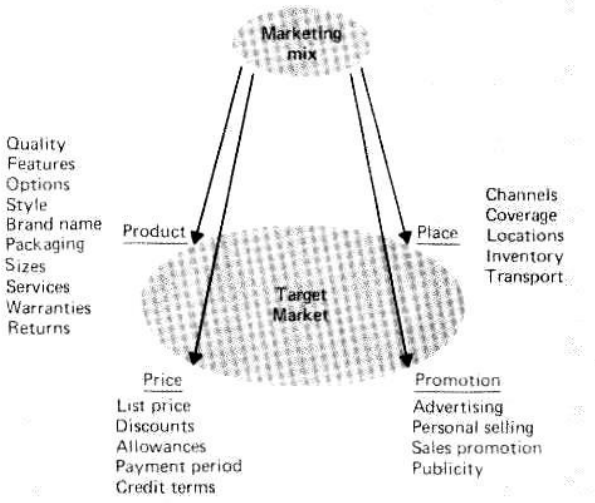
1	Product planning
2	Pricing
3	Branding
4	Channels of distribution
5	Personal selling
6	Advertising
7	Promotions
8	Packaging
9	Display
10	Servicing
11	Physical handling
12	Fact finding and analysis

(Adapted from Borden, 1964:9)

While an initial survey of the historical and marketing literature identified examples of many of these functional specialisms, the only category which produced a wide range of exemplars pre-dating the medieval period was the area of 'distribution'. These included discussions of various forms of land and water transport and the rôles of business managers, wholesale merchants and retail shopkeepers. Evidence was found to show that other functional

marketing specialisms such as product planning, pricing and promotional activities were also developing in tandem with distributional activities. The relationships between product, pricing, promotion and distribution (place) continue to form the central core of marketing activities, as represented by McCarthy (1960) in the '4P marketing mix' (Kotler, 1983:44).

Figure 1.3 The 4P Marketing Mix



(Adapted from Kotler, 1983:44, Figure 2-6)

Within the archaeological literature only a handful of papers were found that explicitly discussed marketing activity, each of which focused on either a specific group of ceramics (Hartley, 1973; Middleton, 1980; Webster, 2001) or a regional pottery distribution (Fulford, 1973; Fulford & Hodder, 1974; Hodder, 1974a; 1974b; 1974c). While the range of papers discovered was more limited than might have been expected, this may be a reflection of the relatively small number of scholars who possess both the requisite inter-disciplinary skills and the specific research interests to combine the two very different intellectual fields of history and marketing (Manning & Morris, 2005b:31).

1.2 RESEARCH JUSTIFICATION

The inspiration to undertake the present investigation may be traced directly to a challenge set by Professor Andrew Wilson (Oxford University) during the plenary session of the 5th OXREP Conference, held on 2nd October 2010 at the Classical Studies Institute, St Giles; Oxford. Professor Wilson invited delegates to consider what new approaches might be adopted to enable more to be learned about the workings of the Roman economy from the data we already possess. The notion that theoretical models or analytical techniques from other academic disciplines might be used to enhance our understanding of the ancient economy or resolve previously intractable historical problems is a product of the 'modernist' approach to archaeological thinking (Morris *et al*, 2007:7). This approach, along with the other research traditions used to study the Roman economy, will be discussed more fully in Chapter 3.

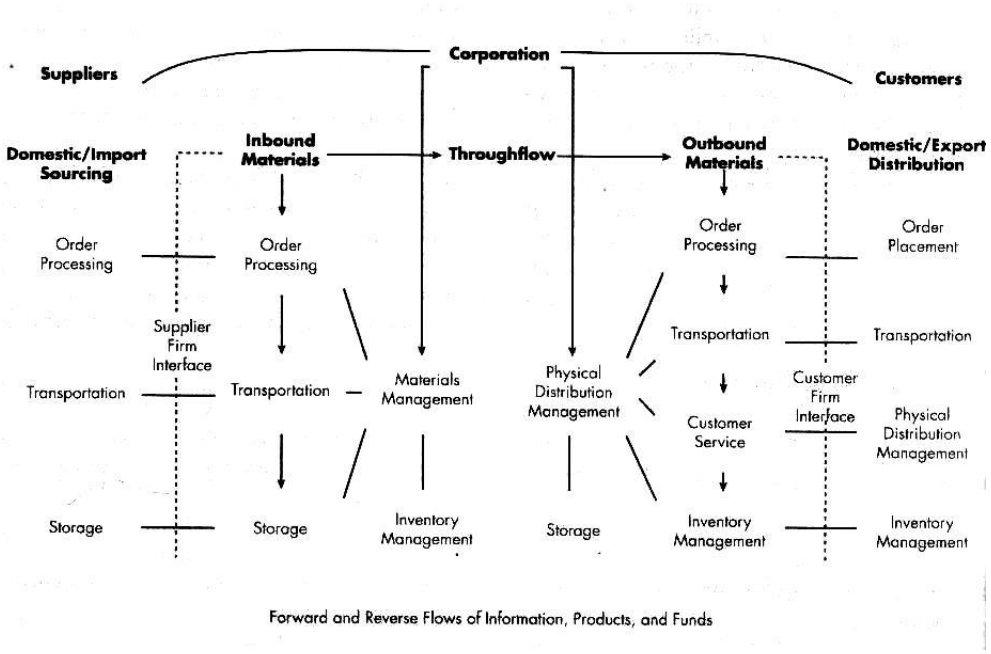
My immediate reaction was to consider whether progress might be achieved if appropriate analytical techniques were borrowed from a commercial field like marketing. There are clearly difficulties associated with an approach of this kind; firstly, in respect of satisfying the requirements of the two very different research philosophies which distinguish the humanities from the social sciences (Morley, 2004:10), and secondly, in avoiding the trap of applying 'modernist' thinking to traditional societies (Morley, 2007a:9).

Nevertheless, given the substantial body of evidence we have concerning cross-channel exchange during the Romano-British period, I wondered if these import patterns may reveal fresh insights if we switched the focus of our attention from the manufacture and deposition of the artefacts involved and concentrated instead on the forces which drove their supply. If we were able to determine whether particular imports were demand led (consumer-pull), supply driven (producer-push), or market oriented (merchant-centred) it may then be possible to increase our knowledge of the logistical processes

involved in these exchanges. This in turn may indicate why certain products featured in long distance transfers, while others did not; and help to explain both the rise to prominence of those items which became successful and identify the reasons for their eventual demise.

Supply-chain analysis is a technique which may be used to explore the rôles of the distribution channel members engaged in the provision of a particular product or service (New & Westbrook, 2004). The device enables each link in the supply process to be assessed and the contribution of the participants determined. Supply-chain analysis is widely used in modern business, but only one reference to the technique has been found in the archaeological literature, where Dannell & Mees (2013:176) mention 'distribution chains'. This lack of coverage is hardly surprising, as models of this kind often contain features designed to cope specifically with the complex pattern of modern exchange. An example of such a model is shown in Figure 1.4.

Figure 1.4 Model of a Modern Commercial Supply-Chain



(Adapted from Czincota *et al*, 2009:310, Figure 10.3)

While such a framework would appear straightforward to a modern business manager, it is unlikely that a Roman merchant would ever have taken such a holistic view of this process, even if many of the individual functions may have been familiar to them. The complexity of a model of this kind makes it inappropriate as a tool with which to analyse Romano-British trade patterns.

The structure of a pre-industrial distribution system probably lends itself quite well to a conventional 'producer-push' - 'consumer-pull' product diffusion model however (Vance, 1970:5). Although best known today for its use in the field of marketing communications, this analytical approach has its roots in the domain of economic demand analysis, emphasizing the rôle of 'scarcity' as a key determinant of whether a market should be designated as either 'buyer led' or 'supplier led' (Kotler, 1983:13-14).

A relatively simple conceptual model of this kind, stripped of its modern embellishments, may offer an appropriate analytical tool in attempting to understand the operation of distribution systems during the Roman period; an era in which producer / merchant / customer exchanges were still largely relationship based and commercial thinking remained at an early stage of development. The challenge therefore lay in devising a supply-chain model which was simple enough to explain the workings of the Romano-British economy, yet robust enough to analyse the rôles and relationships of the key distribution channel members and the nature of long distance product flows.

1.3 RESEARCH AIM AND OBJECTIVES

Having a long standing professional and academic interest in marketing and archaeology it seemed apparent that each discipline may be able to benefit by borrowing hitherto unused models and techniques from the other. In line with the cross-disciplinary nature of this investigation a dual research aim

was therefore established to enable archaeological and marketing data to be synthesized in new ways to open further research avenues in each domain.

1.3.1 Research Aims

1.3.1.1 To identify how marketing historians may use archaeological and epigraphic evidence to trace the development of distribution as a functional marketing specialism during the Romano-British period.

1.3.1.2 To consider ways in which historians and archaeologists who study the Roman period may be able to utilize additional economic and marketing models to aid their understanding of the forces which influenced long distance inter-provincial exchange.

1.3.2 Research Objectives

In order to be able to deal effectively with overarching aims of this kind, a number of specific objectives were devised, each of which relates to a key aspect of the topic and which collectively provide an holistic view of the subject matter involved in this investigation. As the Roman period spans more than a millennium and Rome's hegemony covered a vast geographical area, it is necessary in a work of this length to focus on a specific region and time period. Carreras Monfort (2010:132) identified *Britannia* as a suitable case study for investigations of this kind and following his commendation this province was selected and the following objectives established:-

1.3.2.1 To understand the nature of the Romano-British economy.

1.3.2.2 To develop a conceptual model of a Romano-British supply-chain and analyse the interaction of each of its functional components.

1.3.2.3 To evaluate the empirical operation of this model during the Roman-British period via the use of a number of product-based case studies.

1.4 DEVELOPMENT OF A CONCEPTUAL MODEL

The most direct type of exchange transaction occurs where goods pass from producer to consumer without any third party intervention. This may take the form of either a socially-embedded transfer, as happens in the case of reciprocal gift exchange (Polanyi *et al*, 1957), or as a commercial economic arrangement involving barter or monetary payment (Peacock & Williams, 1991:55). The nature of these exchanges may vary widely, but the location of each may be plotted along a continuum which stretches from reciprocal transfers through to fully fledged market exchanges (Pryor, 1977:31).

Over time these exchange transactions have become predominantly market-based as economies have become 'disembedded' (Meikle, 1995:185). This process has been seen by Berry (1967) as occurring in three stages:-

1/ socially administered reciprocal exchanges
2/ barter, or simple monetary transactions, in peasant societies
3/ modern economic specialization

(Adapted from Berry, 1967:106)

The conventional view of Roman society, as set out by Finley (1965:38-39; 1979:144) contended that the 'division of labour' in the Roman world was probably very limited and that most routine exchanges were likely to have been carried out without the use of middlemen. It is becoming increasingly clear though that many households were beginning to abandon the ideal of self-sufficiency at this time in favour of a degree of personal specialization (de Ligt, 1993:138; Laurence, 1998:139). While the flow of goods and services generated by such specialization can initially be accommodated by resorting to the kind of one-to-one exchange Finley acknowledged, this has its limits. If continued, this process will eventually generate the need for a more effective means of exchanging the increased economic output which would inevitably have resulted (Lancaster & Massingham, 1993:3). As Boyd *et al* (2002) observe:-

> *"*A society cannot reap the full benefits of specialisation until it develops the means to facilitate the trade and exchange of surpluses among its members*."*
>
> (Boyd *et al*, 2002:6)

The requirement for commercial intermediaries who could act as middlemen in order to provide a link between producers and consumers probably arose at quite an early date (Lancaster & Massingham, 1993:3; Stokes, 1994:16-17). Examples have been observed by Jones & Shaw (2002:41-43) in 7th century BC Anatolia, in 4th century BC Athens and in 1st century BC Rome.

Such intermediation may have taken many forms and involved a wide range of personnel, including state contractors (*conductores*), commercial agents (*negotiatores*), shippers (*navicularii*), merchants (*mercatores*) and retailers (*tabernae*); (Rougé, 1966). Each of these specialist rôles will be considered in detail in the course of this thesis and it is sufficient at this stage to simply note their importance to the supply-chain.

The final influence we need to consider in our analytical model is the rôle 'state intervention' may have had in the supply process. As Polanyi (1977) reminds us, administrative redistribution formed an important component of the Roman economy and was one of three key forms of transfer involving:-

1/ Reciprocal exchanges
2/ Redistributive transfers
3/ Market-based transactions

(Polanyi, 1977:37)

The inclusion of 'state intervention' as a determinant of supply patterns in antiquity leaves us with four principal participants in the supply process:-

1/ Producers
2/ Consumers
3/ Merchants
4/ State administrators

The significance of each of these groups is reinforced by Borden's (1964) analysis of the marketing framework, where in addition to his twelve part functional model, reproduced in Figure 1.2 (above), he identified four key external constraints which shape marketing's operating environment.

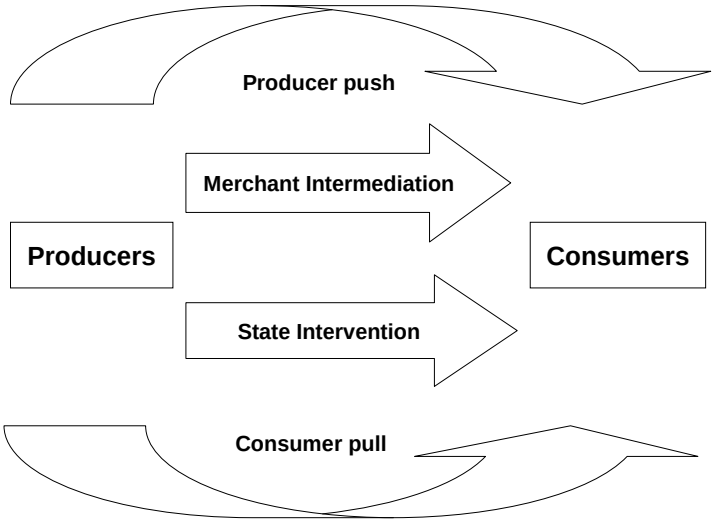
Figure 1.5 External Marketing Constraints

1	Consumers' buying behaviour
2	Traders' behaviour
3	Competitors' position and behaviour
4	Government's behaviour

(Adapted from Borden, 1964:10)

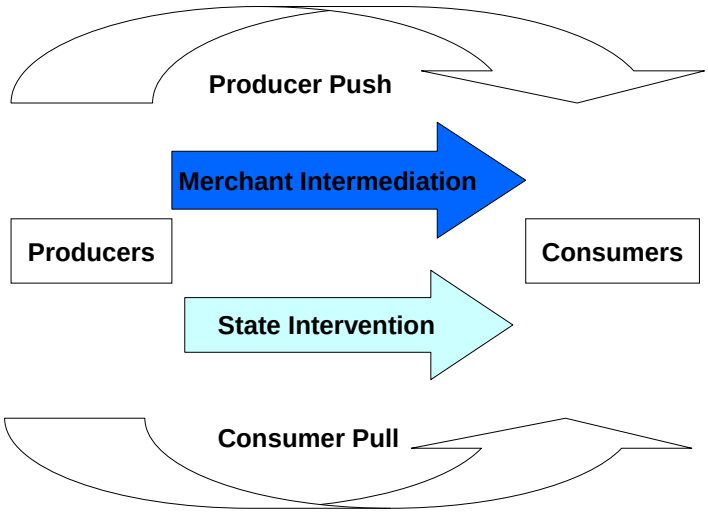
Borden's list offers a clear match between the distribution channel members who constituted the traditional exchange networks of antiquity and those of the modern trading environment. It is possible to use common components identified in this way to propose a simple, effective, analytical framework.

Figure 1.6 Proposed Supply-Chain Model



This structural model enables the influence exerted by each distribution channel member to be measured, in ordinal terms at least. Heavily shaded areas will be used to identify the principal driving force in each case, lightly shaded areas will indicate the involvement of secondary participants and unshaded areas will signify distribution channel members who appear to have had only passive involvement in the supply process.

Figure 1.7 Visual Representation of the Strength of Each Distribution Channel Members' Involvement in Driving Supply



Key

	Primary Driver
	Secondary Driver
	Passive Participant

While visual representations of this kind are inevitably impressionistic in the way in which the findings are presented, it is important to recognize that in very many cases too little quantitative evidence survives from the Romano-British period to enable the contribution of each supply-chain member to be assessed numerically. While lacking the precision of cardinal measurement a graduated scale, of the kind provided by this model, offers an opportunity to at least rank the relative importance of each distribution channel member in ordinal terms, thereby enabling us to identify the primary and secondary drivers in the system and to observe how their relationships evolved over time.

1.5 DISTRIBUTION CHANNEL PARTICIPANTS

While the relative positions of the producer-merchant and retailer-consumer interfaces marks the respective limits of the proposed supply-chain model, it is important to remember that direct contact is only likely to have occurred between producers and consumers in a purely localized market, of the kind Finley (1979:144) envisaged. It is clear from archaeological and epigraphic evidence, however, that many products exchanged in the Romano-British period formed part of a long distance supply network in which direct producer-consumer contact would not have been feasible. The involvement of one or more distribution intermediaries must therefore be envisaged.

A system of this kind would have necessitated the services of independent merchants, who possessed the particular skills and contacts needed to enable the two ends of the supply-chain to be connected. We must also recognize in our analysis that mercantile action of this kind may have been moderated from time to time by state intervention, particularly where strategically important products were required for military consumption or diplomatic exchanges, or where the Roman state licensed the supply of luxury products to generate tax revenue.

It is critical in all of this to remember that the actions we observe during the course of this investigation occurred within the social and economic context which prevailed in Roman Britain, for as Robbins (1947) points out:-

> "From the historical viewpoint, any inquiry into the nature of trading, to be significant, must be one that takes cognizance of the particular institutional fabric of which it is a part."
>
> (Robbins, 1947:230)

This requirement applies not only to the commercial environment, but extends to the actions of the individuals who operated within such a framework, for as Hopkins (1983a) reminds us, the two are inextricably connected:-

> "In order to understand the ancient economy, we need to know the part played in it by trade and traders; in order to understand the rôle of trade and traders, we need to hold some view of the ancient economy."
>
> (Hopkins, 1983a:ix)

1.6 OUTLINE STRUCTURE

It is therefore necessary from the outset to give careful consideration to the manner in which this investigation has been conducted, both in terms of the choice of an appropriate epistemological position and research methodology and to the way in which data has been analysed and the findings presented. These issues are summarized below, with forward references provided to the chapters where full discussion of each of these topics may be found.

1.6.1 Research Methodology

Chapter 2 of this thesis will contain details of the epistemological position and the research methodology selected for the study. The manner in which the different research traditions encountered have been reconciled will be explained and the theoretical models which form the conceptual framework for the thesis will be identified. The research aims will then be re-stated and the methodological approach and choice of case study material outlined.

1.6.2 Context of Exchange within Socially-Embedded Economies

Chapter 3 will examine the structural differences which distinguish the Roman economy from our own and will explore the nature of the economic environment in which exchange took place in the Romano-British period. Three principal mechanisms, based on reciprocal, redistributive and market exchange will be examined and the rôle of 'New Institutional Economics' will be considered as an analytical approach which may help to clarify the structure and operation of supply-chains during the Romano-British period.

1.6.3 The Structure of Production in the Roman Empire

Chapter 4 will examine the way in which production was organized in Roman times, exploring the rôle which agricultural producers played in the processing of their crops and how manufacturing industry was structured. The case of *terra sigillata* (samian ware) will be used to illustrate the nature of ceramic production during the Roman period, tracing samian's stylistic development and the migration of its manufacturing centres.

1.6.4 The Rôle of Rome's State-Administered Supply Network

Chapter 5 will outline the Roman state's rôle in long distance exchange, both as a direct supplier of resources and via the use of private contractors to provide these services on the state's behalf.

1.6.5 Evidence of Mercantile Activities in the Roman Economy

Chapter 6 will review the epigraphic and archaeological evidence relating to merchant operations in Roman Britain and its neighbouring provinces. The chapter will focus on the activities of commercial agents (*negotiatores*),

shippers (*navicularii*) and merchants (*mercatores*). The opportunities for *navicularii* and *mercatores* to engage in 'parasitic' trade while undertaking official exchanges will be identified. The interface between merchants and other distribution channel members in the supply process will be examined.

1.6.6 The Rôle of Consumers in the Roman Economy

Chapter 7 will explore the structure of consumer demand in the Roman era. The principal segments of the consumer market will be reviewed to identify what opportunities may have been available to Roman traders. The range of market infrastructure and purchasing facilities available to Romano-British consumers will also be considered.

1.6.7 Case Studies of Romano-British Ceramic Imports

Chapters 8-11 present the results of a series of product-based case studies in order to trace the development of a number of specific cross-channel supply networks which enabled goods to reach Britain from the continent between the 1st century BC and 3rd century AD. Ceramic artefacts have been chosen due to their superior survival rates and four specific pottery types have been selected for study. This has enabled sufficient data to be gathered to map their distributions both spatially and chronologically. The products chosen are:-

1/ Wine *amphorae* - (Chapter 8)
2/ Olive-oil *amphorae* - (Chapter 9)
3/ Samian tablewares - (Chapter 10)
4/ Rhenish drinking beakers - (Chapter 11)

1.6.8 Conclusions

The thesis will conclude in Chapter 12 by assessing the extent to which the aim(s) of the investigation have been achieved. The dual aims of the study will be evaluated by considering the ways in which evidence of marketing activity in the Romano-British period may offer new insights to marketing historians, together with the reciprocal benefits which appropriate economic and marketing models may offer archaeologists and historians in their study of Romano-British exchange. Additional research opportunities which have been identified by this study will also be identified.

CHAPTER 2

METHODOLOGY

2.1 INTRODUCTION

The purpose of this chapter is to outline the methodological techniques used to collect and analyse the data from which this thesis was compiled. Explicit research methodologies do not feature in all archaeological treatises, for as Gardner (2001:42) explains, a conventional set of approaches evolved in the second half of the 20th century which are implicitly understood by scholars working in this field. These techniques include cultural and anthropological frameworks, such as world-systems analysis, which draws on economic and geographical information, as well as conventional historical data (Carreras Monfort, 1994:15; Wallerstein, 2004:16-17). Processual approaches offer an alternative approach which avoids the need to utilize modern economic theory to analyse the ancient world and looks instead at distribution patterns and chronological evidence (Hodder, 1999:3-5).

In business or marketing investigations, by contrast, explicit methodologies are commonly included, given the diverse range of approaches scholars in these domains may choose to adopt, depending on where within the social-scientific research continuum their particular investigation lies (Collis & Hussey, 2003:51). The cross-disciplinary nature of the present thesis places it into a category whose methodological approach needs to be clearly set out before any findings are presented. This is not because novel or controversial techniques are involved, but as two academic disciplines are embraced, each with their own investigative traditions and analytical approaches, the way in which the research has been designed to satisfy the intellectual requirements of each field needs to be clarified.

2.2 RESEARCH DESIGN

The methodology section of a research document describes the underlying rationale of the investigation. According to Saunders *et al* (2003):-

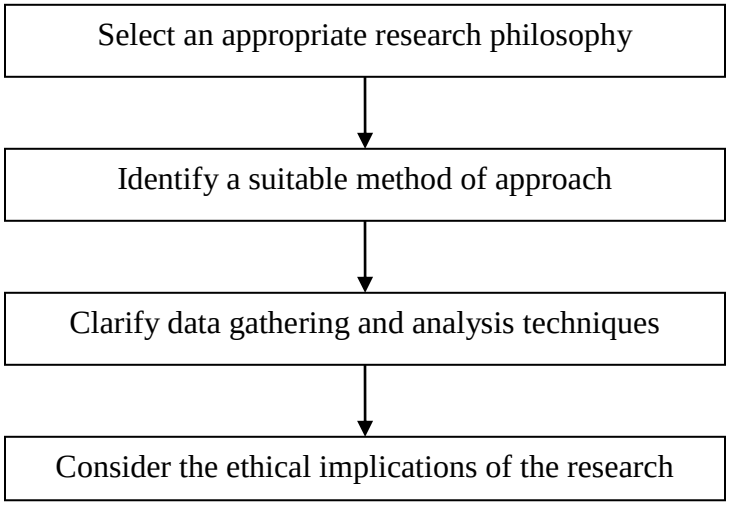
> "… the term methodology refers to the theory of how research should be undertaken."
>
> (Saunders *et al*, 2003:2)

In order for meaningful answers to be provided in respect of the research question it is essential for an appropriate approach to be taken to the design of the investigation (Ghauri & Grønhaug, 2002). Specifically, Collis & Hussey (2003:132) identify three key elements of the research design that need to be satisfied to achieve a successful outcome:-

- selection of an appropriate research methodology
- identification of suitable data collection methods
- implementation of effective data analysis techniques

To enable a sound research methodology and suitable data collection and analysis techniques to be determined, an appropriate research paradigm must be selected. This paradigm, or philosophical approach to the study, determines how the subject matter for the investigation is to be undertaken and helps identify the nature of the information which may contribute to furthering our understanding. This process constitutes four main stages, as Figure 2.1 illustrates:-

Figure 2.1 Outline of the Methodological Process



2.2.1 Research Philosophy

Ontological considerations form the starting point in the design of a suitable research approach, as these issues determine the assumptions we make about the nature of reality in our chosen area (Easterby-Smith *et al*, 2002:31-33). Difficulties may arise in selecting suitable ontological or epistemological approaches in inter-disciplinary research projects where elements of these paradigms conflict, as may occur if attempts are made to combine evidence from the business and historical domains. Paradigm conflicts may involve:-

- Different philosophical stances within the humanities / social sciences
  - epistemological issues (interpretive vs positivistic approaches)
  - ontological differences (constructionist vs objectivist beliefs)

- Variation in methodological approaches in each research tradition
  - research methodology (inductive vs deductive)
  - data collection method (quantitative vs qualitative)

2.2.2 Social Science Research Approaches

Turning firstly to the social sciences, as marketing is the academic field within which this research will principally be located, Collis & Hussey (2003: Ch 1) remind us that the dominant research tradition lies towards the objectivist / positivist end of the philosophical spectrum. This tradition can be traced back to marketing's development from the social science of economics, where the neo-classical theory of profit maximizing behaviour, developed in the 19th century, drew heavily on methodological approaches from natural sciences such as mathematics and physics (Hatton & Oldroyd 1992:7).

While economic models of supply and demand still provide a foundation for topics such as pricing policy, more recent developments in associated social sciences, such as behavioural psychology, have contributed to other areas; especially consumer behaviour and marketing communications (Doyle & Stern, 2006:32). A research tradition has therefore developed in marketing which positions the subject near the centre of the science based / humanities based divide, as Figure 2.2 shows.

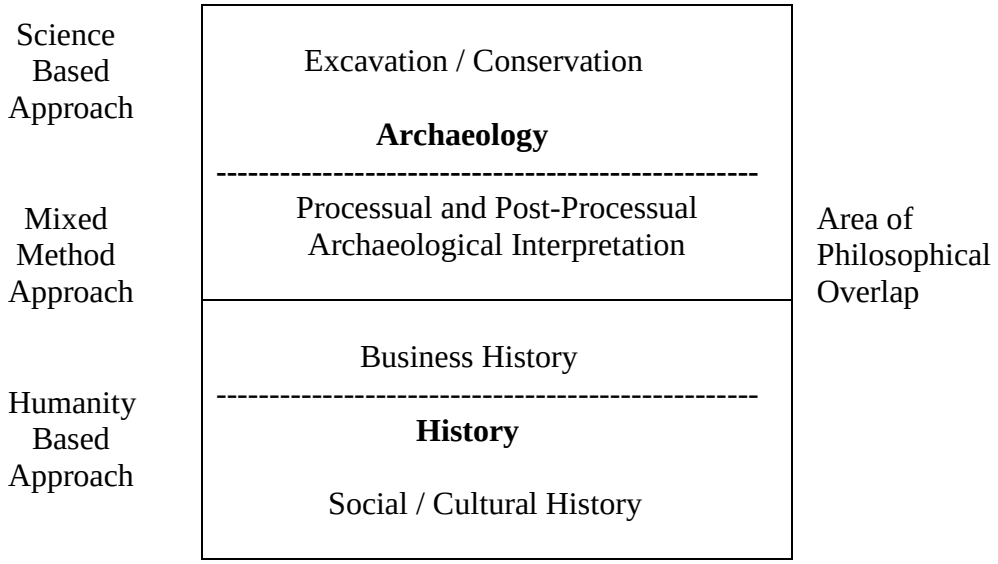
Figure 2.2 Research Paradigms in Marketing

Science Based Approach	Pricing & Logistics **Marketing**
Humanity Based Approach	**Management** Consumer Behaviour & Marketing Communications

2.2.3 Historical and Archaeological Research Approaches

While historical research methodologies often lie towards the constructionist end of the ontological / epistemological spectrum, in archaeology advances in the environmental and physical sciences have shifted the balance in many areas. Hodder (1999:80-83) distinguishes between archaeological analysis and archaeological interpretation, observing that while most archaeologists come from a scientific / analytical tradition their reasoning is often primarily interpretive.

Figure 2.3 Research Paradigms in History & Archaeology



2.2.4 Mixed Method Research Approaches

The challenge involved in combining these diverse approaches, coupled with the comparatively small number of scholars whose experience and interests embrace both historical and business research, helps to account for a relative lack of previous studies in this area. As Savitt (1980) explains:-

> "... one can easily understand why, in general, marketing history has received little attention. As an applied discipline, marketing must cater to its client market of decision makers ... Looking backwards to them is a luxury."
>
> (Savitt, 1980:54)

The diversity of philosophical approaches apparent in both the historical and social-science research traditions clearly reflects the breadth of each subject area. To establish suitable parameters for the research paradigm in an inter-disciplinary study of this kind, the schematic models previously outlined in Figures 2.2 and 2.3 may be incorporated into a single framework.

Figure 2.4 Synthesis of Research Paradigms in this Thesis

Science Based Approach	Pricing & Logistics **Marketing**	Excavation / Conservation **Archaeology** ---------- Analysis / Interpretation
Humanity Based Approach	**Management** Consumer Behaviour & Marketing Communications	Business History ---------- **History** Social / Cultural History

(Adapted from Thomas, 2004:65)

2.2.5 Critical Realism Approach

The key issues to be addressed relate to how Romano-Britons perceived the world they inhabited. Only by grasping this can we begin to interpret the

behavioural patterns we see through our subjects' contemporary perceptual lens, rather than from the perspective of our own 21st century reference criteria (Doole & Lowe 2004:79-80). Both Salway (1993:427) and Millett (1995:31) agree that the thinking patterns of Romano-Britons must be regarded as fundamentally different from our own. Such variations extend beyond recent technological or educational advances and penetrate deeper into the societal and cultural domains. As Millett (1995) cautions:-

> "We cannot simply view Roman Britain through modern eyes and look for similarities."
>
> (Millett, 1995:31)

While such caution is apposite, it raises endless questions as to how exactly a Romano-Briton's perceptions differed from our own. For example:-

- Were moral or ethical values, such as fairness and honesty, a common expectation in Romano-British exchange?
- Was rational decision making based on the same criteria and evaluated in the same way as it is today?
- Did Romano-British consumers regard coinage and monetary payment mechanisms in the manner we would?
- How did producers and merchants balance commercial risks against rewards in the Roman era?
- Did Roman artisans take a similar pride in their creations and place the same value on their professionalism as craftsmen do today?
- How was an object, such as a piece of imported samian, perceived by a native Romano-British consumer *vis-à-vis* locally made colour-coated wares?

The need to recognize such perceptual differences is vital when it comes to selecting an appropriate research methodology and has implications for the validity and neutrality of our whole investigation (Brett-Davies, 2007:240). The manner in which this has been addressed in the present study has been to consider whether each piece of evidence may hold alternative meanings and, where possible, to triangulate this data via the use of multiple reference sources and correlate this with other aspects of established Romano-British behaviour. This inevitably means that many of the findings presented in this investigation will be tentative, but as so many gaps remain in our knowledge of the Romano-British period this caution is felt by the author to be justified, particularly when approaching the topic from a relatively new direction.

To address the needs of each academic domain, 'critical realism' has been chosen as the philosophical standpoint for this research. Critical realism is an approach based on the ontological assumption that a finite independent truth exists, but the approach differs from positivism in that it maintains that we cannot (at present) fully understand this truth via the means available to us (Bhasker, 2008; Sayer, 2010). As Griseri (2002) points out:-

> "It is entirely consistent with the idea of realism to say that:
> a) the world does not depend on our perceptions;
> b) we have a limited contact with this world;
> c) our contact may change as the technologies of investigation change."
>
> (Griseri, 2002:119)

The challenges which confront us when adopting a realist approach to the issues to be explored in each subject domain are set out in Figure 2.5.

Figure 2.5 Methodological Applications of a 'Realist' Approach

Subject	Analytical Issue
History	The dynamics of Romano-British society are unclear The details of exchange are obscured by time and distance
Archaeology	Understanding the physical evidence presents challenges
Marketing	Evidence of both markets and marketplaces remains limited

2.3 DATA COLLECTION AND ANALYSIS

2.3.1 Data Collection Methods

Given the nature of the research question and the resource constraints which are inevitably involved in a study of this kind, secondary sources have been the principal means by which the data used in this thesis was acquired. The findings represent a synthesis of the established knowledge in each subject area, to which specific models and theories from the marketing domain have been used to ask new questions of the existing historical and archaeological data. This approach was designed to enable the strengths of each discipline to be brought together in a way that address the overall aim(s) of the thesis, namely:-

- To identify how marketing historians may use archaeological and epigraphic evidence to trace the development of distribution as a functional marketing specialism during the Romano-British period.

- To consider ways in which historians and archaeologists who study the Roman period may be able to utilize additional economic and marketing models to aid their understanding of the forces which influenced long distance inter-provincial exchange.

Questions of this kind have long been neglected in business and historical literature, the former often simply stating that commercial activity has deep historical roots, without exploring what these may have been; and the latter merely noting that commercial activity was commonplace in antiquity, but making no further attempt to explore where, when or in what manner these events occurred. The present research therefore seeks to fill a gap in each domain created by these previous omissions.

The starting point for the literature survey was to determine the structural nature of the Romano-British economy, beginning with the pioneering work in the field (Finley, 1973; Jones; 1974; *contra* Frank, 1937; Rostovtzeff, 1957). This led in turn to a review of the more recent contributions to this area, culminating in attendance at the 4th and 5th Oxford Roman Economy Project (OXREP) Conferences in October 2009 and 2010, where many of the latest ideas were discussed (Wilson & Bowman, forthcoming).

This was followed by a review of product distribution in the Roman era and while no comprehensive reviews of this topic were found, it was revealed that specific aspects of the supply-mechanism had been explored in other studies, *e.g.* the rôle of business managers (Aubert, 1994) military supply (Erdkamp, 2002; Roth, 2012) and distribution chains (Dannell & Mees, 2013). Similarly, specialist reports relating to the artefacts included in Chapters 8-11 sometimes dealt with aspects of their supply. In particular, analysis of the distributions of wine *amphorae* (Peacock, 1978; Fitzpatrick, 1985); olive-oil *amphorae* (Carreras Monfort, 1994; Funari, 1996) samian (Middleton, 1980; Dannell, 2002; Fulford & Durham, 2013) and Rhenish-ware (Symonds, 1992) were particularly useful.

2.3.2 Analytical Techniques

In an attempt to explore these questions, the analytical model illustrated in Figure 1.5 (above) was developed as a mechanism through which the activities of the four principal supply-chain participants could be evaluated and their inter-relationships explored. While this model may be regarded as highly simplistic from a modern commercial perspective, its design is intended to reflect the less complex nature of the business environment that is believed to have existed in the time period we are concerned with (Finley, 1979:41-42; Salway, 1993:430; Millett, 1995:31).

The model will be used in a thematic manner to examine four case studies which together enable the supply-chains' rôle in the development of long distance exchange to be understood via chronological and inter-product comparisons. The items chosen for this analysis are wine, olive-oil, samian (*terra sigillata*) and Rhenish-beakers; all of which were selected because of their relative longevity and the substantial data sets which are available in each instance. Two other products, *Gallo-Belgic* wares and *mortaria* were initially considered for inclusion, but each was subsequently omitted due to word constraints and to allow more comprehensive coverage to be achieved for the four categories included. It is hoped to include *Gallo-Belgic* wares and *mortaria* in due course as part of a post-doctoral research project.

2.4 ETHICAL CONSIDERATIONS

As this research seeks to investigate the behaviour of a population living 2,000 years ago, the study presents few direct ethical challenges. The primary ethical considerations identified relate to beneficence, fair use of data and the appropriate acknowledgement of reference material and external assistance.

2.5 TRANSITION

Having identified the methodological approach and conceptual model, the investigation will begin by considering the structure of the Romano-British economy. This will help to establish the context within which supply-chains operated in the Romano-British period and in which long distance exchange occurred.

CHAPTER 3

THE ROMANO-BRITISH ECONOMY

3.1 INTRODUCTION

A close relationship exists between the academic disciplines of marketing and economics via a shared interest in themes such as value, specialization and exchange. Indeed, Heeler & Chung (2000:63) suggest when marketing emerged as a distinct intellectual discipline during the early 20th century it was initially considered to be a branch of applied economics. Marketing has evolved significantly in the last century though, influenced by related fields such as psychology (Foxall, 2000:86) and sociology (Grønhaug, 2000:102).

These links serve to remind us that marketing activities occur within specific economic and social frameworks, whose structures may themselves evolve over time (Robbins, 1947:230). Consequently, if evidence exists to suggest the Roman economy differed significantly from its modern counterpart it is important to establish precisely how the two systems diverged to reveal the true nature of the Romano-British marketing environment.

3.2 THE ORIGINS OF CONTEMPORARY ECONOMICS

There is a widespread consensus among economists that the origins of their subject as an academic discipline can be traced to the late 18th century; in particular, to the work of the Scottish moral philosopher Adam Smith. It is no coincidence that Smith's (1776) '*Wealth of Nations*' appeared at the very beginning of the industrial revolution; a period of intense technological and

commercial innovation which shaped the course of industrial development during the next two centuries.

In his groundbreaking work, Smith explored a wide range of economic issues including specialization and the division of labour; the factors of production; money, prices and wages; foreign trade; public spending and taxation. These topics feature prominently in the generations of economic texts which followed Smith's work and still form the core of the discipline.

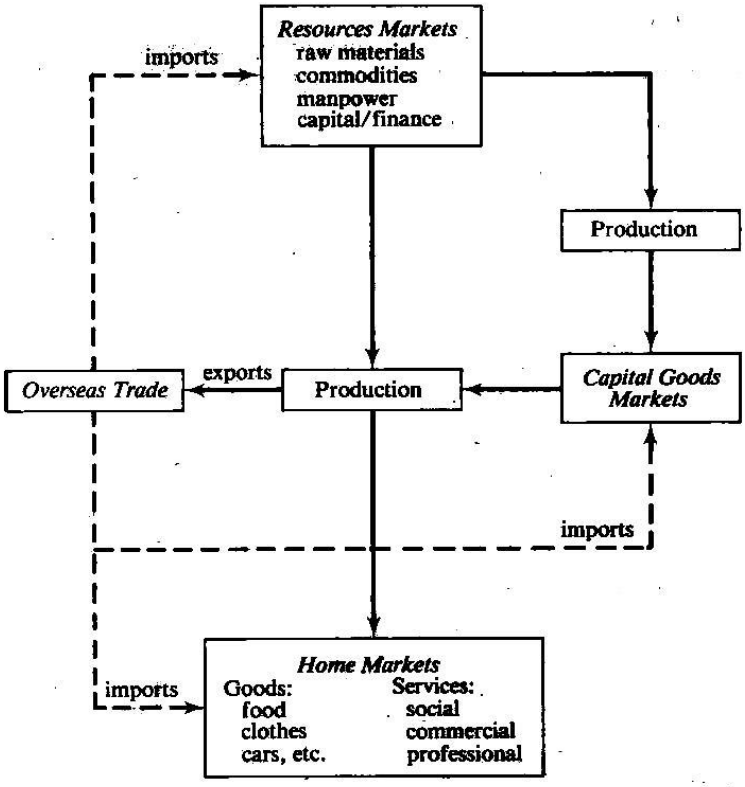
Economics continues to evolve, however, as it seeks to explain the workings of our increasingly complex world. While these changes are often gradual and present no problem for most analytical investigations, when economic historians seek to compare the performance of societies widely separated in time it is vital to consider whether any structural changes have occurred in the intervening period which may influence their findings.

3.3 THE STRUCTURE OF THE MODERN MARKET ECONOMY

The economic system which exists in Britain today is classified as a 'mixed-economy' (Mulhearn *et al*, 2001:8). This consists of both a 'private sector' or 'market economy', which is characterized by profit-seeking competition, and a state controlled 'public sector', in which the provision of goods and services are determined by social needs (Palmer & Worthington, 1992:5-6). Within this system, the market economy is dominant in quantitative terms, accounting for 80.9% of Britain's Gross National Product (GNP) in 2011, (EUROSTAT, 2014).

The key features of a market economy of this kind are set out in Figure 3.1:-

Figure 3.1 Structural Characteristics of a Market Economy



(After Fearns, 1980:9, Figure 2.1)

3.4 THE STRUCTURE OF THE ROMAN ECONOMY

While Figure 3.1 reflects modern economic practice, it does not necessarily follow that pre-industrial societies operated in quite this way. When this is explored, in line with objective 1.3.2.1, it is evident that important structural differences existed in a number of key areas.

3.4.1 Labour Supply

One of the striking differences which distinguished the Roman economy from that of today was the widespread use of slavery in the Roman labour-

force. The numbers involved would inevitably have varied according to the rates at which new captives were enslaved or born into servitude, compared to the numbers who either died or achieved freedom (Harris, 2011:Ch 3). As a proportion of the overall labour supply the numbers involved were certainly not trivial and at times several million people are thought to have been used as slave labour, leading to the assertion that the Roman economy was supported by a 'slave mode of production' (Rathbone, 1983:166-168).

While Temin (2013:135) is right to imply that slavery was more prevalent in Italy than in Rome's provinces, the use of slave labour has nevertheless been recognized in many parts of the Roman Empire, including Britain (Tomlin, 2003:41). While Mattingly (2006:294) reminds us that the number of slaves in the Romano-British labour-force would probably have been relatively low, the range of activities in which slaves were engaged across the empire as a whole is known to have been extensive. As Scheidel (2012c) observes:-

> "Slaves were engaged in an enormous variety of activities, as estate managers, field hands, shepherds, hunters, domestic servants, craftsmen, construction workers, retailers, miners, clerks, teachers, doctors, midwives, wet-nurses, textile workers, potters and entertainers. "
>
> (Scheidel, 2012c:90)

It is important to recognize, however, that while slaves offered an alternative to hired help, they were by no means a cost free resource. Slaves had in the first instance to be either bought or raised; after which they needed to be fed, housed and clothed in accordance with their duties (Cato, *De Agri Cultura*; cited by Saller, 2012:72). In addition to these essential outlays, many slaves also received a small amount of pay (*peculium*) which could on occasions be used by the slave to purchase their own freedom (*manumission*).

Not all slaves worked in onerous activities and some who achieved positions of trust and responsibility required little supervision (Scheidel, 2012c:100). Where slaves did need to be 'managed', this task was often carried out by members of the slave owning families, or by freedmen (manumitted slaves). Freedmen often remained in their former master's service after their release, becoming part of their patron's *familia* and incorporating the family's name into their new *tria-nomena* (Scheidel, 2012c:101).

The widespread use of both slaves and freedmen to supplement the family's internal labour supply clearly reduced the need for hired help, thus limiting the employment opportunities for members of the freeborn population, (Morris, 1999:xxii). The structure of the Roman economy's labour market was therefore clearly very different from that of today's and represented a closed system in which occupational mobility was extremely restricted and conventional employment opportunities were scarce.

3.4.2 Agricultural Output

The second fundamental difference we encounter in the Roman economy relates to its heavy reliance on primary production, *i.e.* the agricultural and extractive industries (Worthington & Britton, 2003:252). Recent National Income statistics indicate that in 2011 the UK's primary sector, which in addition to agriculture includes hunting, forestry and fishing; accounted for just 0.7% of total economic output (EUROSTAT, 2014).

The rôle of agriculture was vastly more important in Roman times, where it lay at the heart of the ancient economy (Mattingly & Salmon, 2001b:3; Sallares, 2007:27). At a time when technology was extremely limited and storage facilities basic, the population's reliance on maintaining a secure food supply is clearly an issue which cannot be overstated. Compared to

today's intensive, mechanized farming regime, agricultural production during the classical era was extremely labour intensive, especially in the case of activities such as cereal production (Kehoe, 2007:551).

Agricultural economies are notoriously susceptible to external factors such as climatic conditions or endemic disease, which often cause unpredictable variations between planned and actual output (Colman & Young, 1997; Jongman, 2000:275). As a result of the inbuilt instability of the agricultural sector, Romano-British farmers may have adopted a cautious 'satisficing' approach, in which safe but modest annual returns were preferred to riskier profit maximization strategies (Paterson, 1998:158-159; Kehoe, 2007:549).

In addition to the quantitative demands made by farming on the available land and labour supplies in the Roman era, it is also important to recognize that the exploitation of resources such as clay, stone and timber, or mineral extraction were areas of major economic importance (Wacher, 1997:127). It may even be argued that the land itself was regarded as the principal form of wealth by the Roman élite (Potter & Johns, 1992:78). Land ownership was so closely linked to the concept of social status in the Roman mind that affluent Romans regarded its acquisition and custodianship as honourable and virtuous activities (Percival, 1981:106). As Morris (1982) points out:-

> "Great estates, and large incomes earned from them, brought social and political honour and influence; but the goal was mastery of men and pre-eminence among them."
>
> (Morris, 1982:264)

3.4.3 Household Production

The final key area where the Roman economy differed significantly from its modern counterpart concerns the way in which the ownership and control of resources shaped the structure of production. Compared with today, income distribution in the early Roman Empire appears to have been very uneven. This imbalance was particularly marked in the case of the senatorial class, whose average incomes are estimated to have been more than 500 times subsistence level, with many of the Roman nobility being far richer than even this (Duncan-Jones, 1974:17-32). Even lesser members of the social élite, such as knights (*equites*), often had incomes 200 times the subsistence rate, while for town councillors (*decuriones*) a figure of perhaps 50 times the subsistence norm was probably not unusual (Jongman, 2007:600).

During the Roman era wealth on this scale was usually invested in private estates, which were frequently large enough to achieve self-sufficiency (Morris, 1999:ix). This concentration of resources led to the emergence of what have become known as 'household economies'. In a system of this kind the entire cycle of production and consumption could be achieved in the confines of a closed social unit, comprising the members of an affluent family, together with a few close associates (Davies, 1998:229).

It has been argued that these wealthy household units constituted not only the primary unit of production in the Roman economy, but formed the basis of the economy itself, for in tracing the word's roots, Finley (1979) notes:-

> "The word 'economics', Greek in origin, is compounded from *oikos*, a household, and the semantically complex root, *nem*-, here in its sense of 'regulate, administer, organize'."
>
> (Finley, 1979:17)

The assets of household units of this kind were generally not restricted to one location but were frequently divided between several estates extending over a wide geographical area. This not only helped to spread capital risk more widely, but enabled the family unit to gain access to the diversity of products needed to attain the goal of self-sufficiency (Morris, 1999:xx-xxi; Kehoe, 2007:548). We must therefore bear in mind that a proportion of the material transfers which we know to have taken place in the Roman period may not be the result of conventional trade, but constituted the large-scale internal transfer of goods within devolved, family owned estates (Whittaker, 1985:62; Morley, 1996:160).

The importance of household production and the quest for self-sufficiency via internal redistribution of output suggests a sizeable portion of the Roman economy operated in a quite different manner to that of the market economy outlined earlier in section 3.3. The Roman's slave-based labour market and integrated household production system seem to point towards a socially-embedded economy of the kind Haselgrove (1987a) illustrates in Figure 3.2.

Figure 3.2 Characteristics of a Socially-Embedded Economy

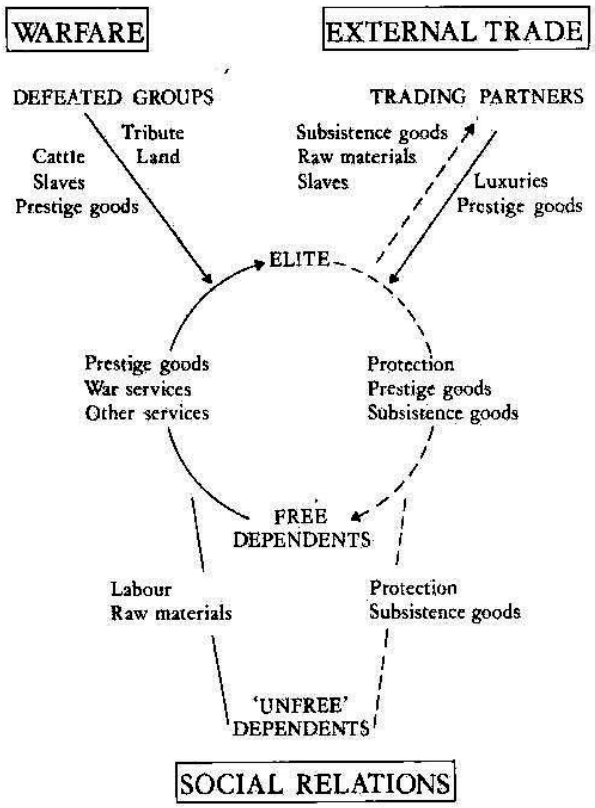


Fig. 10.1 Principal mechanisms open to the elite for the accumulation of wealth.

(After Haselgrove, 1987a:106, Figure 10.1)

3.5 FORMALIST AND SUBSTANTIVIST APPROACHES

The differences between the 'mixed economy' and the 'socially-embedded economy' are clearly very marked. It is therefore important to ask whether these different approaches form part of a common economic framework which contains socially-embedded or disembedded / market-oriented variants; or whether two quite separate exchange mechanisms are involved (Meikle, 1995:184-185). This question is important, for Scheidel (2012b:9) reminds us that the answer will determine both the methodological approach we must adopt when studying the Roman economy and the nature of the

evidence we have to work with. Two different approaches have developed in response to this problem and these have shaped the subsequent debate.

3.5.1 The Formalist Perspective

From a formal economic standpoint, the principles of neo-classical theory, as expounded by Marshall (1947) and his followers are considered to be universal in their application (Morley, 2007a:11). All societies, including ancient Rome, faced problems of scarcity and had to make choices about how to allocate resources, respond to differences in comparative advantage and deal with price fluctuations (Morley, 2004:43; Scheidel, 2012b:7-8).

From a formalist perspective, all the essential components of a functioning economy existed by the Roman period, even if a fully integrated market economy had still to be established (Temin, 2001:181). Roman literary texts contain no discussion of what would today be regarded as economic theory though and invariably adopted a pragmatic approach to business (Peacock, 1982:152; Frayn, 1993:164). This lack of theoretical content is not regarded as important by formalists, however, as conceptual principles of this kind are assumed as implicit in the economic models they use and tend to receive little attention in empirical studies (Amemiya, 2005:157).

3.5.2 The Substantivist Perspective

The substantivists, by contrast, contend that while the theories devised by neo-classical economists may help to explain the workings of the capitalist system they are meaningless when applied to pre-industrial societies, since the latter are structured along entirely different lines (Dowling, 1979:292). Substantivists instead adopt an anthropological approach, following the lead

of Polanyi (1946), basing their views on the inherent belief that social relationships were dominant in the classical world. Social considerations operated quite independently of economic concerns and if the two spheres ever came into conflict it was social obligations which always prevailed (Morris, 1999:xii; Scheidel & von Redden, 2002b:2).

Within this socially-embedded, status driven framework, the key structural differences we encountered in section 3.4 were designed to generate specific outcomes for the social élites. These included the desire of wealthy patrons to increase their own client bases, to extend their individual landholdings and to enhance their personal political prestige (Scheidel, 2012b:7-8). Indeed, the élites' obsession with social concerns seems to have become so deeply rooted in Roman society as to lead Morley (2007a) to observe that:-

> "... there is little trace in antiquity of any alternative ideology to that of the landed elite."

(Morley, 2007a:8)

As a result, substantivists prefer to rely on anthropological mechanisms such as socially-embedded reciprocal exchange and state-managed redistributive transfers to explain the flows of materials which occurred in the classical world. The rôle of market exchange is thus relegated to a residual position, in a model which perceives material transfers to take one of three forms:-

1/ Reciprocal exchanges
2/ Redistributive transfers
3/ Market exchanges

(Polanyi, 1977:37)

3.6 SOCIALLY EMBEDDED AND ECONOMIC EXCHANGE

Rather than exhibiting a single dominant pattern of exchange, the classical world may be regarded as having a tripartite system within which social reciprocity, redistribution and market exchange simultaneously co-existed (Grønhaug, 2000:103-104). The distinguishing characteristics of each mode of exchange are identified by Polanyi *et al* (1957):-

> "Reciprocity denotes movements between correlative points of symmetrical groupings; redistribution designates appropriate movements towards the centre and out again; exchange refers to vice-versa movements taking place between 'hands' under a market system."
>
> (Polanyi *et al*, 1957:250)

It is important to recognize that even in a mixed-economy there is nothing alien in these approaches. Reciprocal exchanges continue to occur today principally as gift exchanges between family members and close friends, for example to celebrate birthdays or other special occasions. Similarly, we are familiar with the notion of redistribution in the form of government taxation and transfers and through private charitable activities. Thus, even though the balance between these three modes of exchange has altered considerably since Roman times, no new form of exchange has emerged and none have entirely vanished.

Examining the forces which generated each type of transfer, Pryor (1977) divided these into centric, non-centric or market exchanges, depending upon whether state activity or private interactions triggered these movements. This distinction is clearly significant in relation to our supply-chain model (Figure 1.5), where the state has already been identified as one of the four important agents involved in the Romano-British supply network.

Pryor's centric transfers describe the redistributive element of this tripartite exchange process, being associated most closely with the state's taxation and administered supply mechanism. Non-centric transfers, by contrast, involved reciprocal exchanges which occurred between private individuals within the socially-embedded sector of the economy (Temin 2013:7). If the state needed to supplement its tax-based resources by purchasing additional materials, Pryor (1977:31) felt such acquisitions would fall into the category of market exchanges. These processes are all thought to have had a rôle in shaping the Romano-British economy and we must therefore examine the evidence we have for each of them, beginning with reciprocal exchange.

3.6.1 Reciprocal Exchange

Social anthropologists, such as Polanyi *et al* (1957:70-71) recognized quite clearly that societies across the Roman Empire, including newly acquired provinces such as Britain, had until recently been tribally-based. They also understood that exchanges which took place within social settings of this kind occurred primarily within the context of a family or kinship group, in which shared cultural, political and religious bonds far outweighed any conventional economic considerations. Members of a traditionally based tribal society of this kind may have had few opportunities and perhaps little inclination to take part in market exchanges with individuals outside their existing social circle (Polanyi *et al*, 1957:262).

Rome's influence will no doubt have reshaped traditional ways of life across the territories it subsumed as the Empire expanded (Paterson, 1998:166). It is widely believed, however, that the vast majority of individuals continued to live in rural communities throughout the Roman period and, for them at least, a system based on traditional peasant agriculture would have remained the norm (Hingley, 1989:10; Finley, 1999:xx).

In such a situation, the majority of items exchanged would presumably have represented gifts designed to maintain key social bonds (Robbins, 1947:233; Shaw, 1995:11). Reciprocal transfers of this kind probably ranged from offers of food and hospitality at the household level, through to exchanges of prestigious gifts in the case of tribal élites (Nash, 1984:96). Each gift in turn created future moral obligations for the recipient, which within a stable social framework would have been repaid in due course, creating a system of broadly balanced transfers (Morris, 1981:70; Grønhaug, 2000:104).

Pre-conquest Britain is thought to have had a socially-embedded economy of this kind (Cunliffe, 1994b:76-77; Mattingly, 2006:496). Migrations from the near continent in the centuries leading up to the Claudian conquest of AD 43 meant that close links existed between tribal groups in eastern and southern England and their Gaulish counterparts (Allason-Jones, 2008:4). Reciprocal exchanges between these groups are thought to account for the arrival of many of the valuable continental imports which reached Britain at this time (Haselgrove, 1987b:193; Salway, 1993:428).

Cross-channel exchanges of this kind certainly continued during the century between Julius Caesar's arrival (55-54 BC) and the Claudian invasion, as Rome sought to establish diplomatic relations with some of the major tribal polities in southern England (Fulford, 1989:178; Millett, 1990:34; Cunliffe, 2007:9). This was strategically important, as Mattingly (2006) explains:-

> "It is not uncommon for powerful states to nurture allies or clients beyond their borders and the Roman Empire had a strong tradition of such relations with 'friendly kings'."
>
> (Mattingly, 2006:67)

Goods which arrived from the continent during this period included amber, ceramic tableware, glass, ivory, metalwork, olive-oil and wine; the last two being *amphorae* borne commodities (Todd, 1999:3; Mattingly, 2006:84). It is also likely that other artefacts reached Britain as part of the social and diplomatic exchanges which took place in the pre-conquest period, but as many were probably perishable items, little trace of them now remains.

Some of the reciprocal exports which were offered in exchange for these exotic imports can also be identified, since the Roman geographer Strabo (*c.* 64 BC-AD 23), listed grain, cattle, gold, silver, iron, hides, slaves and clever hunting dogs among the items which British chieftains provided in return. Strategic items of this kind would have been highly prized by a Roman state hungry for resources to support its continuing expansionary ambitions (Strabo, *Geographica*, iv**.** 5**.** 2; cited by Cunliffe, 1988a:102).

3.6.2 Redistributive Transfers

The second exchange mechanism that operated in the Roman world related to the state's central rôle in the management of public finance. As the Roman imperial government did not introduce a budget until the reign of Diocletian (AD 284-305) it is impossible to establish the precise level of the state's involvement in the economy before this time (Williams, 1985:125). The cost associated with administering a territory of the size and complexity of the Roman Empire would clearly have been enormous however.

Even without access to any detailed figures, the general nature of the Roman taxation and spending model is relatively clear (Hopkins, 1980:101-102). The vast majority of urban and rural communities were not only expected to be self-supporting, but were required to generate regular surpluses in order to meet the state's wider fiscal obligations. The revenue generated in this

way was used by the imperial government to support the large *plebeian* population of metropolitan Rome and to maintain the legionary forces stationed on its frontiers (Hopkins, 1978:58). State-managed redistribution of resources via centric transfers of this kind will therefore have formed an important, but unquantifiable, component of the Roman economy.

Taxes were raised both in cash and in kind, the form of payment depending on the nature of the levy. Monetary payments were perhaps more common in the case of items such as the personal poll-tax (*tributum capitis*), sales taxes and harbour duties (*portoria*); while land taxes (*tributum soli*) or taxes based on agricultural output (*annona)* were probably more often paid in kind (Scullard, 1979:88).

The only direct literary evidence we have which relates to taxes in Roman Britain is a brief reference in Tacitus, who mentions an example of a grain levy being supplied to the army by the native population (Tacitus, *Agricola*, xix; cited by Fulford, 1989:181). Further archaeological evidence which may relate to this process comes in the form of a large bronze corn measure (*modius*) found at the fort of Carvoran (*Magna*) on Hadrian's Wall. This is a type of instrument which would presumably have been used in collecting payment of the *annona* (Alcock, 2011:286).

While the notion of funding public services from tax contributions is widely recognized throughout Europe today, tax levies may have been regarded as an unwelcome innovation by many inhabitants of Roman Britain. Millett (1984:67) reminds us that some tribal leaders probably exacted tribute from their dependants in the pre-conquest period, although it is not entirely clear how universal this practice may have been. The massive storage capacity of many of the later Iron Age hill-forts would be consistent with the idea of a social structure that involved the centralized collection of resources though,

and it is quite likely that at least a proportion of these will have constituted tribute payments (Cunliffe, 1994b:77).

The introduction of taxation is likely to have had a major impact on families experiencing these demands for the first time however. For many Romano-British peasants affected in this way, these new fiscal obligations may have forced them to alter their economic position from that of a sufficer to one of a maximizer, in order to create surplus output that could then be offered as payment in kind, or sold at a local market to raise cash to meet their new tax liabilities (Garnsey & Saller, 1987:56; Cunliffe, 1995:113). Indeed, by the 2nd century AD, Hopkins (1980) has suggested that economic redistribution had reached such a scale in the Roman Empire that substantial, long distance trade mechanisms had to be developed for the first time to cope with these flows of materials.

As a frontier province, Britain is likely to have been a net recipient of such redistributive transfers, with the northern and western regions benefiting most, as a large proportion of the legionary garrison were stationed in these areas (Holder, 1982). The extent of these transfers will probably never be fully quantifiable, but they were clearly substantial and it is perhaps difficult to overstate their importance to a relatively underdeveloped province such as *Britannia* (Peacock & Williams, 1991:57).

3.6.3 Market Exchange

The final form of exchange which we need to consider is the one with which we are most familiar today; namely the market transaction. It is important to remember, however, that evidence of the widespread existence of markets throughout the Roman Empire is not in itself proof that a market economy existed in classical times (Meikle, 1995a:185).

In considering this topic, it is important to distinguish clearly between the idea of a market as an intellectual construct and a market as a location. The former involves the rôle of the price mechanism in allocating economic resources in a way which enables stable market-clearing equilibriums to be achieved, while the latter concerns a market's physical structure and/or its functional arrangement (Heeler & Chung, 2000:75).

Taking the intellectual construct first, Lancaster & Massingham (1988) clearly link the concept of a market to the exchange process, pointing out that:-

> "Exchange is the act of obtaining something of value, usually a product or service, from another party, an individual or organisation, by offering something of value to the other party."
>
> (Lancaster & Massingham, 1988:7)

Exchange of this type is both voluntary in nature and designed to produce balanced outcomes in terms of the values received by each of the parties. Value may be represented either by means of direct exchange, usually in the form of a barter arrangement, or by means of a monetary transaction (Pryor, 1977:106; Shaw, 1995:12). Money quickly became the dominant form of payment in commercial transactions however. Indeed, even substantivists such as Polanyi *et al* (1957) are forced to concede that:-

> "...where money is in evidence, trade, and therefore markets, should be assumed."
>
> (Polanyi *et al*, 1957:257)

Although we now normally assume that market exchanges are transactional and often take place between parties who have no previous acquaintance, it is important to bear in mind that multiple motives may have been present in many early commercial transfers. Polanyi *et al* (1957:259) are therefore correct to point out that a proportion of market exchanges may have been undertaken primarily to gain social status.

Braudel (1979:195) reminds us, however, that in practice exchange is rarely entirely economic or social in nature and that both characteristics can be determined in most cases. Temin (2013) agrees, going on to suggest that reciprocal and market exchange are actually mutually supportive:-

> "Reciprocity allowed people to engage in market activities in the expectation that the people they dealt with would fulfil their expectations and act to their mutual benefit."
>
> (Temin, 2013:12-13)

What does seem to distinguish market-based transactions from other forms of exchange, however, is that the marketplace appears to bring together groups or individuals with either goods to sell or money to buy, irrespective of their existing social relationships (Greene, 1986:48). While marketing may have represented a peripheral activity for most members of traditional subsistence-based economies, it may nevertheless have provided a useful source of supplementary income or resources for anyone fortunate enough to have a surplus to exchange.

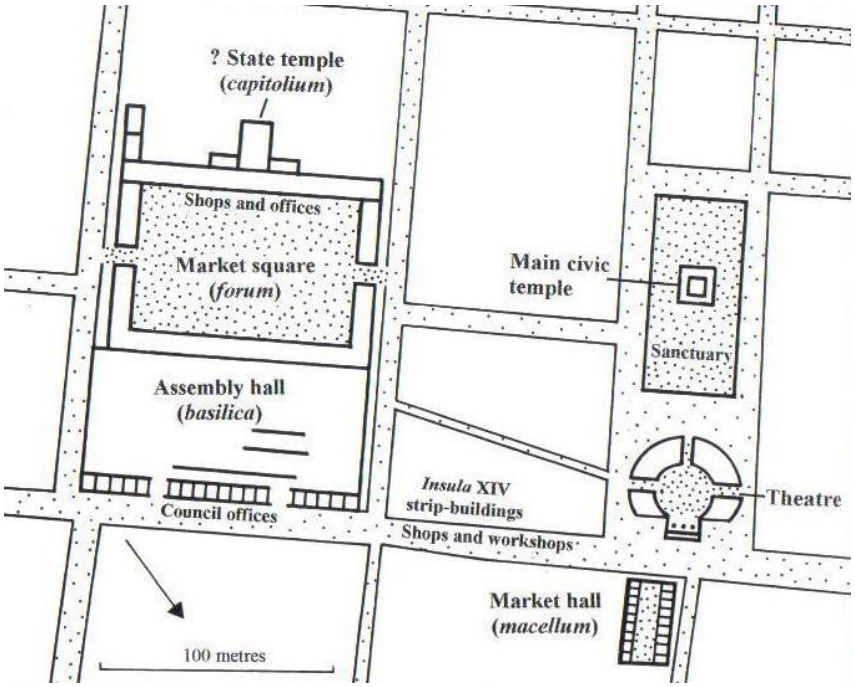
This takes us on to the idea of the market as a location; evidence of which may be obtained from both epigraphical and physical sources. A more detailed discussion of this topic will appear in Chapter 6, when the activities of Romano-British merchants will be considered in detail. At present it is

sufficient to observe that the most recognizable forms of market structure seem to be situated close to the centre of urban settlements. These usually consist of permanent or semi-permanent shops or stalls, which are found in one of three main types of location:-

1/ Dedicated market-halls (*macella*), situated close to the town's centre
2/ Roadside buildings with shop frontages (*tabernae)*
3/ Temporary stalls, usually in a town's market square (*forum*)

While the layout of each urban market varies to some degree, Faulkner's (2001) map of the Romano-British town centre at St Albans (*Verulamium*) provides an idea of how a range of different market outlets may have existed in close proximity.

Figure 3.3 *Basilica*, Market Hall (*Macellum*) and Shops at *Verulamium*



(After Faulkner, 2001:34, Figure 14)

Urban centres were not the only market locations at this time, however, as Pryor (1977:106) makes clear. A fuller account of other forms of markets, particularly rural and seasonal fairs, will be provided when we return to the topic of Romano-British consumers in Chapter 7.

3.6.4 The Balance of Reciprocal, Redistributive and Market Exchange

One of the important problems encountered when attempting to evaluate the quantitative importance of each of these different types of exchange is that all appear to produce similar patterns of artefact distribution, thus making it impossible to tell if a specific product changed hands as a result of a centric or a non-centric transfer or via a social or transactional exchange (Peacock, 1982:81). This ambiguity leaves us unable to resolve the dispute between those who consider marketing to have had only a marginal rôle in classical society and those who believe it made an important contribution.

3.7 PRIMITIVIST vs MODERNIST INTERPRETATIONS

The question of whether the Roman economy differed from our own in terms of its structure or merely its scale, dates back to the late 19th century when two eminent economic historians Karl Bücher (1893) and Eduard Meyer (1896) adopted diametrically opposing views of this problem. Although clear parallels exist between this modernist-primitivist dialogue and the more theoretical formalist-structuralist debate which we encountered in section 3.5, the modernists and primitivists differ more in terms of their empirical approaches rather than over philosophical disagreements.

3.7.1 Primitivist Perspectives

The primitivists maintain that the ancient economy was in fact qualitatively different from today's, being primarily relationship based and hierarchically structured (Scheidel & von Reden, 2002b:3; Morley, 2007a:4). In this respect the primitivist school adheres closely to the ideas of Moses Finley (1973), who rejected the notion that modern economic concepts could be applied to the ancient world, as traditional societies based their production and distribution decisions on 'use values' rather than on 'exchange values'.

Much credit for stimulating the modern-day interest in the economies of the Greco-Roman world is owed to Finley, who identified what are regarded as the key characteristics that distinguish the ancient economy from its modern counterpart. These differences centre on five main issues:-

- Concerns of social status far outweighed commercial interests
- The desire for self-sufficiency prevailed among the landed élite
- The economy was rurally based and made little use of capital
- Technological development was minimal
- Economic growth was either slow, or non-existent

(Mattingly & Salmon, 2001b:3)

These factors contributed to an economy which Finley (1973) regarded as being both primitive in structure and minimalist in scale (Woolf, 2001:49). In a socially-embedded economy of this kind profit-seeking activities were marginalized and opportunities for long distance trade curtailed (Morris, 1999:xxii-xxiii). Finley's powerful analysis laid the foundations of a debate on the nature of the Roman economy which continues to this day.

The primitivist movement has gained the support of many leading scholars, particularly among Finley's followers at Cambridge University. The most eminent of these individuals are listed in Figure 3.4; together with a brief *résumé* of the principle contribution each has made to this debate.

Figure 3.4 Primitivists' Contributions to Ancient Economic Analyses

AUTHOR	INTELLECTUAL CONTRIBUTION
Bücher (1893)	The development of the primitivist model
Polanyi (1946; 1977)	An anthropological 'substantivist' approach
Jones (1964)	Significance of state-administered supply
Finley (1973; 1987)	Qualitative differences of the Roman economy
Whittaker (1985)	Trade and the aristocracy in the Roman Empire
Duncan-Jones (1990)	The structure and scale of the Roman economy

3.7.2 Modernist Perspectives

The modernist thinkers respond by asserting that the ancient economy was in fact very like our own, differing in its scale, but not in its fundamental mode of operation (Scheidel & von Reden, 2002b:3). It is inconceivable from a modernist perspective that an entity as successful as the Roman Empire could have administered a territory of such size and complexity for over half a millennia without the aid of a developed and integrated economy (Jongman, 2002:33).

The empirical evidence modernists draw on to support their claim that the Roman economy was far from primitive in its outlook or operation comes from a variety of sources. These include its development of sophisticated monetary and financial systems, the widespread use of Roman law and the

important rôle played by the state in tax collection and long distance supply (Harris, 1993b:27).

The modernist school is also supported by a significant number of eminent scholars, the foremost of whom are identified in Figure 3.5, along with a brief indication of what each had added to the discussion.

Figure 3.5 Modernists' Contributions to Ancient Economic Analyses

AUTHOR	INTELLECTUAL CONTRIBUTION
Meyer (1895)	Development of the modernist model
Frank (1933-1940)	An economic survey of ancient Rome
Rostovtzeff (1957)	Significance of Rome's economic expansion
Hopkins (1980; 1995/6)	A tax and trade (fiscal stimulus) model
Aubert (1994; 2001)	Rôle of Roman business managers (*institores*)
Temin (2001; 2013)	Development of a Roman market economy

3.7.3 Intermediate Models

While both the primitivists and the modernists present powerful arguments to support their respective positions, each approach takes a particular view of the ancient economy, resulting at times in a rather polarized debate. Primitivists, for example, are undoubtedly correct in their contention that perhaps as much as 98% of the Roman economy was based on subsistence agriculture, but they apparently have little to say concerning the other 2%, which is the sector their modernist counterparts are primarily interested in.

Recently, a more holistic approach has begun to emerge which may enable common ground to be established between the primitivist and modernist approaches via the use of intermediate models (Verboven, 2007:295; Harris,

2011:5-6). As the theoretical debate between formalists and substantivists arises from conflicting philosophical approaches, this is unlikely to be easily resolved. The disagreements between the primitivists and modernists are empirically based though and may therefore offer greater scope for accord. As Morley (2004) observed:-

> "Substantivism is plainly incompatible with a modernising view of antiquity. Formalism and primitivism, however, are not so wholly antipathetic; one might plausibly hold both that economic theory does reveal universally valid principles and that in material terms the ancient world was underdeveloped."
>
> (Morley, 2004:44)

One way forward may be offered by 'New Institutional Economics' (NIE), a relatively new analytical approach to which both modernists and primitivists appear to subscribe. NIE is a branch of economics closely associated with the work of recent Nobel laureates such as Douglass North (1990) and Ronald Coase (1991).

3.8 THE CONCEPTS OF NEW INSTITUTIONAL ECONOMICS

One of the primary reasons why many traditional historians are unwilling to accept neo-classical economics as an appropriate means of studying the past are the simplifying assumptions which this analytical approach incorporates to enable it to focus on the crucial 'marginal' changes which lie at its heart. These simplifications include the assumption that buyers have perfect knowledge of market conditions and that resources are able to move freely between alternate uses, with no transaction costs (Stanlake, 1983:193). While these assumptions are convenient from a theoretical perspective,

these conditions do not conform to reality, thus diminishing the usefulness of neo-classical models as empirical tools.

3.8.1 Transaction Costs

These limitations were first addressed by Coase (1937), who recognized the need to bridge the gap between economic theory and practice in relation to transaction costs. These include items such as negotiation fees, information provision, transport charges, verification processes and dispute settlement procedures (North, 1977:711; Hawkins, 2012:176-177). Although Coase (1937:21) realized that costs of this kind could never be entirely eliminated, he recognized that they could be substantially reduced by using specialists who were skilled in such activities.

Coase's contribution is particularly relevant to the current investigation since transaction costs, in the form of transportation charges, are a factor which may serve to either inhibit or stimulate long distance trade flows (Coase, 1991:231; Temin, 2012:59). The rôle of specialist merchants, experienced in the art of market exchange, and thus able to stimulate long distance trade, will therefore form a major theme of this research.

3.8.2 Institutional Developments

The second major contribution of 'New Institutional Economics' comes from North's (1990) analysis on institutional development. The significance of this work for historians was to identify the rôle of institutions in the process of economic development. Among these institutions is 'the state' itself and, as an economic historian, North (1981) applied his analysis to Rome's economic rôle in the management of its empire.

The state has a dual function, firstly in establishing a stable legal framework within which social and commercial activities can take place; and secondly, in performing a central redistributive function to achieve its formal civic or constitutional obligations (North, 1979:250). Within this general economic framework, private sector institutions play an important rôle in facilitating business by reducing both costs and uncertainty in the process of bringing buyers and sellers together (North, 1991:97-98). Merchants again play an instrumental rôle here by using their specialist skills and understanding of market conditions to create and sustain profitable long distance trade flows. North referred to this particular merchant attribute as the acquisition and use of asymmetric knowledge. This is defined by Temin (2013) as:-

> "...shorthand for one party to a transaction knowing more than the other."
>
> (Temin, 2013:98)

3.9 DEDUCTIONS

As we have seen, the socially-embedded Roman economy, with its heavy reliance on household production and slave labour, appears very unlike its modern counterpart in either its structure or its orientation. The magnitude of these differences has raised questions at both the theoretical and the empirical levels as to whether these two types of economies can be studied in the same way. The possibility of finding common ground between the primitivist and modernist positions seems to be offered by the emergence of the field of 'New Institutional Economics' however.

Two particular aspects of this approach which have particular relevance for the present study are the notions of 'institutional developments' (North,

1990) and ‘transaction costs’ (Coase, 1991). As mechanisms through which we can analyse the activities of both the Roman state and Romano-British merchants these approaches may help to shed valuable light on the operation of long distance supply-chains in our chosen era.

CHAPTER 4

THE STRUCTURE OF ROMAN PRODUCTION

4.1 INTRODUCTION

From a marketing perspective a logical starting point for an investigation into the supply of any product or service would be to consider the nature of its consumer's needs, for the marketing philosophy maintains that customers are the key to commercial success (Christopher, 2004:23). As we have seen in Chapter 3, however, the structure of the Roman economy appears to have differed in a number of significant ways from that of its modern counterpart. Care must therefore be taken to ensure that the analytical approaches used to investigate this theme reflect contemporary Romano-British behaviour.

As 'distribution' was identified in Section 1.1.3 as the only functional area of marketing for which substantial evidence survives from the Roman era, the supply-chain appears to provide a convenient framework through which to analyse the rôles and relationships of its participants. The model, set out in Figure 1.5, will therefore be used to plot the sequential flow of materials through the supply-chain from the time they enter the distribution system at the end of the production cycle to the point at which they reached Romano-British retail outlets.

To achieve this goal, the structure of production and the extent of producer involvement in the physical distribution process during the Roman period will be reviewed in this chapter. The investigation will then move on to consider the rôles of the other supply-chain participants, focusing on state-administered supply (Chapter 5), merchant intermediation (Chapter 6) and Romano-British consumers (Chapter 7).

4.2 ROMAN PRODUCTION PATTERNS

As we saw in sections 3.4.2 and 3.4.3, the Roman economy was dominated by its agricultural sector which was organized on the basis of household- or estate-production. The principal objective of each household or estate was to achieve self-sufficiency and marketable surpluses were only required to generate a small amount of income to procure any items which could not be produced internally and to meet the household's tax liabilities. We must therefore recognize that even though the planned production of large-scale surpluses and high volume manufacturing remains our focus, these activities occurred only at the margins of a socially-embedded economy.

A wide range of artefacts was produced in Roman times, but due to word constraints this review will concentrate on those which relate most closely to the case studies covered in chapters 8 to 11. The review will therefore look initially at agricultural output, particularly at wine and olive-oil production, before moving on to consider the manufacture of colour-coated pottery such as samian (*terra sigillata*) and Rhenish-wares.

4.3 AGRICULTURAL SURPLUS

The majority of Romano-British farmers are believed to have operated at, or close to, subsistence level (Birley, 1979:21). Even peasant households were obliged to pay taxes, however, which would have required them to set out to produce at least a small annual surplus (Hopkins, 1980:104). This produce could have been turned into cash at one of the periodic markets (*nundinae*) which were held on a weekly basis in many areas (MacMullen, 1970:333). Wholesalers frequently visited these rural markets to purchase agricultural produce which they could then assemble into consignments to sell to urban consumers or send for export (Smith, 1974:186).

While commodities like grain would require little processing before they could be sent to market, owners of olive-groves or vineyards would have been faced with the additional challenge of processing their crops if they wished to turn their fruit into oil or wine. Many Roman landowners faced strong cultural inhibitions when it came to participating in manufacturing activities however. Members of the social élite, in particular, saw their rôle as custodians of the land itself, the acquisition and development of which they regarded as their overriding concern (Percival, 1981:106).

The produce generated by their estates was apparently regarded almost as a matter of secondary importance by members of the Roman aristocracy, its principal usefulness being to satisfy their own domestic needs, especially if they had a large staff to support. Any remaining surplus could be disposed of via the market, as long as this did not require the landowner to engage in overt commercial activity (Whittaker, 1985:62; Laurence, 1998:139). The objective of landholding was to enhance personal prestige and social status, rather than to build business careers (Wells, 1984a:96; Faulkner, 2001:76).

4.4 WINE PRODUCTION

Despite the obvious reticence of many landowners to become involved in wine production, vast quantities of this commodity were clearly available, since wine is known to have been one of the staple elements in the Roman diet. Many leading Roman agronomists discussed wine production, with contributions by Cato (*De Agri Cultura*, xxiii-xxvi), Columella (*De Re Rustica*, xii**.** 18-40), Palladius (*Opus Agricultura*, i**.** 18), Pliny (*Naturalis Historia*, xiv) and Varro (*Rerum Rusticarum*, i**.** 54) being among the most prominent (Rossiter, 1981:346). With minor variations, all agree that five stages were involved in wine production:-

1/ Suitable grapes were first selected for processing

2/ Grapes were trodden or pressed to extract their juices

3/ The 'must' was collected in a fermentation jar (*dolia*)

4/ After fermentation the wine was racked into *amphorae*

5/ The wine was then stored until it had matured

(Rossiter, 1981:346-347)

4.4.1 Harvesting and Grape Selection

If landowners were reluctant to engage in commercial wine production, the task of harvesting and processing their grapes was probably handed over to intermediaries (Paterson, 1982:155; Morley, 1996:161). Support for this is provided by Cato, who included a number of specimen contracts in his *De Agri Cultura*, which he commended to his readers when hiring contractors. Included in these is a *pro forma* contract for the sale of grapes still on the vine (Morley, 1996:161).

Figure 4.1 Mosaic Depicting Fruit Picking in Southern Gaul

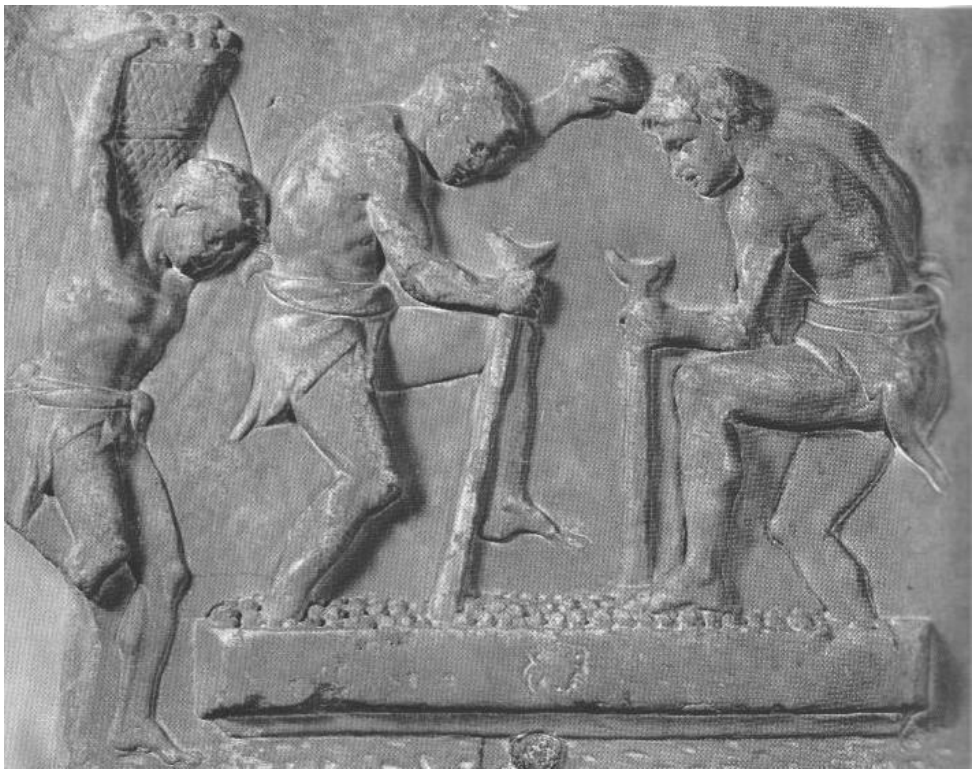
(After Cowell, 1969:89)

Contractors are certainly known to have been employed to pick, press and ferment grape harvests, even bringing their own *amphorae* with them to store and mature the vintage. The volumes of wine produced in this way could be considerable, one estimate suggesting that the annual output of the Sestius family at the *villa Settefinestre* in Cosa (Tuscany) may have filled up to 4,260 *amphorae* (Sealey, 1985:125).

4.4.2 Juice Extraction

A simple treading floor would probably have been sufficient for household production, as the scene depicted in the engraving in Figure 4.2 illustrates.

Figure 4.2 Relief from the *Museo Archelologico*, Venice; Depicting Domestic Grape Treading



(After White, 1970:254, Figure 60)

The volume of grapes needed for commercial production would have called for a more mechanized approach however, involving the use of some form of wine-press (Rossiter, 1981:348; Mattingly, 1988b:159). Both screw- and lever-presses are thought to have been used, with an example of the former illustrated in Figure 4.3.

Figure 4.3 Modern Replica of a Roman Screw Press

(After Wilkinson, 2000:133)

4.4.3 Inclusion of Additives

Once juice had been extracted, this was channelled to a collection reservoir where the 'must' could be prepared and any inclusions added prior to the fermentation process. As McGovern (2013) explains:-

> "Chalk, lime from marble shells and sea water were added to wine to make it more mellow by binding up the acids and accentuating sugar. In classical times, cooking in lead containers and adding high-lead constituents had the same effect."
>
> (McGovern, 2013:309-310)

Classical authors refer to the inclusion of a wide range of additives in their commentaries on wine production, some of which appear bizarre by modern standards (Waldron, 1973:393-394; Cool, 2006:130). The most common of these are shown in Figure 4.4.

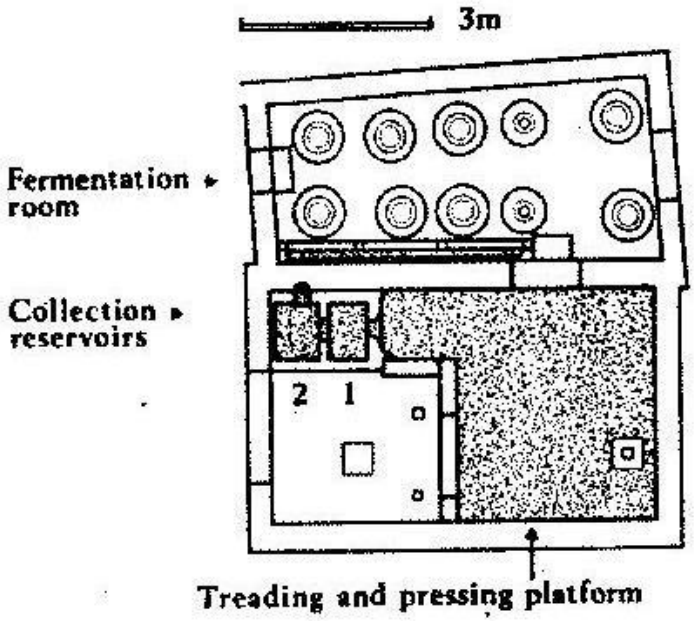
Figure 4.4 Wine Additives Discussed in Classical Literature

Additive	Purpose	Classical Source
Ash from vine leaves	Softens roughness	Cato, *De Agri Cultura*, xxiii Pliny, *Naturalis Historia*, xiv.120
Boiled wine lees (*sapa*)	Sweetening agent	Cato, *De Agri Cultura*, xxiii Pliny, *Naturalis Historia*, xiv.121
Chalk or powdered marble	Reduces acidity	Cato, *De Agri Cultura*, xxiii Pliny, *Naturalis Historia*, xiv.120
Lead sulphide (*galena*)	Sweetening agent	Columella, *De Re Rustica*, xii.18
Lime or gypsum	Softens roughness	Pliny, *Naturalis Historia*, xiv.120
Resin or pitch	Increases piquancy	Pliny, *Naturalis Historia*, xiv.121
Salt or brine	Preserving agent	Cato, *De Agri Cultura*, xxiii Pliny, *Naturalis Historia*, xiv.121

4.4.4 Wine Fermentation

The fermentation process took place in large ceramic vessels known as *dolia* (Rossiter, 1981:347). The fermentation room was often situated close to the pressing-floor, as the plan of a wine facility in *Regio* II, *Insula* 5 at Pompeii demonstrates.

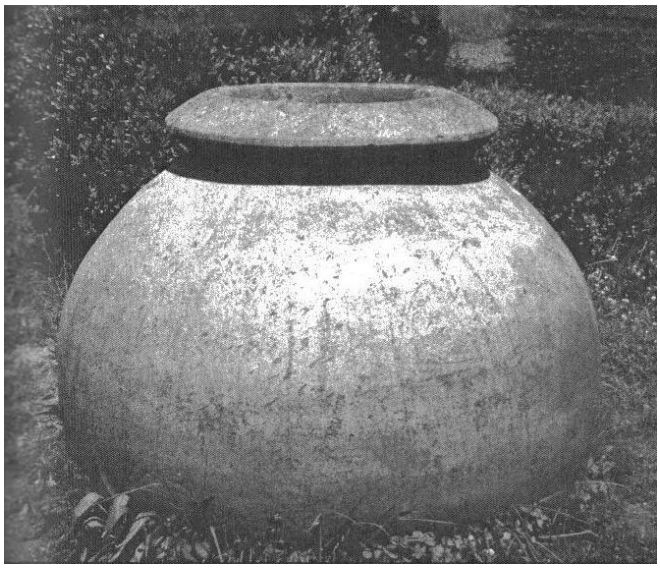
Figure 4.5 Plan of a Wine Production Facility at Pompeii



(After Rossiter, 1981:350, Figure 2)

The *dolia* in which the wine was fermented were substantial vessels, with a capacity of between 400 and 2,000 litres (Peña, 2011:20). They were often set into the ground to protect them from damage as Figure 4.6 shows.

Figure 4.6 Illustration of a *Dolia* showing how this was set into the ground to protect the vessel and its contents



(After Peña, 2011:21, Figure 2.1)

4.4.5 Racking Wine into *Amphorae*

The manufacture of the *amphorae* into which the new wine was racked will be considered in section 4.6, when ceramic production is discussed. Buyers could bring their own *amphorae* when they came to collect their purchases, although Roman jurists suggest that only wine sold in the manufacturer's *amphorae* was guaranteed against future deterioration, as sellers were only willing to assure the sterility of their own equipment (Yaron, 1959:77).

4.4.6 Maturing Wine Prior to Sale

While some wines are best drunk young, Cato recommended that superior wines should be kept for up to five years to allow them time to fully mature (Cato, *De Agri Cultura*, xi**.** 1; cited by Sealey, 1985:107). Careful storage

was needed to minimize the risk of deterioration (Yaron, 1959:71). It was therefore usual for a buyer to insist on tasting wine before a purchase was completed so that any products which had become sour or musty could be identified and rejected (Yaron, 1959:74; Morley, 1996:162).

4.4.7 Wine Distribution

Consideration of the methods by which wine was brought to market will be considered in Chapter 8, where we will look in detail at the specific case of Dressel 1 *amphorae*. This container played an important rôle in wine supply to pre-conquest Britain and provides a useful exemplar of how this beverage was transported over long distances in antiquity.

4.5 OLIVE-OIL PRODUCTION

Olives were second only to grain as a source of nutrition during the Roman period and may have accounted for up to a third of many peoples' calorific intake (Hitchner, 2002:72). Olive-groves were common in southern Europe and North Africa, with a mixture of small independent landowners and large private estates being the most likely ownership pattern (Remesal Rodriguez, 1998:188). Not all producers would have pressed their own fruit however and oleo-production may have been based on three main variants:-

1) olives were produced but sold to others to mill
2) olives were produced and milled on the grower's own estate
3) olives were pressed by specialist millers who owned no groves

(Remesal Rodriguez, 1998:188)

Middlemen who owned neither olive-groves nor oil-presses could have acted as production intermediaries in the same way as for wine production and it is interesting to note that Cato also included a specimen contract for the sale of olives still on the tree in his *De Agri Cultura* (Morley, 1996:161). Once again Cato (*De Agri Cultura*, xviii), Pliny (*Naturalis Historia*, xv**.** 6**.** 23) and Varro (*Rerum Rusticarum*, i**.** 24**.** 3) all offered advice on olive-oil production (Mattingly, 1988c:184). This involved a five stage process:-

1/ Suitable olives were first selected for processing
2/ The fruit was crushed prior to pressing to produce a pulp
3/ This pulp was pressed to extract its oil (25%) and water (75%)
4/ The oil and water were separated in a settlement tank
5/ The oil was siphoned into *amphorae* for distribution

(Forbes & Foxall, 1978:39)

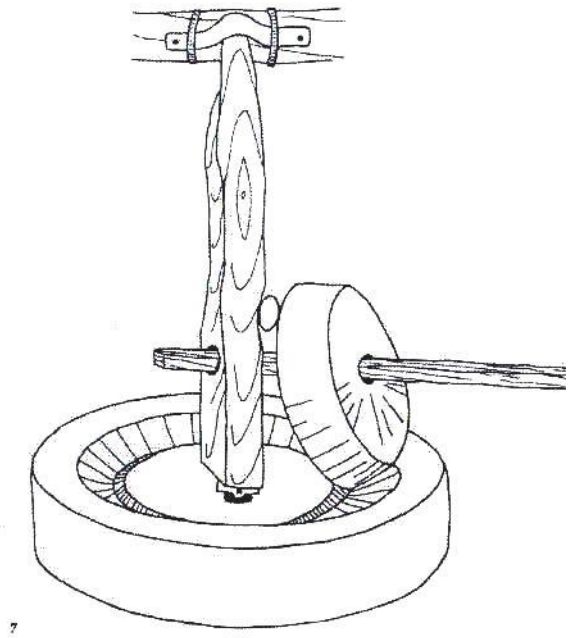
4.5.1 Harvesting and Olive Selection

As some olives were eaten, the larger fruit were often extracted and reserved for this purpose. As fresh olives are extremely bitter they must be soaked in brine before processing to improve their flavour (Forbes & Foxall, 1978:37).

4.5.2 Olive Milling

As olives have a hard stone-pit, a preliminary milling was often performed prior to the pressing process. This produced a pulp of flesh, skin and nut fragments from which oil could be extracted (Mattingly, 1988b:156). The type of olive mill which might have been used in this process is illustrated in Figure 4.7.

Figure 4.7 Representation of a Roman Olive-Mill



(After Forbes & Foxall, 1978:41, Figure 7)

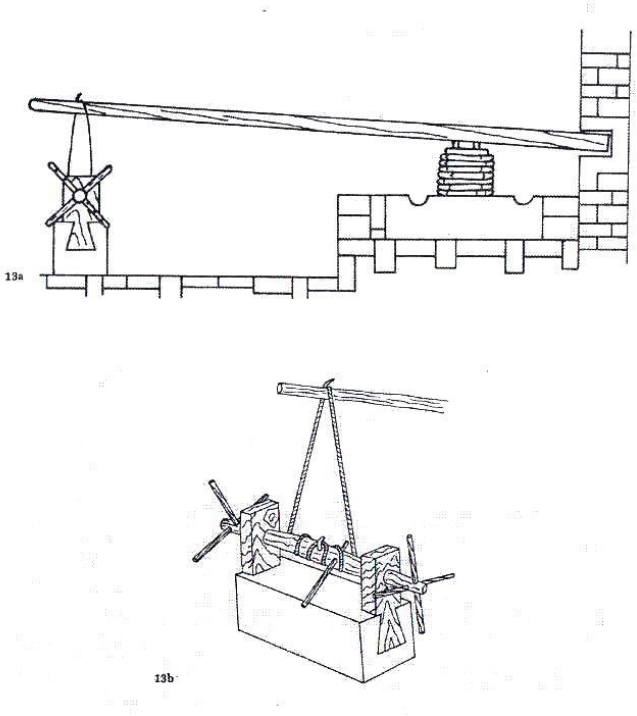
4.5.3 Olive Pressing

The pulp produced by the milling process would then have been pressed to extract its fluid content, of which about one quarter would be oil. Taking Varro's data (*Rerum Rusticarum*, i**.** 24**.** 3; cited by Mattingly, 1988c:184) a single pressing might typically contain 950-1,250 kg of fruit and produce 150-200 kg of oil, equivalent to *c.* 165-220 litres by volume. Simple lever-presses would probably have been used for this purpose; typical examples being illustrated in Figures 4.8 and 4.9. Columella recommended that the pulp be pressed three times, the first producing the purest oil (Columella, *De Re Rustica*, xii**.** 52**.**10-11; cited by Lowe, 2009:125).

Figure 4.8 Mosaic Depiction of a Manual Olive Press in Southern Gaul

(After Cowell, 1969:88)

Figure 4.9 Representation of a Roman Mechanical Lever Press

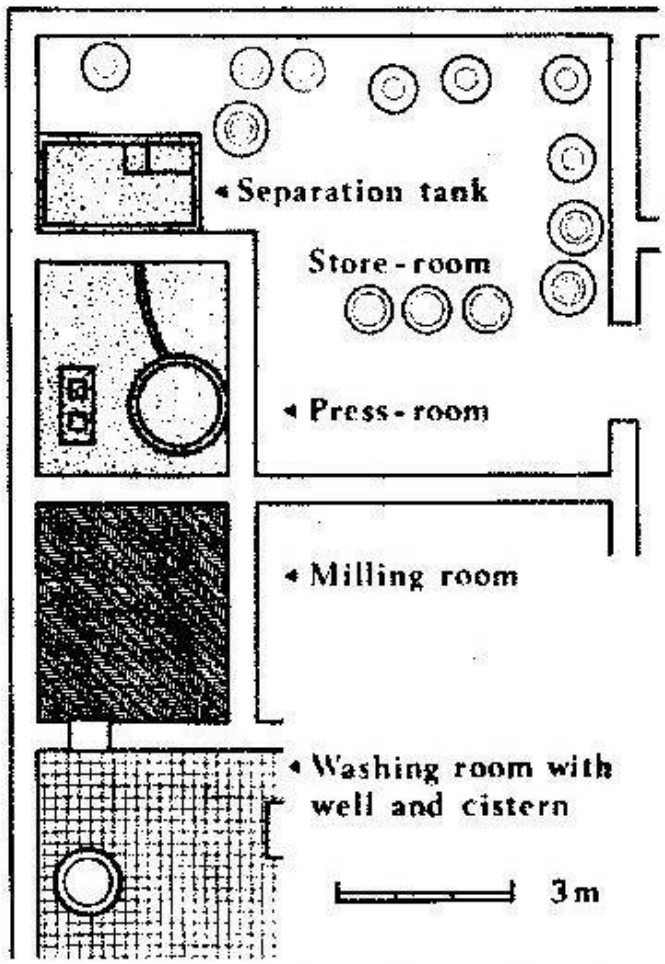


(After Forbes & Foxall, 1978:44, Figure 13)

4.5.4 Oil Separation

As olive-oil and water each have different specific gravities, the two may be separated in a settlement tank. Being the less dense fluid, oil will rise to the surface, allowing the water (*amurca*) to be drained from the base of the tank (Lowe, 2009:125). This was achieved by means of a removable plug. The presence of separation tanks helps to identify oil production facilities during excavation, as the plan reproduced in Figure 4.10 illustrates.

Figure 4.10 Plan of an Olive-Oil Production Facility at *Posta Crusta*



(After Rossiter, 1981:357, Figure 5)

Olive-oil production was certainly undertaken on an industrial scale and it is believed that an average of 20 litres *per annum* may have been consumed by Roman citizens. This would have required an annual production of between 500,000 and 1,000,000 metric tonnes to meet the demands of the empire as a whole (Mattingly, 1988a:34).

4.5.5 Oil Distribution

Olive-oil has a shorter shelf-life than most wines and may deteriorate if it is not consumed within two years of manufacture (Mattingly, 1988a:34). It is therefore important that the product reaches its intended market as quickly as possible. In contrast to wine production, the absence of *amphorae* debris suggests that olive-oil was probably not placed in these transport containers immediately after separation. Instead, the oil was generally carried down to the coast in animal skins and decanted into *amphorae* shortly before it was shipped (Mattingly, 1988a:41; Anderson, 1992:62).

4.6 CERAMIC PRODUCTION

Apart from wine and olive-oil, the other area in which Roman production took place on a truly industrial scale was the area of ceramic manufacture. This covered a wide range of products, including:-

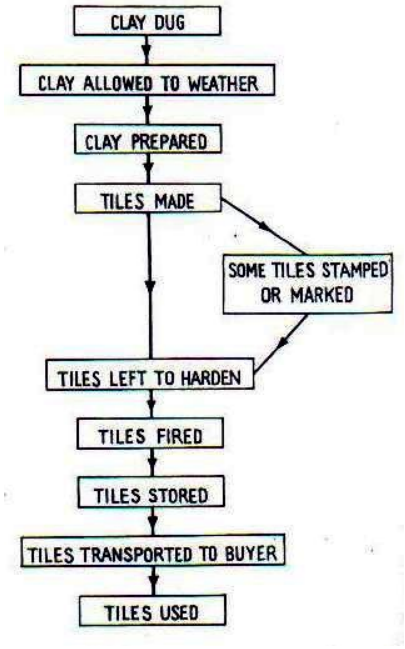
1/ Building materials such as bricks and tiles
2/ Storage vessels, including *dolia* and *amphorae*
3/ Coarse kitchenwares, such as cooking pots and storage containers
4/ Fine tableware pottery, such as samian and Rhenish-wares

(Peña, 2011:20)

4.6.1 Bricks and Tiles

Construction materials like bricks and tiles were manufactured in enormous quantities, especially in regions where stone was scarce (King, 1990:125; Wacher, 1997:166). Bricks and tiles were often made in the same workshops and their production cycle, which is typical of many other ceramic artefacts, is illustrated in Figure 4.11.

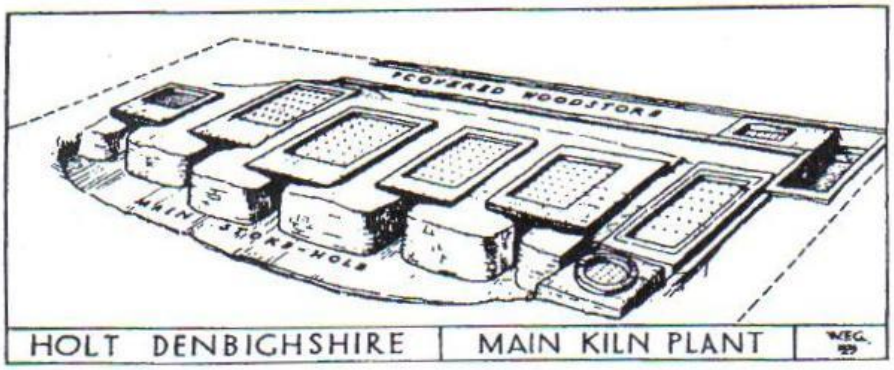
Figure 4.11 Processes Involved in Brick and Tile Production



(After McWhirr & Viner, 1978:360, Figure 1)

Many bricks or tiles were stamped by their maker and these stamps confirm that most were produced in large kilns, many of which were under military or municipal control (Wacher, 1979:103; Jones & Mattingly, 1993:217). The firing process was relatively simple, often using a turf covered 'clamp'. Sophisticated brick and tile kilns have been found at some larger production centres, however, as the layout of the legionary works-depot at Holt shows.

Figure 4.12 Roman Brick and Tile Kiln from a Military Depot at Holt



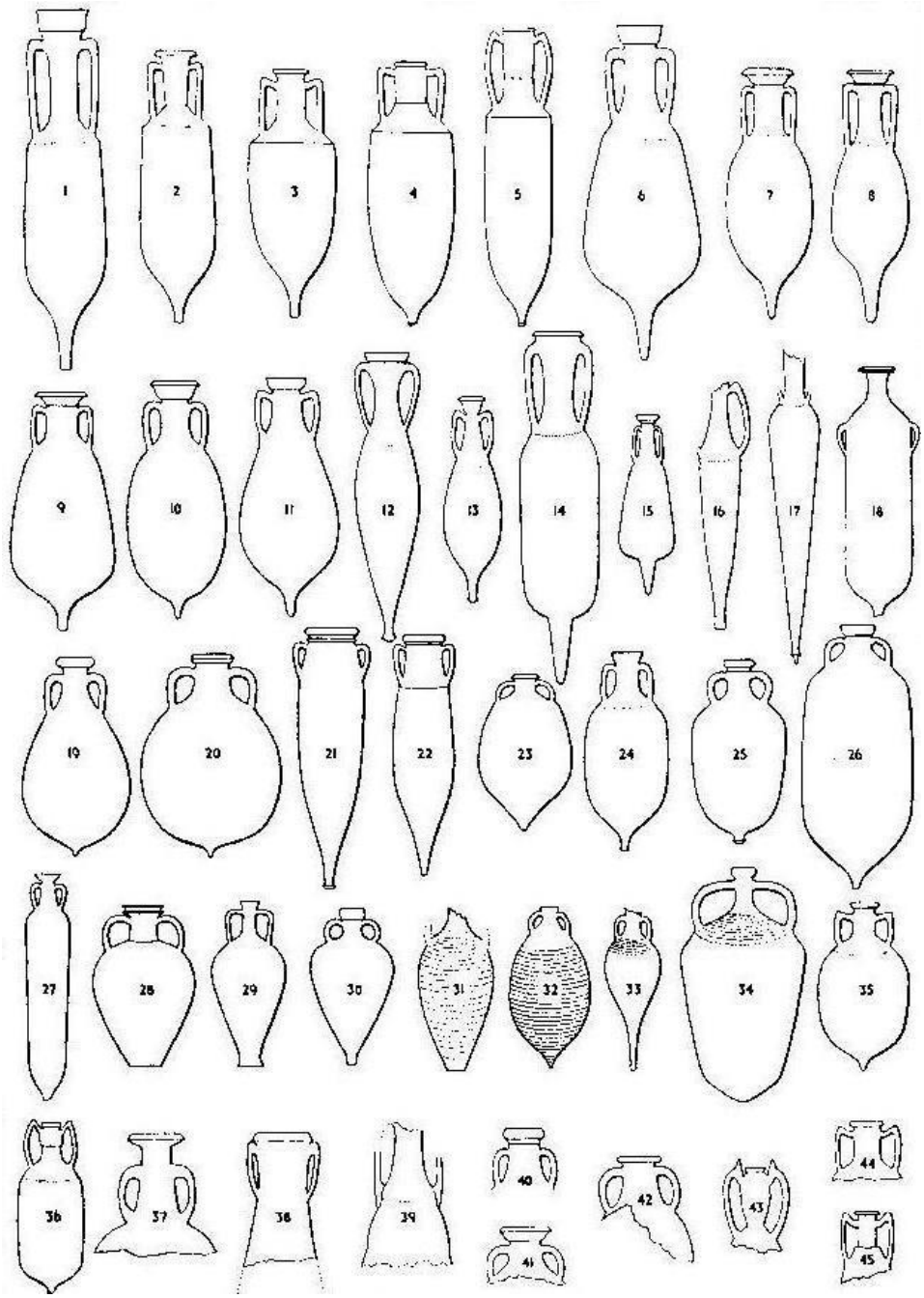
(After Corder, 1964:12, Figure 1)

The widespread availability of clay meant that kilns often served only their local area and over fifty such production sites are known in Roman Britain (McWhirr & Viner, 1978:360; Wacher, 1997:166). Heavy, low value items like bricks or tiles would probably have been considered as commercially unattractive by most merchants, other than for use as saleable ballast. This may explain why these items rarely feature in long distance trade (Wacher, 1997:168).

4.6.2 *Amphorae* and *Dolia*

These large ceramic containers were mainly used for the storage of liquids, their key functional difference being that *amphorae* were portable whereas *dolia* were permanent fixtures at a farm or workshop (Aubert, 1994:262). *Amphorae* appear in many different shapes and sizes, as Dressel's (1899) classification of their principal forms shows.

Figure 4.13 Heinrich Dressel's Classification of *Amphorae* Forms



(After Peacock & Williams, 1991:6, Figure 1)

Their variety of shapes may have provided a visual clue to their contents, as similar shaped vessels were sometimes made to carry the same products in

different regions (Williams, 1989:142). This sometimes makes it difficult to identify an *amphora's* geographical origin without analysing the clay from which it was made (Peacock, 1978:50). Although *amphorae* and *dolia* are large and bulky objects, they were not technically difficult to manufacture. In Italy and Gaul their production is often associated with sites which made other coarse-wares such as bricks, tiles and *mortaria* (Hartley, 1973:40).

A link between estate production and the manufacture of various types of coarse-wares is provided by Varro (*Rerum Rusticarum,* i**.** 22), who singles out *dolia* specifically when recommending that where possible landowners should utilize their own resources to obtain the equipment they needed (Aubert, 1994:256). *Amphorae* kilns may therefore have been common features in oil- and wine-producing regions. Hitchner (2002:78) estimates that 150-200 kilns in the Guadalquivir Valley produced *c.* 200,000-300,000 *amphorae* per annum in the mid 2nd century AD.

4.6.3 Kitchenwares

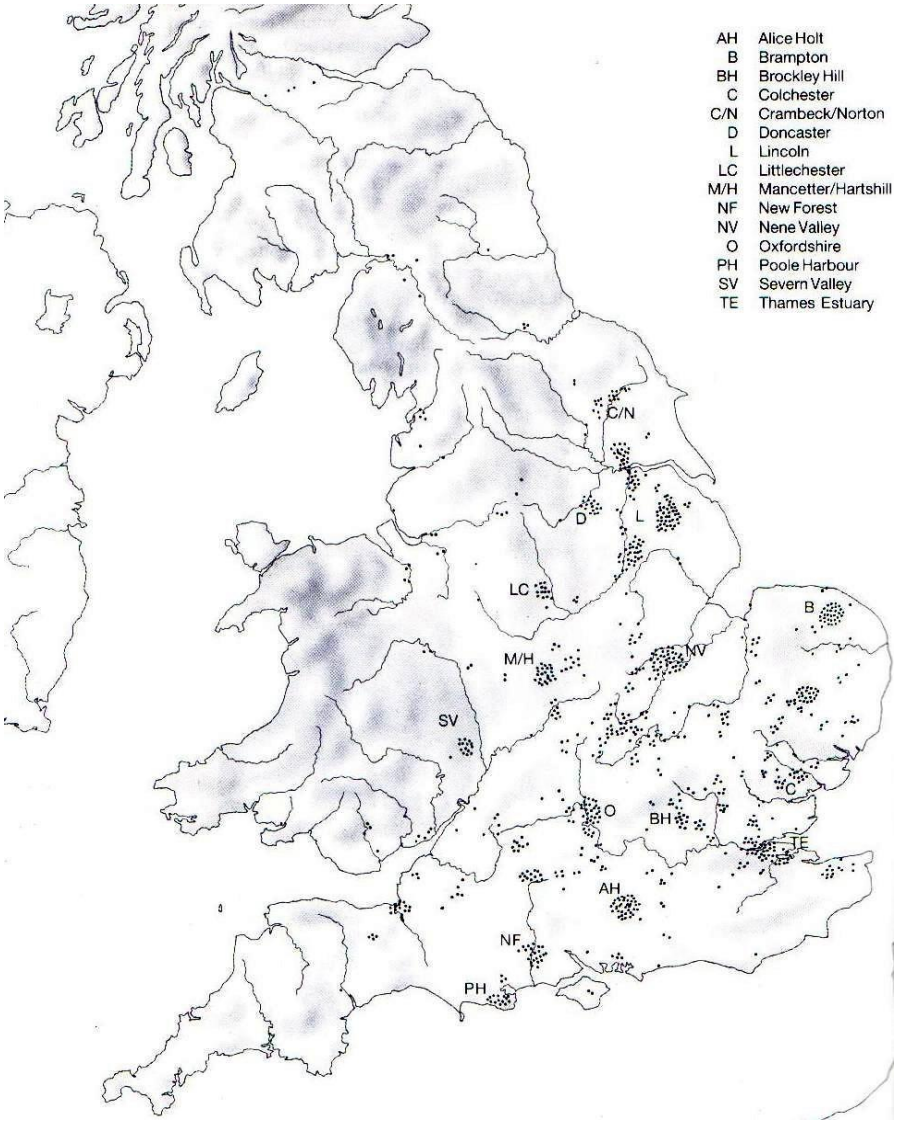
Pottery manufacture was not a Roman innovation, as the practice of using earthenware vessels to cook and store food can be traced back to Iron Age communities in many regions (Evans, 1993:107; Cunliffe, 2010:611-651). As Wacher (1979:103) reminds us though, demand increased significantly after the Roman conquest. This need was met from three sources:-

1/ Local production
2/ Regional suppliers
3/ Imported wares

(Fulford & Huddleston, 1991:38)

Kitchenwares were generally produced close to their intended market, often by potters who perhaps operated on a part-time basis as part of what we may now regard as a 'cottage-industry' (Peacock, 1982:8-9; Greene, 1986:164). A few larger production centres are known which probably employed full-time craftsmen to serve a regional market (Peña, 2011:32). Workshops of this kind often operated as a nucleated industry which shared some common facilities and appear as 'clusters' in the map reproduced in Figure 4.14.

Figure 4.14 Locations of Romano-British Pottery Kilns



(After Jones & Mattingly, 1993:206, Figure 6.24)

While many kilns are situated close to Roman forts, evidence from potters' stamps suggests that the army only manufactured their own pottery in the early post-conquest period (Peacock, 1982:150). Thereafter, civilian potters seem to have supplied both the military and domestic kitchenware markets (Fulford, 1977b:301; Peacock, 1982:148-149).

The range of products supplied can be grouped under five main headings:-

1/ Bowls
2/ Dishes
3/ Flagons
4/ Jars
5/ *Mortaria*

(Evans, 1993:95-96)

Simple kilns would have been sufficient to fire vessels of this kind and an assortment of pottery and other clay artefacts may on occasions have formed part of the same load.

As kitchenwares do not normally feature in long distance exchange it is not proposed to explore them as part of the ceramic case studies which form chapters 8-11 of this thesis. Readers who are interested in the marketing of kitchenwares are referred to articles by Fulford (1973), Fulford & Hodder (1974) and Hodder (1974a; 1974b; 1974c) which deal with the distributions of several key Romano-British regional production centres.

4.6.4 Tablewares

Unlike kitchenwares, which were used to store or cook food, tablewares are associated with its serving or consumption (Peña, 2011:20). The processes

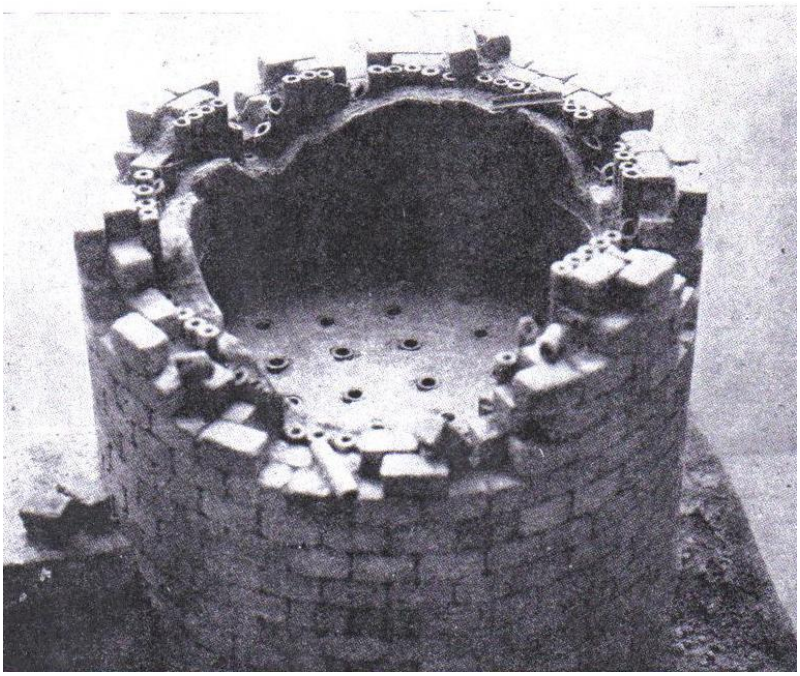
involved in making kitchenwares and tablewares are similar however, the main differences being that tablewares are often:-

1/ Wheel-thrown or moulded rather than hand-crafted
2/ Made from special clays, *e.g. illite* clay in the case of samian ware
3/ Colour-coated prior to firing
4/ Decorated with impressed stamps or mouldings
5/ Fired in special high-temperature kilns

(Greene, 1982:73-74)

Advanced kilns of the type illustrated in Figure 4.15, channelled flue gasses through pipes in their outer walls in order to produce the intense heat needed to fire fine, colour-coated tablewares such as samian (Peacock, 1982:73).

Figure 4.15 Structural Design of a High Temperature Pottery Kiln Used to Fire Samian at Lezoux in the 2nd Century AD



(After Chenet & Gaudron, 1955:88, Figure 40)

Common tableware forms can again be grouped into four main types:-

1/ Beakers or cups
2/ Bowls or dishes
3/ Jugs or flagons
4/ Plates

(Greene, 1982:71-72)

These items perform the same function as their glass or metal counterparts, but would have been much more affordable and are likely to have found a ready market for this reason (Potter & Johns, 1992:138). British demand was met by imports until the late 2nd century AD, after which a number of provincial kilns slowly began to gain market share *vis-à-vis* their continental rivals (Millett, 1995:87).

One of the most popular imported tablewares between the mid 1st century and the mid 3rd century AD was samian (*terra sigillata*), whose production merits special attention for two reasons:-

1/ its dominance of continental supply to the Romano-British market
2/ the geographical migration of production as its markets changed

The import of samian wares into Roman Britain will be considered in detail in Chapter 10 and discussion of the supply-chain for this class of products will be deferred until then. A survey of the structure and development of samian manufacture is relevant to our current theme however, as this may help us understand the way in which this pottery reached its target market.

4.7 SAMIAN PRODUCTION

Samian ware, or *terra sigillata* as it is known throughout Europe, began to be produced in Italy soon after 50 BC (Greene, 1986:9). The development of *terra sigillata* is an area of study in its own right and while space does not permit a detailed review of its evolution in this thesis, it is important to note that a wide range of objects was included within its *repertoire*, including plates, cups, dishes, bowls, lamps, *mortaria* and inkwells (Webster, 2005). Over the course of three centuries *terra sigillata* experienced many changes in its fabrics, forms and decorative styles. Webster (2005) provides a useful synopsis of these developments:-

- Fabric - Webster (2005:13-14)
- Form - Webster (2005:29-71)
- Decoration - Webster (2005:74-91)

A list of reference sources relating to the principal *terra sigillata* production centres, forms and decorative styles are set out in Figure 4.16.

Figure 4.16 *Terra Sigillata* Reference Sources

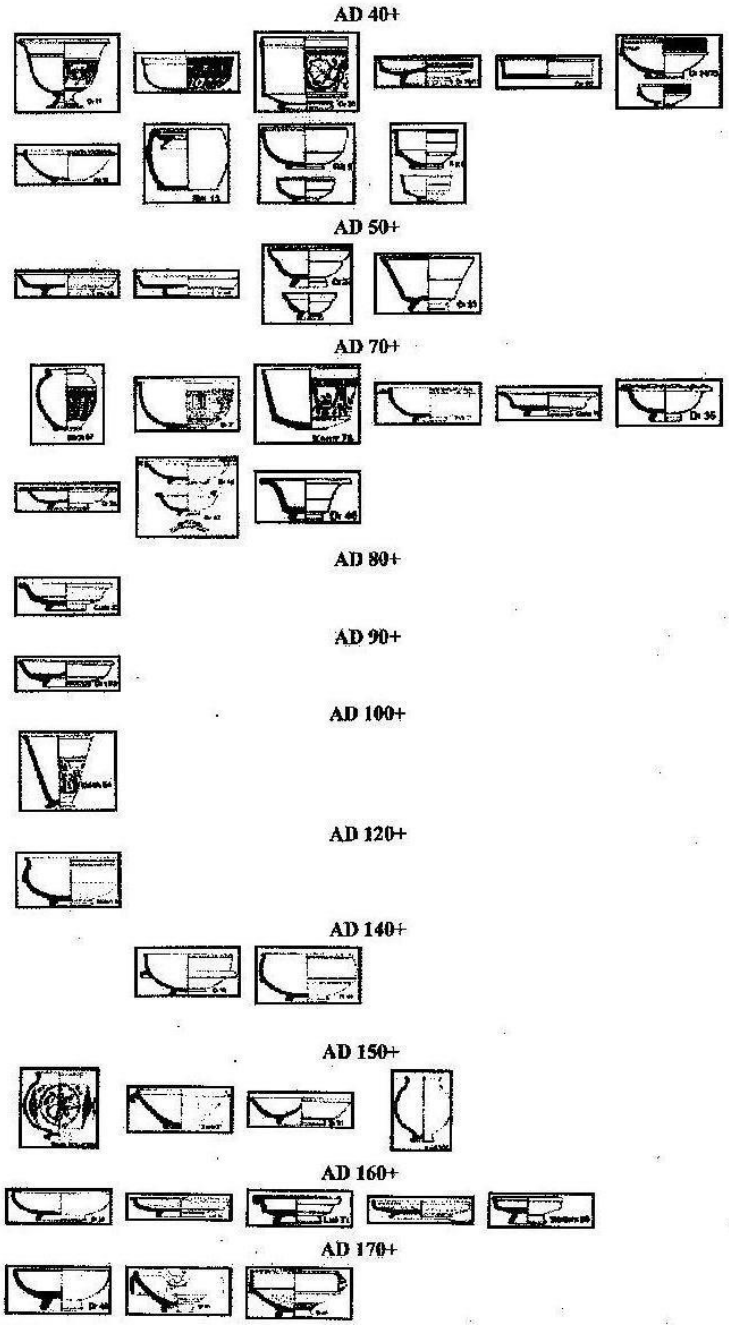
PRODUCTION REGION	REFERENCE SOURCES
Arretium	Ettlinger et al (1990) Oxé et al (2000)
Lyon	Lesfargues (1972)
Southern Gaul	Hermet (1934) Knorr (1952) Vernhet (1991)
Central Gaul	Stanfield & Simpson (1958) Terrisse (1968)
Eastern Gaul	Ludowici & Ricken (1948) Ricken & Fischer (1963) Bird (1986)

(Adapted from Webster, 2005:106-108)

4.7.1 Chronological Development

The chronological evolution of each of the major *terra sigillata* forms are illustrated in Figure 4.17.

Figure 4.17 Evolutionary Developments of *Terra Sigillata* Forms



(Adapted from Tyers, 2012)

4.7.2 Samian Production Techniques

Samian vessels were made in both plain and decorated forms and Webster (2001) describes the procedures involved when manufacturing plain wares:-

> "The methods employed to produce it can be summarized as follows:
> 1. Vessels were hand thrown on a wheel.
> 2. They were then finished with templates. In some cases, bases were formed by additions or by cutting.
> 3. Some decoration could be added, generally *en barbotine* or with the aid of a *roulette*, but sometimes with a small subsidiary mould used to add sprigged decoration.
> 4. Some, but not all, vessels had a stamp bearing the potter's name impressed into the basal interior.
> 5. They were then dipped in slip, dried and fired."
>
> (Webster, 2001:289)

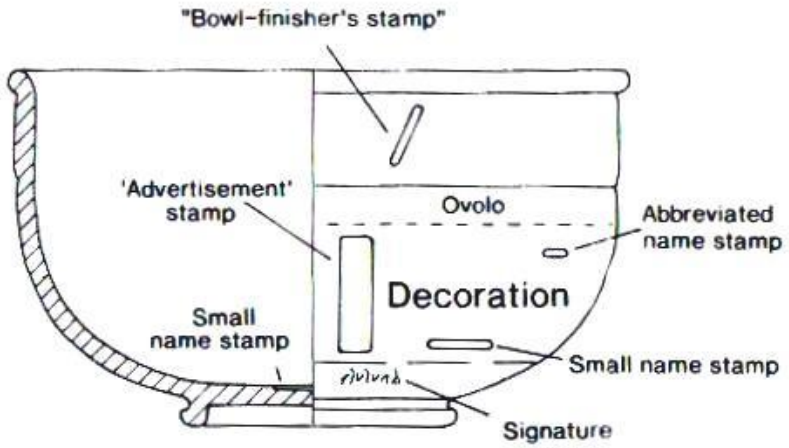
A rather more complex process was involved in the case of decorated wares however:-

> "The ... decorated vessels are separated from the plain-ware by a different method of manufacture and particularly by the use of moulds ... The basic process is reasonably clear:
> 1. Punches (*poinçons*) were made for the main design element.
> 2. A blank mould was thrown and impressed with the *poinçons* and *styli*.
> 3. The completed mould was fired.
> 4. A bowl was made in the mould and the rim raised and finished, presumably with a template or former. A maker's stamp might be added at this stage.
> 5. The bowl was allowed to dry and thus shrunk sufficiently to enable it to be easily removed from the mould.
> 6. The basal foot-ring, if required, was either cut or added.
> 7. The bowl was slipped, dried and fired."
>
> (Webster, 2001:291)

4.7.3 Application of Potters' Stamps

Stamps were sometimes added to these products before firing to identify the individuals involved in the production process. These marks may be found on the exterior, interior or base of the vessels and they are often quite small, with names in many cases being abbreviated. Stamps frequently refer to the potter or workshop manager concerned, but marks belonging to *poinçon* or mould-makers and vessel-finishers also occur (Webster, 2001:297; Dannell, 2002:218).

Figure 4.18 Stamp Varieties Found on *Terra Sigillata*



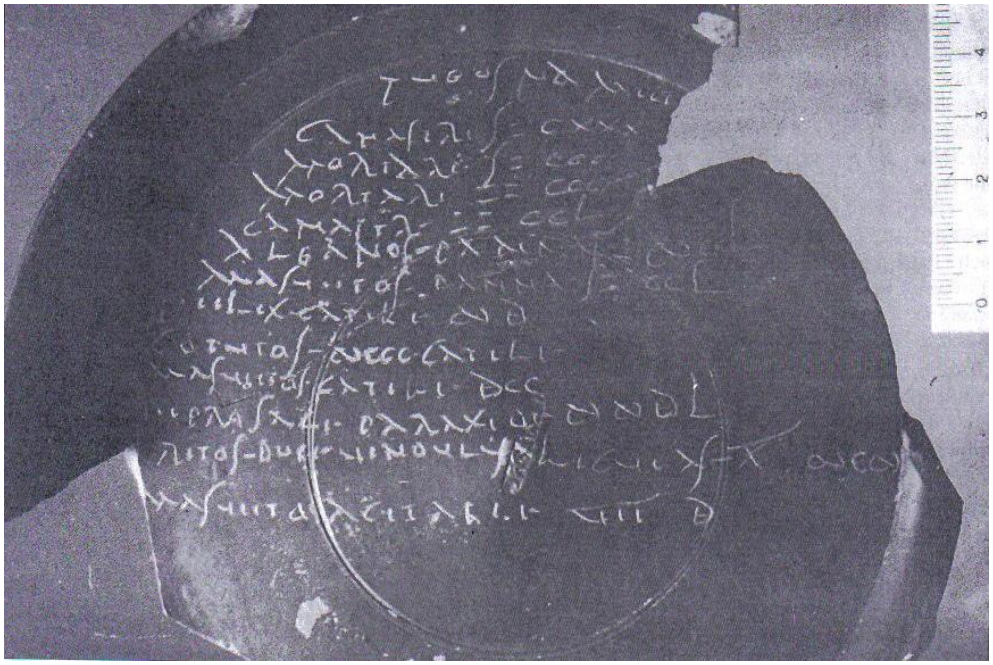
(After Webster, 2005:8, Figure 5)

4.7.4 Scale of Operations

As the degree of technological development at this time was not sufficiently advanced to support a fully mechanized approach, production probably took place in traditional artisan workshops (Peacock, 1982:121; Fülle, 1997:112). Nevertheless, samian manufacture was carried out on a massive scale and by

the time the industry achieved its zenith *c.* AD 60-80, output had achieved monumental proportions, with several million vessels being produced each year (Rhodes, 1989:46; Polak, 1998:115). Graffiti scratched into clay plates at the La Graufesenque site in southern Gaul prior to their firing are thought to represent tallies relating to the operation of communal kilns and are taken to imply that the potters working there may have contributed to the loading of up to 30,000 individual vessels on some occasions (Peacock, 1982:126; Dannell, 2002:220). An illustration of such a tally is shown in Figure 4.19.

Figure 4.19 *Graffito* Firing List from a Kiln at La Graufesenque in Southern Gaul



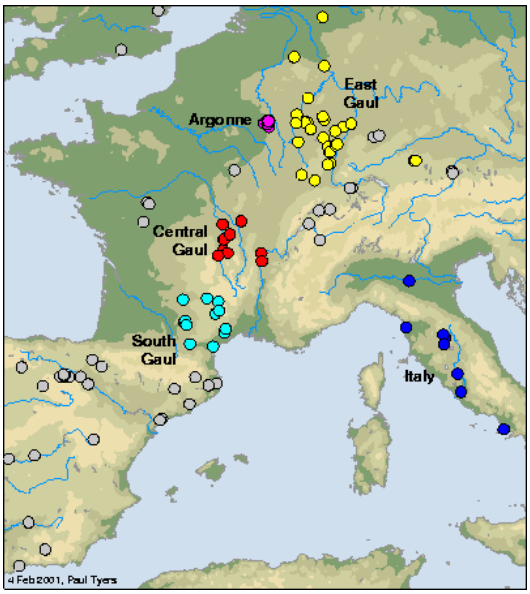
(After Peacock, 1982:125, Figure 30)

La Graufesenque appears to have been the main production centre that made regular use of such tallies, although kiln debris at other sites in Gaul suggest output there was on an equivalent scale.

4.7.5 Migration of Production Centres

Samian continued to be popular throughout Gaul, the Rhineland and Britain until *c.* AD 260 and over the course of more than three centuries a number of major production centres developed. The earliest of these were located in Italy (Arezzo, *Puteoli* and Pisa), before production moved north of the Alps, first to Lyon and then via southern Gaul (La Graufesenque and Montans), to central Gaul (Les Martres-de-Veyre and Lezoux) and finally to the Argonne and eastern Gaul (Rheinzabern and Trier); (Dannell, 2002:234-236; Tyers, 2012). The location of each of these production areas are shown in Figure 4.20.

Figure 4.20 Major Areas of *Terra Sigillata* Production



(After Tyers, 2012)

The simplest way to account for these migrations would be to see them as an attempt by the workshops to move production closer to their customers as the important military market redeployed to Gaul and the Rhineland in the late 1st century BC and early 1st century AD (Whittaker, 1989:73; Bird,

2003:118). The manner in which these new workshops were organized is not entirely clear though. Fülle (1997) suggests three principle alternatives:-

1/ a branch workshop (*figlinae*) supervised by a single foreman
2/ joint facilities shared by several workshop managers (*officinators*)
3/ migration of the master-potter and his entire retinue

(Fülle, 1997:143)

Papyrological evidence from Egypt also suggests that landowners who had suitable clay-beds at their disposal may have been instrumental in attracting branch-workshops to set up business on their estates (Fülle, 1997:121-122). While the contracts we know of often relate to *amphorae* and bricks, rather than samian, these documents do raise the possibility that branch workshops were at times leased (rather than owned) by the potters who operated there and that estate owners may have regarded clay extraction as an adjunct to their farming activities (Wells, 1984a:211; Lewit, 2013:116).

Whatever the structural basis of the samian industry, the practice of setting up branch-workshops seems to have begun quite early. By *c.* 5 BC evidence exists to show that a number of important potters such as Cn Ateius, who is thought originally to have had his manufacturing base in the Italian town of Arezzo (*Arretium*), set up a new factory at Pisa (Jefferson *et al*, 1981:161; Kenrick, 1997:186; Dannell, 2002:218). This move would make commercial sense as a coastal location like Pisa may have been convenient if middlemen were engaged in the onward transmission of these wares.

Ateius was not only active in *Arretium* and Pisa, however, as he established a further branch factory at Lyon (Central Gaul) *c.* 20 BC, being joined there by several other well known samian manufacturers, such as Aco and Sarius (Kenrick, 1993:236; Aubert, 1994:278).

Figure 4.21 A *Crater* from the Workshop of ATEIVS (*c.* 20 BC-AD 20)

(Photograph courtesy of the British Museum)

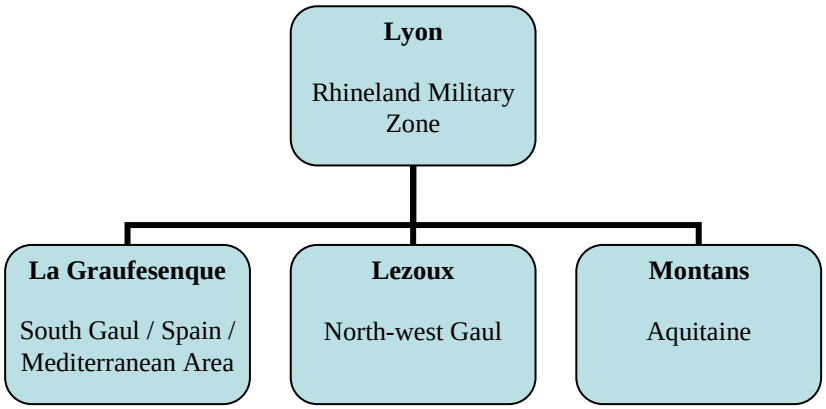
In about AD 25, Bulmer (1979:14) points out that Ateius moved his factory once again, this time to La Graufesenque (Southern Gaul). The timing of this last relocation is curious however, as both *Arretium* and *Lugdunum* appear to have been falling into decline before the new workshops at La Graufesenque began to take over their markets (Marsh, 1981:208). If this is the case, then a demand-led change is unlikely to have been the reason for Ateius' move, especially as the La Graufesenque workshop was not nearly so well situated in respect of Gaul's road and river networks as *Lugdunum* had been. Other explanations may therefore exist to account for this move.

4.7.6 Comparative Advantage of Manufacturing Locations

Modern investors conventionally base their locational decisions on the ideas of economists like Adam Smith (1776) and David Ricardo (1817) who saw absolute or comparative cost advantages as critical to commercial success. Cost advantages of this kind are also thought to be dynamic; shifting their balance as new resource-centres emerge, thereby creating a requirement to periodically relocate production if a business is to maintain its competitive edge. Changes in comparative advantage of this kind have been identified as the reason behind the migration of a number of important industries in the Roman period, including glass manufacture, wine making and production of *terracotta* lamps (Balsdon, 1970:148; Drummond & Nelson, 1994:159-161). The leading example of this practice relates to pottery manufacture however, in particular the production of samian wares.

Access to efficient transport routes, such as those offered by Gaulish samian production centres at Lyon, Lezoux or Montans provide a clear comparative advantage in terms of Ricardo's classical model. Along with these benefits, Hofmann (1974) suggests that each site may have found a rôle in catering for the needs of specific regional markets, as Figure 4.22 shows:-

Figure 4.22 Regional Supply Opportunities for Early Gaulish *Sigillata*



(Hofmann, 1974:9-11)

While Ricardo's theory of comparative advantage suggests how an industry might benefit from a favourable location, it does not attempt to explain why a particular site may initially have been chosen. Nor does it seek to identify what the key resource considerations are which would enable a decision of this kind to be reached. A theoretical explanation of industrial location was subsequently developed by Weber (1929) though, and Ohlin's (1933) 'factor endowment' model took these ideas a stage further, by linking the economic advantage of an area to the relative abundance of the factors of production on which its industry relies. In the case of ceramics:-

> "The essential ingredients for any pottery are:-
> 1. A supply of suitable clay;
> 2. A reasonable water supply;
> 3. A workforce;
> 4. Fuel for the kiln"
>
> (Webster, 2001:295)

With samian production, however, periodic migrations such as those which took place from Lyon (*Lugdunum*) to La Graufesenque (*Condatomagus*) in the early 1st century AD or from Les Martres-de-Veyre to Lezoux (*Ledosus*) early in the 2nd century AD seem to have been determined by factors other than cost reduction or resource availability, which are normally regarded by economists as the driving forces in location decisions (Weber, 1929; Ohlin, 1933). Each case therefore requires specific consideration.

4.7.7 Migration from Lyon to Central and Southern Gaul

Increasing military and civilian requirements for Italian-style *terra sigillata* during the late 1st century BC may help to explain the geographical spread of its production from Lyon, first to Lezoux and then to La Graufesenque and Montans. Although Symonds (1992:4) found no evidence of a similar

potting tradition at any of these centres which might explain their selection as manufacturing outstations, all three locations are believed to have begun producing *sigillata* by 10 BC; the date at which the output of the Lyon kilns is thought to have been reaching their height (Simpson, 1976:253; Hartley, 1977:252). While *sigillata* produced at La Graufesenque and Montans was similar in quality and finish to that from Lyon, the clays used in Lezoux at this time contained a high proportion of mica, which produced a porous fabric and inferior gloss finish (Boon, 1967:28-29; Picon *et al*, 1971:195). Quality control problems may therefore have delayed Lezoux's emergence as Gaul's leading samian production centre until superior clay deposits became available in the early 2nd century AD (Greene, 1978:57; Goodman, 2013:123).

4.7.8 Migration from Central to Southern Gaul

The reasons La Graufesenque was chosen when production began *c.* AD 10 are not entirely clear, for while at first sight its location close by the river Tarn seems favourable, this advantage may be illusory as the Tarn may not have been navigable beyond Gaillac in Roman times (Middleton, 1980:187). In addition to facing a potential distribution difficulty, access to an adequate supply of potting-clay may also have been an issue, as suitable *illite*-clays are not found in La Graufesenque's immediate vicinity (Webster, 2001:296).

La Graufesenque's choice may have been determined by the Roman state (Dannell, 2002:218). It has recently been suggested by Fulford (2013:12) that the kilns may even have been located on an 'imperial estate'. If this was indeed the case, it is possible that the operational emphasis of the kilns may have been directed towards state redistribution rather than commercial supply. State ownership, or a 'public-private partnership' which combined wealthy landowners, master potters and their *entourages*, kiln operators and

pottery merchants, would be entirely consistent with patterns of economic activity outlined in the previous chapter.

A possible link with the operation of the Roman silver mines at La Rabasse on the slopes of the mountainous Causses du Larzac has been suggested as a possible reason for La Graufesenque's choice (Hermet, 1934:229-230). The importance of the mines at this time is enough to have attracted official interest and La Graufesenque's kilns may have been able to take advantage of the return journeys of the empty mule-trains that served the mines, to convey their products to market (Middleton, 1980:190; Martin, 1985:131).

La Graufesenque may have enjoyed other locational advantages however. Goodman (2013:118-119) has pointed to the abundance of raw materials in this region; particularly the extensive fuel supply available from the nearby Causses forest; while Lewit (2013:116-118) has identified the presence of a vibrant agricultural industry in southern Gaul. This sector produced exports such as wine, a commodity which could have provided a convenient host-cargo to enable samian to gain access to vital long distance trade routes.

As with Lyon, the reasons for the demise of La Graufesenque are opaque. Middleton (1980:190) has suggested that a reduction, or even a complete suspension, of the silver-mining operations at La Rabasse may be the cause, as without the subsidy provided by military baggage-trains the economic cost of transporting the samian to market may have made La Graufesenque's wares prohibitively expensive. Other explanations are possible however. These include resource depletion, if the rate of production exceeded the area's ability to regenerate. If the demand for fuel exceeded the quantity which could be produced locally, even by means of coppicing, the kilns would no longer have been able to operate and production would have been brought to a halt (Dannell 2002:236). A shift in agricultural production in

southern Gaul from viticulture to pastoral farming, depriving samian exports of their host-cargo, might also explain this change (Lewit, 2013:116-117).

4.7.9 Reverse Migration from Southern to Central Gaul

Central Gaul was a region with a long tradition of *terra sigillata* production, as we noted when we mentioned the production centres at Lyon and Lezoux in section 4.7.5. When large-scale output returned to the region *c.* AD 100, however, it was a new centre at Les Martres-de-Veyre rather than one of the more established sites which was chosen (Hartley, 1977:254).

The location of Les Martres-de-Veyre, close to the banks of the river Allier, enabled it to benefit from easy access to an important tributary of the river Loire, from where a direct route could be achieved to some of the principal samian markets of the time, especially those in western Gaul and Britain (Bulmer, 1979:16; Marsh, 1981:208; Peacock, 1982:119). Les-Martres' dominant position appears to have been relatively short-lived. For reasons which are still not fully understood, a mass relocation of production took place soon after AD 125, when many of the potters who operated at Les Martres moved their workshops *en masses* to Lezoux (Hartley, 1977:254).

Lezoux does not enjoy the favourable riverside location of Les Martres and there would have been an additional need for land transport to enable output to reach the Allier *en route* to the Loire. Resource depletion may again have been a cause of this migration, or state intervention might have played a part in the decision to relocate; although how this might have been advantageous to the imperial authorities at this time is unclear.

Similarly, the reasons for Lezoux's decline following its period of sustained success are again obscure. It was once thought that the collapse of exports *c.* AD 200 was a consequence of the civil wars of this period which brought

the Severan dynasty to power. This is no longer felt to be the case though, as the date of this dynastic change does not match the revised chronology associated with the abandonment of the kilns at Lezoux (King, 1981:69-71).

It is now considered likely that Lezoux's decline was linked to commercial adjustments which are thought to have been occurring at this time (Salway, 1993:450). One of these factors may have been a reduction in demand for samian ware in Gaul in the later 2nd century AD as consumers' tastes altered (Marsh, 1981:212). Faced with a smaller home market and fewer economies of scale, the costs of serving long distance markets such as Britain may have become prohibitive (King, 1981:69; Marsh, 1981:212).

4.7.10 Migration from Central to Eastern Gaul

By the time samian production in eastern Gaul began to rise to prominence in the later 2nd century AD the industry was already well established locally, as the first *terra sigillata* kilns in the region had been set up at Boucheporn on the river Mosel and at Chémery-Faulquemont near Metz in about AD 60 (Hartley, 1977:253; Bulmer, 1979:19). The advantage of being close to the Rhineland meant the eastern Gaulish kilns were well placed to expand their market share as Lezoux ran into difficulties and by *c.* AD 200 this process was complete. The eastern Gaulish production centres thereafter dominated export supplies to the British market (Dickinson & Hartley, 1971:130).

A few large sites, particularly Rheinzabern and Trier, dominated production (King, 1981:68; Bird, 1995:1). The volume of output generated by clusters of urban workshops in centres such as Rheinzabern and Trier may have been more successful than dispersed rural manufactories in attracting middlemen with the skills and experience needed to establish long distance distribution networks. An advantage of this kind may have enabled the eastern Gaulish

producers to access more remote markets, such as those in Britain (Peacock, 1982:127-128).

While Trier's kilns were active from *c.* AD 130-275; those at Rheinzabern began slightly later, in the mid 2nd century AD (Symonds, 1992:46). Output continued at both sites until disrupted by *Alamannic* raids in AD 259-260. Both centres ceased to export about the same time (Bird, 1995:1). Whether these raids were the primary cause of the demise of samian production or the collapse of the industry occurred for other reasons is difficult to say. An alternative possibility is that consumer tastes may have been changing, both in Britain and on the continent, as other forms of tableware replaced samian in terms of popular demand. A number of British regional kilns rose to prominence at this time, but whether this is a cause or an effect of declining imports is unclear.

4.7.11 Appraisal of the Samian Industry's Migratory Cycle

The *terra sigillata* industry dominated fine tableware production for just over 300 years, from the mid 1st century BC until the mid 3rd century AD. During this time it migrated through a series of major kiln-centres across Gaul as its market and supply conditions evolved. At the height of its popularity in the late 1st and early 2nd centuries, the scale of production was immense, with literally millions of the most popular forms being produced each year (Rhodes, 1989:46; Polak, 1998:115). The scale of its success arguably makes samian the world's first true 'mass-market' consumer good.

This demand was so strong that the state's own administered supply system may have had an important part to play in the long distance distribution of these wares and official interest may even have influenced the location of some of the Gaulish production centres. As Fulford (2013) observes:-

> "It is hard to escape the conclusion that circumstances other than geography and geology determined where the large and successful industries were located."
>
> (Fulford, 2013:11)

State involvement may have overridden commercial considerations, such as comparative cost advantages, which producers would normally have taken into account when deciding where to situate their kilns. State interventions of this kind make commercial models less useful in explaining the process of manufacturing relocations and central-planning frameworks may offer a better alternative.

Another interesting consequence which the migration of samian production may have produced in the 1st century AD is an example of an 'international product-cycle'. This marketing phenomenon is associated with a model developed by Vernon (1966) and explains the way in which an established export industry is initially challenged by a lower cost competitor in its overseas market and thereafter superseded by the emergent rival in its home market, as comparative advantage shifts in favour of the new producer. As Morrison (2006) explains:-

> "Raymond Vernon's theory ... traces the product's life from its launch in the home market, through to export to other markets and, finally, the manufacture in cheaper locations for import to its original home market."
>
> (Morrison, 2006:323)

In the case of *terra sigillata*, manufacture began in central Italy *c.* 50 BC, with exports to southern Gaul commencing shortly after this date (Wells, 1972:254). Production then shifted to a coastal location near Pisa around

AD 1 to help facilitate exports (Kenrick, 1997:186). This re-location was short-lived and a decade or so later the industry moved again, this time north of the Alps to Lyon (Wells, 1984a:210-211). La Graufesenque's kilns were established soon after this and by the mid 1st century dominated supply (Dannell, 2002:217).

Increasing prosperity and a relative rise in the costs of pottery *vis-à-vis* glass and metal artefacts probably reduced demand for ceramic tablewares in the Italian domestic market at this time, leading to the demise of the kiln-centres at *Arretium* and Pisa. Some Italian merchants continued to import *sigillata* though, as can be seen from the find of a recently arrived batch of southern Gaulish samian, still stacked in the remains of its crate, in the ruins of one of the buildings at Pompeii that was destroyed in the volcanic eruption of AD 79 (Atkinson, 1914:27; Weber, 2013:188). The supply of *sigillata* had thus reversed completely, with the original production area now importing these products from a region it had initially regarded as a customer, then as a competitor and finally as a supplier; in line with Vernon's (1966) model.

4.8 DEDUCTIONS

The socially-embedded nature of the Roman economy and its concerns with self-sufficiency would strongly suggest that deliberate production of surplus output for the purpose of long distance trade was not common. There were exceptions to this principle, of course; a leading example was the ceramics industry where bricks, tiles and pottery were clearly produced on a massive scale. Even here, however, most output was intended for local markets and only transport containers such as *amphorae* or fine tableware such as samian tended to feature as major components in long distance exchange.

In a pre-mechanized era, pottery production was primarily an artisan activity which often appears to have been organized on a nucleated basis, in which potters gained common access to raw materials, kiln facilities and possibly distribution networks (Swan, 1984:7; Aubert, 1994:319). Landowners who possessed suitable clay deposits may have approached the task of extraction in a similar way to vine and olive-growers, by subcontracting this operation to specialist intermediaries, or even to the potters themselves.

If this scenario is correct, it would indicate landowners may have adopted a common approach to production, by delegating these tasks to the wine or oil producers and/or potters, while concentrating their efforts on cultivating and maintaining the land itself, in keeping with their social status. A clear link back to estate production and the landowning élite can nevertheless be seen in many of the key commodities involved in long distance exchange.

Whether the interests of oil, wine or pottery producers extended beyond the manufacturing processes each was involved with is uncertain. Potters were commercially oriented insofar as they were prepared to relocate in order to achieve comparative advantages in production; moves which were perhaps influenced in part by the state's own supply requirements. The main focus of pottery producers may have been directed towards the technical aspects of their operations and on maintaining good relations with the landowners and production specialists with whom they worked. A different skill-set and contact network would have been required to establish and maintain the long distance supply system needed to enable them to market their products. No evidence of a producer-led network of this kind stands out, however, and this is an issue which we will need to examine more closely when we review the case study data presented in chapters 8-11.

CHAPTER 5

STATE-ADMINISTERED SUPPLY

5.1 INTRODUCTION

In order to fully understand the rôle of the Roman state in the distribution of long distance supplies during the late republican and early imperial periods (*c*. 133 BC-AD 284) it is necessary to relate this process to three of the key policy areas through which Rome's rulers exercised control over their wide domains:-

1/ the nature of the Roman system of provincial administration
2/ the strategic positioning of legionary forces along external frontiers
3/ the links between the taxation system and military supply

While each of these topics can be seen as a discrete policy area, a review of their relationships will make their relevance to the supply process clear.

5.1.1 Roman Provincial Administration

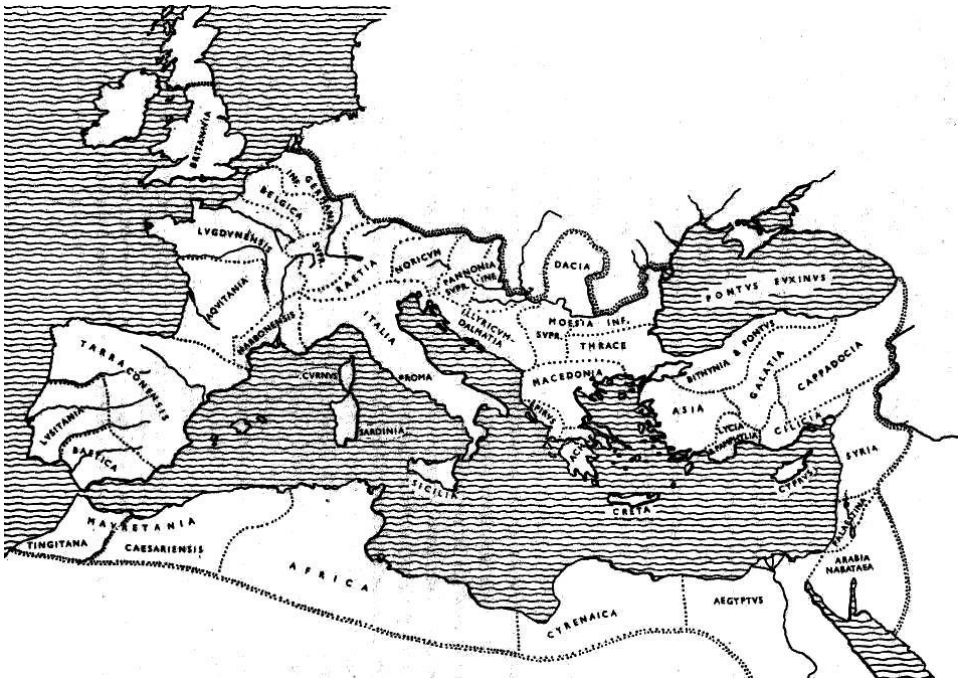
From the traditional date of Rome's foundation in 753 BC, it took the city-state almost 500 years to gain hegemony over the rest of peninsular Italy and to establish its first province in Sicily in 264 BC (Rawson, 1986:417). After that time, however, Rome's external interests increasingly began to bring her into conflict with other established regional powers, foremost among which were Carthage, Corinth and the Greek city-states (Masson, 1974:67).

In 242 BC Sicily became Rome's first province when Carthaginian forces were ejected from the island and further colonies were added a year later when Corsica and Sardinia were acquired at the end of the First Punic War (Cary, 1967:150-152). Two Spanish territories, *Baetica* and *Lusitania* also came under Roman control in 201 BC, following her victory over Carthage in the Second Punic War (Rawson, 1986:417). This left only Corinth as a major trading rival and competition from this quarter was eliminated when the city fell and was razed to the ground at the end of the Achaean War in 147 BC.

With Carthage and Corinth suppressed, Rome became the dominant power in the Mediterranean in the 2nd and 1st centuries BC. Her control was further strengthened in 133 BC when the last independent territories in Spain fell to Scipio's army and Rome acquired her first Asian territory when Attalus III bequeathed *Pergamum* to her on his death (Boardman *et al*, 1986:851).

The Roman Republic opted where possible to develop its external relations via treaties with friendly client-kings (Cary, 1967:227). This policy worked well in the east, where the city-states of the region provided an opportunity for such alliances. In the west though, Rome encountered less sophisticated tribal polities and its normal practice was to convert conquered territories into provinces (Rawson, 1986:429). By 31 BC more than twenty provinces existed and this number had doubled by the time *Dacia* was absorbed in AD 106 (Wacher, 1997:30). At its height, the Empire stretched from the Atlantic Ocean to the Red Sea, as Webster (1979) illustrates in Figure 5.1.

Figure 5.1 Provinces of the Roman Empire (AD 116)



(After Webster, 1979:49, Figure 2)

Each province was administered by a Roman governor, whose tenure of office was kept deliberately short. Governors were granted extensive legal power within their designated province, where conquered subjects (*dediticii*) were regarded as foreigners (*perigrini*) rather than Roman citizens. The nature of provincial governors' duties evolved over time, but commonly consisted of:-

1/ the defence of their province
2/ the administration of justice
3/ the collection of taxes

(Cary, 1967:230)

The rôles of legionary forces in provincial defence and in collecting taxes from conquered subjects both had implications for the development of long distance supply.

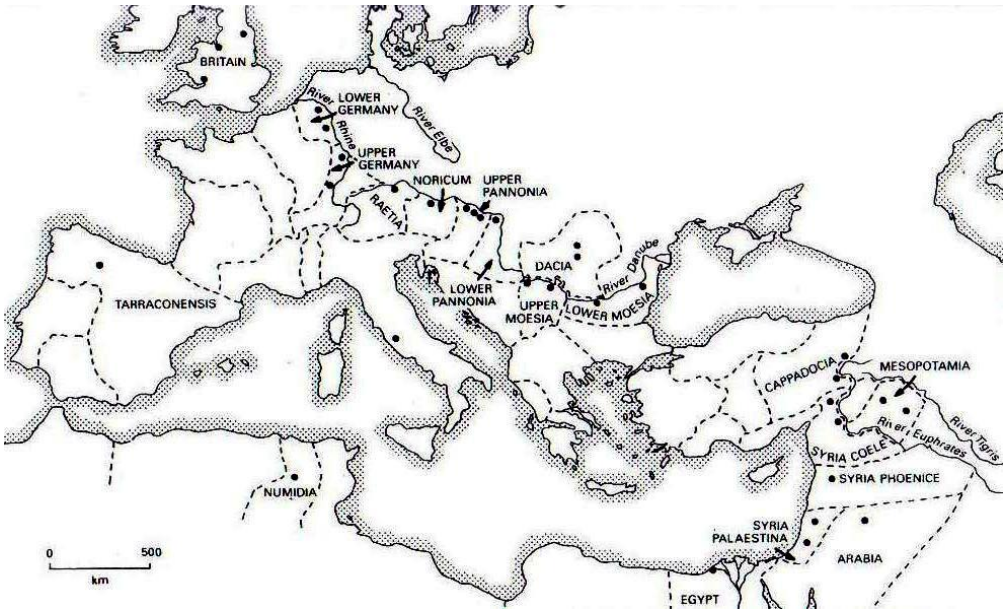
5.1.2 Legionary Deployments

While provincial governors retained strategic responsibility for the defence of their territories, the day-to-day control of the troops lay in the hands of legionary commanders appointed by the Roman senate (Wacher, 1997:17). During the initial phase of occupation, unless external threats existed along a province's borders, the army's principal rôle was generally to contain the local population until they could be fully pacified (Webster, 1979:48).

The legions were not evenly distributed throughout the conquered territories however, since the defensive requirements of the different provinces varied considerably (Birley, 1981:46). Since most legionary forces were stationed near to provincial frontiers, there was little need for troop deployments in areas such as North Africa, where local geographical features reduced the risk of invasion. Along its eastern borders, however, the Romans came into contact with cultures even older than their own, which resisted assimilation and required a continuing military presence to suppress dissent (Webster, 1979:52). The situation Rome faced on her northern frontier was even more volatile, as a series of warlike barbarian tribes could only be held in check by either monetary payments or a display of military force.

The way in which legionary deployment clustered in the frontier provinces during much of the Romano-British period is illustrated in Figure 5.2.

Figure 5.2 Roman Legionary Deployments (c. AD 200)



(After Campbell, 2002:20)

The need to maintain large numbers of troops in frontier regions had clear logistical implications, as it was essential to ensure that these garrisons were provided with the resources they required to carry out their duties.

5.1.3 Taxation and Military Supply

The need to provide frontier units with both food and raw materials meant that a regular supply of these items had to be acquired (Breeze, 1984:268; Morley, 2007b:576). Since the Roman state was ultimately responsible for guaranteeing these resources the involvement of imperial administrators in the supply process became inevitable (Garnsey & Saller, 1987:88-89).

Many of these material needs were met through the regular system of tax levies which Rome imposed on her subjects (Potter & Johns, 1992:191).

Taxes were almost invariably paid in cash, the money being transferred to the frontier zones where grain and other materials were obtained locally, often through compulsory purchase (Mann, 1985:21-22; Roth, 2012:238).

Where these tax payments were rendered in kind, the state retained the right to demand these goods be delivered to a place of its choosing. This practice is illustrated by Tacitus in the passage to which we referred in section 3.6.2 (Tacitus, *Agricola*, xix; cited by Fulford, 1989:181). Arrangements of this kind may have proved particularly useful in the initial phase of occupation as, in the short term at least, a newly conquered province may have lacked the productive capacity to meet the increased supply needs of an incoming force and few material goods might have been available for cash transfers to buy (Fulford, 1992:302; Whittaker, 1994:104).

Over time, however, most frontier garrisons would presumably have become less reliant on long distance imports, as local populations adapted to their new circumstances and increased the supply of grain and other essential items (Jones, 1990:100). Apart from the need to cope with occasional local crises, imported supplies may thereafter have consisted mostly of specialist items such as oil and wine (Whittaker, 1994:104).

5.2 MILITARY SUPPLY REQUIREMENTS

With large numbers of troops deployed in barren and sparsely populated frontier areas, the need to ensure that these units had adequate supplies of food and essential equipment rapidly became a strategic imperative for the Roman state (Thomas & Stallibrass, 2008:1; Breeze, 2011:xx). Indeed, as Morley (2007b) reminds us:-

> "Supplying 400,000 or so soldiers with food and pay was a prerequisite for the security of the empire as a whole…"
>
> (Morley, 2007b:575)

This issue was in fact so vital that Whittaker (2002:204) insists that military supply would never have been left to chance, given the existential threat to the Roman state which would have resulted from the legionary system's collapse. Satisfying the material needs of such large numbers of troops was a complex undertaking however (Davies, 1971:122). Foremost among their regular requirements would have been food, fodder and fuel; all bulky items which must have been consumed in vast quantities (Roth, 2012, Ch 1).

The Roman army's dietary needs have been thoroughly reviewed by Davies (1971) who confirms that wherever possible troops continued to be provided with Mediterranean cuisine, irrespective of their geographical location. This would have included basic food items such as grain, oil, salt and wine; as well as condiments like g*arum* (fish sauce) which was considered to be an important flavouring ingredient. In addition to food, access to other vital materials such as leather, metals, pottery and textiles had to be provided, if adequate supplies were not available locally (Jones, 1990:103).

The need to supply these commodities set a considerable logistical challenge where troops were based in frontier provinces such as Britain. Continued access to these materials was considered essential to help maintain a sense of cultural identity however (Webster, 1979: 254-255; Carreras Monfort, 1998:162). The nature of these items therefore needs to be examined to gain an insight into the logistical challenges each would have presented.

5.2.1 Grain

The chief component of each soldiers' daily ration was cereal-grain, usually provided in the form of wheat. Once this had been ground and turned into bread it would generally have accounted for 60-75% of a soldier's calorific intake (Roth, 2012:18). Roman grain rations were issued by volume, with infantrymen receiving 64 *sextarii* (4 *modii*) of grain per month, *i.e.* 2 *sextarii* per day (Polybius, vi, 39.13; cited by Roth, 2012:18-19). The weight of this daily allowance may have varied according to the water content of the grain, but will usually have been in the region of 1-1.4kg (2-3lbs) per day (Breeze, 1984:269). Using this data, Millett (1984:71) has calculated that, depending on the size of the British garrison at any time, between 10,000 and 24,820 tonnes of grain *per annum* would have been required.

5.2.2 Olive-Oil

Olive-oil is not a commodity that is thought to have been widely consumed in Britain before the Claudian conquest (Carreras Monfort, 1998:161). Oil was an essential item in the Roman lifestyle, however, having an extremely varied set of uses which included nutrition, lighting and personal hygiene, as well as in lubrication, medication, cosmetics and in the preservation of wood and leather (Mattingly, 1988a:33; Hitchner, 2002:72; Alcock, 2011:293).

Oil represented one of the basic items in a soldier's daily ration and as each may have consumed on average 20 litres/annum, vast amounts would need to have been imported (Mattingly, 1988b:161). Most of the oil consumed in Roman Britain is believed to have arrived from Spain in distinctive Dressel type 20 *amphorae*, whose supply will be examined in detail in chapter 9.

5.2.3 Salt

Salt was again one of the key items in each soldiers' ration. Although the amount required for personal consumption was small, it is important to remember that salt was a vital commodity in the preservation of meat and fish, as well as being used in a range of industrial processes, such as curing hides (Burnham & Wacher, 1990:80-81).

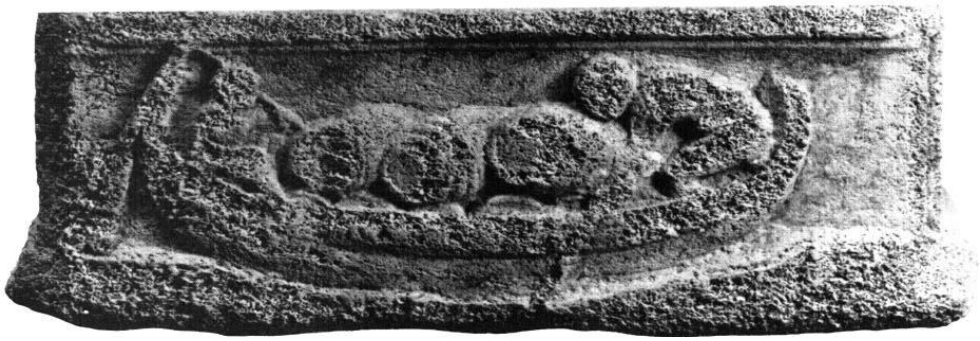
Salt can be extracted directly from seawater and Britain was fortunate to have many salterns along its east and south coast, from which the army received some of its supplies (Gerrard, 2008:117-118). Saline springs are also found at inland locations such as Droitwich (*Salinae*), Middlewich (*Salinae*), Northwich (*Condate*) and Whitchurch (*Mediolanum*) and each of these sites was used for salt extraction during the Roman period (Mattingly, 2006:135). It is possible that salt may even have reached Britain from the continent, as Flemish salterns are believed to have exported this commodity in Roman times (Van Neer *et al*, 2010:177).

5.2.4 Wine

A minimum allowance of two litres of wine or *posca* (sour wine/vinegar) was also included in the soldiers' monthly ration (Fulford, 2000:46). Wine first reached Britain during the pre-conquest period, although demand for this beverage increased significantly after the Claudian invasion. Between the 1st and the 3rd centuries AD most of Britain's wine came from Gaul and the Mediterranean and arrived via the North Sea (Hassall, 1978:45; Carver, 2001:8). Supplies from Aquitaine and Iberia increased in the 2nd century though as the Atlantic coastal route became more active (Peacock, 1978:51; Fitzpatrick & Timby, 2002:164).

The use of wooden barrels, which began to replace *amphorae* by the mid to late 1st century AD, makes wine imports more difficult to track. Barrels occasionally survive, where environmental conditions are favourable, while depictions of vessels carrying them have been found on wine merchants' tombstones at various points along the Rhine and Moselle rivers (Ellmers, 1978:8-12).

Figure 5.3 Portion of an Altar from *Nehalennia*'s Shrine at Colijnsplaat Showing a Vessel Carrying Barrels (*c.* AD 200)



(After Ellmers, 1978:10, Figure 15)

5.2.5 Fish Sauces

Pungent fish-sauces (*salezones*) are not thought to have formed part of the indigenous British diet, but following the conquest they were imported by the army (Galliou & Jones, 1991:97). These products are also believed to have been widely adopted by members of the civilian community who wished to emulate the Roman lifestyle (Alcock, 1996:77; Cool, 2006:58-59). *Salezones* came in a number of varieties of which *garum* is generally considered to have been the product of choice (Davies, 1971:131). Lesser varieties are also known; *allec* being a type closely linked with the markets of Britain and Gaul (Martin-Kilcher, 2003:69; Van Neer *et al*, 2010:87).

Britain's main import source of *salezones* from the Claudian period until at least the mid 2nd century AD was probably Iberia, from where these sauces arrived in Dressel form 7-14 / Beltran form I, IIa or IIb *amphorae* (Carreras Monfort, 1998:164). By the start of the 3rd century though these *amphorae* become rare in Britain and barrels appear to have taken over as the chief transport container (Martin-Kilcher, 2003:82; Van Neer *et al*, 2010:178).

5.2.6 Leather

Apart from food, one of the largest bulk commodities Roman quartermasters would have required would probably have been leather (Van Driel-Murray, 1985:65). This material was used in the production and maintenance of a wide range of military equipment, including aprons, buckets, saddles, shield covers, shoes and tents (Holder, 1982:93-94; Potter & Johns, 1992:152).

The uniformity of the military leatherwork that has been recovered suggests these items were produced either by the army or under military supervision (Van Driel-Murray, 1985:66). As up to seventy goatskins or thirty eight calfskins were needed to make one tent, the military's demand for leather would have been massive (Van Driel-Murray, 1985:66; Alcock, 2011:159).

5.2.7 Metals

Metal artefacts were essential to the Roman army and Britain was fortunate enough to possess copper, iron, lead, silver and tin in recoverable quantities (Wacher, 1979:79). All mineral rights were vested in the Emperor and the military controlled mining activities throughout the province, either directly or under state licence (Jones & Mattingly, 1993:180). The navy (*Classis Britannica*) was directly involved in iron production in the Weald and it has

been estimated that about 700-750 tons per annum were exported (Cleere & Crossley, 1985:83). The Rhine frontier was probably the primary destination for these shipments, for while iron was mined at Ahrweiler and Eisenberg in the Rhenish Massif, ferrous deposits are not widespread in this region (Tyler Franconi, pers comm. OXREP Study Forum 4/3/2015). Wealden iron was probably shipped from Bodiam to Dover (*Dubris*), from where it crossed the channel to Boulogne (*Gesoriacum*) before travelling along the north Gaulish coast to the Rhine estuary (Cleere & Crossley, 1985:83).

Metals served a wide range of functions in the Roman period, the principal usages being:-

Figure 5.4 Principal Metals and Metal Artefacts in Roman Britain

Metal	Key Artefacts
Silver	Coinage, prestige tableware
Copper alloys	Low value coinage, saucepans, mirrors and harness fittings
Lead	Water pipes, pewter ware
Iron	Weapons, armour, tools, chains, nails, hinges and vehicle fittings

While it remains unclear whether the movement of supplies formed part of the duty of the *Classis Britannica*, detachments of the II (*Augusta*) and the IX (*Hispana*) legions are known to have been deployed to mine lead and extract its silver content during the 1st century (Davies, 1984:101; Salway, 1993:442). None of these silver ingots have been found, but this is hardly surprising since the metal is both valuable and easily recyclable. Dominic Rathbone has even suggested that this bullion would probably have been

taken directly to a Roman mint under military escort, given its value (pers comm - OXREP Conference, 2/10/2009).

A number of lead ingots have been found, many of which had been stamped and dated by the military units which produced them and marked 'BRIT EX ARG' (*Bitannicum ex argentario*) to signify that the ingots were cast in Britain after their silver content had been extracted (Legg, 1983:66). Ingots of this type, weighing *c.* 74 kg / 200 Roman pounds (*librae*) have been found near to Romano-British ports such as Bitterne (*Clausentium*), Brough-on-Humber (*Petuaria Parisiorum*), Chester (*Deva*) and Sea Mills (*Abonae*), (Branigan, 1980:143).

A wreck carrying a cargo of British lead-pigs has been found off the coast of Brittany, confirming these items were exported in bulk (L'Hour, 1987, cited by Fulford, 1989:189). Further evidence of their dispersal is provided by finds of further ingots at St Valéry-sur-Somme in northern Gaul and at Châlon-sur-Saône in central Gaul (Fulford, 1991:41). The former carried markings showing it had been cast in Britain by members of the II (*Augusta*) legion in AD 49 (Frere, 1974:322). As the military can be shown to have a clear link with metal extraction in the post-conquest period, the involvement of the *Classis Britannica* in the export of this material cannot be ruled out. If the fleet brought continental supplies to the British garrison, it is possible their vessels may have carried ingots or metal artefacts on the reciprocal leg of these journeys, even if only to serve as ballast.

5.2.8 Pottery

Pottery was another item which the army needed to function effectively. A large quantity of kitchenware and tableware would have been required and the army probably brought potters with them from the Rhine and Danube

frontiers (Darling, 1977:57). The low numbers of legionary potters' stamps in Britain suggests that military output of kitchenwares was soon replaced by local supplies however (Peacock, 1982:150). Specialist tablewares such as samian continued to be imported though (Swan, 1981:149).

5.2.9 Textiles

The army would almost certainly have supplied its troops with at least the basic clothing they required, even if the cost of their food and equipment were deducted from the soldiers' pay (Wild, 1978:80; Watson, 1981:102-104). An imperial weaving-mill is known to have existed in Britain and it is likely that the army obtained at least some of its uniforms from this source (Wacher, 1979:103). Garments were generally made of wool; other fabrics were uncommon in the Roman period (Alcock, 1996:87). Cloth was clearly a valuable commodity, as references to its theft in the lead 'curse tablets' (*defixiones*) from Bath and Uley demonstrates (Tomlin, 1988:80; 1993:116).

5.3 CAMPAIGN SUPPLIES

The provision of such a diverse range of materials will have represented a complex undertaking which would have required sophisticated planning (Davies, 1971:122; Vivenza, 2012:27). The success of this operation must have been particularly critical during periods when the Roman army was on campaign, a situation which existed almost continuously from the invasion of Sicily in 264 BC until the end of the Roman Civil War in 31 BC (Roth, 2012:164). Before we go on to examine the ways in which the state met its supply needs in the peacetime conditions which prevailed throughout most of the Romano-British period, it is useful to consider how Rome achieved

the strategic imperative of military supply during the expansionary phase which led to the creation of the Empire.

While Roman Republican armies may have become familiar with the use of supply-trains during their Italian provincial campaigns, Roth (2012:158) reminds us that there is little to suggest that the Roman state possessed the nautical capability to support overseas supply-lines prior to the beginning of the First Punic War (264-241 BC). Over the course of the next half century, however, Roman administrators rapidly gained maritime experience and by the time of the Second Punic War (218-202 BC) a relatively reliable long distance supply mechanism had been developed (Badian, 1983:16-17; Roth, 2012:159).

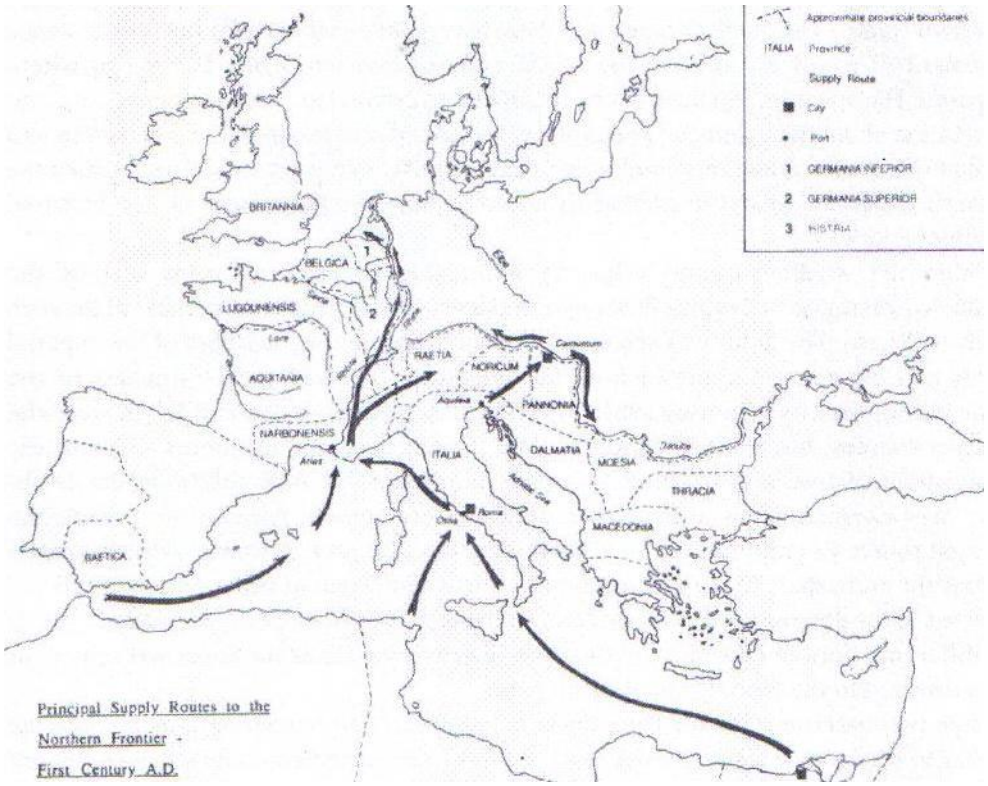
The overwhelming importance of guaranteeing that a campaigning army had access to strategic materials would inevitably have required local military commanders to adopt personal responsibility for ensuring that their supply-lines continued to operate effectively (Erdkamp, 1995:180-183). This could have been accomplished in a variety of ways, including the procurement of locally available materials and from levies 'donated' by friendly allies.

In cases where sufficient resources could not be obtained locally the army may have called on the services of state contractors (*publicani*) or private merchants to bring in materials from further afield. Where possible the army probably preferred to perform these tasks itself, as civilians accompanying an army on campaign inevitably put themselves at risk, as merchants who followed Quintus Cicero into Germany in 53 BC found to their cost when Quintus' base was attacked and the civilians camped outside its ramparts slaughtered (Caesar, *de Bello Gallico*, vi, 37; cited by Roth, 2012:100).

While the army therefore preferred to limit the numbers of non-combatants present at military sites, we do know that Caesar made use of merchants to

supply his army while on campaign (Caesar, *de Bello Gallico*, vii, 42; cited by Saddington, 1991:414) and Sallust's account of the Jugerthine War also makes reference to this practice, (Sallust, *Bello Jugerthine*, xliv, 5; cited by Sommer, 1984:34). But as Whittaker (2002:215) reminds us, examples of this kind do not necessarily prove that merchants were regularly involved in these activities. The routes used to transport supplies to the northern frontier prior to AD 43 are well known however and are illustrated in Figure 5.5.

Figure 5.5 Supply Routes to Rome's Northern Frontier (1st Century AD)



(After Fulford, 1992:298, Figure 1)

As the aim of this thesis is to explore the peacetime conditions in which permanent supply-chains developed, it is not intended to discuss the issue of campaign supplies in further detail. Information on this particular aspect of

military operations may be found in Roth's (2012) recent survey of '*The Logistics of the Roman Army at War*'. Similarly, Peddie (1997) and Fulford (2000) have provided accounts of Claudius' preparation for the invasion of Britain in AD 43, while Breeze (1993) examined the logistics of Agricola's campaign to advance the Romano-British frontier to the Scottish border in the late 1st century AD.

Recognizing the importance of each of these contributions, we turn now to explore the longer-term needs of the army during the post-conquest period. The provision of supplies during the settled conditions which prevailed throughout much of the Romano-British period would still have presented significant logistical challenges, however, and it is the nature of these long-term supply operations which forms the basis of the rest of this chapter.

5.4 SUPPLY NEEDS OF THE ARMY IN PEACETIME

5.4.1 Strategic Considerations

Once a territory had been pacified and frontier garrisons were able to settle into permanent bases, regular supply-lines would be able to be established to allow the units stationed there to remain fully equipped. As we have seen in Section 3.6.2, from an economic perspective these supplies would have been regarded as redistributive transfers and cost considerations will presumably have played little part in deciding what materials were to be supplied or the scale or timing of such flows (Anderson, 1992:64; Monaghan, 1997:867). These issues would have been determined by administrative considerations (Morley, 2007b:582).

In terms of the mechanisms used to deliver these goods, while the Roman state may occasionally have used naval detachments to carry cargo, it never

seems to have considered the acquisition of a merchant fleet to have been an operational priority, preferring instead to rely on civilian contractors to meet its transport needs (Garnsey & Saller, 1987:88; Temin, 2001:177). Local army commanders may have preferred for strategic reasons to make their units as self-sufficient as possible and wherever feasible military supplies were probably obtained close to their point of consumption (White & Barker 1998:51).

To satisfy their logistical needs Roman military commanders had access to three principal sources, as Carreras Monfort (2002) explains:-

> "The army could obtain these supplies from:
> 1) the local territory
> 2) their own province
> 3) the other provinces of the Empire."
>
> (Carreras Monfort, 2002:72)

The exact volume and range of goods obtained from each of these sources would inevitably vary to some extent, depending on the location of the unit concerned and the availability of local supplies. In this respect it may be helpful to focus on a particular region to see how this process worked and Carreras Monfort (2002) considers Roman Britain to be a useful exemplar:-

> "The province of *Britannia* is a very suitable case-study for the analysis of military supply due to its insular condition and because of the ...well-published excavations of military bases ..."
>
> (Carreras Monfort, 2002:83)

The choice of Britain is certainly appropriate to the current investigation and the province will form the focus of later chapters in which the supply-chains for various forms of ceramic imports are examined.

5.4.2 Self-Sufficiency

Taking as a starting point the question of how far Romano-British garrisons could have met their material requirements from their own resources, the range of materials available and the carrying-capacity of the available land would have been issues of crucial importance (Van Waateringe, 1989:99).

The numbers of legionary and auxiliary troops based in Britain fluctuated according to military needs. It has been estimated that about 40,000 troops were involved in the Claudian conquest (Manley, 2002:83), but the military presence altered over time. Birley (1981:47) places Britain's garrison size at 50,000 by the mid 2nd century AD, while Frere (1967:310) believes it reached 63,000 in the early 3rd century. This number of troops would have generated substantial supply needs, irrespective of whether these could be satisfied locally. Once permanent forts had been established most of their food and raw materials would probably have been obtained from local sources (Southern, 2011:188). As Ottaway (2004) explains:-

> "By analogy with practice elsewhere in the empire, it is likely that the legion took a piece of land adjacent to the fortress under its direct control. This is usually referred to as a *prata* or *territorium* and was perhaps as much as 50,000 ha (125,000 acres) in extent."
>
> (Ottaway, 2004:53)

Where local land was requisitioned for military use the soldiers themselves need not necessarily have cultivated this directly, for as Higham (1989:161) points out, once a fort like Brougham (*Brocavum)*, Old Carlisle (*Olerica)* and Old Penrith (*Vereda*) had been established their food requirements may have been met by taxing agricultural surpluses generated by the many native homesteads which existed in their locality.

The primary purpose of establishing a *territorium* may therefore have been to provide strategic materials such as clay, stone and timber, all of which would be needed in vast quantities by military units (Higham, 1989:164; Carreras Monfort, 2002:72). Direct access to resources of this kind would allow a garrison to avoid the need to import these items (Holder, 1982:93).

Five Romano-British legionary bases are known to have possessed *territoria* of this type, as Figure 5.6 indicates:-

Figure 5.6 Suggested Location of Romano-British Legionary *Territoria*

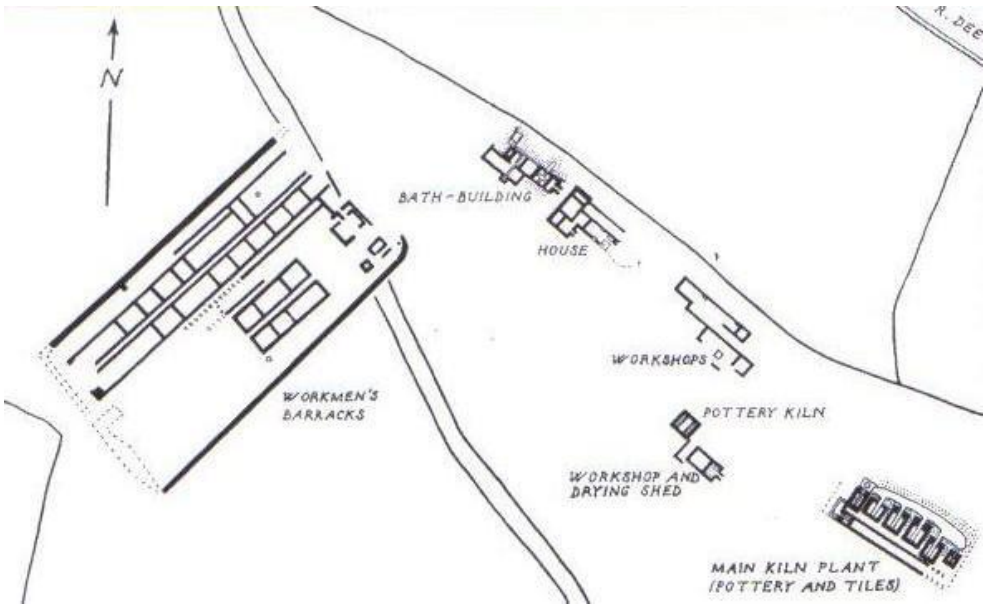
Legionary *Territorium*	**Reference Sources**
Caerleon (*Isca*)	Davies (1984:106)
Colchester (*Camulodunum*)	Crummy (1988:46)
Gloucester (*Glevum*)	Hurst (1988:68-69)
Lincoln (*Lindum*)	Jones (1988:164)
York (*Eboracum*)	Ottaway (2004:53)

Similar *territoria* were probably established around other Romano-British legionary bases such as Chester (*Deva*) and Exeter (*Isca Dumnoniorum*). Military units would normally be expected to manufacture and maintain a large proportion of their own clothing and equipment. Many forts would therefore have possessed their own workshops (*fabrica*) where such items could be made or repaired (Holder, 1982:93; Bishop, 1985b:1-2). It is likely that the army manufactured simple artefacts on site, but obtained complex items from works-depots or purchased these from contractors (Oldenstein, 1985:86). Manufacturing installations have been identified at a number of forts by the presence of ovens or smelting hearths (Johnson, 1983:183).

In a few cases specialist manufacturing facilities were also established by military units, such as the tile-works in East Sussex, whose products were stamped *CL BR* to identify them as having been manufactured by the British fleet, the *Classis Britannica* (Brodribb, 1987:140-141). We saw in section 5.2.7 that the *Classis Britannica* was involved with the iron-smelting in the Weald and the manufacture and export of tiles in this area also appears to have been under direct military control.

While no kiln sites have yet been discovered in the Weald, a tile factory and works-depot which served the needs of the XX (*Valeria Victrix*) legion has been identified at Holt, near Chester (Mason, 2001:151-153).

. **Figure 5.7 Plan of the Legionary Depot at Holt, near Chester**



(After Mason, 2001:152, Figure 97)

Another major works-depot was located on the River Mersey at Wilderspool (Hinchcliffe & Williams, 1992). Pottery production, together with glass- and metal-working is known to have taken place at this site from *c.* AD 90-160

(Jones & Mattingly, 1993:224). Similar facilities also existed at Tiddington, Warwickshire (Liversidge, 1973:212) and at Walton-le-Dale, Lancashire (Mattingly, 2006:172), but little is yet known of these sites.

5.4.3 Access to Local Resources

The debate as to whether military grain supplies were generally obtained locally or brought in from elsewhere in the province, or even from abroad, remains largely unresolved due to lack of clear archaeological evidence. A strong case was made by Manning (1975:112-115) who suggested that the garrisons at Caerleon and Chester both probably acquired most of their grain supplies locally, while Higham (1989:165) has made a similar case for the units stationed along Hadrian's Wall. These arguments are supported by aerial photographs which show extensive field-systems in Britain's frontier regions and pollen evidence, indicating that substantial cereal production took place in the Roman period (Higham, 1989:165). While it remains difficult to establish how much of this output was consumed by military units, Britain's garrisons were nevertheless deployed in a province where good agricultural land was in plentiful supply and many raw materials were readily available.

As far as non-food items were concerned it is likely that any bulk supplies a unit could not provide from its own *territorium* or works-depot would have been acquired through the state-administered supply network (Garnsey & Saller, 1987:93). In a pre-industrial era local manufacturing facilities would simply not have been available for the army to draw upon. At an individual level though, soldiers may have been able to obtain items from the civilian settlements (*canabae* or *vici*) which developed close to established fortresses or forts (Davies, 1971:123-124; Alcock, 2011:61).

Civilian settlements of this type would have housed a variety of traders and craftsmen, as well as retired veterans (Jones & Mattingly, 1993:161; White & Baker, 1998:49). Most of the commercial activity which occurred in such locations probably focused on the needs of the local garrison and low level trade between a fort and its neighbouring *canabae* / *vicus* provided a useful economic link between the army and the local civilian population (Bowman, 1994:46; Dark & Dark, 1997:90; Haynes, 2002:123).

5.4.4 Availability of Provincial Resources

Not every unit would have been able to satisfy all of its requirements locally however. This would certainly have been true for its food supply at a time when agricultural yields remained unpredictable, especially in the highland zones where most military units were deployed. As a result, local output would need to have been supplemented on occasions by supplies brought in from other parts of the province (Sommer, 1984:39; Hurst, 1988:69).

The perishable nature of grain means direct evidence of its intra-provincial transfer is scarce, although it may be possible to gain an idea of the nature of cereal transfers by tracing the movements of tangible goods such as pottery which arrived through the same supply network (Scheidel, 2012b:3). Care must be taken when dealing with indirect evidence of this kind, however, for as Fulford (1992) reminds us:-

> "It is widely recognized that there are problems in using pottery as proxy for other, perishable goods and that there need be no precise correspondence between the flows of artefacts which survive in the archaeological record and the perishable items which do not."
>
> (Fulford, 1992:296)

While proxy data does not allow import patterns to be reconstructed in any detail, artefact evidence may help identify the sources from which many of these goods were obtained and help trace their supply-routes. Pottery is by far the most useful form of proxy evidence as the manufacturing centres of many ceramic forms can now be identified, as Figure 5.8 indicates:-

Figure 5.8 Intra-Provincial Pottery Transfers to Frontier Locations

Pottery Type	Date	Source	References
Mortaria	1st C	Brockley Hill & Radlett (Hertfordshire)	Dickinson & Hartley (1971) Hartley (1973) Tyers (1996)
Mortaria	2nd C	Colchester (Essex) Hartshill / Mancetter; (Warwickshire) Wilderspool (Lancashire)	Hawkes & Hull (1947) Tyers (1996) Dickinson & Hartley (1971) Tyers (1996) Webster (1992)
Severn Valley Colour Coated	2nd - 4th C	Severn Valley	Webster (1976; 1977) Tyers (1996)
Black-burnished 1	2nd - 4th C	Dorset	Gillam (1973) Williams (1977) Tyers (1996)
Black-burnished 2	2nd - 3rd C	Essex & Kent	Farrar (1973) Gillam (1973) Tyers (1996)
Nene Valley Colour Coated	2nd - 4th C	Nene Valley	Perring *et al* (1972) Tyers (1996)
Dales ware	3rd - 4th C	Yorkshire	Loughlin (1977) Tyers (1996)
Crambeck ware	4th C	Yorkshire	Evans (1991) Tyers (1996)

With the need to cope with the arrival of long distance commodity transfers, it is probably no coincidence that the principal legionary headquarters at Caerleon, Chester and York were all located on navigable rivers to enable them to be supplied by sea (Manning, 1975:114). Similarly, direct access to the forces stationed at the eastern end of Hadrian's Wall could be achieved via coastal supply bases at South Shields (*Arbeia)*, where substantial stone-built granaries and storehouses have been identified (Bidwell *et al*, 1994:30) while at the western end of the Wall, Carlisle (*Luguvalium Carvetiorum*) is believed to have performed a similar function (Bidwell, 1997:77).

5.4.5 Long Distance Supply Requirements

Even allowing for access to intra-provincial supplies, with so many troops stationed in Britain during the Roman period it is inevitable that imports would have been required from time to time if adequate food stocks were to be maintained (Carreras Monfort, 2002:72-73; Funari, 2002:241-242). This fact is demonstrated by the presence of foreign cereal-pests and non-native weeds in samples of carbonized grain recovered from Romano-British military sites, clearly indicating that cereal imports continued throughout the Roman period (Buckland, 1978:44-45; Smith & Kenward, 2011:248-249). This import pattern can be found across the province, as Figure 5.9 shows:-

Figure 5.9 Imported Grain Evidence from Romano-British Sites

Date	Location	Reference Sources
Pre-Boudican	London	Fulford (1984)
Late 1st century	Caerleon	Helbaek (1964)
Early 2nd century	York	Kenward & Williams (1979)
Early 3rd century	South Shields	Van der Veen (1988)

(Adapted from Thomas & Stallibrass, 2008:5)

From the demand side, Thomas & Stallibrass (2008:5) remind us that for strategic reasons military commanders may have preferred to avoid relying exclusively on local resources, as this may have made them vulnerable if civil unrest were to arise in their neighbourhood. Conversely, on the supply side, Manning (1975:114) has observed that the location of many harbours in eastern of England probably made it more convenient to transfer surplus grain from lowland Britain to the Rhineland rather than to ship this cargo to the northern frontier. Inter-provincial cereal flows are attested by evidence from the military granaries at South Shields (*Arbeia*), which are known to have received at least some grain shipments from the continent (Anderson, 1992:102).

Roman military supply patterns therefore seem to have been quite complex and sourcing decisions may have been shaped by administrative factors as much as by local availability. Inter-provincial transfers of personnel, or the need to import items such as oil, wine and specialist ceramics that were not available locally, may also go some way to explain these supply patterns. Evidence for the type of items involved in long distance exchange is drawn from materials recovered from archaeological contexts and as Wilson (2009) observes:-

> "In practice, this largely means objects of pottery or stone - fine table pottery, cooking and common wares, transport *amphorae*, stone sculpture, architectural stone (usually marble), and millstones (usually in volcanic lava)."
>
> (Wilson, 2009:215)

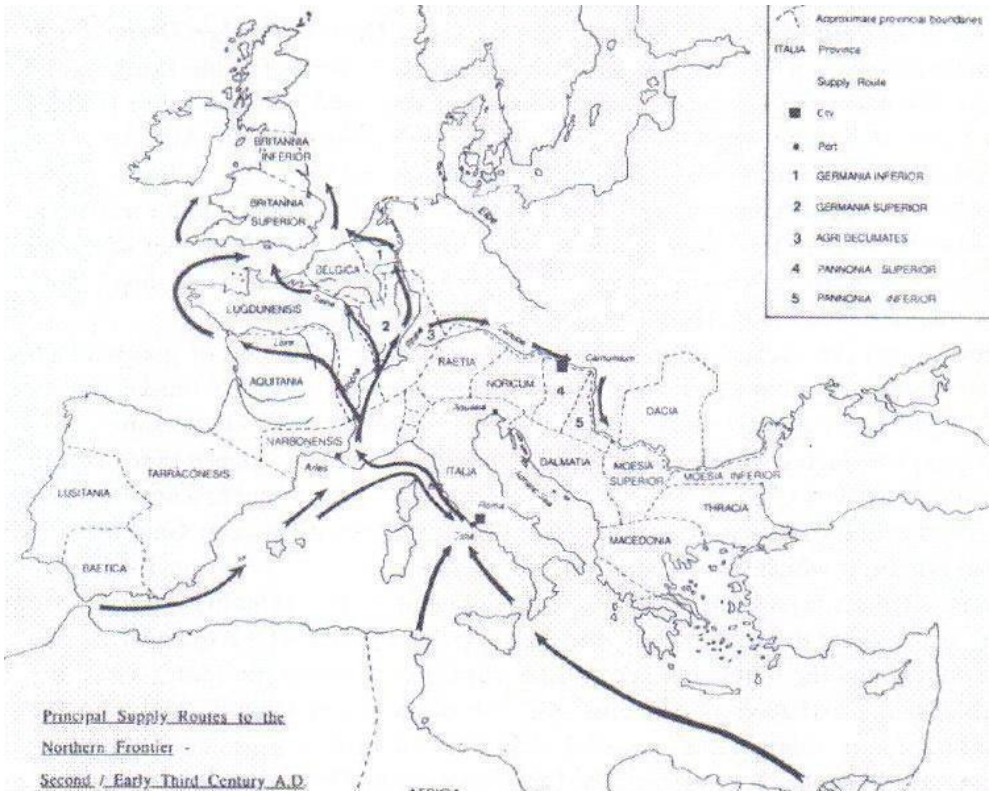
The path of these items can be traced due to the tendency of long distance shippers to compile mixed cargoes (Morley, 2007a:31). Material remains of this kind are particularly evident in cases where goods were lost in-transit between the port of departure and their final destination (Rhodes, 1989:44-

52). Shipwreck evidence, in particular, has contributed significantly to this analysis and has enabled some important insights to be gained concerning:-

1/ the composition of these cargoes (Paterson, 1982; Parker, 1992)
2/ the places of manufacture of many of the items (Anderson, 1992:58)
3/ the trade routes along which they passed (Jones & Mattingly, 1993:197)

The principal supply-routes which linked Britain to the continent during the Romano-British period have been carefully mapped by Fulford (1992) and are illustrated in Figure 5.10:-

Figure 5.10 Principal Supply Routes to Roman Britain (2nd & 3rd C)



(After Fulford, 1992:299, Figure 2)

Stone artefacts, whether in the form of lava millstones (Wilson, 2009:218), or specialist building stone such as marble or alabaster (Scullard, 1979:133), are comparatively rare, as is manufactured or raw glass (Jones & Mattingly, 1993:216). Pottery is very common however, and kitchenware, tableware and transport containers are found on most Romano-British archaeological sites (Evans, 1981:517). The Romans introduced a number of distinctive new pottery types to Britain, including *amphorae*, *mortaria*, and *terra sigillata*. These items arrived in large numbers and Fulford (2007:54) reminds us that tens of thousands of these vessels reached Britain between the 1st and 3rd centuries AD. Pottery is also an important diagnostic tool when it comes to tracing the development of this supply, for as Wacher (1997) explains:-

> "It often exhibits rapid changes in form and fabric, while a large number of vessels were stamped with the makers' or the estates' names, so making for easy classification."
>
> (Wacher, 1997:168)

Rapid development in ceramic forms and fabrics are particularly useful from the perspective of our current investigation as supply patterns appear to have changed markedly between the late 1st century BC and the late 3rd century AD. The rapid evolution and distinctive character of many of these vessels means that they can often be attributed to specific continental manufacturing centres or shipped from particular export locations. Detailed evidence of this kind is of enormous value in helping to trace the development of long distance supply and as Fulford (1978) remarks:-

> "Pottery is certainly the best suited artefact to demonstrate trade and marketing patterns."
>
> (Fulford, 1978:59)

For this reason the import patterns of a number of key 'marker' products will be examined later in this study when the dynamics of specific ceramic supply-chains will be used to look for evidence of marketing activities in the Romano-British economy. In particular, attention will focus on imports of the following artefacts:-

- Dressel type 1 wine *amphorae* (Chapter 8)
- Dressel type 20 olive-oil *amphorae* (Chapter 9)
- Samian wares (Chapter 10)
- Rhenish drinking beakers (Chapter 11)

To map the distribution of these items however, it is necessary to establish how they reached their final destination. The channel-member responsible for designing a supply-chain would be instrumental in deciding its structure; thereby shaping the distribution network and the diffusion patterns of the products which passed through it.

Care must be taken when seeking to evaluate the operation of supply-chains by means of artefactual evidence, however. The reason for this caution lies in the fact that distribution occurs during the lifetime of an object, often very soon after its original manufacture; while deposition is an end-of-life event (Orton *et al*, 1993:14; Cooper, 2007:40). Between its date of manufacture and deposition a portable object may move far from its original destination and may be subject to re-use once its primary function has been performed (Remesal Rodriguez, 1998:187).

Consideration should therefore be given to the contexts in which items are found, as well as to wear-patterns, evidence of re-use and the likelihood of deliberate deposition or accidental loss. Similarly, patterns of evidence, such as the recovery of *c.* 24,000 wine *amphorae* from the trans-shipment point of Châlon-sur-Saône (*Cabillonum*) on the Rhône-Rhine river system,

may be considered more informative than the discovery of isolated objects (Carver, 2001:18).

Two alternative distribution channels stand out as being the most likely mechanisms to have been used for the delivery of state supplies during the Romano-British period; these being:-

- Direct management by the state of its own supply networks
- Secondment of private contractors, operating under state supervision

The first of these alternatives will form the theme for the final part of this chapter, while consideration of the second possibility will be deferred until Chapter 6, when the rôle of merchants and contractors will be explored.

5.5 STATE-ADMINISTERED SUPPLY NETWORKS

The simplest model we could conceive to facilitate the operation of a long distance distribution mechanism would involve the military themselves as the prime movers, either as the sole participants using their own vessels and equipment, or using their powers of compulsory requisition to commandeer ships and crews to perform these duties under the direction of either local or provincial administrators. This would have been the strategy adopted when Rome was at war with other polities, for in such circumstances supply was too vital to have been left in private hands (Erdkamp, 1995:180-183; Roth, 2012:100).

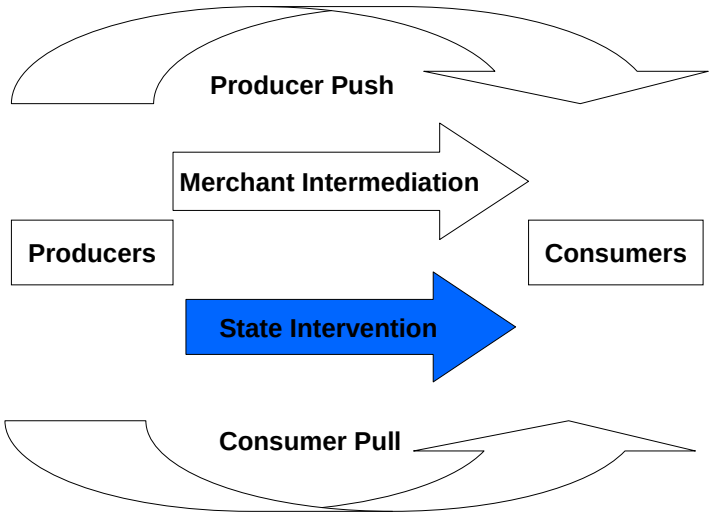
The idea that a self-contained redistributive model of this kind also operated in peacetime is attractive for those who consider Rome to have had a small and primitive economy. Such an arrangement would be perfectly adequate where long distance material transfers were infrequent and limited in scale.

If, as Temin (2001:177) suggested, the state did not choose to invest in its own merchant fleet, then the management of military supplies would have had to have been delegated to others. An obvious solution would have been to requisition private vessels, as and when required. As Mason (2003) has observed:-

> *"*Although, strictly speaking, they were not part of the Roman navy, merchant ships and shippers were contracted, or in certain circumstances compelled, to transport military supplies and equipment.*"*
>
> (Mason, 2003:51)

While private contractors may have been involved in a state-administered framework of this kind, they would simply have acted as distribution agents on the state's behalf. The state meanwhile would have exercised monopoly control over all aspects of military supply, as Figure 5.11 illustrates.

Figure 5.11 State Monopolization of Military Supply



While it is easy to see how attractive it would have been from the army's point of view to retain complete control of military supplies, either through their own offices or via the state *annona*, there is no evidence to show that distribution was actually organized in this way. The physical movement of bulk cargoes in the Roman period would have been an extremely labour intensive process and one which would have required specialist skills in terms of both its planning and execution. This may not have been a task to which military commanders would have been willing to commit resources, if alternative ways of managing this process could be found.

The possibility therefore remains that commercial shippers (*navicularii*) or merchants (*mercatores*) were hired to undertake these supply activities on the state's behalf. If this is the case, then Vance (1970:11) is probably right to suggest that the need for specialists skilled in the long distance supply of materials and equipment developed at a very early date.

5.6 DEDUCTIONS

Three key strategic themes which concerned all Roman rulers were the need for a sound system of provincial administration, legionary supply and fiscal security. These separate policy requirements appear to have been brought together during the late Republic and early Empire in a way which enabled the Roman state to redistribute tax revenue to meet the cost of defending its territory. This fiscal and administrative approach generated an outward flow of resources from the centre to the periphery (Millett, 1990:7). On reaching the frontier, these resources would then have been used to support the forces stationed there to enforce the *pax Romana* (Balsdon, 1970:177).

The nature of these supply requirements would have varied according to the region in which troops were stationed. Wherever possible these materials

would have been obtained locally; although this would not always have been feasible. Grain would certainly have formed a major component of supplies brought in from outside a garrisons' own *territorium*, although other items would also have been required on occasions. Foodstuffs which may have needed to have been imported included oil, sauces and wine. Leather and textiles would also have been required in considerable quantity and may have been brought in from elsewhere. In addition, kitchenware, tableware and *amphorae* often appear to have reached military garrisons from external sources.

While the mechanisms for supplying an army in the field will have differed from those used to support a settled garrison in peacetime, in each case the task of equipping the Roman legions was too important to be left to chance; or to market forces. While the structure of the supply-chains used to deliver these products has still to be established, the possibility of using direct state control to manage long distance supply has been considered in this chapter.

While entirely feasible from a logistical perspective, the direct provision of state-owned supplies to military garrisons using the army's own resources would involve a redistributive transfer rather than commercial trade and therefore has no direct marketing implications. The alternative scenario, in which independent carriers were used to deliver military supplies, provides a clear marketing dimension and the rôle of merchants in long distance supply will therefore be discussed in the next chapter.

CHAPTER 6

MERCHANT ACTIVITIES

6.1 INTRODUCTION

It is important to recognize that in the period covered by this investigation, merchants will have operated in an environment which was technologically simpler and commercially less sophisticated than the one with which we are familiar today (Frank, 1962:314-315). In particular, transport in the Roman period would have relied heavily on human, animal or wind power.

In the case of overland transport, where paved roads existed, ox-drawn carts would have been the principal form of motive power prior to the invention of the horse-collar in the medieval period (Drummond & Nelson, 1994:107). Mule-trains would have proved a versatile alternative on unpaved tracks and over rough ground, but would have needed a larger team of drivers and may consequently have been more difficult to manage (Sippel, 1987:37). Water transport likewise relied on simple forms of propulsion, with oars or sails being the usual methods employed (Greene, 1986:27-28).

Communication via all forms of transport would have been slow, especially in winter, for as Greene (1986:28) reminds us, few ships would have risked putting to sea between mid-November and mid-March. Overland journeys may also have been restricted at this time of year if road conditions inhibited the use of wheeled vehicles (Burnham & Wacher, 1990:43-44).

6.2 MERCHANT INTERMEDIATION

Where long distance exchange took place in pre-modern times it was often necessary to call on the services of a commercial intermediary to facilitate these transactions (Vance, 1970:6). The benefits of third party involvement went beyond the need to bridge the physical distance between the purchaser and vendor, as other barriers to exchange may sometimes be caused by the conflicting goals of buyers and sellers. These attitudinal differences often include conflicting views between the batch-sizes manufacturers prefer to produce and the amount consumers want to buy, or the point in the annual production cycle when producers wish to manufacture particular items and the times customers want to buy these goods (Bagozzi *et al*, 1998:531).

6.2.1 Benefits of Intermediation

Intermediaries are often able to bridge this gap by purchasing stock in bulk when the manufacturing cycle is completed; later releasing these items from their warehouses at a time that suits consumers' needs.

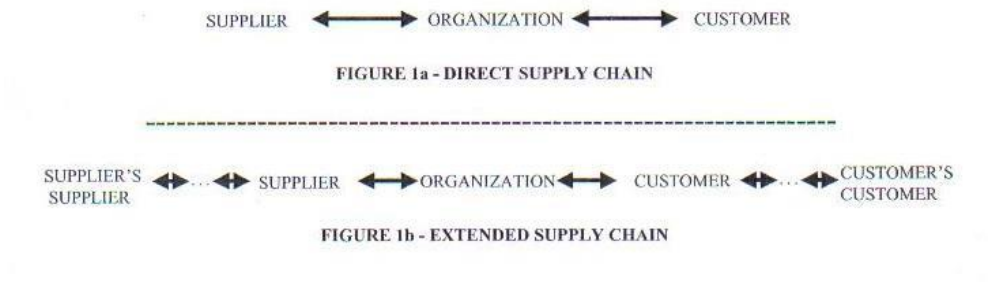
While the benefits (product utilities) which customers derive from specific commodities are created during the manufacturing process, merchants contribute to overall customer satisfaction by enabling items to be made available in the places where they are required (locational utilities), at the moment when they are needed (time utilities) and at prices which customers can afford (financial utilities). The overall objective of this aspect of the distribution process is captured by Keskinocak & Tayur (2001) who state:-

> "The goal is to deliver the right product to the right place at the right time at the right price."
>
> (Keskinocak & Tayur, 2001:73)

One of the distinguishing features of commercial intermediaries is that they do not desire the goods in which they deal for their own sake, but buy these items in order to sell them for a profit (Morley, 2007a:53). Value may be added at each stage of a long distance supply-chain by intermediaries such as import-export merchants, wholesalers and retailers, through the specialist services each provides (Kotler *et al*, 2005:873).

Mentzer *et al* (2001:4-5) note that the structure of channel relationships may vary according to the complexity of the market concerned and the degree of managerial involvement required. The relative simplicity of commercial behaviour during the Romano-British period means that only the more direct forms of relationship, involving direct or extended supply-chains are likely to have existed at this time. These mechanisms are illustrated in Figure 6.1.

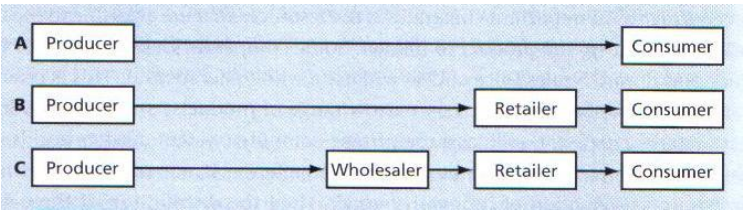
Figure 6.1 Types of Distribution Channel Relationships



(Adapted from Mentzer *et al*, 2001:5, Figure 1)

The number of intermediaries involved in a supply-chain will determine the overall length and character of the particular distribution channel (Lancaster & Massingham, 1988:191). The three common variants which are likely to have existed during the Romano-British period are illustrated in Figure 6.2.

Figure 6.2 Traditional Distribution Channel Structures



Key
A = Direct channel (*e.g.* State-administered military supply)
B = Short channel (*e.g.* Civilian supply - direct to retail outlets)
C = Long channel (*e.g.* Civilian supply - initially via wholesalers)

(Adapted from Palmer, 2004:456, Figure 9.7)

In the context of the current investigation, use of the direct channel (Figure 6.2A), in which privately owned ships were requisitioned to distribute state-owned cargoes, is arguably not a form of intermediation as such, since the *navicularii* concerned acted primarily as agents of the Roman state. This issue is somewhat problematic, however, since Roman law never developed a judicial concept of agency. The Roman approach was to consider a ship's captain to be either a representative of the shipowner (*actiones exercitoriae*) or their business manager (*actiones institoriae*), thus giving him appropriate contractual powers to carry out his duties (Temin, 2012:104).

6.2.2 Merchants' Risks

While merchants provided many benefits to both producers and consumers, they clearly operated in an environment of uncertainty (McGrail, 1989:353). The situation which long distance traders faced at this time is characterized by three major types of risk:-

1/ Natural disasters, including storms and shipwreck
2/ Piracy
3/ Commercial hazards, including confiscation and/or fraud

The need to find profitable markets from which to recoup the costs of their expedition and secure an adequate reward for the risks they incurred meant that merchants needed to choose their products and destinations carefully; as well as timing their voyages so as to maximize the chances of a good profit (Morley, 2007a:30-31). In order to balance their risks and returns a number of strategic choices were available:-

1/ Follow a regular route to a reputable port
2/ Specialize in products with proven demand
3/ Stop at multiple destinations to maximize sales
4/ Pack mixed cargoes, so something being carried might sell
5/ Build mutually-beneficial relationships with foreign clients

(Morley, 2007b:579)

Even for a merchant operating a single vessel, the cost of mounting a trading expedition would have been considerable (Temin, 2013:97). Finance would be needed to purchase a cargo, to pay their crew, equip a vessel, pay harbour fees or border taxes and to cover the interest charges on any loans taken out to fund the venture (Morley, 2007a:56).

If merchants were not able to accompany the cargo in person, they ran the risk that whoever was appointed to supervise the work on their behalf might steal their goods or siphon-off some, or all, of their profits. We refer to this problem today as 'moral-hazard', a concept closely associated with the field of 'New Institutional Economics' (Temin, 2013:98). One way to overcome this difficulty in Roman times is suggested by Cicero, whose works contain a letter he wrote to Titus (a merchant) on behalf of Avianius, recommending

the young man as a trusted friend of Pompey, a mutual acquaintance of both Titus and Cicero (Cicero, *Ad Familiares*; xiii, 75 cited by Temin, 2012:109). Temin (2012) observes that through devices of this kind:-

> "This problem has been mitigated from time immemorial by using family and friends as agents wherever possible."
>
> (Temin, 2012:99)

Considerations of personal trust and financial security would have helped determine the length and structure of the distribution channels for many commodities in antiquity. If merchants were able to specialize in particular routes or specific cargoes they may have been able to attract regular clients to help provide a reliable source of income. Rauh (2003:106) suggests that while the carriage of bulk cargoes to the most popular destinations probably accounted for the majority of long distance traffic by the 1st century AD, short-haul 'tramping' (cabotage) would still have been common at this time.

Where cabotage did occur, we may reasonably assume that profit accrued to those involved at each stage of the voyage, for otherwise wholesalers or retailers at the ports-of-call throughout the journey-cycle would have had little interest in acquiring these goods. Evidence can certainly be found in the work of Roman moralists like Cicero (*de Officiis*) or satirists such as Petronius (*Satyricon*) to show that the profit motive remained strong among merchants in the late Republic and early Empire. The same may safely be assumed for those merchants who served Roman Britain and wished to be rewarded for the hazards faced on each channel crossing (Salway, 1993:3).

6.3 TYPES OF ROMAN INTERMEDIARY

Even in the Romano-British period the nature of merchant intermediation was sufficiently complex to require the services of several different types of specialists. Entrepreneurs and financiers (*negotiatores*), export merchants (*mercatores*), wholesalers and retailers are all known to have been involved in trading links between Britain and the continent during Roman times.

Analysis of the part played by each of these groups often proves difficult, however, as there appears to have been a good deal of overlap between their activities (Temin, 2006:146; Harris, 2011:177; Broekaert, 2013:218). Since the rôles of *negotiatores* and *mercatores* do not neatly equate to modern commercial functions, it may perhaps be useful to clarity the part played by each group in Roman commerce.

6.3.1 *Negotiatores*

These individuals seem to have provided a vital link between producers and consumers, particularly in respect of large-scale exchanges such as military supply (Greene, 1979b:135). They appear to have been far more than just military contractors, however, for as Rauh (2003) observed:-

> "*Negotiatores* were merchants who engaged in overseas *negotia*, an ambiguous term that usually entailed money-lending along with several other activities integral to foreign trade."
>
> (Rauh, 2003:138)

Negotiatores seem for the most part to have been wealthy individuals, rather than companies or trade guilds (Hassall, 1978:45). Roman senators were prohibited by the provisions of an ancient Republican law, the *plebiscitum Claudianum*, from direct involvement in commercial activities (Morley,

1996:160). This formal restriction may not have prevented wealthy citizens from indirect involvement in business, however, so long as these unsavoury activities could be kept at arms-length.

There is reason to believe many members of the Roman élite maintained active commercial interests through either their slaves or freedmen, or by means of surrogate friends or associates (*amicitia*) who could be used to mask their patron's involvement (Verboven, 2002:343; Harris, 2011:180). An example of this kind of is provided by Plutarch, who in a biography of Cato (*c*. 234-149 BC) observed the well known Roman senator:-

> "... used to lend money in what is surely the most disreputable form of speculation, that is, the underwriting of ships. Those who wished to borrow money from him were obliged to form a large association and when this reached the number of fifty, representing as many ships, he would take out a share in the company."

(Plutarch, *Cato Maior*, xxi, 6; cited by Temin, 2001:175)

The chief function of *negotiatores*, whether operating on their own account or on behalf of a sponsor, appears to have been to provide financial support and logistical assistance to state and private distributors (Frayn, 1993:134; Paterson, 1998:160). The precise nature of their activities is hard to define however, as the meaning of the term *negotiator* seems to have altered over time. During the 1st century BC the word appears to have been used mainly in connection with trade finance, but by the 3rd century AD its usage is more often associated with practical aspects of physical distribution (Broekaert, 2013:19). Direct involvement in the operational aspects of supply may have enabled some *negotiatores* to assume the rôle of 'channel captain', a function performed today by the supply-chain member responsible for coordinating the distribution function and ensuring its overall operational effectiveness (Coughlan *et al*, 2001:36; Mentzer *et al*, 2001:14).

The existence of *negotiatores* is referred to on a number of occasions by classical authors (Pliny the Elder, *Naturalis Historia*, 50; Pliny the Younger, *Epistles*, ii, 1; both cited by Whittaker, 1988:55). Much of the evidence we have concerning their day-to-day activities comes from epigraphic sources, however, primarily in the form of 2nd and 3rd century inscriptions from the Rhine estuary (Hassall, 1978:43; Verboven, 2007:299-300).

The commodities in which these *negotiatores* dealt are also mentioned on occasions; for example, olive-oil (CIL VI, 1625b), wine (CIL XIII, 1805) and pottery (CIL XIII, 1906; CIL XIII, 1978; CIL XIII, 2033). The range of goods they dealt in was clearly quite extensive and fish sauces, metalwork and textiles may also be added to this list (Broekaert, 2013:18).

A number of these continental inscriptions explicitly mention trading links with Britain (Hassall, 1978:43; Bogaers, 1983:16-24). Some inscriptions even go as far as to indicate the type of goods which were being supplied, one individual describing himself as a *negotiator cretarius Britannicus*, (pottery merchant) while two others identify themselves as *negotiatores vestarius* (textile merchants), (Fulford, 1991:41).

6.3.2 *Mercatores*

Mercatores also appear to have been closely involved with the operational aspects of physical distribution, including the purchasing, transportation, storage and wholesaling of produce. As Broekaert (2013) explains:-

> "A *mercator* is basically anyone whose main profession is to organize the sale or resale of merchandise, with the intention to make a profit. Whether he is selling goods produced by himself or his family, or reselling merchandise produced by others, is not important."
>
> (Broekaert, 2013:151).

One of the key differences which appears to have distinguished *negotiatores* and *mercatores* lies in the size of their operations and the financial resources each class of intermediary had available (Broekaert, 2013:20). *Mercatores* may have operated on a smaller scale than most *negotiatores*, but they seem to have been quite common as over a dozen references to their activities can be found in the works of leading classical authors.

Figure 6.3 References to *Mercatores* in Classical Literature

Author	Literary Reference
Appian	*Iberia*, 85.
Caesar	*De Bello Gallico*, i, 18; i, 45; iii, 1; vi, 36-37; vii, 3; vii, 42.
Cassius Dio	*Historia Romana*, lvi; 20, 2-5.
Josephus	*Bellum Iudaicum*, iii, 115.
Sallust	*De Bello Jugerthine*, xliv, 5.
Strabo	*Geographica*, iv, 1; iv, 3-5; iv, 6.

Mercatores may also have been instrumental in bringing farm produce to market by buying crops for resale to urban residents or by sending them for export (Morley, 1996:166). Writing in the 2nd century BC, Cato observed:-

> "The *mercator* I consider to be an energetic man, and one bent on making money; but ... it is a dangerous career and one subject to disaster."
>
> (Cato, *De Agri Cultura*, i, 3; cited by Morley, 1996:166)

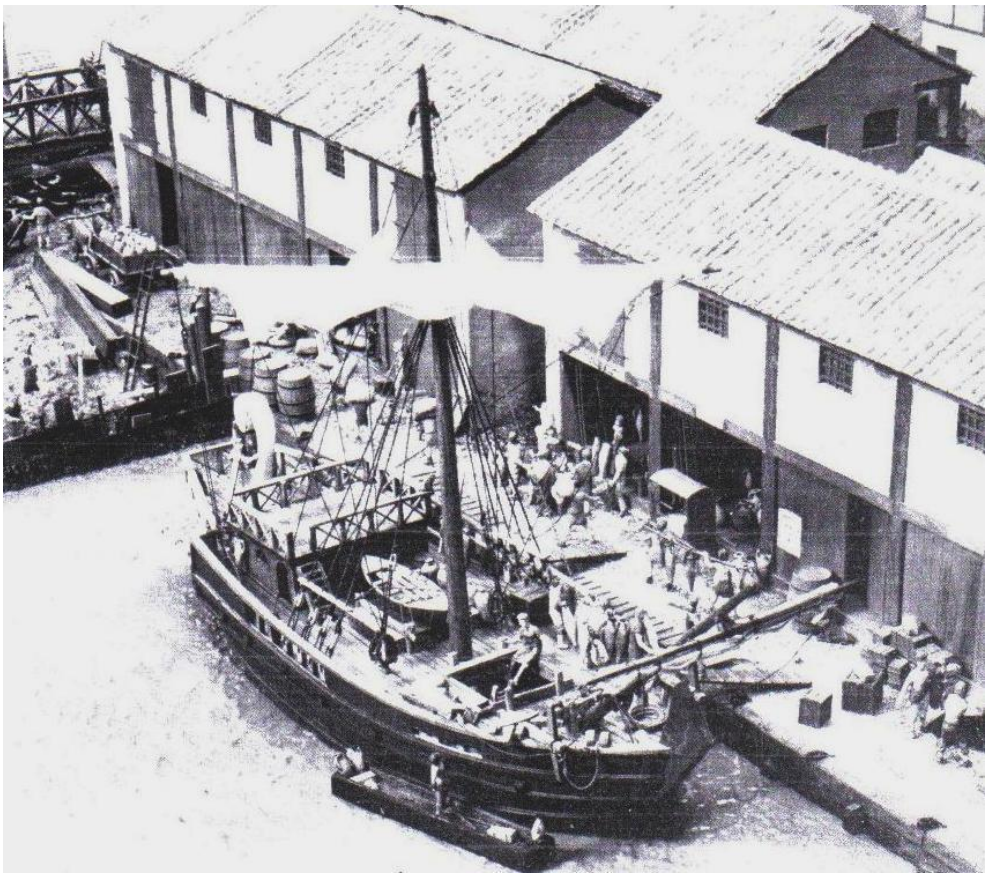
The limited size of most *mercatores'* businesses meant many probably had to handle a wide range of tasks themselves, including ensuring the safety and security of their produce whilst in transit, paying customs duties

(*portoria*) at provincial borders and bearing responsibility for any losses or breakages which occurred (Broekaert, 2013:20). This personal involvement makes it likely many *mercatores* would have attempted to form close relationships with other supply-chain members, such as financiers (*negotiatores*), ship-owners (*navicularii*), independent wholesalers, retailers, or even military commanders and their quartermasters (Dannell, 2002:236).

6.3.3 *Navicularii*

Navicularii specialized in long distance carriage of goods by sea and their expertise lay in organizing cargoes and in arranging the finance of such voyages (Rauh, 2003:147; Broekaert, 2013:218). *Navicularii* performed rôles which *negotiatores* and *mercatores* would have undertaken where goods were being transported by an overland route (Broekaert, 2013:218). The capacities of their ships ranged from *c.* 100-150 tons and most were between 15 and 37 metres in length (Greene, 1986:25; Mason, 2003:51). Many would have resembled a Gallo-Roman vessel whose remains were found near Blackfriers' bridge, London.

Figure 6.4 Representation of the Ship found at Blackfriars, London



(After Milne, 1985:69)

Inscriptional evidence enables us to identify several *navicularii*, including M. Frontonius Europus and L. Secundus Eleuther, both of whom were based in Arles (*Arelate*) in southern Gaul (Garnsey, 1983:125). Many *navicularii* operated independently; hiring vessels from shipowners (*exercitores*) as and when required (Frank, 1962:303).

6.3.4 *Nautae*

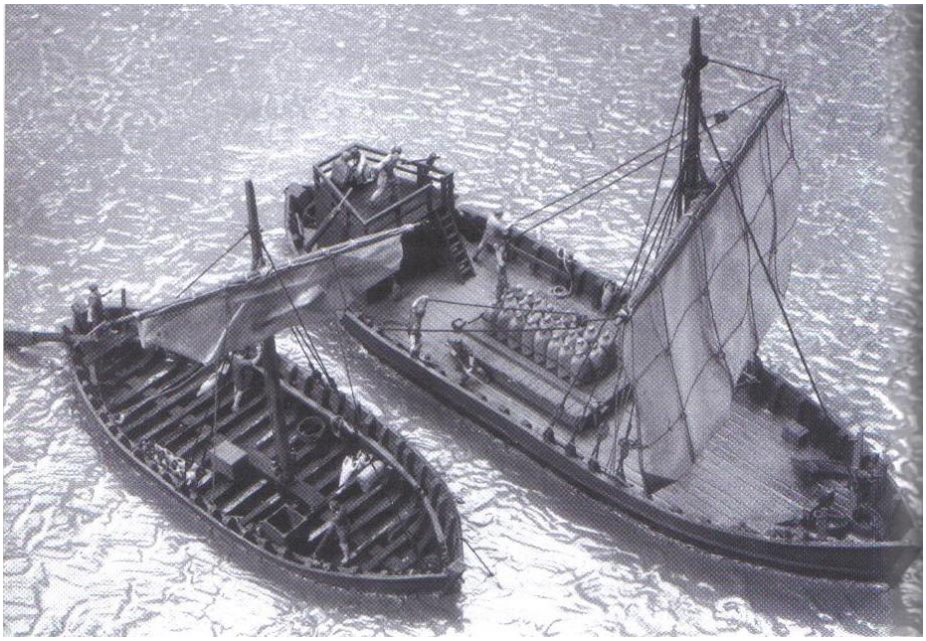
Nautae were also concerned in managing long distance water transport, but operated as river boatmen rather than ocean carriers (Middleton, 1979:85). Inscriptions left by *nautae* most often appear along the Rhône-Saône-Rhine river system, examples having been found at Lyon (*Lugdunum*), Cologne (*Colonia Claudia Ara Agrippinensium Ubiorum*), Mainz (*Moguntiacum*) and Trier (*Augusta Treverorum*), (Wightman, 1985:155). Some inscriptions also provide a visual representation of the craft they used, as the image of the barrel-laden barge in Figure 6.5 shows.

Figure 6.5 Rhenish Tombstone from Corbières d'Aigues Showing a Barge Carrying Barrels

(Adapted from Harris, 1980:252)

Nautae are also known to have formed guilds on occasions and it is likely that they also worked in close association with *navicularii* where no suitable quayside facilities were available, using barges to transfer goods from ship-to-shore, as shown in Figure 6.6.

Figure 6.6 Ship-to-Shore Transfer from a Cargo-ship to a Lighter at the Port of *Londinium*



(After Mason, 2003:54, Figure 17)

6.4 MERCHANTS' SOCIAL STANDING

Despite providing the luxury imports that many members of the Roman élite desired and offering them an indirect means to further enrich themselves via the surrogate use of their slaves and freedmen, classical sources invariably suggest the wealthy looked down on those involved in commercial activity (Finley, 1979:41). The Roman view of commerce is summed-up by Cicero (*c*. 106-43 BC) who observed:-

> "We must consider anyone who buys from wholesale merchants in order to retail immediately to be vulgar; for they would gain no profit from this without having to resort to outright dishonesty; and there is no form of behaviour that is less noble than lying."

(Cicero; *de Officiis*; i.150, cited by Morley, 2007a:84)

It is evident from the work of Cato (*c*. 234-147 BC), Varro (*c*.116-27 BC) and Columella (*c*.18-70 AD), that Cicero was voicing a longstanding and widely held view of a Roman élite, who regarded the ownership and use of land to be the only honourable source of wealth (Kelley, 1956:62; Percival, 1981:106). This belief led them to regard all other forms of income as inferior, particularly those involving industry or trade. In his biography of the philosopher Apollonius of Tyana, the historian Philostratus (*c*. AD 170-224) reports that Apollonius severely admonished one young aristocrat for abandoning his family heritage in order to take up a profession among:-

> "... the ill-starred breed of traders and shippers, who secure themselves in the hold of a ship and think of nothing but cargoes and petty bills of lading."
>
> (Philostratus; *Vitae Apollonius*; iv. 32; cited by D'Arms, 1981:153)

It is interesting to note, however, that contrary to the view presented in the literary sources, the manner in which merchants portray themselves in their epigraphic and funerary images provide a very different picture. Indeed, it is quite clear from inscriptions which appear on their tombstones that many merchants saw their place in society as being an honourable one and were happy to celebrate their own achievements.

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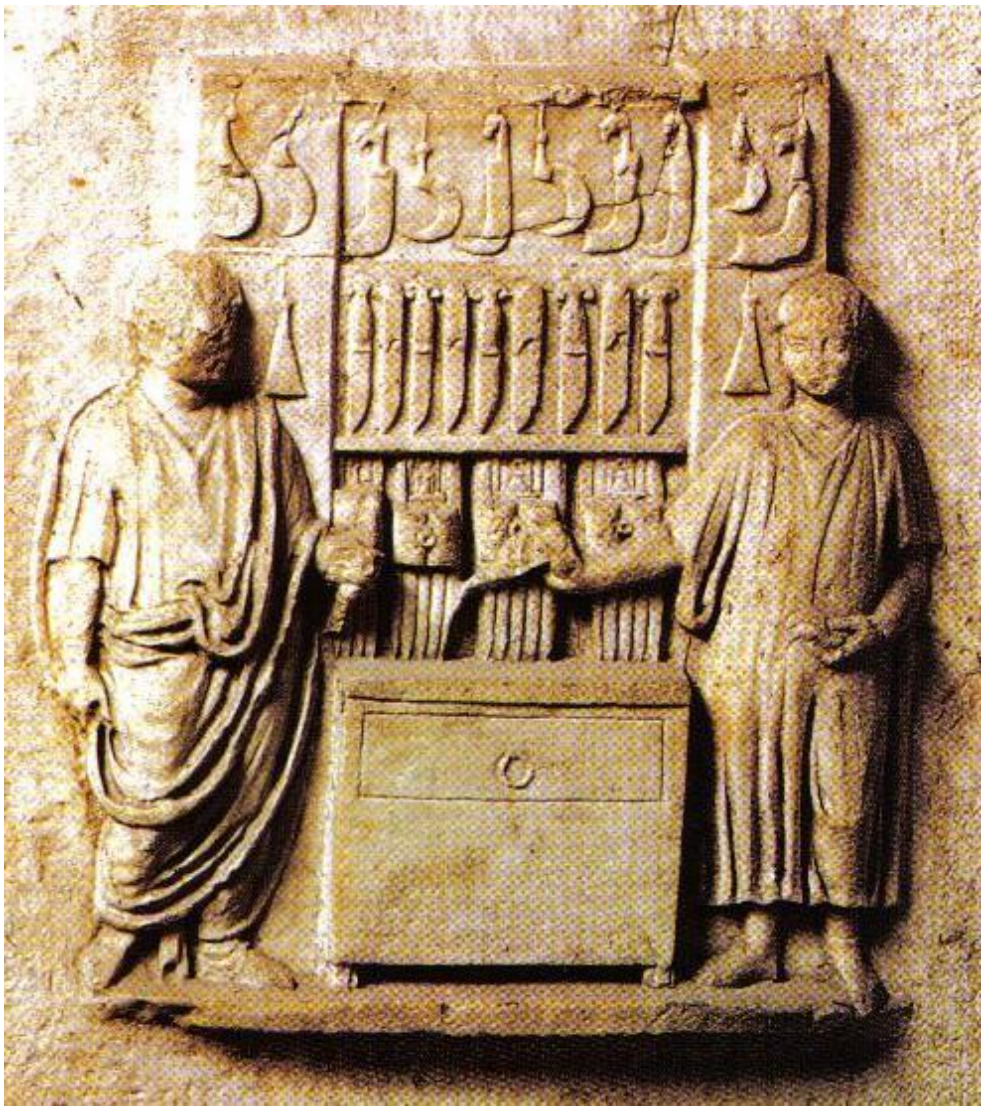
Figure 6.7 Altar of *Atimetus* in Rome Depicting a Roman Ironmonger's Shop



(After Liberati & Bourbon, 2005:62)

The value of commerce to the Roman state was also indicated by the actions of successive emperors, who were never slow to protect merchants' interests (Oliver, 1907:154). This is confirmed by Roman jurists, who devoted most of books XVIII and XIX of the *Digest of Roman Law* to the consideration of commercial issues (Paterson, 1998:153).

6.5 PHYSICAL DISTRIBUTION IN THE ROMAN PERIOD

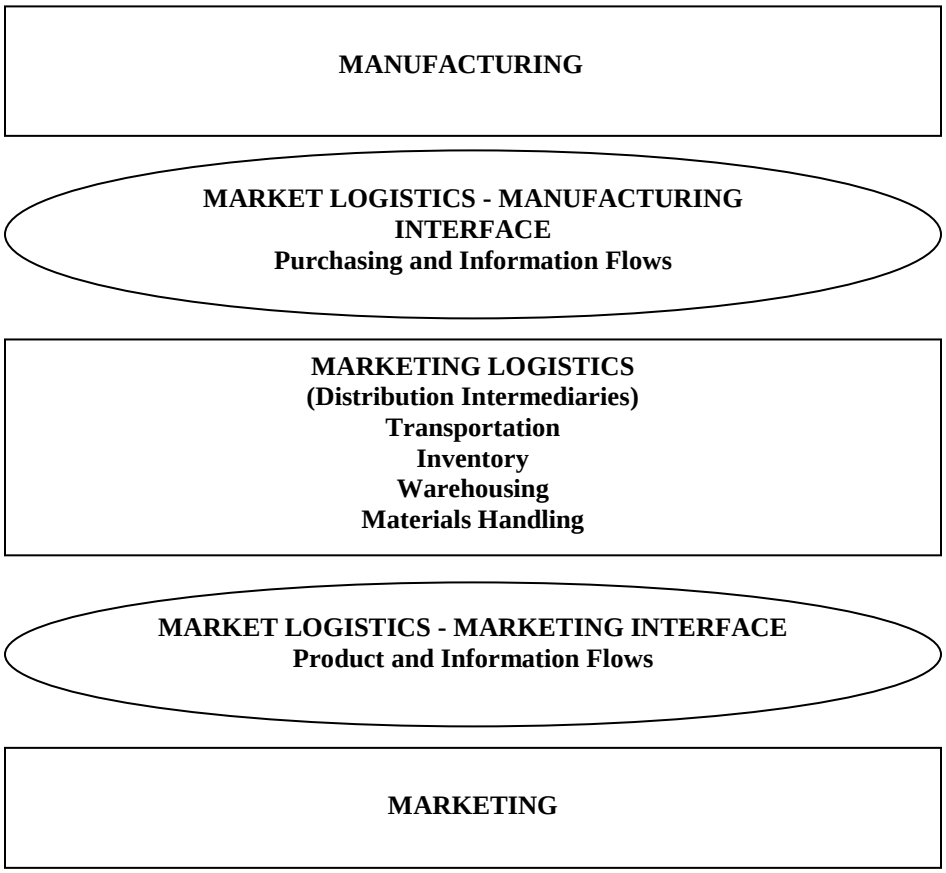
When analysing merchants' activities, it is important to distinguish clearly between their 'organizational rôle' as financial entrepreneurs (*negotiatores*), export managers (*mercatores*), shipowners (*navicularii*), wholesalers and retailers within the formal distribution channel structure, (as illustrated in Figure 6.1, above) and the 'practical rôle' each supply-chain member performed within the physical distribution process; *i.e.* the function of transporting products to their intended destination.

'Physical distribution' is not only the most visible aspect of marketing in the Romano-British period, but is also crucial to understanding the commercial and redistributive exchanges which took place at this time (Brassington & Pettit, 2003:500). As Berry (1967) notes:-

> "It is through the process of distribution, that the supplies of producers and the demands of consumers are brought together."
>
> (Berry, 1967:1)

From the producers' perspective, distribution represents the organization's 'outbound logistics', the functional area of the business which is concerned with delivering materials to their point of need (Palmer, 2004:368; Blyth, 2005:190). A successful logistics system provides an effective link between producers at the beginning of the supply-chain; through the wholesalers or retailers at the intermediate stages of the distribution cycle; and eventually on to the end-users at the customer interface. These relationships are illustrated in Figure 6.8.

Figure 6.8 Manufacturing-Logistics-Marketing Interfaces



(Adapted from Bradley, 1995:796, Figure 18.1)

While the Greeks coined the term *logistikê* to describe calculations related to the supply or movement of military equipment, Roth (2012:1-2) reminds us that there was no Latin term which directly translates as 'logistics'. Romans clearly understood this notion however, as can be seen from the scientific way in which they approached the task of provisioning their armies, both in times of peace and war. It is also evident that private merchants also played a part in this process, for even though the Roman army often provided its own overland transport, it required assistance when it came to the movement of sea-borne supplies (Roth, 2012:278).

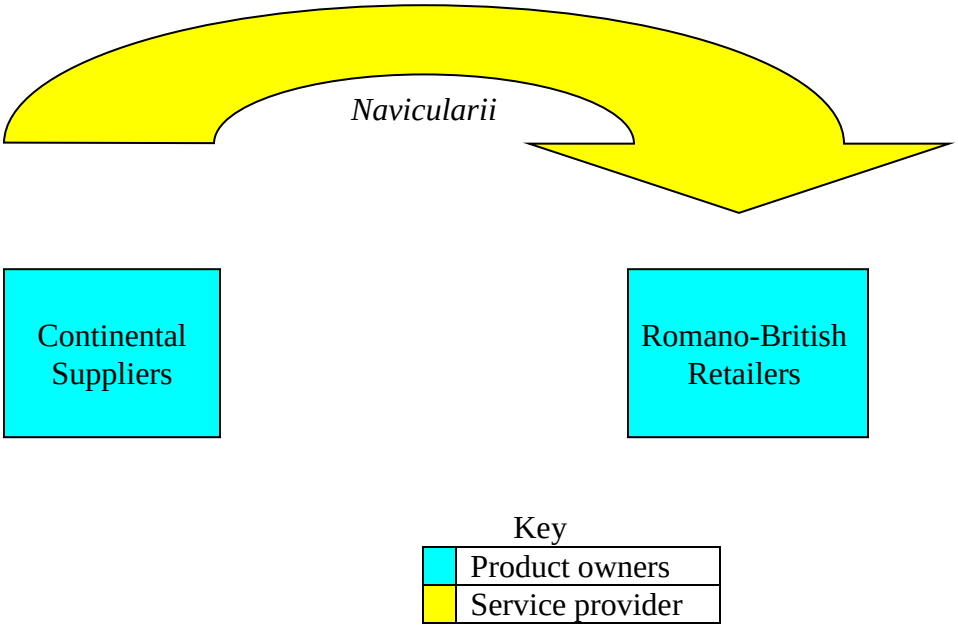
Where long distance transfers were required water transport is often thought to have been the most economical method of delivery for both military and civilian supplies. Using early 4th century data from Diocletian's *Price Edict*, Duncan-Jones (1974) has produced the following cost comparison:-

> "Taking the Diocletianic figures for sea transport and road transport by wagon, the cost ratios for the three types are sea 1, inland waterway 4.9, and road 28-56 ..."
>
> (Duncan-Jones, 1974:368)

Overseas cargoes would normally have been carried by specialist shippers (*navicularii*), using either their own ships or vessels they had chartered for the purpose (Peacock, 1982:158; Paterson, 1998:160). Epigraphic evidence for *navicularii* is less common than that for *negotiatores* or *mercatores*, but the inscriptions discovered at Arles (*Arelate*) identify two such individuals; M. Frontonius Europus and L Secundius Eleuther. Given their location, we may presume the two men played a rôle in the flow of supplies between the Mediterranean and the Rhône-Rhine river systems (Garnsey, 1983:125).

While *navicularii* were often involved in overseas shipping, it is important to remember that this task may also have been organized by consortia of the type in which Cato invested, or were kept 'in-house' where *negotiatores* or *mercatores* owned suitable vessels themselves. *Navicularii* can also be distinguished from *negotiatores* or *mercatores* in that their duties did not require them to take ownership of the goods they carried, as their rôle was essentially that of a service provider. In the case of Roman Britain, the *navicularii* are best seen as providing the physical link between continental suppliers and their Romano-British customers, as Figure 6.9 illustrates:-

Figure 6.9 Cross-Channel Distribution Activities



Shipping is not the only service which could have been arranged internally or outsourced. Liability for maritime risks was another area that may have been handled in this way (Andreau, 1999:54). Although formal insurance policies had still to be developed, it was possible in return for an increased premium to obtain commercial loans which relieved merchants of financial liability if a cargo was lost in a shipwreck (Scaevola, *Digest*, xlv, 1, 122, 1; cited by Sirks, 2002:142-145). In this respect Romans generally followed the conventions of Rhodian maritime law when apportioning losses which occurred during sea voyages, including the cost of damage sustained in the loading or unloading of cargo, or in the jettisoning of cargo in order to save a ship (Ashburner, 1909:viii).

6.6 SECONDMENT OF PRIVATE CONTRACTORS

In view of the vital importance of security of supply to the Roman state, the likelihood that responsibility for managing this critical task was ever handed over to private merchants seems remote. A problem remains though if the state did not possess its own merchant fleet but opted instead to hire vessels on an *ad hoc* basis to meet its supply requirements. In this scenario, Roman administrators would have been forced to rely on the services of commercial entrepreneurs and financiers (*negotiatores*). As many *negotiatores* regarded themselves as coordinators rather than practitioners, however, they may have been supported at an operational level by merchants (*mercatores*) who provided their technical expertise in areas such as procurement, storage and transportation to allow the *negotiatores* to fulfil their contracts.

While the involvement of *negotiatores* and *mercatores* does not necessarily indicate that the state relinquished its overall control of military supply, their presence is nevertheless important. The significance of their involvement lies in the fact that so long as the overall responsibility for these operations remained under state control the 'operational effectiveness' of the system may be regarded as the only crucial performance consideration. Economic issues like the costs of acquiring and distributing materials were presumably matters of little concern to imperial administrators when redistributing state-owned resources (Whittaker, 1988:56; Funari, 2002:262). Even if the state needed to enter the 'market' to acquire specific items, the impact of this on imperial finances would presumably be considered irrelevant where issues of security or army morale were concerned (Carreras Monfort 1998:162).

The consequence of delegating the responsibility for military supply to the private sector would have meant that profit considerations would inevitably have become much more important, shifting the operational emphasis from 'effectiveness' to 'economy'. With profit as a motivator, the *negotiatores* or

mercatores contracted to deliver these services are likely to have adopted an 'efficiency' based approach, *i.e.* a compromise between the state's preferred option of achieving the best possible standard (effectiveness of supply) and the contractors desire to maximize profits by supplying at the lowest cost (economy of supply). The nature of each approach is set out in Figure 6.10:-

Figure 6.10 Managerial Approaches to Distribution Strategy

Approach Adopted	Operational Emphasis
Effectiveness	Achieving the highest possible standard
Efficiency	Balancing overall quality against cost
Economy	Achieving the lowest possible cost

(Adapted from Johnson & Scholes, 2002:166-168)

The crucial question in determining how far this balance may have tipped rests again on the issue of legal ownership of the materials being supplied at the time of delivery. Adcock *et al* (2001:243) make it clear that ownership of the goods they buy and sell is a key feature of merchant activity, at both the wholesale and retail level. As the goods involved in redistributive supply remained the property of the Roman state, it follows that if merchants were simply employed to carry an imperial cargo, the situation we are looking at is one of transport rather than trade.

Merchants operating simply as carriers would have faced few financial risks in respect of the goods they transported, as long as they complied with the terms of the contracts they had undertaken to fulfil. Their monetary rewards would have been similarly restricted though, being fixed in advance by the agreement they had entered into. A 'low risk / fixed reward' business model might have suited many long distance carriers at this time, especially if the

members of commercial ship-owning partnerships, of the kind to which Cato allegedly subscribed, were looking for relatively safe but secure returns on their investments (Plutarch, *Cato Maior*, xxi, 6).

For more entrepreneurially minded merchants, the scope for greater profits may have presented itself if they saw an opportunity to use their asymmetric knowledge of local market conditions to purchase commodities in locations where these were available and transport them to places where such items were scarce and could be sold to public or private consumers at inflated prices. Ownership of the materials being carried would have created both a financial risk and a profit-potential, neither of which would have existed if the merchant was simply employed in a contractual capacity to carry a state-owned cargo. This 'high risk / high reward' approach distinguishes the free-enterprise culture associated with commercial profit-seeking ventures from the more cautious 'risk-avoidance' model favoured by those who preferred to adopt a safer contractual rôle within a state-controlled distribution system.

An important clue to which situation prevailed in particular instances may at times be revealed by epigraphic sources and Middleton (1979:90) has noted that this kind of evidence sometimes links individual shippers to particular supply networks. Many of these inscriptions directly link individual traders with the distribution of specific commodities such as grain, oil and wine, or with manufactured goods such as pottery, metalwork or textiles (Fitzpatrick, 1993:235; Harris, 1993b:12). Evidence from Spain (CIL, II, 1180) confirms local *navicularii* were hired as boatmen to carry state-owned supplies for the *annona* (Carreras Monfort, 1998:162; Blázquez, 1992:177).

The idea that the Roman state retained direct control of military supplies has been strongly contested however, for as Roth (2012) reminds us -.

> "Van Berchem completely rejects the idea that there was any centralized supply system overseeing Roman military logistics. He points out that there is no evidence to support the idea of a permanent existence of the prefect or office of supply under the Early Empire, or for a central organization of the supply system."
>
> (Van Berchem, 1937:143-145; cited by Roth, 2012:263)

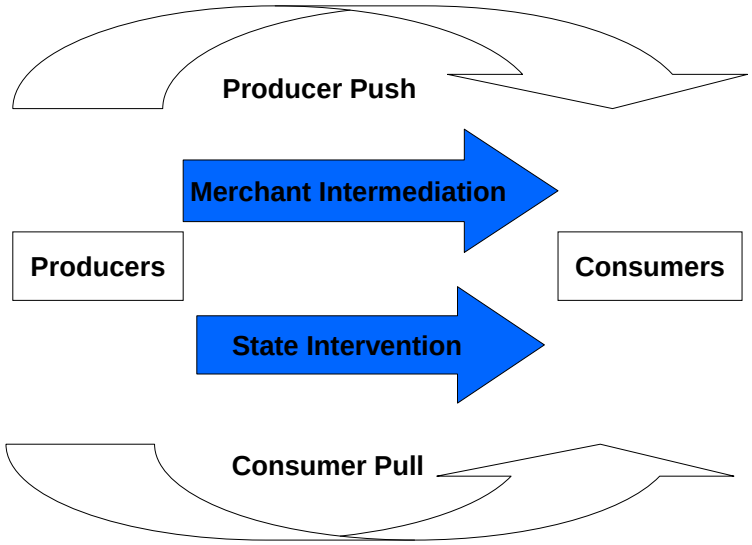
An interesting scenario for how military supplies may have been organized has been proposed by Verboven (2007:298) who suggests local commanders may only have seen it as their duty to supply troops with food and essential equipment, that is to say, items which the state included in its official list of rations. This would open the way for the supply of all other 'non-essential' items to be arranged on a commercial basis. If this scenario is correct, then a clear separation would have existed between state provision of all 'official rations' and commercial supply of any remaining items the troops required. This would have had major implications for the way in which long distance supply-chains were managed.

The merchants' rôle in satisfying these discretionary spending requirements could have been achieved in a number of ways. Merchants may have acted as intermediaries between the frontier forces and local artisans to provide a market for artefacts produced in a fort's local civilian settlement (*vici*) or by nearby native communities. Alternatively, troops' demands may have been met by importing goods from elsewhere in the province or using the army's long distance supply-trains to bring goods from overseas (Kolb, 2002:161; Carreras Monfort, 2010:133).

The cooperation of both the state and private contractors in military supply would have created a shared responsibility for the management of these operations, with the 'public' and 'private' sectors each taking responsibility for ensuring the provision of different types of materials. This may be seen

as two parallel supply-chains, one carrying 'essential' and the other 'non-essential' items. As the merchants used to carry supplies probably handled both type of goods, 'essentials' and 'non-essentials' may often have arrived together, which suggests a supply-network with some level of joint control.

Figure 6.11 Public-Private Partnerships in the Supply of 'Essential' and 'Non-Essential' Resources



Even the secondary involvement of private contractors in a supply system that remained 'state-led' raises the possibility that some merchants behaved entrepreneurially and used their experience to develop parallel distribution networks alongside the formal supply mechanism, operating not in direct competition with the state, but co-existing alongside the official system. In such a situation merchants would have operated independently of the state, even if the two categories of supplies they carried may have travelled side-by-side.

6.7 DEVELOPMENT OF PARALLEL SUPPLY-CHAINS

The simplest way for a parallel distribution channel to have evolved would be if a merchant who was already hired to carry official supplies decided to transport his private goods alongside a state-cargo. Apart from any cost-savings which may have accrued from not having to establish a distribution network of his own, a state contractor would have obtained free carriage for his private cargo by shipping this in a vessel that had already been chartered and paid for by the state (Whittaker, 1994:112; Morley, 2007a:71-72).

The opportunity for individuals to participate in entrepreneurial ventures of this kind may have been widespread, with individual crew members as well as established merchants participating in this activity (Whittaker, 2002:211). The range of goods involved in this kind of entrepreneurial venture was also probably quite diverse (Mattingly, 2006:512). A structure of this type which is attached to an established supply-network may be referred to as a parallel, parasitic or piggy-back distribution arrangement. This versatile practice has a long history and still survives in some areas of exporting (Doole & Lowe, 2004:222-223; Hollensen, 2004:296-297).

It is clear from archaeological and epigraphic evidence that independent merchants were engaged in conducting parallel supply operations alongside their official state-sanctioned activities in a number of provinces by the reign of Tiberius (AD 14-37). A well known inscription of this period from *Pisidia* in Asia Minor contains a copy of an edict forbidding traders in the region from requisitioning transport to carry their own wares (Mitchell, 1976:123). The monument bearing this inscription was found at Burdur, in what is now southern Turkey, and is shown in Figure 6.12.

Figure 6.12 The Monument Containing the *Pisidia* Inscription

(After Mitchell, 1979: Figure X)

This edict was issued in the early 1st century AD by Sextus Sotidius Strabo Libuscidianus, who is believed to have been provincial governor at this time (Mitchell, 1979:112-113). The inscription contains the proclamation in both Latin and Greek and its purpose appears to have been to counter abuse of the imperial transport system by state-appointed contractors and private traders who seem to have been making unauthorised use of government vehicles and pack-animals to serve their private needs (Mitchell, 1979:112-114).

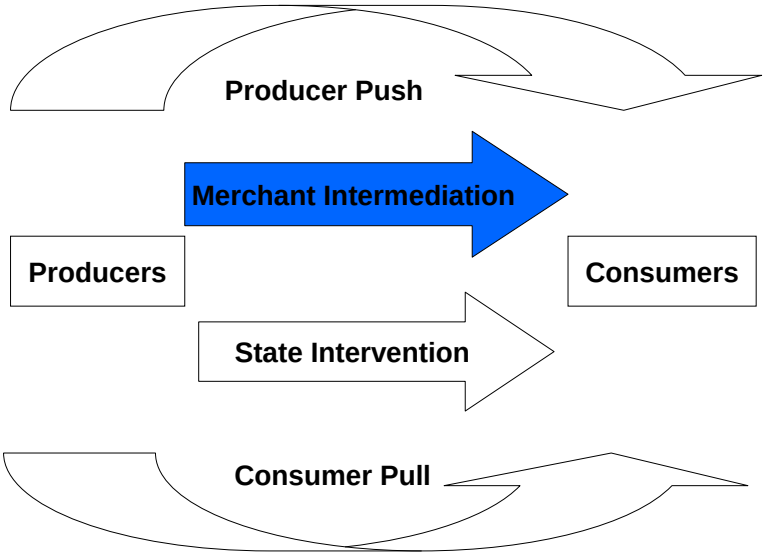
The edict covers three forms of transport; donkeys, mules and wagons. Lines 13-21; 35-47 define the type of officials who may use these resources for state business and the amounts they may requisition (Mitchell, 1979:122-123). Lines 21-23; 47-49 then expressly forbid private individuals from using official transport to carry grain or similar produce in order to obtain private profit (Mitchell, 1979:127). It is not clear whether the edict resulted from a complaint by a state-appointee or a private competitor whose trade was being undermined by the abuse of imperial resources, but the existence of the proclamation indicates that by the mid 1st century AD the practice of parasitic trade had become common enough, in this province at least, to attract official attention and warrant a formal response (Mitchell, 1979:127).

While it is believed that merchants were increasingly carrying private goods alongside official state cargoes by the late 1st century BC, when we turn to the issue of how widespread this parallel system may have become, or try to plot the course of its development, the picture becomes less clear. One of the problems we face in trying to untangle the various strands of evidence is that the behaviour of independent traders is often so similar to the actions of official state contractors that it is usually impossible to distinguish the one from the other in the archaeological record (Jones & Mattingly, 1993:198).

Indeed, the supplementary activities of independent traders may even have been indistinguishable from the work of state contractors to contemporary observers, especially if merchants attempted to 'pass-off' private cargoes as public ones to gain the benefits of tax-free passage which state-owned goods enjoyed (Whittaker, 1988:56; McCormick, 2001:90). Even proponents of the state-led model, such as Garnsey (1983:123) and Whittaker (1985:53), recognize that, in the imperial era at least, some state appointees engaged in the practice of moving private goods alongside their official rôle of carrying state supplies.

Parallel, parasitic, or piggy-back distribution activities of this kind would exclude the state from any share in the proceeds of the venture, however, even if state-chartered vessels were used to carry the goods. The merchants involved in this trade would be the sole supply-chain members as far as the recipients of these supplementary cargoes were concerned.

Figure 6.13 Merchant Control of Parasitic Supply



6.8 PRIVATE CIVILIAN SUPPLY

The strongest evidence of merchant involvement in long distance supply comes from their connection with civilian consumers however. Civilian demand was probably quite small initially, compared to the needs of the state-sector and it is difficult to identify any specific products for which civilian demand alone was strong enough to have sustained a viable import network (Middleton, 1979:81). Even if civilians formed only a secondary source of income for continental export merchants, the issue of how best to harness their demand would still need to have been addressed.

If goods were destined for a civilian settlement situated near to a military base, these would probably have been shipped along with military supplies and separated on arrival. Civilian communities in remoter locations are more likely to have received their supplies by means of secondary routes, possibly involving down-the-line-trade (Cunliffe, 2008:28).

6.8.1 Down-the-line-trade

Down-the-line-trade or cabotage involves the movement of goods from their original source through a series of intermediate distribution centres where some of them would have been sold and other items added to the cargo for onwards transmission (Hodges, 1989:18). These intermediate legs of a long distance journey-cycle may create opportunities to develop short distance as well as long distance distribution networks (Duncan-Jones, 1990:32; Millett, 1993:418-419). If small-scale commercial activity of this kind took place in the way envisaged it is likely to have involved regular harbour-side trading (Evans, 1981:528; Peña, 2011:37; Kron, 2012:168).

Our evidence of cabotage comes primarily from ceramics, which Fulford (1992:296) identifies as being the most visible component of long distance supply due to its longevity and traceability. Some evidence of short distance trade in glass and metal artefacts exists to add to the pottery record, while Trow (2002:106) reminds us that a number of other items such as food or textiles may also have featured in this type of exchange. Much of our data comes from 1st or 2nd century AD shipwreck assemblages in which there is almost universal evidence of mixed cargoes, even in the case of vessels which are thought to have been carrying state supplies (Whittaker, 1988:54). Various reasons have been put forward to explain this pattern, including:-

1) Carriage of saleable ballast (McGrail, 1989:89; Parker, 1992:128)
2) Attempts to increase product diversity (Anderson, 1992:64)
3) Efforts to fill unused cargo space (Pucci, 1983:111-112)

Trans-shipment of goods may have occurred at major route-nodes and this practice would certainly have assisted traders in putting together composite sub-cargoes (Rhodes, 1989:46; Peña, 2011:37). We may even envisage the presence of cargo-agents at some of the larger ports-of-call to help facilitate such transactions (Webster, 2001:297).

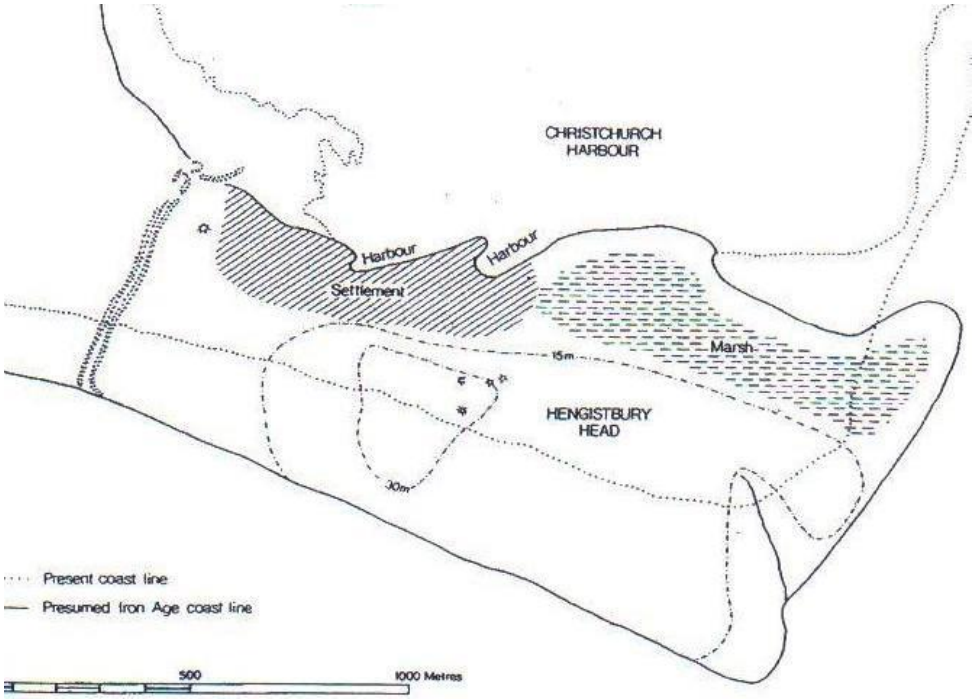
6.8.2 Entry Gateways

The need for Roman merchants to establish trust and find buyers in overseas harbours reminds us that in antiquity foreigners would have been regarded as outsiders and may have possessed few, if any, legal rights (Polanyi *et al*, 1957:260). The existence of a secure, neutral location where merchants and customers could meet in safety to conduct their business would have been a pre-requisite in the development of regular trade and from prehistoric times merchants had sought to identify such places (McGrail, 1983:311).

These facilities, variously referred to as *emporia* (Strabo, *Geographica*, iv, 5.1), gateway communities (Hirth, 1978), or ports-of-trade (Polanyi, 1963); satisfy the need for a neutral meeting-place where business could safely be undertaken. Such sites were often located at route-nodes and are frequently found on islands or promontories situated on coastal estuaries or navigable rivers (Mays, 1981:56; Cunliffe, 1988a:5). Tribal boundaries are especially suitable for this purpose, representing neutral areas long associated with this kind of exchange (Hodder, 1979:189).

Entry gateways of this kind are known to have existed in Britain, as Strabo, (*Geographica*, iv, 5.1) refers to an (un-named) *emporium* in Britain which was used in cross-channel trading expeditions by the *Veneti*, a tribe based in *Armorica* (modern Brittany). This reference is generally thought to refer to Hengistbury Head, an important coastal site in Dorset which appears to have served as a port-of-trade since the bronze-age (Cunliffe, 1978:21).

Figure 6.14 Presumed Port-of-Trade at Hengistbury Head, Dorset



(Adapted from Papworth, 2011:39, Figure 4)

Unlike urban centres, where retailing activities tended to dominate, ports-of-trade attracted commercial middlemen and focused on wholesale activities (Hirth, 1978:38; Cunliffe, 1988a:6). In addition to selling imported wares, archaeological evidence suggests that sites like Hengistbury Head may also have provided merchants with an opportunity to manufacture or assemble goods (Mays, 1981:57). If this assumption is correct, ports-of-trade may have operated in a similar way to the *entrepôt* facilities we find at modern international sea- and air-ports.

Entry gateways were not restricted to rural locations and it is highly likely that Roman or Gaulish merchants visited Colchester (*Camulodunum*) in the pre-conquest period as part of the diplomatic contacts Augustus made with Cunobelinos, an important British tribal leader and possible client-king (Webster, 1988b:12). Another inland settlement site has also been identified at Braughing, Hertfordshire where Roman or Gaulish merchants may have established a semi-permanent trading centre prior to the Claudian conquest (Haselgrove, 1984:29-30; Niblett, 2001:33; Mattingly, 2006:76).

6.9 DEDUCTIONS

It is clear that by acting as intermediaries in the distribution process, export merchants played an important rôle in both the organization and delivery of long distance supplies in the Romano-British period. The differing nature of civilian and military demand will have helped determine the channel length and structure in each case, although until urban settlements began to develop during the late 1st or early 2nd century, military supply probably dominated import flows and any civilian items are likely to have arrived alongside state supplies.

The use of independent merchants to deliver military supplies will have introduced profit considerations into this equation, irrespective of whether *negotiatores* or *mercatores* were employed to manage the overall supply operation, or merely took advantage of the chance to carry some of their own goods alongside state cargoes. A situation can therefore be envisaged whereby the state chose either to share control of its long distance supply-chains with merchant intermediaries, or allowed merchants to serve civilian markets on a freelance basis in parallel with their official responsibilities, as long as their main contractual duties were not compromised.

While a permanent or semi-permanent merchant presence has been inferred at Braughing and Hengistbury Head in the late pre-historic period, it is important to remember that these sites may have served as *entrepôt* centres rather than retail locations. Indeed, as we will see in Chapter 10, the stock-in-trade of the itinerant merchants who supplied provincial retail outlets in the Romano-British period appear to have involved composite consignments of pottery, whetstones, metalwork and other items, indicative of down-the-line trade rather than long distance bulk supply of a single commodity. The nature of this work suggests that continental merchants are unlikely to have been involved after their exports reached Britain, with the final stage of the distribution cycle being carried out by Romano-British traders, whose local knowledge and contact networks would have enabled them to complete the task of conveying these wares to civilian markets throughout the province.

CHAPTER 7

ROMANO-BRITISH CONSUMERS

7.1 INTRODUCTION

While the aim of this thesis is to investigate the supply-chains which linked Roman Britain to the continent, the import demands which occurred during this period can only be understood in relation to the size and structure of the population which constituted the Romano-British market. This group not only represented the driving force for any 'consumer-pull' that contributed to cross-channel exchange, but their characteristics and buying behaviour will have played an important part in shaping the challenges contemporary merchants would have faced when conducting business.

Few sources have been discovered which deal specifically with the structure or organization of Roman retailing. An historical and anthropological study of the way in which traditional retailing has evolved can be found in Berry's (1967) *Geography of Market Centers and Retail Distribution* though. More recently, MacMahon's (2000) *The Taberna Structures of Roman Britain* and Holleran's (2012) *Shopping in Ancient Rome: the Retail Trade in the Late Republic and the Principate* provide excellent accounts of the structure of retailing activities in their urban settings. Valuable as these studies are, we cannot simply assume that Roman consumers thought or behaved in quite the same way as their modern counterparts.

A number of issues nevertheless stand out as being of importance in shaping Romano-British retailer-customer interactions. These include:-

1/ the size and distribution of the Romano-British population

2/ the development of urban settlements within the province

3/ the creation of market infrastructure in many towns

4/ the establishment of a standard system of weights and measures

5/ the emergence of a number of distinctive 'consumer segments'

7.2 ROMANO-BRITISH POPULATION ESTIMATES

The task of estimating the sizes of ancient populations is acknowledged to be an exceedingly difficult one (Jones, 1991b:55; Burnham *et al*, 2001:71). Even attempts to approximate this figure by assessing an order of magnitude for the Romano-British population have produced results which have varied widely, as Figure 7.1 demonstrates:-

Figure 7.1 Historic Estimates of the Romano-British Population

Reference Source	Methodology Used	Estimate
Collingwood & Myers (1937:180)	Known sites + the army	0.5 million
Frere (1967:309-311)	Known sites + food needs	2 million
Henig (1975:230)	Known sites	1 million
Cunliffe & Rowley (1978b)	Known sites + food needs + rural density	4-6 million
Fowler (1978:6)	Known sites + food needs + rural density	3-4 million
Fulford (1984:131)	Medieval comparisons	2.8 million
Hingley (1989:3)	Known sites + food needs + rural density	4-6 million
Potter & Johns (1992:68)	Known sites + food needs	2.5 million

(Adapted from Millett, 1990:182, Table 8.1)

Estimates of Roman Britain's population have increased gradually over time as more sites have been discovered, especially following the advent of air-photography. The most reliable figure is probably based on data provided in

Millett (1990). This analysis began by gathering the best previous estimates (Millett, 1990:182, Table 8.1), before proceeding to recalculate a likely size for both the urban (Millett, 1990:183, Table 8.2) and the rural population (Millett, 1990:185, Table 8.4). This exercise suggested a population size of 3.6-3.7 million (Millett, 1990:185, Table 8.5); as shown in Figure 7.2.

Figure 7.2 Millett's (1990) Estimate of the Romano-British Population

	Mid-range (approximate)	
Range	No.	%
Army 10,000–20,000, plus dependents = 50,000–200,000	125,000	3.4
Urban population = 183,971–290,057	240,000	6.5
Rural population = 1.8 ± 1.2 to 4.6 ± 2.9 million	3,300,000	90
Total	3,665,000	

(After Millett, 1990:185, Table 8.5)

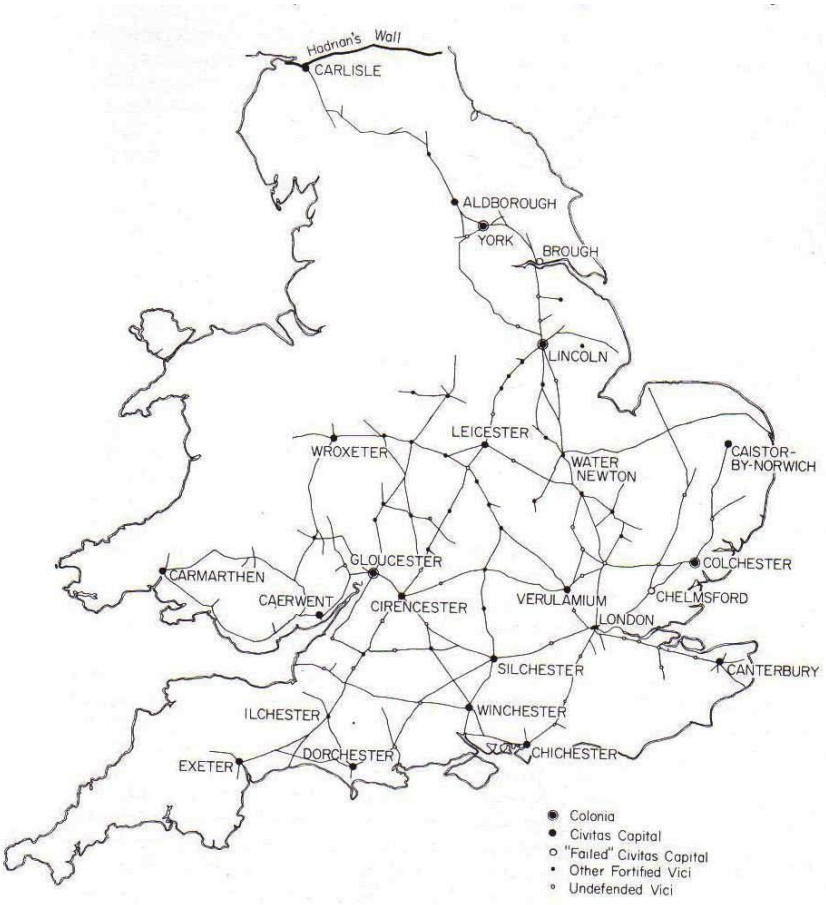
While Figure 7.2 suggests about 90% of Roman Britain's inhabitants lived in rural locations, it is the urban population which may be important from a marketing perspective as they provided commercial opportunities that would probably not have been available in rural areas (Dark & Dark, 1997:124). Even if the mid-range population estimate of 240,000 (Figure 7.2), does not seem high by today's standards, we must remember that the most common age of death in Roman Britain seems to have been between 30 and 40 years (Birley, 1979:19). By this measure, an average of three generations / century over a period of 300 years would have produced an aggregate market size of over 2 million urban consumers. As Goldsmith (1984:272) reminds us that urban incomes exceeded those of the countryside, their overall demand for wine, oil and domestic pottery may well have been sufficient to attract the interest of continental exporters.

7.3 URBAN SETTLEMENTS

7.3.1 Location of the Major Romano-British Towns

It is difficult to provide a precise figure of the number of Romano-British towns and villages, as aerial photography and field surveys are constantly adding to this total. Current estimates suggest that by the late 2nd century AD *c.*150 towns and villages existed (Mattingly, 2009:165). Their origins vary, some being colonies of retired army veterans (*coloniae*), or provincial tribal capitals (*civitates*); while many grew up as small trading centres at ports or crossroads. Wacher (1974) gives a detailed account of twenty four of the largest of these settlements, as Figure 7.3 illustrates.

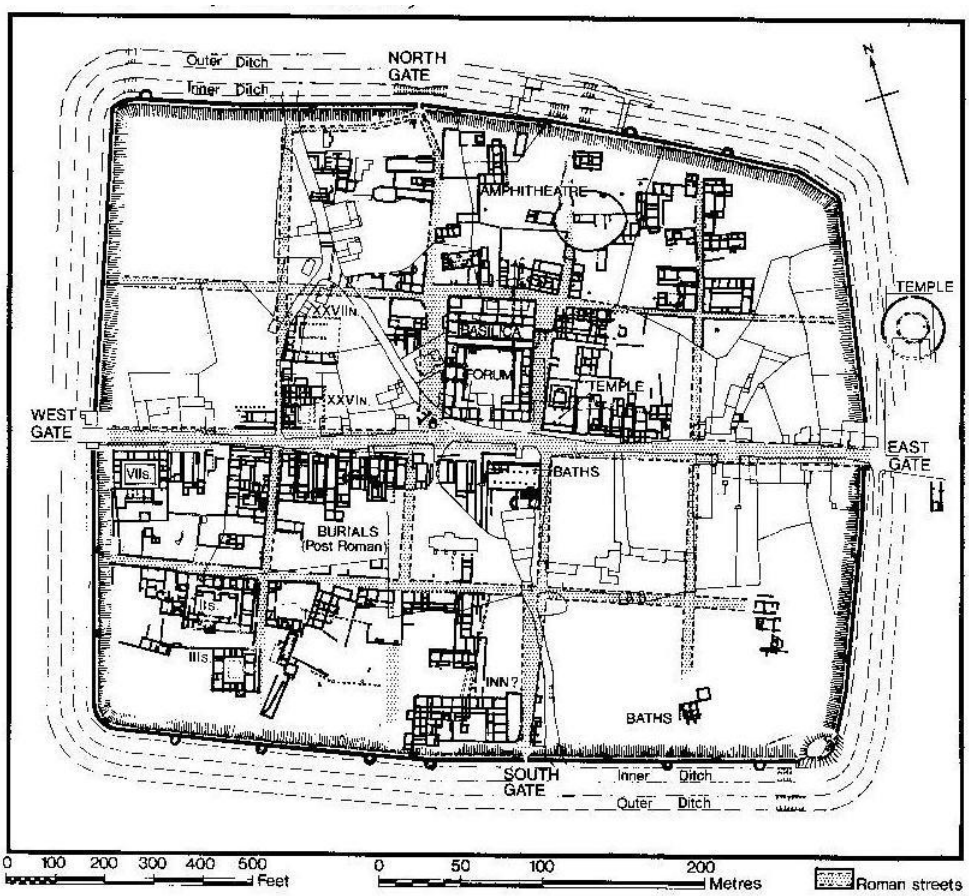
Figure 7.3 Major Towns of Roman Britain



(After Wacher, 1974:23, Figure 1)

Burnham & Wacher (1990) subsequently provided profiles of a further fifty one of the more important 'small towns' of Roman Britain. It is difficult to provide accurate data on the number of residents in any of these towns, but the best estimates suggest *Londinium'*s population may have reached 30,000 (Millett, 1995:65), while those of Colchester (*Camulodunum*) and St Albans (*Verulamium*) were perhaps close to15,000 (Potter & Johns, 1992:68; Laing, 1997:123). Medium sized towns like the *colonia* at Gloucester (*Glevum*) or a *civitas* capital like Caerwent (*Venta Silurum*) may have had 3,000-5,000 residents (Scullard, 1979:99; Alcock, 2011:313).

Figure 7.4 Plans of the *Civitas* at Caerwent (*Venta Silurum*)



(After Wacher, 1974:377, Figure 82)

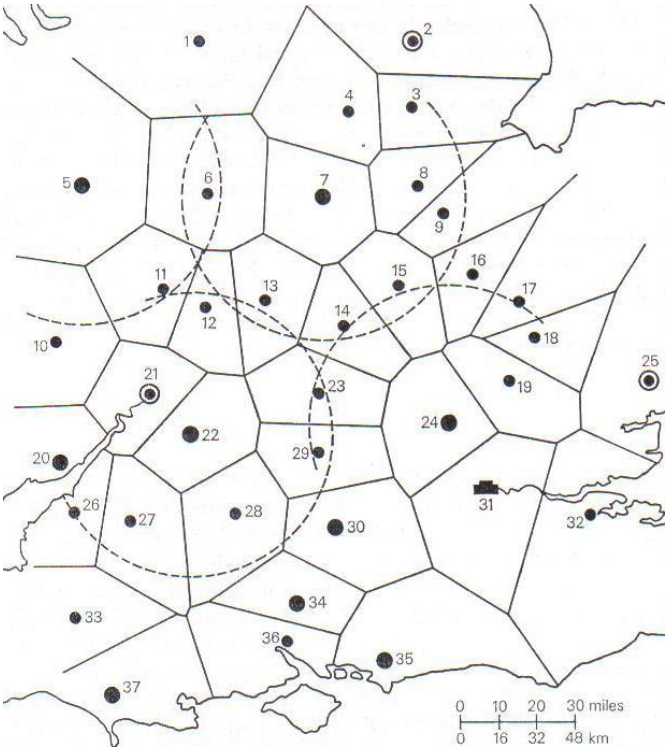
Towns of all sizes appear to have served as central locations where urban or rural customers might have obtained the goods and services they could not produce themselves (Vance, 1970:2; Salway, 1993:409). Unlike their rural counterparts, however, urban consumers would probably have had to rely on these retail markets for many of their daily needs (Morley, 2000:213; Hill & Ireland, 2006:71).

7.3.2 The Rôle of Towns as Central-Places

The notion that towns may have played an important rôle as 'central-places' in the geography of retailing emerged from their function as regional service centres (Christaller 1933; cited by Cunliffe, 1985:1; Lösch, 1938:71-78). The tendency of rural inhabitants to travel to the nearest convenient location to buy and sell wares has had a powerful attraction for social anthropologists (White & Gaffney, 2003:221). One implication of this behaviour pattern is the non-random spacing of market centres (Hodder, 1972:902).

Especially in the lowland zone of southern England, many Romano-British urban centres are located at roughly equidistant intervals, thus enabling rural inhabitants to travel no more then ten or fifteen miles to market, a distance which could be conveniently managed in a single day (Percival, 1981:154). The distribution of Romano-British walled towns in southern England has been mapped by Hodder & Hassall (1971) to illustrate how the location of the major *civitas* centres and 'small towns' may have created a hierarchy of major and minor market centres, as Figure 7.5 shows.

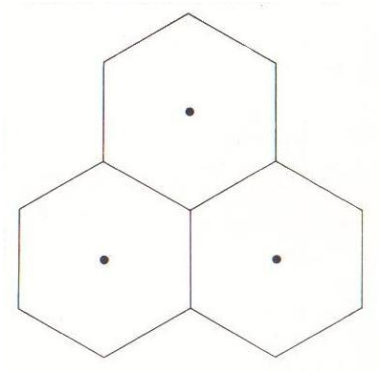
Figure 7.5 Romano-British Market Centres in Southern England



(After Hodder & Hassall, 1971:398, Figure 5)

At its extreme, the geographical distribution of markets might result in a series of locations arranged in a regular hexagonal lattice (Smith, 1974:171).

Figure 7.6 Central-Place Model based on a Simple Lattice Structure



(After Berry, 1967:63, Figure 3.7)

As some towns develop for reasons other than to serve as market centres, however, their distribution is likely to diverge from this simple hexagonal model (Smith, 1974:171). Thus, the location of spa towns like Buxton (*Aquae Arnemetae*) or Bath (*Aquae Sulis*), or towns which were established to serve mining communities, such as Charterhouse (*Iscalis*) or *Dolau Cothi* / Pumsaint (*Luentinum*) were determined by the resources their inhabitants exploited rather than primarily to serve as local retail centres (Greene, 1975:133).

In the case of conventional market centres, however, central-place theory allows for the existence of a hierarchy of towns of differing importance. As Smith (1974) points out:-

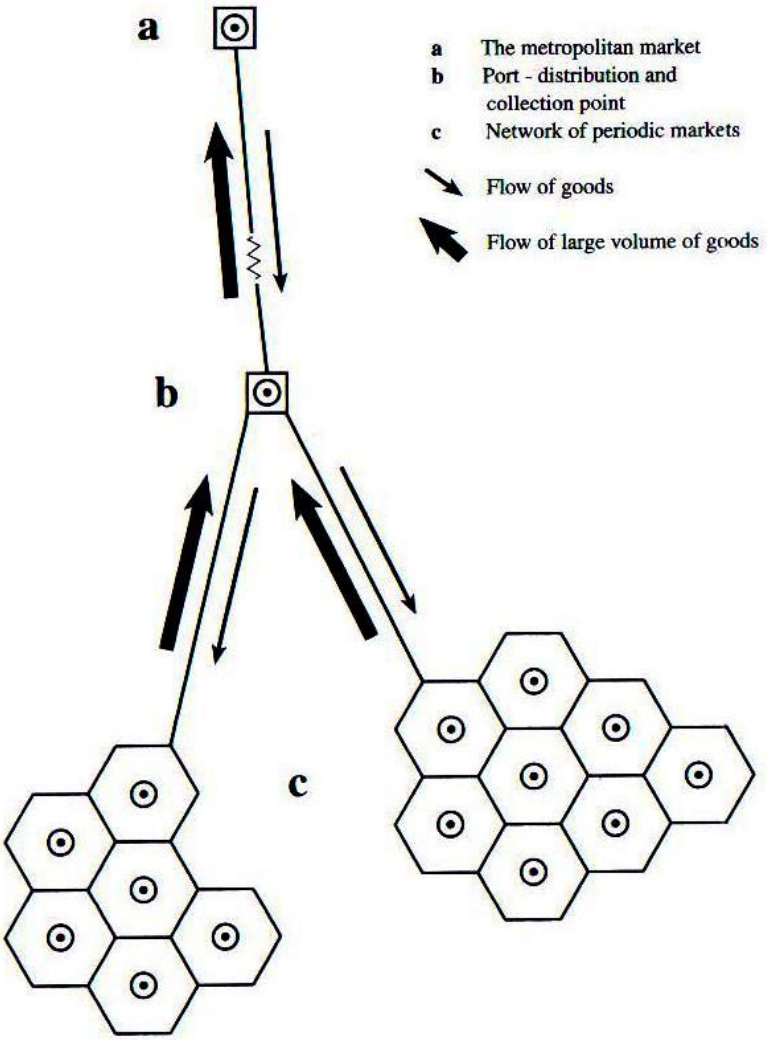
> "As many field researchers have observed ... commodities do not normally flow between equivalent centers: they flow between different levels of centers, thereby complementing the needs of each. Market centers at different levels in a hierarchy will, for reasons stipulated by central-place theory, commonly be located closer to each other than to market centers of the same level or function in the hierarchy."
>
> (Smith, 1974:185)

This functional differentiation opens up a rôle for central-place theory in the analysis of long distance supply, for as Haselgrove (1976) explains:-

> "Vance (1970) has described the evolution of an externally based central place hierarchy, following the establishment of an initial point of attachment on the coast and the development of trading lines up rivers and land routes. This would lead in due course to the growth of secondary centres on alignments, shaped by the early transport routes, due to the increasing demand for hinterland goods, promoted by the growth of the first *entrepôt* ..."
>
> (Vance, 1970; cited by Haselgrove, 1976:32-33)

A model of this kind may go some way to explain the marketing function of ports-of-trade like Hengistbury Head or Colchester (*Camulodunum*), whose rôles as entry gateways were briefly explored in Section 6.8.2 and will be examined again in Chapter 8. The concept may also be extended to show the way in which market centres in many small towns and villages throughout Roman Britain acted as conduits to channel the flow of consumer goods to larger cities, such as the provincial capital at *Londinium*. Links of this type could work equally well for local, regional or long distance exchanges.

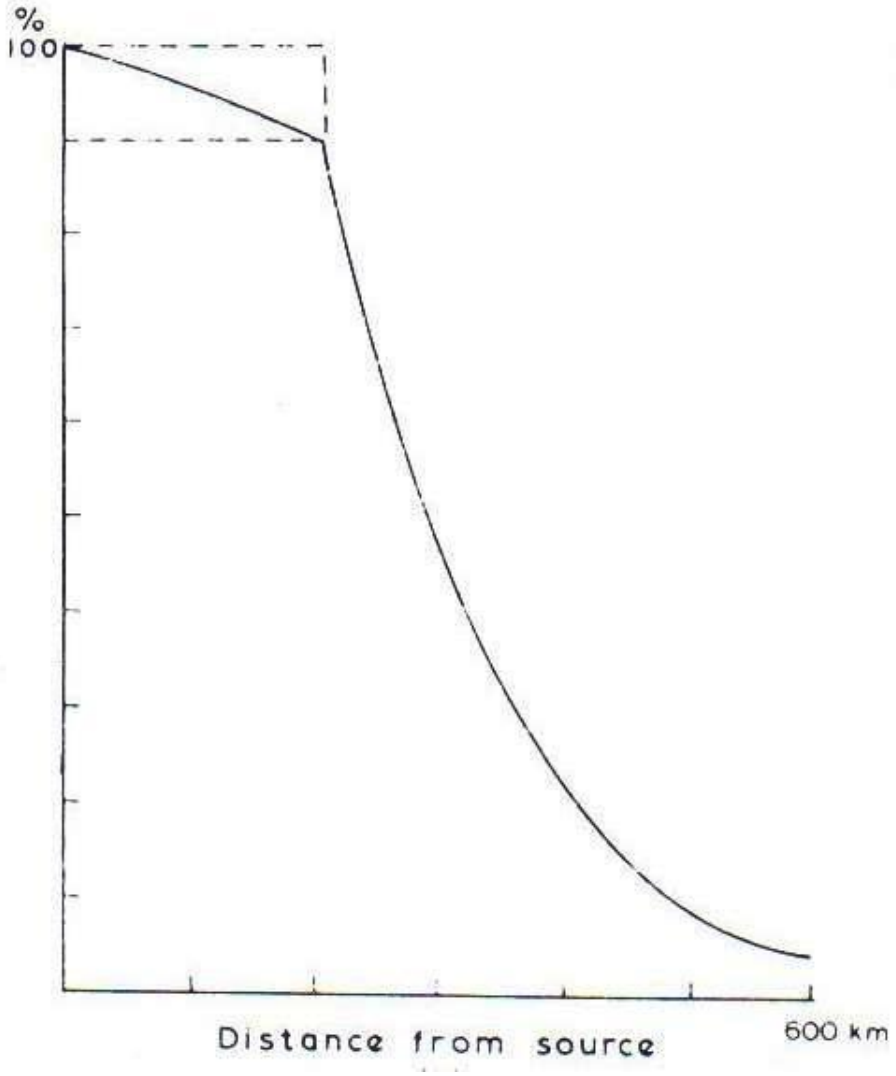
Figure 7.7 Rôle of Central Places in Long Distance Exchange



(After Morley, 1996:168, Figure 3)

In addition to helping explain the gravitational attraction of consumers to particular market centres, central-place theory also offers some clues as to the distance urban merchants may have willingly travelled to reach potential customers, thereby setting limits to the size of the prospective 'market area' for each supplier. Renfrew (1977:78) suggested the value of the items being offered would determine a market's geographical size and that this fall-off in sales may be presented visually in the form of a 'distance-decay' curve.

Figure 7.8 Distance-Decay Model of Predicted Market Areas



(After Renfrew, 1977:78, Figure 4a)

The geographical distributions of a wide range of Romano-British pottery types have been traced, including, *inter alia*, two distinct varieties of black-burnished wares (Farrar, 1973; Williams, 1977, Allen & Fulford, 1996), Crambeck wares (Evans, 1989), Dales ware (Loughlin, 1979), *mortaria* (Hartley, 1973), New Forest wares (Fulford, 1975), Oxfordshire wares (Young, 1977) and Severn Valley wares (Webster, 1977). In addition to these specialist surveys, Tyers (1996; 2012) has produced detailed maps showing the distributions of each of these groups. The only studies which focus on the 'marketing' of Romano-British pottery, however, are those by Fulford (1973), Fulford & Hodder (1974) and Hodder (1974b; 1974c).

While intra-provincial transfers of the kind outlined above lie beyond the aims of the present study, they are clearly a source of parallel investigation and it is hoped that the supply-chain model developed in this thesis may be used to address some of the outstanding questions concerning the marketing of these wares as part of a post-doctoral investigation.

The market areas for higher value items such as wine, oil and tablewares tend to be considerably more extensive than the types of domestic pottery covered in these studies however. This is an issue to which we will return when the ceramic case studies are considered in Chapters 8-11.

7.3.3 Towns as Consumption Centres

A second area of anthropological interest which overlaps our investigation is the notion of the consumer-city. The concept of the ancient city as primarily a centre of consumption rather than production relates to the structure of the Roman economy, which as we saw in Section 3.4 was dominated by a social élite whose interests focused on household production and self-sufficiency. As the wealthiest members of Roman society usually spent part of each year at their urban residences to provide an opportunity to display their wealth or

indulge in social and political pursuits, resources needed to be transferred from the countryside to the towns to maintain them during this period (Jones & Wacher, 1987:37). Such resources may have been acquired directly from their own estates or purchased with revenue obtained from rents imposed on their rural tenants (Kehoe, 2007:546). Viewing élite behaviour of this kind from a substantivist position Finley (1979) declared:-

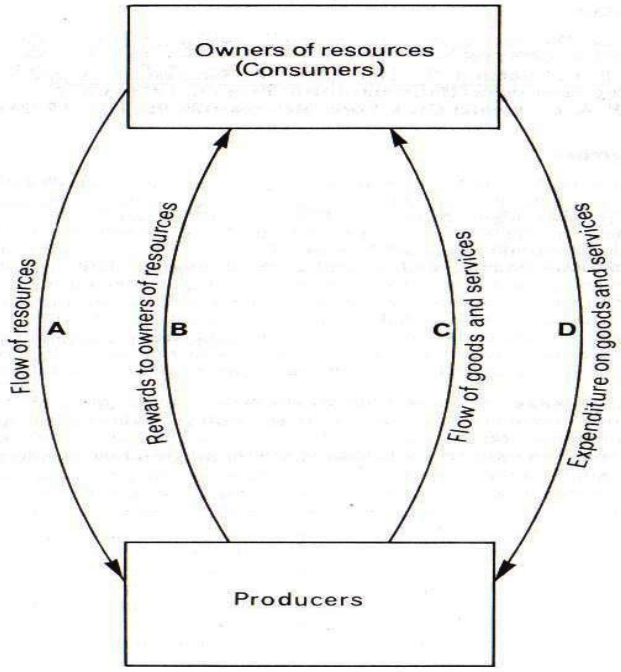
> "All residents of a city who are not directly engaged in primary production derive their food and raw materials from the producers in the countryside. All cities are in that sense centres of consumption."
>
> (Finley, 1979:125)

Testimony of the 2nd century physician Galen suggested that in some years the scale of urban demand left inadequate food supplies to sustain the rural population and cities behaved parasitically towards their country neighbours (Galen, *de Probis Pravisque Alimentorum Succis,* cited by Salway, 1985:71-72). In this respect cities are seen not as production centres, but as centres in which a small affluent élite indulged in various forms of conspicuous consumption (Gleason, 1999:82-83; Kehoe, 2007:550). The way in which the wider population contributed to aggregate demand is ignored though, if we see Roman cities as places which catered only for the needs of the élite. But as Morley (2007a) reminds us:-

> "All of these activities gave employment to the craftsmen and other workers, whose needs also had to be supplied: urbanisation creates consumers, in the sense of people who rely on others to produce their food and on systems of distribution."
>
> (Morley, 2007a:50)

We recognize today that producers and consumers are each part of a circular flow, however, in which consumers' spending represents producers' income.

Figure 7.9 Circular Flow of Income



(After Livesey, 1986:5, Figure 1.1)

The link between income and expenditure would apply even in an economy in which independent craftsmen predominated and where wage-labour had not yet become the norm. The spending power of these consumers would have been far more modest than those of the élite and a large proportion of artisan expenditure was presumably on essentials rather than luxury items. In contrast, their numbers will have been considerably greater than their richer neighbours. Even low-level demand by the general population for products such as olive-oil, wine or tablewares may have contributed to the economies of scale on which merchants relied to reduce their transaction costs and stimulate further trade (Bowman & Wilson, 2009b:56).

7.4 MARKET INFRASTRUCTURE

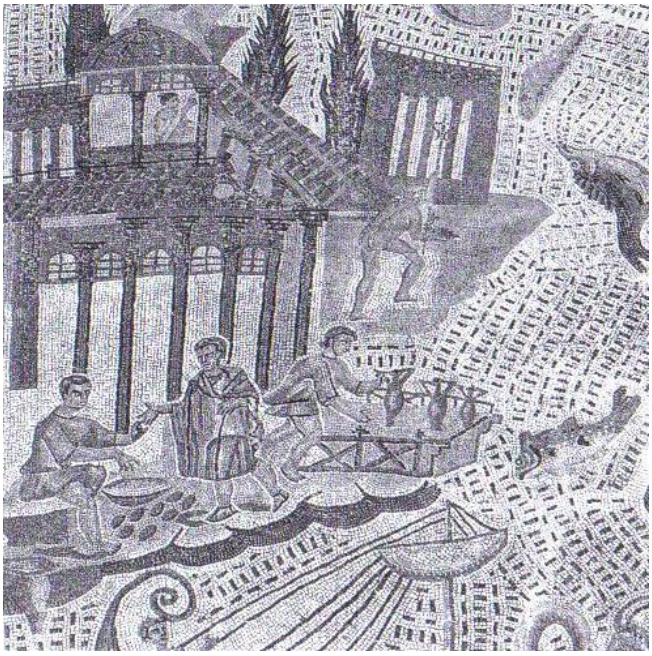
Access to the urban markets which began to develop in the post-conquest period may also have become much easier. Colchester (*Camulodunum*) probably continued to be an important entry gateway for civilian imports at this time, while Richborough (*Rutupine*) is thought to have been the main entry gateway for most military supplies. Following the Boudican revolt of AD 60/61, *Londinium* seems to have replaced *Camulodunum* as the major import centre (Roscams, 1991:68; Millett, 1996:34; Creighton, 2006:94).

While urbanization may have been slow to take hold in Britain in the post-conquest period, merchants would still presumably have been able to access the civilian markets which developed around the major legionary fortresses in places like Exeter (*Isca Dumnoniorum*), Lincoln (*Lindum*) and Gloucester (*Glevum*), via military supply-chains that served these locations (Webster, 1988a). Continental export merchants may have restricted their activities to the ports through which goods entered Britain however, as a network of retail contacts would need to have been established and maintained if they wished to extend their involvement beyond this point. Quayside warehouses existed at most ports to enable local retailers, or the itinerant merchants who served the provincial markets, to obtain stocks of imported wares. A scene of this kind is depicted in the *Oceanus* mosaic at the Roman villa in Bad Kreuznach (Rheinland Pfalz) in Figure 7.10.

Figure 7.10 *Oceanus* Mosaic from Bad Kreuznach, near Mainz

(After Dominguez & Jiminez, 2014:203, Figure 1)

Figure 7.11 Quayside Market shown on the *Oceanus* Mosaic



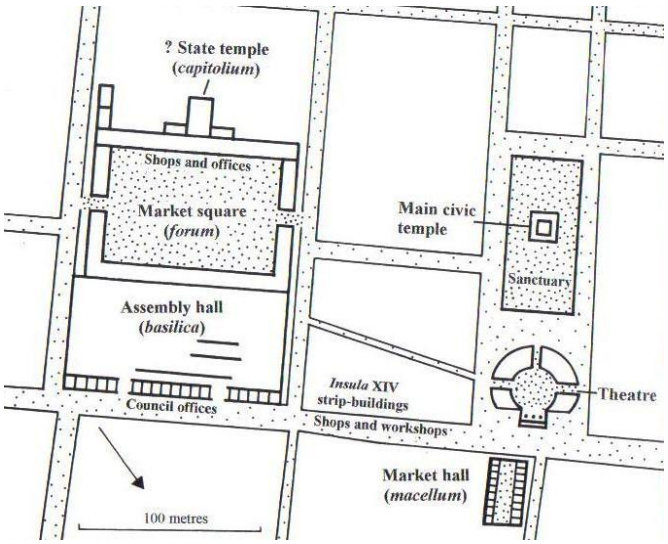
(After Holleran, 2012:69, Figure 2.1)

As products reached the retail stage in the supply-chain and diffused into the civilian community the difficulties we face in trying to understand the way in which markets operated in antiquity increase significantly. Three main types of retail outlet are known to have existed, at least in some of the larger Romano-British urban centres:-

1/ Dedicated market-halls (*macella*)
2/ Roadside 'strip-buildings' with shop frontages (*tabernae*)
3/ Temporary stalls, often in a town's market square (*forum*)

All these facilities can be identified on the plan of St Albans (*Verulamium*) illustrated in Figure 7.12. The function of each will be explored using the structures at *Verulamium* as exemplars of the way in which these outlets may have served similar urban communities at this time.

Figure 7.12 ***Forum*, Market-Hall (*Macellum*) & Shops at *Verulamium***

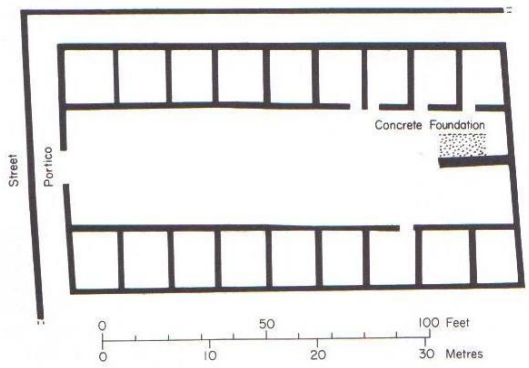


(After Faulkner, 2001:34, Figure 14)

7.4.1 *Macella*

Permanent market-halls (*macella*) tend only to occur in larger urban centres. Cirencester (*Corinium Dobunnorum*), Leicester (*Ratae Corieltauvorum*) and Wroxeter (*Uriconum Cornovorum*) provide further such examples (Wacher, 1974:60). The internal structure of *Verulamium*'s *macellum* is fairly typical with individual booths, situated around a courtyard (Frayn, 1993:106-107).

Figure 7.13 **Plan of the Market-Hall (*Macellum*) at *Verulamium***

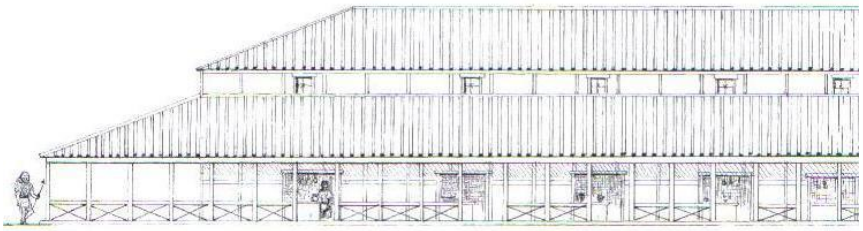


(After Wacher, 1974:52, Figure 10)

7.4.2 Shops

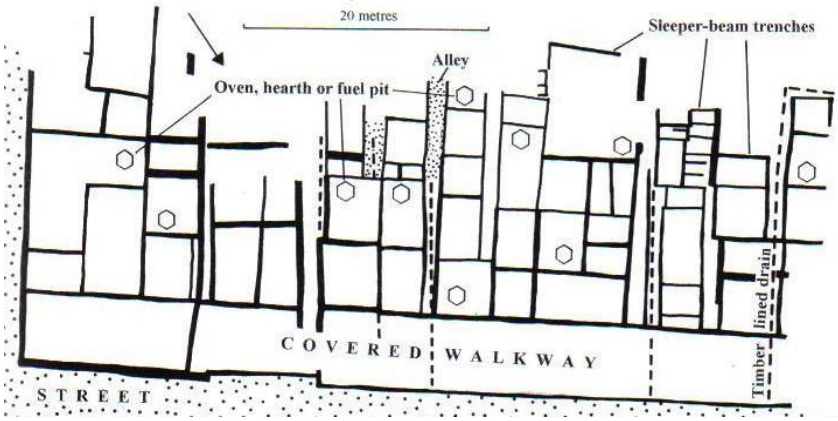
Masonry or timber framed structures, which are commonly thought to have been shops, line the principal streets of virtually every Romano-British town (Wacher, 1997:120). Strip-buildings of this kind generally have their narrow axis parallel to the street to provide a shop-frontage and sometimes have an exterior colonnade in which goods could have been displayed (Burnham & Wacher, 1990:45; Esmonde Cleary, 1990:75). *Verulamium* again provides examples of these structures, a front elevation and plan of one such arcade being illustrated in Figures 7.14 and 7.15:-

Figure 7.14 Elevations of Strip-Buildings in *Insula XIV* at *Verulamium*



(After de la Bédoyère, 1991:143)

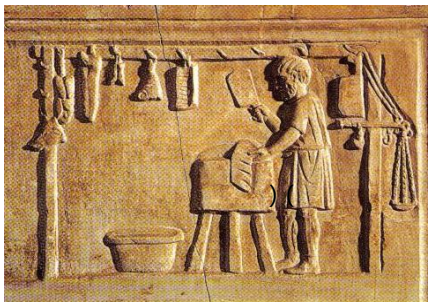
Figure 7.15 Plans of Strip-Buildings in *Insula XIV* at *Verulamium*



(After Faulkner, 2001:33, Figure 13)

While it is not always easy to determine the specific goods that a particular shop stocked, on occasions structural features such as ovens, or rubbish pits from the garden plots which are often located behind these buildings, may provide a clue to this (Wacher, 1979:82; Alcock, 1996:79). An open shop-front, which is typical of these buildings, is shown in the illustrations of the Roman butcher's shop in Figure 7.16.

Figure 7.16 Images of a Roman Butcher's Shop



(After Liberati & Bourbon, 2005:62)

(After Alcock 1996: Plate 7)

7.4.3 Market Stalls

Temporary market stalls may also have been set up around a town's central *forum*, where weekly (*nundinae*) markets would be held (Wacher, 1979:82; Frayn, 1993:37). This was the time at which the market-hall (*macella*) and stall markets situated in the central marketplace (*forum*) would probably have been most active, as the illustration of a market-day at *Verulamium* reproduced in Figure 7.17 illustrates. While temporary stalls of this kind leave few archaeological traces, their presence can often be inferred by other means, such as the telltale patterns of coin-loss which are sometimes found in this type of location (Jones, 1991b:59).

Figure 7.17 Reproduction of an Alan Sorrel Painting Showing a Market-day Scene in the *Forum* at *Verulamium*

(After Sorrell, 1976:40 reproduced as Faulkner, 2001: Plate 5)

7.4.4 Rural Markets and Fairs

While many export merchants probably passed their wares on to retailers to complete the final link in the supply-chain, the possibility remains that some traders may have chosen to continue their involvement through to the point at which their products reached one of the small towns or fairs which served the remoter communities of Roman Britain. It is doubtful that the level of rural demand would have sustained the interest of many merchants however. Whether due to cultural antipathy or lack of income, import penetration was slow to develop in Roman Britain, especially among the civilian population in rural areas. As Jones (1990) points out:-

> "What seems clear is that within the province Roman finds frequently reached native rural sites after the lapse of time and perhaps a generation after conquest."
>
> (Jones, 1990:105-106)

This view is supported by the scarcity of coin finds at civilian settlements near to forts on Britain's northern frontier (Whittaker, 1994:128). In native settlements throughout this region coins are extremely rare (Allason-Jones, 1991:2; Hanson & Macinnis, 1991:87). Conversely, substantial evidence of coin usage is found at rural shrines, many of which may have served as the locations for periodic markets in the late Iron Age and the Romano-British periods (MacMullen, 1982:25; Millett, 1990:290; Potter & Johns, 1992:75).

A religious function is suggested at many of these sites by evidence of small temple-like structures which resemble the Romano-Celtic shrines found in Gaul (Lewis, 1966:4-12). A substantial number of temple-shrines of this type are known to have existed in Roman Britain and many have produced significant coin assemblages.

Figure 7.18 Distributions of Temples and Shrines in Roman Britain

(After Lewis, 1966:205, Figure 130)

While many low denomination coins have been found at these rural shrines, their distribution suggests that most were probably the result of casual losses rather than deliberate votive deposits (Milne, 1931:102). Small-change of this type would have been useful for buying the type of trinkets or religious ephemera which visitors to such shrines may have purchased to donate as ritual offerings (Frayn, 1993:133; Henig, 1995:163).

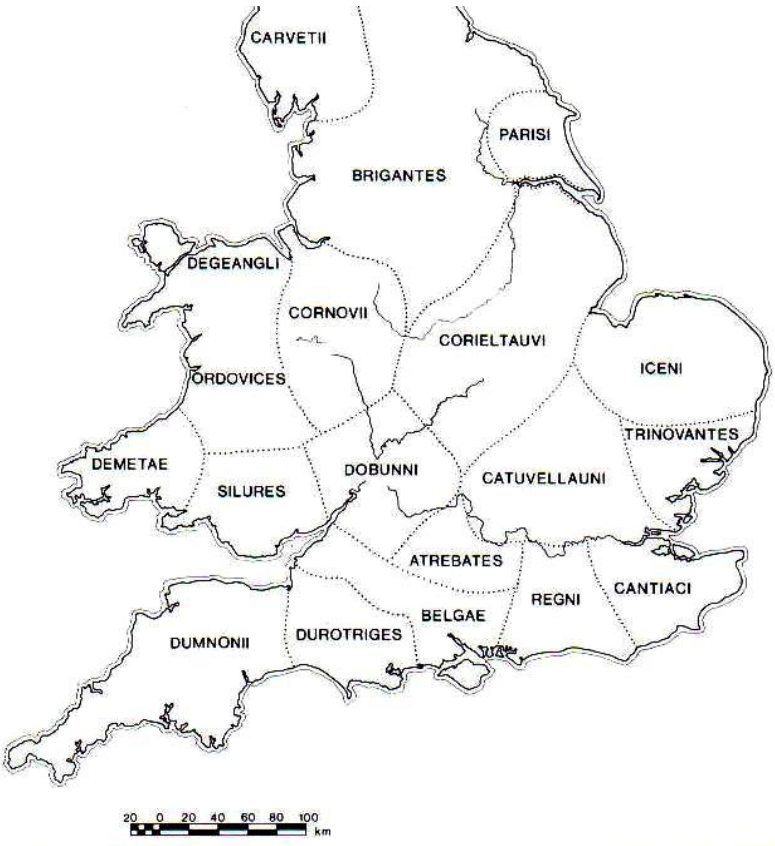
Figure 7.19 Unknown Artists Impression of a Market Scene beside the Rural Shrine at Uley (Gloucestershire)

(Adapted from Woodward, 1992:43, Figure 27)

7.4.5 Markets at Tribal Boundaries

Rural shrines may sometimes have served a wider commercial function, as many are located at tribal boundaries and may have been places where inter-tribal meetings could be held on neutral ground (Berry, 1967:101; Burnham & Wacher, 1990:40). Unlike the socially-embedded exchanges between members of a homogenous tribal community, dealings with members of other tribes are likely to have been transactionally based and approached with much greater caution. In this situation the presence of a powerful deity, near whose shrine such exchanges could have taken place, may have helped engender trust and facilitate inter-tribal exchange (Durant, 1970:117; Hodder, 1979:193).

Figure 7.20 Tribal Boundaries in Roman Britain



(After Millett, 1990:67, Figure 16)

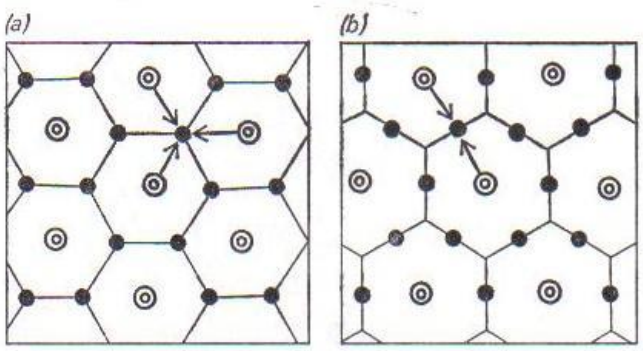
A number of rural shrines have been identified close to such presumed tribal boundaries which may have served this function, as Figure 7.21 shows.

Figure 7.21 Shrines Located at Romano-British Tribal Boundaries

Tribal Boundary	Site	Reference
Atrebates *Belgae*	Waltham (Hampshire)	Cotton (1956:51-54) Burnett (1990)
Atrebates *Catuvellauni* *Dobunni*	Frilford (Oxfordshire)	Bradford & Goodchild (1939) Blagg (1986:21) Hingley (1985:209-210)
Belgae *Dobunni*	Nettleton Shrub (Wiltshire)	Wedlake (1982) Jones & Mattingly (1993:290)
Belgae *Durotriges*	South Brewham (Somerset)	Rivet (1958:156)
Cantii *Regni*	Titsey (Surrey)	Blagg (1986:21)
Catuvellauni *Corieltauvi*	Brigstock (Northants)	Greenfield (1963:240-242) Lewis (1966:84-85)
Catuvellauni *Corieltauvi*	Collyweston (Lincolnshire)	Rivet (1958:149) Knocker (1965:52-63)
Catuvellauni *Dobunni*	Woodeaton (Oxfordshire)	Milne (1931:101-109) Goodchild & Kirk (1954:15-37)
Catuvellauni *Trinovantes*	Harlow (Essex)	Dunnett (1975:115-118) France & Gobel (1985)
Catuvellauni *Trinovantes*	Heybridge (Essex)	Haselgrove (1987a:109)
Catuvellauni *Cornovii* *Dobunni*	Alcester (Warwickshire)	Burnham & Wacher (1990:96) Cracknell & Mahany (1994:253)

Unlike the situation we may expect to encounter in an urban market close to the focal point of a tribal territory, a rural market situated at the interface of two (or more) territories would perform a different central-place function from the simple model we saw in Figure 7.6 (above). For a market located at a point where three tribal territories intersected, as at Alcester or Frilford, the situation shown in Figure 7.22(a) would occur; drawing merchants and customers from each area. Conversely, Figure 7.22(b) shows a rural market at the boundary of two tribal areas and while the central-place focus again switches from the tribal heartland to its boundary, these markets may have been simpler affairs, drawing merchandise and customers from just the two territories involved.

Figure 7.22 Central-Place Functions of Markets Located at Tribal Boundaries



(After Hodder & Orton, 1976:61, Figure 4.5)

Vance (1970:6) and Cunliffe (1988a:6) both remind us that markets which occur in 'central-places' such as small towns or at rural meeting points tend to focus on retail activities. Consequently, the evidence obtained from these locations offers few insights concerning the organization of Romano-British wholesale distribution or the overall structure of long distance supply.

7.5 STANDARDIZED COINS, WEIGHTS AND MEASURES

Consumer confidence is an important prerequisite in the development of any market and the availability of a standardized currency and regulated system of weights and measures are important to this process (North, 1991:99). By providing greater security to merchants and consumers alike, such measures help to lower transaction costs and to stimulate trade (Hitchner, 2005:211; Morley, 2007a:63). As Frayn (1997) also reminds us:-

> "The provision of standard weights and measures was a characteristic feature of Roman market organization and a reminder of the rule of law in commercial transactions throughout the Roman Empire."
>
> (Frayn, 1993:109)

7.5.1 Coinage in the Pre-Roman Period

The use of coinage in Britain predates the Roman conquest and coins had been minted by several tribes in south-east England prior to the Claudian conquest. These mainly took the form of high denomination units, mostly struck in gold or electrum (a gold-silver alloy) and were probably intended to enable wealth to be stored as bullion rather than to form the basis of a conventional currency (Frere, 1974:34; Morley, 2007a:62).

A currency system which contains small denomination coins and enables money to be used as a payment mechanism is a pre-requisite for commercial development and there is evidence that a system of this type had begun to emerge in Britain by the late Iron Age (Frere, 1974:37). Seven tribes, or confederacies, were involved in this process; the *Atrebates / Regni*; *Cantii*; *Corieltauvi*; *Dobunni*; *Durotriges*; *Iceni* and *Trinovantes / Catuvellauni* (Selwood, 1984:191; Van Arsdell, 1989:8). Most tribes adopted the gold

stater as their principal denomination, a coin inspired by an ancient Greek prototype (Scullard, 1979:140; Van Arsdell, 1989:8; Jones & Mattingly, 1993:50).

> "The ultimate origin and inspiration of Celtic coins can be traced to a gold coin (stater) of Philip of Macedon (359-336 BC) portraying the head of Apollo on the obverse and a two-horse chariot on the reverse."
>
> (Mattingly, 2006:68-69)

Among Britain's coin using tribes, the *Atrebates, Cantiaci, Catuvellauni* and *Trinovantes* developed the most sophisticated systems, which included small silver and bronze denominations (Selwood, 1984:191). Roman influence is evident in the monetary development of the tribes which lay closest to Gaul and the *Atrebates* went as far as adopting Mediterranean imagery on some of their coins, a vine leaf being one such motif (Frere, 1974:59; Creighton, 2006:24).

Low value continental coins also entered Britain in the pre-conquest period, (Rodwell, 1976:221; Haselgrove, 1987a:110). Examples are sometimes found at sites which are thought to have served as markets and these may have performed a function in providing small change. *Gallo-Belgic* coins sometimes occur in Essex and Kent (Dunnett, 1975:7; Holman, 2005:38-39), *Armorican* coins appear in Dorset and Hampshire (Langouët, 1984:73; Cunliffe & de Jersey, 1997:89) and Roman *sestertii* and *denarii* turn up at many locations in south and south-east England (Rodwell, 1976:285-286).

While Salway (1993:467) points out that the commercial importance of coinage should be treated with caution, as some pre-conquest coin transfers may represent inter-tribal reciprocal exchanges, the increasing use of small change suggests the development of a monetized economy by the late Iron Age and may be linked to the emergence of consumer markets at this time.

7.5.2 Roman Currency System

The Romans introduced a standardized set of graduated coinage after their arrival and these proved convenient as a tool which could be used in normal commercial transactions (Branigan, 1980:90). Monetary reforms occurred from time to time which changed the structure of the currency, but for much of the Romano-British period a tri-metallic system based on gold, silver and bronze coins operated. These were structured in the following way:-

1 gold *aurieus*	=	25 silver *denarii*
1 silver *denarius*	=	4 bronze *sestertii*
1 bronze *sestertius*	=	4 bronze *asses*

(Adapted from Rathbone, 2009:301)

While Reece (1973:250) points out that small denomination coins appeared to be in short supply in the immediate post-conquest period, local imitations soon began to enter circulation to supplement regular issues. Some, at least, seem to have been officially sanctioned ‘counterfeits’ which were produced by the army to ensure that sufficient ‘small change’ was available to allow the state taxation system to function smoothly. Many low denomination coins issued for this purpose may have subsequently found their way into general circulation and been used in market exchange (Howgego, 1992:18; Reece, 2002:39-40).

7.5.3 Roman Weights and Measures

Roman measuring systems included standardized calibrations of length and of volume; the latter involving both dry and liquid measures. Responsibility

for ensuring the compliance of merchants with these regulations lay in the hands of local magistrates and as Frayn (1993) explains:-

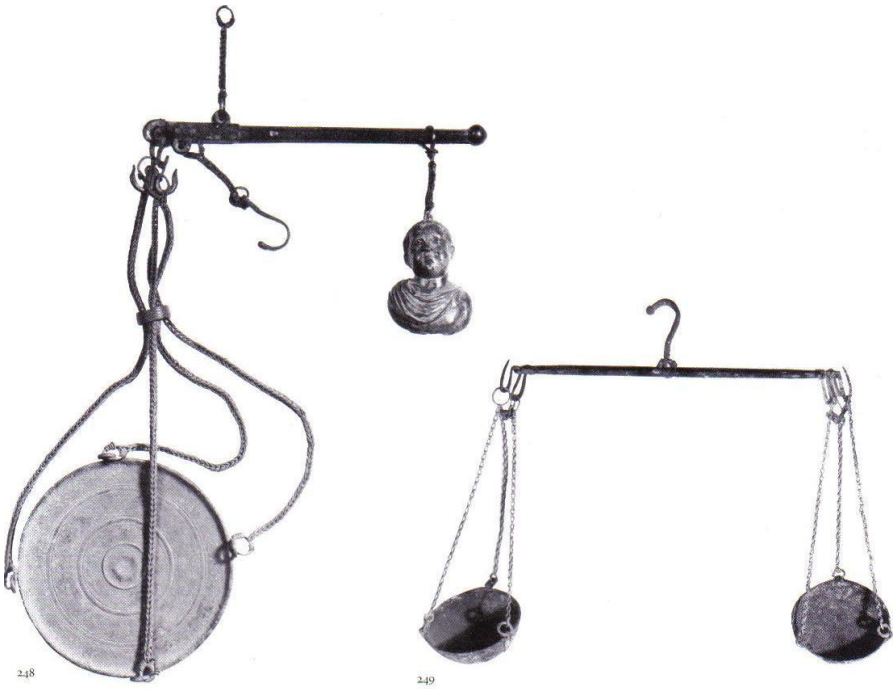
> "One of the most important pieces of equipment usually available in or near a Roman market was the *mensa ponderaria*. This was a stone or marble table with spaces of various sizes into which the correct measures for dry goods could be fitted. Liquids could also be tested in this way ... Some of the *mensae* were also inscribed with measures of length."
>
> (Frayn, 1993:108-109)

The standard unit of length was the Roman foot (*pes monetalis*), measured 11.64 inches / 296 mm and was based on an original kept in the temple of *Juno Moneta* in Rome (Blagg, 1984:251-252; Wacher, 1997:101). British examples of Roman foot-rules (*regulus*) have been found at various sites, including Caerleon, Colchester and Wilderspool (Ward, 1997:218).

The standard measure of weight was the Roman pound (*libra*) which had a mass of 327.45 grams, or *c.*12 imperial ounces (Cowell, 1973:50; Branigan, 1980:93). This is one third less than its modern equivalent of 454 grams /16 ounces (Allason-Jones, 2008:22).

A convenient way to measure dry goods by weight at either temporary or permanent market stalls would have been by means of a device such as a portable scale-beam, of the kind illustrated in Figure 7.23. Several of these instruments have been discovered in Britain, along with the weights which would have been used with them, as Figure 7.24 shows. A number of these items have been found at roadside settlements and point to the rôle played by small towns and rural markets in commercial exchange (Smith, 1987:84).

Figure 7.23 Roman Weighted Steelyard and Scale-balance from Pompeii



(After Ward-Perkins & Claridge, 1976:248, Figures 248 & 249)

Figure 7.24 Roman Steelyard Weight Cast in the Image of Mercury

(After Branigan, 1980:93)

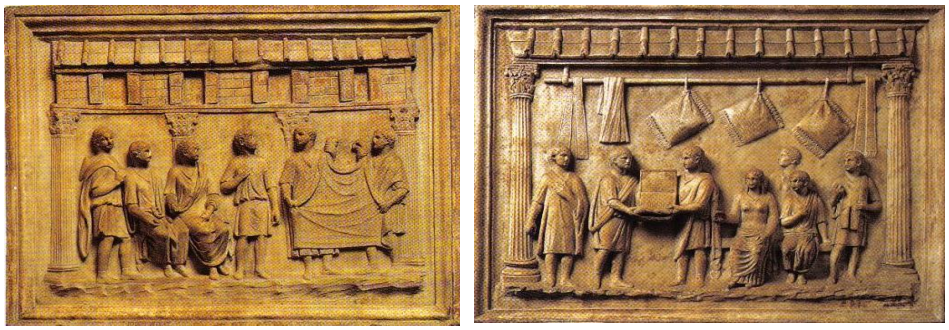
The weights used in association with these scale-beams were often cast in the form of a Roman god such as Baccus, Isis or Mercury; or as effigies of members of the imperial household, presumably as a mark of their sanctity and integrity (Henig, 1995:179).

Dry measures of volume are represented by the *modius*, which contained an equivalent of 8.732 litres (Cowell, 1973:51). Liquid measures, meanwhile, were based on the Roman *sextarius*, which was equal to 0.54 litres, a shade less than an imperial pint's 0.568 litres (Frayn, 1993:109).

7.6 CONSUMER BEHAVIOUR AND MARKET SEGMENTATION

While archaeological evidence provides us with a clear picture of the kind of infrastructure we might have found in many Romano-British markets, the consumer behaviour which accompanied these transactions remains much more elusive. It is clear that personal selling was important in some retail settings, as the images of Roman textile shops in Figure 7.25 show.

Figure 7.25 Personal Selling in Roman Textile Shops



(After Liberati & Bourbon, 2005:63)

7.6.1 Consumer Behaviour

Although knowledge of the nature of Roman retailing activities would be fascinating, unfortunately such features are generally irrecoverable as they leave so few physical traces. The images we do have clearly suggest that retailers treated their customers with respect and considered their patronage important however. Details of the personal relationships involved remain inaccessible to us though and we can only speculate as to the nature of their dealings.

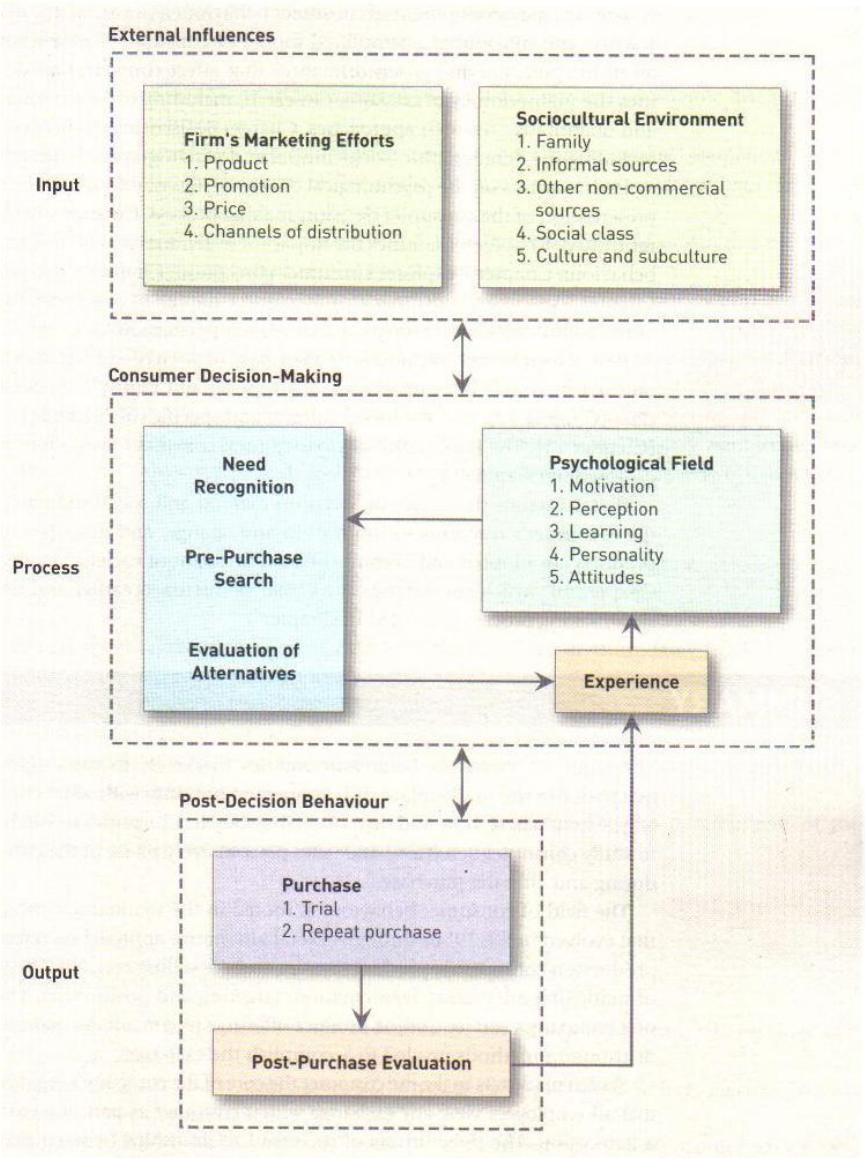
If parallels may be drawn between Roman consumers and those of today, Lawson (2000) identifies the most important biological features of modern consumer behaviour as being:-

- motivation
- perception
- learning
- attitudes
- personality
- social status

(Lawson, 2000:134)

Behavioural psychology is an area of the social sciences whose application may help us to understand customers' decision making processes (Foxall, 2000:86). The danger in attempting to use this kind of technique is that even the most sophisticated Roman consumer would have been utterly bewildered by even a simple consumer behaviour model of the type shown in Figure 7.26.

Figure 7.26 Simple Consumer Behaviour Model



(After Schiffman *et al*, 2012:15, Figure 1.1)

Our familiarity with Roman Britain makes it easy to overlook the fact that our predecessors not only lived in a much more traditional way, but also saw the world through a very different perceptual lens from the one we use today (Millett, 1995:31). In particular, material acquisition, which may often be a driving force for modern consumers, is unlikely to have been a motivational factor in Roman times (Fusfield, 1957:345). As Salway (1993) reminds us:-

> "We are, moreover, dealing with a world that, though highly sophisticated, worked in such a different way from our own that many of the commonplaces of modern economics are largely irrelevant."
>
> (Salway, 1993:430)

Rational behaviour need not be based primarily on economic or commercial criteria though and we must allow for the possibility that Roman consumers were motivated by stimuli that we can no longer identify (Finley, 1965:31; Hopkins, 1983b:95). We must therefore be willing to adopt an analytical approach which goes beyond our own modern ways of thinking if we hope to understand Romano-British consumer behaviour (Salway, 1985:68).

It is equally important to remember, however, that not all Romano-British consumers were identical. Millett (1995:32) reminds us that Roman Britons were a very diverse group, both individually and collectively. In the early post-conquest period, in particular, significant cultural variations have been discovered between the 'native' and 'romanized' populations at a number of important urban settlement sites (Willis, 2011:207).

One illustration of this is evident from the ceramic preferences displayed by different segments of the population at both Colchester (*Camulodunum*) and Gloucester (*Glevum*). At Colchester, a high proportion of imported *Gallo-Belgic* tablewares occur on the extra-mural site at Sheepen, which are quite unlike the contemporary fineware assemblage found at the nearby *Colonia Victricensis*. A strong case has been made to suggest that this may point to the existence of parallel communities in these adjacent locations during the pre-Flavian period. If this scenario is correct, Sheepen may be seen to have housed a 'native' population which maintained strong trading links with the continent, while the *colonia* held a 'romanized' population whose ceramic preferences were for *Gallo-Roman* rather than *Gallo-Belgic* wares (Pitts &

Perring, 2006:206-207). At Gloucester, meanwhile, an extra-mural 'native' settlement beneath the later Roman town produced a ceramic assemblage dominated by local Severn valley wares, in clear contrast to the nearby Kingsholm fortress where imported *Gallo-Roman* finewares were the norm (Darling, 1977:66; Hurst, 1985:125).

Urban communities seem, in general, to have been willing to adopt Roman material culture quite quickly (Saddington, 1991:413; Morley, 2007a:94). Merchants may soon have experienced an undifferentiated market in which consumers' possessed common material requirements and displayed similar purchasing preferences (Palmer, 2004:165; Schiffman *et al*, 2012:39). Such a situation may have provided the opportunity to introduce a standardized retailing approach, even in a traditional market during the early stages of its development.

7.6.2 Market Segmentation

Market segmentation is the process of dividing prospective customers into specific groups on the basis of their personal or behavioural characteristics to enable organizations to target each segment with 'product offers' which they believe may appeal to them most (Solomon *et al*, 2002:8; McDonald & Dunbar, 2004:37). As Croft (1994) explains:-

> "The idea of dividing up a market into homogeneous segments and targeting each with a distinct product and/or message is now at the heart of marketing theory."
>
> (Croft, 1994:1)

Whether Romano-British retailers ever employed an approach of this kind is extremely questionable, although Mattingly (2006) recognizes the potential for a segmentation strategy to have existed when he observed that:-

> "Various factors can be suggested as bearing on individual and group identity in the Roman world: status; wealth; location; employment; religion; origin; proximity to the imperial government; legal status and rights; language and literacy; age and sex."
>
> (Mattingly, 2006:18)

Given the limited sophistication of the Romano-British economy, only age, gender, employment status and disposable income stand out as being criteria merchants might have focused on in their commercial dealings (Rostovtzeff, 1957:177; Liversidge, 1973:169; Garnsey & Saller, 1987:138). Of these, disposable income is likely to have been the key consideration for suppliers of imported luxuries such as wine, oil or prestige tableware.

In an era when advertising was rare and branding almost unknown, products are likely to have been seen as generic commodities (Christopher, 2004:26). In this situation issues such as product availability, quality and price become the chief consideration for a potential purchaser (Schiffman *et al*, 2012:3). The strength of the personal relationships which are built up between buyers and sellers tend to fill the vacuum which brand identity would provide in the modern marketplace. Personal trust would have been particularly important in an era when the quality of imported bulk commodities such as oil or wine may have been highly variable and the contractual risks of purchasing goods fell on the buyer, as Roman law adopted a maxim of 'let the buyer beware' (*caveat emptor*), (Frayn, 1993:118-119).

7.7 DEDUCTIONS

While some aspects of consumer behaviour may be regarded as universal, it is still important to recognize that purchasing decisions take place within a specific cultural context. The further we move in time or distance from the markets we operate in today the greater the possibility becomes that we will

be faced with cultural and commercial practices which are different from our own. In this case, Romano-British customers probably adopted what we would consider to be a very traditional approach to exchange, more akin to the practices that might have been adopted by early-modern consumers or the methods we may expect to find in an emerging market today (Cavusgil *et al*, 2002:112; Samli, 2004:82-83).

Evidence suggests the vast majority of the Romano-British population lived in rural locations, with only 6.5% being urban residents (Millett, 1990:185). Income distribution was also polarized. While most of the population lived at, or just above, subsistence level; a tiny land-owning élite possessed vastly greater wealth. This *status quo* was maintained by an economy which was oriented towards self-sufficiency, in which an élite transferred resources between their estates and urban residences via a closed-cycle rather than by market exchange. Exceptions to this arrangement mainly involved produce which was not available from estate-owner's own resources, or by means of expenditure on prestige items which could then be used in demonstrations of conspicuous consumption to enhance the social status of those concerned.

The principal civilian targets for merchants trading in oil, wine or quality tablewares would have been the households of the urban élite, whose high disposable income and affluent lifestyle generated a significant demand for luxury products of this kind. Secondary targets might have been found in civilian towns and military *vici*, although the demand generated by residents in these locations is likely to have been smaller and less frequent than that of their richer counterparts.

Retail sales appear to have taken place through a variety of outlets, which ranged from dedicated market-halls (*macella*), through to permanent shops and temporary market-stalls. The behavioural nature of these exchanges remains unclear although personal trust-based relationships are likely to

have figured heavily, especially in an era when techniques like advertising and branding, or the notion of consumers' rights, had yet to be developed.

7.8 EMPIRICAL EVALUATION

So far our investigation has primarily been concerned with developing the analytical model of the supply-chain. This has now been completed and the rôles of each of the principal participants have been explored with the aid of product examples. If we are to achieve our aim of understanding the forces which drove these exchanges, however, we need to consider the empirical evidence from a range of strategically important products to see what these tell us about the part each supply-chain member played in their distribution.

We know from the archaeological record that a wide range of goods such as glass, metalwork and ceramic pottery reached Britain in the Roman period, although many perishable items that undoubtedly accompanied these items have sadly left no trace (Fulford, 1984:135). Pottery stands out from this list as a useful research tool, however, since its durability allows it to survive in sufficient quantity to provide useable data (Fulford & Huddleston, 1991:40).

Four major ceramic forms have been chosen as case studies for the next part of the thesis; their selection having been determined by their prominence in the archaeological record which has enabled their movement to be clearly traced through each stage of the supply-chain. These items are:-

1/ Wine *amphorae* (*c.*150 BC-AD 50) - Chapter 8
2/ Olive oil *amphorae* (*c.* AD 1-250) - Chapter 9
3/ Samian tableware (*c.* 50 BC-AD 270) - Chapter 10
4/ Rhenish drinking beakers (*c.* AD 150-270) - Chapter 11

CHAPTER 8

WINE SUPPLY

8.1 INTRODUCTION

The supply of wine to late Iron Age tribal élites in pre-conquest Britain is a subject that has intrigued historians and archaeologists for many years. It is possible to trace its distribution by means of the distinctive *amphorae* which were used to transport this beverage, for while the wine itself was consumed and leaves no visible traces, the *amphorae* in which it arrived often survive, even if only as recognizable fragments.

8.2 INVESTIGATIVE APPROACH

Wine began to reach southern England in small quantities perhaps as early as 150 BC, with imports continuing through to the conquest and beyond (Sealey, 2009:3). The early phases of wine supply differ greatly from the regular distribution which developed after the mid 1st century AD however, and imports may be tracked through four main phases (*c*.120-56 BC / 56-10 BC / 10 BC-AD 43 / AD 43-270). Over time supply switched between a number of different entry-points as political and trading alliances gradually evolved.

Before considering the detailed characteristics of supply-chain activities in each of these periods however, it would be useful to remind ourselves of the core involvement of the wine producers, state administrators, merchants and consumers throughout this period. This may help us to understand the key differences between each supply phase as these are examined. The standard

approaches adopted by each of the supply-chain members will be considered in the order in which these were presented in Chapters 4-7; beginning with the interests of the producers.

8.2.1 Producer Involvement

Grape production presented many challenges to early agriculturalists, yet it proved to be an extremely profitable venture for many estate owners when compared with the alternative crop choices then available (Duncan-Jones, 1974:33-59; Sealey, 1985:15). A useful summary of the classical sources relating to viticulture is provided by Rossiter (1981:346-353).

8.2.1.1 Producers' Commercial Interests

We have seen in Section 4.3 that vineyard owners generally considered wine production to be a matter of secondary importance, beyond the level needed to satisfy their own requirements (Whittaker, 1985:62; Laurence, 1998:139). The way in which landowners sold surplus grapes to private contractors to avoid direct involvement in wine production has likewise been discussed in Section 4.4.1.

Whether landowners took any interest in marketing the resulting vintage or left this entirely to the contractors remains unclear, although it is interesting to note that both Columella and Varro avoid any discussion of marketing in their agricultural treatises (Morley, 1996:159; Rosenstein, 2008:19). Tasks of this kind would presumably have been conducted at arms-length through friends (*amicitia*) or freedmen to minimize the risk of social stigma.

8.2.1.2 Producers' Involvement in Wine Supply

If Roman vineyard owners had no direct involvement in commercial wine production beyond the point at which their grapes were sold to independent contractors, they are unlikely to have played any part in the development of the supply-chain through which this wine reached Britain.

8.2.2 State Involvement

The state clearly had an interest in ensuring the availability of resources to meet its own needs and as Rome's territorial interests expanded during the late Republic and early Empire, additional supplies will have been required to meet the growing military and logistical needs of the developing frontier regions (Fulford, 1992:296). We have seen in Section 5.2.4 how wine was an important component of the Roman soldiers' diet and this was therefore an item that would have been involved in long distance supply.

8.2.2.1 Diplomatic Gifts and Trade Alliances

In addition to engaging in periodic bouts of military expansion and a more sustained policy of developing mutually beneficial trading contacts with its neighbouring states, successive Roman emperors appear to have recognized the value of establishing diplomatic relations with local client-kings, to help secure access to a range of valuable resources such as metal, grain, livestock and slaves (Haselgrove, 1982:80). Highly prized commodities such as wine are likely to have been among the items Rome used to obtain these resources (Tchernia, 1983:99-100; Braund, 1984:79-81).

8.2.2.2 State Involvement in Wine Supply

Any direct involvement the Roman state may have had in the supply of wine seems likely to have been undertaken for strategic reasons. This would have involved guaranteeing the availability of this important beverage to the army and using wine as a commercial bartering tool.

A question remains as to whether the military were directly involved in the distribution process, or whether this task was sub-contracted to *publicani* or *negotiatores*. As we saw in Section 5.5, the overriding importance of secure military supplies made it unlikely that the state would ever have surrendered control of this vital task. The state therefore represents a potential force in the wine supply-chain, even if its influence was intermittent and exercised only in times of shortage; for example, after poor harvests or during periods of imperial expansion.

8.2.3 Merchant Involvement

Relatively little mention is made of merchants in classical literature, as their activities presumably failed to interest Roman audiences (Finley, 1979:59). Accounts which do refer to them include a range of titles, such as *apparitor, diffusor, mercator, navicular* and *negotiator* (Whittaker, 1985:55). The use of such a wide variety of terms implies that a number of distinct specialisms existed in the rôles merchants performed and that readers would have been familiar with these distinctions. *Mercatores, navicularii* and *negotiatores* are the three categories that stand out as being the most important in relation to long distance supply. Each of these specialist rôles have been described in section 6.3.

8.2.3.1 Wine Production and Bottling

The opportunity for merchant involvement in the wine production process was identified in section 4.4 and it is important to reiterate the pivotal rôle they played in commercial wine production. A 4th century mosaic from the church of *Santa Costanza* in Rome depicts the harvesting and treading of grapes, a task which Cato reminds us was often delegated to independent contractors.

Figure 8.1 Grape Harvesting and Treading in the 4th Century AD

(After Harris, 1980:223)

While it is still unclear how widespread the use of these merchants was, a clue may be provided from the stamps and painted inscriptions (*tituli picti*) which are sometimes found on *amphorae* and often enable us to identify the origins, dates and contents of these vessels. A degree of caution is needed, however, as Manacorda (1978:126) reminds us that much uncertainty still surrounds the issue of who marked these *amphorae* and the purposes such markings served. Peacock & Williams (1991) agree, noting that:-

> "Many *amphorae* were stamped on the handle, spike or body, but there is some question whether these were the marks of the potters who made the amphorae or of the estate where they were filled ... Clearly practice may have varied in different parts of the empire, but the balance of opinion at the moment is in favour of the stamps representing the estate owner rather than their subservient potters."
>
> (Peacock & Williams, 1991:9-10)

The impressed marks which were stamped into the body of an *amphora* can only have been applied before the vessel was fired and must therefore have been added during the manufacturing process (Twede, 2002:104). As such, they are likely to relate to the potter who made the vessel, the customer for whom it was produced, or the estate where it was manufactured (Paterson, 1982:156). If the contractors hired to harvest the grapes and produce the wine supplied their own *amphorae*, as Yaron (1959:177) suggested, then a link between the manufacturing stamps and the first stage of the distribution cycle may be established.

Similarly, *tituli picti* painted on the necks and bodies of *amphorae* are now widely thought to relate to the vessel's contents, while similar devices found on the neck-bungs, or stoppers, may refer to the wine merchant (*negotiator*) or shipper (*navicularius)* who distributed these (Fülle, 1997:115). As these stoppers were often made from perishable material like wax, wood or cork they unfortunately seldom survive.

The apparent lack of correlation between *amphorae* stamps, painted *tituli picti* and stopper-marks recovered from shipwreck assemblages implies that the successive stages in *amphorae* manufacture, charging and shipping were carried out as independent operations, rather than as part of a unified process (Aubert, 1994:271). This suggests that production and distribution involved little vertical integration and individual specialists were probably involved at

each stage, adding their own marks to the *amphorae* before passing them on to the next link in the supply-chain.

8.2.3.2 Transport and Distribution

The efficient transmission of goods over long distances requires specialist skills, as well as access to individuals with appropriate capital and contact networks (Vance, 1970:11). While it remains unclear whether the Roman state possessed a transport fleet of its own, no such doubts exist concerning the existence of civilian cargo vessels or the capacity of independent traders to move official supplies. The *navicularii* and *nautae* were each recognized as specialists in the field of distribution, the former being ocean traders and the latter river boatmen (Broekaert, 2013:153). Both groups operated in close association with *negotiatores* and *mercatores*, as we saw in Section 6.3.

It is important to remember, however, that the state would have maintained control of military wine supplies, even if civilian merchants were hired to undertake their distribution. The amount of wine required each year would have been enormous and Tchernia (1983:92) estimates that 50,000-100,000 hectolitres of wine *per annum* may have been shipped from Italy to Gaul during the 1st century BC. An export contract of this kind would have been very lucrative for anyone fortunate enough to have been able to obtain one. Its value would have been increased still further if linked to the grant of an export monopoly for the route concerned (Tyers, 1996:50).

The possibility that state-appointed contractors gained further benefits by being able to transport secondary cargoes on either a cost-free, or subsidized basis, using state-chartered vessels, has already been noted in section 6.7. This practice may have been common in the case of a commodity such as

wine, where a single amphora could fetch the price of a slave (Diodorus Siculus; *Historia*, v, 26, 2-3; cited by Cunliffe, 1992:36). This was perhaps 50 times the price the beverage would have attained in Italy (Arthur, 1995:242). It is not clear if the state paid much attention to the traders' practice of carrying 'piggy-back' cargoes of this kind and Roman administrators may have been indifferent to this activity as long as their own supply needs were met.

8.2.3.3 Knowledge of Market Conditions

One of the benefits merchants derived from their day-to-day involvement in cross-channel exchange was an up-to-date knowledge of product availability and market conditions in both Britain and Gaul. If a participant has access to specialist information which is not available to other distribution channel members, they may be said to benefit from asymmetric knowledge (Temin, 2013:98). While any channel member may gain a temporary advantage as a result of short-term fluctuations in supply or demand, long-term dominance of a supply-chain is likely to fall to the party who can achieve lasting control over the flow of information or goods through the most crucial parts of the system (Carreras Monfort, 1999:87).

In a physical distribution network, control of this kind may be exerted at a bottleneck through which goods or information must pass. Such places are often referred to as 'choke-points' or 'pinch-points' and occur at such places as provincial borders or at trans-shipment points where goods are transferred between different modes of transport. Evidence of intense merchant activity at *entrepôt* centres in the Roman period therefore offers few surprises (King, 1990:117; Parker, 1992:21-22).

8.2.4 Consumer Involvement

At the end of the supply-chain lay the consumers who were the recipients of the wine itself. As a high value commodity, that was unavailable from local sources, the opportunity to acquire wine would have been possible for only a privileged few (Haselgrove, 1987a:107). In this situation wine would have been seen as a prestigious and 'superior' good (Ferguson, 2002:58).

8.2.4.1 Acquisition Motives

The socially-embedded nature of Britain's Late Iron Age economy, which is illustrated in Figure 3.2 (above), is crucial to understanding the significance of a commodity such as wine, the possession of which would have enhanced the status of the local élite if used in displays of conspicuous consumption (Hodder, 1979:195; Renfrew, 1993:10). Whether obtained via diplomacy or trade, wine would have been useful to tribal leaders as a way of emphasizing status and indicating the political friendships they enjoyed with powerful allies (Mattingly, 2006:84; Sealey, 2009:14).

8.2.4.2 Diversity of Demand

One of the difficulties we face in understanding the nature of wine usage, particularly in the pre-conquest period, is that *amphorae* deposits do not equate directly to evidence of wine consumption, as some of these vessels may subsequently have been re-used after their original contents had been removed (Loughton, 2003:199-200). Carver (2001:3) has studied *amphora* distributions, both chronologically and in different geographical and social contexts. The question of whether the vessels were predominantly intact or fragmentary when deposited and their division between habitation sites and

funerary contexts featured prominently in her analysis. This reminds us that heterogeneous behaviour patterns may have influenced the acquisition and consumption of wine at different periods and that these differences probably shaped consumers' demand characteristics within the supply-chain.

8.2.4.3 Consumers' Involvement in Wine Supply

It is clear that wine was a prized commodity among the Iron Age élites in southern England who had access to supplies of this scarce and valuable beverage. While wine demand may have remained strong, for personal consumption, gift exchange or ceremonial feasting; British tribal leaders were just one of many groups throughout the Roman world demanding a commodity whose output would have fluctuated from year to year.

The influence of 'consumer pull' on the supply-chain varied according to the relative scarcity of wine *vis-à-vis* the competing requirements of the Italian domestic market and other provincial consumers. Even when wine was available, British customers would still have needed something to offer in exchange, presumably in the form of strategic resources which the Roman state or commercial traders desired in return for the beverage. The strength of 'consumer pull' therefore presumably varied in line with the prevailing political and economic situation.

8.2.5 Empirical Evidence

The behavioural features identified above tell only part of the story as far as wine imports are concerned, especially at a time when trading alliances and import patterns were sometimes unstable. To understand the way in which supplies evolved at this time we need to consider each phase of development in turn and analyse the manner in which the supply-chain adapted to these

changes. The starting point for this review must therefore be the arrival of the earliest wine imports.

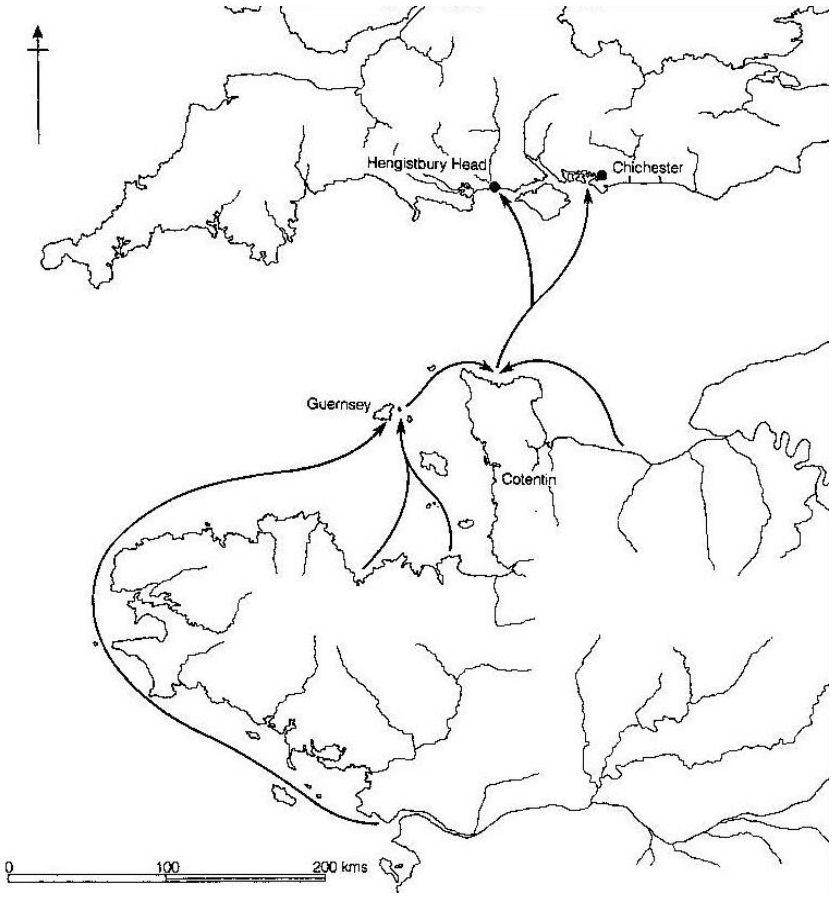
8.3 LATE REPUBLICAN IMPORTS (*c*. 120-56 BC)

8.3.1 Introduction

Wine probably began to reach Britain in small quantities in the mid to late 2nd century BC (Poux, 2004; cited by Sealey, 2009:3). Finds of Dressel type 1A *amphorae*, a container generally believed to have transported wine, have been identified at Hengistbury Head, a site on the Dorset/Hampshire border. Hengistbury Head is situated at a strategic interface between two important tribal territories, at a route-node which gave access to the Wessex heartland (Cunliffe, 2001:404). It provided a convenient landfall for traders carrying goods from Brittany (*Armorica*), as well as the Atlantic sea route (Cunliffe, 1984a:36). This in turn gave access to a transport network which eventually led back to the Mediterranean. Along this route flowed wine from Tuscany, Latium and Campania (Arthur, 1986:241; Loughton, 2009:82).

> "For the Garonne route, Mediterranean cargo was loaded at the port of *Narbo Martius* and taken via the River Aude as far as Carcassone (*Carcaso*) where it was discharged and taken by road transport some 90km to Toulouse (*Tolosa*) for transfer to barges on the navigable river Garonne (*Garumna*). At the confluence with the river Dordogne the Garonne entered the estuary of the Gironde; reaching the port of Bordeaux (*Burdigala*) after 22 km, where cargoes were again transferred, this time to sea going ships ..."
>
> (Jones, 2012:109)

Figure 8.2 Principal Trade Routes in the Late Prehistoric Period



(After Cunliffe & de Jersey, 1997:92, Figure 48)

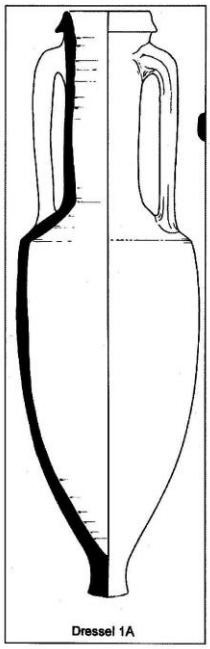
8.3.2 Development of Late Republican Wine Supply

Hengistbury has produced the remains of over 40 Dressel 1A *amphorae*, an assemblage which far exceeds that from any other British site of this period. An illustration and drawing of this type of wine container are shown in Figures 8.3 and 8.4.

Figure 8.3 Images of Two Dressel Type 1A *Amphorae* from Welwyn

(Photograph courtesy of the British Museum)

Figure 8.4 Drawing of a Dressel Type 1A Amphora

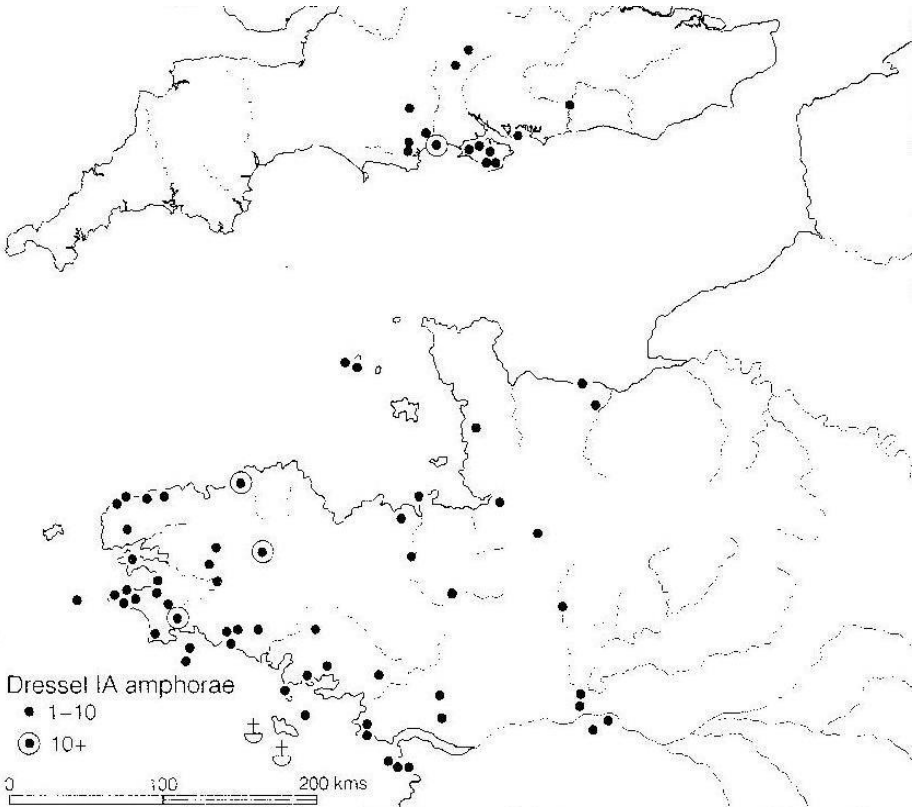


(After Tyers, 2012)

The fact that no complete Dressel 1A *amphorae* have so far been discovered at Hengistbury has led to suggestions that the comparatively high numbers found at the site may indicate that wine was being decanted into barrels or animal-skins for distribution to its final destination (Cunliffe, 1994b:79-80; Carver, 2001:24-25). This would fit in well with the idea that Hengistbury was in fact an early *entrepôt* centre (Cunliffe, 2001:402-403).

Dressel 1A *amphorae* have a limited distribution beyond the Hengistbury peninsular and appear to have travelled no more than about 50 miles, mainly by coastal or river routes (Haselgrove, 1976:40-41; Cunliffe, 1978:68). This reminds us that redistributing imported goods was an important activity for the coastal communities of the region (Cunliffe & de Jersey, 1997:51; Trott & Tomalin, 2003:163).

Figure 8.5 Distribution Maps of Dressel 1A *Amphorae*



(After Cunliffe, 2010:481, Figure 17.28)

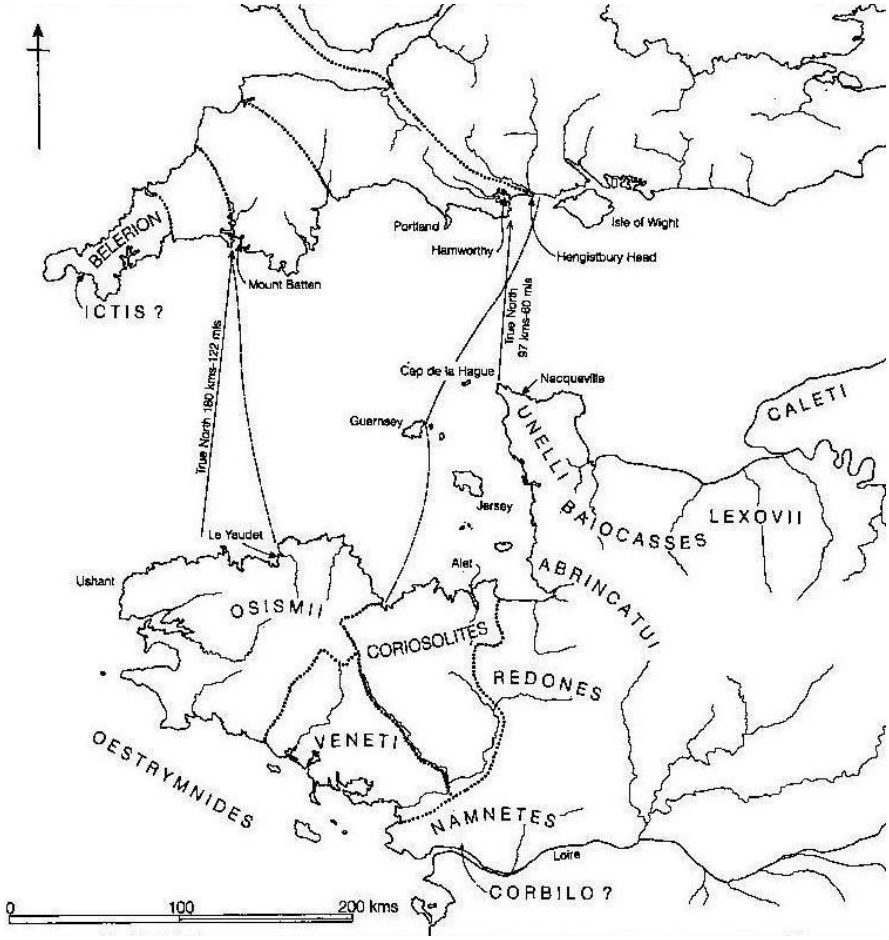
As seen in subsection 8.2.3.2, Roman merchants may have been granted a legal monopoly on any export routes they were awarded, extending their influence far along the provincial supply networks (Tyers, 1996:50). The question of whether a commodity like wine was distributed directly by the merchants' own slaves or freedmen, or was subcontracted to others, remains unclear (Paterson, 1998:162). The grant of an export monopoly presumably related to the management of the supply-system however, and may not have precluded the use of local middlemen in the operational aspects of this work, as long as overall control of the operation remained in Roman hands.

The lack of vertical integration in the distribution system, which we noted in subsection 8.2.3.1, would have avoided the requirement for Mediterranean merchants to establish and maintain an extensive network of contacts which extended to, or beyond, the empire's borders and would support the notion of a devolved supply-chain. Indeed, it has been argued that as long as access to the vital Atlantic trade routes could be obtained through cooperation with the Gallic tribes who controlled the coastal regions, there was little need for Mediterranean merchants to involve themselves directly with the final stages of the supply-chain at all (Rodwell, 1976:238; Cunliffe, 1995:60-61).

Support for this hypothesis comes from Strabo, whose account of this period goes as far as identifying the *Veneti* as one of the Gallic tribes who had been trading with Britain through an *emporium* on the south coast prior to 56 BC; a site which it has been pointed out may well be Hengistbury Head (Strabo, *Geographica*, iv; cited by Mays, 1981:56). While Nash (1984:102) reminds us that the *Veneti* also probably carried British produce along the *Armorican* coast as far as Bordeaux (*Burdigala*), where these could be exchanged for wine or other goods for northward distribution, little evidence exists to show direct *Venetic* contact with Britain (Cunliffe, 2001:395).

It now seems more likely that while the *Veneti* controlled the Biscay leg of this trade, and were thus visible to Strabo and the Roman merchants in Gaul, these cargoes may later have been passed on to tribes like the *Coriosolites* of Brittany (*Armorica*), who traded along the channel coast (Galliou, 1984:29; de Jersey 1993:331). As Trott & Tomalin (2003:165) note, the *Coriosolites* would have had knowledge of the local waters and weather conditions that are vital to maritime trade. The high numbers of *Coriosolitian* coins found at Hengistbury suggest links between this tribe and the port (Cunliffe, 1982:45; Langouët, 1984:73). The cross-channel trading links of the *Coriosolites* and their neighbouring tribes are shown in Figure 8.6.

Figure 8.6 Northern Gaulish Tribes and their Trading Contacts



(After Cunliffe & de Jersey, 1997:52, Figure 35)

Cunliffe & de Jersey (1997:50) suggest a model whereby the trade between Hengistbury and the continent may have been managed on a seasonal basis, with a group of merchants perhaps arriving from *Armorica* each spring and returning home in the autumn. This model includes the possibility that a small number of traders may have been resident at Hengistbury throughout the year, receiving merchandise from Gaul during a 'sailing season' that usually lasted from March until November (McGrail, 1983:307; Greene, 1986:28). A route from a continental harbour in the region of the Baie de Saint Brieuc to Hengistbury, via Guernsey, seems likely to have formed the final stage of such a journey (Cunliffe & de Jersey, 1997:51).

8.3.3 Analysis of Late Republican Supply-Chain Operation

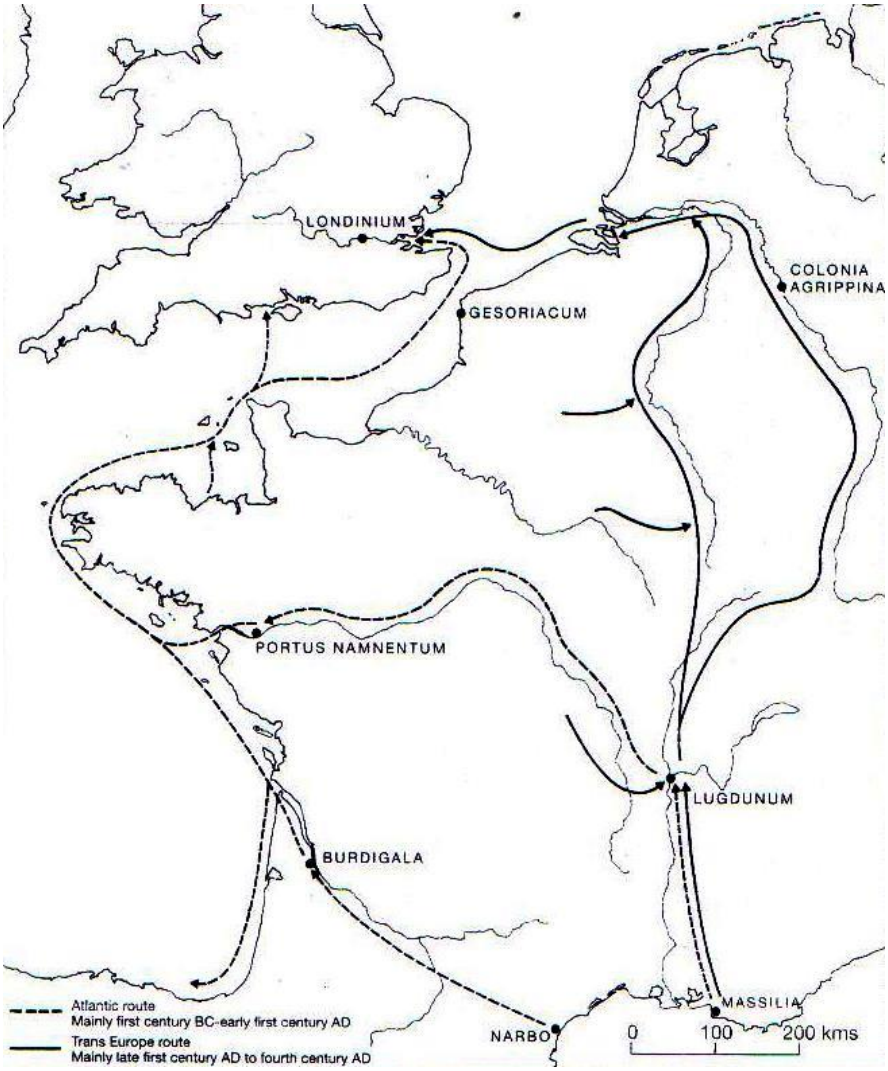
Hengistbury may not have been the only *entrepôt* centre operating along the south coast at this time and other possibilities have been suggested at Selsey (Magilton, 2003:159), Hamworthy-Poole Harbour (Fitzpatrick, 1989:824) and Mount Batten, Plymouth (Cunliffe, 1988c:1). Hengistbury offers the best evidence of cross-channel trade links between southern England and Gaul in the late Republican period however, and provides an opportunity to assess the relative strengths of each of the main participants in the wine supply-chain at this time.

8.3.3.1 Producer Push

While Peacock (1971:173) considers Italian wine to be the likely contents of the Dressel 1A *amphorae* found at Hengistbury, there is nothing to indicate that vineyard owners had any direct involvement in the distribution of wine once it had left their estates.

It is even doubtful that the *negotiatores* involved in the winemaking process or in arranging shipment for the initial leg of the wine's journey, played any direct part in its distribution thereafter. Once wine reached an intermediate transhipment point such as Marseilles (*Massilia*), Narbonne (*Narbo*), Lyon (*Lugdunum*), Bordeaux (*Burdigala*) or Nantes (*Portus Namnentum*), it may have been sold-on to third parties and the rôle of the original *negotiatores* probably ended. The effect of 'producer push' will therefore have ceased long before the wine itself reached Britain.

Figure 8.7 Locations of the Major Gaulish Trans-shipment Points



(After Cunliffe, 2001:418, Figure 9.36)

8.3.3.2 State Intervention

There is equally little evidence of official state involvement as far west as Britain prior to the start of the Gallic wars in 58 BC. Dressel 1A *amphorae* were being exported in quantity from north-west Italy, *via* ports such as Cosa, to destinations in Gaul and beyond during the late Republican period (Manacorda, 1978; Fitzpatrick, 1985; McMann *et al*, 1987). There is little to suggest that the Roman state were responsible for such transfers however, but their involvement is a possibility for which we must continue to allow.

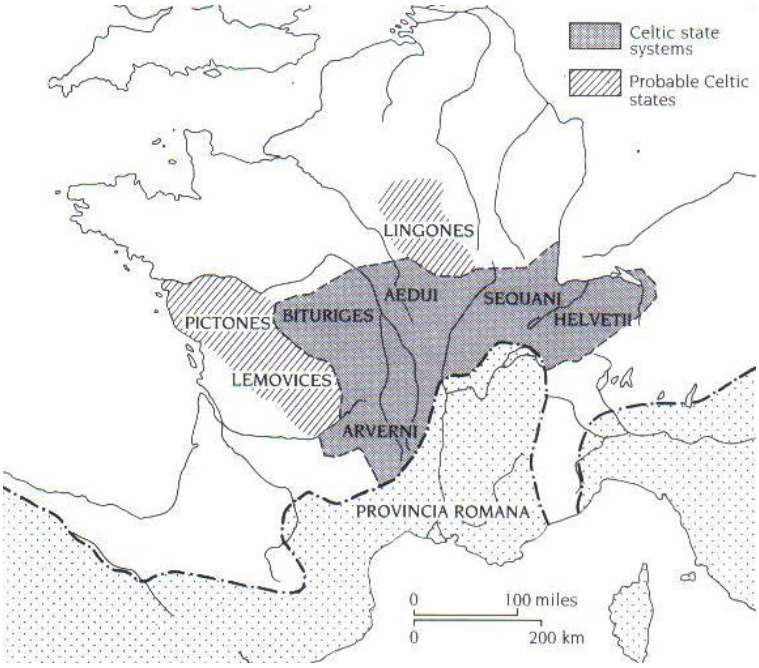
8.3.3.3 Mercantile Intermediation

Narbonne (*Narbo*) was one centre from which wine merchants are known to have operated during the late 2nd century BC (Fitzpatrick, 1985:316), while Toulouse (*Tolosa*) and Châlon-sur-Saône (*Cabillonum*) developed as wine transhipment points in the following decades (Tchernia, 1983:92; Cunliffe, 2001:388-389). These centres would have made convenient points where Gaulish merchants could have entered the supply-chain, particularly if wine had to be transferred from *amphorae* to smaller containers at this point to make it easier to transport across the short land-bridge which separated the Rhône and Rhine river system (Tchernia, 1983:90; Cunliffe, 2001:388-389). Extensive evidence of wine *amphorae* along the Gaulish river network show that three important trade routes existed there in the late Republican period (Fitzpatrick, 1985:308). The first of these led via the Rhône and the Saône to the Seine (Middleton, 1979:85; Garnsey, 1983:123); the second along the Rhône and Loire (Strabo, *Geographica*, iv, 1, 14; cited by Jones, 2012:109); and the third via the Garonne (de Jersey, 1993:331; Cunliffe, 2001:402).

These trade routes each passed through a number of distinct tribal territories and the rôle which local tribes played in wine distribution in northern Gaul

has already been illustrated in Figure 8.5. The tribal structure of southern Gaul suggests a similar arrangement may also have applied in this region.

Figure 8.8 Southern Gaulish Tribes and their Territories



(After Cunliffe, 1994a:419)

A valuable commodity like wine would have attracted the attention of the tribal leaders through whose territory it passed and tolls are known to have been levied at some borders (Caesar, *de Bello Gallico*; i .18; i .45; iii .1; Strabo, *Geographica*; iv .1; iv .3; iv .6; all cited by Fitzpatrick, 1989:42). It is also possible that *amphorae* were transferred to other vessels at some of these locations, if the pattern observed on the Atlantic coast was similar to that in other parts of Gaul. Wine destined for onward transmission might have been handed over at tribal boundaries to a new set of boatmen (*nautae*) with the requisite route knowledge and contact network to complete the next stage of its journey. Roman merchants may have retained notional control of the wine throughout its journey by appointing a representative to travel with the cargo and act as their agent. A set of intermediate exchanges linked

to local tribal alliances is easier to envisage than a single network stretching all the way from the Mediterranean to Britain. If Hengistbury served as a port-of-trade at the end of such a supply network it may have formed the hub of a *de facto* import monopoly. This type of arrangement would have enabled merchants based there to manage the flow of goods over the crucial channel-crossing. As we saw in section 8.2.3.3, asymmetric knowledge can give those who controlled such a 'choke-point' enormous power within a supply-chain. In this respect a merchant's ability to combine an export monopoly with their asymmetric knowledge of market conditions on each side of the channel would have placed these individuals in a strong position.

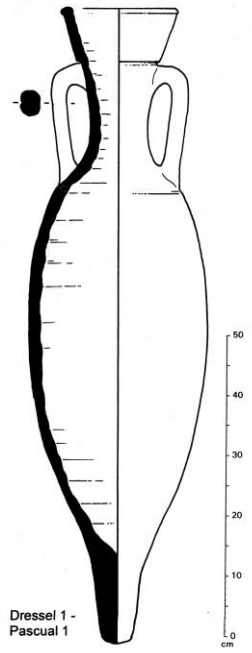
8.3.3.4 Consumer Pull

The prestige which wine would have bestowed upon its owners would have ensured that the demand for this commodity always remained high. While little is known about the nature of British wine consumption in this period, Dressel 1A *amphorae* deposits are almost exclusively found on settlement sites or at transhipment points. *Amphorae* distributions along the coastal plains and river valleys of southern England provide some indication of the spread of the product, but tell us little about how far wine penetrated into the wider community, as it was probably transferred to barrels or animal-skins prior to onward distribution.

While wine's popularity suggests 'consumer pull' had some influence on the supply-chain in the late Republican period, its impact would have depended on what resources purchasers had to offer in exchange. Britain's principal exports at this time were cattle, grain, hides, metal, slaves and hunting dogs (Strabo *Geographica*, iv, 5, 2; cited by Duncan-Jones, 1990:33). Of these, slaves and tin may have been items that suited Hengistbury's geographical

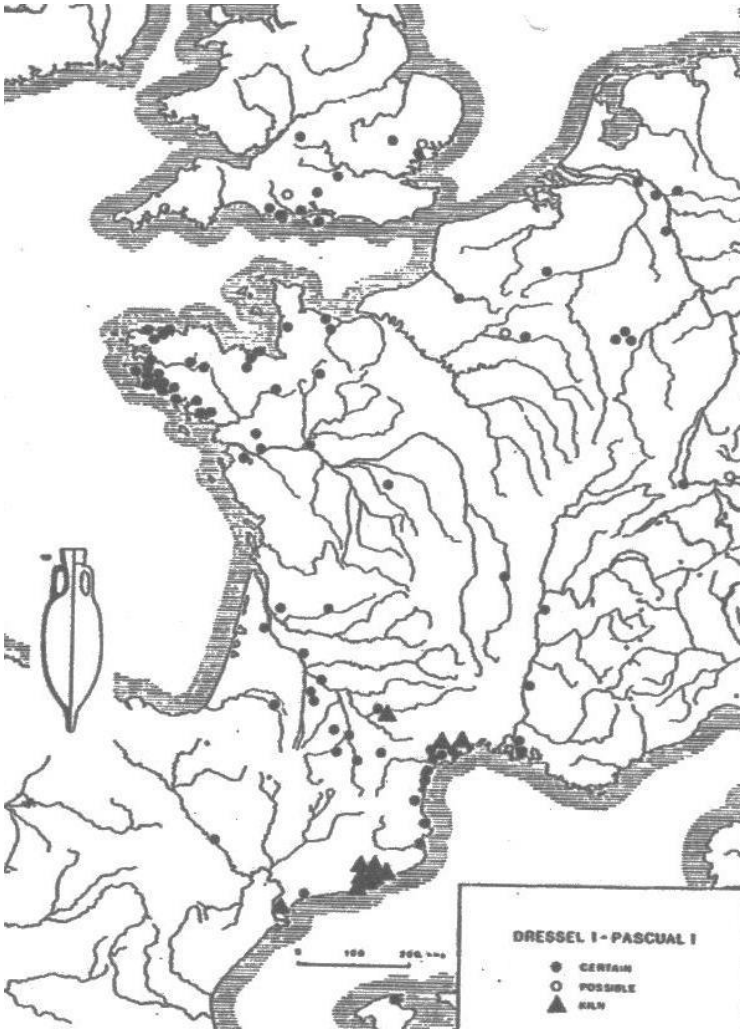
location, linked as it was by good river access to the Wessex heartland and strong coastal connections to the south west peninsula (Cunliffe, 1978:66). The site's importance seems to have continued until the mid 50s BC, when the trade-link between *Armorica* and Hengistbury ended, perhaps as a result of disruption of the supply routes through northern Gaul during the Gallic wars (Caesar, *de Bello Gallico*, iii, 8; cited by Galliou, 1984:30). The Ower peninsula in Poole Harbour, which lies 17 km west of Hengistbury, became the main import centre after this time (Collis, 1984:163; Carver, 2001:24). The choice of a new import location coupled with the arrival of a different type of amphora (the Dressel 1-Pascual 1) suggests that a new distribution network may have been established. Dressel 1-Pascual 1 *amphorae* were produced in the Catalan region of Spain, which indicates that wine probably continued arriving via the Atlantic trade route (Williams, 1991:119). Finds of Dressel 1-Pascual 1 *amphorae* are not as common as Dressel 1A, which suggests the numbers imported were probably smaller (Cunliffe, 2007:7).

Figure 8.9 Drawing of a Dressel 1-Pascual 1 Amphora



(After Tyers, 1996:92, Figure 62)

Figure 8.10 Dressel 1-Pascual 1 *Amphorae* Distributions

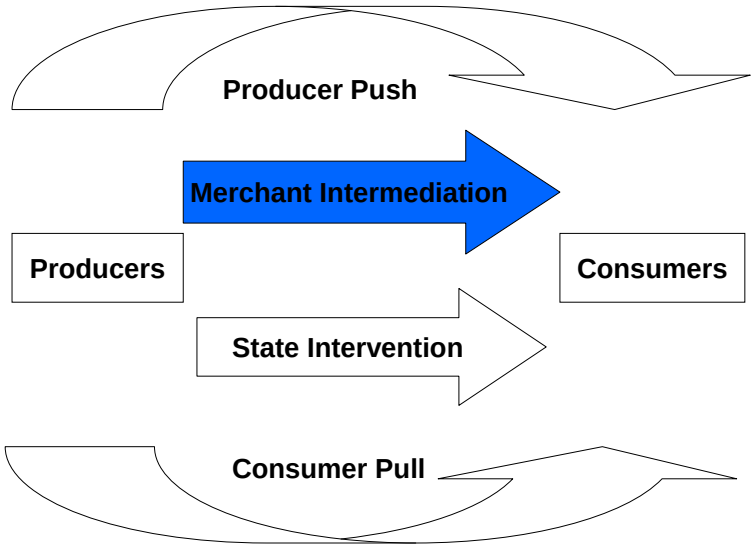


(After Fitzpatrick, 1985:320, Figure 8)

8.3.4 Evaluation of Late Republican Supply-Chain Operation

The evidence suggests that control of the vital cross-channel distribution link in the Republican period lay primarily in the hands of the continental merchants. Although the strength of 'consumer-pull' may have influenced the flow of wine at times, the merchants' domination of the choke-point at the channel crossing appears to have made them the dominant force on the final leg of the wine's journey, as Figure 8.11 shows.

Figure 8.11 Drivers in Romano-British Wine Supply (*c*. 120-56 BC)

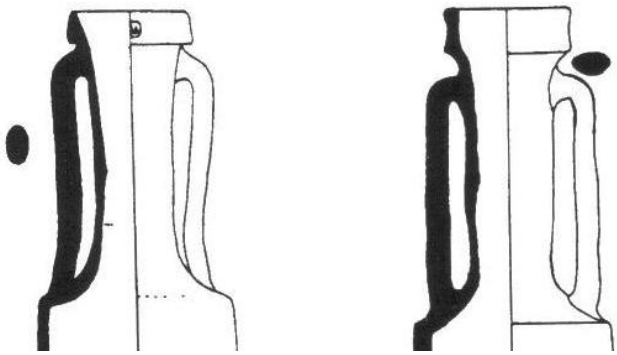


8.4 REPUBLICAN-IMPERIAL TRANSITION (*c*. 56-10 BC)

8.4.1 Introduction

Wine imports after the Gallic wars can be traced by a modified *amphorae* form (Dressel 1B). Although similar in many respects to its predecessor, the 1B form has a distinctive handle and rim, as Figure 8.12 illustrates.

Figure 8.12 Dressel Type 1A and Type 1B *Amphorae* Rim-profiles



(Adapted from Carver, 2001:41, Figure 1)

Arthur (1986:241) confirms that Dressel 1B *amphorae* were produced primarily in Campania and Tuscany. Their distributions show that while the Toulouse-Bordeaux axis remained in use, its importance declined as the inland routes via the Rhône-Saône-Loire and the Rhône-Saône-Seine rose to prominence (Fitzpatrick, 1985:318). This change may have been stimulated by military supply needs, as several legions were now stationed in Gaul. It is possible that Roman and Gaulish merchants who had previously operated along the Atlantic trade-route now switched their attention to the inland river systems (Fitzpatrick, 1985:319).

8.4.2 Inland Gaulish Supply Routes in the Late 1st Century BC

The presence of Dressel type 1A *amphorae* in the Paris basin confirms that the Seine had been used to transport these vessels before the Gallic wars and some wine may possibly have reached Hengistbury in this way (Fitzpatrick, 1985:313; Trott & Tomalin, 2003:163). The Rhône-Saône-Seine route rose to dominance after *c*. 50 BC however. As Jones (2012) explains:-

> "Cargo from the Mediterranean destined for the Loire was loaded at the mouth of the Rhône near Marseille (*Massilia*). Strabo (*Geog* 4.1.14) describes the Rhône as fast flowing and difficult to sail up, and that wagons were used for traffic up the valley of the Gier and then across to the Loire, near to Bruges (a distance of some 40 km) from where the river transport was used to reach Nantes (*Portus Namnentum*) 55 km from the Atlantic coast."
>
> (Strabo, *Geographica,* iv, 1, 14; cited by Jones, 2012:109)

While military demand was clearly important at this time, literary sources confirm that civilian demand was also significant, as Figure 8.13 shows.

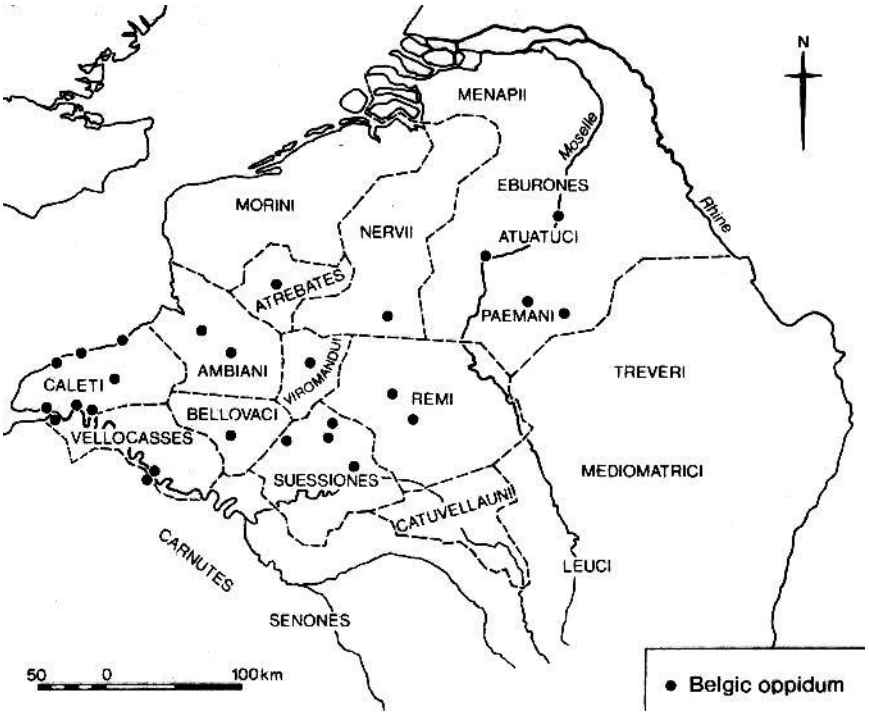
Figure 8.13 References to Gaulish Wine Supply in Classical Literature

Author	Literary Reference
Athenaeus	*Deiponosophistae*, iv; 36, 152c
Caesar	*De Bello Gallico*, ii;15; iv; 2.6
Cicero	*De Republica*, iii; 9.16
Diodorus Siculus	*Historia*, v; 26. 2-3
Strabo	*Geographica*, v; 1. 8

(Adapted from Tchernia, 1983:93-94)

The presence of thousands of Dressel 1 *amphorae* at the *Aeduian* settlement (*oppidum*) at *Bibracte* and the S*egusiavian oppidum* at *Essalois* link wine supply to civilian sites of the period (Tchernia, 1983:93). Wine also reached tribes like the *Remi* and *Treveri*, whose territories are shown in Figure 8.14.

Figure 8.14 Gaulish Tribal Territories (Late 1st Century BC)



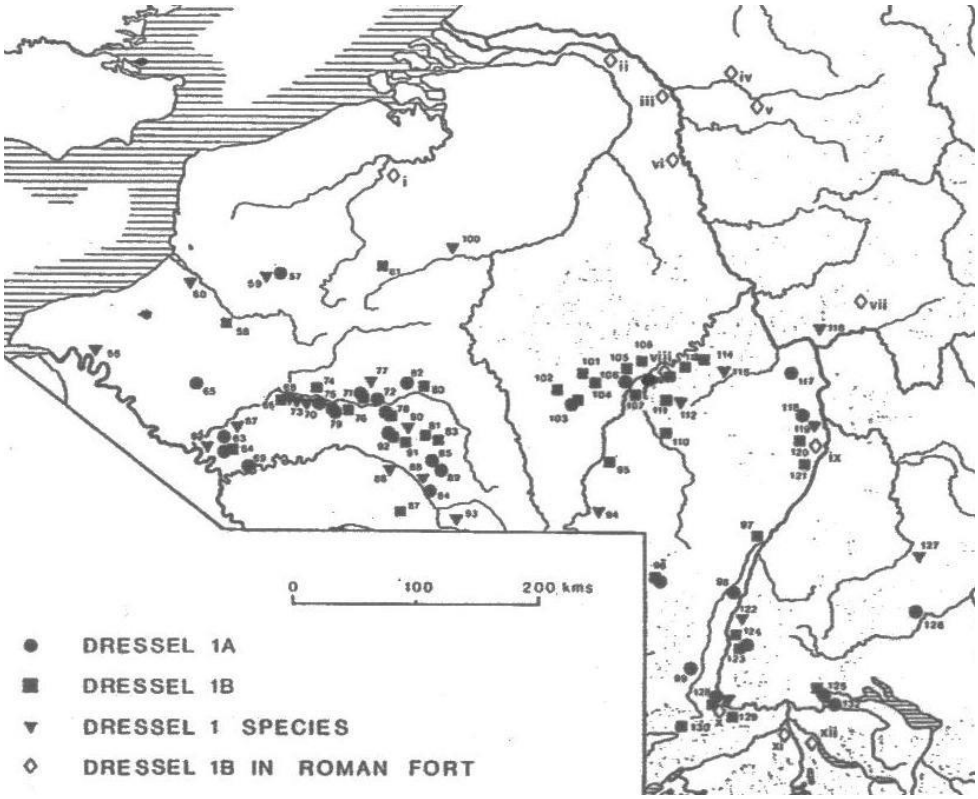
(After Cunliffe, 1988a:105, Figure 44)

Alliances with powerful tribes like the *Aedui*, whose territory occupied the important land-bridge between the Seine and the Rhône-Saône river systems would also have been of enormous value to Roman merchants at this time. The *Aedui* were close allies of Rome and their *oppidum* at Mont Beauvais (*Bibracte*) may have helped to regulate the movement of wine through Gaul and control the reciprocal flow of slaves and other strategic materials which travelled in the opposite direction (Tchernia, 1983:101).

A network of short distance, inter-tribal transfers would again seem to have been an operationally attractive way of moving items which were destined for onward transmission. This arrangement would have increased security and enabled local knowledge of each stretch of waterway to be utilized as goods passed along rivers such as the Seine (*Sequana*) on their way to or from the coastal port of Lillebonne (*Juliobona*).

Strabo identified the Seine estuary, which formed part of the territory of the *Lexobii* tribe, as one of four key shipping routes between Gaul and Britain at this time, linking it with Spithead on the Solent (Strabo, *Geographica*, iv**.** 6**.** 11; cited by Manley, 2002:38). Whether the Seine-Solent link was the major route by which wine reached south-east England is difficult to say, as there are few finds on the lower reaches of the river or on the nearby Somme, as Figure 8.15 shows.

Figure 8.15 Dressel Type 1 *Amphorae* Distributions in Northern Gaul



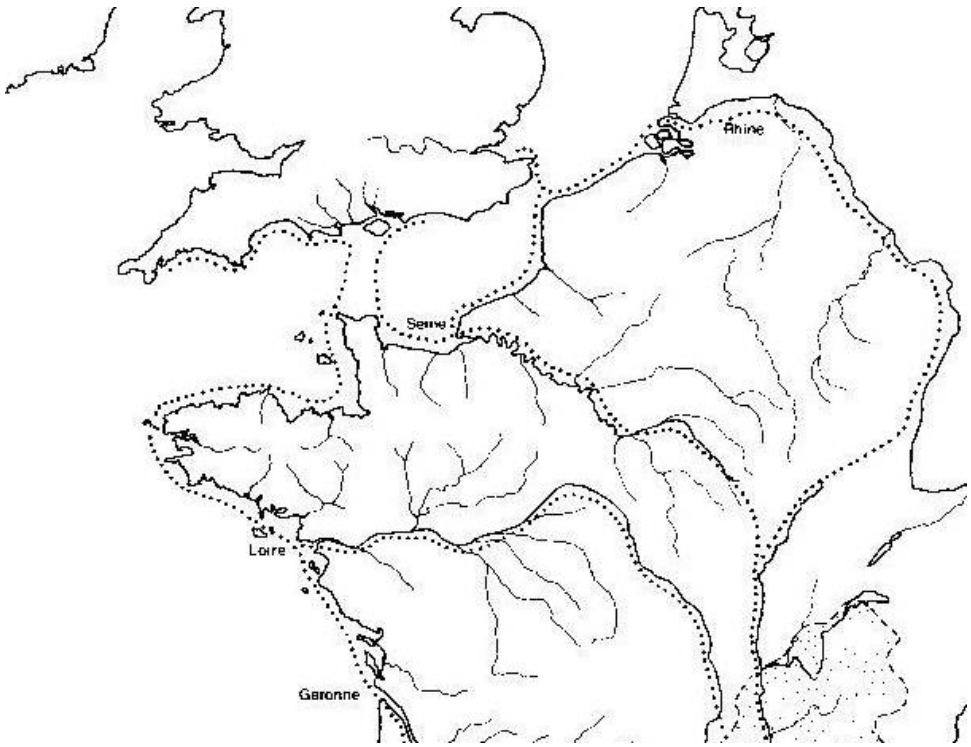
(After Fitzpatrick, 1985:314, Figure 5)

In addition to the Solent crossing, three other routes were identified as being important links between Britain and the continent in the late 1st century BC.

> 'There are four crossings which men customarily use from the Continent to the island, from the Rhine, from the Seine, from the Loire and from the Garonne, but for those making the passage from places near the Rhine, the point of sailing is not from the mouths themselves but from the Morini.'

(Strabo, *Geographica*, v. 5. 2; quoted by Manley, 2002:38)

Figure 8.16 Trade Routes to Britain in the Late 1st Century BC



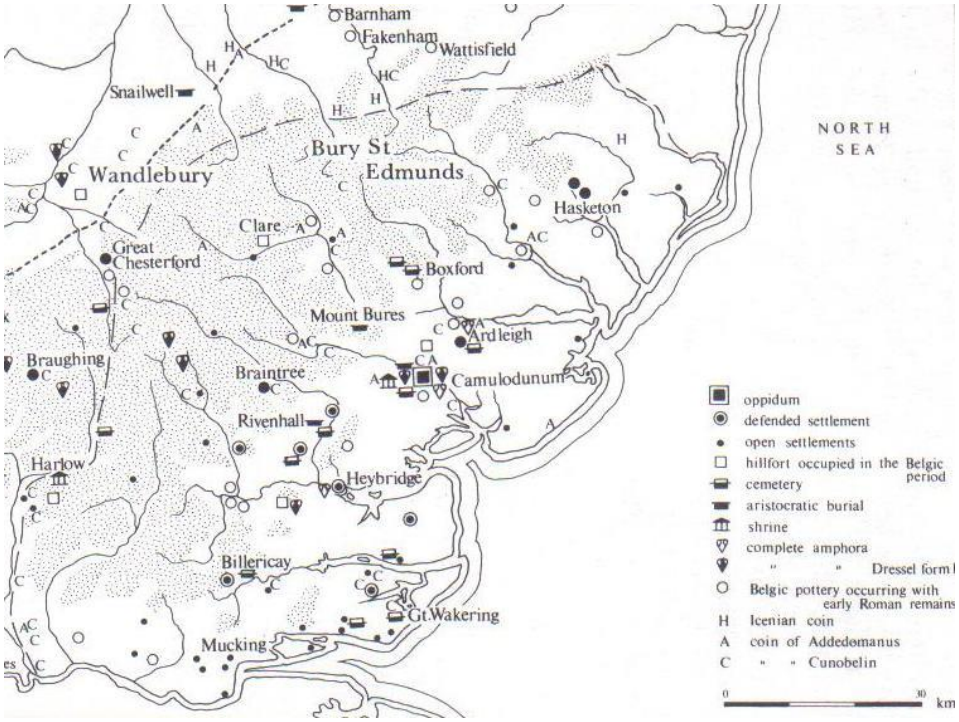
(After Cunliffe, 1984b:7, Figure 2)

Each of these routes present similar problems as far as the arrival of Dressel type 1B *amphorae* is concerned. Boulogne (*Gesoriacum*), in the territory of the *Morini*, which Julius Caesar once used as a base, is a possibility though. Peacock (1971:173) has pointed out that finds of Dressel 1B are rare along the French coast and Figure 8.15 confirms this. Fitzpatrick (1985:312-313) has also shown that the route from the Rhine estuary did not really develop until the beginning of the 1st century AD. *Amphorae* are also seldom found along the North Sea coast. This leaves only the Garonne and Loire as a link to the Atlantic coastal route. This passage may continue to have served the distribution needs of western Gaul, but it again lacks an apparent connection to south-east England.

8.4.3 British Wine Supply in the Late 1st Century BC

Wine-bearing Dressel 1B clearly continued to reach Britain from 58-52 BC, a period in which Rome formed new diplomatic alliances with the tribes of southern England (Rodwell, 1976:238; Cunliffe, 1995:69). As the Atlantic trade route declined in importance, *amphorae* appear in increasing numbers at *entrepôts* in Essex and Kent (Jones & Mattingly, 1993:57; Cunliffe & de Jersey, 1997:57). The realignment may have had political origins; the local *Trinovantes* being a powerful tribe who appear to have allied themselves to Rome (Dunnett, 1975:8). The distributions of Dressel 1B *amphorae* suggest that Roman or Gaulish merchants established an import monopoly with the *Trinovantes* after the Gallic wars (Wacher, 1979:18; Cunliffe, 1995:69). As a result of this alliance the *Trinovantes* may have gained preferential access to a range of imported luxury goods (Cunliffe, 1979:362).

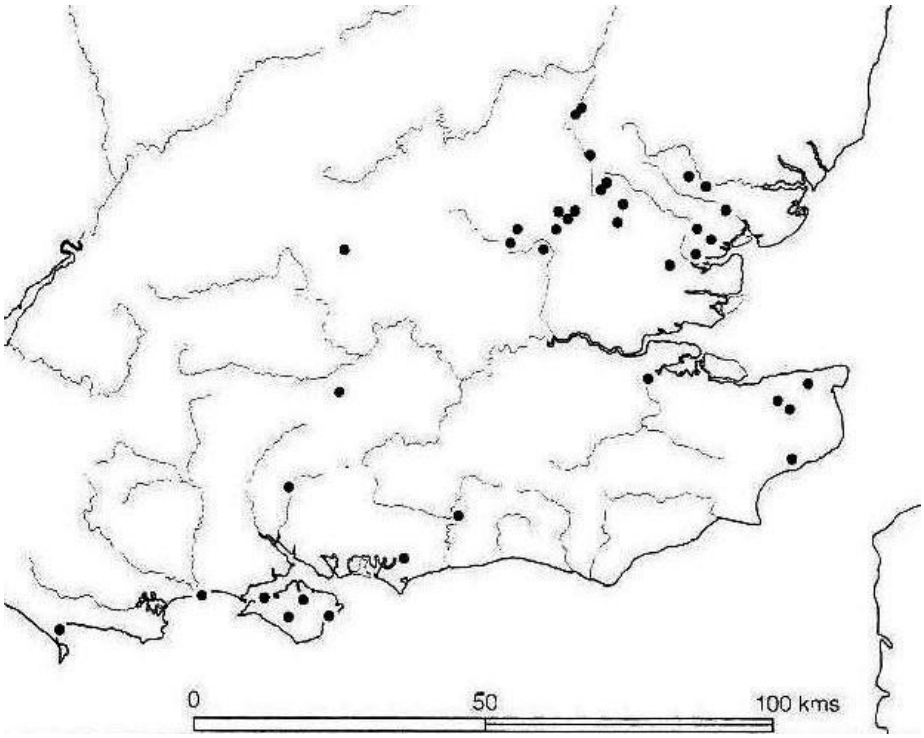
Figure 8.17 *Trinovantian* Territory in the Late 1st Century BC



(After Dunnett, 1975:10, Figure 3)

Wine continued to play an important rôle in the later 1st century BC, but its usage by the *Trinovantes* probably differed from the previous consumption pattern encountered at Hengistbury. While the *amphorae* we find in Wessex appear as broken fragments at ports-of-trade or settlements, the deposits in south-east England almost always occur in funerary contexts and are found as complete, or near complete, vessels (Carver, 2001:3). These differences point to behavioural differences in the way in which wine was consumed and/or the *amphorae* were disposed of in each area.

Figure 8.18 Dressel type 1B Amphora Distributions



(After Cunliffe, 2010:483, Figure 17.30)

Late 1st century BC *Trinovantian* burials containing Dressel 1B *amphorae* appear to cluster around the tribal capital (*Camulodunum*), the wine's likely 'entry-gateway'. A further group appear around Braughing, Welwyn and St Albans (*Verulamium*) in an area close to the *Trinovantes* presumed western

border (Peacock, 1971:175; Rodwell, 1976:241), or perhaps the territories of the *Ancalite, Bibroci, Cassi, Cenimagni* or *Segontiaci* (Partridge, 1981:353). These tribes were all mentioned by Caesar (*de Bello Gallico,* v**.** 2), but each had vanished before the Claudian conquest, perhaps forming a confederation or being absorbed by the area's principal tribe, the *Catuvellauni* (Partridge, 1981:353-354). Apart from *amphorae*, *Trinovantian* graves contain exotic items such as silver, bronze, iron and glass (Haselgrove, 1987b:196-197).

Trinovantian access to imports seemingly increased in the late 1st century, although the means by which the *Trinovantes* paid for these commodities in a pre-monetary era is not known. It is important to remember, however, that the *Trinovantes* were based in a region through which strategic commodities such as slaves and minerals are likely to have been channelled *en route* from Britain's peripheral zone to continental markets (Haselgrove, 1976:43). An astute *mercator* would have recognized that slaves represented a surplus that British tribal leaders would gladly exchange for the wine that slave-hungry Rome had in abundance, creating mutual benefits for both buyer and seller and profits for these merchants. *Trinovantian* relations with Rome were probably boosted by Augustus' move into northern Gaul and the Rhineland during the later part of the 1st century BC (Pitts & Perring, 2006:205). This campaign would have increased Rome's need for both human and material resources, which the *Trinovantes* were able to supply (Sealey, 2009: 13).

8.4.4 Analysis of Republican-Imperial Supply-Chain Operation

The establishment of a new point of entry for wine supplies in the aftermath of the Gallic wars requires a reappraisal of the activities of each of the key participants in wine's supply-chain and to consider how these changes may have affected the structure of the overall distribution network.

8.4.4.1 Producer Push

The Civil Wars (49-37 BC) which followed Caesar's return from Gaul must have been a turbulent time and wine producers were probably affected by this turmoil (Purcell, 1985:9; Loughton, 2009:85). When peace was restored and production returned to normal, domestic wine consumption seems to have increased significantly and the demands of their home market probably interested Italian vineyard owners more than a remote market such as Britain (Purcell, 1985:9; Sealey, 1985:136). There is therefore no reason to suppose producers played a major rôle in the supply-chain at this time.

8.4.4.2 State Intervention

The Gallic wars (58-52 BC) marked the first direct contact between Britain and the Roman world, a relationship which offered many mutual benefits. For Caesar, the kudos of military success was obvious, and a diplomatic alliance with the *Trinovantes* may have enabled control of cross-channel exchange to be maintained for many decades through the establishment of a client kingdom (Pitts & Perring, 2006:205). This device was widely used by Rome's rulers to manage their external relations at minimal cost (Scullard, 1979:50). The political and economic advantages obtained might be secured by offers of Roman friendship and protection, or through lavish gifts and the granting of trading monopolies (Millett, 1995:50; Allason-Jones, 2008:6). Wine is clearly an item which would have been suitable for this purpose.

Augustus appears to have renewed many of the alliances he inherited and Strabo informs us that a number of British rulers obtained the Emperor's friendship through embassies which visited Rome (Strabo, *Geographica*; iv**.** 5**.** 3; cited by Cunliffe, 2001:406-407). The suggestion that the *Trinovantes* were able to consolidate their favoured position is supported by the Lexden

burial, which contained a medallion of Augustus, dated to *c.* 17 BC (Laver, 1926:251; Haselgrove, 1987b:197). Continuation of this alliance may have helped Augustus acquire resources to support his German campaigns and perhaps accounts for the increasing flow of imports reaching Britain at this time (Millett, 1990:33; Fulford, 1991:36; Sealey, 2009:7-8).

The potential benefits to the Roman state of maintaining friendly relations with British tribal leaders, either via trade or diplomatic gifts, is apparent at key times during this period and the state's rôle as a determinant of British wine supply must therefore be considered. Haselgrove (1984:22) reminds us that direct political involvement would not have been necessary for the trade to prosper, as this result could also have been achieved by merchant intermediaries who dealt exclusively with Rome's allies (Cunliffe, 1978:79).

8.4.4.3 Merchant Intermediation

It is also not clear how far the influence of the Italian *negotiatores* extended along the supply route at this time. Most customers probably received their supplies either in the form of diplomatic gifts or as surplus produce released from military consignments originally shipped to Gaul (Paterson, 1982:152). Whether transfers of this kind were arranged by Italian or Gaulish merchants remains unclear. Middleton (1983:80-81) suggests that military supply may have been the principal driver, but Tchernia (1983:100-101) and Fitzpatrick (1985:316) argue for civilian involvement.

Graffiti found on artefacts at Braughing, Hertfordshire, suggest they may have been the personal possessions of continental traders who visited this important tribal-centre (Partridge, 1981:351). Similar contacts have been suggested at other sites, including Colchester (*Camulodunum*), Silchester (*Calleva Atrebatum*) and St Albans (*Verulamium*), all of which were tribal

capitals (Cunliffe, 2007:9). Roman merchants are certainly known to have been active in Gaul at this time (Woolf, 1997:45). It is therefore possible to envisage a chain of intermediate tribal groups involved in the passage of commodities such as wine through the region, in the same way in which the Atlantic coastal distribution network operated in earlier decades. While the route(s) by which wine reached Britain remain unclear, most commentators favour an inland passage via the Rhône-Saône-Seine, or perhaps the Rhône-Saône-Somme (Loughton, 2003:192).

8.4.4.4 Consumer Pull

Wine still seems to have been a scarce, prestigious commodity in the late 1st century BC and Sealey (2009:7-8) suggests that the occurrence of so many *amphorae* in élite graves may indicate that wine was imbibed in a display of conspicuous consumption at the funerals of tribal leaders. There is little to suggest that wine consumption generally took place at habitation sites at this time, apart from Braughing, where a few *amphorae* sherds have been found (Rodwell, 1976:301). This implies that wine was used primarily in social or ceremonial contexts. It may therefore be seen as a product that represented a suitable diplomatic gift, serving as a reminder to allies and enemies alike that the *Trinovantian* nobility had powerful Roman friends. The possibility that some wine reached Britain by commercial exchange cannot be excluded however (Arthur, 1995:243).

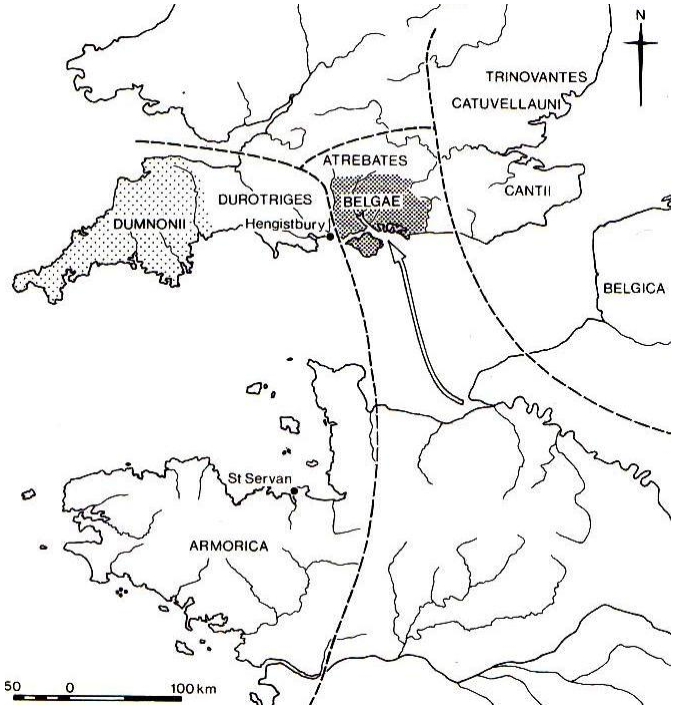
8.4.5 Evaluation of Republican-Imperial Supply-Chain Operation

While ‘producer push’ appears to have no discernable influence on British wine supply during the late 1st century BC, the rôle of the state, mercantile intermediation and consumer demand may all have been significant. Millett

(1990:35) suggests most continental imports are likely to have originated via reciprocal exchange between political élites operating within the confines of an existing social order. Low-level wine imports in the early part of this period would be consistent with the notion of diplomatic exchange within a state-administered supply network, as mercantile trade would probably have resulted in a dilution of any import monopoly, leading to more widespread distribution of the product and the increased visibility of *amphorae* remains.

The case for direct state-control of the shipping routes to south-east England is particularly strong during the period of Augustus' Germanic campaigns, when a larger quantity of strategic resources would presumably have been needed (Sealey, 2009:13). Control over trade with Britain could still have been exercised by the state during later peacetime conditions, by enforcing legal regulations requiring merchants to deal only with Roman allies, even if cross-channel merchants were granted designated trade monopolies.

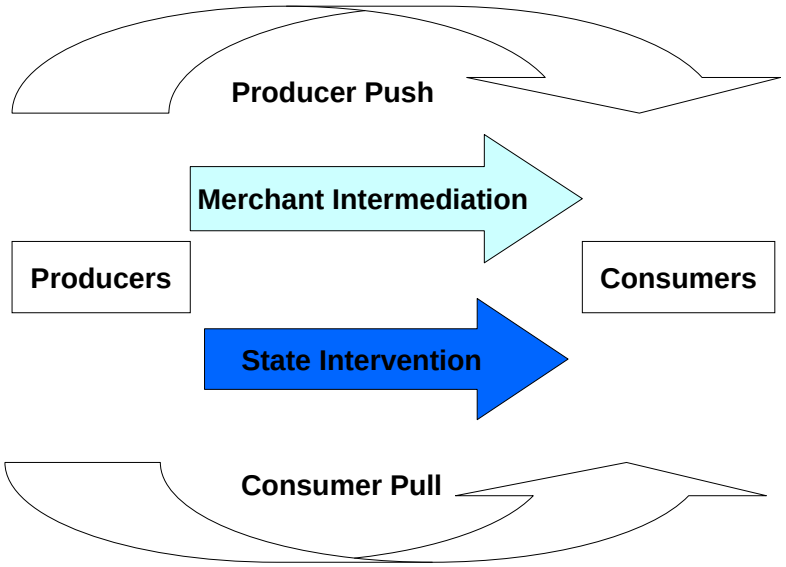
Figure 8.19 Cross-Channel Exchange Zones in the Augustan Period



(After Cunliffe, 1988a:148, Figure 56)

The channel-crossing again appears to be the most likely 'choke-point' in the distribution system, with the party who controlled this vital link being able to regulate the flow of wine and thus dominate the supply network. Evidence points to state control being more significant during this period, although independent merchants probably carried much of this cargo and may have assumed increasing importance as the principal force within the supply network after the Rhine frontier had been established and the state's requirement for strategic resources diminished. Centralized control of cross-channel supply, with merchants operating under imperial direction, would appear to be the most likely mode of operation at this time.

Figure 8.20 Drivers in the Romano-British Wine Trade (*c*. 56-10 BC)



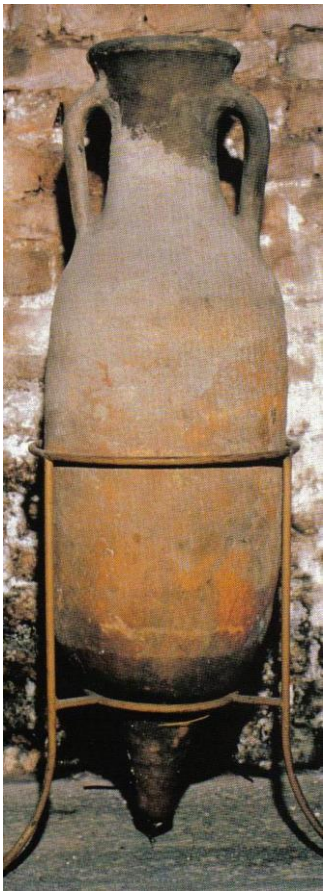
A tipping-point in the flow of imports to Britain may have occurred after the abandonment of Augustus' Germanic campaigns in AD 12. The desire to replace lost export opportunities conceivably increased merchant's interest in Britain from this time onwards (Haselgrove, 1984:23-24). The impact of any shift from state to mercantile domination of cross-channel supply moves us into the final phase of pre-conquest trade.

8.5 EARLY IMPERIAL IMPORTS (*c.* 10 BC-AD 43)

8.5.1 Introduction

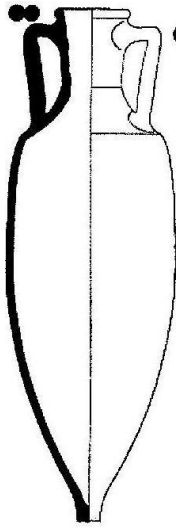
At the turn of the 1st millennium a new *amphorae* type (Dressel 2-4) once again replaced the earlier Dressel 1B as wine's principal transport container (Peacock & Williams, 1991:105-106; Tchernia, 1986:127-129; Fitzpatrick, 2003:14). Dressel type 2-4 *amphorae* were manufactured in Spain and Gaul, as well as the traditional Italian wine producing regions (Galliou, 1984:31).

Figure 8.21 Photograph of a Dressel Type 2-4 Amphora



(After Wilkinson, 2000:93)

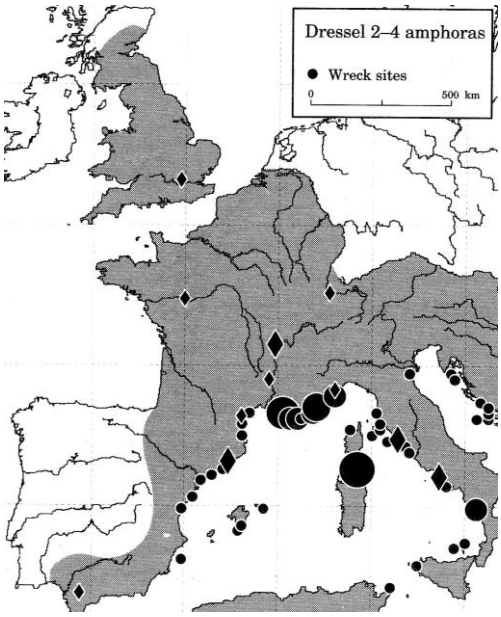
Figure 8.22 Drawing of a Dressel Type 2-4 Amphora



(After Tyers, 2012)

Dressel type 2-4 *amphorae* had a wide distribution on the continent in the early 1st century AD, as Figure 8.23 shows.

Figure 8.23 Distribution of Dressel Type 2-4 *Amphorae*



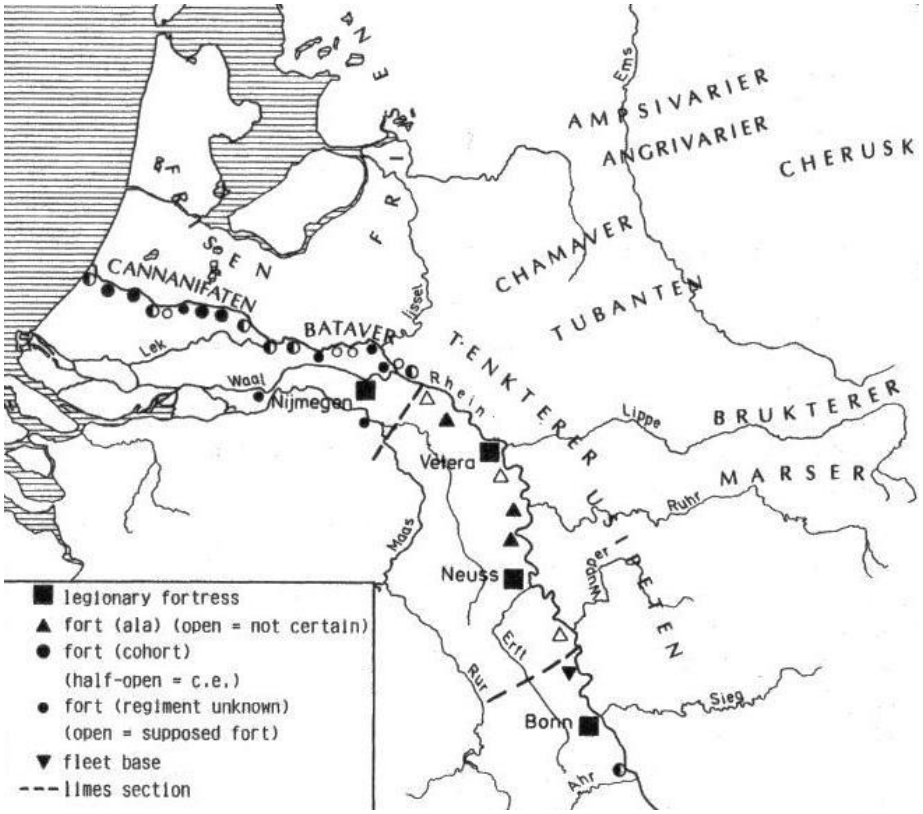
(After Tyers, 1996:90, Figure 57)

8.5.2 Supply Routes in the Late 1st Century BC-Early 1st Century AD

Towards the end of the 1st century BC Italian wine exports appear to have declined sharply as domestic demand continued to grow (Parker, 1990:325; Sealey, 2009:1). Military supply was an exception to this trend and wine continued to pass through Gaul on its way to the Rhineland to meet the needs of units stationed there. Peacock (1978) describes the route which would have been taken:-

> "The Rhine could be reached by branching from the Saône along the Doubs and thence overland via the Col de Montbéliard, or by continuing northwards across country from the Saône to the Moselle."
>
> (Peacock, 1978:49)

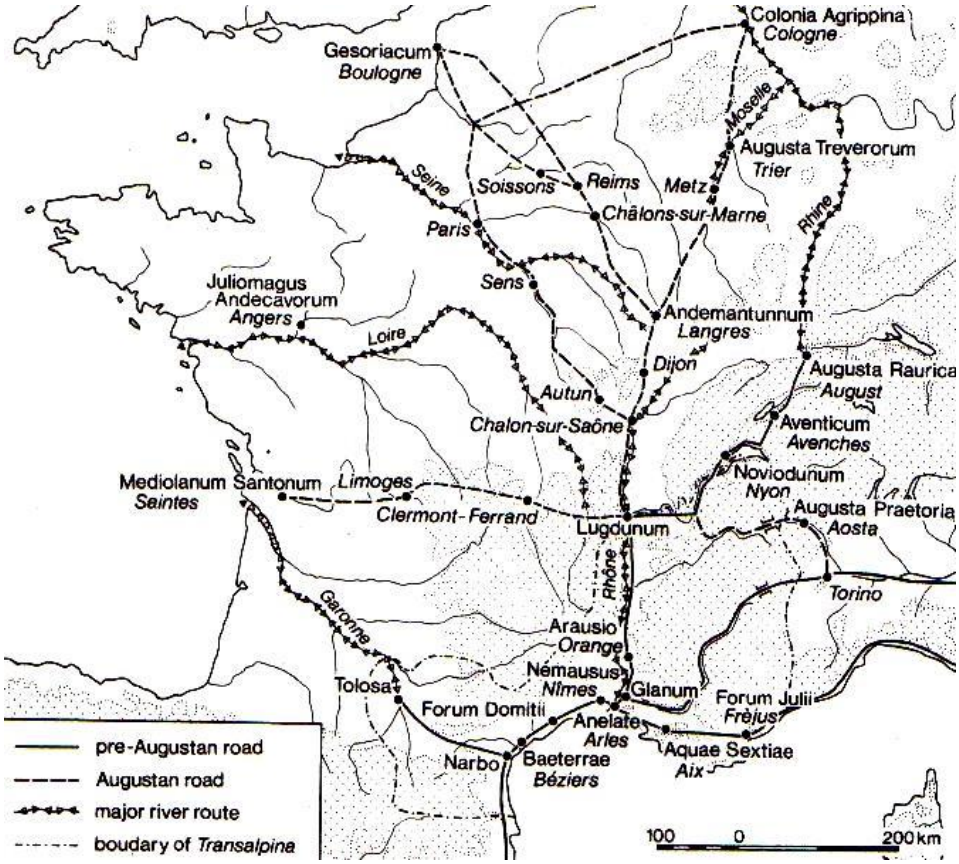
Figure 8.24 The Rhine Frontier in the Early 1st Century AD



(After Kunow, 2002:92, Figure 7.2)

By the early 1st century AD vine production had spread to the Loire and the Rhône, as Italian exports were being increasingly replaced by Gaulish and Spanish wine (Whittaker, 1985:50-51; Woolf, 2001:53). Many Dressel 2-4 *amphorae* from these regions are found on the Rhine frontier, but are rare in Gaul itself, suggesting administrative rather than commercial supply was responsible for their distribution (Whittaker, 1994:105). Lyon (*Lugdunum*) is believed to have played a prominent rôle in these transfers, as a guild of wine-merchants (*corpus vinariorum*) are known to have been located there (Verboven, 2007:307).

Figure 8.25 Location of Lyon (*Lugdunum*) at the Crossroads of Gaul



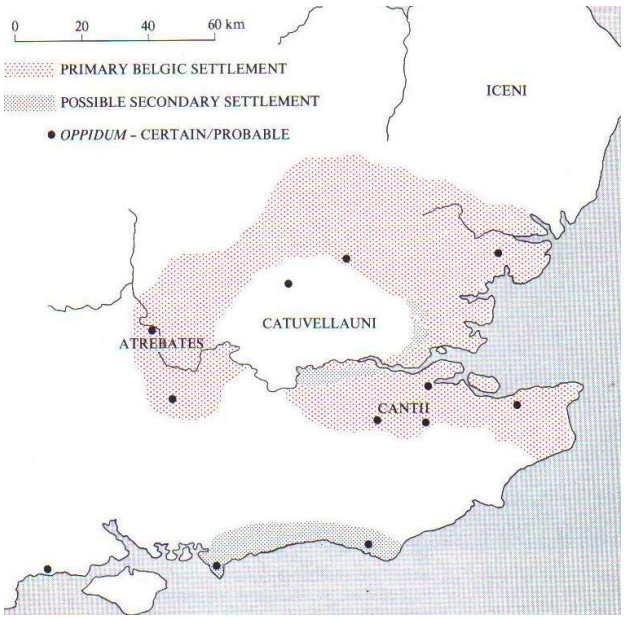
(After Cunliffe, 1988a:126, Figure 49)

8.5.3 British Imports in the Late 1st Century BC-Early 1st Century AD

Around 10 BC, numismatic evidence suggests that a number of dynastic changes occurred among the tribes of south-east England, which led to the political borders of the powerful *Catuvellauni* tribe shifting eastwards to take over the territory in Essex previously occupied by the *Trinovantes* (Branigan, 1987:6; Todd, 1999:19). This expansion may have been driven by the *Catuvellaunians'* desire to gain control of the important continental trade routes rather than to acquire territorial dominance (Southern, 2011:52).

Any pre-existing trade monopoly appears to have been unaffected by these changes (Potter & Johns, 1992:34). The *Catuvellaunian* ruler, Cunobelin, (*c*.10-42 AD) may have become an ally of Rome, or at least maintained a neutral stance towards them (Frere, 1974:61; Webster, 1980:63). In either case, a wide range of imports, including wine *amphorae* continued to arrive at *Camulodunum* during Cunobelin's reign (Scullard, 1979:31-32).

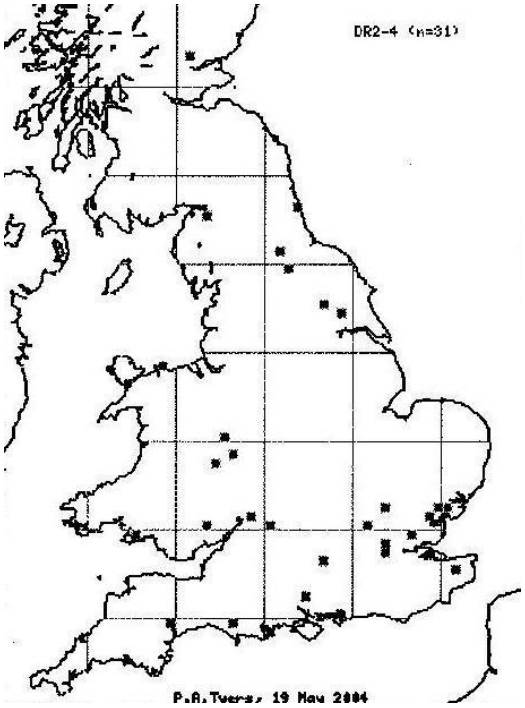
Figure 8.26 *Catuvellaunian* Territory in the Early 1st Century AD



(After Wacher, 1979:19, Map 3)

It is evident from finds of Dressel type 2-4 *amphorae* that wine continued to reach Britain after 10 BC. Initially most of this may have come from Spain, replacing Italian supplies that were now needed for domestic consumption. By the early 1st century AD wine also began to arrive *via* the Rhine frontier (Peacock, 1978:50-51; Sealey, 2009:26). Dressel 2-4 *amphorae* have a wide distribution in pre-conquest and early Roman Britain, as Figure 8.27 shows.

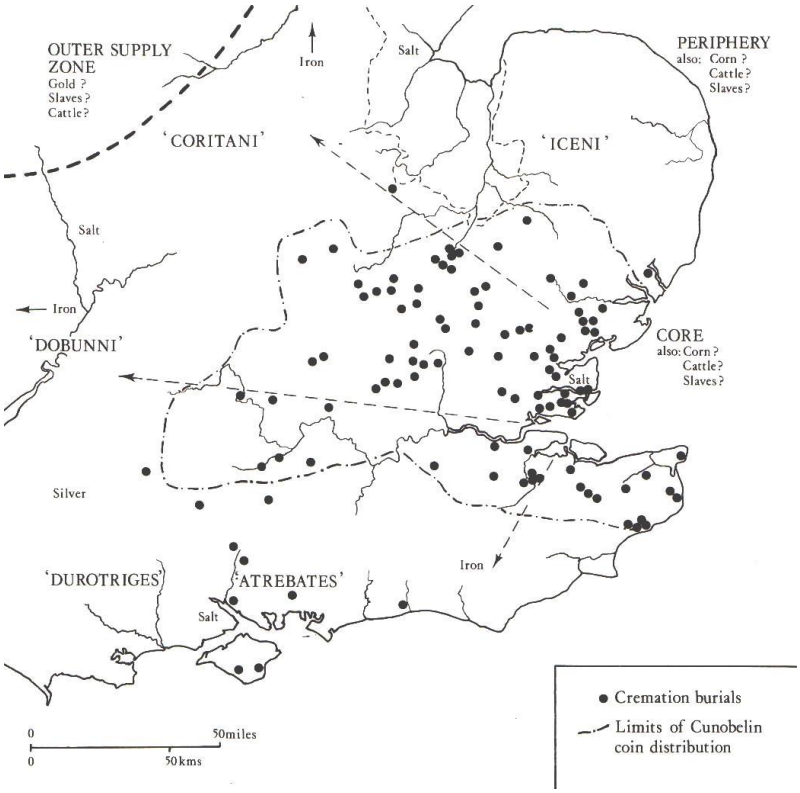
Figure 8.27 Dressel 2-4 Amphora Distributions



(After Tyers, 2012)

The *Catuvellauni* like their predecessors, the *Trinovantes,* controlled access to Britain's outer-core supply zone, as Figure 8.28 shows. Exchange of this kind was a feature of a socially-embedded economy, as we noted in Chapter 3. Some of the imports reaching south-east England in the early 1st century AD may therefore be attributable to continental traders seeking to use their contacts with the *Catuvellauni* to gain new markets in areas that lay beyond their existing commercial territories (Haselgrove, 1984:24).

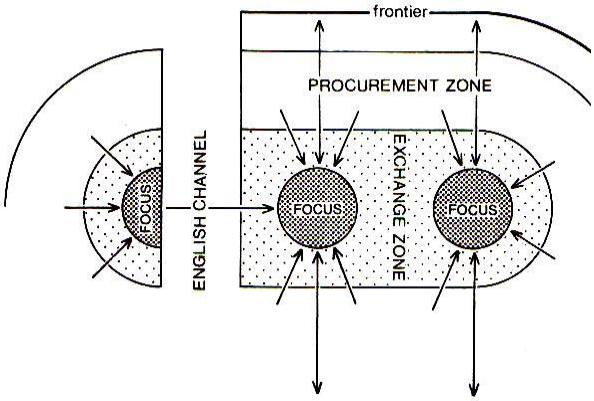
Figure 8.28 ***Catuvellaunian* Core-Periphery Exchange Zone**



(After Haselgrove, 1982:86, Figure 10.6)

These cross-channel flows can be linked to Rome's wider policy of resource acquisition from Gaul and other peripheral regions, as Figure 8.29 shows:-

Figure 8.29 **Model of Cross-Channel Trade in the Early 1st Century**



(After Cunliffe, 1988a:198, Figure 75)

The origin of continental imports suggests that resources may have been reaching *Camulodunum* both directly and via other Essex ports, such as Heybridge or Wickford (Wickenden, 1986:62; Hobbs & Jackson, 2010:23). Boulogne (*Gesoriacum*) is the probable hub from which wine reached Britain, at this time, as Strabo noted that goods from the Rhine often moved along the coast to this port in order to make the channel crossing (Strabo, *Geographica,* iv; 5**.** 2; cited by Manley, 2002:38). A central assembly point of this kind would certainly be a useful device in maintaining any trading monopoly which still existed.

8.5.4 Analysis of Early Imperial Supply-Chain Operation

The *Catuvellaunians'* territorial expansion at the turn of the 1st millennium placed them in a dominant position as far as the control of cross-channel trade was concerned. Their rôle as successors to the *Trinovantes* seems to reflect an evolutionary succession rather than a revolutionary dislocation of supply. The directional shift from administered supply to market exchange, which this period seemingly witnessed, probably began towards the end of the preceding era and the operation of the supply-chain therefore needs to be assessed in this light.

8.5.4.1 Producer Push

While less Mediterranean wine may have reached Britain at the start of the 1st millennium, Italian wine production may actually have increased at this time to meet growing demand in their domestic market (Sealey, 1985:136). Viticulture had also spread to Gaul and Spain and by the early 1st century AD wine started to reach Britain from these sources (Sealey, 2009:27).

8.5.4.2 State Intervention

Rome appears to have condoned the dynastic change in *c*. AD 5 that brought Cunobelin to power (Mattingly, 2006:72). The Empire's need for strategic resources may have declined soon after this date, however, when Augustus' Germanic campaigns were brought to an end and the Rhine frontier pacified. Strabo's observation that Britain was seen as being more useful as a source of tax revenue than as a target for conquest is perhaps a sign of its growing commercial importance at this time (Strabo, *Geographica,* iv; 5**.** 3; cited by Mattingly, 2006:491). Some of these taxes undoubtedly represented levies extracted from merchants using the cross-channel trade routes.

8.5.4.3 Merchant Intermediation

Merchants, meanwhile, seem to have become more proactive during this period and in addition to their activity in mainland Gaul, continental traders may have established semi-permanent settlements in communities such as Braughing and Heybridge by the early 1st century AD (Trow, 2002:105).

Fitzpatrick & Timby (2002:168) have identified a growing range of trading interests between Britain and the continent during this period, spreading across a broad arc of territory in south and south-east England that extended from Hampshire to Suffolk. Developments of this kind would have made an import monopoly difficult to maintain, especially if traders were able to seek new outlets for their produce with tribes such as the *Atrebates*, who seem to have been developing good relations with Rome (Scullard, 1979:27).

8.5.4.4 Consumer Pull

The extensive range of continental imports visible at *Camulodunum* and at other settlement sites indicates increasing demand for prestige items. The scale of wine imports is difficult to gauge however, due to the uncertainty surrounding the forms of transport containers being used. The availability of wine from a variety of continental sources suggests that it still featured as a significant import item, despite the declining number of wine *amphorae* found on settlement sites and in rich graves.

8.5.5 Evaluation of Early Imperial Supply-Chain Operation

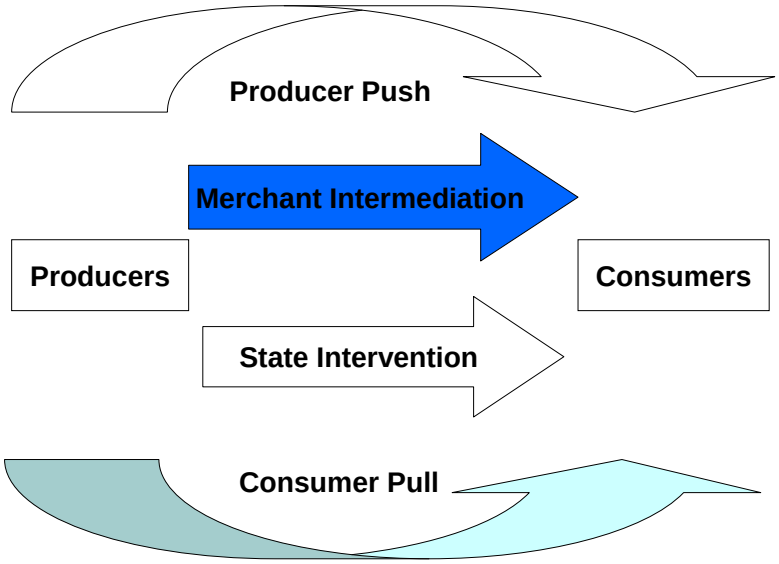
The pattern of supply-chain activity encountered during the early 1st century AD has its origins in the increased levels of merchant activity which began to appear at the end of the previous century. State interest during the latter part of Augustus' life (d. AD 14) and throughout the succeeding reigns of Tiberius (AD 14-37) and Gaius (AD 37-41), seems to have focused on the consolidation of existing frontiers and maintaining peaceful relations with neighbouring client-kings, rather than on territorial expansion. By contrast, increased merchant activity is apparent at settlement sites which continental traders may have continued to use as *entrepôt* centres. The concentration of imports at *Camulodunum* is a sign of the continued importance of this entry gateway and points to the channel-crossing as an important route into south-east England.

Strabo's list of Britain's imports and exports becomes important at this time. The requirements of the Rhine frontier make it a likely destination for many of Britain's exports and the Roman state may be responsible for much of the wine which reached Britain during this period. Peacock (1978:51) suggests that the merchants used to deliver these goods may have loaded these first to

avoid the need to handle them again until the end of the journey. If this is so, their destination was determined from the outset and these items cannot be regarded as disposals of unsold surplus. Fulford (2007a:60-61) argues that decisions regarding the final destination of many items may have been made near to the end of the journey, possibly at a transit point like Cologne (*Colonia Claudia Ara Agrippinensium Ubiorum*). This approach fits the idea of a system of down-the-line trade.

Consumer pull from the British side of the channel seems to have become stronger during Cunobelin's reign. How strong this pull was, or if it came close to rivalling merchants' power remains unclear. While the presence of continental merchants in Britain is evident, whether they had a permanent presence here remains uncertain. It is highly likely that wine exports were linked in some way to the annual crop-cycle and sailing season though. The volume of wine being shipped across the channel and its diversity of sources all point to a high level of mercantile involvement, linked to a growing (but secondary) consumer pull; as Figure 8.30 indicates.

Figure 8.30 Drivers of Romano-British Wine Supply (*c*. 10 BC-43 AD)



8.6 ROMANO-BRITISH IMPORTS (*c*. AD 43-270)

8.6.1 Introduction

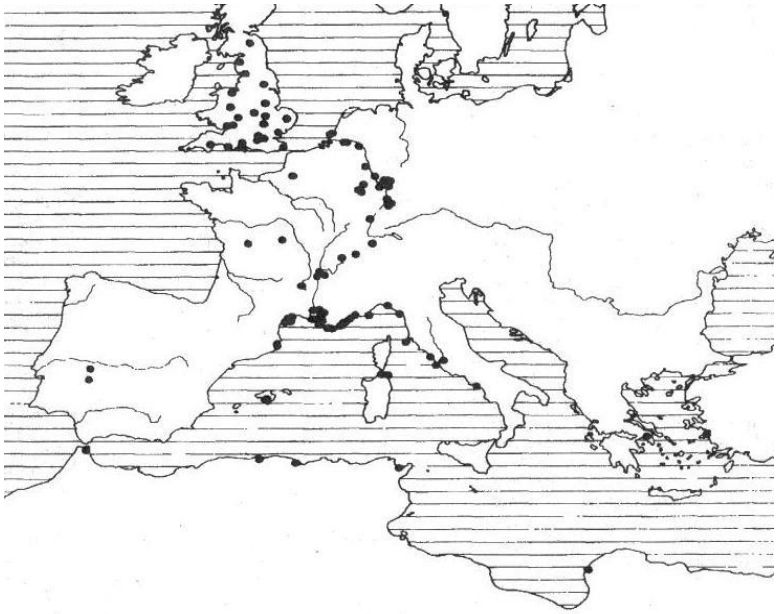
As an important element of a civilized lifestyle, wine must have continued to reach Roman Britain in significant quantities well into the 3rd century and would have been demanded by military and civilian consumers throughout the province (Arthur & Williams, 1992:253-254). Wine is more difficult to track during this era though, as the containers in which it arrived continued to become more diverse. Once again we must follow the evidence back to the vineyards and trace the supply routes from there.

8.6.2 Sources of Supply in the Romano-British Period

Southern Gaul had become Britain's principal provider by the 1st century AD, yet other wine producing areas like the Rhineland and *Tarraconensis* in southern Spain were also significant suppliers (Balsdon, 1970:148; Cunliffe, 1988a:140; Sealey, 2009:25). Output from these regions had reached such a scale by the late 1st century AD that Domitian ordered provincial vineyard-owners to pull up half their vines to protect the interests of Italian growers; an order he later rescinded due to the outrage which this directive caused (Suetonius, *Domitian*; vii**.** 2; cited by Frank, 1962:427).

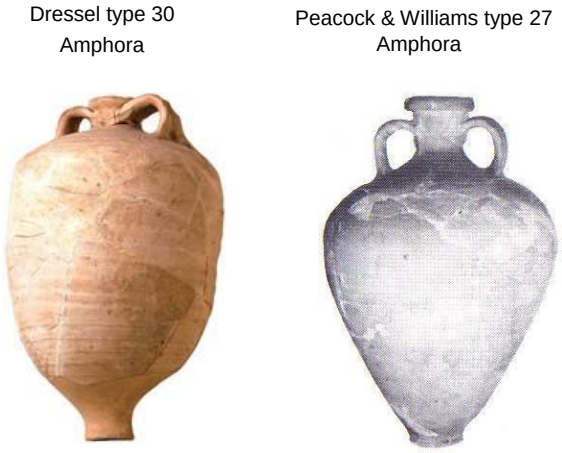
The principal wine-bearing *amphorae* used in the post-conquest period were Dressel type 30 and Peacock & Williams type 27. These are similar forms, manufactured in the Rhône delta to support the region's viticulture, as their painted inscriptions (*tituli picti*) confirm (Peacock, 1978:50; Laubenheimer, 2004:168). Their distribution in the 2nd and 3rd centuries AD was principally directed towards the Rhine and the northern frontier, as Figure 8.31 shows.

Figure 8.31 Distribution of Gaulish Wine in the 2nd & 3rd Centuries



(After Peacock, 1978:50, Figure 44)

Figure 8.32 Dressel 30 and Peacock & Williams 27 *Amphorae*



(After Tyers, 2012 and Peacock & Williams, 1991:142)

It is often difficult to identify these amphora in the archaeological literature, as the Dressel type 30 and Peacock & Williams type 27 have each acquired other aliases as individual *amphorae* typologies have developed (as Figure 8.33 indicates).

Figure 8.33 Dressel 30 and Peacock & Williams 27 Aliases

Dressel 30	Peacock & Williams 27
	Augst 12
Keay 1a	Callender 10
	Gauloise 4
Keay 1b	Ostia 60
	Pélichet 47

(Adapted from University of Southampton, 2005)

The manner in which these *amphorae* travelled to the northern frontier via the Rhône-Rhine river systems, resembles the distribution of Dressel 1 and Dressel 2-4 *amphorae* in previous periods; probably suggesting an element of state involvement. If so, the presence of many Peacock & Williams 27 *amphorae* in Britain could be the consequence of official military supply, with army surplus being made available for general distribution to civilian markets (Anderson, 1992:60). Trade in items like wine would have enabled profitable trade to continue, even in a period of increasing self-sufficiency. While civilian access may have been irregular, military supply would have been more constant, at least until the onset of the barbarian incursions in the 3rd century AD.

In addition to its shipment in *amphorae*, there is also evidence to show that wine was transported in barrels in the 2nd and 3rd centuries AD. We must avoid the temptation to assume that all barrel usage in this period related to wine shipments however, as a wide variety of other items may also have been carried in this versatile form of container. Products which may have been transported in this way include beer (Wilmot, 1982), fish sauce (Van Neer *et al*, 2010) and salt (Van Beek, 1983).

Barrels manage to combine a good weight-volume ratio in a vessel form which is relatively easy to manoeuvre during loading or unloading (Morris, 2010:36-37). With a capacity of between *c*.120-220 gallons, barrels would have proved popular for bulk carriage of fluids (Alcock, 2011:271). Given the vast number of barrels that must have existed, the surviving specimens are exceedingly rare. The examples we possess have mostly been recovered from waterlogged deposits such as wells, where they were often used to line the sides and base of the shaft.

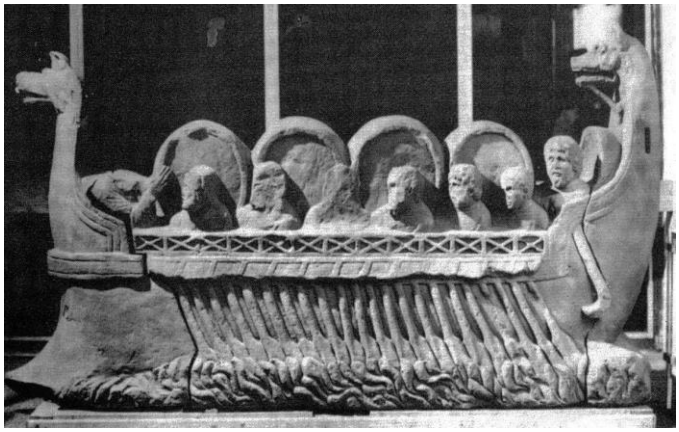
Figure 8.34 Examples of Barrels that have been re-used as Timber Well-Linings

(After Boon, 1975:54, Plate VII)

Indications that barrel-usage continued into the 3rd century AD comes from two sources; the first is an inscription left by Commodius Ufeni?tis filius, a wine merchant (*negotiator vinarius*) at Colijnsplaat in the Scheldt estuary; the other being an altar from the same site which depicts a barrel surrounded by vine-leaves (Hassall, 1978:45; Anderson, 1992:59).

Further evidence is provided by images of barrel-laden ships which appear on altars or tombstones at trans-shipment centres along the Rhine, like Bonn (Hassall, 1978:45), Cologne (Espérandieu, 1907:341) and Mainz (Ellmers, 1978:12); or tributaries such as the Moselle at Neumegen (Ellmers, 1978:8).

Figure 8.35 Restored Tombstone from Neumegen (Eastern Gaul) Showing a Consignment of Wine Barrels



(After Ellmers, 1978:8)

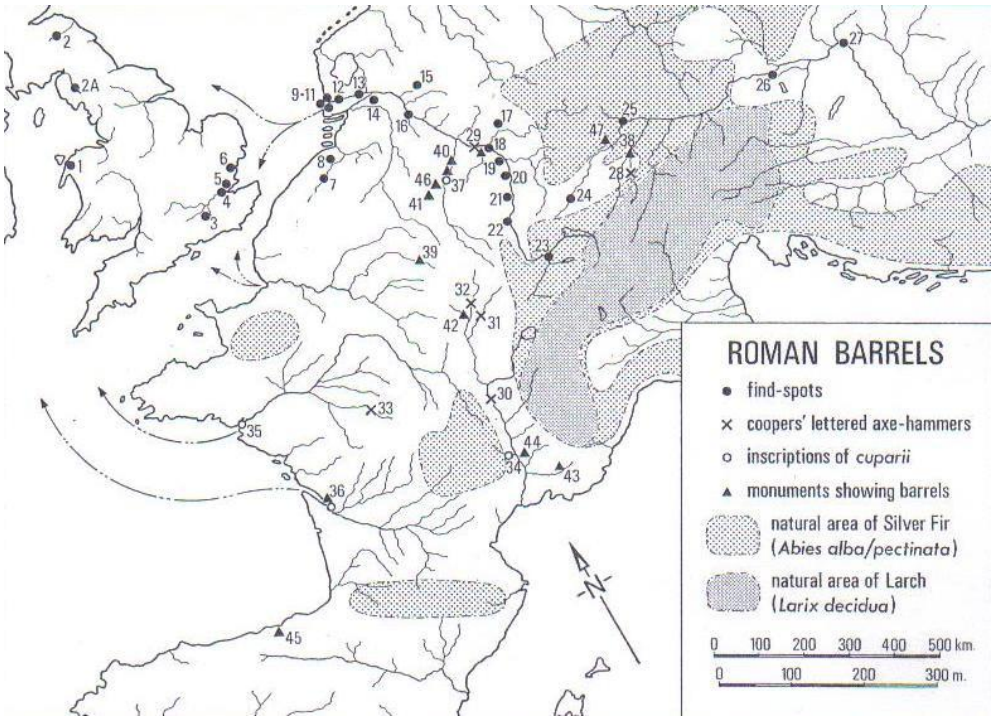
Similar monuments depicting barrels on altars and tombstones can be found throughout the region, as Figure 8.36 indicates.

Figure 8.36 Rhineland Monuments Depicting Wine Shipments

Monumental Evidence	Source / Location	Reference
Barrel Laden Barge	Altar / Colijnsplaat	Ellmers, 1978:10
Stevedores Unloading Barrels	Tombstone / Mainz	Ellmers, 1978:12
Barrels Onboard Ship	Tombstone / Neumegen	Espérandieu, 1907, Volume 6:384
Barrels Onboard Ship	Tombstone / Neumegen	Espérandieu, 1907, Volume 6:389
Stevedores Unloading Barrels	Tombstone / Cologne	Espérandieu, 1907, Volume 7:341

Confirmation that barrel manufacture took place at many sites along the Rhône and Rhine is provided by the widespread discovery of coopering equipment, together with occasional finds of barrels or their remnants.

Figure 8.37 Finds of Rhône-Rhine Barrels and Coopering Equipment



(After Boon, 1975:56, Figure 3)

Proof that some of these containers are linked to the wine trade is provided by branded or painted inscriptions (*tituli picti*) from the barrels themselves. These provide important information regarding the manufacturing location, contents and original ownership of some of these vessels (Fülle, 1997:115). Further evidence of their contents may also be derived from residues in some cases, such as sediment found on a barrel stave from Oberaden in Germany (Hopf, 1967:216; cited by Wilmot, 1982:47), or the resinous lining of a stave from Harelbeke in Belgium (Boon, 1975:55).

More than 35 barrels have been discovered in Britain, mostly from London and Silchester (Morris, 2010:72). Both sites reveal evidence of the identity of some of the merchants involved, as Wacher (1979) notes:-

> "External markings, on the same barrels, probably indicate the name of the shipper or merchant; one of the London examples had been branded with the name Vettius Catullius, while two from Silchester were inscribed respectively with Sualinos and Herm, the latter probably an abbreviation for Hermogenes or some such name."
>
> (Wacher, 1979:164)

Curiously, no barrels have yet been discovered which clearly dates from the later part of this period, as the examples from securely dated sites in Britain come from contexts in either the 1st or 2nd centuries AD. To complicate matters further, many examples are thought to originate not from the Rhineland but from the Bordeaux region, which is known to have been an important wine-producing area at this time.

Trade between Britain and Aquitaine is attested by inscriptional evidence, the best known being from Bordeaux itself, where two monuments appear to have been set up by individuals connected with the wine trade (Birley, 1979:127). The first of these is a tombstone erected in the late 1st century AD in honour of L. Solimarius Secundus, who is described as a British merchant (*negotiator Britannicianus*). L. Solimarius Secundus is also identified as a native of the city of Trier (Corteault, 1921:104). The second is a sacrificial altar dedicated by M. Aurelius Lunaris; a civic and religious dignitary (*sevir Augustalis*) who held posts at York and Lincoln (Corteault, 1921:102-103). This inscription (RIB 678) has now been dated to AD 237 (Butler, 1971:145).

Figure 8.38 M. Aurelius Lunaris' Altar found at York

(After Ottaway, 2004:84, Figure 43)

8.6.3 Analysis of Romano-British Supply-Chain Operation

The arrival in AD 43 of four legions, together with their auxiliaries and civil administrators inevitably created a demand for wine which will have lasted throughout the occupation period (Richmond, 1963:171; Alcock, 2011:272). While the size of the garrison and its dependants varied, Millett (1990:185) has estimated a range of *c*. 50,000-200,000. This represents a substantial demand, which could only have been met by imports.

8.6.3.1 Producer Push

Little is known about the structure of viticulture in the new provincial wine producing regions. Domitian's attempt to roll-back the spread of vineyards in the late 1st century AD indicates that output had become widespread in these regions. The techniques used to produce wine remained unaltered, however, judging from the 4th century mosaic in the church of *St. Costanza*

in Rome (Rossiter, 1981:348) and an account provided by Palladius (*Opus Agricultura*) which dates from the early 5th century AD.

Figure 8.39 Grape Treading *Fresco* from *St. Costanza* (Rome)

(After Stern, 1958, Figure 18)

Members of the Roman aristocracy presumably continued to retain an active interest in viticulture on their provincial estates, as Domitian seems unlikely to have bowed to purely local Gaulish or Spanish pressure when deciding to repeal his planned curbs on vine-production in these areas. The impact on wealthy landowners may also explain the demise of Spanish production in the late 2nd century AD if, as Salway (1992:166) conjectured, Septimius Severus confiscated land in AD197 to punish supporters of the defeated usurper Clodius Albinus. Much uncertainty still surrounds the factors which led to the demise of Spanish wine production however (Keay, 1988:98).

The vineyards of the Rhône-Rhine valleys were well situated in relation to the military supply routes which linked the Mediterranean to the northern frontier (Hassall, 1978:45; Carver, 2001:8). Similarly, those in Bordeaux and the Loire valley were conveniently placed to serve the Atlantic route which connected the *Baetican* region of Spain to Britain (Peacock, 1978:51;

Fitzpatrick & Timby, 2002:164). Wine arrived from both areas until the late 3rd century AD (Hassall, 1978:45; Arthur & Williams, 1992:253-254).

8.6.3.2 State Intervention

As we saw in section 5.2.4, Roman soldiers received a monthly allowance of 2 litres of wine. This was generally provided in the form of *posca*, a form of sour wine-vinegar that was mixed with water prior to consumption (Fulford, 2000:46; Roth, 2012:24-25). Based on Manley's (2002:83) estimate that 40,000 troops were involved in the Claudian invasion, it is apparent that a minimum of 80,000 litres / month (960,000 litres / annum) of *posca* would have been needed in the post-conquest period to satisfy this requirement.

There is evidence to show that table-wines were also imported, as a *graffito* on an amphora at the military supply-depot at Richborough indicate that it contained *LYMP[A]*, wine from a vineyard near Pompeii destroyed in AD79 (Davies, 1971:131). *Graffito* found on *amphorae* at other military sites like Caerleon (*Isca*), Carpow, Mumrills and Newstead (*Trimontium*) show that fine wines were also available there (Davies, 1971:131). In addition, sour-wine (*acetum*) and table-wine (*vinum*) feature among the items listed on the *Vindolanda* tablets (Bowman, 1994:68; Bowman & Thomas, 1994:153).

Figure 8.40 Sources of 1st Century Military Wine Supplies

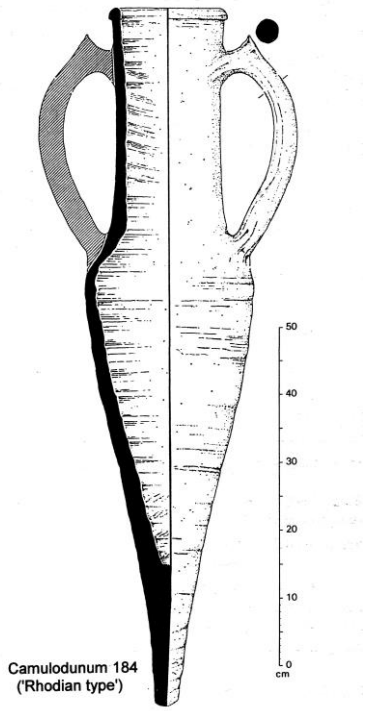
Site	Date	Gaul %	Rhodes %	Unprovenanced %	Weight (kg)
Kingsholm	*c.* 50-67	4	90	6	22.49
Exeter	*c.* 55-80	19	24	57	10.13
Wroxeter	*c.* 57-73	65	25	10	12.42
Inchtuthil	*c.* 78-84	52	--	48	2.28

(Adapted from Cool, 2006:133, Table 15.1)

The dominance of wine from the Aegean island of Rhodes in many early assemblages is interesting and has been linked to administered supply. As Williams (2003) explains:-

> "In Britain, the Rhodian form is commonly associated with pre-Flavian forts, which suggested to Peacock (1977) that Rhodian wine might have formed a portion of the tribute imposed on the Rhodians during the reign of Claudius and used in particular to supply the military, both in this country and on the continent."
>
> (Peacock, 1977:270; cited by Williams, 2003:26)

Figure 8.41 Drawing of a Rhodian (Cam 184) Amphora



(After Tyers, 1996:93, Figure 64)

The importance of Rhodian wine imports declined before the end of the 1st century AD, but supplies from elsewhere reached British garrisons until the 3rd century. Archaeological evidence suggests that supply was not uniform

in all parts of the province however. The 2nd century military supply to the Yorkshire forts, for example, often contain Gaulish *amphorae*, which rarely occur further north on Hadrian's Wall. Separate distribution routes appear to have supplied each area, with wine reaching the northern frontier from the Rhineland (Cool, 2006:135). Similarly, in the 3rd century, Campanian wine *amphorae* have been found in the north at Catterick (*Cateractonium*), South Shields (*Arbeia*), Wallsend (*Segundunum*) and York (*Eboracum*), but rarely appear in *Londinium* or in southern Britain (Arthur & Williams, 1992:254; Cool, 2006:135). These differences suggest separate supply-chains served each of these areas.

8.6.3.3 Merchant Intermediation

Little is known about the merchants who operated in the early post-conquest period. It seems likely that the Rhine was one of the main routes by which goods reached Britain. A wine merchant (*negotiator vinarius*) is recorded on an inscription at Bonn (CIL XIII 8105) and we know that Commodius Ufeni?tis filius set up a similar altar at Colijnsplaat (Hassall, 1978:43).

Wine merchants also operated on the Atlantic route. Keay (1988:98) has identified one of these as Quintus Ovilius Venustianus; while M. Aurelius Lunaris also used this route in the 3rd century. Other un-named individuals were no doubt involved in this work, as inscriptions from their *amphorae* reveal. One of these reads:-

> "Received; *Hispalis*; value 20 *sest*; weight 215lbs; from estate of *Capito*; export duty: 2 *asses*; name of clerk; consular date (AD 179)."
>
> (Frank, 1933-40, 72)

8.6.3.4 Consumer Pull

Evidence suggests that wine began to become more widely available to the urban civilian population during the Claudio-Neronian period (AD 43-69). Data from the civilian settlement at Sheepen, near Colchester, indicates that wine arrived there from at least three sources before the Boudican rebellion of AD 60/61, as Figure 8.42 indicates.

Figure 8.42 Civilian Wine Supplies at Sheepen, AD 43-60/61

Source of Supply	% of Sample	Minimum Vessel Numbers
Aegean	5.30	5
Italy	45.19	21
Spain	23.68	11
Uncertain Provenance	25.83	12
Total	100.00	49

(Adapted from Sealey, 1985:17, Table 8)

Aegean wine, from the island of Rhodes, also reached London at this time, although Gaul seems to have been the town's principal supplier, as Figure 8.43 shows.

Figure 8.43 Civilian Wine Supplies at London, AD 50-60/61

Source of Supply	% of Sample	Weight (kg)
Aegean	21	1.74
Gaul	44	2.06
Uncertain Provenance	35	0.98
Total	100	4.78

(Adapted from Cool, 2006:134, Table 15.2)

Gaul continued to dominate *Londinium's* wine supply when the town was restored in the late 1st century AD and this position lasted until the late 3rd century (Cool, 2006:134). Gaul and the Rhineland had become the main supply regions for the province as a whole by the 2nd century however and this situation continued until well into the 3rd century (Fulford, 1978:67).

8.6.4 Evaluation of Romano-British Supply-Chain Operation

Military supply accounted for most of the wine entering Britain in the initial post-conquest period, as civilian demand probably only developed later, as urbanization took hold. The army received their supplies from a variety of sources in the 1st century however, as Figure 8.40 indicates.

Apparent variations in the origins of military and civilian wine supplies and between the sources used to furnish the Yorkshire forts and the garrison on Hadrian's Wall led Evans (2002:482) to conclude that parallel distribution networks may have been in operation by the 2nd century. These differential supply patterns apparently continued, with some modifications, into the 3rd century and Cool (2006:125) has suggested that individual garrisons may have been responsible for ordering their own provisions. This idea is not new, as Breeze (1984:279-282) had previously contended that Britain's frontier garrison was probably responsible for procuring the materials they needed by placing small orders with individual merchants rather than *via* regular contracts with set suppliers.

As we noted in section 6.6 though, much uncertainty still surrounds the manner in which military procurement took place in the Romano-British period and the likelihood that any centralized military supply mechanism existed has been challenged (Van Berchem, 1937:143-145; cited by Roth, 2012:263). One of the difficulties we face in approaching this question is

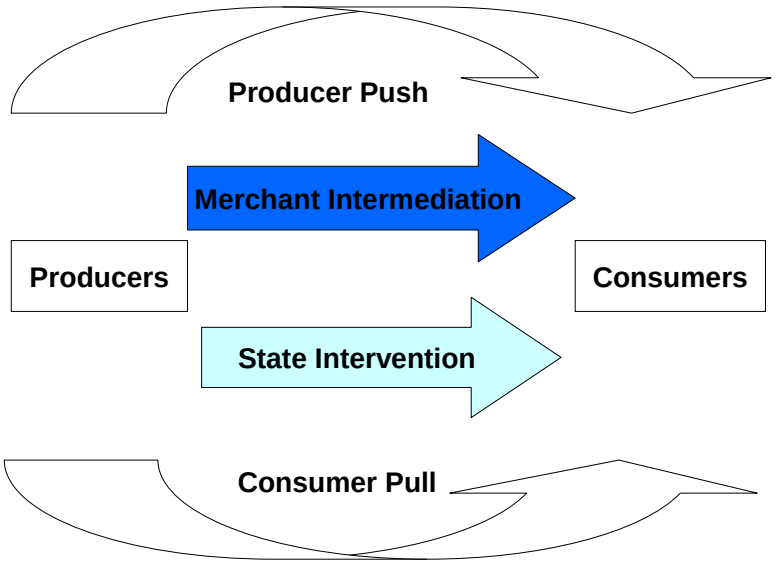
that while we know the identities and responsibilities of some of the senior officials who administered Roman Britain, their lower ranking counterparts, such as the *beneficiarii* who oversaw supplies, or the camp prefects who were responsible for managing resources for each legionary or auxiliary unit, remain anonymous (Carreras Monfort, 2002:77-78; Roth, 2012:242).

The case for requisitioning military supplies at a local level appears strong, however, as unit commanders would have been best placed to know their own supply needs. The acquisition of wine from different sources may well have been a matter of administrative or logistical convenience, with units in the north of the province being supplied from the Rhineland and those in the south receiving their provisions from Gaul. If the responsibility for placing orders was indeed delegated to individual garrisons, the direct involvement of a camp prefect or quartermaster with the merchants who supplied their unit does not necessarily indicate that the line between public and private supply had been crossed, providing that the merchants concerned were dealing with these officials in their capacity as agents of the Roman state.

The public / private divide is less clear when we consider the manner in which individual retailers from the *vici* or *canabae* may have acquired their wine supplies. These may have arrived as parallel imports having travelled cost-free alongside official supplies, as we saw in section 6.7; in which case the line between private and public supply becomes blurred. Similarly, if retailers acquired surplus stock released from military stores, the question of who benefited financially from this arrangement is the key to determining if the public / private divide has been transcended. If payment passed through the unit's 'books' the transaction was presumably 'official' and constituted a 'public' transfer, whereas if the unit commander or camp prefect pocketed the payment the transaction would almost certainly have been of a 'private' and 'unofficial' nature. Without further evidence it is impossible to confirm which of these practices may have been more prevalent.

Merchants clearly had an important rôle to play in wine distribution during this period and epigraphic evidence provides details of several individuals who specialized as wine merchants (*negotiatores vinarii*) and brought in cargoes from both the Rhineland and Bordeaux. As the province gradually became pacified in the post-conquest period, independent merchants may have taken the lead in managing the overall supply process, presumably under indirect military supervision.

Figure 8.44 Drivers of Romano-British Wine Supply (*c*. AD 43-270)



8.7 DEDUCTIONS

The supply of wine to pre-conquest Britain appears to have taken place in four phases; the first from *c.* 120-56 BC, reaching south coast ports-of-trade such as Hengistbury, from where the wine was distributed to the local tribal hinterlands. The second phase, from *c.* 56-10 BC saw a switch in imports to south-east entry points like Colchester (*Camulodunum*), where the dominant local tribe, the *Trinovantes*, seem to have used wine in association with élite burials. The third phase of pre-conquest imports, *c* . 10 BC-43 AD saw wine shipments to *Camulodunum* continue, the recipients being the

Catuvellauni, who had taken over this area. The final phase of wine supply, commencing with the Claudian conquest in AD 43, lasted through to *c.* AD 270, the date at which most bulk imports from the continent ceased.

The quantity of wine reaching pre-conquest Britain was never high and it is conceivable that some form of supply constraint existed. Such restrictions may have been imposed by the Roman state or applied by the independent merchants who controlled key transport bottlenecks such as the channel-crossing. The power of these merchants would have been enhanced if they operated some form of export monopoly that allowed only favoured British clients to benefit from this trade. There is no historical evidence to prove such restrictions were ever in force, but several leading academics suggest such an arrangement is likely (Haselgrove, 1976:43; Rodwell, 1976:238; Cunliffe, 1995:69; Millett, 1995:38).

The early decades of the 1st century AD saw the end of the Roman state's campaigns north of the Rhine and with it a slackening of the demand for strategic resources that may have previously driven cross-channel exchange. A demand for wine had by this time been established in south-east England and, as state involvement dwindled, merchants seem to have stepped in to fill the vacuum the Roman state's withdrawal from the market created, and to supply the commodity on a commercial basis.

After the Claudian invasion in AD 43 the supply network altered once again. Significant quantities of wine reached Britain, with military supply arriving mainly from the Rhineland, while civilian demand appears to have been met by merchants using the ancient Atlantic trade routes. Parallel supply-chains may have served different geographical locations, presenting a complicated picture. With multiple entry points and growing consumer demand, large-scale imports would have been required to satisfy consumer demand and the supply-chain will have had to evolve to cope with this changing situation.

CHAPTER 9

OLIVE-OIL SUPPLY

9.1 INTRODUCTION

Olive-oil, like wine, is a perishable commodity and when consumed leaves no direct physical trace. It is often possible to detect the presence of olive-oil in the archaeological record, however, through the distinctive *amphorae* in which the product was carried (Funari, 1994:98; Fitzpatrick & Timby, 2002:164). This enables us to identify the areas from which these imports came, the routes they took to reach Britain and their distribution throughout the province once they had arrived.

Olive-oil is an extremely versatile product. Its most important use during the Roman period was as a source of nutrition, especially in Mediterranean-type diets (Mattingly, 1988a:33). Olive-oil also had a significant range of secondary uses, including fuel for lamps, lubrication, or as the base for many medicaments, perfumes and cosmetics (Hitchner, 2002:72).

The olive is not native to Britain and its oil had no tradition of usage here before Roman times (Carreras Monfort, 1998:161). There is clear evidence that small quantities had begun to be imported before the Claudian conquest however (Peacock & Williams, 1983:266-267; Fitzpatrick, 2003:17).

9.2 INVESTIGATIVE APPROACH

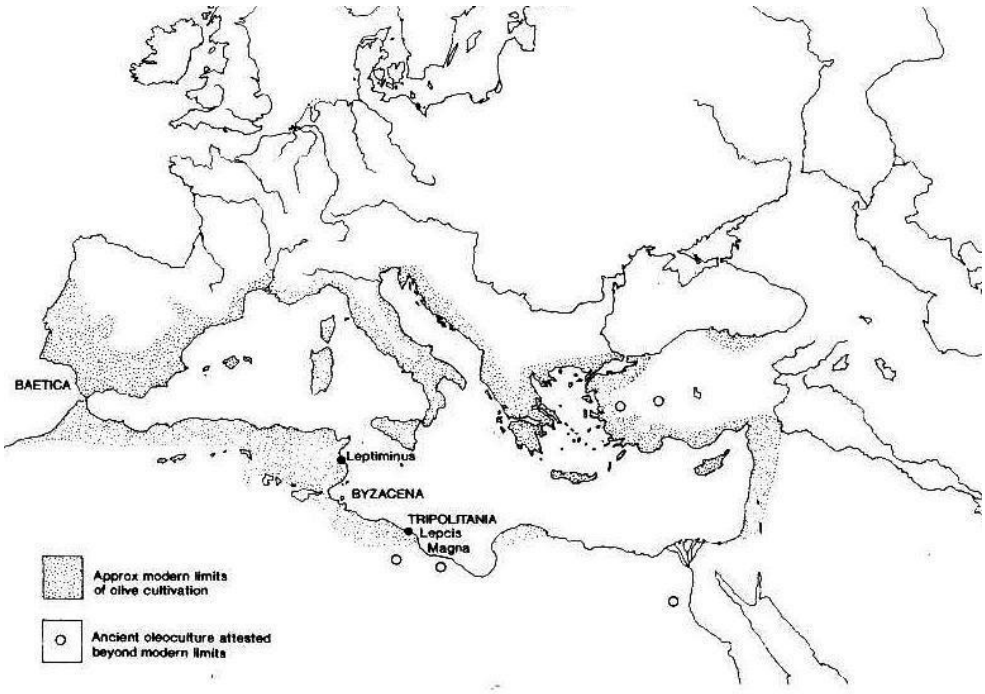
As with wine supply, we will begin our investigation by considering the core-interests of the producers, merchants, state officials and consumers

involved in the distribution of this commodity in order to establish a general supply framework, before moving on to consider the ways in which imports developed through each of its chronological phases.

9.2.1 Producer Involvement

Italy, North Africa and Spain were all important oil-producing regions in the 1st and 2nd centuries AD, which clearly indicates that olive cultivation was an important branch of agriculture in many parts of the Mediterranean by this date (Hitchner, 2002:73). Columella (*c.*18-70 AD) described the olive as being 'the first among all trees' (Columella, *De Re Rustica*, v**.** 8**.** 1; cited by Mattingly, 1996:215).

Figure 9.1 Mediterranean Olive-Growing Regions



(After Mattingly, 1996:217, Figure 9.3)

Olive-oil was a vital commodity in the Roman period and Cato, Columella, Pliny the Elder and Varro discuss *oleoculture* in their agricultural treatises (Rossiter, 1981:353). Cato's provision of sample contracts for his readers suggests that many olive-growers employed contractors to pick their fruit and extract its oil (Cato, *De Agri Cultura*; cited by Morley, 1996:161). As a result, there is little to suggest that olive-growers had much involvement in the supply-chain after the harvesting stage.

9.2.2 State Involvement

The state appears to have acquired most of the oil it required by means of taxation (*fiscus*), requisition (*indictiones*), 'voluntary' donations, or state-funded purchases (Blázquez, 1992:176-177). This oil was then redistributed through the state-administered supply system (Funari, 1994:244). Rome's expansion into Gaul and the Rhineland in the Julio-Claudian period (58 BC-AD 69) took the armies beyond the limits of olive cultivation, stimulating demand in new areas (Bagozzi *et al*, 1998:537; Hitchner, 2002:73). Public sector demand arose from two sources:-

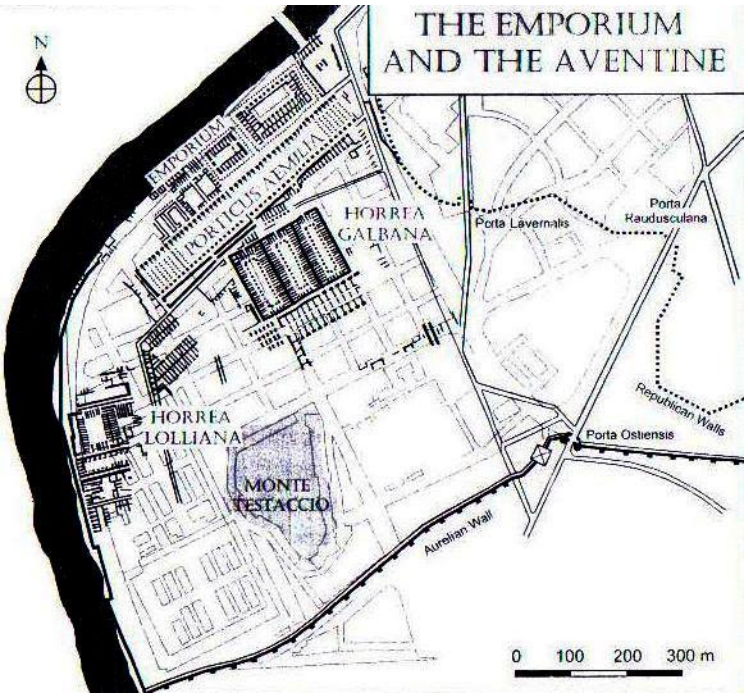
1/ Rome (the *annona urbana*)
2/ the northern military frontier

(Funari, 1994:95)

The city of Rome displayed a vast appetite for olive-oil. A huge mound of *amphorae* fragments from this period can still be found behind the old store buildings which lined the River Tiber. This waste tip was built-up between the reigns of Augustus (27 BC-AD 14) and Gallienus (AD 253-268) still stands to a height of over 40 metres, with a circumference of around 1,000 metres (Lowe, 2009:124). It is thought to contain the remains of over 53 million *amphorae*, which together contained about 3 billion litres of oil

(Mattingly, 1996:240). These *amphorae* came mainly from the *Baetican* region of Spain (85%), the remainder being largely of North African origin (Holleran, 2012:77). The dump, now known as *Monte Testaccio* (potsherd mountain), was in use until at least AD 257 (Bláquez, 1992:178).

Figure 9.2 Location of *Monte Testaccio* in Rome



(After Holleran, 2012:66, Map 3)

In addition to supplying the needs of Rome's urban population, olive-oil was also required by army units stationed throughout the empire. Since oil was often available locally, routine long distance supply was only necessary when a garrison was located outside an olive-growing region. Most supplies for the northern frontier came from *Baetica* (Carreras Monfort, 1998:161). Distribution of this important commodity would have been carried out, or at least supervised, by the Roman state (Blázquez, 1992:176).

9.2.3 Merchant Involvement

Mercantile involvement in olive-oil distribution is again evident both from the transport fees (*vecturae*) the Roman state paid to traders (*negotiatores*) and shippers (*navicularii*) and from the inscriptions (*tituli picti*) and graffiti that appear on their *amphorae* (Carreras Monfort, 1998:162). It is apparent that some merchants became specialist oil-distributors (*diffusers olearii*); especially to major markets such as Rome (Carandini & Panella, 1981:492).

Merchants were also involved in carrying olive-oil to the northern frontier, as *amphorae* markings at several German military sites link these to specific production facilities in *Baetica* (Blázquez, 1992:175-176). Families as well as individuals were involved in this trade, which at times spanned several generations (Carreras Monfort, 1998:163-164). It is not clear whether these exporters sold the oil to local traders on arrival at their destination or retailed it themselves (Remesal Rodriguez, 2002:304).

9.2.4 Consumer Involvement

Olive-oil was regarded as important to many aspects of the Mediterranean lifestyle, making it a key commodity in the state's desire to maintain the army's cultural identity (Carreras Monfort & Funari, 1998:83; Mattingly, 2004:10-11). This need would also have been shared by Roman merchants visiting Britain and their presence may account for the occasional finds of oil *amphorae* from pre-conquest contexts (Partridge, 1981:351).

As olive-oil shipped to the northern frontier appears to have been primarily intended for military consumption, it is difficult to assess civilian demand (Remesal Rodriguez, 2002:304). Most oil *amphorae* found on civilian sites come from urban or *vicus* locations rather than rural settings (Cool, 2006:61, table 7.2). This suggests that oil usage was mainly among segments of the

population who wished to adopt Roman cultural or dietary practices (Tyers, 1996:52; Morley, 2007a:94).

9.2.5 Amphora Markings

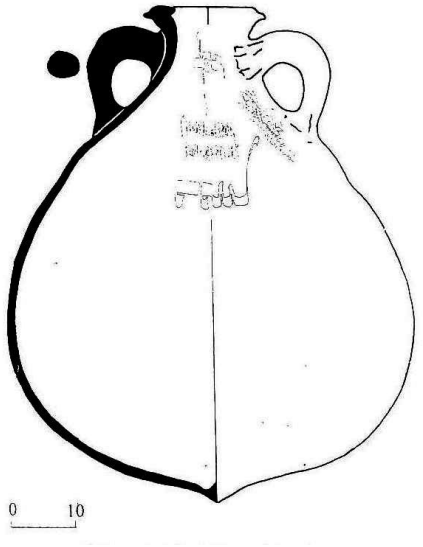
As with wine containers, a set of markings were often applied to the exterior of olive-oil *amphorae* which allow us to discover much about their supply. These inscriptions are generally more detailed and complex than those from wine jars and not all are yet fully understood. Mattingly (1988a) provides details of the general structure of these markings.

> "When filled and ready for export, a typical Dressel 20 carried the following information on it:
> 1) stamps which could identify the *figlina* or estate which had produced the amphora (or for which the amphora was produced)
> 2) *Tituli picti* - a series of painted notations giving:
> α - the weight of the empty vessel;
> β - the name of the merchant handling the consignment;
> γ - the weight of the oil contained in the vessel;
> δ - the names of slaves or freedmen carrying out the 'customs' checks, the name of the *conventus* (*Corduba*, *Astigi* or *Hispalis*) and the estate from which the oil originated and its proprietors name
> 3) a number of as yet unsatisfactorily explained graffiti and painted notations"
>
> (Mattingly, 1988a:43)

There are key differences in the meaning the marks exhibited on olive-oil *amphorae*. Remesal Rodriguez (1978) analysed the stamps pressed into the handles of the vessels before firing and was able to identify these as belonging to the oil's owner rather than the potter who made the container (Hughes, 2009:26). This suggests that potters either produced batches of *amphorae* for specific oil exporters, or that some form of vertical economic integration existed between the kiln-owners and export merchants. The potters' own manufacturing symbols appear as *ante cocturum* markings; one

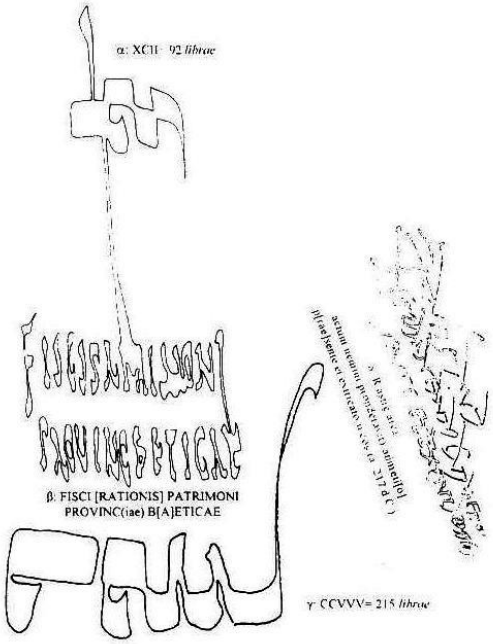
of a number of types of graffiti found on these vessels (Remesal Rodriguez, 1998:187).

Figure 9.3 Olive-Oil Amphora Showing Positions of Markings



(After Remesal Rodriguez, 1998:191, Figure 3)

Figure 9.4 Detail of the *Tituli Picti* shown in Figure 9.3



(Adapted from Remesal Rodriguez, 1998:191, Figure 3)

While these markings are often complex, they still provide much useful information about the manufacture and distribution of these containers (Carreras Monfort, 2002:86; Twede, 2002:105). To relate this to the supply process we must begin in *Baetica* itself to identify how the region's location influenced the development of its distribution network.

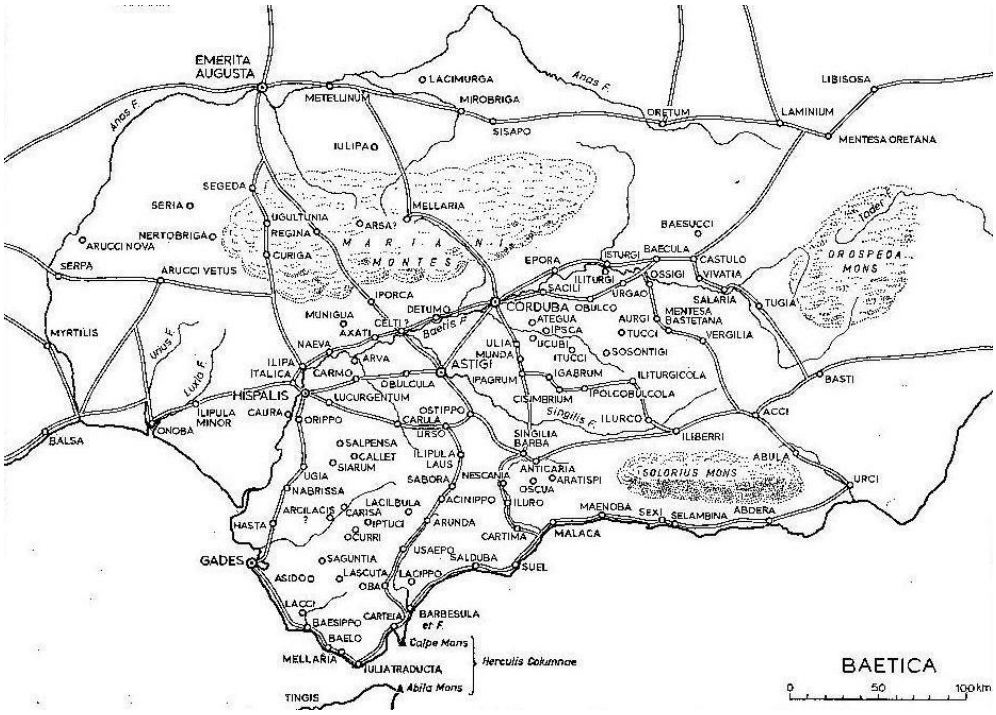
9.3 PRODUCTION AND DISTRIBUTION OF *BAETICAN* OIL

9.3.1 Introduction

The *Baetican* region of southwest Spain became a Roman province in 206 BC and is an area that is well suited to olive cultivation and oil production (Remesal Rodriguez, 2002:298). By AD 43 *Baetica* had become the main oil supplier to most of Rome's western provinces and the northern frontier (Mattingly, 1988a:38; Funari, 1994:88; Remesal Rodriguez, 1998:183).

.

Figure 9.5 Map of Roman *Baetica*



(After Sitwell, 1981:56)

9.3.2 The Development of *Baetican* Olive-Oil Production

More than 160 oil-presses have been discovered on Roman period sites in this part of Spain, with many more no doubt awaiting discovery (Hitchner, 2002:76). Interestingly, while most *Baetican* olive groves and oil-mills are located in the hilly regions of the middle and upper Guadalquivir Valley, the oil itself seems to have been collected in coastal centres like Écija (*Astigi*), Cordoba (*Corduba*) or Seville (*Hispalis*) where it was bottled for shipment (Funari, 1991:65, cited by Anderson 1992:62; Ponsich, 1980; 1983; cited by Remesal Rodriguez, 1998:188). The need to trans-ship the oil in this way arose because the *amphorae* kilns lay in the valleys of the Genil and the Guadalquivir, where suitable clay was available (Mattingly, 1988a:41-43; Remesal Rodriguez, 1998:188; Lowe, 2009:129). Once the *amphorae* were filled, sealed and stamped, most appear to have been assembled ready for shipment at *Hispalis*, the principal export centre (Funari, 1994:88; Remesal Rodriguez, 1998:188).

9.3.3 Characteristics of the *Baetican* Olive-Oil Supply Network

Baetican olive-oil had established three principal markets by the Augustan period (27 BC-AD 14):-

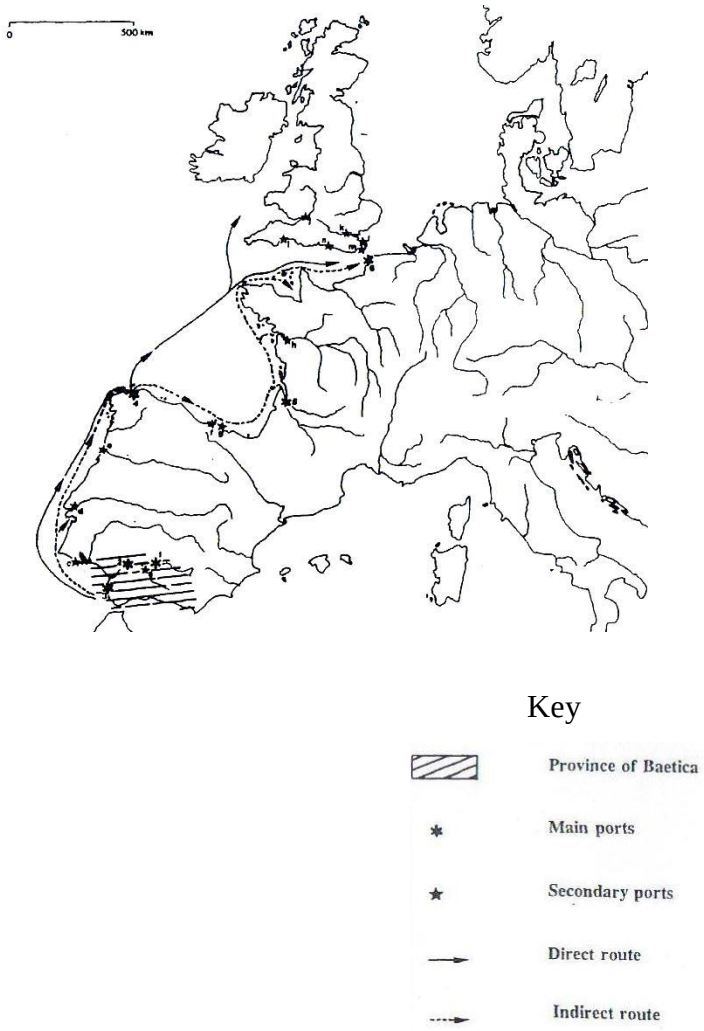
1/ the Roman *urbs*
2/ the armies of the Rhine frontier
3/ urban centres elsewhere in the western empire

(Funari, 1994:95)

Baetican merchants probably began to ship olive-oil via the Mediterranean coast to the northern frontier by way of the Rhône-Rhine river systems from

the late 1st century BC (Garcia Vargas, 2010:64). Parallel routes appear to have developed over the next century to serve *Baetica*'s expanding markets. The original Mediterranean route through the Straits of Gibraltar provided a safe passage along the coast of *Gallia Narbonensis* to Marseilles (*Massilia*) and from there via the Rhône-Rhine river systems to the northern frontier; or onward to Rome along the Italian coast or via the Balearic isles and Sardinia (Whittaker, 1994:100). An Atlantic coastal route also extended northwards via *Lusitania*, *Tarraconensis*, *Aquitania* and *Lugdunensis* during this period, as shipwreck evidence confirms (Blázquez, 1992:176).

Figure 9.6 Atlantic Coastal Supply Routes from *Baetica* to Britain



(Adapted from Carreras Monfort, 1994:311, Figure 77)

The Atlantic coastal-route stretches back into prehistory and its revival at this time may in part reflect the growing supply needs of northern Gaul and Britain (Blázquez, 1992:176). In addition to being central to this thesis, the nature of Britain's demand for olive-oil enables useful light to be shed on the structure of its distribution network, for as Carreras Monfort (2002) explains:-

> "The province of Britannia is a very suitable case-study for the analysis of military supply due to its insular condition and because of the … well-published excavations of military bases, granaries and monographs on ceramic distributions …"
>
> (Carreras Monfort, 2002:83)

9.4. BRITAIN'S OIL SUPPLY IN THE PRE-CONQUEST PERIOD

9.4.1 Introduction.

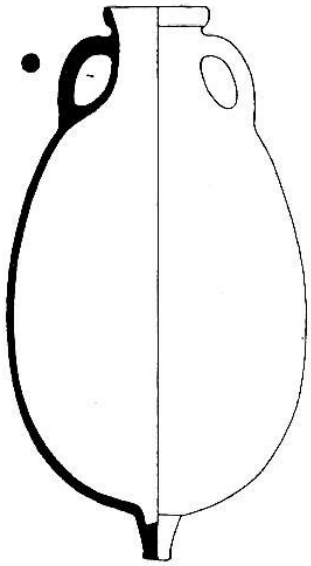
Unlike wine, which would have been easily assimilated into the feasting traditions of the Iron-Age societies which prevailed in Britain prior to the Claudian conquest, olive-oil is a commodity whose use is closely embedded in Mediterranean cultural traditions (Carreras Monfort, 1998:162). While Peacock (1984:40) has dated the earliest olive-oil *amphorae* discovered in southern England to the Augustan period, the numbers of these finds are small and the quantity of olive-oil imported at this time appears to have been very limited (Carreras Monfort, 1998:161).

Olive-oil *amphorae* discovered in pre-conquest contexts in Britain are of the Oberaden 83 / Dressel 25 type. This form remained in use until the early 1st century AD (Peacock & Williams, 1991:134-135).

Figure 9.7 Oberaden 83 (Dressel Type 25) Amphora

(Photograph courtesy of University of Southampton, 2005)

Figure 9.8 Drawing of an Oberaden 83 Amphora



(Adapted from Peacock & Williams, 1991:134, Figure 64)

These vessels have been discovered at only four British sites in Wessex and south-east England (Williams & Carreras Monfort, 1995:232). The Sheepen site has produced two examples; while the other locations listed in Figure 9.9 have each produced one specimen.

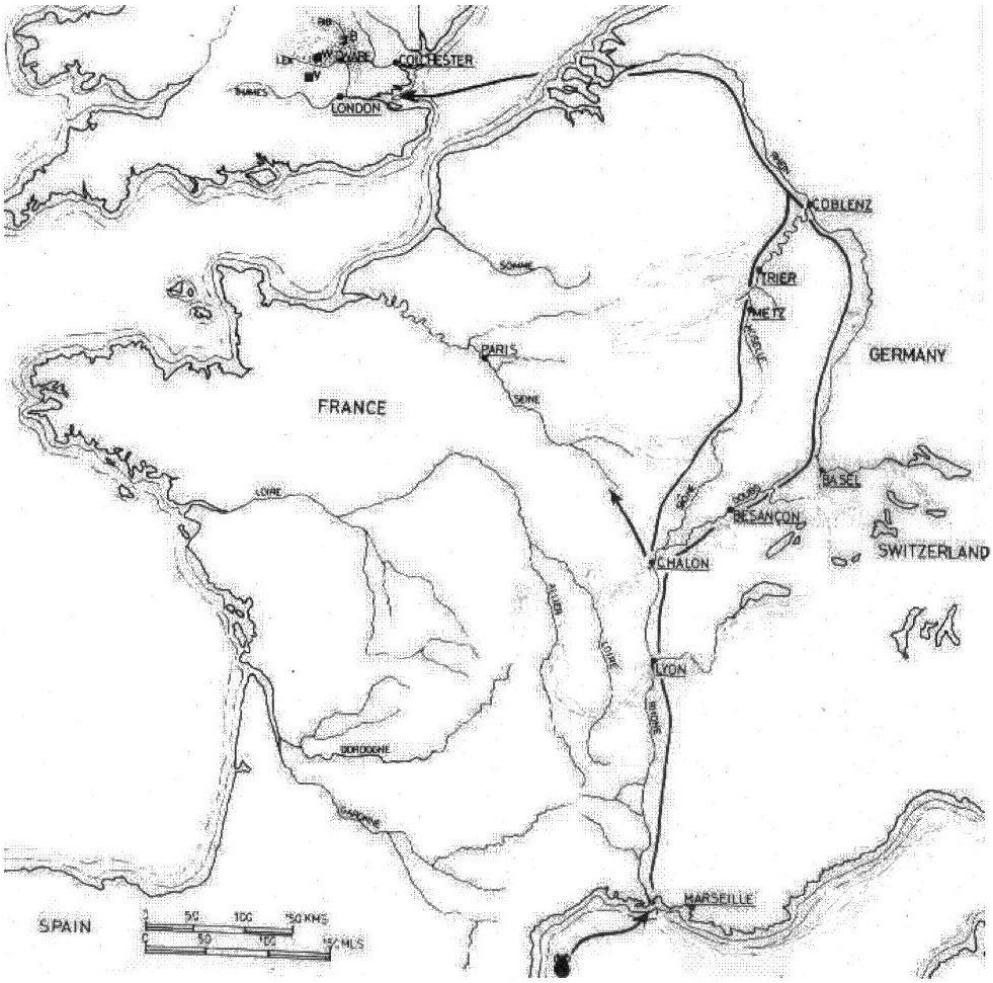
Figure 9.9 Locations of Oberaden 83 *Amphorae* Finds in Britain

Location	Reference Source
Braughing - Gatesbury Track	Partridge (1979:114, Figure 34.4)
Colchester - Sheepen	Sealey (1985:67-69, Figure 10; 79-80)
Hengistbury Head	Williams (1987:273)
St Albans - Prae Wood	Peacock (1971:184)

(Adapted from Fitzpatrick, 1989:716)

The continental distributions of this *amphorae* type suggest that they are most likely to have reached Britain via the Rhône-Rhine trade route, with imports commencing in the last decade BC, or shortly thereafter (Morris, 2010:37). The probable routes by which these *amphorae* reached Britain are shown in Figure 9.10.

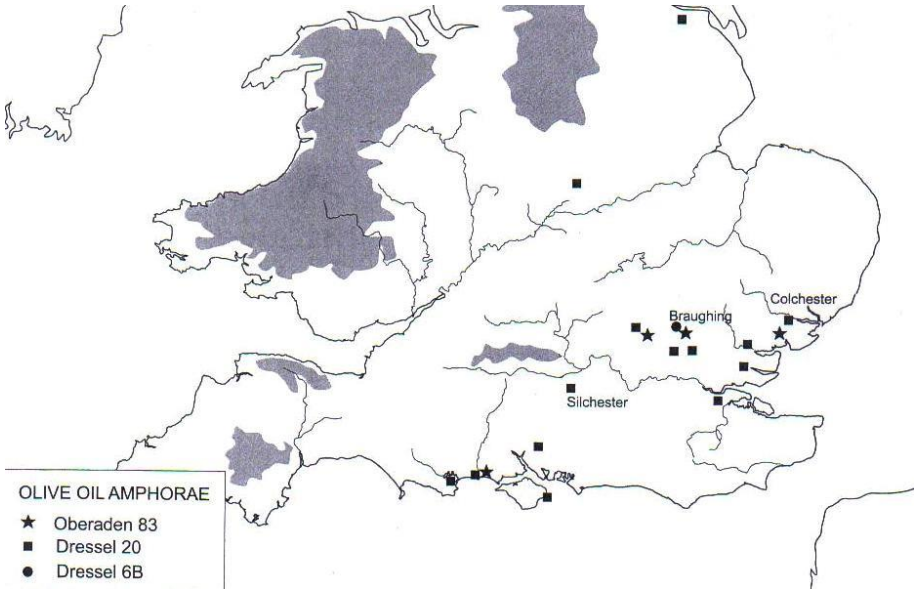
Figure 9.10 Probable Supply Route of Oberaden 83 *Amphorae*



(Adapted from Partridge, 1981:352, Figure 137)

In addition to these imports, Peacock (1984:39-40) has suggested that a few Dressel 6 *amphorae* may also have been used to bring oil into pre-conquest Britain during the Tiberian period (AD 14-37), although only one Dressel 6 has been found in a securely dated pre-conquest context so far. Examples of the better known Dressel 20 began to arrive by AD 43 and fourteen British sites are known to have received this type of amphora.

Figure 9.11 Distributions of Oil *Amphorae* in the Pre-Conquest Period



(After Fitzpatrick, 2003:18, Figure 8)

While olive-oil *amphorae* are scarce in Britain, it is interesting to note that the sites where Oberaden 83 and early Dressel 20 *amphorae* are found closely match those on which Dressel 2-4 wine *amphorae* also occur. It is therefore possible the olive-oil supply-chain resembled the one used to carry wine and the two commodities may have arrived together on occasions.

9.4.2 Evaluation of Britain's Pre-Conquest Olive-Oil Supply

Twenty specimens of oil-bearing *amphorae* (14 Dressel 20s; 5 Oberaden 83s and 1 Dressel 6) fail to constitute a sufficient sample to meaningfully analyse the route(s) by which oil reached Britain in the pre-conquest period. Partridge (1981:351) is probably correct to suggest that the presence of continental traders in settlements where these *amphorae* have been found may explain their arrival. Personal consumption does not represent trade though and the beginning of commercial supply has still to be identified.

9.5 BRITAIN'S OIL SUPPLY IN THE POST-CONQUEST PERIOD

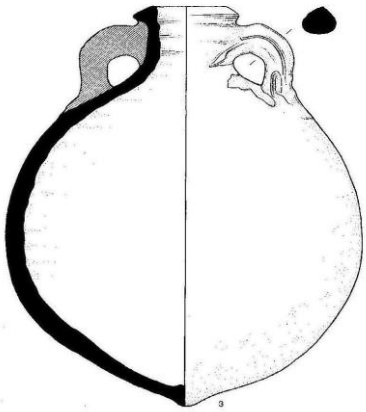
9.5.1 Introduction

By *c.* AD 30, Oberaden 83 *amphorae* had been succeeded by the long-lived Dressel type 20 (Funari, 1994:98; Carreras Monfort & Williams, 2003:64). These had a capacity of about 60-65 litres (Fitzpatrick & Timby, 2002:164).

Figure 9.12 Dressel Type 20 Amphora

(After Tyers, 2012)

Figure 9.13 Drawing of a Dressel Type 20 Amphora



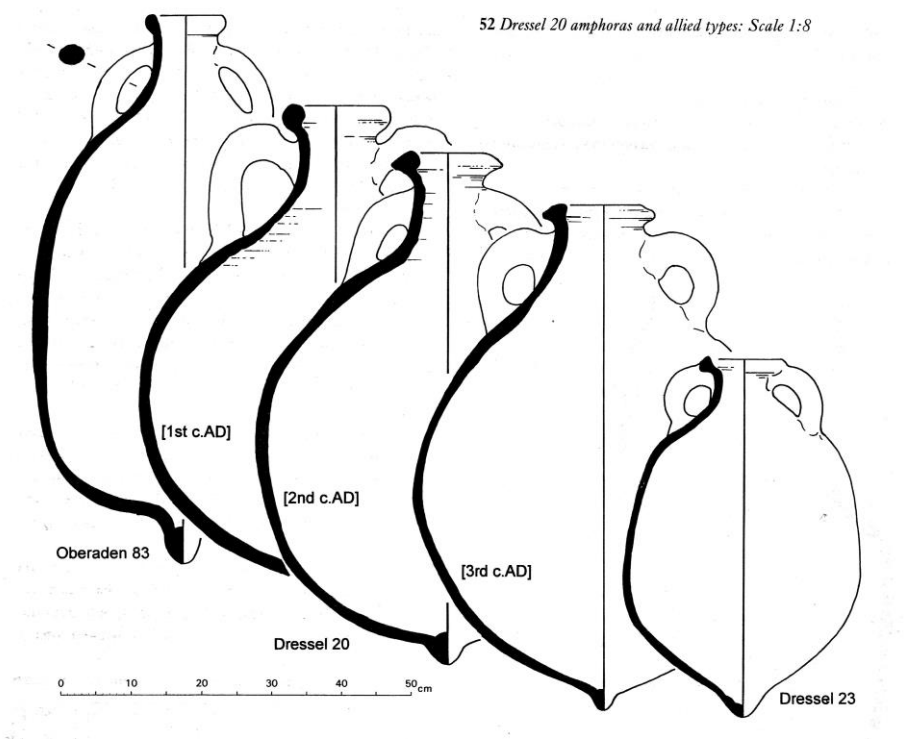
(After Davies *et al*, 1994:10, Figure 2)

Unlike the pre-conquest period, an abundance of Dressel 20 oil *amphorae* reached Britain from *c.* AD 43-260 and provide an extensive data set with which to analyse their importation. In addition, Morris (2010) points out:-

> "More than 1,800 of these stamps have been recovered from Britain, of which over 1,400 can be closely dated."
>
> (Morris, 2010:67-68)

This wealth of datable evidence, from both Britain and the continent, has allowed the development of Dressel 20 *amphorae* forms to be studied and a typological sequence established. From this we can see how these vessels gradually evolved, as Figure 9.14 illustrates.

Figure 9.14 Evolutionary Developments of Dressel Type 20 *Amphorae*



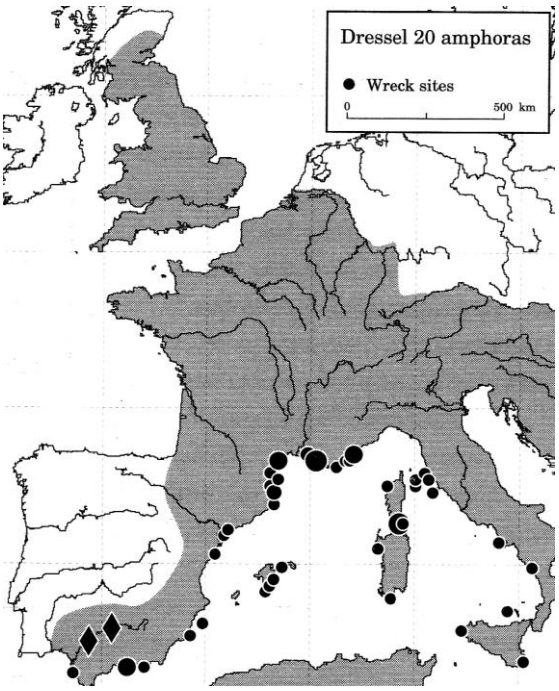
(Adapted from Tyers, 1996:88, Figure 52)

Dressel 20's are by far the most commonly found *amphorae* type to occur in Britain during the Roman period. In comparing the methods available to analyse pottery assemblages Tomber (1993) notes:-

> "Three methods are available: EVEs, count and weight. Statistically estimated vessel equivalents (EVEs) have been shown to be the most reliable measure of comparing assemblages (Orton, 1975; 1982). By this method, the extant percentage of diagnostic sherds (frequently rims) provide a relative assessment of the quantity of pottery present."
>
> (Orton, 1975; 1982; cited by Tomber, 1993:148)

In the case of Dressel 20, Carreras Monfort (1994:41) calculates the three separate measures as 67% by EVE, 75% by sherd-count and 84% by weight. The distribution of Dressel 20s throughout Britain and Western Europe is very widespread, as Figure 9.15 shows. In Britain, the main concentrations of these vessels are linked to sites which have a strong military presence.

Figure 9.15 Distributions of *Baetican* Dressel Type 20 *Amphorae*



(After Tyers, 1996:88, Figure 53)

Funari (1996) and Carreras Monfort (1998) have been able to use data from Dressel 20 distributions to explore Britain's import patterns in some detail and to identify a number of important trends. These variations mainly relate to the changing fortunes of the merchants based at the three export centres (*conventus*) that supplied olive-oil to Britain, rather than to changes in the basic structure of the supply-chain itself. In order to avoid repetition when considering successive supply periods, attention will be focused on changes to the operational aspects of supply in each chronological phase of olive-oil distribution, leaving the analysis of the rôle each individual supply-chain member played in this process until the end of this review. This is a similar approach to that used to analyse Britain's post-conquest wine supply in the previous chapter. This review will begin by considering the first phase of bulk olive-oil imports during the pre-Flavian period.

9.5.2 Oil Supply in the Pre-Flavian Period (AD 43-69)

The Roman invasion of AD 43 marked the moment when Dressel 20 olive-oil *amphorae* first entered Britain in bulk. Much of this increased supply can be explained by the fact that each Roman soldier received a monthly allowance of olive-oil (Appian, *Hispania*, 9.54; Plutarch, *Crassus*, 19.5; Caesar, *Bello Africo*, 67.2; all cited by Roth, 2012:35). This may have involved a personal ration of *c.* 20 litres of oil *per annum* (Mattingly, 1988b:161). Mattingly's mid-range estimate lies between the 16 litres *per annum* figure alluded to in a 4th century *papyrus* (P. Beatty *Panop*. 2.245-9; cited by Roth, 2012:35) and a 25 litres *per annum* allowance recorded in a similar 6th century document (Le Roux, 1994:409 cited by Roth, 2012:35).

If these quantities appear low in view of oil's diverse range of uses, it is important to remember that it may have been possible in many cases for a soldier to supplement his basic ration with additional supplies purchased

from a local *vicus*, while communal cooking may have helped to economize on oil usage. Other alternative cooking fats were also available in many cases, such as the bacon fat (*laridum*), which also formed part of the regular ration (*Historia Augusta*, 10.2; Code Theodosius. 7.4.6; both cited by Roth, 2012:26). Butter may also have been used, although resorting to this is claimed to have been considered a hardship (Strabo, *Geographica*, 16.4.24; cited by Roth, 2012:35). Other substitutes for oil, for non-culinary uses, may have included wax or tallow candles and / or rushes for lighting, animal fats for lubrication, *etc*. An annual allowance of 20 litres (+/– 20%) may therefore perhaps be regarded as being a plausible as a 'basic' ration.

Of the four legions involved in the invasion, three had previously been stationed in the Rhine provinces; the II *Augusta* (Strasbourg), XIV *Gemina* (Mainz) and XX *Valeria* (Neuss) and it seems likely that the supply network which had served these units may have been extended to carry supplies to Britain in the post-conquest period.

Most of these early supplies are thought to have entered through ports like Colchester (*Camulodunum*) or Richborough (*Rutupine*), (Carreras Monfort, 2002:86). It is also likely that London became an important entry-gateway when the trading centre was established in about AD 50 (Marsden, 1980:9). While the pre-Flavian period lasted a mere 26 years, 16.4% of all datable Dressel 20 manufacturers' stamps found in Britain relate to imports which arrived at this time. Oil-bearing *amphorae* only reached the south-east of England during this first phase of importation though and this presumably reflects the initial pattern of occupation in the recently acquired province (Funari, 1996:76).

Figure 9.16 confirms that the number of amphora stamps relating to this period currently comprise less than twenty examples. Shennan (1988:307-313) and Baxter (2003:40-41) both agree that the confidence limits attached

to numerical data-sets correspond to the sample sizes involved and warn that the margin of error increases considerably in the case of extremely small assemblages, of the type we are dealing with here. The conclusions which have been drawn from the following tables are therefore only provisional and the percentages shown must be viewed with an appropriate degree of caution, as further finds could easily alter the present picture.

Figure 9.16 Sources of Olive-Oil Supply in the Pre-Flavian Period

Source of Supply	Number of Stamps	% of Britain's Imports
Astigi	4	21.0
Corduba	2	10.5
Hispalis	13	68.5
Total	19	100.0%

(Adapted from Funari, 1996:80-82)

All of the supply in the pre-Flavian period was restricted to the south and east of the province, as olive-oil did not begin to reach other parts of Britain until Rome's frontier was extended northwards and westwards during the AD 70s (Johnson, 1980:3; Funari, 1996:78).

9.5.3 Oil Supply in the Flavian-Hadrianic Period (AD 69-138)

The amount of oil reaching Britain appears to have increased towards the end of the 1st century AD (Funari, 1996:77). These additional imports were presumably triggered by market expansion as the territory under Roman control was advanced to the Scottish border and consumers in the south of the province became more acculturated in Roman ways. Analysis of the

manufacturers' stamps found on imported oil *amphorae* suggests that imports probably reached a peak in the early 2nd century (Funari, 1996:77). The proportion of oil reaching the south declined somewhat in the Flavian-Hadrianic period though, perhaps due to the redeployment of some of the military units previously stationed in this area (Funari, 1996:76).

As oil supply became less focussed on the south, the distribution pattern became more complex as the export regions, *Astigi*, *Corduba* and *Hispalis* all continued to remain active in this market. The nature and extent of their respective involvement varied in relation to the regional demands that were developing in Britain at this time. In his analysis of Dressel 20 stamps and *tituli picti* found in Britain, Funari (1996) identified three regional markets, each with distinctly different supply characteristics:-

1/ Southern and eastern England (South)
2/ Hadrian's Wall and the northern frontier (North)
3/ Wales

(Funari 1996:86)

Figure 9.17 Sources of Oil Supply in the Flavian-Hadrianic Period

Region ***Conventus***

	Astigi	*Corduba*	*Hispalis*	Total
South	7 stamps = 7.1%	20 stamps = 20.2%	72 stamps = 73.7%	99 stamps = 100%
North	3 stamps = 3.9%	3 stamps = 3.9%	71 stamps = 92.2%	77 stamps = 100%
Wales	2 stamps = 9.0%	1 stamp = 4.5%	19 stamps = 86.4%	22 stamps = 100%

(Adapted from Funari, 1996:81-82)

Almost 200 datable amphora stamps have been recovered in Britain from this period and Figure 9.17 suggests that *Hispalis* remained the dominant supply region. Meanwhile, in the emerging northern market and in Wales

Astigi and *Corduba* seem, on the basis of the limited evidence available, to have matched each other, although neither came close to rivalling *Hispalis*.

The similarity of 'stamp' assemblages in Britain can be closely correlated to those found in both northern Gaul and along the Rhine frontier at this time; there were less than 2 percentage points difference between these areas and our own (Remesal Rodriguez, 1986:37; Baudoux, 1990:168-170; both cited by Funari, 1996:80). This confirms beyond doubt that the Rhône-Rhine river system was the route used to deliver oil to Britain at this time, using much the same route which Oberaden 83 *amphorae* had taken a century earlier (Whittaker, 1994:100).

Most of these imports are thought to have reached Britain *via* Richborough, a port with strong military connections in Roman times, or through London. From these locations, the oil *amphorae* were redistributed to their intended destinations, with the eastern coastal route being the best documented route (Carreras Monfort, 1998:161-162).

9.5.4 Oil Supply in the Antonine Period (AD 138-191)

Figure 9.18 confirms that only about half the number of amphora stamps are known for the Antonine period, compared to the Flavian-Hadrianic era, but the available data suggests that having peaked in the early 2nd century AD, the quantity of olive-oil reaching Britain declined between AD 138 and 191 (Funari, 1996:77). The amount available on the northern frontier seems to have fallen by only a fraction compared to other regions however, probably due to the number of troops who remained stationed there (Funari, 1996:78).

Figure 9.18 Sources of Olive-Oil Supply in the Antonine Period

Region	***Conventus***			
	Astigi	*Corduba*	*Hispalis*	Total
South	10 stamps = 20.9%	1 stamp = 2.1%	37 stamps = 77.1%	48 stamps = 100%
North	5 stamps = 13.5%	1 stamp = 2.7%	31 stamps = 83.8%	37 stamps = 100%
Wales	2 stamps = 10.0%	0 stamps = 0.0%	18 stamps = 90.0%	20 stamps = 100%

(Adapted from Funari, 1996:81-82)

With the exception of *Hispalis* the data remains scarce but, if the picture presented is accurate, the most striking feature of the Antonine period seems to have been *Corduba's* virtual withdrawal from the supply-chain which served Britain. The main beneficiary in the south looks to have been *Astigi*, whose share appears to have increased slightly, albeit in a smaller market; while in the north it was *Hispalis* which continued to dominate.

This was a period in which competition among the suppliers who remained active in the market appears to have increased. This is indicated by the fact that while the total number of manufacturers' 'stamps' remains fairly static, the number of different 'dies' used to create these impressions increased by a significant measure (Funari, 1996:77). At least 71 separate individuals or firms are known to have been stamping *amphorae* in *Baetica* at this time (Funari, 1996:77). It is this sudden burst of die production which Funari believes led Peacock & Williams (1983:268) to erroneously conclude that the Antonine period was the era at which British imports reached their peak. Another important change associated with this period is the switch from the traditional Rhône-Rhine route to the shorter, more direct, Atlantic coastal route (Remesal Rodriguez, 1986:77-79; *contra* Whittaker, 1994:99).

While Fulford (1992:298) reminds us that the Rhône-Rhine axis remained in use until at least the early 3rd century AD, it is evident that at least some oil made its way north by the Atlantic route, as a number of wrecks containing

Dressel 20 *amphorae* have been found along the Galician coast (Blázquez, 1982; cited by Blázquez, 1992:176). Further weight has been given to the notion that traffic increased on the Atlantic route in the Antonine period by the fact that manufacturers' stamps in northern Gaul and along the Rhône-Rhine corridor begin to differ more markedly from their British counterparts at this time, suggesting that alternative delivery systems were now being used to supply each of these areas (Carreras Monfort & Funari, 1998:82).

Carreras Monfort (2000) suggested that Guernsey would have made a useful staging point where goods destined for Britain's east and west coasts could be divided for onward shipment. Guernsey is known to have been an active trading centre at this time, following the discovery of the wreck of a *Gallo*-Roman merchant vessel close to the entrance of St Peter Port harbour (Rule, 1990; Rule & Monaghan, 1993).

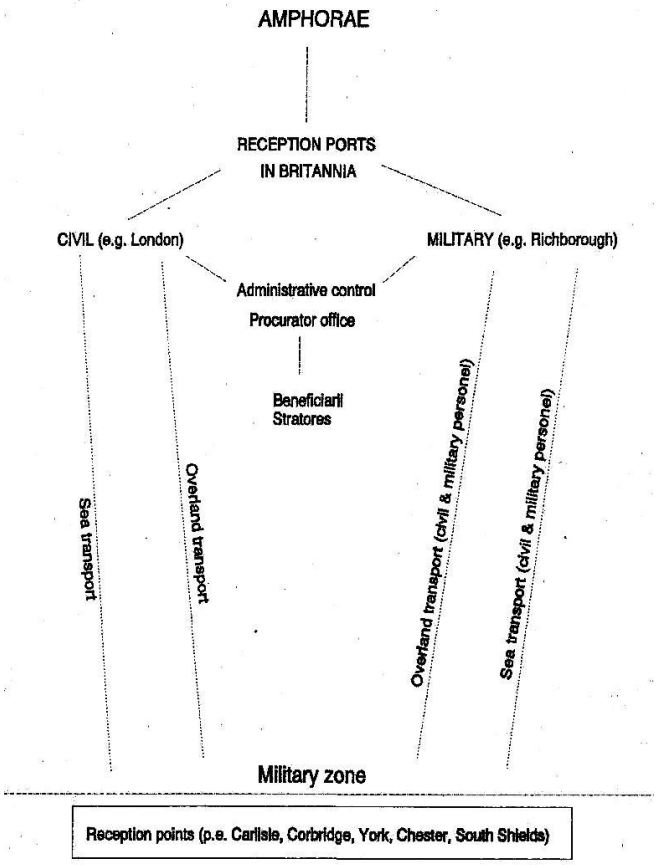
Oil destined for southern Britain would generally have reached the mainland through the port of London (*Londinium*). While *Londinium* probably served as a distribution centre for other parts of the province, Callender (1965:56) was the first to suggest a direct route from Spain may have been established by the mid 2nd century AD to carry oil to Britain's frontier regions. Funari (1996:86) has even suggested that each of Britain's regional markets was supplied by a specific *conventus*. This notion is supported by Anderson (1992:69), who has drawn attention to the increased importance of South Shields as a port and supply-base from *c.* AD 160.

The rôle of supply-bases are important to understanding the operation of the state-administered distribution system as Carreras Monfort (2002) explains:-

> "From the south, the military supplies were mainly directed to four or five reception points in the north such as Carlisle, Corbridge, South Shields, York and Chester. These military ports register the highest density of Dressel 20 *amphorae* in the north, since they become 'breaking points', or store and distribution centres ..."
>
> (Carreras Monfort, 2002:86)

An appreciation of the way in which olive-oil supplies entered circulation enables us to gain a better understanding of the relationship between civilian and military supply, as Figure 9.19 illustrates.

Figure 9.19 Structure of the Roman Military Supply Network



(Adapted from Carreras Monfort, 1994:234; Figure 48)

While depots such as South Shields (*Arbeia*) and York (*Eboracum*) dealt with the east coast traffic, Carlisle (*Luguvalium Carvetiorum*) and Maryport (*Alauna*) would have served similar rôles at the western end of Hadrian's Wall for goods which had travelled north via the Irish Sea. Chester (*Deva*) and Caerleon (*Isca*) would have performed corresponding functions for the two legionary garrisons in Wales. The west coast route to Wales and Britain's northern frontier is also well documented as a military supply corridor and olive-oil, wine and samian all travelled this route, along with other military supplies (Greene, 1979b:103; Fulford, 1981:201-203). The Welsh distribution pattern shows a particularly strong connection with *Hispalis*, 90% of the region's oil *amphorae* arriving from that *conventus* in the Antonine period, suggesting a direct link between the two locations.

9.5.5 Oil Supply in the 3rd Century

The number of amphora stamps from the 3rd century is again smaller than in the preceding period, suggesting that Britain's olive-oil supply may have continued to contract, to perhaps half the mid 1st century level and below 60% of the volume imported in the Antonine era (Funari, 1996:77).

Figure 9.20 Sources of Olive-Oil Supply in the 3rd Century

Region	***Conventus***			
	Astigi	*Corduba*	*Hispalis*	Total
South	15 stamps = 32.6%	7 stamps = 15.2%	24 stamps = 52.2%	46 stamps = 100%
North	19 stamps = 67.8%	0 stamps = 0.0%	9 stamps = 32.2%	28 stamps = 100%
Wales	2 stamps = 28.6%	0 stamps = 0.0%	5 stamps = 71.4%	7 stamps = 100%

(Adapted from Funari, 1996:81)

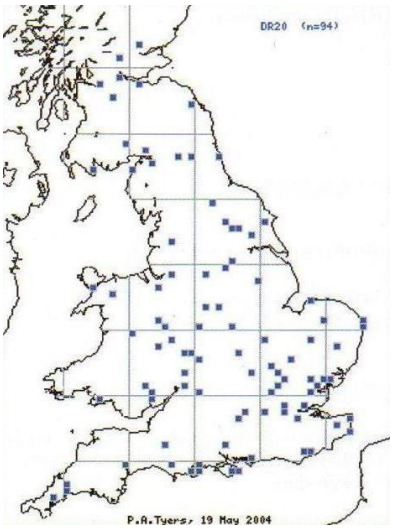
Significant variation in supply from each Spanish *conventus* is again evident during this period. If the evidence from the relatively small group of stamps set out in Figure 9.20 is accurate, *Corduba* may have regained some success in the south, but in quantitative terms this gain was reduced by an overall fall in import volumes. *Astigi*, meanwhile, seems to have made modest gains in the south and Wales, but began to dominate the northern market. The data currently suggests that *Hispalis* continued to be the most successful *conventus*, managing to retain almost complete control of a diminished Welsh market, maintaining a marginal lead in the south, but losing control of the vital northern market; the area where demand seems to have remained buoyant. This loss would have been acute, as the northern military market was the most important supply destination at this time (Funari, 1996:78).

The reasons why olive-oil ceased to be imported in significant volumes after the middle of the 3rd century remains unclear. Carreras Monfort & Williams (2003:68) suggest three possible reasons:-

1/ Political turmoil during the Gallic-Empire disrupted supplies
2/ Changes may have occurred in dietary preferences
3/ Military demand collapsed as troop numbers were reduced

Whatever the reason, oil imports declined to negligible proportions after the mid 3rd century AD, although a little did still manage to arrive from Spain and North Africa (Carreras Monfort, 1998:164; Allason-Jones, 2008:107). The collapse of Britain's imports coincided with a general contraction of exports along the Atlantic coastal route, perhaps connected to the general social and political turbulence which spanned the period between the end of the Severan dynasty in AD 235 and the accession of the emperor Diocletian in AD 284 (Williams, 1985:18; Millett, 1990:163). The distribution of Dressel 20 *amphorae* within Britain between the mid 1st and the mid 3rd centuries AD was widespread, as Figure 9.21 shows.

Figure 9.21 Dressel Type 20 *Amphorae* Distributions in Britain



(After Tyers, 2012)

9.5.6 Analysis of Britain's Post-Conquest Olive-Oil Supply

Olive-oil is a commodity which had no cultural tradition in Britain prior to the Roman period. Its import and distribution is therefore closely linked to the needs of the Roman consumers. Import growth was not gradual though, as an immediate need existed in AD 43 to meet the needs of 40,000 or more troops and auxiliaries involved in the Claudian invasion (Manley, 2002:83). Supply therefore peaked early, as the proportion of stamps relating to each phase of the occupation period shows.

Figure 9.22 Trends in Olive-Oil Supply in the Post-Conquest Period

Period	Duration	Number of Stamps	% of Stamps	% *Per Annum*
Pre-Flavian	26 years	71	16.4	0.63
Flavian-Hadrianic	68 years	153	35.4	0.52
Antonine	54 years	126	29.3	0.54
3rd Century	59 years	81	18.7	0.31

(Adapted from Funari, 1996:77)

9.5.6.1 Producer Push

Having examined the potters' stamps and *tituli picti* attached to Dressel 20 *amphorae* from the *Baetican* region, Hitchner (2002:78) recognized some form of vertical integration may have evolved between the successive stages of the industry, *i.e.* oil production, *amphorae* manufacture and bottling. A development of this kind would imply a degree of central control on the part of those involved in coordinating these activities (Sloman, 2008:106-107).

While this idea would seem appealing from a commercial perspective, when he compared the evidence from the manufacturers' stamps and *tituli picti* found on the bodies of these *amphorae* with the painted or incised shipping marks on their stoppers, Aubert (1994:276) found little correspondence between the two sets of markings. This led him to conclude that different individuals were involved in the manufacturing and distribution processes.

If a parallel is drawn between wine and oil production, it is likely that the merchants contracted to harvest and press the olives will have supplied their own *amphorae*, as wine producers often did. It is therefore conceivable that the stamps which appear on Dressel 20s indicate the identity of the merchant for whom the vessels were made, rather than the potters who made them. If the merchants (*negotiatores / mercatores*) exported the oil themselves, a link with the *tituli picti* might be established, but if oil producers or bottlers sold the filled *amphorae* to independent exporters (*navicularii*) prior to shipment, no correspondence would be found between the marks of the oil producer or bottler on the *amphorae* bodies and those of the shipper on the neck-bungs.

If this hypothesis is correct, it again follows that producers would focus on their own areas of expertise in preparing their commodity for sale, while the responsibility for exporting the oil would have been delegated to specialist merchants with the necessary maritime skills and contact networks to carry

these goods to market. In this scenario, producers would therefore have played no further part in the supply-chain once the oil had left their hands.

9.5.6.2 State Intervention

A close correlation clearly exists between Dressel 20 deposits and sites that were occupied by the army during the 1st and 2nd centuries AD; a link which has been shown to be statistically stronger for Britain's garrison than for any other *amphora* type (Carreras Monfort, 1998:161). This pattern is hardly surprising, if the assumption that many military commanders wished their troops to continue to have access to a Mediterranean style diet is correct (Carreras Monfort, 1998:162; White & Barker, 1998:51).

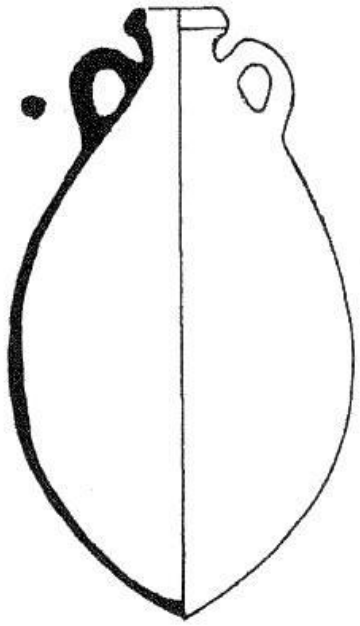
Funari (1996:85) regards olive-oil as a product far too important for the state not to have taken an interest in. Oil was a strategically significant resource, with a diverse range of uses, as we saw in section 5.2.2. This placed oil in a special category of items in which the state-administered supply system took a central interest.

Funari's analysis of Dressel 20 amphora stamps from Britain has revealed that the south-east received the largest number (290 stamps - primarily from *Corduba*), followed by Hadrian's Wall (90 stamps - mainly from *Astigi*) and Wales (51 stamps - mostly from *Hispalis*). Linking this data to the periods in which these *amphorae* were produced, Funari was also able to trace how the consumption pattern of each region developed over time. This led him to conclude that three discrete supply routes existed, each operated from a different *conventus*, with separate distributors responsible for serving each export region.

> *"*... olive-oil consumption patterns varied in the three areas, the Southeast, Wales and Hadrian's Wall area. There were three different dealers and purchasing contracts in the three areas. Were these differences the result of military and civilian separate supplying networks? It seems improbable, as Welsh sites follow neither Southeast nor Hadrian's Wall patterns. There are three different consumption patterns, not military and civilian. It is more likely that there were three different trade routes to these areas.*"*
>
> (Funari, 1996:86)

An arrangement of this kind would inevitably have required a much more complex relationship between the state, the *Baetican* producers and their British clients than has previously been thought and points strongly to the state as the key driving-force behind olive-oil supply at this time. Carreras Monfort & Funari (1998:82) share this view, stating that it was not until the 3rd century AD that civilian demand began to predominate, coinciding with the introduction of a new form of olive-oil *amphorae*, the Dressel type 23.

Figure 9.23 Drawing of a Dressel Type 23 Amphora



(Adapted from Carreras Monfort, 1994:113, Figure 16)

9.5.6.3 Merchant Intermediation

The demand for oil in parts of the western empire where olives could not be cultivated meant that supplies had to be transported to these areas from the production zones (Bagozzi *et al*, 1998:537). With the exception of a short period in the early 3rd century when Septimius Severus reorganized olive-oil production and distribution in *Baetica* and epigraphic evidence from Ostia indicates the imperial fleet became involved in its supply, private merchants are thought to have been responsible for the commodity's transport; albeit under close state supervision (Carandini & Panella, 1981:498-499).

The painted *tituli picti* which appear on many Dressel 20 *amphorae* clearly reveal the identity of many of the merchants involved in this trade (Morley, 2007b:581). As Funari (2002) points out:-

> "Merchants were the middlemen between the olive-oil producers and their clients, private and state alike. They bought and sold contracts for the transportation of oil to different destinations, among them Britain."
>
> (Funari, 2002:245)

An inscription from *Hispalis* refers to one of the individuals engaged in oil supply, M. Iulius Hermesianus, a distributor of olive-oil (*diffusor olearius*) on behalf of the state *annona* (Blazquez Martinez, 2007:182-183; cited by Lowe, 2009:124-125). A number of other *families* are known to have been associated with this trade in the various *conventii* of *Baetica* or in provinces they served and these links sometimes lasted not just years, but generations (Blázquez, 1992:175-176; Carreras Monfort, 1998:163-164). Among those included were the D. Caecilii family from *Astigi*, who were active from the late 1st to the mid 2nd century and the Aelii Optati family from *Hispalis*, who operated in the 2nd and early 3rd centuries (Keay, 1988:103). In Gaul, meanwhile, the Fadii, Olitii, Segolatii and Valerii families are also known to have been heavily involved in oil distribution (Keay, 1988:102).

The personal names of many of the individuals recorded on the Dressel 20 *amphorae* found in shipwrecks along the Atlantic coast have led Carandini & Panella (1981:492) to suggest that most of the merchants involved in this route were probably either Spaniards or Gauls. If this deduction is correct, the parallels between the dominance of local seafarers in the long distance shipment of oil along the Atlantic coastal route and the similar monopoly enjoyed by the tribes of northern Gaul in distributing wine *amphorae* in the late Republican period, is clear. Trott & Tomalin (2003:165) have made a powerful case for the advantages which local knowledge of wind, tide and landmarks would give to local mariners. Many individuals may also have gained the advantage of Roman citizenship status by the 1st century AD.

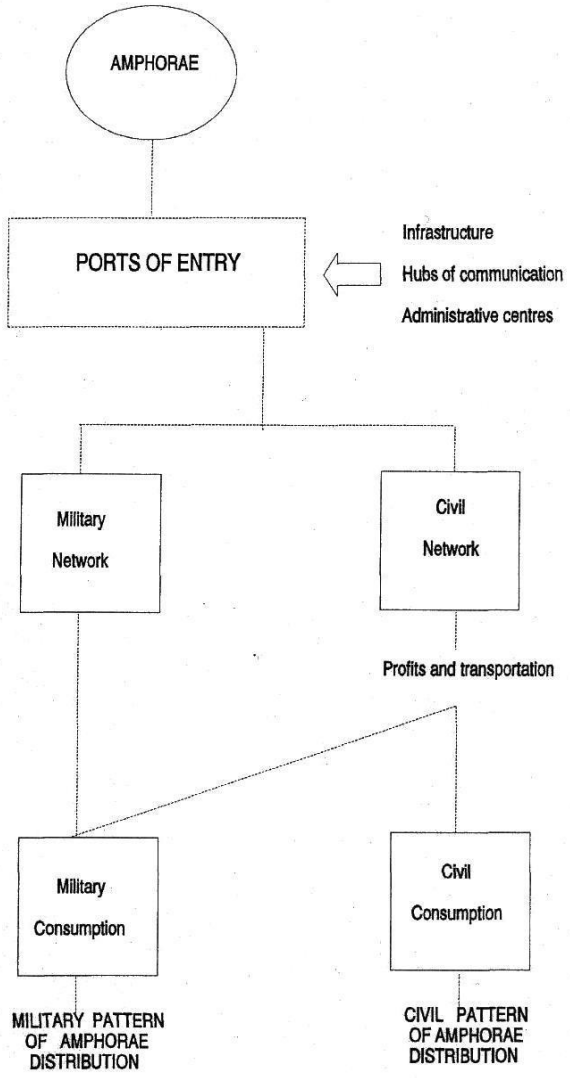
9.5.6.4 Consumer Pull

While the pattern of oil consumption appears to be broadly similar on both civilian and military sites, especially in the north of the province, this may partly be explained by the fact that Dressel 20 *amphorae* are rarely found in locations which lack a military presence (Hughes, 2009:70). There is little doubt that the Roman army was the principal consumer of this product, but a secondary demand is also apparent from members of the civilian population who wished to emulate a Mediterranean lifestyle.

Peacock & Williams (1983:270) were the first to recognize that a common supply pattern existed between the civilian and military segments of the oil market and, since it was clear that independent merchants were involved in delivering these supplies, they concluded that military consumers acquired their oil through the civilian sector. Funari (1996:86) has since suggested the reverse to be the case though, basing his opinion on the distinct supply patterns he discovered when analysing the stamps and *tituli picti* on Dressel 20 *amphorae* which arrived in Britain from the different *Baetican conventii*.

In this respect Funari (1996:86) points out that there is little justification in searching for different consumption patterns between military and civilian users in Roman Britain, as the distribution of Dressel 20 *amphorae* stamps point to the fact that both of these market segments demonstrated common trends in oil consumption. Where discernable differences do stand out, they relate to regional variations in oil usage between Hadrian's Wall, Wales and the southeast, rather than to a civilian-military divide. This insight enabled the pattern of supply to each community to be schematically represented.

Figure 9.24 Military and Civilian Olive-Oil Supply Networks



(After Carreras Monfort, 1994:202, Figure 34)

Although the civilian sector was probably a late-entrant to the market and remained a subsidiary source of demand until military supply came to an end in the mid 3rd century AD, civilian consumers continued to provide a niche market for *Baetican* and North African oil for a few decades longer, as the presence of Dressel 23 and North African *amphorae* on civilian sites in the south demonstrates (Carreras Monfort & Funari, 1998:82). While the effect of consumer-pull was therefore slight for most of the Roman period, it seems to have enjoyed a short flourish towards the end of the 3rd century.

9.5.7 Evaluation of Britain's Oil Supply in the Post-Conquest Period

Olive-oil imports continued to arrive in Britain from the Claudian conquest until the mid 3rd century in the ubiquitous Dressel type 20 *amphorae*. The contents of these vessels were imported primarily to supply military units stationed in Britain, with the civilian sector representing a secondary market segment. In this respect Carreras Monfort & Funari (1998:82) confirm that the demand for olive-oil differed significantly from other types of *amphora*-borne commodities, which were primary consumption products for both communities.

While the army remained the driving force behind the supply of oil for over two centuries, the supply-chain evolved during this time in terms of both the route it followed to market and those engaged in carrying these goods. The Rhône-Rhine river system, which characterized supply during the 1st and 2nd centuries AD , reached Britain in a very circuitous manner and Carreras Monfort (1994:344-346) has suggested that the extra costs involved would have made this route commercially unattractive, compared to the more direct Atlantic seaway. It is conceivable that state administrators may have specified the route to be taken, especially if the oil was travelling as part of a military supply-convoy. Carreras Monfort & Funari (1998:83) point out that

the cost of providing oil to the British garrison must have been enormous and while this expense may not have concerned the Roman state from a strategic perspective, it would presumably have compensated the merchants it employed for the additional time and expense involved in carrying these goods on such a roundabout route, assuming their vessels had not been compulsorily requisitioned.

By the early 3rd century AD the Rhône-Rhine river route had been largely replaced by a more direct Atlantic route, which may imply that Britain's oil supplies had become more commercialized by this point. Supplies seem to have reached the military consumers in southeast England, Wales and Hadrian's Wall via three distinct commercial circuits operated by *Baetican* distributors based in *Astigi*, *Corduba* and *Hispalis* (Funari, 1996:86).

On those occasions where clear evidence exists to link a merchant with a particular route, debate still continues as to whether these individuals acted entrepreneurially, seeking out cargoes and funding the venture themselves; or served in a purely functional capacity as paid carriers of state supplies (*vecturae*), (Remesal Rodriguez, 1998:192). On balance, the latter seems more likely in most cases, as analysis by Carreras Monfort (1994:345-351) of the routes used to carry *Baetican* Dressel 20 *amphorae* to market suggest that minimizing transport costs was not a concern to the merchants involved in their distribution, as would have been the case in an independent profit-seeking venture. Further analysis of *Baetican* Dressel 20 distributions by Carreras Monfort & Funari (1998) reinforces this view and concludes that:-

> "Thanks to the study of the olive-oil *amphorae* distribution in Britain, chiefly *Baetican* vessels, it was realized that their distribution pattern was not the result of a random exchange within a market system, but of a complex public network. This network was designed to supply the military and probably administrative personnel active in the province."
>
> (Carreras Monfort & Funari, 1998:82)

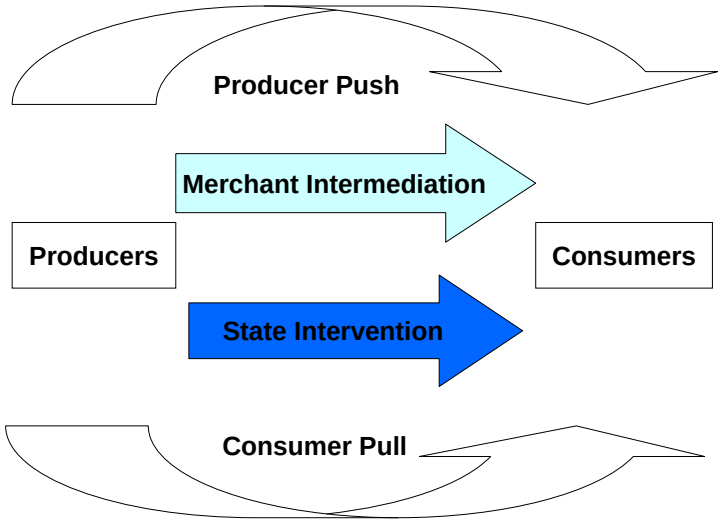
The involvement of 'family-concerns' in the distribution of olive-oil over an extended period may have provided a degree of stability to the supply-chain through the internal bonds such relationships create and the continuity that long-lasting relationships engender within a distribution network. Broekaert (2011) draws attention to the ability of family-based businesses to reduce transaction costs during the Roman period by their ability to increase levels of trust among supply-chain members through providing greater access to information, enhanced contact networks, *etc.* This may even have extended to membership of commercial guilds (*collegium*), which are known to have facilitated exchange in Rome's home port of *Ostia* and in various parts of Gaul (Hassall, 1978:45; Greene, 1979b:134; Raepsaet & Raepsaet, 1988).

Through their participation in commercial networks of this kind, merchants involved in *Baetican* olive-oil distribution would have been able to benefit from an early form of strategic alliance. As Broekaert (2011) explains:-

> "Using the framework of the *collegium*, a trader had the chance to be introduced to a wider range of partners, which may result in better commercial opportunities."
>
> (Broekaert, 2011:12)

The continued dominance of military demand for olive-oil during the peak import period from the mid 1st to the mid 3rd century AD clearly identifies state intervention as the main driver in the supply-chain for this commodity. In carrying the product to market, merchants can be seen to have performed an increasingly important rôle, especially from the Antonine period when the use of a greater number of *amphorae* dies and the emergence of distinct commercial distribution circuits suggests that the supply process may have become more competitive. The overall picture that emerges is of a supply-chain led by the state, in which merchants performed a useful, but subsidiary rôle; as shown in Figure 9.25.

Figure 9.25 Drivers of Romano-British Olive-Oil Supply (43-270 AD)



9.6 DEDUCTIONS

The demand for olive-oil throughout the Romano-British period was very different to the pattern we have seen for wine-usage in the previous chapter. Olive-oil consumption is closely linked to the cultural practices and dietary preferences of the Mediterranean region and as these did not start to become embedded into British society until after AD 43, demand for this commodity in the pre-conquest period was sparse. Much of the oil that did arrive prior to AD 43 was probably imported to meet the personal needs of continental citizens who visited Britain, as diplomatic and trading contacts began to be developed with the Roman world.

Even after the Claudian conquest, the vast majority of the oil which reached Britain appears to have arrived as military supplies, to maintain the cultural identity of the Roman forces stationed in the province. While the Dressel 20 *amphorae* carrying oil from *Baetica* reached Britain via a circuitous route, the expense involved was probably regarded as insignificant by the Roman

state, which saw these transfers as part of a redistribution mechanism rather than as commercial supply (Carreras Monfort & Funari, 1998:83).

The leading rôle of the state as the force behind the growth of long distance supply in the late Republican and early Imperial periods is recognized by many prominent historians (Garnsey & Saller, 1987:48; Whittaker, 1988:53; Duncan-Jones, 1990:46). The key to distinguishing a system based on state-administered supply from one driven by mercantile trade rests on the legal ownership of the goods concerned. Adcock *et al* (2001:243) remind us that ownership of their stock-in-trade is regarded as a prerequisite of merchant activity, at both the wholesale and retail levels.

Since ownership of the goods involved in the inter-provincial transfer of military-supplies remained the property of the Roman state throughout, the olive-oil reaching Britain from the mid 1st to the mid 2nd centuries AD is best seen as redistribution rather than trade, with the shippers who delivered these goods acting as agents of the state rather than as independent traders. Epigraphic evidence from Spain (CIL, II, 1180) supports this view, stating that local *navicularii* were engaged simply as boatmen by the *annona* to carry state supplies (Carreras Monfort, 1998:162; Blázquez, 1992:177).

The dynamics of oil supply are less clear after the mid 2nd century AD, not least because of the limited range of data we possess. By the Antonine period the fortunes of the *Baetican* supply centres at *Astigi*, *Corduba* and *Hispalis* began to alter markedly (Funari, 1996:80). Merchant families also became increasingly important at this time as the *conventii* they represented came to dominate particular supply areas. As Funari (2002) explains:-

> "Merchants were the middlemen between the olive-oil producers and their clients, private and state alike. They bought and sold contracts for the transportation of oil to different destinations, among them Britain."
>
> (Funari, 2002:245)

The notion that oil supply might have been put out to tender, with specific merchant families bidding for the grant of a trading monopoly in particular markets is wholly in accordance with Roman practice, following precedents established by the *publicani* in the Republican period (Badian, 1983).

The common pattern of military and civilian supply, which is clearly evident in British Dressel 20 *amphorae* distributions, suggests that export merchants either took advantage of their state contracts to supply the secondary needs of private consumers, or that these needs were met by local traders drawing on supplies which reached *Londinium*, or military bases elsewhere in the province. The view portrayed by Higham (1991:95) of merchants primarily attracted to Britain's frontier regions by the economic needs of the military, but happy to take advantage of the additional needs of civilians resident in these areas, may still hold good in principle, although olive-oil was never a commodity for which demand was high.

Civilian demand did not come to dominate import flows until the mid 3rd century AD and even then only increased in relative importance due to the fact that military demand had collapsed. Segmentation strategies which sought to distinguish separate military and civilian markets in Roman Britain have little rôle to play in the supply of olive-oil (Croft, 1994; McDonald & Dunbar, 2004).

CHAPTER 10

SAMIAN SUPPLY

10.1 INTRODUCTION

Unlike *amphorae*, whose presence in Roman Britain is attributable to the commodities they carried, tablewares such as samian (*terra sigillata*) were desired for functional reasons and imports arrived to satisfy direct consumer demand. Samian's production process and the migration of its kiln-centres across Roman Gaul have already been discussed in section 4.7. The present chapter will therefore focus primarily on the distribution of these products and the nature of their respective supply-chains.

10.2 INVESTIGATIVE APPROACH

Although Tyers' (2012) *Atlas of Roman Pottery* lists over one hundred kiln-centres which produced *terra sigillata* between the mid 1st century BC and the late 3rd century AD, it is only possible in this study to consider Britain's four most important supply sources; namely:-

1/ La Graufesenque
2/ Lezoux
3/ Rheinzabern
4/ Trier

Analysis will be undertaken for each of the main import phases associated with these supply centres to identify the routes-to-market used in each case and the rôles and relationships of each supply-chain member. In line with the procedure adopted when analysing wine and olive-oil supply, we will

begin by considering the interests of the samian producers, merchants, state administrators and consumers, to establish the general supply framework before attempting to examine the characteristics of the individual import-phases in detail.

10.2.1 Producer Involvement

As we saw in section 4.7.2, samian production occurred within a nucleated industry in which a range of specialists such as clay extractors, *poinçon*- and mould-makers, potters and kiln-operators came together to pool their skills (King, 1990:128; Webster, 2001:296; Dannell, 2002:211-212). Neither the potters themselves, nor the landowners who perhaps oversaw the production process, are likely to have possessed either the expertise or contact network needed to manage a long distance distribution process (Strobel, 1987:110-111; Fülle, 1997:129). It therefore seems unlikely that the samian producers would have had any rôle in the supply-chain once the pottery had left their workshops.

10.2.2 State Involvement

The Roman state, by contrast, seems to have taken a close interest in samian supply. This involvement took a number of forms, including influencing the location of major kiln-sites, purchasing vast quantities of samian for military usage and utilizing military supply-trains to transport these wares to market. The pattern of official intervention varied over the course of the industry's life, as will be seen, but the state's active involvement in the supply-chain is clear in the case of each production centre.

10.2.3 Merchant Involvement

Merchants are another group who were regular supply-chain participants, their rôles ranging from agents contracted by the Roman administration to carry state supplies, through to independent operatives serving the growing civilian markets of the post-conquest period. While their rôle increased over time, merchants stand out in each phase as being key supply-chain members.

10.2.4 Consumer Involvement

The military's rôle as samian consumers clearly forms the reciprocal of the state-administered supply process. While the level of supply-chain activity will have been determined by the consumption needs of military units, the distribution channel's structure will have been shaped by strategic factors, such as the kilns' location and the most suitable route(s) to market.

Civilian demand may have been loosely shaped by military decisions, in so far as soldiers would have provided an economic stimulus in areas where they were deployed. Consumer demand was slow to develop in most areas though and while it would never have equalled the volume generated by the military, civilian consumers nevertheless offered a supplementary source of income to samian importers. As empirical evidence of consumer behaviour remains limited it is not intended to follow the diffusion of samian into the wider civilian population in this investigation, although a number of specific assemblages relating to 'pre-consumption deposits' such as warehouse- or shop-fires will be considered in sections 10.4.3 and 10.5.3, as these provide important insights into the wholesale and retail stages of the supply-chain.

Samian would probably have been seen by many civilian customers as a luxury, given its obvious high quality and the cost involved in bringing it to market. As Willis (2011) explains:-

> "Samian vessels were indeed evidently costly purchases: a Drag 37 of Cinnamus has a *graffito* pricing it at 20 *asses*, the approximate equivalent of one day's pay for a soldier, while a *Ludowici Ta*' plate has a *graffito* indicating a price of 12 *asses* (Darling 1998:169)."
>
> (Darling, 1998:169; cited by Willis, 2011:171)

10.2.5 Logistical Considerations

Irrespective of the geographical location of the kilns and the period in which their pottery was produced, a range of logistical challenges will have faced samian distributors when the time came to move their products to market. Among these concerns would have been the pottery's relatively low value-to-weight ratio, which may have restricted the mode of transport and choice of routes available, thereby shaping other aspects of the supply-chain.

Such constraints may have been mitigated, to some extent, by the fact that many samian vessels were of relatively small size. In addition, some of the more popular forms, *e.g.* Dragendorf type 18 and type 31 platters; could be loaded into stacks to minimize their bulk (Ettlinger, 1987:6). The ability to assemble these goods into compact consignments may have helped to make this pottery attractive as infill cargo. The weight of the produce may even have been regarded as a virtue, especially if samian was viewed as saleable ballast by shipowners (McGrail, 1989:357). In the case of overland carriage though, the pottery's weight would inevitably have represented a constraint on how much each beast or wagon could handle, making water the preferred mode of transport in many cases (Peacock, 1982:159).

The fragility of samian would no doubt have represented the second major consideration facing distributors, for unlike *amphorae*; tableware was prone to breakage and required careful packing prior to transportation. This would have been particularly important in the case of decorated wares and vessels of more complex shape or design. These objects could have been loaded into crates, with some form of packing such as straw being placed between each item to protect them during transit (Ettlinger, 1987:10). The use of crates in long distance transport seems to accord with evidence for Pompeii, where a recently arrived batch of samian was found in the ruins of house 9, *insula* 5; in *regio* viii (ii), (Atkinson, 1914:27).

As an alternative to wooden crates, which would have fitted easily into boats or carts, but not onto individual pack-animals; wicker baskets or mesh-nets may at times have been employed. This would still have allowed protective packaging to be used, enabling the goods to be dispatched where local road conditions were too poor to permit the use of wheeled vehicles. Nets may also have provided a way of securing loosely packed ceramic cargo during some sea voyages (Millett, 1993:418; Gianfrotta *et al*, 1997:127).

The risk of losses due to breakages must have been a perennial problem for pottery merchants, irrespective of whether land or water transport was used. Experience would undoubtedly have enabled merchants to minimize the risks involved in these tasks (Dannell & Mees, 2013:176). Occasional breakages remained unavoidable however and the consequence of such mishaps is evident from the dumps of broken samian found near the riverside wharves at La Nautique in southern Gaul, through which much of La Graufesenque's samian probably passed *en route* to Britain (Rhodes, 1989:46). Evidence of similar dumps may also be seen at the point of arrival, for example at various sites in London (Dunning, 1945:52-53; Miller *et al*, 1986:199-203) and York (Monaghan, 1997:833).

10.3 SAMIAN SUPPLY IN THE PRE-CONQUEST PERIOD

10.3.1 Introduction

We have already seen in chapters 8 and 9 that a diverse range of continental imports began to reach south and south-east England in the century before the Claudian invasion. While Strabo (*Geographica*, iv. 5, 2-3) curiously makes no mention of pottery, archaeological evidence from the pre-conquest period does show that some *terra sigillata* managed to reach Britain at this time, although the quantities involved were very small.

10.3.2 Pre-Conquest Imports of Italian *Arretine* Ware

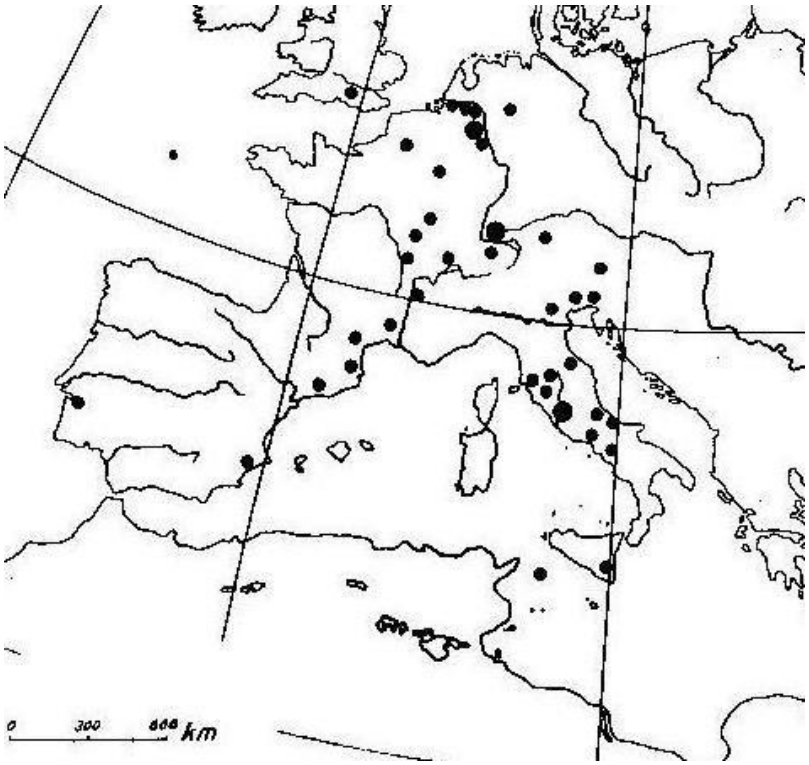
The earliest forms of *terra sigillata* were made at Arezzo (*Arretium*) in the Etruria region of northern Italy in the mid 1st century BC (Wells, 1972:254). *Arretine*-ware has now been discovered at more than twenty five sites in Britain, although finds are often limited to just one or two sherds (Dannell, 1977:229). Its main concentration is in Essex and Hertfordshire and the earliest examples come from the pre-conquest trading centre at Braughing (Fitzpatrick & Timby, 2002:166). The date of this assemblage (*c.* 20 BC-AD 15) finishes shortly before Italian *arretine* exports to Gaul ended.

With the exception of Braughing, Canterbury (*Durovernum Cantiacorum*), Fishbourne / Chichester (*Noviomagus Reginorum*) and Silchester (*Calleva Atrebatum*), where significant numbers of these vessels have been found, the quantity of Italian *arretine* reaching British settlement-sites was small. It is important to remember, however, that the sites listed above may have been trading centres where continental merchants established semi-permanent bases (Mattingly, 2006:76; Dannell & Mees, 2013:182). If so, the *arretine* found there may represent traces of the traders' personal possessions.

10.3.3 Evaluation of Britain's Pre-Conquest *Arretine* Imports

The scarcity of Italian *arretine* makes it difficult to determine the route(s) by which this material reached Britain. Help in tracing its possible path may be gained by observing the military supply-patterns of the period, as the Roman army has been strongly associated with its bulk purchase (Ettlinger, 1987:7; Wells, 1992:201).

Figure 10.1 Italian *Arretine* Distributions (*c.* AD 20-30)



(After Ettlinger, 1987:8)

Supplies of Italian *arretine* continued to reach units stationed along Rome's northern frontier until newly established Gaulish kilns ousted the remaining Italian producers from the market at the end of the Augustan era (Ettlinger, 1987:17). Early displacement of *arretine* from the regions north of the Alps may help to explain why so little of this material reached Britain.

Taking into account Britain's geographical distance from the Italian kilns and the circuitous route which *arretine* took to get here, it is inconceivable that the producers were responsible for managing this process (Dannell, 1979:180). We are therefore left with the alternatives of state involvement, perhaps within the context of diplomatic exchanges; or merchant activity, as the most likely explanations for these imports. There is little to suggest that *arretine* proved popular with the British tribal élites who received it, as this type of pottery seldom accompanies other prestigious items like glass, wine, bronze or silverware in high-status funerary deposits.

Arretine's scarcity in pre-conquest finds assemblages and the clustering of the few which do occur at 'gateway communities', supports the notion that these items may have been the personal possessions of continental traders resident at these locations.

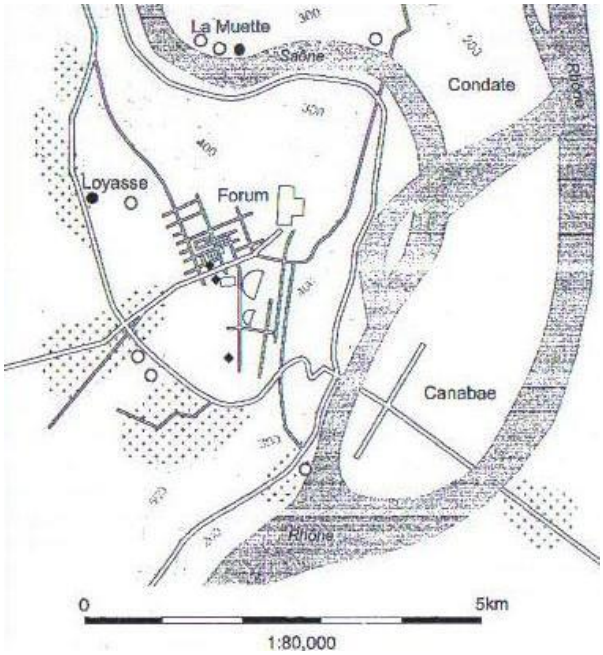
10.3.4 Pre-Conquest Imports of Provincial Gaulish *Sigillata*

It was originally thought that military forces stationed along the early Rhine frontier obtained their pottery from Italy via the state-supply network. An assemblage from the fort at Haltern (abandoned in AD 9) included Italian *arretine* as well as provincial Gaulish *sigillata* made in Lyon (*Lugdunum*), (Wells, 1972:255; Ettlinger, 1987:6). During the following decades Lyon's kilns would go on to displace Italian *arretine* from the whole of the frontier region (Menchelli, 2004:273).

Three major kilns are known to have existed in Lyon around this time; at Loyasse, La Muette and La Butte (Greene, 1979b:140-141). The earliest of these was Loyasse, which enjoyed only temporary success during the initial attempt to establish the Germanic frontier. Its wares date from *c.* 30 BC and exports there peaked by *c.*15 BC (Greene, 1979b:9). Loyasse produced poor

quality *sigillata*, the pottery having porous fabric and an inferior gloss finish (Widemann *et al*, 1975:45). The quality available to frontier units improved dramatically from *c.* 10 BC when new kilns were established at La Muette, on the opposite bank of the Saône to Lyon (Wells, 1984b:164). La Muette's development is linked to the decision of several Italian workshops to move their production facilities closer to their key markets (Greene, 1979b:140; Wells, 1984b:165).

Figure 10.2 Sites of the Loyasse and La Muette Kilns at Lyon



(After Goodman, 2013:132, Figure 9.8)

The rapid rise of La Muette seems to have been matched by a corresponding demise at Loyasse. For the remainder of the Augustan period La Muette's *sigillata* appears to have enjoyed success over an area which extended from Switzerland, through northern Gaul and the Rhine frontier. A small quantity even reached Britain, arriving soon after AD 9 (Dannell, 1977:231; Wells, 1984b:166). These items almost certainly arrived from the Rhine frontier,

as the distribution of provincial Gaulish *sigillata* lay almost wholly in this direction (Ettlinger, 1987:6). As Dannell (1979) observes:-

> "Interpreting the marketing of these wares is complicated by the chronology, which appears to place the development of British trade at a time when the purchasing power of the Rhineland armies was pulling large quantities of merchandise to the northern frontier ... It is conceivable that the samian was redistributed as part of a secondary trade, together with other contemporary pottery imports which were found in British and Rhenish sites."
>
> (Dannell, 1979:180)

Despite the success that La Muette's kilns achieved on the northern frontier during the late Augustan period, a further reorganization of supply seems to have taken place early in Tiberius' reign (AD 14-37), when production was transferred to a newly established kiln at La Butte (Greene, 1973:29). The quantity of *sigillata* produced at La Butte's appears to have been smaller than the volume previously available from La Muette and this contraction may be linked to a fall in aggregate military demand after the consolidation of the Rhine frontier (Greene, 1979b:10).

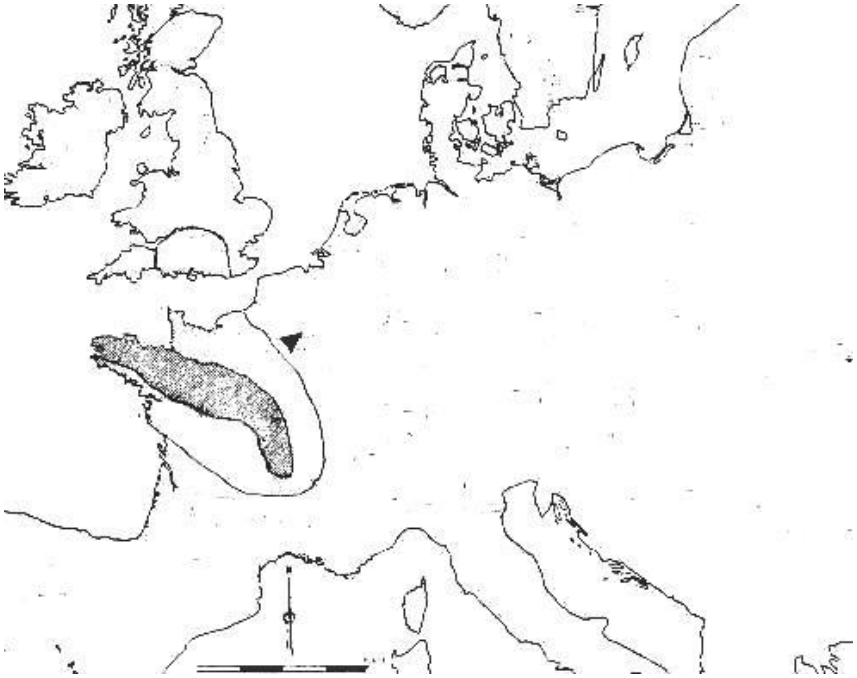
Despite these developments, *sigillata* does not feature heavily among the items selected for onward transmission to Britain at this time. While not as rare as *arretine*, early-provincial *sigillata* still remains scarce. Most occurs at entry gateways like Colchester or Fishbourne, with imports reaching their peak *c.* AD 15-25 (Dannell, 1977:229).

Petrological evidence confirms that early provincial *sigillata* from Lyon, Lezoux and La Graufesenque all reached Britain in the early 1st century AD; although not necessarily via the same supply-routes. While the Lyon and La Graufesenque wares may have followed a northerly passage to reach Britain, Lezoux's *sigillata* appears to have used a southerly route; travelling

initially by barge along the river Allier to the mouth of the Seine (*Sequana*), before crossing the Channel to southern England (Boon, 1967:30-31; Ward, 1995:16).

The high mica-content of Lezoux's *sigillata* may well be to blame for the challenges these wares apparently faced when competing for the northern frontier market with the technically superior products from La Butte and La Graufesenque. The widespread distributions of Lezoux's *sigillata* in both northern and western Gaul clearly show that these wares were popular in their home region though, as Figure 10.3 illustrates.

Figure 10.3 Pre-Conquest *Sigillata* Distributions from Lezoux



Key

	Primary Distribution Area
	Secondary Distribution Area

(After Delage, 2001:122, Figure 2.1)

10.3.5 Analysis of Britain's Early *Sigillata* Supply-Chain Structure

All of the provincial Gaulish kilns achieved modest and short-lived success as far as the British market was concerned. Supply seems to have suffered a dramatic collapse in the late-Tiberian period, with the fall-off beginning in the mid 20s and reaching an absolute low *c.* AD 30 (Marsh, 1981:217). The fact that Britain's pre-conquest imports peaked just before this downturn began raises the question of whether lack of supply or lack of demand led to the decline in imports (Dannell, 1977:229). Resolving this problem may help us identify which supply-chain member(s) were primarily responsible for the provincial *sigillata* that managed to reach Britain in the pre-conquest period.

Figure 10.4 Sources of Britain's Pre-Conquest *Sigillata* Supply

Production Source			Import Dates
Italian *Arretine*	–	Arezzo	*c.* 20 BC-AD 15
Provincial *Sigillata*	–	Lyon (Loyasse)	*c.* 15 BC-AD 1
Provincial *Sigillata*	–	Lyon (La Muette)	*c.* 8 BC-AD 25
Provincial *Sigillata*	–	Lyon (La Butte)	*c.* AD 15-AD 42
Provincial *Sigillata*	–	Lezoux	*c.* AD 15-AD 42
South Gaulish samian	–	La Graufesenque	*c.* AD 15-AD 42

The fact that at least six distinct production centres shipped *terra sigillata* to Britain via at least two widely separated supply-routes effectively precludes the possibility that this material was delivered from the kilns *en masses*. The small amount of material involved, coupled with the replacement of several key production centres by newly emerging rivals in the pre-conquest period makes the structure of the supply-chain very difficult to interpret.

10.3.5.1 Producer Push

The fragmented nature of supply and the distance this material had to travel makes it implausible to think that any of these wares reached Britain directly from the kilns, thus ruling out the option of producer involvement (Greene, 1979b:142). It is far more likely that pre-conquest *sigillata* reached Britain indirectly, via existing continental trade-networks (Dannell, 1979:180).

10.3.5.2 State Intervention

The use of separate and widely scattered production centres, each shipping its own variety of *sigillata* to Britain, using a number of different routes is difficult to reconcile with the idea of centralized control. *Sigillata* is known to have reached the northern frontier in volume via the state supply system at this time and the possibility that some may have been redistributed to Britain as diplomatic gifts cannot be ruled out, even if Rome's desire for territorial expansion may already have started to wane (Salway, 1989:11).

10.3.5.3 Mercantile Intermediation

While demand for *sigillata* appears to have been slow to take-off, it may have accompanied other continental imports such as *amphorae*, brought over by the merchants operating the cross-channel shipping routes. If the demand for *sigillata* began to grow in the Tiberian period, these merchants would have been well placed to satisfy these needs, for as long as stocks were available. Increased demand of this kind may account for the import peak identified at *entrepôt* centres such as Baldock, Braughing, Colchester (*Camulodunum)*, Chichester (*Noviomagus Reginorum*) and St Albans (*Verulamium*), or at remoter sites like Leicester (*Ratae Corieltauvorum*) or Bagendon (Dannell, 1977:229; Fitzpatrick, 1989:810-811). Whether this

distribution is a consequence of merchant activity or inter-tribal exchange remains unclear.

10.3.5.4 Consumer Pull

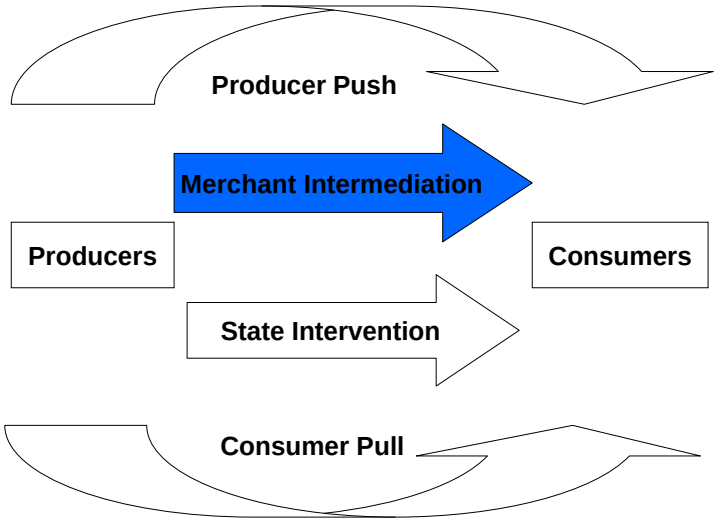
The absence of Italian *arretine* and Gaulish *sigillata* from burial deposits in the pre-conquest period implies that tableware of this type never achieved the status of other élite objects such as glass, silver or bronze, or prestigious consumables like wine. This does not mean *sigillata* was seen as worthless, however, as its value may have been as a lifetime possession rather than a burial offering (Willis, 2011:171).

While pottery of this kind may be found far from its point of entry, our lack of understanding of the manner of its diffusion or the meaning attached to it by the native population makes it difficult to judge if consumer-pull played any significant part in its distribution.

10.3.6 Evaluation of Britain's Early *Sigillata* Supply-Chain Structure

The limited amount of provincial *sigillata* imported during the pre-conquest period suggests that native élites could at best be regarded as a niche market. The suitability of *sigillata* to act as infill-cargo may have enabled individual consignments to be imported when space was available and this may explain how some of these items arrived prior to AD 43 (Greene, 1979b:142). If we regard its import as a speculative venture then entrepreneurial activity would seem the most probable explanation of Britain's pre-conquest supply.

Figure 10.5 Drivers of Pre-Conquest *Sigillata* Supply (*c.* 20 BC-AD 42)



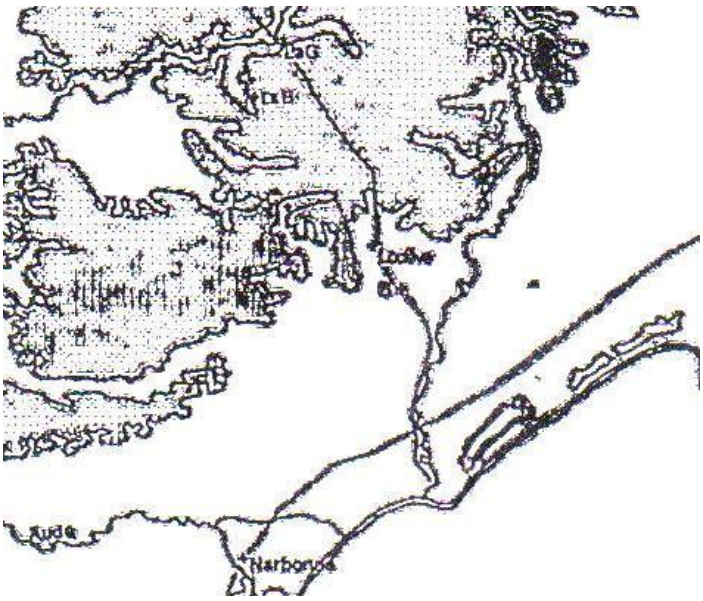
10.4 SAMIAN SUPPLY IN THE POST-CONQUEST PERIOD

10.4.1 Introduction

Samian began to reach Britain in quantity only after the Claudian conquest when bulk supplies began to arrive from La Graufesenque (*Condatomagus*). The choice of this south Gaulish site as Britain's main 1st century supplier was not an obvious one, as these kilns were neither geographically close to Britain, nor linked to the province by direct transport routes.

The logistical challenges facing the samian distributors at La Graufesenque were unusual, as we observed in Section 4.7.7. The river Tarn, which at first sight appears to offer a convenient passage to the river Garonne and thence to the Atlantic coast, may not have been navigable in Roman times, so an alternative route to market seems to have been found using the empty baggage trains which returned to Arles (*Arelate*) or Narbonne (*Narbo*) from the silver mines at La Rabasse (Hermet, 1934:230; Middleton, 1980:190).

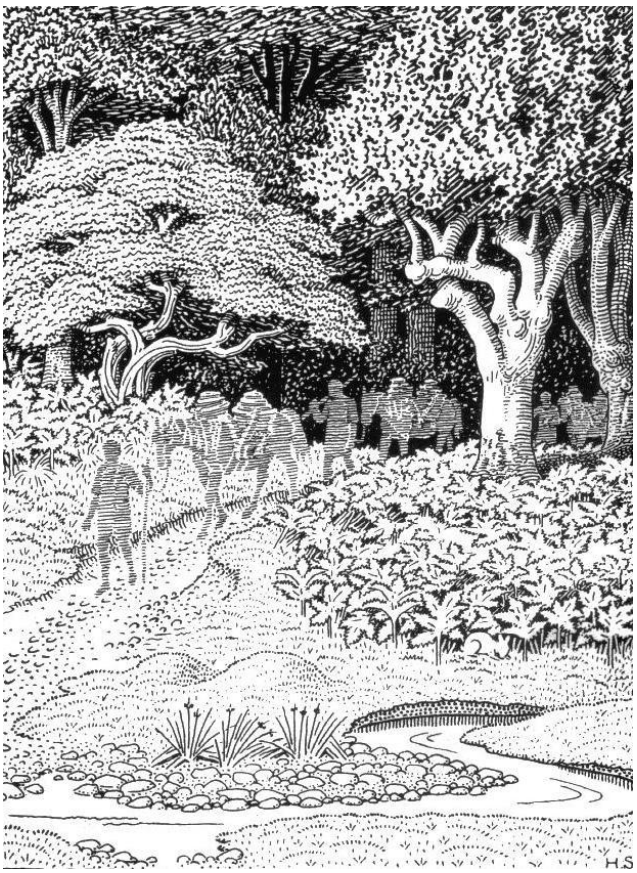
Figure 10.6 La Graufesenque's Supply Route to Narbonne



(After Middleton, 1980: Figure 1)

If this scenario is correct, a question arises as to why the imperial authorities would sanction this use of official transport. A possible explanation may lie in the fact that the military are known to have been major purchasers of samian ware and since the army would undoubtedly have been involved in supervising the silver mines at La Rabasse, they may already have had links with La Graufesenque in order to purchase pottery to meet the needs of the state-administered supply system (Martin, 1985:131). The journey cycle to the mines at La Rabasse may therefore have involved a scheduled stop at La Graufesenque on the way back to Arles or Narbonne to collect these wares.

Figure 10.7 Roman Mule-Train Conveying Pottery to Market



(After Sumner, 1927:43, frontispiece to Sloden and Linwood)

Fulford (2013:12) reminds us that the primary orders for this pottery would have been for state supplies and these would have accounted for the bulk of the traffic. Private arrangements between workshop managers and visiting merchants were therefore very much of secondary importance and subject to the availability of surplus stock. Once the state's supplies had been loaded onto the pack-animals, the use of any spare carrying capacity could well have become the subject of negotiation between the workshop managers and mule-drivers though. Mule-train managers may have assumed an additional entrepreneurial rôle at this stage for, as Dannell (2002:234) observed, the workshop managers themselves would have been poorly placed to manage the task of long distance supply.

It is unlikely that pottery production and distribution would have been seen as sequential stages in an integrated logistics system, as the arrival of baggage-trains may have been an irregular occurrence. It might therefore have been necessary to store finished stock at the production centre on occasions until transport could be arranged to dispatch this material to market. While the temporary storage at La Graufesenque was probably managed on an *ad hoc* basis, the coastal transit centres at Arles (*Arelate*) or Narbonne (*Narbo*) would have had to deal with a diverse range of stock which arrived from a number of production centres; making the use of conventional warehouses (*horrea*) likely.

10.4.2 Warehouse Management and Wholesale Supply

A well managed warehouse would not only permit stock to be stored in safe and secure conditions, but would allow inventories to be taken to keep track of what items were held, while enabling damaged goods to be identified and discarded. Jessop & Morrison (1994:209-211) remind us that this work involves specialist skills, making it likely that experienced staff would have managed these facilities, acting either as independent merchants or as state contractors.

The publication of Hartley *et al*'s (2008-2012) nine volume compendium '*Names on Terra Sigillata*' has now enabled a correlation to be established between the pattern of potters' stamps found in kiln-waste dumps, such as the *Fosse de Cirratus* at La Graufesenque, and pre-consumption deposits at the retail end of the supply-chain. It appears that many consignments stayed together throughout their journey (Dannell & Mees, 2013:176). As mixing of stock is most likely to occur when goods entered a transit warehouse, the lack of such contamination requires us to consider how intermediate storage facilities may have operated so as to enable this to be avoided.

The fact that kiln assemblages remained largely intact as they passed along the supply-chain suggests that systematic unloading and sorting of stock was not the normal practice when goods reached a major trans-shipment point. The volume of traffic passing through these establishments may have been considerable and Fulford (2014:14) has suggested *negotiatores* may simply have taken the next available batch, rather than seeking out specific potter's work.

Some way of verifying the contents and condition of each 'parcel' of goods will have been necessary, as *negotiatores* would often have been looking for particular assortments of goods to fulfil the needs of their military or civilian clients. A superficial inspection of the contents of a batch of pottery still in its cargo-net, or opening a sample of crates to check the contents were sound and corresponded to the description of the goods inside, would have enabled this requirement to be satisfied. A rapid turnover could thereby have been achieved to enable the efficient operation of the warehouse, with only specialist wares or batches of stock which had suffered high breakage rates needing to be manually sorted and stored.

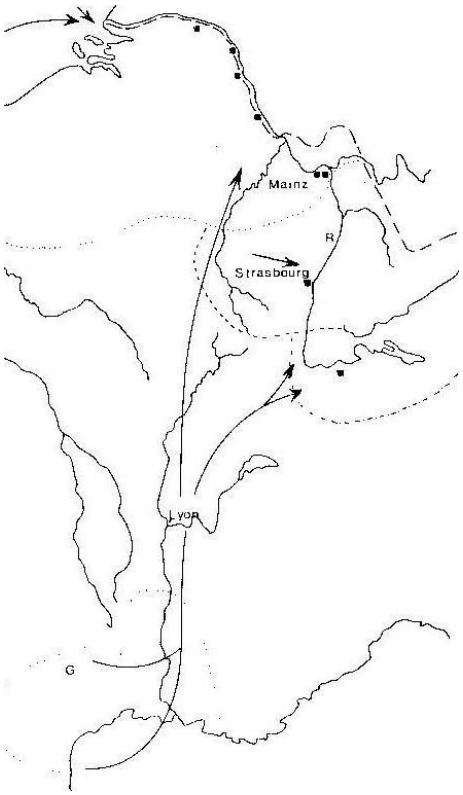
Millett (1993) has suggested that the pottery from the Cala Culip shipwreck, dated to *c.* AD 65-75, probably came from a warehouse of this kind.

> "Given that the samian seems to have been brought from La Graufesenque to Narbonne and then loaded from warehouses onto the ship, we might expect some mixing of kiln products. The warehouse at Narbonne could have had stocks of different forms originating from different potters because it was the shape which interested the buyer."
>
> (Millett, 1993:418)

After leaving Arles (*Arelate*) or Narbonne (*Narbo*) the samian would have travelled east along the Mediterranean coast to Marseilles (*Massilia*) where

it would have entered the Rhône–Saône river network *en route* to the Rhine frontier.

Figure 10.8 La Graufesenque's Supply Route to the Northern Frontier



(After Middleton, 1979:88, Figure 3)

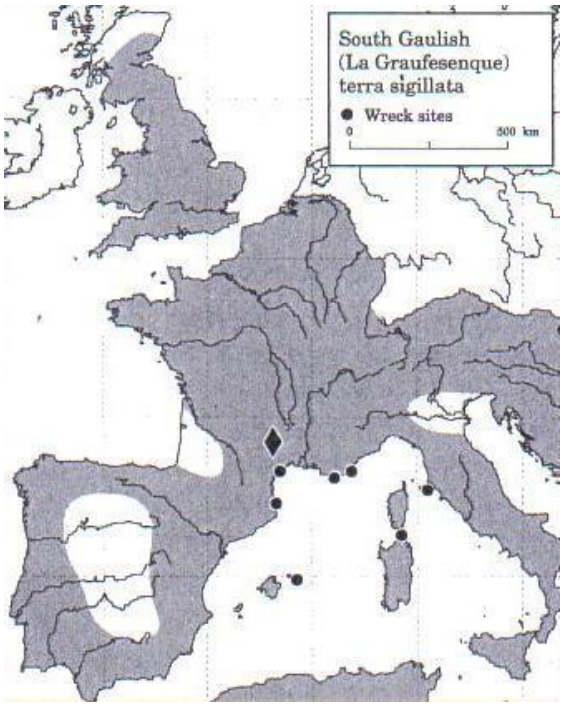
While a southerly passage via the Mediterranean was clearly important, the possibility that some of La Graufesenque's samian may have travelled west towards Bordeaux (*Burdigala*) by an overland route must also be considered (Goodman, 2013:124).

10.4.3 La Graufesenque's 1st Century Domination of Samian Supply

By the mid 1st century AD, La Graufesenque had become Gaul's main *terra sigillata* production centre. Graffiti recovered from the site show that tens

of thousands of vessels were included in some firings and that annual output reached several million items (Peacock, 1982:126; Rhodes, 1989:46; Polak, 1998:115). La Graufesenque's products found a wide market throughout Britain, continental Europe and even North Africa, as Figure 10.9 shows.

Figure 10.9 La Graufesenque Geographical Market Area



(After Tyers, 1996:111, Figure 96)

10.5 SAMIAN IMPORTS IN THE PRE-FLAVIAN PERIOD

10.5.1 Introduction

While samian imports may have been sparse in the pre-conquest period, this situation changed dramatically after AD 43. Three of the legions involved in the invasion came from the Rhine provinces and members of these units would have been familiar with samian as one of many items they enjoyed.

Consequently, *sigillata* will almost certainly have been among the products despatched to Britain once a regular supply network was established.

Civilian demand may also have begun to evolve around this time at gateway communities like Colchester (*Camulodunum*) and the newly established trading settlement of London (*Londinium*); although the amounts involved were at first quite small. These two sites have proved particularly important in helping to identify the volume and variety of samian reaching Britain in the first two decades of Roman rule. As the latest evidence suggests that *Londinium* was probably established *c.* AD 50 (Davies *et al*, 1994:166), its residents would have had less time than their counterparts at *Camulodunum* to set up import networks before both sites were destroyed in the Boudican uprising of AD 60/61 (Webster, 1978:113-121). The destruction horizons created by these events at each location allows us to identify samian which had arrived before the town was sacked (Hawkes & Hull, 1947:191; Davies *et al*, 1994:166).

Within the range of materials found at both *Camulodunum* and *Londinium* are specific assemblages recovered from sites believed to have housed pottery shops (Hull, 1958:153-154, 198-202; Bird, 2011:299-300). While Millett (1987:106) suggests one of the *Camulodunum* shops may pre-date Boudica's destruction of the town, the dating of the second shop remains secure and provides us with important evidence of the wares available there in AD 60/61. The *Camulodunum* assemblage is interesting in a number of ways, for as Peacock (1982:156) points out, while high quality tablewares are well represented, kitchenwares are virtually absent, implying that the retailer's stock consisted primarily of luxury ceramics. The variety of die-stamps recovered at each of these locations makes inter-site comparisons difficult, although the overall pattern is consistent with the idea that retailers probably acquired mixed batches of samian from merchant intermediaries, rather than directly from the kilns.

The question of whether south Gaulish samian was carried to Britain via routes other than the Rhine frontier is raised by Anderson (1992:62) who reminds us that merchants in Bordeaux (*Burdigala*) were receiving large amounts of south Gaulish samian at this time, some of which may have eventually found its way to Britain. The possibility of a parallel southern route cannot therefore be discounted (Morris, 2010:55).

While many samian assemblages at continental civilian sites show a more uniform composition than those in Britain, this may merely reflect their closer proximity to the Gaulish kilns (Rhodes, 1989:48). A more varied product-mix is perhaps to be expected in a more remote market and this may explain why the wares of only about 20 potters from La Graufesenque are common in Britain (Tyers, 2012).

Figure 10.10 A Dragendorf Form 29 Bowl from La Graufesenque

(Photograph courtesy of the British Museum)

A more complex picture emerges when we compare consumption patterns at British and continental military sites. While it is clear that military demand for samian remained strong on the Rhine frontier, Greene (1979b:14-17) and Willis (2003:132) both point out that high proportions of *Gallo-Belgic* wares

characterize military assemblages in western Britain. Most notable among these is the apparent preference for Lyon ware by the unit stationed at Usk (*Burrium*). The presence of this material may simply reflect an affinity for a pottery style which Wells (1972:264) reminds us was widely used in regions of the Rhine frontier from which troops for the British invasion force were drawn. By contrast, the usage patterns of military units in south-east England appear to be very different from those at Usk. For example, while Pitts & Perring (2006:201) report a high level of continental *Gallo-Belgic* pottery at the civilian site at Sheepen (Colchester) these wares were absent in deposits from the nearby military *colonia*.

10.5.2 Analysis of Samian Imports in the Pre-Flavian Period

10.5.2.1 Producer Push

The case for assuming that La Graufesenque's potters surrendered control of the distribution network as soon as the samian left the kiln-site has been set out in Section 10.4.1. If this assumption is correct, producers will have had no further involvement in the supply-process.

10.5.2.2 State Intervention

The state, by contrast, continued to have a clear rôle; either directly through its purchase of samian to satisfy the needs of the military supply system, or indirectly via the merchants they hired to transport these wares. Most of the samian destined for the British garrisons would probably have arrived by way of the Rhine frontier, with the supply-base at Richborough presumably being one of the principal ports of entry (Dickinson & Hartley, 1971:131).

Once the territory had been secured, units would have settled into permanent bases in locations such as Exeter (*Isca Dumnoniorum*), Lincoln (*Lindum*) or Gloucester (*Glevum*) where abundant evidence of such wares exist (Bidwell, 1979:13-16; Jones & Darling, 1988:28-32; Hurst, 1985:124). It is important to note that in the pre-Flavian period concentrations of samian in the civilian settlements close to many Roman forts does not challenge the notion that the military were samian's primary consumers. While some of the pottery from these locations may reflect civilian usage, the bulk probably relates to the rôle of these settlements as marketplaces, from which troops stationed at the nearby forts bought their personal wares (Breeze, 1977:139).

10.5.2.3 Mercantile Intermediation

By contrast, the presence of samian at larger civilian sites like *Londinium* indicates merchants may have been involved in the commercial as well as the military supply of these wares. As we saw in section 10.4.3, the range of samian stamps found in the civilian potters' shops at *Camulodunum* and *Londinium* suggest that these items arrived from continental warehouses and this would be consistent with the idea of cross-channel merchants selecting stock they believed would find a ready market at their intended destination.

10.5.2.4 Consumer Pull

Civilian consumption seems to have been relatively restricted in the first few decades of Roman occupation and *Londinium* is the one settlement where private demand appears to have been strong. This might reflect the needs of a population which at the time was largely made up of continental citizens (Millett, 1996:34). As all the settlements destroyed in the Boudican uprising of AD 60/61 contain significant amounts of samian, this indicates the early

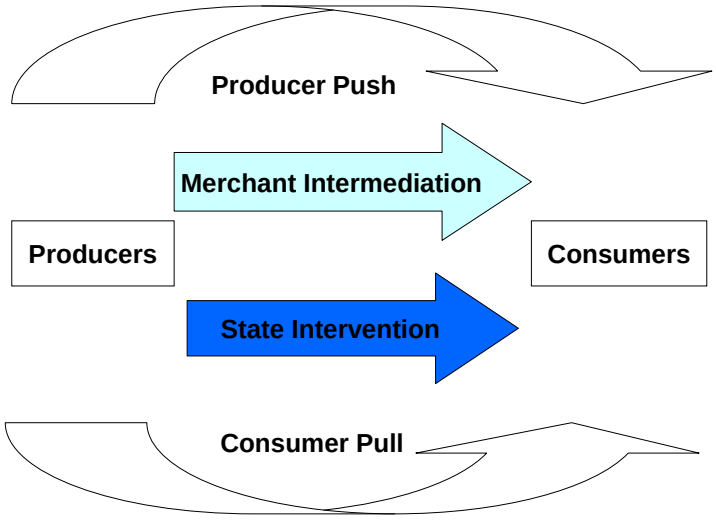
cultural assimilation of these towns (Dannell, 1979:181). The force of consumer-pull elsewhere in the province appears to have been negligible.

10.5.3 Evaluation of Samian Imports in the Pre-Flavian Period

The scarcity of pre-Flavian samian at sites other than military or mercantile settlements argues for an element of state involvement in the supply process. This would have helped ensure a smooth flow of essential provisions could be maintained and a culturally acceptable lifestyle quickly re-established for the incoming legionary and auxiliary forces.

Early civilian demand generally appears to have been low, apart from in *Londinium*, whose consumption pattern is probably explained by its rôle as an *entrepôt* centre. While the principal driving-force behind supply in the immediate post-conquest period was the state's desire to equip its forces as they established control of the new province, trading activity best explains the secondary imports which reached civilian settlements like *Londinium*.

Figure 10.11 Drivers of Pre-Flavian Samian Supply (*c.* AD 43-69)

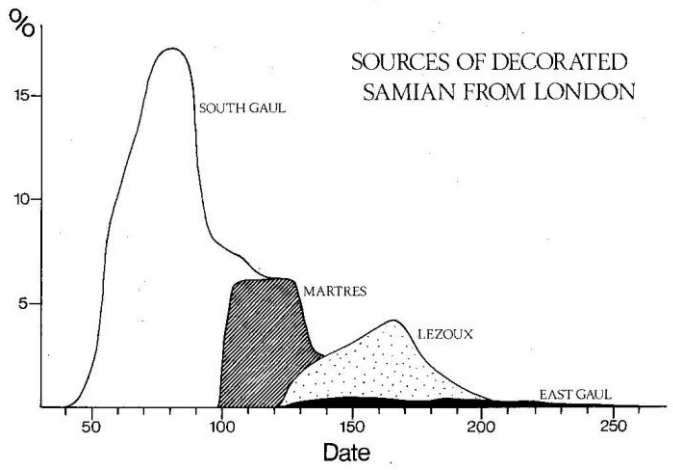


10.6 BRITAIN'S SAMIAN IMPORTS IN THE FLAVIAN PERIOD

10.6.1 Introduction

Despite the disruption caused by the Boudican rebellion, London's samian supply soon recovered and thereafter increased steadily, reaching its peak in about AD 80, as Figure 10.12 shows.

Figure 10.12 Samian Imports Arriving Through the Port of London



(After Marsh, 1981:185; Figure 11.5)

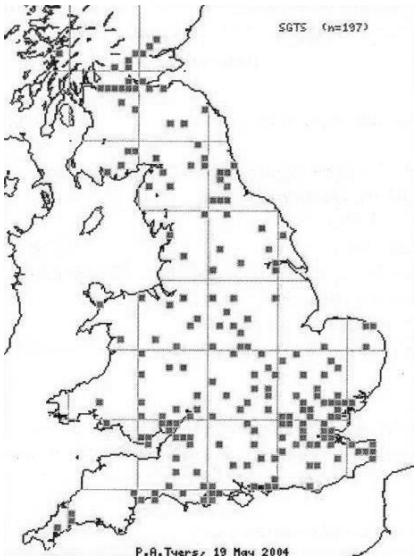
From *c.* AD 70 onwards samian gradually begins to become more common in urban pottery assemblages (Verboven, 2007:307). One such collection, dated to *c.* AD 80, was found in a row of shops at St Albans (*Verulamium*) and contained a high proportion of decorated vessels on which four stamps from three different potters were identified (Frere, 1972:25-28).

The ratio of decorated to plain vessels increased during the Flavian period and while the significance of this development for British consumers is not entirely clear, it is important to note that a major structural reorganisation took place at La Graufesenque around this time (Willis, 2011:198). This

change resulted in significant alterations in both vessel forms and decorative designs (Dannell, 2002:234). Any remaining stock held at the kiln-site or in commercial warehouses would probably have been sold as soon as possible before it became obsolete and both Marsh (1981:212) and Going (1992:93) have noted peaks in the volume of samian reaching London and other cities in the western provinces from AD 70-80. The 'spike' we see in imports at this time may therefore be supply-driven rather than demand-led.

In addition to samian's increasing popularity in southern England after *c.* AD 70 it is also important to remember that the redeployment of military forces to the new northern and western frontiers led to a wider distribution of these wares (Tyers, 2012). Despite its continuing geographical spread, most samian imports are still believed to have arrived in Britain through a small number of south coast ports, including *Londinium*, Dover (*Dubris*) and Richborough (*Rutupine*), from where the pottery was conveyed by road, river or coastal transport to its final destination (Dickinson & Hartley, 1971:131). La Graufesenque's wares continued to circulate widely within the province for the remainder of the 1st century AD, as Figure 10.13 shows.

Figure 10.13 Distribution of Samian from La Graufesenque



(After Tyers, 2012)

The picture presented by the late 1st century AD is of a successful product which evolved from a niche commodity into a mainstream urban consumer good. There are unfortunately no samian assemblages relating to pottery-shop fires from this period, although several dumps of unused samian have been found in the forts at Cirencester (Hartley & Dickinson, 1982:139) and Cardean (Wilson, 1971) and the legionary fortress at Inchtuthil (Pitts & St Joseph, 1985); all of which were abandoned due to military reorganizations. It is difficult to compare this data with pottery from shop fires however, for as Orton (1993:178) reminds us, the composition of 'lifetime assemblages' dumped in this way tend to differ from newly acquired material, of the type we find in pottery-shop deposits.

10.6.2 Analysis of Samian Imports in the Flavian Period

10.6.2.1 Producer Push

Breeze (1977:139) initially suggested that once the conquest of *Britannia* was complete and the army had settled into permanent bases, contracts for supplies of items such as samian may have been placed directly with the kilns. Other leading authorities, including Bulmer (1979:27) and Dannell (2002:212), consider this to be unlikely. Dannell (2002:237), in particular, reminds us that throughout their entire existence potters at La Graufesenque played little, if any, part in organizing the distribution of their wares. Their skills were centred on production, rather than marketing or logistics. We may therefore exclude them from our list of candidates.

10.6.2.2 State Intervention

The state again stands out as having a direct interest in supply, especially as Roman forces advanced north from the Trent and Mersey in the early 70s to

complete their conquest of *Britannia* (Frere, 1974:91-91; Johnson, 1980:3). Tacitus informs us that supplies to support this campaign were organized by military procurators based here (Tacitus, *Agricola*, xix**.** 4; cited by Fulford, 1989:181). One of the *Vindolanda* writing tablets mentions that a regional commander (*centurio*) was stationed at the Agricolan fort at Carlisle (*Luguvalium Carvetiorum*), (Burnham & Wacher, 1990:54). This may be significant in a supply context, as this town is known to have been one of the conduits through which materials later reached Hadrian's Wall (Willis, 2011:181-182).

The British fleet (*Classis Britannica*) is known to have been active in this campaign (Tacitus, *Agricola*, xxi**.** 5; cited by Allen & Fulford, 1999:178). Their rôle probably involved military supply and may have continued until Agricola's campaign came to an end in AD 83 (Millett, 1995:17).

10.6.2.3 Mercantile Intermediation

Greene (1982:71-72) suggested that the growth of samian imports after AD 70 probably points to the development of an active commercial network at this time, as an import monopoly would undoubtedly have led to restrictions in supply to drive up the product's price. High volume would have suited a competitive cross-channel market, for in addition to the transport subsidies merchants may have gained by carrying samian alongside state cargoes, the unit cost of each item would fall as the volume handled increased, making consignments more profitable (King, 1981:69).

10.6.2.4 Consumer Pull

It seems to have taken about a generation for samian to penetrate widely into the urban population (Willis, 1998:87). Its distribution map (Figure 10.13)

shows that by the end of the 1st century these wares had spread over a wide geographical area and were no longer confined to urban centres. It is clear that civilian demand had begun to take hold by this point but it remains difficult to judge the strength of 'consumer-pull' as our evidence relates to the end-of-life disposal of the products rather than to purchasing behaviour.

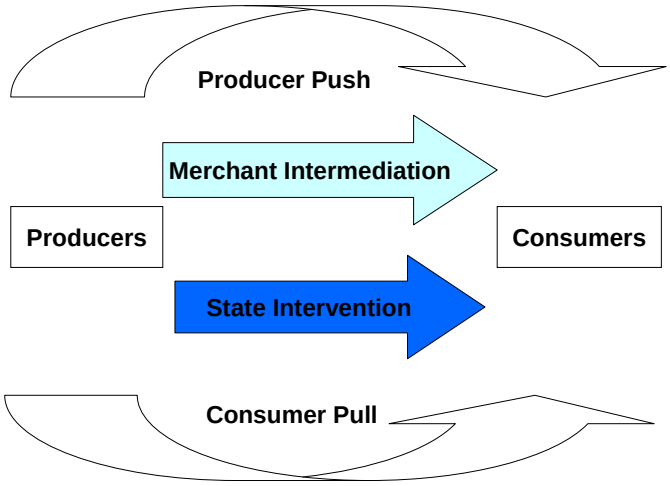
10.6.3 Evaluation of Samian Imports in the Flavian Period

The main differences between this period and its predecessors relates to the increasing availability of samian as the Roman army extended its territorial control and civilian demand developed as Roman cultural tastes spread more widely, especially in southern England. Military demand remained strong, particularly in the north and west where many troops were now stationed, but the redeployment of legionary and auxiliary forces would have required significant adjustment to the post-conquest supply-chain to enable samian to reach these new locations.

Most military ceramics are thought to have arrived from the continent with grain shipments, as cereals were the main bulk commodity imported by the army at this time (Anderson, 1992:64). Whether samian arrived via the same routes, and indeed as part of the same shipments as wine and oil, or whether each commodity arrived independently, remains unclear however.

Merchants would certainly have had an increasingly important rôle to play by the Flavian period, as the supply-chain needed to adapt to simultaneous changes in the military supply routes and to a continuous growth of civilian demand. It therefore seems likely that the supply-chain was shaped by dual drivers in the Flavian period, with the state continuing to take the lead, but merchants playing a significant supporting rôle.

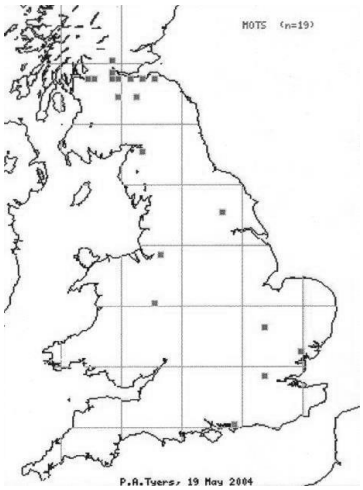
Figure 10.14 Drivers of the Flavian Samian Supply (*c.* AD 70-100)



10.6.4 1st – 2nd Century Transitions

Marsh's graph (Figure 10.12) suggests that by *c.* AD 100 samian may have become increasingly hard for continental merchants to obtain as production at La Graufesenque collapsed. Some attempts were made by a rival kiln at Montans to fill this vacuum, but the volume of samian reaching Britain from this source was relatively small.

Figure 10.15 Distribution of Samian from Montans



(After Tyers, 2012)

Montans' brief foray into the market was the last flourish of south Gaulish supply as far as Britain was concerned, as imports had begun to be drawn from other production areas by the early 2nd century AD.

10.7 SAMIAN SUPPLY IN THE 2nd CENTURY

10.7.1 Introduction

In about AD 100 British retailers appear to have turned again to central Gaul for their samian supplies, this time importing products from the kilns at Les Martres-de-Veyre. Marsh (1981:184) confirms that samian from this centre began to arrive in southern England soon after AD 95, but it seems that this was a temporary arrangement, as samian from Les Martres had ceased to pass through London by AD120. Its almost complete absence from sites on Hadrian's Wall confirms that imports from this site had ended before work on the wall had advanced very far (Bulmer, 1979:16).

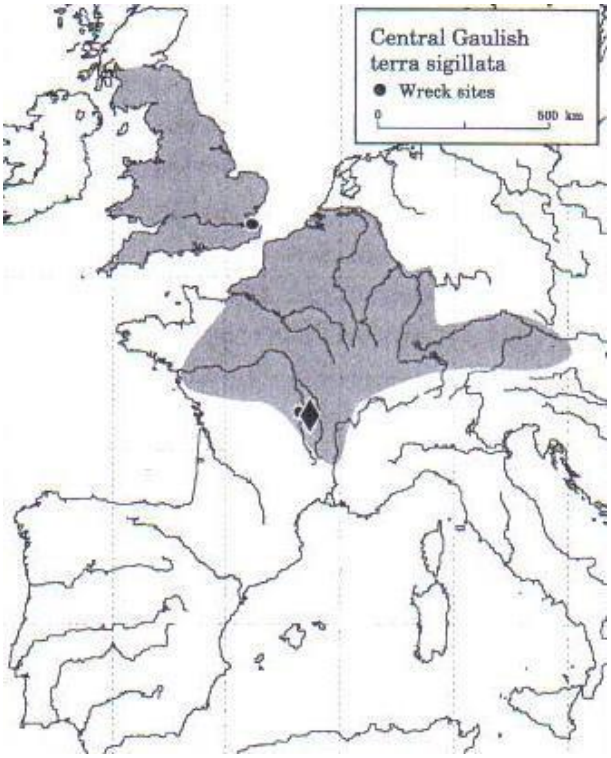
The largest British assemblage of samian from Les Martres is again linked with a catastrophic fire which occurred near Regis House, London; *c.* AD 125 (Marsh, 1981:222). Given the amount of samian and its proximity to the Thames waterfront, the stock is thought to have been from a warehouse rather than a retail outlet (Symonds, 1998:40; cited by Monteil, 2005:99). Around 125 stamps were recovered, representing the work of approximately 50 different potters (Dunning, 1945:53). The range of potters' stamps and vessel-forms discovered suggest many of the items may have become rather outdated by the time of the fire and it is possible the warehouse contained a quantity of old stock, or had gone out of use prior to its destruction (Rhodes, 1986:203). The existence of moribund facilities of this kind is unsurprising if Lezoux's new product-portfolio had already made the older designs from Les Martres-de-Veyre obsolete.

10.7.2 Lezoux's Domination of Samian Supply in the 2nd Century

Following the brief success of Les Martres-de-Veyre, potters' stamps show that many of the craftsmen who had worked there migrated to the nearby kiln-centre at Lezoux. Following this relocation, it would have taken some time for output to be re-established and for the new centre's export routes to become fully operational. It is no surprise then to see Marsh's (1981:185) graph of samian supplies dip in response to these changes. Imports appear to have reached their nadir *c.* AD 140, before later recovering as production expanded again to achieve a new peak *c.* AD 150-165 (Marsh, 1981:184).

While the kilns at Lezoux were geographically much closer to Britain than those at La Graufesenque, it is evident that Lezoux's own distribution zone exhibited a clear northern and western bias, as Figure 10.16 shows.

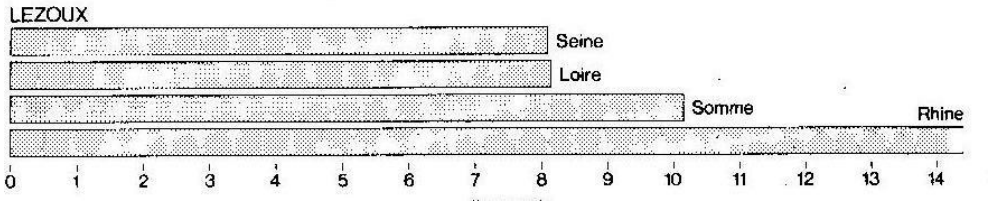
Figure 10.16 2nd-Century Samian Distributions from Central Gaul



(After Tyers, 1996:113, Figure 99)

While Lezoux's market area covers much of northern Gaul, it interestingly failed to include the important Rhine frontier, as this region apparently lay in the commercial territory of the neighbouring eastern Gaulish producers. This territorial divide may reflect Lezoux's apparent preference for the river systems of northern and western Gaul as their route to market. The wreck of a barge containing a cargo of Lezoux samian found at Vichy, a little to the north of the kiln-site, presumably represents the remains of one such cargo (Rhodes, 1989:50). Although Lezoux's kilns were several kilometres from the Allier, a short overland journey would enable the river to be reached, thus allowing access to the Loire and the channel-coast. This was probably the most economical route, as the cost comparisons in Figure 10.17 suggest.

Figure 10.17 Comparative Costs for Shipping Samian from Lezoux



(Adapted from Fulford, 1984:134, Figure 2b)

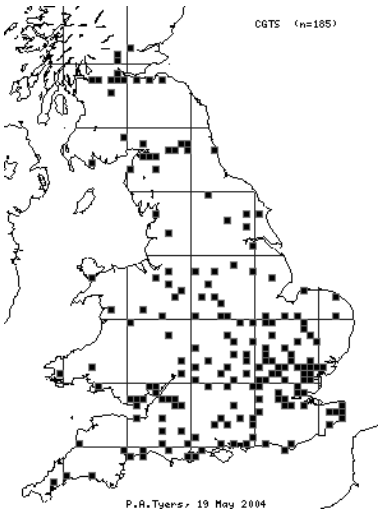
The variety of routes used at this time suggest that a number of merchants may have been involved, each with their own contact network and preferred route to market. In addition to the direct routes via the English Channel, a small amount of Lezoux samian also reached Britain by a more circuitous passage, involving the Rhine and the North Sea (Morris, 2010:60-62).

Figure 10.18 Export Routes of Lezoux Samian to the British Market

(Adapted from Jones & Mattingly, 1993:200, Map 6.20)

In view of the multiplicity of transport routes which linked the western coast of Gaul to southern England, it is clear how Lezoux managed to dominate Britain's samian supply for the remainder of the 2nd century AD. While Marsh's graph (Figure 10.12) indicates the amount of samian which reached London between AD 120 and 190 was lower than in the Flavian period (AD 69-96), we must remember that with various import routes now in operation supplies may have been arriving via other entry-gateways and this certainly enabled Lezoux's samian to circulate widely, as its distribution map shows.

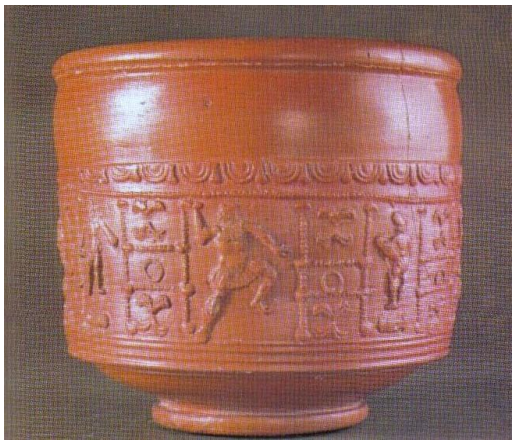
Figure 10.19 2nd-Century Samian Imports from Lezoux



(After Tyers, 2012)

While pottery assemblages in the 2nd century AD show higher samian counts in southern Britain, when the composition of these collections are analysed they tend to include a similar range of vessel forms and potters' stamps as those from the remainder of the province (Dickinson & Hartley, 1971:128; Marsh, 1981:184). Regional differences may therefore reflect variations in local rates of market penetration rather than patterns of product usage.

Figure 10.20 A Dragendorf Form 30 Vase from Lezoux



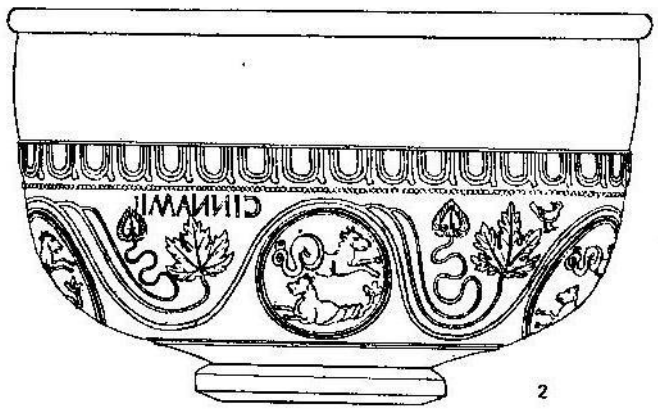
(After Branigan, 1980:139)

10.7.3 Use of Advertising-Stamps on Samian Ware from Lezoux

One interesting aspect of some of the stamps associated with Lezoux is their apparent use as advertisements. We have already seen in section 4.7.2 that potters' stamps may have been applied for a variety of reasons at different stages in the production process. While Fülle (1997:117) acknowledged that these stamps may at times have been used as 'sales promotion' devices, this was clearly not always the intention. As Webster (2001:291) has pointed out, these stamps were often very small and placed in obscure positions on the finished vessels. In addition, the dies used were sometimes broken, or abbreviated in such a way as to make them difficult to interpret by retailers or consumers when considering their purchasing options.

A promotional intention is nevertheless apparent at times and the practice of incorporating bold 'name stamps' in places which would be clearly visible to wholesalers, retailers or customers become more common, especially in the case of the CINNAMVS factory (King, 1981:166; Webster, 2001:293).

Figure 10.21 Advertisement Stamps of CINNAMVS, a Lezoux Potter



(After Peacock, 1982:123)

It is not clear, of course, what proportion of private consumers would have been literate enough to read such advertisements, so a mirror-image stamp of the kind shown in Figure 10.21 may not have proved disadvantageous. The presence of a bold stamp may have been enough to demonstrate that a potter wished his work to be identifiable and had faith in his products and professional reputation.

10.7.4 Commercial Assemblages of Samian Ware from Lezoux

The growing demand for samian in the 2nd century AD inevitably meant that supply-lines had to adapt to carry these wares to new parts of the province. As Britain's imports from Lezoux span a period of over 70 years however, it is important to consider how its distribution network evolved, particularly in respect of any changes it faced concerning its target markets' characteristics. In approaching this question, we are again fortunate in having a number of important samian assemblages available to assist us. As before, several of these collections relate to specific events such as shop fires or shipwrecks, which offer a large enough sample of material to enable valid conclusions to be drawn. Evidence from three key British sites in particular stands out:-

Figure 10.22 2nd Century Pottery-Shop Assemblages of Lezoux Samian

SITE LOCATION	DATE OF DEPOSIT	REFERENCES
Castleford	*c.* AD 140-150	Dickinson & Hartley (2000)
Wroxeter	*c.* AD 165-175	Atkinson (1942)
Corbridge	*c.* AD 180-200	Brassington (1975)

Differences in the archaeological contexts from which these assemblages are drawn make direct comparisons difficult, but since examples of this kind are extremely rare we are perhaps fortunate to have even this number available. The nearest parallels which might serve as comparators are the deposits of unused samian which are thought to come from urban warehouse clearances, such as the extensive New Fresh Wharf deposit in London (Bird, 1986:140). 'Lifetime assemblages' of this kind bring their own difficulties, however, as we saw previously in section 5.4.5, even if the material is thought to have come from a singe shipment (Rhodes, 1989:49).

10.7.4.1 The Castleford Potter's Shop Assemblage (*c.* AD 140-150)

The earliest data for a 2nd AD century retail assemblage is from a civilian *vicus* located near to the Roman fort at Castleford (*Lagentium*), where in about AD 140 a fire engulfed a row of timber buildings and destroyed a pottery-shop, along with its contents (Rush *et al*, 2000:1). Among the burnt remains was found a collection of Lezoux samian along with an assortment of other ceramic wares, representing the unfortunate retailer's stock-in-trade. The samian dates from a time when bulk exports to Britain had only just begun to recover following the early 2nd century dip in supply and the find contained a total of 416 samian stamps, representing the work of 57 potters (Dickinson & Hartley, 2000:52-55). Commenting on the samian present in this assemblage, Dickinson & Hartley (2000) observe:-

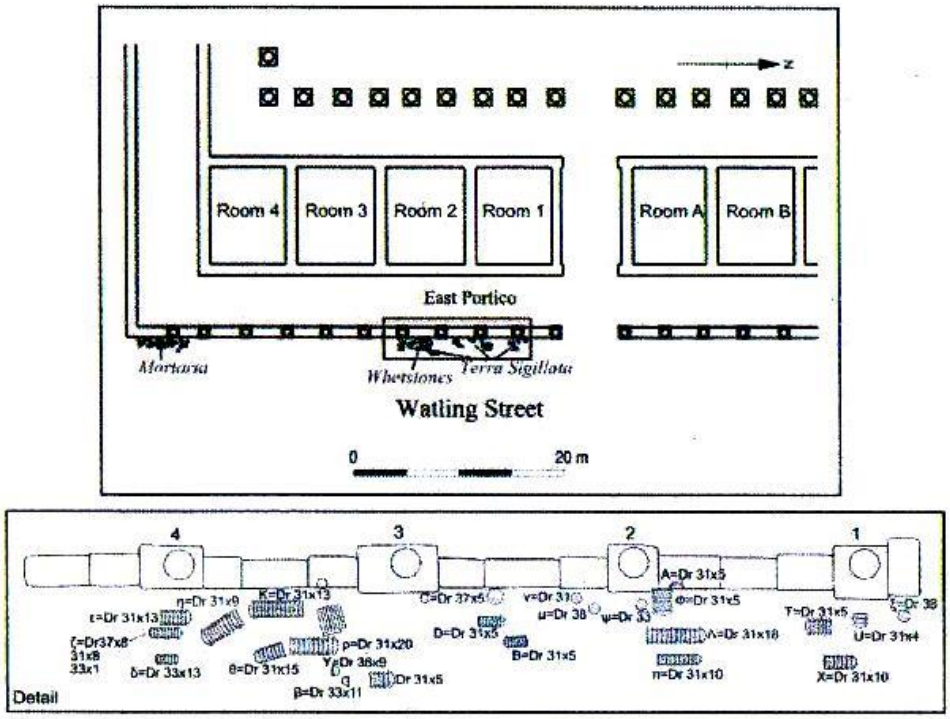
> "... a very high proportion of the decorated bowls are either from more-or-less worn moulds or were blurred in removal from their moulds. The implication seems to be either that Castleford was landed with a batch of near-seconds, or that, if we are truly dealing with a shop, the better bowls of the batch had sold readily and the shelves were left stocked with the poorer specimens."
>
> (Dickinson & Hartley, 2000:52)

As with any retail assemblage, this deposit represents an amalgamation of stock from a number of consignments the retailer had obtained, conceivably from more than one merchant. The relatively low number of samian stamps per potter present in the assemblage suggests that traders continued to prefer mixed batches of stock, presumably to reflect the assortment of vessels they felt would most closely meet their local clients' needs. The nature of some of the other components in the ceramic mix may offer pointers to the route by which this samian arrived from Lezoux however. Of particular interest are a number of *mortaria* which were manufactured in Colchester and had been brought in from a considerably greater distance than locally available supplies from the nearby kilns at Hartshill-Mancetter (Hartley, 1973:42). Additional transport costs may have been negated, however, if the *mortaria* were picked up *en route* by a merchant carrying an official consignment of samian to the military fort at Castleford (Dickinson & Hartley, 1971:131).

10.7.4.2 The Wroxeter Potter's Shop Assemblage (*c.* AD 165-175)

Although we have no contemporary examples to allow us to judge whether the Castleford assemblage provides a representative sample of Lezoux's early exports to the British market, we are fortunate to have access to two later pottery-shop finds which help us assess how these retail assemblages changed over time. The first dates from *c.* AD 165-175 when a catastrophic fire destroyed a number of market stalls that were situated beside the *forum* at the *civitas* of Wroxeter (*Viroconium Cornoviorum*). One of these appears to have belonged to a pottery merchant, whose stock contained both plain and decorated samian ware from Lezoux, as well as products from a rival production centre at Rheinzabern in eastern Gaul (Atkinson, 1942:129).

Figure 10.23 The Pottery-Shop Assemblage from the Wroxeter Fire



(After MacMahon, 2005:60, Figure 4.11)

Lezoux's samian comprised the bulk of the assemblage and produced 173 stamps; representing the work of 26 different potters. In addition, a batch of similar material was recovered from one of the rooms within the *forum* itself, which had been destroyed by the same fire, adding 29 further stamps belonging to 19 potters (Atkinson, 1942:128-131). The separation of these two deposits requires us to be cautious in the way in which we treat them, particularly as some vessels found in the *forum* had been repaired and were, at best, 're-cycled products' rather than new stock. The circumstances of their burial allow us to regard the two sets of finds as being contemporary though, irrespective of whether they ever belonged to the same merchant.

Atkinson (1942:64) identified the 'gutter find' as retail stock from stalls set out along the portico. While this is still the most likely explanation, Fulford

(2014:282) points out other explanations may exist, such as the arrival of a wholesale consignment at the portico just before the fire.

While the presence of Rheinzabern samian at Wroxeter demonstrates that more than one supply source was available to the retailers who operated there, it is again the occurrence of the other artefacts with these finds which provide us with our best insight into the route Lezoux's samian followed to reach its market. *Mortaria* again formed part of the Wroxeter retailer's stock-in-trade, along with Kentish rag-stone hones (Atkinson, 1942:129).

These whetstones are of particular interest in relation to Wroxeter's supply network, as some of the unused hones found in this pottery-shop deposit have been confirmed by petrological analysis to have come from the same source as those found in dumps of discarded samian of similar date at the New Fresh Wharf site in London (Rhodes, 1986:203). While different merchants may have been involved, the possibility that Lezoux samian and Kentish rag-stones travelled north together along Watling Street *en route* from London to Wroxeter as part of a state cargo or a merchant consignment is a scenario we might wish to consider (Rhodes, 1989:203).

10.7.4.3 The Corbridge Potter's Shop Assemblage (*c.* AD 180-200)

Our final 2nd century AD samian assemblage comes from another pottery-shop fire, which occurred at Corbridge (*Corstopitum*) *c.* AD 180-200; *i.e.* close to the end of Lezoux's period of market dominance. This find was discovered over a century ago and in the intervening period its contents have apparently been contaminated by material from other sources (Brassington, 1975). As far as can now be determined, the Lezoux samian from the Corbridge shop included at least 17 stamps, representing the work of 11 potters (Rhodes, 1989:53).

The absence of any eastern Gaulish samian in a late 2nd century assemblage situated so far north suggests that the pottery reached Corbridge by means of a direct southerly route (Rhodes, 1989:48). The composition of this find and the low number of stamps per potter would also support the notion of mixed batches of samian being delivered to the retailer (Rhodes, 1989:53).

10.7.4.4 The Pudding Pan Wreck Assemblage (*c.* AD 175-200)

One further piece of evidence that may help us learn more about Lezoux's samian distribution network comes from a very different source; namely the site of a shipwreck near the Pudding Pan Rock, located 3 miles north of Herne Bay (Edbury, 2012). The vessel, which foundered in the late 2nd century, was carrying a mixed cargo, among which were a large number of *imbrices* and *tegulae* roofing tiles and a consignment of Lezoux samian.

Analysis of the samian assemblage is again difficult, for since the wreck was discovered in 1779 much of the material which has been recovered from the site has been dispersed (Edbury, 2012). It has also been suggested recently that more than one ship may have foundered on this particular rock, adding to the complexity of the deposit (Walsh, 2000:57). Over 285 samian vessels are known to have come from the site, at least 219 of which display stamps belonging to 37 different potters (Rhodes, 1989:50). The high proportion of undecorated vessels in the Pudding Pan assemblage led Rhodes (1989:50) to suggest that the cargo(s) may have been destined for a military customer.

10.7.4.5 Other Significant 2nd Century Samian Assemblages

Two other 2nd century AD samian finds are worth noting, but as both were found in refuse pits near to what are thought to have been pottery shops

neither can be linked to a single event like a fire or shipwreck. The first of these is from Alcester and contained 69 unused vessels dated to *c.* AD 150-165. A total of 45 stamps were identified on these vessels, representing the work of 28 different potters (Hartley, 1994:106). The second find is from Winchester (*Venta Belgarum*) and dates to the late 2nd century. This again contained a quantity of unused Lezoux samian which included 27 stamps belonging to15 different potters (Zant, 1987:14-16). Both finds conform to the pattern seen in the pottery-shop assemblages and the fact that many of the vessels are unused suggests that they may have been deposited following large-scale accidental breakage or as a discard of un-saleable stock.

10.7.4.6 Commonalities among 2nd Century Assemblages

While we must be careful to avoid the danger of placing too much reliance on a small number of examples, these mercantile assemblages constitute the best data we have of the supply networks and delivery mechanisms which operated during the 2nd century AD. Even a cautious interpretation of the evidence they provide allows us to identify a number of key commonalities:-

1/ low numbers of stamps per potter, implying mixed batches of stock were common, or even preferred by pottery merchants

2/ a correlation between the range of potters' stamps and vessel forms in retail assemblages with those found in kiln-waste dumps, suggesting that many consignments remained together throughout their journey

3/ indications that samian was sold by retailers who also dealt in other types of ceramics (*e.g. mortaria*) and hardware (*e.g.* stone hones)

4/ samian may have reached retailers along with consignments of other merchandise, which may offer pointers to the supply-routes used

Negative evidence may also provide us with important information as to the routes used to carry samian to market. Such evidence includes the absence of diagnostic items we might expect to find in association with the samian if stops had been made at specific ports-of-call *en route* to Britain. As Rhodes (1989) observes:-

> "Within Britain, the similarity of the figures from Lezoux samian in the Wroxeter stalls, the Pudding Pan wreck and the Castleford shops is remarkable, and also suggests a fairly direct supply route. In support of this is the complete absence of East Gaulish samian in the Corbridge shop and the Pudding Pan Rock, which might have been expected if the pottery had been trans-shipped via an east-coast warehouse."
>
> (Rhodes, 1989:48)

Identifying the most likely route which a samian cargo might have taken to reach its market and the identity of other diagnostic commodities with which this pottery may have travelled enables us to improve our understanding of the long distance supply network through which samian imports passed to reach British consumers. This in turn helps us identify those responsible for bringing this pottery to the British market and the mechanisms they used.

10.7.5 Analysis of Samian Imports in the 2nd Century

Although the quality of *sigillata* produced at Lezoux in the pre-conquest period had been poor, improvements had been made to its 'paste' and 'slip' by the early 2nd century AD, enabling the quality of the wares to increase (Greene, 1978:57). Little is known of the operating practices used at the central Gaulish kilns, as 'tally lists' are seldom found there, but the scale of production at Lezoux seems to have been lower than at La Graufesenque.

10.7.5.1 Producer Push

While samian seems to have followed a more direct route to market in the 2nd century AD, this does not necessarily imply that the potters themselves were involved in its delivery. Despite some minor changes to the way the kilns were organized in the post-Flavian era, the potters' interests remained in the field of manufacturing and no evidence has been found to show that any potter ever established a direct link with overseas clients.

10.7.5.2 State Intervention

The state's rôle warrants closer examination though. Clear associations may be seen to exist between samian assemblages and military sites through the 2nd century AD and this has led Fulford (1989a:185-186) to suggest that the army maintained a strong interest in the distribution of these wares as part of its strategic oversight of Britain's provincial supplies. An arrangement of this kind would have been of great benefit to export merchants, as it would have made Lezoux's distance from the market much less problematic, as the costs of transporting the samian would have been seen by the state as part of the overall expense of administering the province (Fulford, 1984:135).

10.7.5.3 Mercantile Intermediation

The wider diffusion of samian into the civilian population during the 2nd century AD, coupled with the multiplicity of delivery routes through which it reached its market makes it likely that pottery merchants (*negotiatores ars cretarii*) played an increasingly important rôle in managing the exchange networks used to deliver these wares (Dannell, 1977:233). The length of the supply-lines used at this time suggest that most of this produce would have reached Britain from continental warehouses, before being redistributed to

Gretail outlets in various parts of the province as part of mixed consignments of ceramics and other hardware. This would all have been compatible with a system of 'down-the-line trade', operated through interlinked contact networks, in which the stock became more mixed and batch sizes reduced as they neared the retail outlets.

10.7.5.4 Consumer Pull

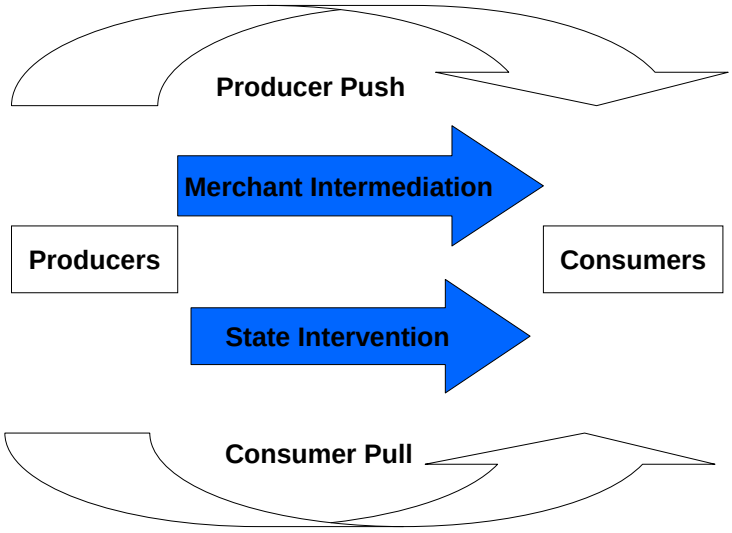
With respect to 'consumer pull', while Marsh's graph (1981:185) indicates that samian imports through London had started to decline before the end of the 1st century AD, data presented by Willis (2011: Table 1) suggests that those imports which did continue to arrive may have reached a wider range of consumers, with extra-mural military sites and civilian settlements both appearing to have increased their uptake before the end of the 2nd century. It is not clear, however, if civilian consumption levels had yet become strong enough to draw-in supplies in their own right. The current investigation followed the supply-chain through to the retailer-consumer interface and has not tracked consumer demand into the civilian population.

10.7.6 Evaluation of Samian Imports in the 2nd Century

The presence of *mortaria* and whetstones alongside the samian found at civilian sites raises the possibility that these materials had arrived by the same supply-routes. This suggests that some merchants may have acted in a private capacity alongside their official rôle as state contractors. There is also evidence to indicate the presence of dual supply-chain drivers during this period; with the state assuming the strategic rôle of commissioning military supplies, while independent merchants carried out the operational aspects of this work and, in addition, attended to the growing needs of a

developing civilian market. This increased complexity suggests a gradual shift in the balance of power during the 2nd century which extended the involvement of merchant intermediaries.

Figure 10.24 Drivers of 2nd Century Samian Supply (*c.* AD 100-200)

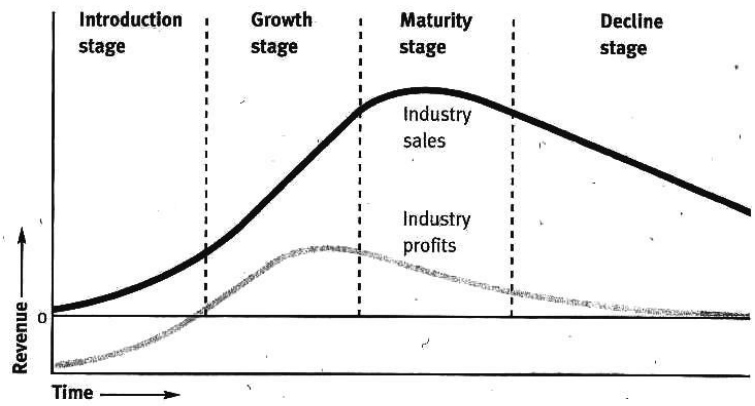


10.7.7 2nd – 3rd Century Transitions

Uncertainty still surrounds the date of Lezoux's displacement by the eastern Gaulish samian kilns. Most leading British authorities place this transition at the very end of the 2nd century AD (Bird, 1986; 1995; Ward, 1995; 1996; Tyers, 1996). Conversely, King (1981; 1984) contends that at least some of Lezoux's samian probably continued to reach the northern frontier until AD 220-230. Many continental archaeologists also think the samian market had become fragmented by this time, with several competing production centres in central and eastern Gaul vying for market share. In this respect they are happy to accept the possibility that Lezoux's kilns remained active until the early 3rd century AD (Monteil, 2005:93).

The increasing geographical spread in popularity which samian seems to have experienced during the course of the 2nd century AD provides a useful opportunity to explore how the distribution of this product developed as it entered the mature stage of its life-cycle in the British market. The notion that the demand for a product will evolve in predictable ways as consumers with different purchasing characteristics enter the market was introduced by Bass (1969) and now forms the basis of the product life-cycle hypothesis.

Figure 10.25 Stages in the Development of a Product's Life-Cycle



(After Dibb *et al*, 2006:305, Figure 10.5)

King (1981:69) suggests that the threats presented by the emergence of rival production centres in eastern Gaul and downward price-pressures generated by this new competition may have contributed to the declining quality of the pottery made at Lezoux in the late 2nd century AD. Cost-pressures of this kind would be characteristic of a product that had reached the 'mature' stage in its life-cycle; a phase in which industry profits fall as sales volumes begin to diminish, as Figure 10.25 shows.

10.8 SAMIAN SUPPLY IN THE 3rd CENTURY

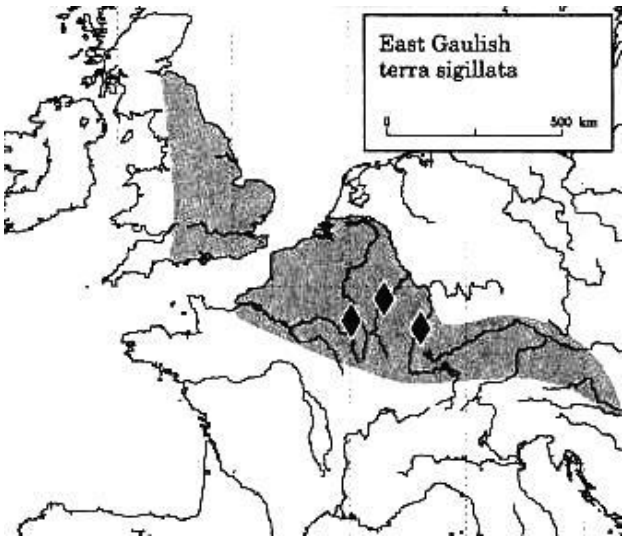
10.8.1 Introduction

The emergence in the early 3rd century AD of Rheinzabern (*Tabernae*) and Trier (*Augusta Treverorum*) as successors to Lezoux (*Ledosus*) was not a random occurrence. Samian production had begun in eastern Gaul as early as AD 60 to serve the needs of the local Rhenish market (Hartley, 1977:253; Bulmer, 1979:19).

Until the mid 2nd century AD the eastern Gaulish industry was characterized by a large number of fairly small production centres (Hartley, 1969:238). By *c*. AD 150 manufacturing began to gravitate to Rheinzabern and Trier and this restructuring had been achieved by *c.* AD 210 (Symonds, 1992:42). Production remained focussed on these sites for the next half century, before finally coming to an end *c.* AD 260 (Bird, 1995:2).

Trier and Rheinzabern had different market areas, as Fulford (1984:134) has observed. Trier's distribution had a distinct westerly bias, focusing on the lower Rhine valley, while Rheinzabern's market covered the same area, but also extended further eastwards along the Rhine valley and south into Gaul (Fulford, 1984:134, Symonds, 1992:64). Samian from both centres reached the Britain, as Figure 10.26 shows. Rheinzabern's products gradually came to dominate the export market as the century progressed though (Wightman, 1970:199; Bird, 1987:325).

Figure 10.26 3rd-Century Samian Distributions from Eastern Gaul



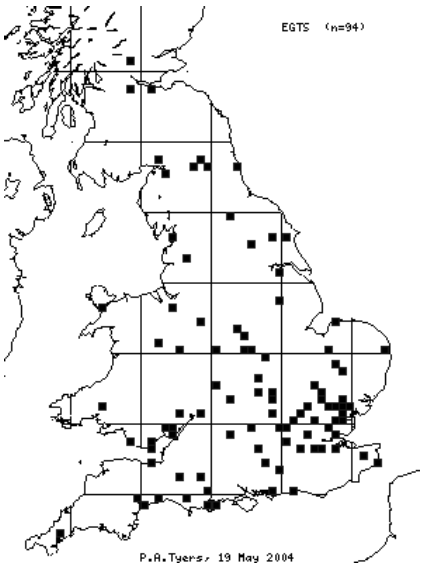
(After Tyers, 1996:114, Figure 100)

10.8.2 3rd-Century Samian Supply from Rheinzabern and Trier

Small amounts of eastern Gaulish samian had begun to reach Britain in the 2nd century AD, as the finds from the Wroxeter pottery-shop illustrate. It is most commonly found in the north of the province, the region lying closest to the production centres (Dickinson & Hartley, 1971:131). The absence of eastern Gaulish samian from Antonine sites in Scotland implies the material did not really begin to arrive in volume until after AD 160 though (Bulmer, 1979:19).

Comparatively little samian seems to have been imported from eastern Gaul compared to the amount that had arrived from La Graufesenque and Lezoux during the two preceding centuries (Bird, 1986:142). While the volume may have been small, however, the distribution of eastern Gaulish samian was widespread, as Figure 10.27 shows.

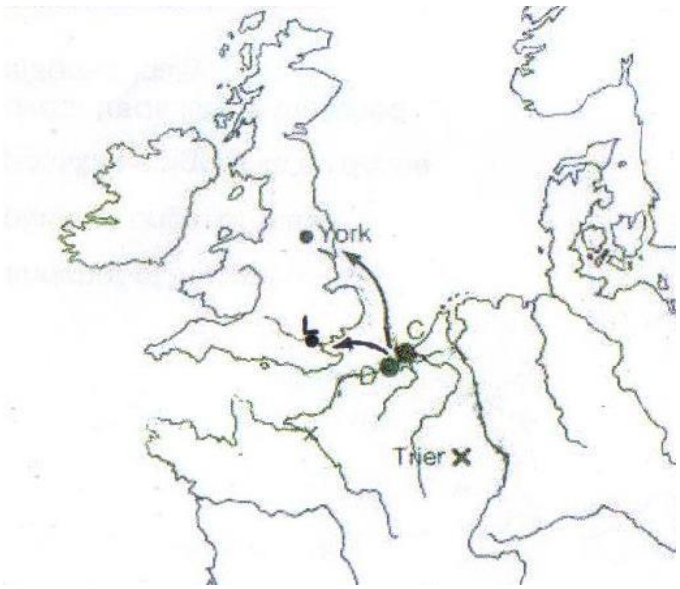
Figure 10.27 3rd Century Samian Imports from Eastern Gaul



(After Tyers, 2012)

The importance of the lower Rhine valley as a transport corridor for both Rheinzabern's and Trier's samian strongly suggests most imports probably reached Britain via the North Sea (Tyers, 1996:114; Morris, 2010:62). The harbours at Colijnsplaat and Domberg, in the nearby Scheldt estuary, would have provided excellent bases for merchants involved in this trade (Hassall, 1978:43; Anderson, 1981:336). Indeed, by *c*. AD 180 some merchants had begun to dedicate altars to *Nehalennia* (a local deity) to ask the goddess to bless their journeys (Fulford, 1977a:38; Bogaers, 1983:13-27).

Figure 10.28 Probable Routes of Eastern Gaulish Samian to Britain

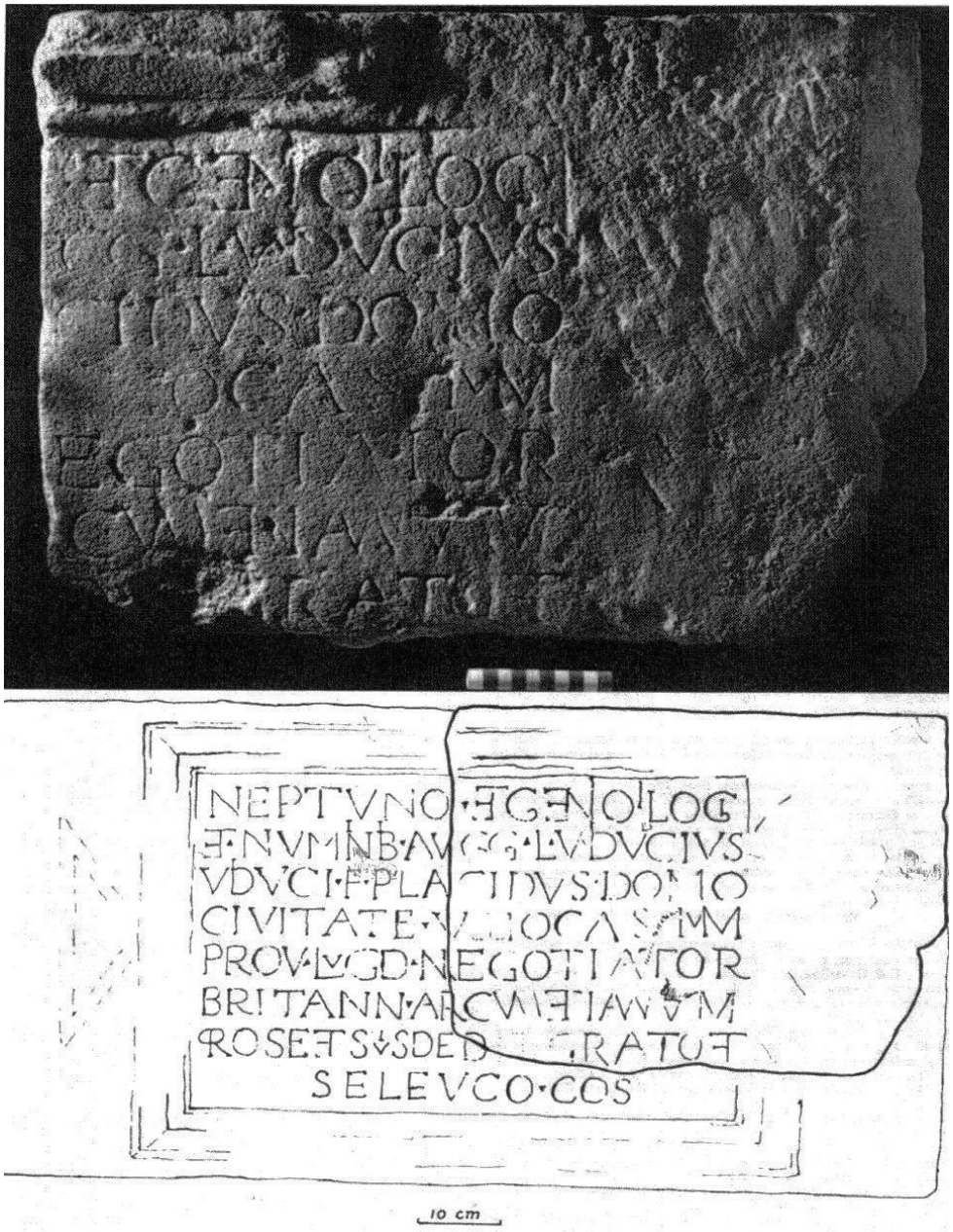


Key
C = Colijnsplaat
D = Domburg
L = London

(Adapted from Jones & Mattingly, 1993:200, Map 6.20)

Unfortunately, inscriptions of this kind are not prolific in Britain, where this particular epigraphic tradition may not have been as strong. A direct trading link is confirmed, however, by a dedicatory inscription from York, made in AD 221 by L. Viducius Placidus, a merchant who also donated one of the altars at Colijnsplaat (Jones & Mattingly, 1993:201). Placidus described himself on the Colijnsplaat inscription simply as a *negotiator Britannicus*, or British trader (Hassall, 1978:43; Birley, 1979:126). The products he dealt in are not stated, but Ottaway (2004:107) considers pottery to be a candidate.

Figure 10.29 Inscription left by Lucius Viducius Placidus at York



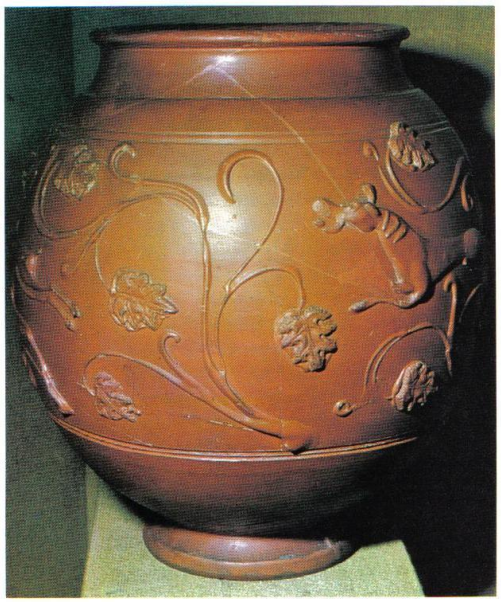
Neptuno] et Genio Loci 1 *[et Numinib(us) Au]g(ustorum) L(ucius) Viducius* 1 *[Viduci f(ilius) Plac]idus domo [civitate] Veliocas[s]ium* 1 *[prov(inciae) Lugd(unensis) n]egotiator* 1 *[Britann(icanus) ar]cum et ianuam* 1 *[pro se et suis de]d[it Grato et* 1 *[Seleuco co(n)s(ulibus)]*

To Neptune and the Genius of the place and the Deities of the Emperors, Lucius Viducius Placidus, the son of Viducius, from the canton of the Veliocasses in the province of Lugdunensis, trader with Britain, presented the arch and gate in the consulship of Seleucus and Gratus (AD 221)

(Adapted from Hassall, 1978:46-47, Figure 43)

The Placidus inscription reminds us of the importance of the Humber as an entry-gateway and it is interesting to observe that much of the 3rd century samian from York is from the civilian *vicus* (Monaghan, 1997:865). This includes a large assemblage from a riverside dump, which may indicate the disposal of transport breakages or disposal of obsolete stock from warehouse clearances (Monaghan, 1997:1114-1115).

Figure 10.30 A Dragendorf Form 72 Vase from Rheinzabern in Eastern Gaul



(After Sitwell, 1981:82)

Apart from York, evidence of direct shipments from the Rhine to ports in north-east England are suggested by the high proportion of eastern Gaulish stamps found along Hadrian's Wall (16.5%). This may point to an official east-west supply route operating from one of the Tyne ports (Dickinson & Hartley, 1971:130; Willis, 2011:181-182). A similar pattern at Piecebridge (17%) has led to suggestions that a direct link to the continent may also have existed there (Ward, 1995:15). The question of whether the shift in favour of eastern Gaulish wares led to a period of greater prosperity for pottery

merchants operating on the North Sea routes, or merely enabled them to maintain their livelihoods for a few decades longer, remains unresolved. This would have depended on whether the volume of samian arriving after *c.* AD 200 increased or merely remained static (Morris, 2010:62). What is clear is that some eastern Gaulish samian continued to reach *Londinium* after AD 200, as the finds from New Fresh Wharf show (Bird, 1986:186).

One consequence of the reorientation of Britain's samian supply would have been the impact such a change would have had on the provincial distribution network as a whole. The port of *Londinium* may have lost a significant part of its trade after this point, with serious consequences for the merchants and shippers who had relied on this for their livelihoods. The key changes that may have led to a temporary demise of the port's fortunes in the later 3rd century are as follows:-

Figure 10.31 Evidence of *Londinium*'s Decline in the Late 3rd Century

Evidence Base	Reference Sources
End of the main phase of fine-ware importation	Marsh (1981:185); Bird (1986:139); Morris (2010:130)
Fall in the river level preventing ocean-going ships from docking	Milne (1985:85-86; 1995:79-80); Brigham (1990:139-147; 1998:33-34)
Dereliction / abandonment of the existing riverside quays	Miller *et al* (1986:51-54); Milne (1990:79); Roscams (1991:68)
Suggested decline in the size of the city's population	Marsden (1980:109-110); Merrifield (1983); Brigham (1990:159)
Changes in the character and usage of *Londinium*'s forum	Milne (1995:81-82); Todd (1999:192); Alcock (2011:203)
Increasing levels of provincial self-sufficiency	Merrifield (1983:195); Southern (2001:258)
Increased rivalry from east-coast ports	McGrail (1990:84); Anderson (1992:66); Todd (1999:165)

As the river level fell and the city's quays became more difficult to reach a new harbour seems to have developed a little further downstream near the 'pool of London' where the river apparently remained deep enough to receive ocean-going traffic (Allason-Jones, 2008:146). While not far from the city, this new harbour would presumably have been less conveniently situated for many resident merchants, whose warehouses were located close to the old wharves. Faced with this added inconvenience and a deteriorating economic climate, many resident merchants are thought to have abandoned their businesses and moved away (Brigham, 1990:159).

What remains clear, however, is that *Londinium* continued to function as the province's administrative centre throughout the 3rd century and beyond (Brigham, 1990:159; Salway, 1993:363). The city's walls were refurbished and in some places extended after AD 270, a sure sign that *Londinium* was still a functioning urban centre, although not necessarily quite so prosperous or so heavily populated as in earlier times (Merrifield, 1983:195; Brigham, 1990:140). As Brigham (1990) remarks:-.

> "It is not possible at present to quantify the effect of the regression on the Roman economy in the Thames region or elsewhere, partly because there is so little evidence for the volume and nature of trade under normal conditions ... but in *Londinium* its worst period coincided with the general economic contraction of the Roman Empire."
>
> (Brigham, 1990:147)

London's advantageous location clearly enabled it to recover its prosperity in due course, but the combination of factors outlined above probably meant that, in the closing decades of the 3rd century at least, the commercial health of the port may have suffered a temporary reversal.

10.8.3 Analysis of Samian Imports in the 3rd Century

A limited supply of samian continued to be available in most parts of Britain during the early 3rd century. The military supply network continued to play a part in this distribution, but the increasing appearance of samian in civilian contexts suggests that access was actually widening, even as overall import volumes declined.

10.8.3.1 Producer Push

A decline in the use of potters' stamps by eastern Gaulish kilns during the 3rd century means that we know little about the way in which production was organized at Rheinzabern and Trier. There is nothing to suggest that the potters operating there had any direct involvement in the distribution of their wares.

10.8.3.2 State Intervention

While a strong military presence was maintained along Britain's northern frontier the state continued to supply pottery and other essential provisions. By the late 2nd century the character of the northern garrisons had started to change and a consequence of this re-structuring was a fall in troop numbers (Breeze, 1982:137-139; Southern, 2001:48). The size of the British garrison continued to decline during the early 3rd century and their supply needs were probably reduced further by the increasing austerity and self-sufficiency that marked this period. The state's rôle may therefore have been less important than in previous generations.

10.8.3.3 Mercantile Intermediation

The dedicatory inscriptions left by pottery merchants at production centres like Trier (*Augusta Treverorum*), (Wightman, 1985:155); at transhipment points such as Cologne (*Colonia Claudia Ara Agrippinensium Ubiorum*) or Mainz (*Moguntiacum*), (Middleton, 1979:95) and seaports like Colijnsplaat or Domburg (Anderson, 1992:66) all confirm the involvement of merchants (*negotiatores*) in long distance supply.

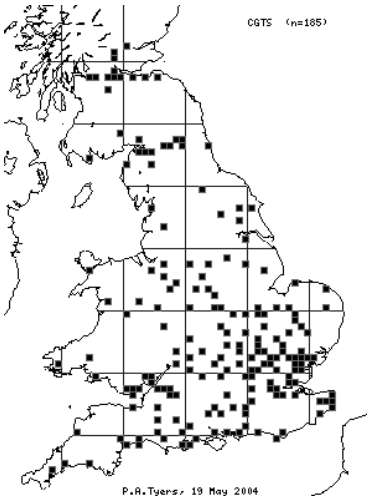
There is no explicit reference in the inscriptions so far recovered to confirm that samian was among the cargoes these merchants carried however. When we consider that many 3rd century shippers seem to have preferred mixed cargoes, one component of which would almost certainly have been pottery, then the probability that some traders were involved in supplying samian to the British market seems assured.

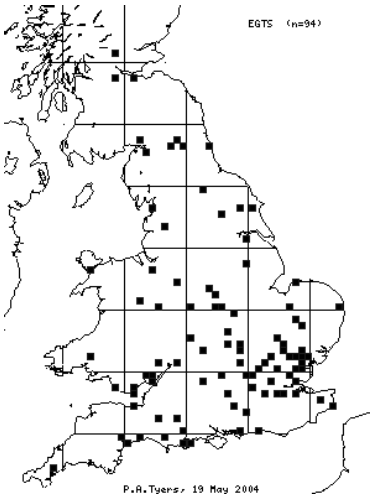
10.8.3.4 Consumer Pull

Samian appears to have become more readily available to civilian users in the 3rd century AD, especially in larger urban centres like York (Monaghan, 1997:865). The same may also be true at smaller settlements like Castleford (Dickinson & Hartley, 2000) and Piecebridge (Ward, 1995:15). Whether greater civilian access reflects an upsurge in consumer demand or merely a greater availability of the product as military demand subsided still remains unclear. It is clear by comparing the distributions of samian imports in the 2nd and 3rd centuries in Figure 10.32 that not only was less of this pottery now arriving, but little of the samian that did manage to reach Britain was finding its way to the 'military zone' in the north and west of the province. The concentration of 3rd century supply was very much in the south and south-east regions, where the civilian market was chiefly located.

Figure 10.32 Comparison of 2nd and 3rd Century Samian Imports

2nd Century Samian Supply **3rd Century Samian Supply**





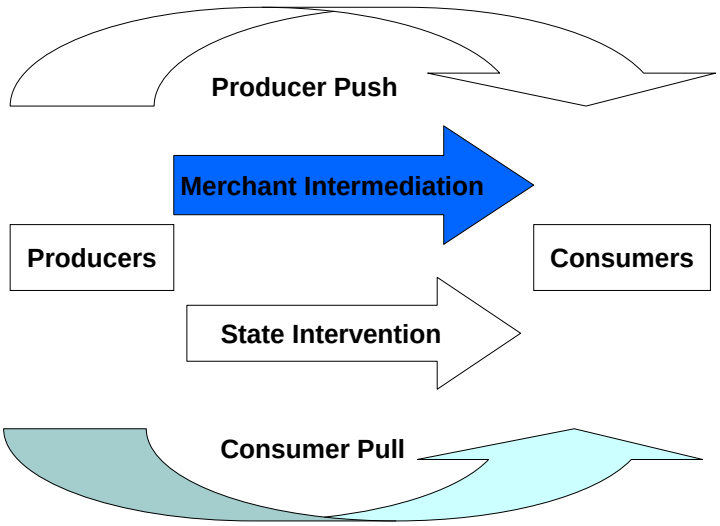
(Adapted from Tyers, 2012)

There is nothing to suggest that retailers or civilian consumers were pro-active in demanding specific items from the potters or merchants who supplied them though (Tony King, pers comm., Beau Street conference, Bath, 23/4/2015).

10.8.4 Evaluation of Samian Imports in the 3rd Century

The final phase of samian imports during the 3rd century presents a rather confusing picture. While the military continued to draw in some supplies from eastern Gaul to service the needs of its northern garrisons, it is unclear whether the *Classis Britannicus* was used to carry these goods. Merchants appear, on balance, to be the likely driver of supply during this final phase of activity, especially if many, like L. Viducius Placidus, took advantage of the opportunity to trade on their own behalf.

Figure 10.33 Drivers of the 3rd Century Supply of Eastern Gaulish Samian from Rheinzabern and Trier (*c.* AD 200-270)



10.8.5 The Decline of Eastern Gaulish Samian Production

Despite an attempt to retain some of its market-share, *Londinium*'s samian supply declined still further after AD 220 and few of the latest wares from either Rheinzabern or Trier appear to have reached *Britannia'*s provincial capital (Marsh, 1981:186). By AD 250 imports had largely collapsed and probably ceased entirely by *c.* AD 260 (Bird, 1995:2; Ward, 1995:18).
The 3rd century AD is often seen as a period of extensive economic change throughout the Roman world. While Cameron (1993:3) is probably correct to suggest that the impact of the so-called '3rd-century crisis' may have been overstated, the long-term structural changes which led samian production to shift locations so many times in the past may still have been occurring. It has been argued that the ultimate demise of samian production was largely brought about by the effect of changing consumer tastes (King, 1984:57-59). The dating evidence relating to the final phases of samian's exports remain contentious (King 1981; 1984, *contra* Bird, 1986; 1995; Ward, 1995; 1996).

By the early 3rd century, however, other forms of continental colour-coated wares had begun to compete with samian and the most prominent of these were Argonne ware (Bird, 1995:12) and Rhenish-ware (Symonds, 1992:1).

A significant increase in colour-coated tableware production is also evident in Britain (Jones & Mattingly, 1993:210). In particular, kilns in the Nene Valley, New Forest and Oxfordshire were at the forefront of this provincial expansion (Fulford, 1975; Young, 1977).

10.9 DEDUCTIONS

It is evident that Britain's samian supply had a long and complex history. Its antecedents, *Arretine* ware and early Gaulish Italian-style *terra sigillata*, both reached southern England in the pre-conquest period, although the volumes involved in each case were small. Furthermore, the clustering of these wares at *entrepôt* centres like Braughing or at high-status sites like Bagendon and Silchester suggests that demand was extremely restricted. The recipients may have included local élites, who obtained these items as diplomatic gifts.

Bulk imports of samian began only after the Claudian conquest and arrived initially to meet military demand. It is therefore likely that the state supply mechanism was the means by which large-scale imports first reached Britain from southern Gaul (Fulford, 1989:180).

Whether these supplies were delivered by the imperial fleet in the immediate post-conquest period remains uncertain. If merchants were used at this time, their international contact networks and ability to manage the large-scale distribution of strategic materials would have given them a pivotal rôle in the supply-chain. Acting as a *negotiator ars cretarii* at an *entrepôt* centre

like Arles (*Arelate*) or Narbonne (*Narbo*), a competent merchant would have been able to set up a reliable logistics network, drawing on the services of specialists like mule-train managers or shipowners to carry out specific aspects of this work; either as sub-contractors, or on a profit-sharing basis (Hassall, 1978:45-46).

Merchant involvement is clearly suggested by the existence of warehouse operations, both at harbours like La Nautique, through which samian was shipped, or from the ports where it arrived (Rhodes, 1989:46). Merchants would have been able to make use of these warehouse facilities to cope with any unforeseen fluctuations in demand and to enable local shopkeepers or pedlars to replenish their own retail stocks. Thus warehouse assemblages like Regis House, London (southern and central Gaulish wares), New Fresh Wharf, London and Wellington Row, York (central and eastern Gaulish wares) provide us with valuable insights into the samian imported from each production area. Evidence obtained from these sites has added significantly to our understanding of the opportunities which warehouses offered pottery merchants to break-up bulk consignments and to provide buffer-stocks of the more unusual samian forms.

It took a generation for samian to become common in civilian contexts, even in the case of the larger urban centres in the south. In considering the reason for this low initial uptake, Monteil (2005:93) has argued that variations in supply may have been more relevant than fluctuations in demand. As long as military requirements continued to create supply-pressures, access for civilian users may have been restricted. The question of why British potters did not step in to fill this apparent shortfall in supply remains unresolved, as this solution seems to have been adopted elsewhere, for example in *Iberia* (Hayes, 1972:11-12; Leveau, 2007:662-663).

Suitable clays were available in various parts of England, but evidence of British samian production remains scarce. So far, only one samian kiln has been discovered in the province, the solitary example being at Colchester (Hull, 1963:20-34, Figures 12-14, Plates 3-6). Other mould-fragments and pottery-wasters have been found elsewhere, which suggest that at least two other production centres may have existed, one in London and the other near Pulborough in Sussex, although neither site has yet been located (Simpson, 1952:68-69; Webster, 1975:163-164).

The Colchester samian kiln operated from *c.* AD 150-200 and produced both plain and decorated wares (Hartley, 1982:45-49; Crummy, 1997:109). Most of the potters who worked at this kiln appear to have been migrants from Eastern Gaul, several having previously worked at the Sinzig kilns, where examples of their work have been found (Simpson, 1982:149; Storey *et al*, 1989:33-35; Dickinson, 1999:120-121).

British samian production does not appear to have enjoyed great success though. As Crummy (1997) reports in relation to the Colchester finds:-

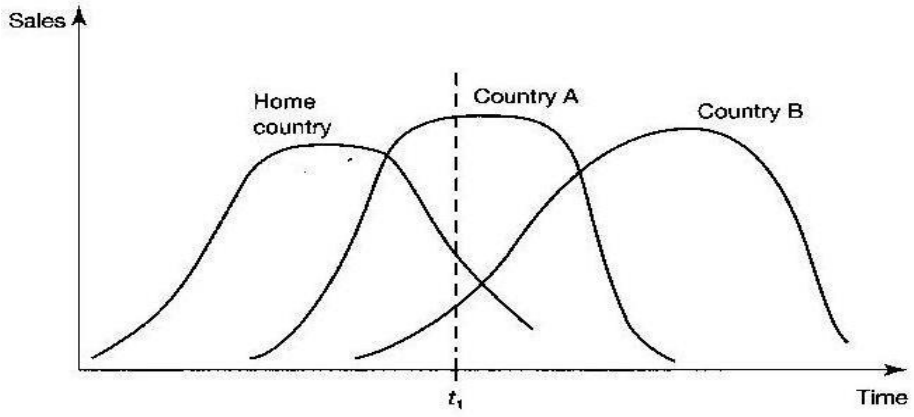
> "Out of 1,288 pieces of decorated samian excavated in the town in recent years, only five – a meagre total – seem to be Colchester products. The manufacture of plain vessels appears to have been more successful, but only marginally so."
>
> (Crummy, 1997:109)

Colchester's samian producers seem to have had a limited localized market in East Anglia and their wares occasionally reached as far as Corbridge (6 examples) and Newstead (2 examples), perhaps travelling with Colchester *mortaria* which penetrated this far north in the Antonine period (Dickinson, 1999:121). The reasons for the failure of the Colchester samian producers

to gain a larger market share are not clear though. Dickinson (1999:120) suggests that the potters may have migrated from Sinzig only towards the end of their careers, leaving little time for them to develop a new market, while Storey *et al* (1989:34-35) note that both Sinzig and Colchester samian is of relatively poor quality in comparison to most of the other *terra sigillata* available at this time. Whatever the reasons, the British samian industry did not take root and presented little real challenge to the Gaulish exporters.

The idea that by the 3rd century AD increased product diffusion may have been occurring in Britain at the exact moment when continental production appears to have been on the point of collapse appears to present a curious paradox. Wells (1984a:210-211) established that the demand for the same product may differ in international markets however. Britain's late absorption into the Roman Empire therefore meant that samian's popularity had already declined in its home country (Italy) and reached the mature stage of its life-cycle in Gaul (represented as Country A in Figure 10.34), before civilian demand had reached its peak in Britain (represented as Country B).

Figure 10.34 The International Product Life-Cycle



(After Hollensen, 2004:459, Figure 15.7)

Britain's demand for samian was out-of-phase with that of its continental neighbours, so when production reached the point of collapse in eastern Gaul, Britain's residual civilian demand appears to have been insufficient to revive this industry. As aggregate demand declined, the critical-mass of output needed to sustain the manufacture of a high-volume product like samian fell below the industry's survival threshold.

Supply probably collapsed quite quickly once the kilns ceased production and stocks would soon have run out. With the loss of its key military-driver the supply-chain will inevitably have been badly disrupted. The effects of these changes on the merchants involved in this market would have been commercially catastrophic. It has been suggested, for example, that the dumps of unused samian at sites like New Fresh Wharf may represent the disposal of stock from warehouses that had gone out of business at this time (Rhodes, 1986:203). For those traders who survived, diversification would have been necessary to minimize their losses. At a time when imports were being replaced by domestic Romano-British products though, this may have proved difficult.

CHAPTER 11

RHENISH SUPPLY

11.1 INTRODUCTION

The 3rd century represented a period of transition for the Roman Empire and the forces which led to the decline of samian production were merely one facet of a more extensive group of structural changes which occurred at this time. Foremost among the changes that shaped Britain's 3rd century ceramic supply was the accelerating pace of import substitution, which by the late 2nd century AD had enabled domestic manufacturers in the Nene Valley to begin production of provincially produced colour-coated wares, with kilns in the New Forest and Oxfordshire regions establishing successful products of a similar type before the end of the 3rd century (Branigan, 1987:148-158).

While these kilns managed to gain an important share of their home market, British output did not completely replace continental imports and a number of specialist colour-coated wares continued to maintain a foothold in the province until the final quarter of the 3rd century. Chief among these were Rhenish beakers, which are known in the continental literature by a variety of names; *e.g.* '*Moselkeramik*', '*Spruchbechers*' or '*Vases Métallescents*' (Pollard *et al*, 1982:343; Symonds, 1992:1).

11.2 CONTINUITY AND CHANGE IN THE 3rd CENTURY

11.2.1 3rd Century Political and Economic Transition

The 3rd century represented an economic and political watershed for Rome. Before this time an orderly succession of dynastic monarchs had reigned, with only occasional interruptions, from the accession of Augustus in 27 BC until the death of Alexander Severus in AD 235 (Cary, 1967). The rewards of this political stability had been a remarkable period of social, cultural and economic prosperity that has become known as the *pax Romana*.

Much of this order and certainty was to be swept away in the years which followed AD 235 however, as a series of chaotic power struggles ensued in which political control of the empire passed quickly from hand to hand in an almost endless stream of usurpations and assassinations.

> "In the half-century from the death of Severus Alexander in 235 to the accession of Diocletian in 284 there were some twenty recognized emperors (many of them just successful usurpers) as well as a host of usurpers and men who ruled over part of the empire."
>
> (Esmonde Cleary, 1990:1)

The extent of the disruption caused to the Roman economy at this time is difficult to gauge with precision, as few reliable records have survived from this period to enable us to make such judgements. Indeed, commentators have recently begun to question how widespread the effects of the 3rd-century crisis actually were. The half century from AD 235 to 285 is still, however, generally regarded as an important period of change for the Roman Empire as a whole (Southern, 2001; Hekster, 2008; Ando, 2012). Even less certainty surrounds the question of how these events affected

Britain, for as Todd (1999:156) has pointed out, written records make no mention of the province between the death of Septimius Severus (AD 211) and Diocletian's accession (AD 284). Archaeological data from this period is also extremely scarce. Potter & Johns (1992:62) remind us that Britain's remote location may have helped spare her from the worst effects of any recession, at least until the short-lived Gallic Empire (AD 260-274) once more drew Britain to Rome's attention (Millett, 1995:21; Mattingly, 2006:226). Even then, geo-political events of this kind may have had little impact on most of Britain's rural inhabitants.

That is not to say that either Gaul or Roman-Britain emerged from the 3rd-century crisis with the same economic structure as when they entered this period. There is in fact good reason to suppose that both regions altered considerably during the course of the 3rd century (Southern, 2001:17-18). The source and extent of these economic and political changes is complex however, and as they were not localized to Britain and Gaul, the task of analysing them in detail lies beyond the scope of this thesis. A specific understanding of the opportunities and threats which pottery manufacturers faced from the late 2nd century is clearly germane to our discussion though, as this may help explain samian's demise and the reaction of the British market to its loss.

11.2.2 Ceramic Developments in 3rd Century Gaul

As we saw in the previous chapter, samian production may finally have been brought to an end as a consequence of a series of barbarian incursions which disrupted eastern Gaul during the 260s (Ward, 1995:19). Opinions differ as to whether these conflicts were merely opportunistic cross-border raids on a fundamentally stable and prosperous province, or whether they constituted an existential threat to a region already suffering severe internal economic

and social stress (Alföldy, 1974:95; *contra*, Drinkwater, 1983:214). While the raids may have resulted in little direct damage to the pottery workshops themselves, any disruption of the kiln-operators or their labour-force may have provided a mortal blow to an industry already experiencing terminal decline.

The notion of fundamental region-wide economic collapse is unlikely as such a hypothesis is difficult to reconcile with evidence which shows that ceramic production continued in eastern Gaul throughout the remainder of the 3rd century. Archaeological evidence suggests that pottery workshops generally became smaller and more widely dispersed during this period. A number of major kiln-sites continued to prosper and to export their products. Chief among these are the producers of the wares listed in Figure 11.1.

Figure 11.1 Major Gaulish Ceramics in the 3rd and 4th Centuries

Product Type	Date Range	Reference Source
Argonne ware	3rd - 4th C	Fulford, 1977a:39-43 Tyers, 2012
Céramique à l'Éponge	3rd - 4th C	Fulford, 1977a:45-47 Galliou *et al*, 1980
German Marbled Flagons	3rd - 4th C	Bird & Williams, 1983 Tyers, 2012
Köln ware	1st - 3rd C	Anderson, 1980 Tyers, 2012
Mayen ware	3rd - 4th C	Fulford & Bird, 1975:179-181 Tyers, 2012
Central Gaulish *Métalescent* vases	2nd - 3rd C	Symonds, 1992:18-23 Tyers, 2012
Eastern Gaulish *Moselkeramik* beakers	2nd - 3rd C	Brewster, 1972 Symonds, 1992:46-62 Tyers, 2012

11.2.3 Ceramic Developments in 3rd Century Britain

As far as Britain's domestic ceramics industry was concerned, the evidence indicates that several leading kilns increased their output during the course of the 3rd century, as Figure 11.2 shows.

Figure 11.2 Major British 3rd and 4th Century Ceramic Producers

Kiln Centre	Date Range	Reference Source
Nene Valley	2nd - 4th C	Perring *et al*, 1972
New Forest	3rd - 4th C	Fulford, 1975
Oxfordshire	3rd - 4th C	Young, 1977

These three centres were by no means the only pottery kilns operating in Britain at this time, as black-burnished wares continued to be produced at two locations in southern England, while further north, Crambeck ware, Dales ware, Derbyshire ware and Huntcliffe ware all prospered during this period (Tyers, 1996). Each of these facilities tended to focus primarily on kitchenwares, however. The significance of the sites identified in Figure 11.2 lies in their ability to produce colour-coated tablewares, which enabled them to compete with continental imports. A number of attempts seem to have been made to imitate particular samian forms by the Nene Valley, New Forest and Oxfordshire kilns and products from each of these locations may be matched to their Eastern Gaulish predecessors, as Figure 11.3 indicates.

Figure 11.3 Provincial Colour-Coated Parallels to Samian Forms

Samian Form	Nene Valley (Dannell, 1973)	New Forest (Fulford, 1975)	Oxfordshire (Young, 1973)
Curle 15		Type 62	
Dragendorf 31		Type 59	Figure 4.28
Dragendorf 32		Type 84	
Dragendorf 33		Type 60	
Dragendorf 35		Type 61	
Dragendorf 36	Figure 1.1	Type 61	Figure 4.29
Dragendorf 37	Figure 1.2	Type 67	Figure 4.31 - 4.33
Dragendorf 38		Type 63	Figure 4.30
Dragendorf 43		Type 81	
Dragendorf 45		Type 79	Figure 2.19 - 2.20
Dragendorf 53	Figure 1.3		
Ludowici Ta/Tn		Type 64	
Ludowici VMh	Figure 1.4		

The extent to which these forms were deliberately meant to imitate their samian predecessors is not clear however, as their apparent similarities may result from the independent development of vessels intended to fulfil similar functional requirements (Fulford, 1975:32-33). In addition, while there may have been a degree of chronological overlap between the latest Eastern Gaulish samian forms and the earliest Nene Valley and Oxfordshire colour-coated products, there seems to have been a gap of several decades before equivalent New Forest wares began to be produced (Fulford, 1975:33).

The new product ranges developed were closer to other 3rd century colour-coated styles such as Köln ware, whose designs included the distinctive hunt-cups (Anderson, 1980). If Webster (1981:349) is right to suggest that

imports were probably interrupted on occasions during the 3rd century, these British suppliers would have been well placed to fill any gaps.

The ability to manufacture high quality tableware in Roman Britain marks an important change in the trading relationship of the province with her continental neighbours, as new production capabilities of this kind will have helped end *Britannia*'s long reliance on imported fine-wares. Ceramic imports did not cease entirely during the early 3rd century, but Britain's increasing self-sufficiency explains why fewer continental wares were imported after this date. The consequences of a shift in demand from high volume 'mass-market' samian ware to smaller quantities of specialist 'niche' products like Rhenish beakers needs to be understood, as these changes impact on the nature of the supply-chains used to distribute these items and the rôle of each channel member.

11.2.4 The Rise in Import Substitution

While import substitution clearly cannot account for the decline of every class of product (for example, olive-oil), the impact of self-sufficiency on ceramic production is the issue which primarily concerns us in this chapter. Here the case seems rather more straightforward, as the vacuum left by a downturn in continental supplies looks to have been filled by domestically produced colour-coated tablewares from the production centres identified in Figure 11.2.

The distribution of these provincial products shows close similarities to those of the imported continental wares they replaced, especially eastern Gaulish samian (Fulford, 1981:196). Such a close overlap would suggest that some of the British merchants who had previously been involved in samian distribution responded to the collapse of continental imports by

turning to the nearest available domestic substitute in order to provide a continuity of supply for their customers. These new opportunities seem to have particularly favoured provincial production centres which had the capacity to expand their output and enjoyed access to good distribution facilities to carry their goods to market. As Jones & Mattingly (1993) observed in relation to the success of the Nene valley kilns:-

> "The position of the industry centring on the town of Water Newton (*Durobrivae*) suggests that the river Nene was a decisive factor in both the production and the transportation of the pottery. This water route gave easy access to the east coast and would have been of prime importance in facilitating northern military contacts."
>
> (Jones & Mattingly, 1993:210)

Not every production centre was able to take advantage of these changes however and a number of the smaller kilns fared less well than those in the Nene Valley, New Forest and Oxfordshire regions. Analysis of the reasons for the success or failure of these other British provincial kilns lies beyond the scope of the present study however. As our focus must remain with the supply-chain for imported pottery, it is important to recognize that despite their remarkable success, these new provincial suppliers did not manage to completely eliminate cross-channel imports (Fulford, 1977b:312). While the mass-market trade in Gaulish samian had clearly come to an end after the mid 3rd century, a small range of specialist continental wares continued to arrive, albeit in smaller quantities than during the previous two centuries. The success of one particular class of products, which originated in northern and central Gaul, is the principal theme of this chapter and it is to these that we now turn.

11.3 RHENISH-WARES

11.3.1 Introduction

The most important group of 3rd century imports, in quantitative terms at least, is the range of dark colour-coated drinking vessels which are known collectively as 'Rhenish-wares'. Although this term is now well established in the archaeological literature, it remains something of a misnomer, as the products concerned originated in central and eastern Gaul before production migrated to the Rhineland (Richardson, 1986:115). While a different variety of Rhenish-ware exists in each of these regions, they nevertheless represent a single family of products. Vessels from the former location may be variously described as central Gaulish black-wares or '*Vases Métalescents*', while those from eastern Gaul are frequently referred to as '*Moselkeramik*' or '*Spruchbechers*', depending on their specific form and decorative style (Symonds, 1981:359).

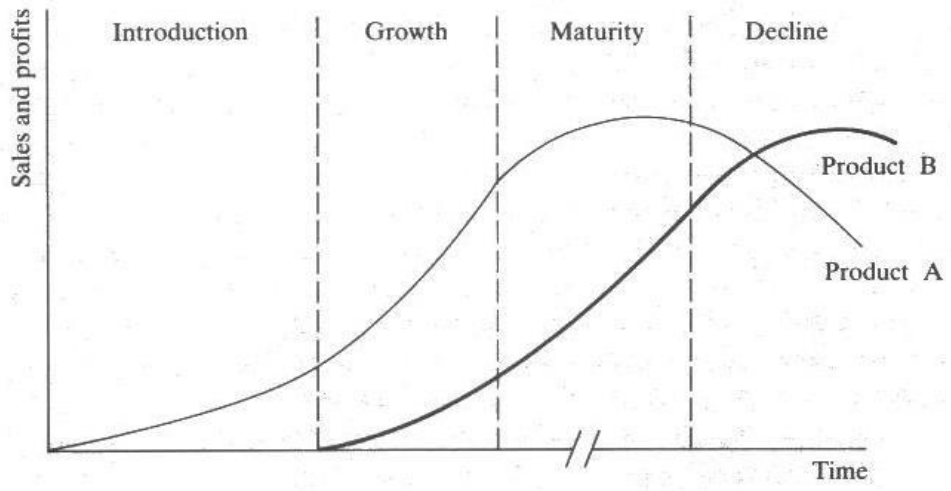
The particular significance of Rhenish-wares to our present investigation is that the supply of these products appears to have reached their peak at a time when samian production was approaching its point of collapse. Interestingly though, the central Gaulish and eastern Gaulish varieties of Rhenish-wares, made at Lezoux and Trier respectively, are both from kiln-centres which also specialized in samian manufacture. This suggests that a link of some kind may have existed between the two industries (Pollard *et al*, 1982:343; Symonds, 1992:1; Bidwell, 1997:95). This need not involve manufacturing collaboration, but might suggest common support services, such as shared kiln facilities or distribution networks.

Of the two principal varieties of Rhenish-ware found in Britain, the *Vases Métalescents* from Lezoux are chronologically the earliest. The ancestry of these products can be linked to central Gaulish samian traditions and to pre-

Flavian vessel forms and decorative styles (Symonds, 1992:10-17). While evolutionary links with samian are less evident in the slightly later eastern Gaulish *Moselkeramik*, both classes of Rhenish-wares are very similar in forms and fabrics, which led to their conflation in many early excavation and finds reports (Tyers, 2012). Methods to distinguish the two wares and to determine their production location now allows the dating of assemblages to be established with greater accuracy (Greene, 1978:56).

As examples of both *Vases Métalescents* and *Moselkeramik* begin to occur in British pottery assemblages from the mid 2nd century, each would appear to overlap with samian imports from their respective regions, despite the divergent stages in the product life-cycles of these two classes of wares. These unsynchronized supply patterns are illustrated in Figure 11.4.

Figure 11.4 Product Life–Cycles of Samian and Rhenish-wares



Key
Product A = Samian ware
Product B = Rhenish-ware

(After Lancaster & Massingham, 1988:146)

11.4 CENTRAL GAULISH BLACK WARES (*Vases Métalescents*)

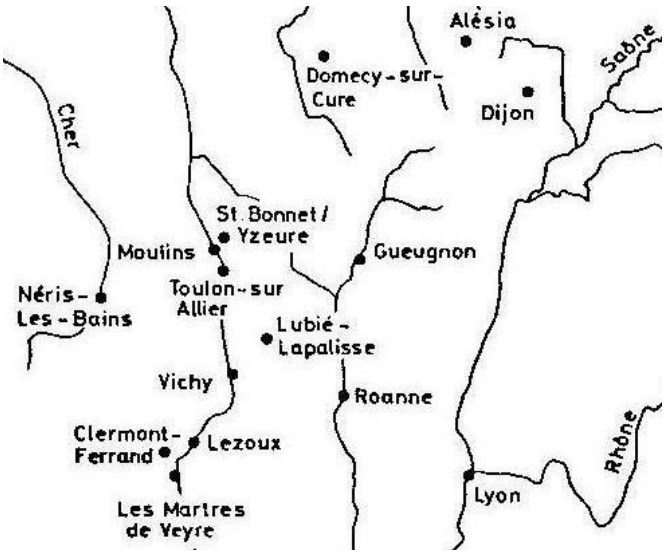
11.4.1 Introduction

The production of the dark colour-coated wares which make up this group commenced in central Gaul well before the 3rd century and their origins can be traced back as far as Hadrianic times (Symonds, 1992:20). In this respect *Vases Métalescents* follow a strong local ceramic tradition often associated with earlier colour-coated wares such as *terra nigra* (Tyers, 2012).

11.4.2 Manufacturing Location

The vast majority of *Vases Métalescents* have been shown by petrological analysis to have originated at Lezoux (Symonds, 1992: Appendix 1). It is possible that a few of these vessels were also produced at Clermont-Ferrand and Toulon-sur-Allier (Pollard *et al*, 1982:344; Symonds, 1992:19-20). The locations of these sites are shown in Figure 11.5.

Figure 11.5 Locations of the Lezoux, Clermont and Toulon Kilns



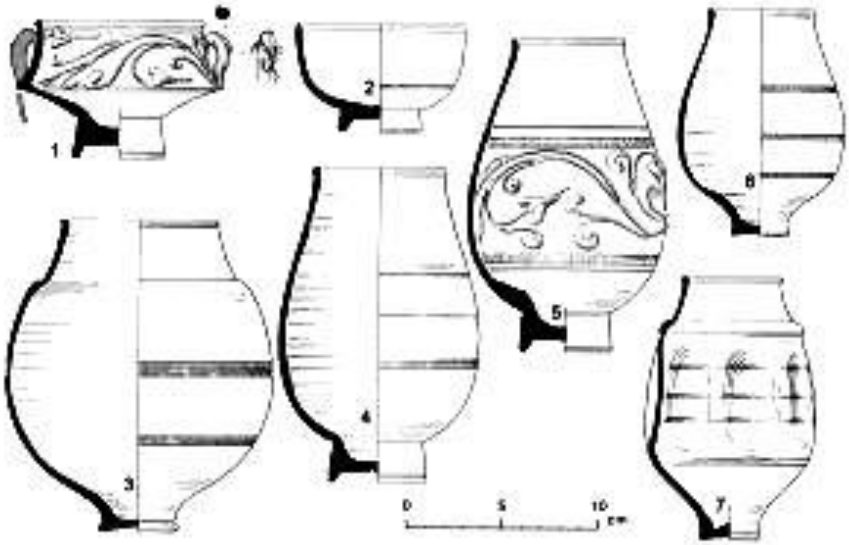
(Adapted from Symonds, 1992:1)

11.4.3 Vessel Forms and Decoration

Rhenish-wares appear in a variety of colours other than black; with dark red, dark brown, dark green and lustrous metallic green being the most common (Symonds, 1992:18). These variations result from the firing process, during which the oxygen supply entering the kiln was restricted to create a reducing atmosphere, in contrast to the oxygen-rich atmosphere used to create samian ware. As the volumes of *Vases Métalescents* produced were far smaller than the amount of samian made fifty years earlier, the technical skills needed to achieve a uniform finish was perhaps beyond the reach of the later Lezoux kiln-masters (Symonds, 1992:18).

The range of forms produced in central Gaulish black-ware were mainly cups and beakers, decorated with *roulette*-impressed patterns, sometimes accompanied with trailed *barbotine* designs, all of which are described in detail by Symonds (1992: Ch 3).

Figure 11.6 Examples of Central Gaulish *Vases Métalescents*

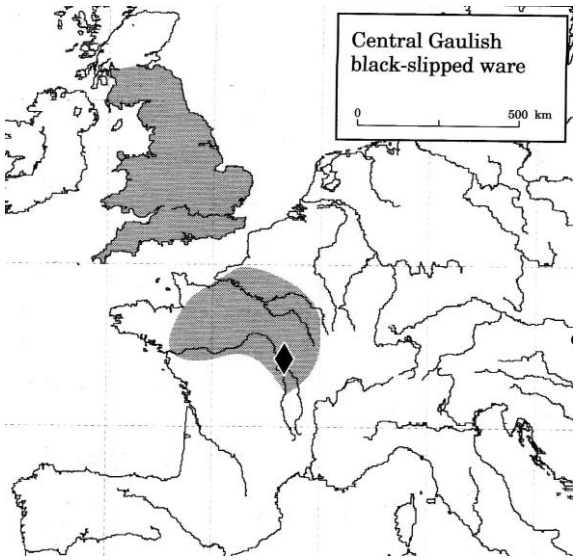


(After Tyers, 1996:137, Figure 146)

11.4.4 Continental Distributions of *Vases Métalescents*

The continental distributions of *Vases Métalescents* reveal that these vessels occur mainly in an area to the east of the Saône, with outlying scatters in the Paris basin and the Loire valley, as Figure 11.7 illustrates.

Figure 11.7 Distributions of Central Gaulish *Vases Métalescents*



(Adapted from Tyers, 1996:138, Figure 147)

There seems to be very little overlap between the continental distributions of central Gaulish *Vases Métalescents* and eastern Gaulish *Moselkeramik*. The distribution of the latter group lay more to the north and the east. This would tend to suggest that the Lezoux and Trier factories supplied different clients (Symonds, 1992:20).

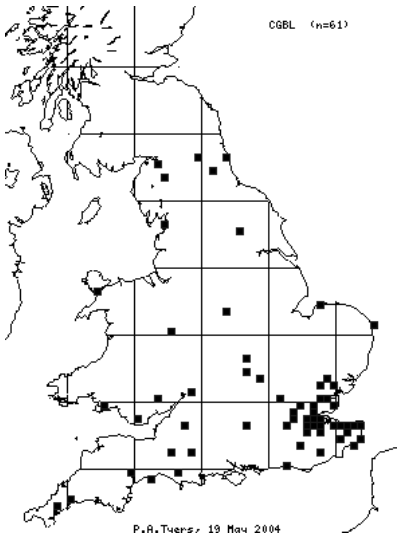
11.4.5 Routes to Market

The continental distribution of *Vases Métalescents* suggest that supplies of these wares probably reached Britain via the rivers of central Gaul (Greene, 1978:57). This route benefited from the excellent local waterways which linked central Gaul to the channel coast (Delage, 2001:122; *c.f.* Fulford, 1984:134). The widespread distribution of this pottery throughout northern Gaul suggests that its river-systems may also have been used to access the cross-channel shipping routes which linked Britain to the continent. Morris (2010:58) reminds us that these routes were the most important gateways through which central Gaulish exports reached Britain at this time, lending weight to the idea that *Vases Métalescents* and samian may have followed similar paths to market.

11.4.6 British Distributions of *Vases Métalescents*

Within Britain itself, *Vases Métalescents* have a wide distribution, as Figure 11.8 shows. These vessels are most common in the prosperous south-east and while much scarcer than samian, the distribution of *Vases Métalescents* is similar. One interesting feature of Rhenish-ware is that its distribution also shows that small quantities reached the south-west peninsula, an area penetrated by few other Roman ceramics. Why this particular vessel-type should be accepted here when others were not remains a curious anomaly.

Figure 11.8 British Distributions of *Vases Métalescents*



(After Tyers, 2012)

11.4.7 Analysis of the *Vases Métalescent* Supply-Chain

Given the strong and recurring similarities between *Vases Métalescents* and central Gaulish samian distributions it seems likely that the supply of these two products are connected, either by means of a parallel or unified delivery system. This idea is supported by the discovery of a considerable quantity of unused central Gaulish samian and *Vases Métalescents* at New Fresh Wharf, London (Richardson, 1986:115). Both vessel-types were produced in Lezoux and are thought to have arrived soon after AD 180 (Richardson, 1986:96).

Figure 11.9 Gaulish Pottery found at New Fresh Wharf

(After Miller *et al*, 1986:7)

As there is evidence to suggest that the material in the New Fresh Wharf deposit came from a warehouse clearance, this may well indicate that the wholesaler concerned was simultaneously dealing in both types of goods. If Bird's (1986:140) suggestion that the two sets of wares may have arrived in London as part of a single shipment is correct, dual involvement with each of these product-types might conceivably be traced back to the *mercator* or *navicularius* who arranged the carriage of this pottery from the continent.

11.4.7.1 Producer Push

There is again nothing to suggest producer participation in the distribution of these goods once they had left the pottery. Their association at New Fresh Wharf with Lezoux samian suggests that a similar export mechanism was used to deliver both samian and *Vases Métalescents*, which would make producer involvement unlikely if different workshops specialized in each of these varieties.

11.4.7.2 State Intervention

While the notion of military supply proved persuasive in explaining samian imports in the post-conquest period, these arguments are less convincing by the time significant imports of *Vases Métalescents* began in the 2nd century. With a reorganization of Britain's northern frontier taking place around AD 180 (Breeze, 1982:137-139) and again about AD 210 (Southern, 2001:48) the size of the garrison and its supply needs may have fallen significantly.

11.4.7.3 Merchant Intermediation

The late 2nd century was the time when mercantile competition among the pottery distributors of central Gaul reached its zenith (King, 1981:67). A range of different routes-to-market would have been available from Lezoux. The sudden collapse of *Vases Métalescent* manufacture at the end of the 2nd century may suggest that the industry utilized the same transport network as the nearby samian suppliers. Support for this notion may be drawn from the similar distributions of *Vases Métalescent* and late 2nd-century samian. If so, merchants may have played a significant rôle, as their importance in samian supply was seen in section 10.7.6 to have increased at this time.

11.4.7.4 Consumer Pull

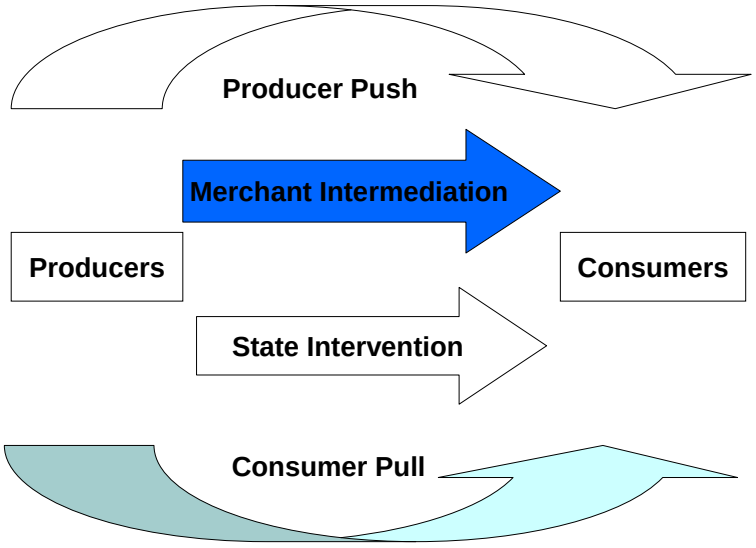
By the late 2nd century British consumers seem to have been developing a taste for darker colour-coated pottery, which was now available from both domestic and continental sources (Salway, 1981:643). The level of demand is difficult to gauge, but the success of early provincial colour-coated wares from the Nene Valley and Oxfordshire kilns suggest that consumer-pull may have been starting to become more important by this time (Young, 1977).

It is interesting to note in Figure 11.8 (above) that the vast majority of the *Vases Métalescents* which reached *Britannia* are concentrated in the south-east of the province. This may suggest that civilian consumers displayed a greater preference for these wares than their military counterparts.

11.4.8 Evaluation of the *Vases Métalescent* Supply-Chain

The rôle of the state clearly diminished in the late 2nd century as the number of troops stationed in Britain fell. The failure of *Vases Métalescents* to hold on to their markets after central Gaulish samian production collapsed in the early 3rd century AD also reinforces the notion that its producers remained dependent in some way on the samian industry for their survival. Whatever the reason **for** its ultimate demise, it is clear that by AD 220 output of *Vases Métalescent* at Lezoux had come to an end (King, 1984:57).

Figure 11.10 Drivers of the Supply of 2nd Century *Vases Métalescents*



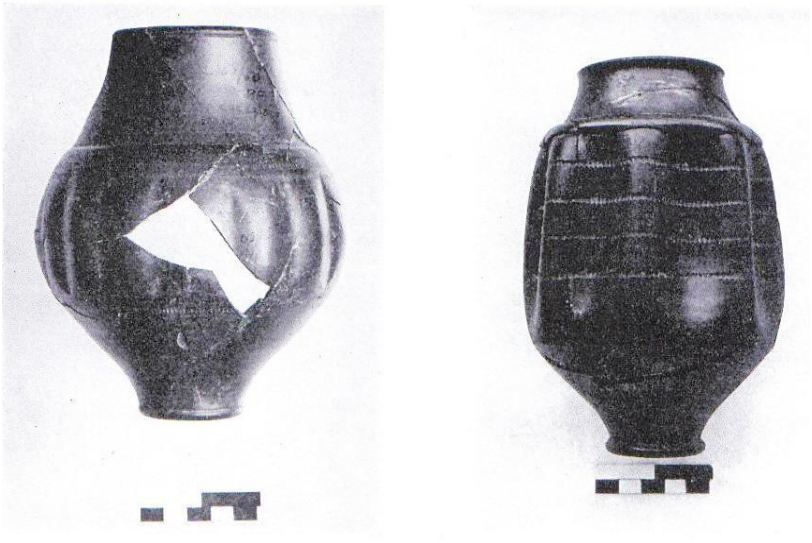
11.5 EASTERN GAULISH BEAKERS (*MOSELKERAMIK*)

11.5.1 Introduction

The second phase of Rhenish-beaker production took place at Trier and also developed in an area with a pre-existing potting tradition, as the production of native colour-coated wares and samian both had long associations with eastern Gaul. It is possible to trace the manufacture of dark colour-coated wares in this area back to at least the mid 2nd century (Wightman, 1970:200-201).

Output of *Moselkeramik* beakers at Trier commenced *c.* AD 200 however and continued until *c.* AD 275 (Symonds, 1992:51). There seems to have been no direct attempt at Trier to copy samian forms (Symonds, 1981:364), although there are some instances where the design of *Métalescent* vases from Lezoux appears to have been replicated; *e.g.* Gillam form 210 cups (Brewster, 1972:216).

Figure 11.11 Examples of Eastern Gaulish *Moselkeramik* Beakers



(After Brewster, 1972:209, Plate XVIII)

11.5.2 Manufacturing Location

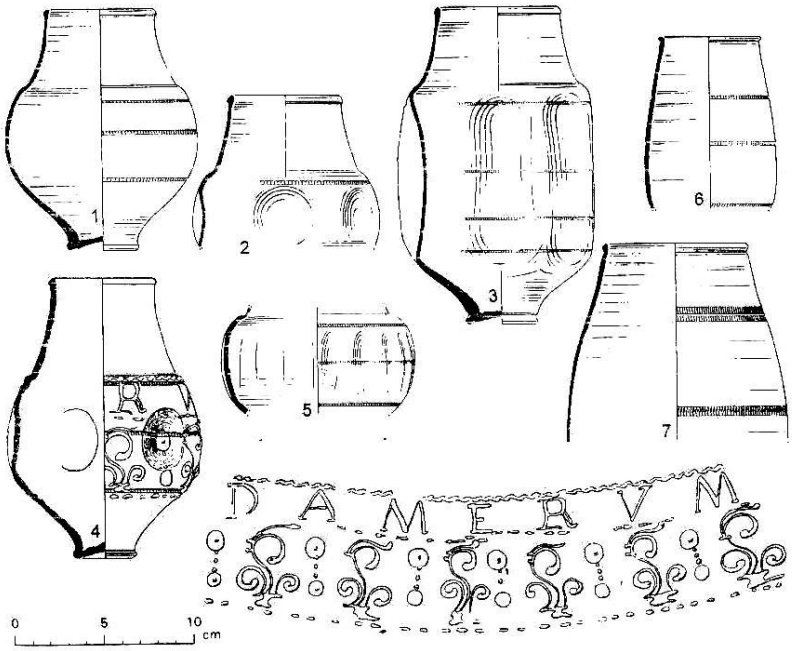
Unlike the geographically dispersed structure of the eastern Gaulish samian industry, *Moselkeramik* production seems to have been restricted entirely to Trier, and unusually, it appears to have been essentially an urban industry (Symonds, 1992:46). By the early 3rd century *Moselkeramik* production at Trier looks to have been in the ascendancy, while the neighbouring samian industry was clearly in decline (Symonds, 1992:70).

Moselkeramik output reached its peak sometime between AD 200 and 275, although it is difficult to say precisely when in the period this event occurred as Rhenish-beakers lack the clear stylistic development which allows the close dating that is often possible for samian wares. By contrast, almost no Rhenish-ware seems to have been made at Rheinzabern where samian wares continued to dominate production until *c.* AD 275 (Symonds, 1992:43).

11.5.3 Vessel Forms and Decoration

Unlike samian, which was largely mould-manufactured, each piece of Rhenish-ware was hand-made and hand-decorated, so no two vessels are identical (Symonds, 1992:49). The most common *Moselkeramik* forms are beakers, although a small number of cups, flagons and carafes were also produced, as Figure 11.12 illustrates.

Figure 11.12 Styles and Decoration of *Moselkeramik* Beakers



(After Tyers, 1996:139, Figure 149)

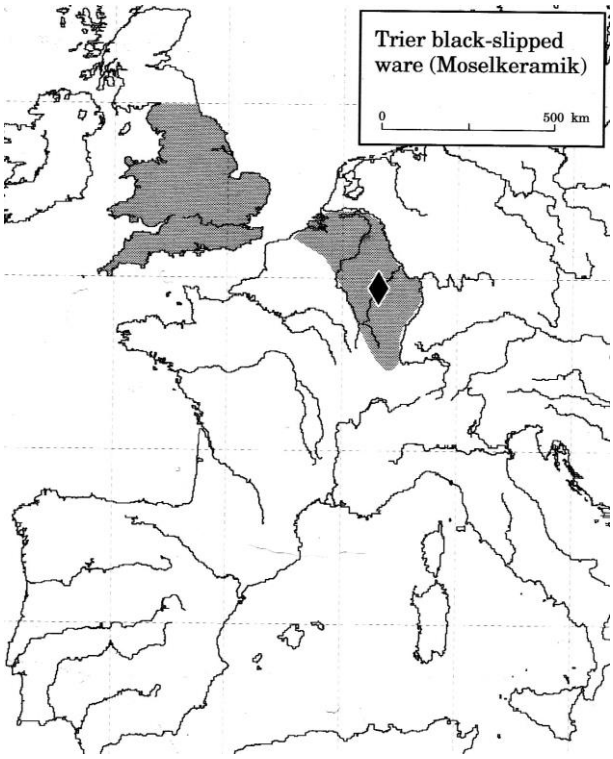
These wares were decorated with impressed *roulette* designs, which were supplemented on occasions with white *barbotine* trailed slip (Pollard *et al*, 1981:177; Richardson, 1986:118). This decoration sometimes included written messages, particularly in the case of so-called 'Motto-beakers' or '*Spruchbechers*'. Such slogans often relate to phrases associated with drinking, such as *BIBE* (Drink), or *VIVAS* (Live-Well); (Birley, 1964:128-

129; Symonds, 1981:359). A full description of *Moselkeramik* forms and their decoration is provided by Symonds (1992: Ch 7).

11.5.4 Continental Distributions of *Moselkeramik* Beakers

The continental distribution of *Moselkeramik* is focused mainly around the Moselle valley and the upper- and middle-Rhine. Occasional examples are found to the south and east of Trier, but the product is rarely found west of the river Saône (Tyers, 2012). *Moselkeramik's* distribution also appears to have been more restricted than that of Trier's samian in the later 2nd century, which suggests the town's market area may have contracted for some reason soon after AD 200 (King, 1981:67). The reason for this change is unclear, however, as British supply was apparently unaffected by this development.

Figure 11.13 Distributions of Eastern Gaulish *Moselkeramik*



(After Tyers, 1996:138, Figure 148)

11.5.5 Routes to Market

As Figure 11.13 shows, Trier is situated close to both the Rhineland river systems and those of Central Gaul. A passage via the Moselle and the Rhine would seem the most obvious way to reach Britain, for as Fulford (1977a) explains:-

> "Ready access to the east coast and the Thames estuary was gained via the Rhine by the shippers of East Gaulish red-slipped wares and the black-gloss 'Rhenish' types of the second and third centuries."
>
> (Fulford, 1977a:57)

The alternative of a more westerly route, making use of the Gaulish river systems cannot be ruled out however, for as Greene (1978a) points out:-

> "What is important is that none of its Rhenish-ware, irrespective of precise source, need necessarily reflect trade with the Rhineland: from Trier a route west to the Marne or a tributary of the Seine would be as feasible as direct shipment down the Mosel to the Rhine."
>
> (Greene, 1978:56)

The continental distributions of *Moselkeramik* support the idea of the Rhine route, although independent confirmation from shipwreck evidence has not yet been obtained. Rhodes (1989), for instance, was unable to identify any examples of 2nd or 3rd century wreck-sites along the coast of northern Gaul in which this type of pottery was present. But conversely, no consignments of *Moselkeramik* have been retrieved from the Gaulish river systems, so for now the issue of the preferred route remains open.

The likelihood that *Moselkeramik* was jointly exported with eastern Gaulish samian remains strong, at least until Trier's *terra sigillata* output reached negligible levels in the mid 3rd century. The problems associated with dating *Moselkeramik* make it difficult to match these beakers with the later eastern Gaulish samian forms, although it is thought most of this material dates to after AD 200 when Trier's output reached its peak (Bird, 1995:10).

11.5.6 Cross-Channel Connectivity and Rhenish Exports

The likelihood that *Moselkeramik* would have been among the items pottery merchants based at Colijnsplaat or Domburg dealt in remains high, although we still lack conclusive evidence of this. It is important to remember though that the volume of *Moselkeramik* exported would have been small, and even when combined with eastern Gaulish samian, would not have been sufficient to make up a viable cargo on its own. To appreciate how *Moselkeramik* was exported in the 3rd century we must consider what other commodities were being traded at that time, as its presence may provide an indication of other cargoes that were being carried, of which no trace now remains (Cunliffe, 2001:445). Identifying these items may also help us to determine the routes used to carry this pottery to Britain and the ports through which it entered the province. Four products stand out as being likely candidates and these are identified in Figure 11.14.

Figure 11.14 Britain's Major 2nd and 3rd Century Imports

Commodity Type	Reference Source
Grain	Whittaker, 1988:54; Anderson, 1992:64
Salt	Van Beek, 1983:6-7
Fish Sauce	Van Neer *et al*, 2010:176
Wine	Peacock, 1978:51; Wilmot, 1982:47-49

11.5.6.1 Grain Shipments

Grain was a vital component in long distance exchange in Roman times, in quantitative terms at least. Cereals are believed to have been imported into Britain, on occasions, until at least the mid 3rd century (Anderson, 1992:64). After this time the picture becomes less clear, as the Emperor Julian (AD 361-363) is known to have ordered his British provincial administrators to export substantial amounts of grain to the Rhine provinces to counteract shortages which had arisen there (Salway, 1993:431; Mattingly, 2006:505).

Regrettably, grain leaves few visible traces, which makes it difficult to prove that this commodity was among the items which pottery merchants used to secure cargo-space to facilitate the export of their wares. It is still tempting to imagine that some *Moselkeramik* accompanied grain shipments, as many large villas lay close to the Rhine frontier, until this area suffered a reversal of fortunes in the mid 3rd century AD, perhaps due to the barbarian incursions which began around that time (Percival, 1981:78).

11.5.6.2 Salt Shipments

Of the range of goods identified on the *Nehalennia* altars at Colijnsplaat and Domburg, salt is the item mentioned most frequently, being named on three inscriptions. One of these commemorates the success of a pair of local salt-trading partners; C. Jul(ius) Florentinus and C. Jul(ius) Januarius (Hassall, 1978:43).

Salt extraction was one of the few activities that were organized on a large scale in Roman times. Such was its importance that a state monopoly is known to have been set up in Rome to oversee the adequate provision and orderly supply of this vital commodity (Van Beek, 1983:9). This monopoly

is widely believed to have been extended to other parts of the Empire and may well have reached as far as Britain (Jones & Mattingly, 1993:224; Wacher, 1997:163; *contra*, Cool, 2006:57).

The frequent references to *negotiatores salarii* on the *Nehalennia* altars may perhaps be taken to infer that salt (or salted-products) were among the principal cargoes shipped to Britain from Colijnsplaat and Domburg in the 3rd century. Interestingly, two of the other *Nehalennia* inscriptions refer to salt merchants, M. Exgingius Agricola and Q. Cornelius Superstis; one from Trier, the other from Cologne. Each may have been shipping salt up-river to their native community along a route which records show extended back to at least the Flavian period (Van Beek, 1983:7). In the case of M. Exgingius Agricola, the return leg of his journey to Trier may have offered the chance to carry a cargo of *Moselkeramik* back to Colijnsplaat or Domburg, where it could have gained passage to Britain, via one of the *negotiatores ars cretarii* or *negotiatores cretarii Britanniciani* who operated from there.

11.5.6.3 Fish-sauce Shipments

The evidence of trade in fish-sauces at Colijnsplaat and Domburg is attested by dedications belonging to three *negotiatores alleciarii*; T. Carinius Gratus, C. Gatullinus Seggo and L. Secundus Similis (Hassall, 1978:43). All three inscriptions are thought to date to the period AD 180-230. The presence of such a large number of *allec* merchants suggests that production facilities may have been located nearby, where manufacturers would have had ready access to the estuary's fishing fleet and to nearby salterns (Van Neer *et al*, 2010:178). It is conceivable that cross-channel consignments of *allec* which began their journey at Colijnsplaat or Domburg in the early 3rd century AD would have provided a convenient host for shipments of *Moselkeramik*.

11.5.6.4 Wine Shipments

Only one dedication by a wine merchant (*negotiator vinarius*) is known from the *Nehalennia* inscriptions, this having been left by the merchant Commodius Ufeni?tis filius at the Colijnsplaat temple (Hassall, 1978:43). Of the 130 or so altars so far recovered from the sea, which subsequently engulfed both Colijnsplaat and Domburg, many contain inscriptions that are now illegible and a single surviving example may not therefore imply that trade in wine was particularly unusual.

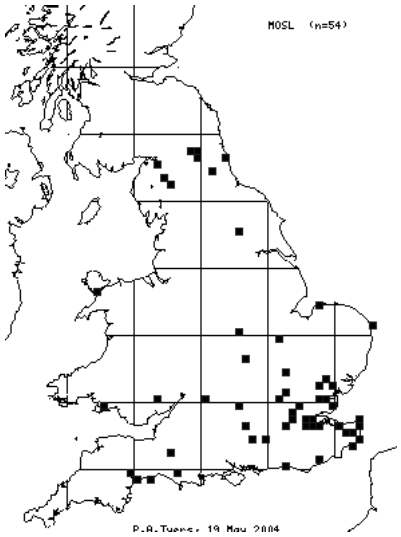
A long-standing triangular relationship is suggested by these inscriptions, which link Bordeaux (*Burdigala*) with both York (*Eboracum*) and Trier (*Augusta Treverorum*). Confirmation of this connection is provided by similar epigraphic evidence from York, which recorded links between this city and the ports of Colijnsplaat and Domburg, both of which in turn have close ties with Trier and the Rhine river systems. All this seems to point to a high degree of connectivity between these various locations in the 2nd and 3rd centuries AD and to a vibrant coastal and cross-channel trading network.

As with Peacock & Williams 27 *amphorae*, Rhenish wine barrels may have provided a valuable bulk cargo and offered an attractive host to any pottery merchant looking to export consignments of *Moselkeramik* to Britain in the early 3rd century. As was noted on page 261, however, all the barrels from securely dated British contexts relate to 1st or 2nd century deposits. While no 3rd century examples have yet been identified in Britain, monuments from the Rhineland indicate that barrels continued to be used there (Figures 5.3, 6.5, 8.36). While some of these may have carried products other than wine, an altar from Colijnsplaat depicts a barrel surrounded by what appear to be vine leaves (Bogaers, 1971; Louwe Kooijmans, 1971; Anderson, 1992:59). A clear product relationship also exists between wine and the beakers which were presumably used to consume this beverage.

11.5.7 British Distributions of *Moselkeramik* Beakers

In Britain, *Moselkeramik* distributions are widespread, with the greatest concentrations appearing in the more prosperous south and east of the province, together with a cluster in the northern military zone.

Figure 11.15 British Distributions of *Moselkeramik* Beakers



(After Tyers, 2012)

Close correspondence again exists in Britain between the distributions of *Moselkeramik* and samian from the same production region. Rhenish-ware is again much scarcer, but the similarities once more suggest commonality of supply in respect of their routes-to-market and distribution mechanisms.

11.5.8 Analysis of the *Moselkeramik* Supply-Chain

By the early 3rd century, dark colour-coated pottery had become popular in Gaul and Britain and as Figures 11.1.and 11.2 (above) both show, a number of important kiln-centres had begun to produce this material. When output

ceased at Lezoux around the end of the 2nd century, the presence of a well established potting tradition and supply-chain at Trier may have influenced the decision to expand a small pre-existing dark colour-coated production facility located there (Symonds, 1992:46).

11.5.8.1 Producer Push

The growing numbers of merchants visible in the distribution process at this time would have relieved producers of the need to find customers for their wares and would have enabled them to focus on production. If demand was high, in relation to manufacturing capacity, prices would also have remained buoyant, unless the local merchants managed to group together to establish a purchasing cartel (*monopsony*). There is no evidence to show that producers had an active rôle in the supply-chain however.

11.5.8.2 State Intervention

In the early 3rd century the Roman army re-structured its forces in a number of provinces, including Britain, in order to increase their mobility and self-sufficiency (Southern, 2001:48). These measures reduced troop numbers on Britain's northern frontier and made units stationed there more responsible for their own upkeep and provisions (Breeze, 1977:140). If this practice led not just to a reduction in the size and number of military baggage-trains, but meant that troops were now responsible for the purchase and replacement of their own equipment from their salaries, this would simultaneously diminish the rôle of state intervention and turn the soldiers into consumers. While the rôle of soldiers as consumers may occur in any era, it presents a challenge in supply-chain analysis as it makes it difficult to distinguish shifts from public to private consumption that may have been quite apparent to those involved.

11.5.8.3 Merchant Intermediation

Epigraphic evidence from the Rhine river system and the Scheldt estuary means that we are able to trace the supply-chain with relative clarity from the production centre to the coast. This suggests a range of short-haul transfers took place, with merchants such as M. Exgingius Agricola (*sic*) and Q. Cornelius Superstis (*sic*) bringing pottery down from Trier (perhaps as ballast) before selling this to *negotiatores ars cretariae* like L. Viducius Placidus or M. Secundinius Silvanus to transport across the channel.

Once in Britain, these wares may again have been passed on to wholesalers, such as those at New Fresh Wharf; who in turn fed the regional distribution network that carried these items to local retailers throughout the province. A down-the-line exchange mechanism of this kind is evident in the parallel samian supply system which operated throughout the 2nd and 3rd centuries.

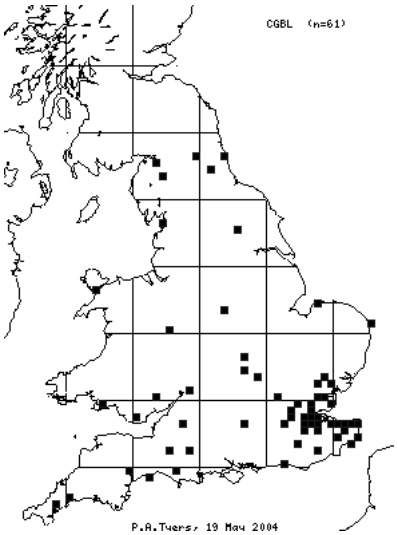
11.5.8.4 Consumer Pull

Although the volume of ceramic imports probably continued to fall in the early 3rd century, paradoxically the importance of consumer demand may have been increasing at this time *vis-à-vis* military orders, as the size of the British garrison declined. As Figure 11.16 shows, the distributions of both *Vases Métalescents* and *Moselkeramik* beakers closely resemble those of 3rd century samian imports from Eastern Gaul. This strengthens the case for arguing that demand was primarily consumer driven, as we have already noted in section 10.8.3.4 that the market for imported samian was primarily located in the 'civilian zone' of the south and south east at this time.

Figure 11.16 Comparison of 3rd Century Samian and Rhenish-Ware Imports

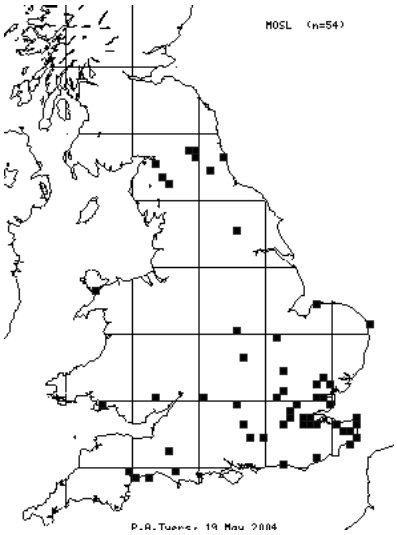
Vases Métalescents

c. AD 180 – 220



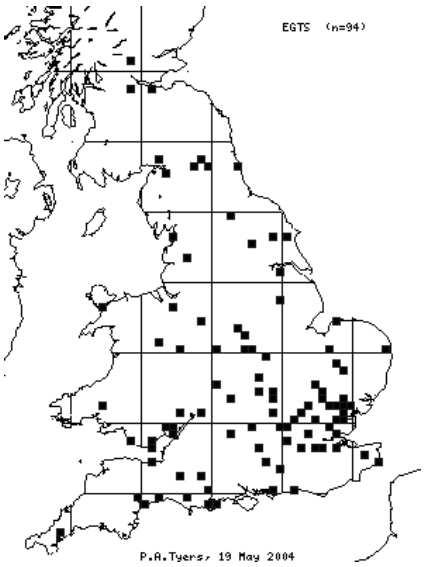
Moselkeramik

c. AD 220 – 270



Eastern Gaulish Samian

(*c.* AD 200 – 270)



(Adapted from Tyers, 2012)

A change in the style of some of the pottery, especially the so-called 'Motto-beakers', may reflect these developments. It is difficult to see a rationale for the inclusion of the exhortations to 'drink' or to 'live well' on these vessels if such slogans were not primarily intended to attract consumer interest and influence buyer-behaviour in a positive way. This product feature offers no obvious benefit if these items were purchased in bulk by the Roman state, but has relevance if the target customer was a private individual who might have been attracted by a motif of this kind.

11.5.9 Evaluation of the *Moselkeramik* Supply-Chain

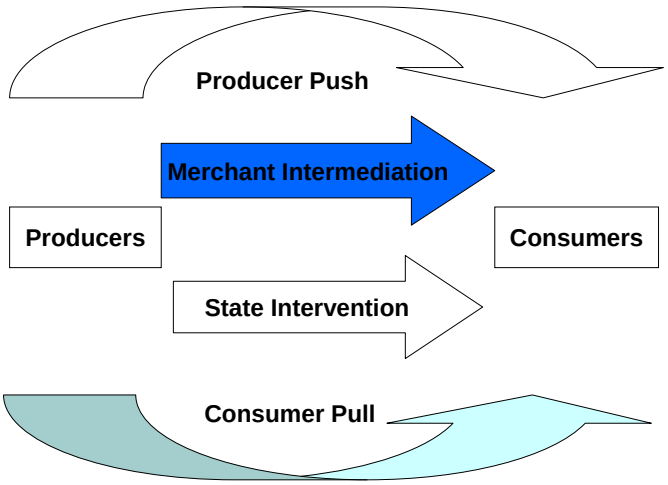
The likelihood of dual supply of *Moselkeramik* and eastern Gaulish samian is again increased by the discovery of both wares in the New Fresh Wharf find from London (Richardson, 1986:115). The New Fresh Wharf pottery is difficult to date however, and could conceivably overlap the end of central Gaulish samian production, allowing the possibility that it may have arrived in Britain from northern Gaul, at much the same time as the Rhenish-wares and samian from Lezoux. Given that output at Trier did not peak until at least the early 3rd century, an association with the eastern Gaulish samian at New Fresh Wharf means a Rhineland delivery route seems, on balance, to be rather more likely.

While the case for a joint distribution network seems attractive, production of samian and *Moselkeramik* in all likelihood remained independent, as key differences exist in the two manufacturing processes (mould-made samian vs hand-crafted beakers / oxidized samian vs reduction-fired *Moselkeramik etc*). It is likely that a *negotiator* visiting Trier would have access to both sets of wares, but would have needed to deal with different potters or kiln-masters to acquire these products. The choice of a similar export approach

for eastern Gaulish samian and *Moselkeramik* beakers would seem high, although the two processes may not have been identical.

A supply-chain model is therefore presented in Figure 11.17 which is based primarily on merchant intermediation as this reflects our evidence of private sector involvement, but also recognizes that state-administered demand and civilian consumer-pull may have had important subsidiary rôles.

Figure 11.17 Drivers of the Supply of 3rd Century *Moselkeramik*



11.5.10 Cessation of Production of *Moselkeramik* at Trier

Production at Trier seems to have been interrupted soon after AD 270, possibly by the cross-border incursions which are known to have affected eastern Gaul at this time (King, 1981:67). The extent of damage to the workshops and kilns is not known, but need not have been great if the producers no longer considered the area safe and abandoned production. British supply appears to have ceased abruptly at this time. There seems to have been a limited resumption of output in the early 4th century AD, but these later wares appear to have commanded only a local market and none are thought to have been exported (Wightman, 1970:201; King, 1981:66).

11.6 DEDUCTIONS

The later 2nd and early 3rd centuries appear to have witnessed a good deal of change in the flow of trade between the continent and Britain, as the latter became increasingly self-sufficient in a wide range of wares, one of which was pottery. Whether import substitution was a response to events in Gaul, which disrupted life in this province at the beginning of the 3rd century, is unclear. An underlying shift in Britain's supply pattern had probably begun prior to this date, but growing risks of import shortages may have increased the pace of this change.

Ceramic production in Gaul was already in a state of flux before the onset of the so-called '3rd-century crisis' and as early as the 2nd century samian output began to contract and potential rivals were emerging in what looks to have been an attempt to fill the gap created by samian's decline. Among the new forms were dark colour-coated Rhenish-wares, which initially appeared from the central Gaulish kiln-centre at Lezoux, before production was later switched to the eastern Gaulish site at Trier after activities at Lezoux ceased around the end of the 2nd century AD.

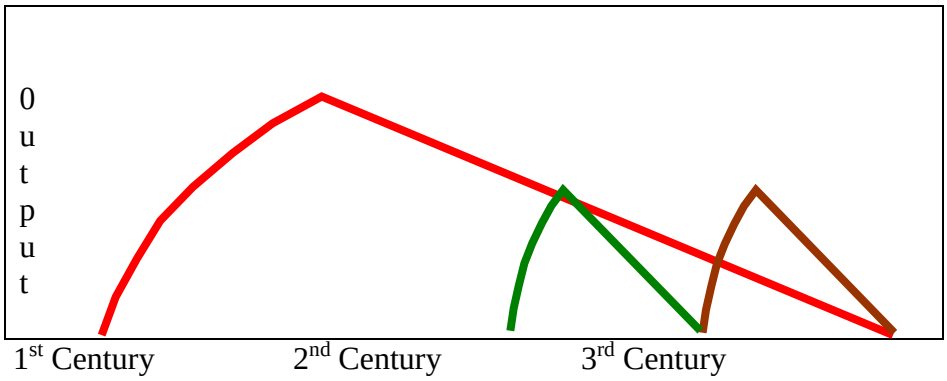
The timing of their market entry and growth in popularity, just as samian was entering the final stages of its life-cycle, may initially suggest Rhenish-ware to be samian's direct successor. While a number of Rhenish forms and decorative styles can be shown to have samian antecedents, these represent only a small proportion of the total product range. Rhenish-ware is also dominated by beakers, compared to the much more diverse range of samian forms, thus creating some uncertainty as to whether the two products were aimed at quite the same target market.

The characteristics of one particular Rhenish form, the so-called motto-beakers or '*Spruchbecher*' may offer a valuable clue in this respect. The

slogans printed on these vessels to encourage users to enjoy their contents seem to have been directed specifically to the purchasers of these wares.

We know from our earlier investigation that samian supply experienced a decline in military consumption during the 3rd century AD and that civilian demand appears to have struggled to make up the aggregate shortfall this created. In Britain's case, at least, Rhenish-ware imports appear to be contemporary with the final phases of samian and that the supply of both type of products seem to end simultaneously. The impression that *Vases Métalescents* and *Moselkeramik* were the direct successors of samian may primarily relate to Rhenish-ware's late market entry and to the exceptionally short duration of the two phases of its product life-cycle.

Figure 11.18 Product Life–Cycles of Samian and Rhenish-wares



Key

–	Samian ware
–	*Vases Métalescents*
–	*Moselkeramik*

(Adapted from Hollensen, 2004:459)

We have also seen that the relatively small scale of Rhenish-ware imports to Britain means that these items would not normally have formed viable commercial cargoes in their own right. This pottery will therefore need to have accompanied other suitable products which were being exported to Britain at this time. The search for potential 'host' cargoes has revealed several interesting possibilities, including grain, fish sauce, salt and wine. The nature of the 'host' cargo would have determined the initial port of arrival of 'infill' items such as Rhenish-ware, although portable products of this kind would be suitable for onward transmission to consumer markets once they had reached Britain.

The tipping-point for samian and Rhenish imports may have been triggered by structural changes in military supply at the beginning of the 3rd century. As we noted in section 11.4.7.2, not only were troop numbers reduced in Britain after AD 180, but much greater reliance was also placed on local requisition as a means of supplying these forces. Coupled with Britain's growing self-sufficiency in grain, a major contraction may have taken place in state shipments to the province. This would have made it harder for the exporters who had previously carried these official consignments to sustain their operations and to offer passage for secondary cargoes such as pottery.

The unused *Vases Métalescents* and *Moselkeramik* found at New Fresh Wharf suggest that consumer demand for both types of Rhenish-ware had subsided before the final stock of each product had been fully exhausted. The reasons for this remain unclear, but if the demand for Rhenish beakers was derived from their rôle in wine consumption, then if the supply of this beverage was interrupted in the late 3rd century by events in Gaul or along the Rhine river system; the need for these beakers may have been rendered redundant, resulting in unsold stocks. Whether for this, or other reasons, eastern Gaulish samian and Rhenish *Moselkeramik* cease to be imported by

c. AD 260, presumably due to lack of demand or the collapse of their shared supply-chain.

While the demise of Rhenish-ware did not mark the end of Britain's ceramic imports in their entirety, it did signal an end to high-volume imports. A few specialist wares continue into the 4th century, as Figure 11.1 indicated, but volumes were generally small and their distributions more limited than in previous periods. Tyers (2012) has mapped the find-spots of the key groups of tableware which continued to arrive during this period and the results are displayed in Figure 11.19.

Figure 11.19 3rd – 4th Century Tableware Imports

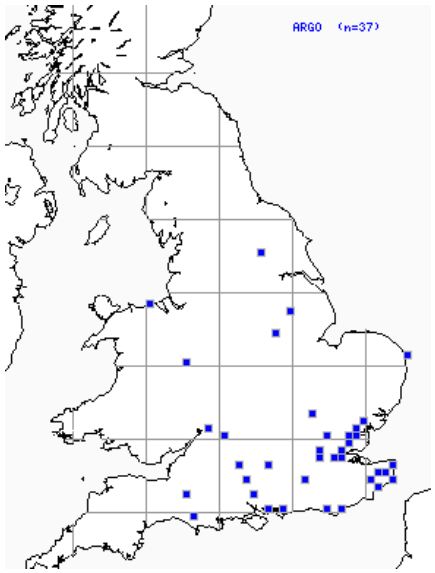
3rd Century Imports Previously Considered	**Number of British Find-spots**
3rd Century Samian	94
Vases Métalescents	61
Moselkeramik	54
Other 3rd – 4th Century Imports	
Argon ware	38
Céramique L'Éponge	37
Marbled Flagons	11

(Adapted from Tyers, 2012)

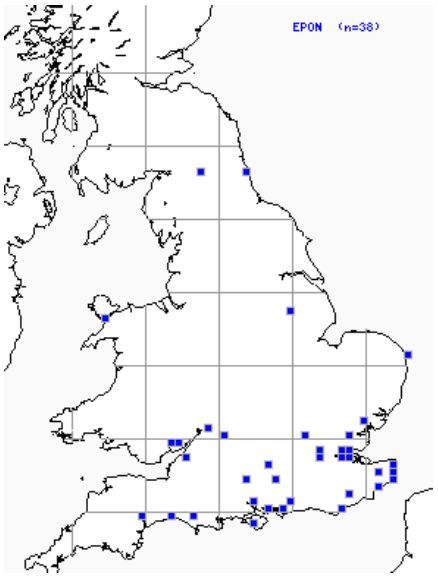
As is evident from these figures, the number of find-spots where 3rd - 4th century ceramics imports occur appear to be significantly lower than for their 3rd century counterparts, suggesting a fall in the volume of cross-Channel exchange in this class of goods. The distribution of find-spots for each of these 3rd - 4th century wares is shown in Figure 11.20.

Figure 11.20 Find-spots for 3rd - 4th Century Tableware Imports

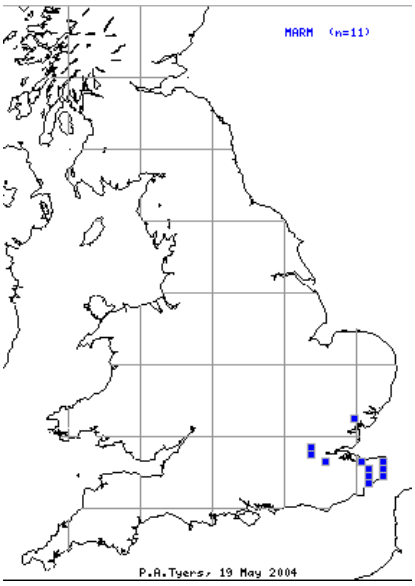
Argon Ware



Céramique l'Éponge



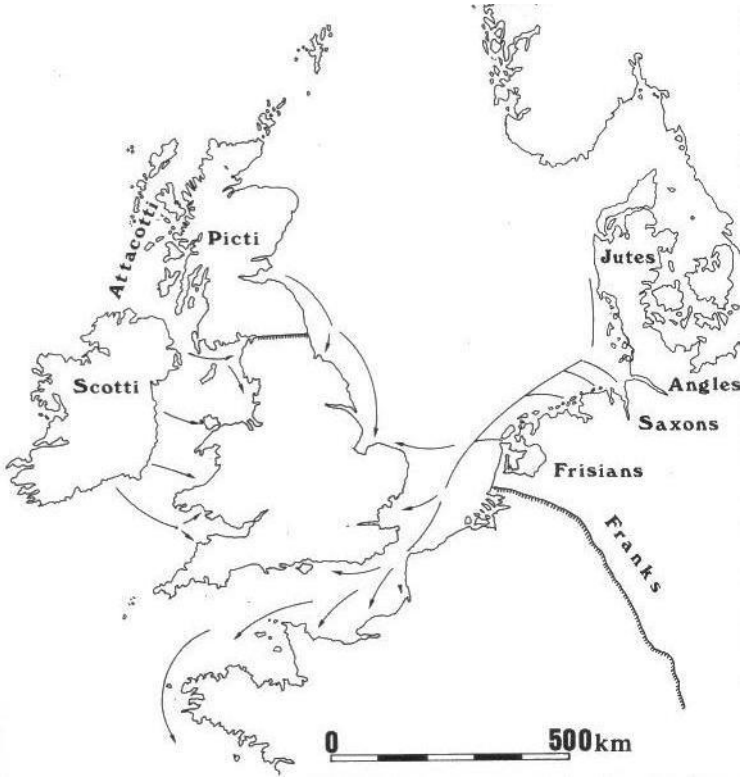
Marbled Flagons



(Adapted from Tyers, 2012)

In addition to the problems which may have been caused by London's possible demise as an import centre (Figure 10.31) and the general trend in import substitution which probably accelerated around this time (Section 11.1), the increasing threat of piracy may also have begun to discourage cross-Channel exchange during the later 3rd century (Peacock, 1977:58; Mason, 2003:178).

Figure 11.21 Reported Pirate Activity in the 3rd and 4th Centuries



(After Mason 2003:178, Figure 96)

It is evident that some cross-Channel trade must have remained profitable however, as without the attraction of potential booty pirate activity would have been unlikely to have persisted. Apart from the continued flow of ceramics, a number of other imports also arrived, as Figure 11.22 shows.

Figure 11.22 Other Classes of 3rd and 4th Century Imports

Type of 3rd – 4th Century Imports	Reference Sources
Food	Fulford (1978b:62) Anderson (1992:67)
Glass	Fulford (1977a:63; 1991:45) Esmond Cleary (1990:83)
Metalwork	Birley (1964:126) Millett (1995:102)
Stone	Birley (1964:130 Morris (1982:272)
Textiles	Fulford (1978b:59; 1991:46) Morris (1982:272)

The evidence for cross-channel trade after *c.* AD 270 appears to be far less compelling than during the preceding two centuries however. The nature and scale of 4th century exchange take us beyond the limits of our present study though and the task of exploring this issue must be left to others.

CHAPTER 12

CONCLUSIONS

12.1 INTRODUCTION

Having sought to discover whether aspects of marketing activity might be identified as early as the Romano-British period, the purpose of this final chapter is to assess what conclusions may be drawn from this investigation. The chapter's structure reflects the study's aims, set out in section 1.3.1 and restated in Figure 12.1.

Figure 12.1 Research Aims

Aims	Task
1 (1.3.1.1)	To identify how marketing historians may use archaeological and epigraphic evidence to trace the development of distribution as a functional marketing specialism during the Romano-British period (*c.* 55 BC-AD 410).
2 (1.3.1.2)	To consider ways in which historians and archaeologists who study the Roman period may be able to utilize additional economic and marketing models to aid their understanding of the forces which influenced long distance inter-provincial exchange.

These dual aims reflect the cross-disciplinary nature of this research, which seeks to identify new ways in which marketing and economics may be used in conjunction with archaeology to solve outstanding problems in each field. The aims of the research are therefore reciprocal, in seeking to establish the contribution each academic discipline may make to the other.

To enable these aims to be achieved, a number of specific objectives were established in section 1.3.2. These are restated in Figure 12.2, along with an indication of where within this thesis each is addressed.

Figure 12.2 Research Objectives

Objective	Task	Chapter
1 (1.3.2.1)	To understand the structure of the Romano-British economy.	3
2 (1.3.2.2)	To develop a conceptual model of a Romano-British supply-chain and analyse the interaction of each of its functional components.	4-7
3 (1.3.2.3)	To evaluate the empirical operation of this model during the Roman-British period via the use of a number of product-based case studies.	8-11

The deductions from this research will be presented thematically, with each aim considered in turn and the insights gained identified. As the first aim (1.3.1.1) was to explore how business historians may use archaeological evidence to trace the development of marketing as a functional specialism in the Romano-British period, the conclusions relating to this research question will be presented first.

12.2 ARCHAEOLOGY'S VALUE TO MARKETING HISTORIANS

Few written records survive from antiquity, but among those that do, Cato, Columella, Pliny and Varro all discuss the rôle of merchants in processing and marketing agricultural produce; Caesar and Sallust link merchants with military supply, while Strabo and Tacitus identify their presence in Roman Britain. Despite these valuable insights, business historians lack the range

of written evidence from the Roman period which enables them to trace the development of marketing activity in more recent times.

Due to the scarcity of written evidence, artefacts are a primary source of data in Romano-British studies. The distribution of a product like samian offers important clues to the ways in which this pottery was marketed, while *amphorae* assemblages provide valuable insights into the demand for the commodities these vessels carried. Similarly, epigraphic evidence such as potters' stamps or painted inscriptions (*tituli picti*) reveals vital information about the individuals involved in the supply process.

12.2.1 Evidence of Functional Marketing in Roman-Britain

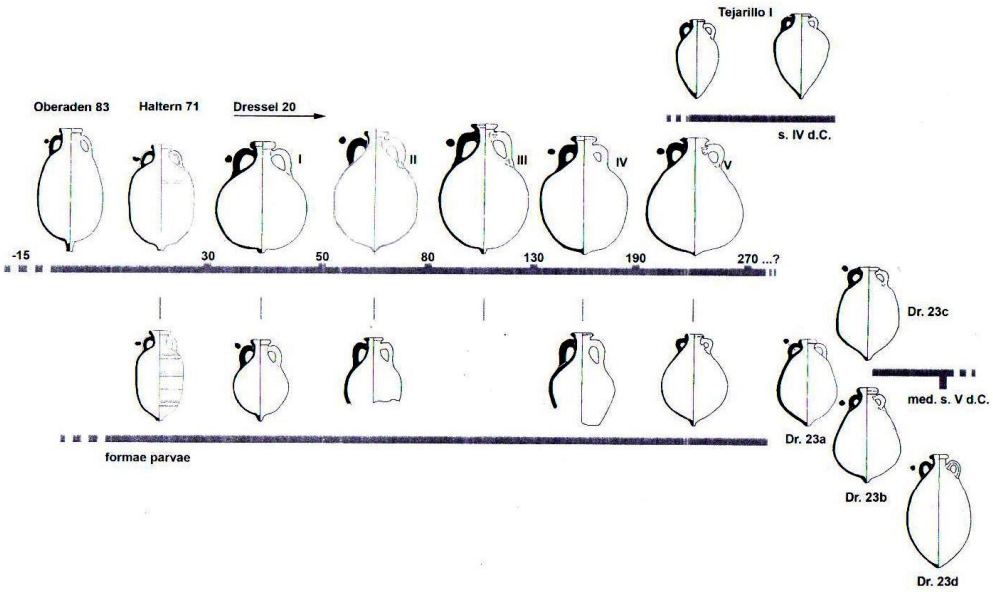
This inquiry took as its starting point Borden's (1964:9) list of functional areas of marketing activity. While only distribution presented a substantial body of evidence for the Romano-British period as a whole, this activity did not operate in a vacuum and other marketing functions have been revealed in the course of this investigation. These include:-

12.2.1.1 Product Planning

Two main aspects of product planning emerge from the evidence uncovered; 'product development' and 'product diffusion'. Figure 4.17 indicates how samian wares evolved from *c.* AD 40-170 and the changes to product forms and decorative style enable us to map the distribution of these vessels and reveal the ways in which consumer tastes developed (Stanfield & Simpson, 1958; Oxé *et al*, 2000).

Amphora designs also changed over time and Chapter 8 traced how Dressel type 1 *amphorae* evolved before being superseded by type 2-4. A similar pattern was seen with olive-oil containers. Oil first reached Britain during the mid 1st century AD in Oberaden type 83 *amphorae*. These in turn were replaced by Dressel type 20 and eventually Dressel type 23 *amphorae*. The full sequence of this development is shown in Figure 12.3.

Figure 12.3 Product Development Sequences for Olive-Oil *Amphorae*



(After Berni Millet, 2008:64, Figure 11)

Distribution maps have been employed extensively in connection with the case studies used in this thesis to help track the diffusion of the products considered. The potters' stamps which may sometimes be found on both *amphorae* and tableware also allow, within certain limits, the routes these products took to market to be identified in many cases (Sections 9.5; 10.5-10.7). The ways in which merchants selected their stock-in-trade may also be traced by means of these stamps (Section 10.7). A degree of caution is needed in this analysis of course, as our sample is small and new discoveries may alter the detailed picture of how these supply-chains operated.

12.2.1.2 Pricing

Coin evidence from market sites in Roman Britain implies that some of the items sold there must have been assigned monetary values. It is difficult to assess the cost of particular items however, as the only comprehensive set of data we have from the Roman period comes from an edict Diocletian issued in AD301 which set maximum prices for a wide range of goods and services (Williams, 1985:129-130). This edict relates to a period later than the one we are concerned with though and the figures set are maximum prices, so may not reflect day-to-day retail values (Sippel, 1987:37; Frayn, 1993:131).

The only specific price information identified in this investigation relates to the graffiti found on two samian plates (Section 10.2.4). One of these cost 12 *asses* and the other 20 *asses* (Darling, 1998:169; Willis, 2011:171). It is not possible to say how representative these prices were, or to even confirm that these figures represent the items' retail prices.

12.2.1.3 Personal Selling

The importance of personal selling may be deduced from the profusion of shops found in Romano-British towns, both in their *fora* and along the roads which led through these settlements (Section 7.4.2). Further evidence of shops is also found at many roadside settlements and major crossroads (Smith, 1987:85). In addition, it is clear that temporary market stalls were set up in urban *fora* and near rural shrines to serve the periodic markets which took place there (Sections 7.4.3; 7.4.4).

Classical literature also refers, on occasions, to aspects of personal selling (Cicero; *de Officiis*, i.150; Caesar, *de Bello Gallico*, vi, 37; Sallust, *Bello Jugerthine*, xliv, 5), as do a number of the Vindolanda tablets (Whittaker,

1999b:92-93). Mosaics, such as the one at Bad Kreuznach, also show retail scenes from time to time (Figure 7.11). Tombstones similarly imply that personal selling must have been a common activity. Various illustrations of this type of monument have already been included, for example Figures 6.7 (Cutler's shop), 7.16 (Butcher's shop) and 7.25 (Draper's & Cushion-maker's shops). Further examples are listed in Figure 12.4.

Figure 12.4 Further Evidence of Personal Selling from Tombstones

Type of Tombstone Illustration	Reference Source
Baker's shop	(Branigan, 1980:95)
Potter's shop	(Liberati & Bourbon, 2005:63)
Vintner's shop	(Liberati & Bourbon, 2005:64)
Stall market	(Harris, 1980:217)

A copy of each of these images may be found in Appendix 5 (pp 467-468).

12.2.1.4 Other Aspects of Marketing

Other types of systematic marketing practices remain hard to identify in the Romano-British period, but examples can be found. An attempt to establish 'brand identity' is revealed by the bold advertising stamps introduced at the samian pottery workshop of *CINNAMVS* in Lezoux (Figure 10.23). This function cannot be attributed to all potters' stamps however, as many related to other aspects of the production process (Section 4.7.2).

Evidence of 'display' may also be deduced from the way certain retailer's stock had been arranged immediately before fires destroyed their premises (Section 10.7.4). Tombstones again offer valuable insights into how items were presented to the public (Figure 6.7).

‘Physical handling’ of materials is another area which must have constituted an important supply function and while evidence is scarce, images of these activities occasionally appear on mosaics, at the quayside market illustrated in the *Oceanus* mosaic from Bad Kreuznach (Figure 7.10), or in tombstone reliefs depicting cargo handling.

12.2.2 Physical Distribution

The area which provides the fullest range of information on Romano-British marketing is physical distribution; in particular the movement of goods such as *amphorae* and tablewares. For this reason these activities form the central focus of this thesis and the supply-chain model set out in Figure 1.5 was devised to explore the structural dynamics of this process.

.

12.2.2.1 Producer Involvement

While distribution is regarded as a core activity by many producers today, a curious feature of the Roman period appears to be that, in the main, vineyard owners and olive-growers sought to avoid direct involvement in commercial activity by hiring contractors to produce wine or oil on their behalf (Sections 8.2.1; 9.2.1).

A similar reluctance to participate in the physical distribution process seems to have been shared by pottery manufacturers, as the evidence reveals that without exception amphora manufacturers and tableware producers focused their efforts into making their wares and left the task of marketing these to others (Section 4.8). The stamps found on some *amphorae* even suggest that batches may have been made-to-order for specific merchants, to enable them to export oil or wine in their own containers (Section 9.2.5).

Gaulish tableware manufacturers probably relied heavily on the state for their core business, even to the extent that Roman administrators may in some cases have influenced the siting of their production centres (Section 4.7.5). If, as seems likely, military orders constituted a major part of their work, the potters' involvement in the distribution process probably ended at the factory-gate, as state administrators would have arranged for either army personnel or hired contractors to collect these goods (Section 10.2.2).

If surplus stock were available for commercial sale once military demand had been satisfied, it would have been convenient for workshop managers to sell these items in bulk to independent merchants rather than to establish and maintain long distance distribution networks of their own. Even if the prices of some of these products had to be 'discounted' to encourage merchants to accept them, this system may still have proved financially advantageous for the potters concerned.

Production decisions would have determined the flow of materials into the supply-chain, but no evidence has been found in this study to link producers with the operational aspects of long distance or cross-channel distribution. Even in their use of bold 'advertising-stamps', the *CINNAMVS* factory may have been seeking to make their products attractive to merchants rather than to connect directly with the end-users of their wares.

12.2.2.2 State Involvement

The Roman state clearly maintained a strong interest in the long distance movement of strategic supplies to enable them to satisfy the resource needs of the military garrisons stationed around its frontiers (Section 5.6). While grain has been shown to have been the most important commodity involved

in inter-provincial transfers, pottery, olive-oil and wine also feature heavily in these exchanges (Section 5.2).

The influence of state-administered supply began in the pre-conquest period, when exotic items such as wine, glass and metalwork were exchanged with British tribal leaders for slaves and other strategic materials (Figure 10.2). In the decades following the Claudian conquest the amount of pottery, olive-oil and wine entering Britain increased substantially, to meet the needs of the garrisons stationed here. Much of this material would originally have been channelled through the port of Richborough (*Rutupine*) before being sent on to bases at Colchester (*Camulodunum*), Exeter (*Isca Dumnoniorum*), Gloucester (*Glevum*) and Lincoln (*Lindum*), (Section 10.5.2). By the early 2nd century, Dover (*Dubris*) superseded Richborough as Britain's principal military supply-base. *Londinium* had become a major import centre by this time and many materials may have been forwarded from the city to the legionary bases at Caerleon (*Isca*), Chester (*Deva*) or York (*Eboracum*); as well as to more northerly ports like Maryport (*Alauna*) and South Shields (*Arbeia*), to supply Britain's frontier garrison (Section 5.4.4).

What is less certain is the extent to which the state's own personnel were directly involved in the physical movement of these goods. It is not known whether the Roman imperial navy included transport vessels as part of their peacetime flotilla, although this does not preclude the possibility that naval warships may have been used to carry supplies as part of their wider remit. The *Classis Britannica* and *Classis Germanica* have both been linked to military supply (Section 5.2.7). In many cases, however, it seems likely the Roman state resorted to the use of civilian contractors to carry out these transfers (Section 6.6).

The fact that Rome often used merchants to deliver their supplies does not reduce the importance of the state as a major driving-force in long distance

supply. Funded by taxation and the *annona*, the state played a dominant part in the long distance movement of goods in the period under review, whether via redistributive transfers or marketplace purchases (Section 5.5).

12.2.2.3 Merchant Involvement

Of all the supply-chain members examined in this study, merchants are the one group whose active involvement has been apparent in every time period and case study. While their rôle may often have been subsidiary in the pre-conquest and early Romano-British periods their importance increased when state interest in these activities declined (Section 8.5.5).
Merchants performed a wide variety of rôles, many of which were specialist in nature. While *negotiatores* and *mercatores* managed long distance supply on behalf of the state or on an entrepreneurial basis, *navicularii* and *nautae* handled the maritime and riverine aspects of this work (Section 6.3). The extent to which these rôles overlapped is unclear and while some integration seems likely, this is difficult to quantify (Section 9.5.7.1). The inscriptions (*tituli picti*) which are sometimes found on *amphorae* bodies or stoppers shed important light on the rôles and identities of the bottlers and shippers and on the structural aspects of the supply-chain (Section 9.2.5).

The idea that a single merchant was involved through the whole length of a long distance supply-chain is probably erroneous. A more likely scenario may be interconnected networks, with each member controlling the passage of goods through their own territory, while maintaining close links with their local retailers and merchant counterparts in the regions bordering their territories (Section 8.3.3.3). Long distance networks of this type would have been difficult for other supply-chain members to establish or maintain. The merchants involved in these networks would have occupied a powerful position in the supply-chain, as an awareness of market conditions in their

own area and at their territorial borders would offer asymmetric knowledge which they could profitably exploit. In this way merchants played a key rôle in the distribution process and in the wider development of marketing activity in the Romano-British period, adding value to the goods in which they dealt by making these items available to their end-users.

12.2.2.4 Consumer Involvement

In contrast to merchants and the state, the influence of 'consumer-pull' on the development of the Romano-British economy is much less apparent. A large proportion of the imports which arrived in Britain at this time were intended for military use and represented redistributive transfers rather than trade (Section 5.4.1).

Private demand for luxury imports may be recognized in the behaviour of wealthy tribal élites in the pre-conquest period, but the volume of goods involved in these exchanges was relatively small (Section 8.2.4.1). In the post-conquest period civilian consumption is evident among the populations of Romano-British towns from the time of their establishment. Much of this demand may reflect the needs of Roman administrators or merchants though (Section 9.6).

The demand for imported luxuries among the indigenous Romano-British population is more difficult to gauge. Some demand would certainly have been generated from this source, especially in the larger urban settlements, but this may have developed only slowly and it has been estimated that it probably took a generation or more for this to take hold (Willis, 1998:87). It was only in the 3rd century that private civilian demand began to outpace its military counterpart, but by this time the size of the British garrison had already begun to decline (Section 11.6).

The vast majority of the Romano-British population continued to be rurally-based during the Romano-British period, most probably living at, or near to, subsistence level (Section 3.6.3). Most urban dwellers may have been little better-off and while they presumably earned enough to pay for the essential items they required, consumption of imported luxuries may have been a rare event (Section 7.2). The slow pace of development in the Romano-British economy meant prosperity was always restricted to a small urban élite and for this reason consumer demand never seems to have been a driving force in the supply-chain.

12.2.3 Deductions

While the picture of long distance exchange which emerges in the Romano-British period offers few surprises, resting as it does on traditional trading relationships based on mutual trust and benefits, the realization of the way in which marketing practices may have contributed to this process is new. It has been demonstrated that even if conventional literature-based sources are lacking artefact evidence may be used, with due caution, as an alternative to written texts in helping identify marketing activities in a previously unexplored period and moves us one step closer to establishing marketing's origins.

While distribution stands out as having developed more fully than any other functional area by the Romano-British period, product planning, pricing and personal selling were also emerging as distinct marketing activities by this date, while examples of branding, display and physical handling in both the wholesale and retail sectors are also evident. The possibility that other aspects of marketing existed but have left no physical traces cannot be excluded, as the popular adage 'absence of evidence is not evidence of absence' reminds us.

Like many other aspects of Romano-British society, marketing activity was only able to evolve in an environment where other criteria such as monetary mechanisms and connectivity existed. As Salway (1993) points out:-

> "The real change in the system from prehistoric to Roman times is ... a world with a money economy, urban markets and the availability of organized transport."
>
> (Salway, 1993:435)

While these conditions were still present in AD 270, within a century and a half Roman influence in Britain had all but ceased and the conditions needed to sustain marketing activity no longer existed. The functional specialisms we have identified in this thesis thus became dormant, re-emerging only in the early-medieval period when a recognizable monetary system again began to evolve and long distance communications started to revive. The genesis of British marketing activities is not found in the medieval period however, but stretches back a further millennium to our island's first contact with Rome, as the evidence presented in this study clearly demonstrates.

12.3 MARKETING'S VALUE TO ARCHAEOLOGISTS

Great care must be taken before introducing external theoretical models to historical or archaeological analysis. From a 'substantivist perspective' modern economic concepts, upon which marketing leans so heavily, simply do not apply to the socially-embedded economy which existed in the Roman period, as the structural frameworks of the two systems are incompatible (Sections 3.5.2; 3.7.1). Authors such as Finley (1973) maintain the ancient economy was primitive in nature and driven by reciprocal and redistributive transfers rather than market-exchange (Sections 3.6.1; 3.6.2). Consequently,

industrial production and commercialized distribution, as we recognize them today, were unknown.

While sound in principle, the 'substantivist' position is ideologically-based and its minimalist view of the Roman economy is becoming increasingly difficult to maintain as advances such as air-photography and excavation data reveal production facilities which at times operated on a massive scale (Figure 4.18). From a 'formalist' perspective, examples of mass-production do not present a problem, as formalists maintain that most of the elements of our modern economy already existed by the Roman period (Section 3.5.1). Acceptance of a 'formalist' position does not mean that 'anything goes' as far as modern economic or marketing models are concerned however. Only concepts that could have been readily understood by a Roman audience can resist the accusations of 'modernist' thinking which are likely to be levelled against them. The economic and marketing models used in this study have been chosen to explore specific aspects of commercial behaviour found in the Romano-British period and are summarized in Figures 12.5 and 12.6. The area in which each of these 'economic models' has contributed to the analysis of the archaeological data contained in this study will be examined in section 12.3.1, and the contribution of the 'marketing models' explored in section 12.3.2.

12.3.1 Use of Economic Models to Analyse Romano-British Supply

Economic analysis provides the contextual background to this study; areas such as production, which forms the entry point to the supply-chain, rest on clear economic foundations. Chapter 4 provides a detailed example where economic models were used to analyse the production and distribution of samian ware (*terra sigillata*).

Figure 12.5 Applications of Selected Economic Models

Economic Model	Archaeological Context	Page
Comparative advantage	*Terra sigillata* production	91-93
International product cycle	Export of *terra sigillata* to Italy after production migrated to southern Gaul	97-99

12.3.1.1 Comparative Advantage of Industrial Location

The idea that cost considerations may have influenced industrial location in the Romano-British period is not new and the relevance of Ricardo's (1817) theory of comparative advantage has previously been recognized (Andrew Wilson; pers. comm. OXREP Conference, 2/10/2010). A Roman audience would certainly have appreciated how cost conditions allowed Italian wine to be produced cheaply, enabling it to be shipped to Britain and exchanged for highly prized slaves. The same principle applies to samian production (Section 4.7.5).

While Ricardo's theory explains why industries may relocate, it does little to identify the specific criteria involved in the choice of a new site and the potential of Ohlin's (1933) factor endowment model to address this issue was therefore discussed (Section 4.7.5). This suggests the selected location will be richly endowed with the factors of production on which the industry most heavily relied; *e.g. illite* clay, fuel, water and human resources in the case of samian production (Webster, 2001:295). This pattern of resource availability is seen at each of the kiln-sites explored as output migrated from southern Gaul to central and eastern Gaul during the Romano-British period.

12.3.1.2 *Terra Sigillata's* International Product Cycle

The potential for a second economic model to help explain particular aspects of *terra sigillata's* long distance distribution was recognized in the form of Vernon's (1966) 'international product cycle'. Cases of products made in one territory being exported to another, which then begins to produce these items to meet its own needs and eventually challenging the original supplier in their home market, are commonplace today; the automotive and textiles industries provide archetypal examples. *Terra sigillata* appears to offer a previously unnoticed case of this phenomenon, this pottery being initially exported from Italy to Gaul, before the latter took over its own supply and eventually exported *sigillata* back to its region of origin, as the consignment of newly arrived samian at Pompeii shows (Atkinson, 1914:27).

12.3.2 Use of Marketing Models to Analyse Romano-British Supply

Turning to the question of how marketing models may assist archaeologists in achieving a better understanding of long distance exchange in the Roman world, it is important to recognize that in a number of areas these techniques are already widely used. In the case of product development, for example, ceramic typologies have become a well established technique, as we saw in the case of *terra sigillata* (Figure 4.17) and oil *amphorae* (Figure 12.3). The use of distribution maps in artefact studies is also linked to the concept of product diffusion. Two further marketing models also feature in this study.

Figure 12.6 Applications of Selected Marketing Models

Marketing Model	Archaeological Context	Location
Product life-cycles	International product life-cycle	372-373
Supply-chains	Rôles of producers, state administrators, merchants and consumers	Ch 4-7

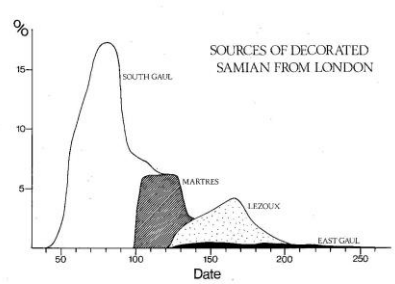
12.3.2.1 *Terra Sigillata's* International Product Life-Cycle

The notion that the sales histories of many consumer products experience a characteristic life-cycle, from the time of their introduction to their eventual withdrawal, has long been recognized by marketing scholars (Bass, 1969). The pattern of growth, maturity and decline would have been familiar to anyone in the Roman period, although the application of this concept to products would have been a novel idea. The use of long-term economic cycles to analyse trade patterns is not new to archaeology (Going, 1992).

As we saw in chapter 10, Marsh (1981:185) has analysed the quantity of *terra sigillata* which reached London from various parts of Gaul from the mid 1st to the mid 3rd centuries AD. This data reveals a life-cycle both for imports as a whole and for each kiln-centre / production-region concerned. *Terra sigillata's* international life-cycle also shows how Britain's demand differed from those of Italy and Gaul, as Figure 12.7 shows.

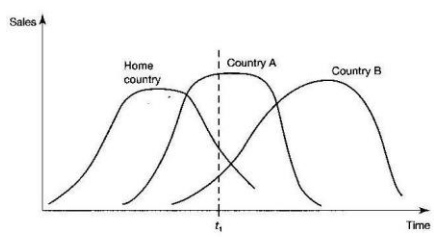
Figure 12.7 *Terra Sigillata's* Regional and International Product Life-Cycles

Figure 10.13



(After Marsh, 1981:185, Figure 11.5)

Figure 10.34



(After Hollensen, 2004:459, Figure 15.7)

Here again, a Romano-British observer would have been familiar with the ways in which crops matured at different times of year and would have understood the principles involved in this progressive cycle, however unusual they may have found the application of this idea to pottery imports.

As a late-entrant to the market, Romano-British civilian demand for *terra sigillata* may still not have peaked at a time when demand had already collapsed in Italy and was approaching terminal decline in Gaul. While the growth in British demand may have been unable to sustain Gaulish samian production, import substitution had begun to develop by the 3rd century AD, benefiting Britain's domestic producers of colour-coated wares.

12.3.2.2 The Rôle of Supply-Chains in the Romano-British Period

The main theme of this investigation was to examine the rôle of the supply-chain in cross-channel exchange in the Romano-British period. The parts played by each distribution channel member are set out in Section 12.2.2 and this section will seek to identify what new insights have been achieved by using this model to explore long distance exchange during this era.

By focussing on the rôles of the individual supply-chain members (Chapters 4-7) it was possible to examine how each fitted into the socially-embedded Roman economy. Having identified the structural framework within which long distance supply operated in the Romano-British period and established the key objectives of each channel member, case studies were then used to explore how the functional relationships between the participants evolved and the impact these changes had on the supply-network (Chapters 8-12).

These case studies clearly demonstrate that a common approach was not applied to all commodities. The situations relating to wine, olive-oil, samian and Rhenish-ware supply must therefore be considered separately.

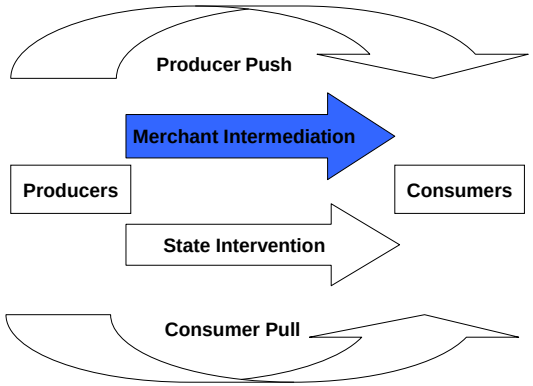
12.3.2.3 The Structure of Wine Supply to Roman Britain

As Figure 12.8 shows, the driving force behind the supply of wine to Britain in the pre-conquest period switched repeatedly between private enterprise and the Roman state. The data examined in Chapter 8 indicated that Roman administrators appear to have assumed control of the flow of this prestigious commodity during the last decades of the Republic and the early years of the Empire, as Rome extended its territorial control westwards into Gaul and Germany. During this period wine seems to have been one of the bartering tools used by the Roman state to obtain the strategic materials it required to support its expansionary aims (Section 8.4.5). When these aspirations waned after its attempts to annex northern Germany were abandoned *c.* AD 9, merchants seem to have stepped-in to fill the vacuum created by Rome's withdrawal and to supply their former clients on a commercial basis. This situation presumably continued until AD 43, when Britain's annexation once more brought wine supply under state-administered control (Section 8.6.4).

Merchants continued to feature in the post-conquest period, but primarily in an operational capacity. It is more difficult to track wine imports during this era as some of Britain's supply is thought to have arrived in barrels, few of which have survived. Epigraphic evidence suggests that several continental export regions supplied wine to British customers, the key participants being Gaul, Germany and Spain (Section 8.6.2). Evidence is also emerging which suggests that some of these production areas might have been supplying specific parts of the British market (Evans, 2002:482). This hypothesis needs further investigation, but the notion that regional supply arrangements may have begun to emerge during the Romano-British period is an issue we will encounter again in the case of olive-oil supply.

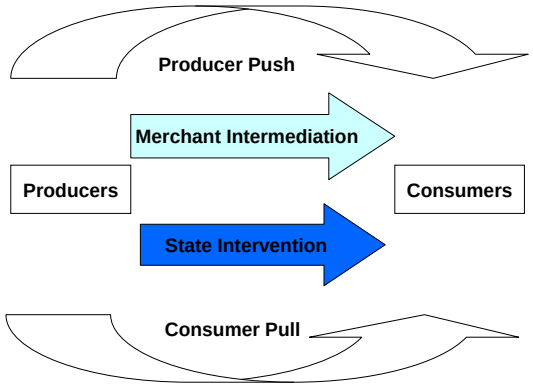
Figure 12.8 Evolution of the Romano-British Wine Supply Chain

c. 120 - 56 BC [Figure 8.11]



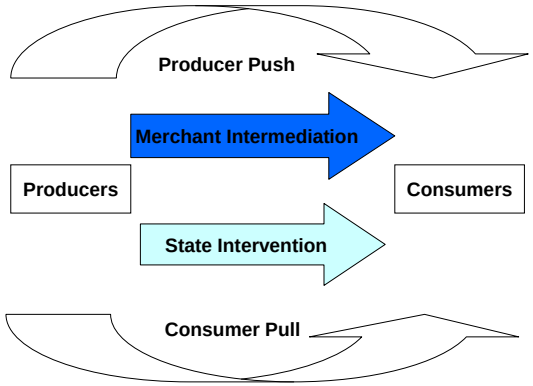
Merchant-led supply in the pre-Gallic War period

c. 56 - 10 BC [Figure 8.20]



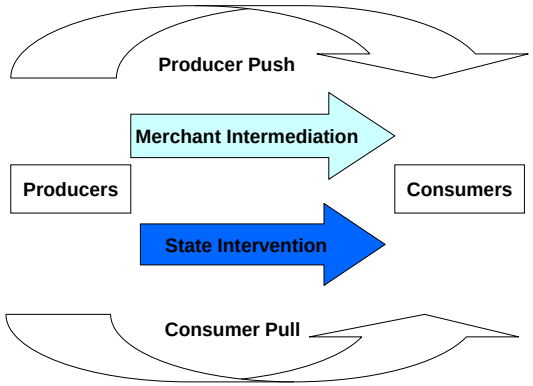
State-controlled supply imposed as Rome expands

c. 10 BC - AD 43 [Figure 8.30]



Merchants fill the vacuum as Rome's expansion falters

c. AD 43 - 270 [Figure 8.44]



State-control resumed in the Romano-British period

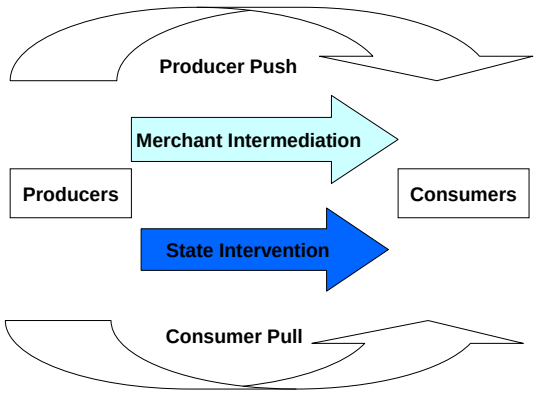
12.3.2.4 The Structure of Olive-Oil Supply to Roman Britain

The data examined in Chapter 9 revealed that little olive-oil entered Britain in the pre-conquest period and analysis of the supply-chain model suggests that when oil did begin to arrive after AD 43, the state remained the prime mover in the import of this commodity until *c.* AD 270. The reason for this continued state-involvement was presumably to ensure that supplies of this vital commodity reached their own personnel until well into the 3rd century, after which time demand appears to have diminished and Spanish imports were replaced by supplies from North Africa (Allason-Jones, 2008:107).

Merchant involvement appears to have focused on the operational aspects of supply, where between AD 43 and 270 specific export centres (*conventii*) in the *Baetican* region of Spain appear to have specialized in shipping olive-oil to particular parts of Britain (Section 9.5.6). Once again a degree of caution is required here, as the evidence for regional specialization rests on a limited data-set. The possibility that distinctive regional supply patterns may have begun to emerge during the Romano-British period is an issue which clearly justifies further investigation though.

Figure 12.9 Structure of Olive-Oil Supply to Roman Britain

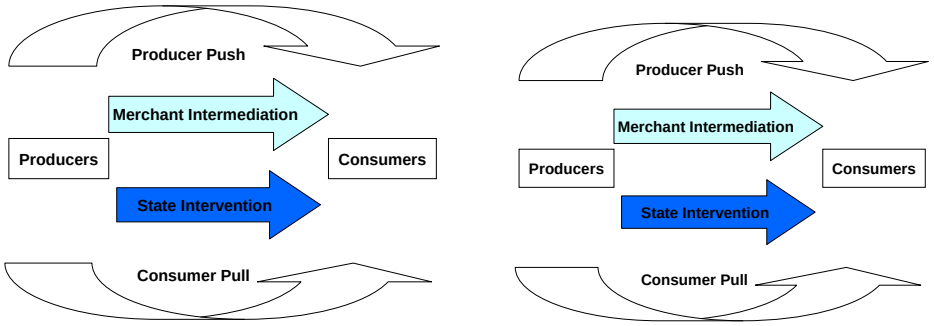
c. AD 43-270 [Figure 9.25]



As far as can be seen, the structures of the supply-chains for both wine and olive-oil remained under state control and appear to have continued largely unchanged throughout the Romano-British period, as both items were no doubt regarded as strategically important products. The similarities in the supply-chains for the two commodities are illustrated in Figure 12.10.

Figure 12.10 Comparisons of the Wine and Olive-Oil Supply-Chains

Wine (*c.* AD 43-270) [Figure 8.44] Olive-Oil (*c.* AD 43-270) [Figure 9.25]



12.3.2.5 The Structure of Samian Supply to Roman Britain

In the case of samian supply the picture appears to be rather more complex. Samian was not a strategic item in the same way that wine or olive-oil were, for while tableware itself was no doubt considered essential in order to maintain a civilized lifestyle, alternatives to samian existed. This was a product that the newly installed British garrison would have been familiar with from their previous postings though and Roman administrators would presumably have taken an interest in ensuring its provision, during the initial phase of occupation at least (Section 10.5.3).

Here again, the evidence indicates that merchants had a vital rôle in the operational aspects of supply, presumably acting under state direction. Samian was a useful infill-cargo and many of its forms will have taken up

little space when stacked and could easily have travelled alongside other military cargoes destined for Britain (Section 10.2.5).

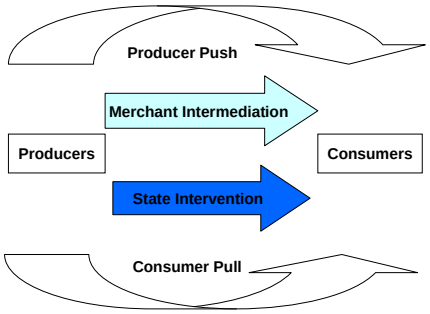
As certain sectors of the civilian population gradually began to adopt Roman culinary habits, an important secondary demand for samian appears to have developed. This provided the merchants involved in its supply with a supplementary market segment and while private demand may have been slow to develop, especially in the north and west of the province, by the 2nd century the south-east looks to have exhibited a growing appetite for these wares (Section 10.7.5).

As a consumable good, rather than a strategic commodity, samian was an item which may have had a lower priority from a military perspective than wine or olive-oil, yet it may have represented a potentially lucrative item from a commercial standpoint. While the market might have been divided between distinct 'military' and 'civilian' segments during its initial phase of operation, this division may have become more blurred over time, especially if soldiers were increasingly expected to purchase and replace their personal equipment (Breeze, 1977:139; Peacock, 1982:149).

Paradoxically, from a commercial perspective, private civilian demand in the south and south east of the province may have been showing signs of expanding at the very time that military orders began to falter as the British garrison was reduced in size and became increasingly self-sufficient (Section 10.8.3). This progressive shift from military to civilian control of the samian supply-chain is illustrated in Figure 12.11.

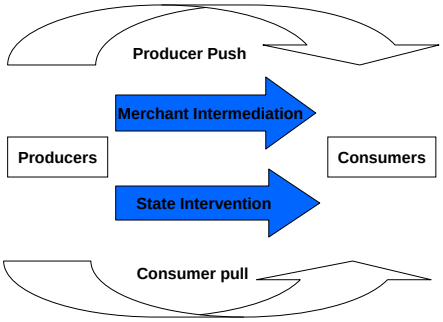
Figure 12.11 Structure of Samian Supply in the Romano-British Period

c. AD 43-100 [Figures 10.11/10.14]



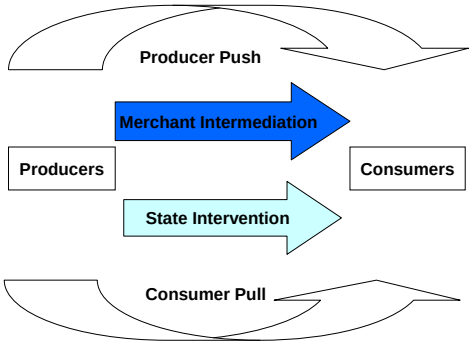
State supply using civilian merchants in the post-conquest period

c. AD 100-200 [Figure 10.24]



State control of strategic supply and merchant control of operational areas

c. AD 200-270 [Figure 11.17]



Merchants take over most aspects of supply as the industry is about to go into terminal decline

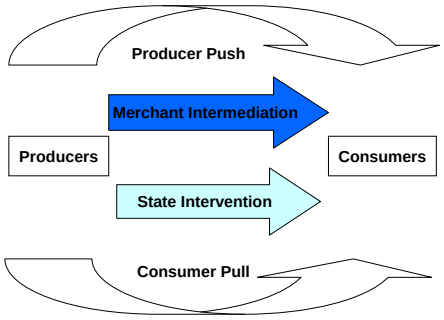
12.3.2.6 The Structure of Rhenish-Ware Supply to Roman Britain

The supply of Rhenish-wares appear to present a more uniform picture than samian, perhaps because this type of pottery entered the market later, at a time when the supply routes to Britain had become more established. The routes Rhenish-wares followed to market during the late 2nd century and for most of the 3rd appear to have been similar to that taken by Eastern Gaulish samian. Clear similarities exist in the distributions of the two varieties of Rhenish-wares (Figure 11.16). What remains unclear, however, is whether the later Eastern Gaulish *Moselkeramik* followed quite the same path as their *Vases Métalescents* predecessors (Section 11.5.5). There is little to imply that the organizational structure of the supply-chain altered much as a result of the change of production region though, as Figure 12.12 reveals.

Figure 12.12 Structure of Rhenish-Ware Supply in 2nd and 3rd Centuries

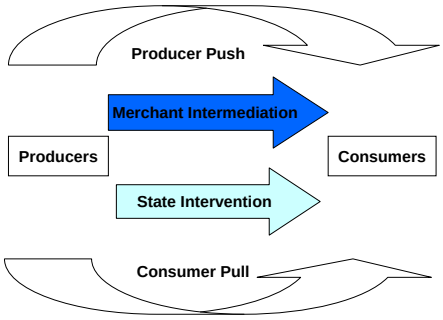
Vases Métalescents

c. AD 180-220 [Figure 11.10]



Moselkeramik

c. AD 220-270 [Figure 11.17]



12.3.2.7 Overview of Romano-British Supply-Chain Structures

The analysis of these of these supply-chains has involved synthesizing data from a wide range of archaeological sources, which has not been collated in this way before. The conclusions of this study must continue to be regarded

as tentative, however, particularly in view of the fact that the statistical data available for many of the products included in this investigation remains very limited. In all the cases that have been examined, however, it is the Roman state and independent merchants who stand out as having been the primary drivers in the supply process.

While the state took the leading rôle until the end of the 2nd century, from the Conquest-period onwards merchants probably engaged in parallel supply to take advantage of the additional commercial opportunities which access to the new province provided (Section 6.7). By the 3rd century however the British garrison had become smaller and much more self-sufficient (Section 11.2.1). While civilian demand had begun to grow by this time, increasing levels of import substitution reduced the ability of overseas supplies to benefit from this development as long distance inter-provincial exchange was replaced by more localized intra-provincial trade.

Even greater difficulties exist in obtaining tangible evidence relating to the 'behavioural' aspects of marketing in the Romano-British period (Section 7.6.1). From what can be deduced from archaeological evidence such as the ground-plans of buildings conventionally interpreted as *macella* and shops, the structural layout of wholesale and retail premises seems to have changed little between Roman times and the Victorian era. As the increasing pace of social and technological advances have probably altered marketing practices more in the last century than over the course of the previous two millennia, it may be argued that in behavioural terms the traditional retail frameworks and customer-supplier relationships which Roman merchants would have been familiar with were probably not dissimilar to those which existed up to relatively recent times.

While it is difficult to verify how Romano-British merchants thought and behaved, contemporary literary accounts occasionally refer to unsavoury

aspects of trading activities such as commercial avarice and sharp practice (Cicero; *de Officiis*; iii, 61; *Pro Fonteio,* 11; *Verres,* 2, 5, 167). In a rather different way, the traders' funeral monuments sometimes depict (rather more sympathetically) their own view of their work and wares (Figure 12.4).

Even allowing for the fact that many aspects of the Roman economy were structurally different from those of its modern counterpart (Figures 3.1 and 3.2), marketing scholars would generally have little difficulty in envisaging how Romano-British merchants may have operated in those sectors of the ancient economy which functioned on commercial lines. An entrepreneurial instinct to use asymmetric knowledge for profit-seeking purposes and the ability to recognize that the party who controls a 'choke-point' in a physical distribution system gains dominance of the supply-chain are embedded into the marketing psyche and commercial scholars are more easily inclined to accept these principles as axiomatic then might those from other disciplines.

12.3.3 Deductions

As indicated in section 1.2; this thesis set out to ascertain whether we could increase our understanding of the operation of cross-channel supply during the Romano-British period by applying economic and marketing models to existing archaeological data. The enquiry focused on supply-chain analysis to widen the traditional emphasis on production or distribution, to examine the forces which drove this supply.

The conclusions of this study are based on data from four case studies and further research will be needed to confirm whether the deductions drawn from these artefacts are applicable to other product categories. The use of a mixed-method approach to ask new questions of existing data has produced some interesting results, in particular the rôle of 'factor endowments' in the

location of ceramic production facilities (Section 4.7.5), the potential for merchants to use choke-points in the supply-network to regulate the flow of products (Section 8.3.4) and the operation of international product-cycles in the Roman period (Section 4.7.10).

12.4 RECOMMENDATIONS FOR FURTHER RESEARCH

During the course of this investigation the dual aims set out in section 1.3.1 have been achieved and the use of an inter-disciplinary approach embracing both marketing and archaeological methodologies has been validated. The scope to extend this research to other product categories, such as the inter-provincial supply of *Gallo-Belgic* wares in the pre-conquest period, or the extension of the study into the 4th century AD by examining imports such as Argonne wares would help to test the validity of the supply-chain model and shed further light on early marketing practices. The intra-provincial supply of Romano-British colour-coated wares from domestic kilns, such as those in the New Forest, Nene Valley or Oxfordshire and to kitchenwares such as black-burnished, Crambeck or Severn valley wares is a further research opportunity. Similarly, supply-chain analysis may enable further insights to be gained into distribution patterns from other parts of the Roman Empire by applying appropriately focussed marketing models to the data we already have from these regions. These all lie beyond the remit of the present study though.

APPENDICES

APPENDIX 1

Reigns of ROMAN EMPERORS from Augustus to Diocletian

27 BC–AD 14	Augustus	the Julio-Claudian dynasty
AD 14–37	Tiberius	
37–41	Gaius (Caligula)	
41–54	Claudius	
54–68	Nero	
68–9	Galba	69, 'the year of the four emperors'
69	Otho	
69	Vitellius	
69–79	Vespasian	the Flavian dynasty
78–81	Titus	
81–96	Domitian	
96–8	Nerva	each emperor chosen and adopted by his predecessor
98–117	Trajan	
117–38	Hadrian	
138–61	Antoninus Pius	
161–80	Marcus Aurelius	
161–9	Lucius Verus (co-emperor)	
178–93	Commodus (178–80, co-emperor with his father)	
193	Pertinax	
193	Didius Julianus	the Severan dynasty (excluding Macrinus)
193–211	Septimius Severus	
198–217	Caracalla (198–211, co-emperor with his father)	
209–12	Geta (209–11, co-emperor with father and brother; 211–12, with brother alone)	
217–18	Macrinus	
218–22	Elagabalus	
222–35	Severus Alexander	
235–8	Maximinus	'fifty years of military anarchy'
238–84	(about twenty emperors)	
284–305	Diocletian and colleagues	

(After Wells, 1984:309)

APPENDIX 2

LIST OF ROMAN PLACE NAMES MENTIONED IN THE TEXT

*Abona*e	Romano-British port of Sea Mills (near Bristol)
Achea	Region of Roman Greece
Alauna	Romano-British town of Maryport (Cumbria)
Aqua Arnemetae	Romano-British town (modern Buxton)
Aquae Sulis	Romano-British town (modern Bath)
Aquitania	Region of Roman Gaul (modern Gironde)
Arbeia	Roman fort on Hadrian's Wall (South Shields)
Arelate	Gallo-Roman city (modern Arles)
Arretium	Town in central Italy (modern Arezzo)
Armorica	Gallic tribal area (modern Brittany)
Astigi	Town and seaport in southern Iberia (modern Écija)
Augusta Treverorum	Gallo-Roman city (modern Trier)
Baetica	Region of Roman Iberia (part of modern Spain)
Bibracte	Gallic hillfort and tribal capital (modern Mont Beauvais)
Britannia	Roman province of Britain
Brocavum	Roman fort and vicus (Brougham)
Burdigala	Gallo-Romano town and seaport (modern Bordeaux)
Burrium	Romano-British town, (modern Usk)
Cabilonum	Gallo-Romano town (modern Châlon-sur-Saône)

Caesaromagus	Romano-British town (modern Chelmsford)
Calleva Atrebatum	Romano-British town (modern Silchester)
Camoludunum	Pre-historic tribal *oppida* near Colchester
Campania	Region of Roman Italy
Carvetti	Romano-British town (modern Carlisle)
Cataractonium	Romano-British small town (modern Catterick)
Clausentium	Romano-British port of Bitterne on Southampton water
Colonia Claudia Aea Agrippinensium	Romano town and regional capital (modern Cologne)
Colonia Victricensis	Romano-British town (modern Colchester)
Condate	Romano-British small town (modern Northwich)
Condatomagus	Town in southern France (modern La Graufesenque)
Corduba	Town and seaport in southern Iberia (modern Cordoba)
Corinium Dobunnorum	Romano-British town (modern Cirencester)
Corstopitum	Roman fort on Hadrian's Wall (Corbridge)
Dacia	Roman province in the Balkans (modern Romania)
Deva	Romano-British town (modern Chester)
Dubris	Romano-British town and seaport (modern Dover)
Durovernum Cantiacorum	Romano-British town (modern Canterbury)
Eboracum	Romano-British town (modern York)
Gesoriacum	Gallo-Romano town and seaport (modern Boulogne)
Glevum	Romano-British town (modern Gloucester)
Hispalis	Town and seaport in southern Iberia (modern Seville)

Isca	Roman legionary fortress (modern Caerleon)
Isca Dumnoniorum	Romano-British town (modern Exeter)
Iscalis	Romano-British lead mining centre (modern Charterhouse)
Juliobona	Gallo-Romano town and seaport (modern Lillebonne)
Lagentium	Romano-British town (modern Castleford)
Lemanis	Romano-British port (modern Lympne)
Lindum	Romano-British town (modern Lincoln)
Londinium	Romano-British provincial capital (modern London)
Luentinum	Romano-British gold mining centre (modern Dolaucothi)
Lugdunum	Gallo-Roman city (modern Lyon)
Luguvalium Carvetiorum	Romano-British town (modern Carlisle)
Lusitania	Region of Roman Iberia (modern Portugal)
Magna	Roman fort on Hadrian's Wall (Carvoran)
Massalia	Gallo-Roman city (modern Marseilles)
Mediolanum	Romano-British small town (modern Whitchurch)
Moguntiacum	Gallo-Roman city (modern Mainz)
Narbo	Gallo-Roman city (modern Narbonne)
Noviomagus Reginorum	Romano-British town (modern Chichester)
Olerica	Old Carlisle
Pergamum	Roman province in Asia Minor (part of modern Turkey)
Petuaria Parisiorum	Romano-British town (modern Brough-on-Humber)
Pisidia	Roman province in Asia Minor (part of modern Turkey)
Portus Namnentum	Gallo-Roman city (modern Nantes)

Ratae Corieltauvorum	Romano-British town (modern Leicester)
Rutupie	Romano-British town (modern Richborough)
Salinae	Romano-British towns (modern Droitwich & Middlewich)
Segendunum	Roman fort on Hadrian's Wall (Wallsend)
Sequana	Romano-Gaulish River (modern Seine)
Tabernae	Gallo-Roman city (modern Rheinzabern)
Tarraconensis	Region of Roman Iberia (part of modern Spain)
Tolisa	Gallo-Roman city (modern Toulouse)
Uriconium Cornoviorum	Romano-British town (modern Wroxeter)
Venta Belgarum	Romano-British town (modern Winchester)
Venta Silurum	Romano-British town (modern Caerwent)
Veratinum	Romano-British small town (modern Warrington)
Vereda	Roman fort and vicus on Hadrian's Wall (Old Penrith)
Verulamium	Romano-British town (modern St Albans)
Vindolanda	Roman fort on Hadrian's Wall (Chesterholm)

APPENDIX 3

SUMMARY OF ECONOMIC THEORIES USED

Theoretical Model	Context of Usage	Location
Characteristics of a market economy (Fearns, 1980)	Comparison of ancient and modern approaches to economic organization	Chapter 3
Circular flow of income and resources (Livesey, 1986)	Rôles of towns as 'central places'	Chapter 7
Comparative advantage (Ricardo, 1817)	Migration of samian production centres Development of Gaulish vine production	Chapter 4 Chapter 8
Economy, efficiency and effectiveness (Johnson & Scholes, 2002)	Motivational differences between state administrators and private merchants	Chapter 6
Factor endowment (Ohlin, 1933)	Relocation of samian kilns	Chapter 4
Fiscal stimulus (Hopkins, 1980)	Taxation-led change from subsistence based to surplus generating economy	Chapter 4
Import substitution (Kindleberger, 1968)	Replacement of imported colour-coated wares by domestic supplies	Chapter 11
Industrial location (Weber, 1929)	Relocation of samian kilns	Chapter 4
International product cycles (Vernon, 1966)	Italian imports of *terra sigillata* after production had migrated to Gaul	Chapter 4
New institutional economics (Coase, 1937; North, 1979)	Rôle of transaction costs in exchange Development of the Roman state as an economic actor	Chapter 3 Chapter 5
Superior goods (Veblen, 1899)	Demand for wine by pre-conquest Britain's tribal elites	Chapter 8
Satisficing approach (Lipsey, 1970)	Attitudes to risk and reward in the Roman period	Chapter 3
Vertical integration (Sloman, 2008)	Production and distribution of wine Production and distribution of olive-oil	Chapter 8 Chapter 10

APPENDIX 4

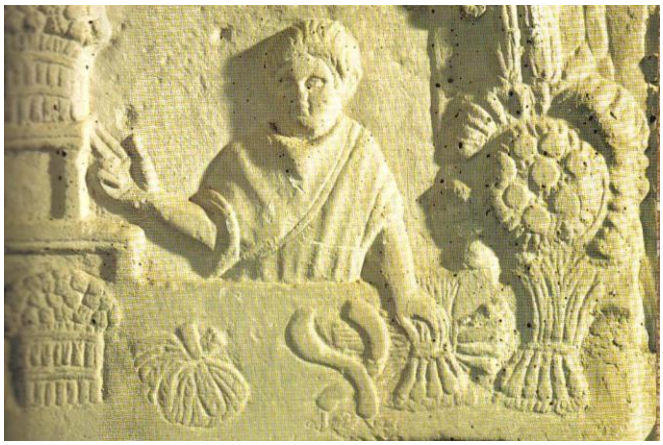
SUMMARY OF MARKETING THEORIES USED
(excluding supply-chain models)

Theoretical Model	Context of Usage	Location
Consumer behaviour (Lawson, 2000)	Behavioural characteristics of Romano-British urban residents Relational-based and transactional-based exchanges	Chapter 7 Chapter 3 Chapter 7
Distribution channel structures (Palmer, 2004)	Comparison of Romano-British and modern distribution structures	Chapter 6
Functional aspects of marketing (Borden, 1964)	Establishing the initial research parameters	Chapter 1
International product life-cycles (Wells, 1968; Hollensen, 2004)	*Terra sigillata* imports Imports of Rhenish beakers	Chapter 10 Chapter 11
Location of 'choke-points' in distribution networks	Merchants use of asymmetric knowledge to gain commercial advantage	Chapter 8
Logistical interfaces (Bradley, 1995)	Exploration of manufacturing, logistics and marketing relationships	Chapter 6
Marketing segmentation (Croft, 1994)	Opportunities for Romano-British retailers to target differing consumer types	Chapter 7
Product development and diffusion (Kotler, 1983)	Typological development of wine *amphorae* Typological development of olive-oil *amphorae* Typological development of *terra sigillata* forms	Chapter 9 Chapter 9 Chapter 10
Product life-cycle (Bass, 1964)	*Terra sigillata* production Imports of Rhenish beakers	Chapter 10 Chapter 11
Parallel distribution (Doole & Lowe, 2004)	Development of private commercial activities alongside state administered supply	Chapter 6

APPENDIX 5

FURTHER IMAGES OF ROMAN MERCHANTS

A) Roman Butcher's Shop

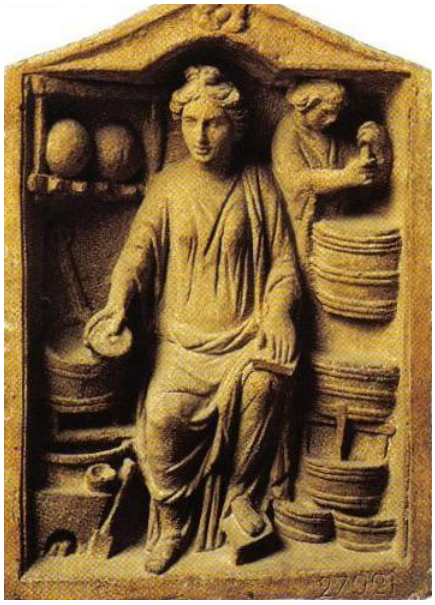


(After Branigan, 1980:95)

B) Roman Vintner's Shop

(After Liberati & Bourbon, 2005:64)

C) Roman Potter's Shop



(After Liberati & Bourbon, 2005:64)

D) Roman Street Market

(After Harris, 1980:217)

BIBLIOGRAPHY

Classical References

	Source	Dates	Works Cited
•	Appian	(c. AD 95-165)	*Hispania, Iberia*
•	Aristotle	(c. 4th century BC)	*The Ethics*; *The Politics*
•	Athenaeus	(late 2nd-ely 3rd C)	*Deiponosophistae*
•	Caesar	(c. 100-44 BC)	*De Bello* Gallico; *De Bello Africo*
•	Cassius Dio	(c. AD 155-229)	*Historia Romana*
•	Cato	(c. 234-149 BC)	*De Agri Cultura*
•	Cicero	(c. 106-43 BC)	*Ad Familiares* , *De Officiis*; *De Republica*, *Pro Fonteio*, *Verres*
•	Columella	(c. AD 18-70)	*De Re Rustica*
•	Diodorus Siculus	(c. 80-29 BC)	*Historia*
•	Galen	(c. AD 129-199)	*De Probis Pravisque Alimemtorum Succis*
•	Josephus	(c. AD 30-100)	*Bellum Iudaicum*
•	Palladius	(early 5th century)	*Opus Agricultura*
•	Petronius	(c. AD 27-66)	*Satyricon*
•	Philostratus	(c. AD 170-224)	*Vitae Apollonius*
•	Pliny the Elder	(c. AD 24-79)	*Naturalis Historia*
•	Pliny the Younger	(c. AD 61-112)	*Epistles*
•	Plato	(c. 4th century BC)	*The Laws*; *The Republic*
•	Plutarch	(c. AD 46-120)	*Cato Maior*, *Crassus*

- Polybius (c. 200-118 BC) *Historia*
- Sallust (c. 86-34 BC) *Bello Jugerthine*
- Strabo (c.64 BC-AD 23) *Geographica*
- Suetonius (c. AD 69-121) *Domitain*
- Tacitus (c. AD 56-113) *Agricola*
- Varro (c. 116-27 BC) *Rerum Rusticarum*
- Xenophon (c. 430-354 BC) *Hellenica* .

Modern References

- Abrams, P. & Wrigley, E. A. (editors) (1978) *Towns in Societies: Essays in Economic History and Historical Sociology*; Cambridge: Cambridge University Press.

- Adcock, D; Halbourg, A. & Ross, C. (2001) *Marketing, Principles and Practice* (4th edition); Harlow: Financial Times / Prentice Hall.

- Alcock, J. P. (1996) *Life in Roman Britain*; London: Batsford / English Heritage.

- Alcock, J. P. (2011) *A Brief History of Roman Britain*; London: Constable & Robinson Ltd.

- Alföldy, G. (1974) The Crisis of the Third Century as Seen by Contemporaries, *Greek, Roman and Byzantine Studies*; Volume 15, pp 89-111, [online]. Available from: http://grbs.library.duke.edu/article/view/9021/4625

- Allen, D. F. & Fulford, M. G. (1999) Fort Building and Military Supply Along Britain's Eastern Channel and North Sea Coasts: the Later Second and Third Centuries, *Britannia*; Volume 30; pp 163-184.

- Allason-Jones, L. (1991) *Roman and Native Interaction in Northumberland*, in Maxfield, V. A. & Dobson, M. J. (editors) (1991) *Roman Frontier Studies*, Exeter: University of Exeter Press; pp 1-5.

- Allason-Jones, L. (2008) *Daily Life in Roman Britain*; London: Greenwood World Publishing.

- Amemiya, T. (2005) *Comment on Davies*, in Manning, J. G. & Morris, I. (editors) (2005a) *The Ancient Economy: Evidence and Models*; Stamford: Stamford University Press; pp 157-160.

- Anderson, A. C. (1980) *A Guide to Roman Fine Wares*; Vorda Archaeological and Historical Publications.

- Anderson, A. C. (1981) *Some Continental Beakers of the First and Second Centuries AD*, in Anderson, A. C. & Anderson A. S. (editors) (1981) *Roman Pottery Research in Britain and North West Europe*; BAR (International Series) Monograph No 123, Oxford: British Archaeological Reports; pp 321-348.

- Anderson, A. C. & Anderson A. S. (editors) (1981) *Roman Pottery Research in Britain and North West Europe*; BAR (International Series) Monograph No 123, Oxford: British Archaeological Reports.

- Anderson, J. D. (1992) *Roman Military Supply in North East England*; BAR (British Series) Monograph No 224, Oxford: British Archaeological Reports.

- Ando, C. (2012) *Imperial Rome, AD 193-284 - the Critical Century*, Edinburgh: Edinburgh University Press.

- Andreau, J. (1999) *Banking and Business in the Roman World*; Cambridge: Cambridge University Press.

- Arthur, P. R. (1986) Roman Amphorae from Canterbury, *Britannia*, Volume 17; pp 239-258.

- Arthur, P. R. (1995) *Wine in the West: a View from Campania*, in Swaddling, J; Walker, S. & Roberts, P. (1995) *Italy in Europe: Economic Relations, 700 BC-AD50*, London: British Museum Press; pp 241-249.

- Arthur, P. R. & Marsh, G. (1978) *Early Fine Wares in Roman Britain*, BAR (British Series) Monograph No 57, Oxford: British Archaeological Reports.

- Arthur, P. R. & Williams, D. F. (1992) Campanian Wine, Roman Britain and the Third Century AD; *Journal of Roman Archaeology*, Volume 5; pp 250-260.

- Ashburner, W. (1909) *The Rhodian Sea Law*; Oxford: Clarendon Press.

- Atkinson, D. (1914) A Hoard of Samian Ware from Pompeii, *Journal of Roman Studies*; Volume 4, pp 26-64.

- Atkinson, D. (1942) *Report on the Excavations at Wroxeter (the Roman City of Viroconium) in the County of Salop, 1923-1927*; Birmingham: Birmingham Archaeological Society.

- Aubert, J. J. (1994) *Business Managers in Ancient Rome: a Social and Economic Study of Institores*; *200 BC-AD 250*; Leiden: E. J. Brill.

- Aubert, J. J. (2001) *The Fourth Factor: Managing Non-Agricultural Production in the Roman World*, in Mattingly, D. J. & Salmon, J. (editors) (2001a) *Economics beyond Agriculture in the Classical World*; London: Routeledge; pp 90-111.

- Aubert, J. J. & Sirks, B. (editors) (2002) *Speculum Juris: Roman Law as a Reflection of Social and Economic Life in Antiquity*; Ann Arbor: University of Michigan Press.

- Badian, E. (1983) *Publicans and Sinners: Private Enterprise in the Service of the Roman Republic*; London: Cornell University Press.

- Bagozzi, R. P; Rosa, J. A; Celly, K. S. & Coronel, F. (1998) *Marketing Management*; Upper Saddle River, N.J: Prentice Hall.

- Baker, M. J. (1996) *Marketing – an Introductory Text*, (6th edition); Basingstoke: Macmillan.

- Baker, M. J. (editor) (2000) *Marketing Theory and Practice*; London: Thomson Learning.

- Balsdon, J. P. V. D. (1970) *Rome: The Story of an Empire*; London: Weidenfeld and Nicolson.

- Barrett, J. C; Fitzpatrick, A. P. & Macinnes, I. (editors) (1989) *Barbarians and Romans in North West Europe*; BAR (International Series) Monograph No 471; Oxford: British Archaeological Reports.

- Bartles, R. (1962) *The Development of Marketing Thought*; Homewood, Illinois: Richard D. Irwin.

- Bartles, R. (1965) *Development of Marketing Thought: a Brief History*, in Sheth, J. & Garrett, D. (editors) (1986) *Marketing Theory: Classic and Contemporary Readings*; Cincinnati, Ohio: South-Western Publishing Company; pp 190-210.

- Bartles, R. (1988) *The History of Marketing Thought*; Columbus, Ohio: Publishing Horizons.

- Bass, F. (1969) A New Product Growth Model for Consumer Durables, *Management Services*; Volume 15; pp 215-227.

- Baxter, M. (2003) *Statistics in Archaeology*; London: Arnold.

- Berni Millet, P. (2008) *Epigrafia Anfórica de la Bética: Nuevas Formas de Análasis*; Barcelona: Universitat de Barcelona.

- Berry, B. L. J. (1967) *Geography of Market Centers and Retail Distribution*; Englewood Cliffs, N. J: Prentice Hall International.

- Bhaskar, R. (2008) *A Realist Theory of Science*; Abingdon: Routledge.

- Bidwell, P. T. (1979) *The Legionary Bath-House and Basilica and Forum at Exeter*, Exeter Archaeological Reports No1; Exeter: Exeter City Council & University of Exeter.

- Bidwell, P. T. (1997) *Roman Forts in Britain*; London: Batsford / English Heritage.

- Bidwell, P. T; Speak, S. & Phillipson, J. (1994) *Excavations at South Shields Roman Fort, Volume 1*; Newcastle upon Tyne: Society of Antiquaries of Newcastle upon Tyne.

- Bird, J. (1986) *The Samian Wares*, in Miller, L; Schofield, J & Rhodes, M. (1986) *The Roman Quay at St Magnus House, London: Excavations at New Fresh Wharf, Lower Thames Street London; 1974-78*; London: London & Middlesex Archaeological Society, Special Paper No 8; pp 139-185.

- Bird, J. (1987) Two Groups of Late Samian from London, *Rei Cretariae Romanae Fautorum Acta*; Volume 25/26; pp 325-330.

- Bird, J. (1995) 3rd Century Samian Ware in Britain, *Journal of Roman Pottery Studies*; Volume 6; pp 1-14.

- Bird, J. (editor) (1998) *Form and Fabric: Studies in Rome's Material Past in Honour of B. R. Hartley*; Oxbow Monograph No 80; Oxford: Oxbow Books.

- Bird, J. (2003) Samian Studies, 1985-1996: a Review, in Plouviez, J. (editor) (2003) Amphorae in Britain and the Western Empire; *Journal of Roman Pottery Studies*, Volume 10; Oxford: Oxbow Books; pp 117-124.

- Bird, J. (2011) *The Decorated Samian*, in Hill, J. & Rowsome, M. (2011) *Roman London and the Walbrook Stream Crossing: Excavations at 1 Poultry, City of London; Volume 2*: MOLAS Monograph No 37; London: Museum of London; pp 299-300.

- Bird, J. & Williams, D. F. (1983) German Marbled Flagons in Roman Britain, *Britannia*, Volume 14; pp 247-252.

- Birley, A. R. (1964) *Life in Roman Britain*; London: BCA / Batsford.

- Birley, A. R. (1979) *The People of Roman Britain*; London: Batsford.

- Birley, A. R. (1981) *The Economic Effects of Roman Frontier Policy*, in King, A. & Henig, M. (editors) (1981) *The Roman West in the Third Century*, BAR (Supplementary Series) Monograph No 109, Oxford: British Archaeological Reports; pp 39-53.

- Bishop, M. C. (editor) (1985a) *The Production and Distribution of Roman Military Equipment*; BAR (International Series) Monograph No 275; Oxford: British Archaeological Reports.

- Bishop, M. C. (1985b) *The Military Fabrica and the Production of Arms in the Early Principate*, in Bishop, M. C. (editor) (1985a) *The Production and Distribution of Roman Military Equipment*; BAR (International Series) Monograph No 275; Oxford: British Archaeological Reports; pp 1-42.

- Blagg, T. F. C. (1984) *An Examination of the Connexions Between Military and Civilian Architecture in Roman Britain*, in Blagg, T. F. C. & King, A. C. (editors) (1984) *Military and Civilian in Roman Britain*: *Cultural Relationships in a Frontier Province*; BAR Monograph No 136; Oxford: British Archaeological Reports; pp 249-263.

- Blagg, T. F.C. (1986) Roman Religious Sites in the British Landscape, *Landscape History*, Volume VIII; pp15-25.

- Blagg, T. F. C. & King, A. C. (editors) (1984) *Military and Civilian in Roman Britain*: *Cultural Relationships in a Frontier Province*; BAR (British Series) Monograph No 136; Oxford: British Archaeological Reports.

- Blagg, T. F.C. & Millett, M. J. (editors) (2002a) *The Early Roman Empire in the West*; Oxford: Oxbow Books.

- Blázquez, J. M. (1992) The Latest Work on the Export of Baetican Olive Oil to Rome and the Army; *Greece and Rome*, Volume 39; pp 173-188; [online]. Available from: http://ceipac.gh.ub.es/biblio/Data/A/0134.pdf.

- Blyth, J. (2005) *Essentials of Marketing*; Harlow: Pearson.

- Boardman, J; Griffin, J. & Murray, O. (editors) (1986) *The Oxford History of the Classical World*; Oxford: Oxford University Press.

- Bogaers, J. E. (1983) *Foreign Affairs*, in Hartley, B. R. & Wacher, J. (editors) (1983) *Rome and Her Northern Provinces*; Gloucester: Alan Sutton Ltd; pp13-32.

- Bongenaar, C. V. M. (2000) *Interdependency of Institutions and Private Entrepreneurs*; MOS Studies No 2; Leiden: Nederlands Instituut voor het Nabije Ooster District.

- Boon, G. C. (1967) Micaceous Sigillata from Lezoux, at Silchester, Caerleon and other Sites, *Antiquaries Journal*; Volume 47; pp 27-42.

- Boon, G. C. (1975) Segontium Fifty Years On, *Archaeologia Cambrenensis*; Volume 24; pp 52-67.

- Borden, H. N. (1964) The Concept of the Marketing Mix, *Journal of Advertising Research*; Volume 4; pp 7–12.

- Bowman, A. K. (1994) *Life and Letters on the Roman Frontier – Vindolanda and its People*; London: British Museum Press.

- Bowman, A. K. & Thomas, J. D. (1994) *The Vindolanda Writing Tablets (Tabulae Vindolandensis II)*; London: British Museum Press.

- Bowman, A. K. & Wilson, A. (editors) (2009a) *Quantifying the Roman Economy: Methods and Problems*; Oxford: Oxford University Press.

- Bowman, A. K. & Wilson, A. I. (2009b) *Quantifying the Roman Economy: Integration, Growth, Decline?* in Bowman, A. K. & Wilson, A. (editors) (2009a) *Quantifying the Roman Economy: Methods and Problems*; Oxford: Oxford University Press; pp 3-84.

- Boyd, H; Walker, O; Mullins, J. & Larréché, J. (2002) *Marketing Management – a Strategic Decision Making Approach*, (4th edition); New York: McGraw-Hill.

- Bradford, J. S. P. & Goodchild, R. G. (1939) Excavations at Frilford, 1937-8, *Oxoniensia*, Volume 4; pp 1-70.

- Bradley, F. (1995) *Marketing Management: Providing, Communicating and Delivering Value*; Hemel Hempstead: Prentice Hall International Ltd.

- Branigan, K. (1980) *Roman Britain – Life in an Imperial Province*; London: Readers Digest.

- Branigan, K. (1987) *The Catuvellauni*; Gloucester: Alan Sutton Publishing Ltd.

- Brassington, F. & Pettitt, S. (2003) *Principles of Marketing*, (3rd edition); Harlow: Financial Times / Prentice Hall.

- Brassington, M. (1975) A Reappraisal of the Western Enclave and Environs, Corstopitum; *Britannia*, Volume 6; pp 62-75.

- Braudel, F. (1979) *Les Jeux de L'Échange: Civilisation Materielle Économique et Capitalisme, XVe - XVIII siècle*; Paris: A. Colin.

- Braund, D. (1984) *Rome and the Friendly Kings: the Character of the Client Kingship*; London: Croom Helm.

- Breeze, D. J. (1977) *The Fort at Bearsden and the Supply of Pottery to the Roman Army*, in Dore, J. & Greene, K. T. (editors) (1977) *Roman Pottery Studies in Britain and Beyond*, BAR (International Series) Monograph No 30; Oxford: British Archaeological Reports; pp 133-145.

- Breeze, D. J. (1982) *The Northern Frontiers of Roman Britain*; London: BCA / Batsford.

- Breeze, D. J. (1984) *Demand and Supply on the Northern Frontier*, in Miket, R & Burgess, C. (editors) (1984) *Between and Beyond the Walls, Essays on the Prehistory and History of Roman Britain*; Edinburgh: John Donald Publishers Ltd; pp 264-286.

- Breeze, D. J. (1993) *The Logistics of Agricola's Final Campaign*, in Breeze, D. J. & Dobson, B. (editors) (1993) *Roman Officers and Frontiers*; Stuttgart: Franz Steiner Verlag; pp 574-595.

- Breeze, D. J. (2011) *Frontiers of the Roman Empire*; Barnsley: Pen & Sword Books Ltd.

- Breeze, D. J. & Dobson, B. (editors) (1993) *Roman Officers and Frontiers*; Stuttgart: Franz Steiner Verlag.

- Brett-Davies, M (2007) *Doing a Successful Research Project*; Basingstoke: Palgrave / Macmillan.

- Brewer, R. J. (editor) (2000) *Roman Fortresses and their Legions*; London: Society of Antiquaries of London.

- Brewster, H. N. (1972) Corbridge: Its Significance for the Study of Rhenish Wares, *Archaeology Aeliana*, (4th series); Volume 50, pp 205-216.

- Brigham, T. (1990) The Late Roman Waterfront in London, *Britannia*, Volume 21, pp 99-183.

- Brigham, T. (1998) *The Port of Roman London*, in Watson, B (1998) *Roman London, Recent Archaeological Work*, Journal of Roman Archaeology: Supplementary Series No 24: Portsmouth, Rhode Island; Journal of Roman Archaeology, pp 22-34.

- Brodribb, G. (1987) *Roman Brick and Tile*; Gloucester: Alan Sutton Publishing.

- Broekaert, W. (2011) *Partners in Business: Roman Merchants and the Political Advantages of Being a Collegiatus*; [online]. Available from; www.https/biblio.ugent.be/input/download?funct=downloadFile&recordOld=1040584&fil.

- Broekaert, W. (2013) *Navicularii et Negotiantes: a Prosoporographical Study of Roman Merchants and Shippers*; Rahde, Westf: Verlag Marie Leidorf.

- Bücher, K. (1893) *Die Entstehung der Volkswirtshaft, Vortrage*; Tübingen.

- Buckland, P. C. (1978) *Cereal Production, Storage and Population*, in Limbrey, S. & Evans, J. G. (editors) (1978) *The Effect of Man on the Landscape: the Lowland Zone*; CBA Monograph No 21, London: Council for British Archaeology; pp 43-46.

- Bulmer, M. (1979) An Introduction to Roman Samian Ware, *Journal of the Chester Archaeological Society*; Volume 62; pp 5-72.

- Burnett, A. M. (1990) Celtic Coins in Britain, III: the Waltham St Laurence Treasure Trove, *British Numismatic Journal*, Volume 60; pp 13-28.

- Burnham, B. C; Collis, J; Dobinson, C; Haselgrove, C. & Jones, M. (2001) *Themes for Urban Research; c. 100 BC to AD 200*, in James, S. & Millett, M. J. (editors) (2001) *Britons and Romans: Advancing the Archaeological Agenda*; CBA Research Report No 125; London: Council for British Archaeology; pp 67-76.

- Burnham, B. C. & Johnson, H. B. (editors) (1979) *Invasion and Response: the Case of Roman Britain*; BAR (British Series) Monograph No 73; Oxford: British Archaeological Reports.

- Burnham, B. C. & Wacher, J. (1990) *The 'Small Towns' of Roman Britain*, London: B. T. Batsford Ltd.

- Butler, R. M. (1971) *Soldier and Civilian in Roman Yorkshire*; Leicester: Leicester University Press.

- Callender, M. H. (1965) *Roman Amphorae: with Index and Stamps*; London: Oxford University Press.

- Cameron, A. (1993) *The Later Roman Empire*, London: Fontana Press.

- Campbell, J. B. (2002) *War and Society in Imperial Rome; 31 BC - AD 284*, London: Routledge.

- Carandini, A & Panella, A. (1981) *The Trading Connections of Rome and Central Italy in the Late Second and Third Centuries: the Evidence of the Terme Del Nuotatore Excavations, Ostia*, in King, A. & Henig, M. (editors) (1981) *The Roman West in the Third Century*, BAR (Supplementary Series) Monograph No 109, Oxford: British Archaeological Reports; pp 487-503.

- Carreras Monfort, C. (1994) *A Macroeconomic and Spatial Analysis of Long Distance Exchange*, Unpublished Ph D Thesis, University of Southampton. Accessed via University of Southampton Library (Thesis Supply Service).

- Carreras Monfort, C. (1998) Britannia and the Imports of Baetican and Lusitanian Amphora, *Journal of Iberian Archaeology* (1989); pp159-172; [online]. Available from: http://ceipac.ub.edu/biblio/Data/A/0021.pdf.

- Carreras Monfort, C. (1999) The Nature of Roman Trade: an Archaeological Perspective, *Münstersche Beitrage zur Antiken Handelgeschichte*; Volume 18 (2); pp 87-114.

- Carreras Monfort, C. (2000) *Economicá de la Britannia Romana: la Importación de Alimentos*; Barcelona: Pubilcación Universitat de Barcelona.

- Carreras Monfort, C. (2002) *The Roman Military Supply during the Principate: Transportation of Staples*, in Erdkamp, P (editor) (2002a) *The Roman Army and the Economy*; Amsterdam: J. C. Gieben; pp 70-89.

- Carreras Monfort, C (2010) *The Structure of Military Supply: an Explanatory Model*, in Carreras Monfort, C. & Morais, R. (2010) *The Western Roman Façade: a Study of the Economy and Trade in the Mar Exterior from the Republic to the Principate*; BAR (Supplementary Series) Monograph No 2162; Oxford: British Archaeological Reports, pp 119-134.

- Carreras Monfort, C. & Funari, P. P. A. (1998) *Britannia y el Meditarráneo: Estudios Sobre el Abastecimento de Aceite Bético y Africano en Britannia*; Barcelona: Universitat de Barcelona.

- Carreras Monfort, C. & Morais, R. (2010) *The Western Roman Façade: a Study of the Economy and Trade in the Mar Exterior from the Republic to the* P*rincipate*; BAR (Supplementary Series) Monograph No 2162; Oxford: British Archaeological Reports.

- Carreras Monfort, C. & Williams, D. F. (2003) Spanish Olive Oil Trade in Late Roman Britain: Dressel 23 Amphorae from Winchester, in Plouviez, J. (editor) (2003) Amphorae in Britain and the Western Empire; *Journal of Roman Pottery Studies*, Volume 10; Oxford: Oxbow Books; pp 64-68.

- Carver, E. (2001) *The Visibility of Imported Wine and its Associated Accoutrements in Later Iron Age Britain*; BAR (British Series) Monograph No 325; Oxford: British Archaeological Reports.

- Cary, M. (1967) *A History of Rome*; London: Macmillan & Co Ltd.

- Cassels, J. (1936) The Significance of Early Economic Thought in Marketing; *Journal of Marketing,* Volume 1 (2); pp 129-133.

- Cavusgil, S. T; Ghauri, P. N. & Agarwal, M. R. (2002) *Doing Business in Emerging Markets*; London: Sage Publications.

- Champion, T. (1989) *Centre and Periphery: Comparative Studies in Archaeology*, London: Routledge.

- Chenet, G. & Gaudron, G. (1955) La Céramique Sigilée d'Argonne des II et III Siecles; *Gallia,* Supplementary Volume No 6; Paris: Centre National de la Recherche Scientifique.

- Christopher, M (2004) *Supply Chains: a Marketing Perspective*, in New, S & Westbrook, R. (editors) (2004) *Understanding Supply Chains: Concepts, Critiques and Futures*; Oxford: Oxford University Press; pp 23-42.

- Christopher, M. & McDonald M. (1995) *Marketing – an Introductory Text*; Basingstoke: Macmillan.

- Christopher, M; McDonald, M. & Wills, G. (1980) *Introducing Marketing*; London: Pan Books.

- Clarke, D. L. (editor) (1972) *Models in Archaeology*; London: Methuen.

- Cleere, H. & Crossley, D. W. (1985) *The Roman Iron Industry of the Weald*; Leicester: Leicester University Press.

- Coase, R. H. (1937) *The Nature of the Firm*, reprinted in Williamson, O. E. & Winter, S. G. (editors) (1991) *The Nature of the Firm: Origins, Evolution and Development*; Oxford: Oxford University Press; pp 18-33.

- Coase, R. H. (1991) *Nobel Lecture: The Institutional Structure of Production*, reprinted in Williamson, O. E. & Winter, S. G. (editors) (1991) *The Nature of the Firm: Origins, Evolution and Development*; Oxford: Oxford University Press; pp 227-235.

- Collingwood, R. G. & Myres, J. N. L. (1937) *Roman Britain and the English Settlements*; Oxford: Clarendon Press.

- Collingwood, R. G. & Richmond, I. (1969) *The Archaeology of Roman Britain*, London: Methuen & Co Ltd.

- Collins, D. (editor) (1975) *The Origins of Europe*; London: Allen & Unwin.

- Collis, J. R. (1984) *The European Iron Age*; London: B. T. Batsford.

- Collis, J. & Hussey, R. (2003) *Business Research* (2nd edition); Basingstoke: Palgrave / Macmillan.

- Colman, D. & Young, T. (1997) *Principles of Agricultural Economics: Markets and Prices in Less Developed Countries*; Cambridge: Cambridge University Press.

- Cool, H. E. (2006) *Eating and Drinking in Roman Britain*; Cambridge: Cambridge University Press.

- Cooper, N. J. (2007) *Promoting the Study of Finds in Roman Britain: Democracy, Integration and Dissemination; Methodologies for the Future*, in Hingley, R. & Willis, S. H. (editors) (2007) *Roman Finds: Theory and Practice*; Oxford: Oxbow Books; pp 35-52.

- Corder, P. (1964) *The Structure of Romano-British Pottery Kilns*; CBA Research Report No 5; London: Council for British Archaeology.

- Corteault, P (1921) An Inscription Recently Found in Bordeaux; *Journal of Roman Studies*, Volume 11; pp 101-107.

- Cotton, M. A. (1956) Weycock Hill; 1953, *Berkshire Archaeological Society Journal*; Volume 55; pp 46-68.

- Coughlan, A. T; Anderson, E; Stern, L.W. & El-Ansary, A. I. (2001) *Marketing Channels*, (6th Edition), Upper Saddle River; N.J: Prentice Hall.

- Cowell, F. R. (1973) *Everyday Life in Ancient Rome*; London: B. T. Batsford Ltd.

- Cowell, R. (1969) *The Dominance of Rome: 616BC-AD629*; London: Hamlyn.

- Cox, P. W. & Hearne, C. M. (1991) *Redeemed from the Heath: the Archaeology of the Wytch Farm Oilfield; 1987-1990*, Dorset Natural History and Archaeological Society Monograph No 2; Dorchester: Dorset Natural History and Archaeological Society.

- Cracknell, S. & Mahany, C. (1994) *Roman Alcester: Southern Extramural Area, 1964-1966 Excavations*; CBA Monograph No 97; London: Council for British Archaeology.

- Creighton, J. (2006) *Britannia: the Creation of a Roman Province*; London: Routledge.

- Croft, M. (1994) *Market Segmentation*; London: Routledge.

- Crummy, P. (1988) *Colchester (Camulodunum / Colonia Victriciensis)*, in Webster, G, (editor) (1988a) *Fortress into City: the Consolidation of Roman Britain in the First Century AD*; London: B. T. Batsford Ltd; pp 24-47.

- Crummy, P. (1997) *City of Victory: the Story of Colchester – Britain's First Roman Town*, Colchester: Colchester Archaeological Trust.

- Cunliffe, B. W. (1978) *Hengistbury Head*; London: Paul Elek.

- Cunliffe, B. W. (1979) *Some Concluding Thoughts*, in Burnham, B. C. & Johnson, H. B. (editors) (1979) *Invasion and Response: the Case of Roman Britain*; British Archaeological Monograph No 73; Oxford: British Archaeological Reports; pp 359-365.

- Cunliffe, B. W. (1982) Britain, the Veneti and Beyond, *Oxford Journal of Archaeology*; Volume 1; pp 39-68.

- Cunliffe, B. W. (1984a) *Iron Age Wessex: Continuity and Change*, in Cunliffe, B. W. & Miles, D. (editors) (1984) *Aspects of the Iron Age in Central and Southern Britain*; University of Oxford Committee for Archaeology, Monograph No 8; Oxford: University of Oxford Committee for Archaeology; pp 12-45.

- Cunliffe, B. W. (1984b) *Relations Between Britain and Gaul in the First Century BC and Early First Century AD*, in Macready, S. & Thompson, F. H. (editors) (1984) *Cross-channel Trade between Gaul and Britain in the Late Pre-Roman Iron Age*; Society of Antiquaries Occasional Paper No 4; London: Society of Antiquaries; pp 3-23.

- Cunliffe, B. W. (1985) *Aspects of Urbanisation in Northern Europe*, in Grew, F. & Hobley, B. (editors) (1985) *Roman Urban Topography in Britain and the Western Empire*; CBA Monograph No 59; London: Council for British Archaeology; pp 1-5.

- Cunliffe, B. W. (1987) *Hengistbury Head, Dorset; Volume 1: the Prehistoric and Roman Settlement, 3,500 BC-AD 500*; University of Oxford Committee for Archaeology, Monograph No 13; Oxford: University of Oxford Committee for Archaeology.

- Cunliffe, B. W. (1988a) *Greece, Rome and the Barbarians: Spheres of Interaction*; London: BCA / Batsford.

- Cunliffe, B. W. (1988b) *The Temple of Sulis Minerva at Bath; Volume 2: Finds from the Sacred Spring*; Oxford University Committee for Archaeology, Monograph No 16, Oxford: Oxford University School of Archaeology.

- Cunliffe, B. W. (1988c) *Mount Batten, Plymouth; a Prehistoric and Roman Port*; Oxford University Committee for Archaeology, Monograph No 26; Oxford: Oxford University School of Archaeology.

- Cunliffe, B. W. (1992) *The Celtic World*; London: BCA / Constable.

- Cunliffe, B. W. (1994a) *The Oxford Illustrated Prehistory of Europe*; Oxford: Oxford University Press.

- Cunliffe, B. W. (1994b) After Hillforts, *Oxford Journal of Archaeology*; Volume 13; pp 71-84.

- Cunliffe, B. W. (1995) *Iron Age Britain*; London: BCA / Batsford.

- Cunliffe, B. W. (2001) *Facing the Ocean: the Atlantic and its People*; Oxford: Oxford University Press.

- Cunliffe, B. W. (2007) *Britain and the Continent: Networks of Interaction*, in Todd, M. (editor) (2007) *A Companion to Roman Britain*; Oxford: Blackwell Publishing Ltd; pp 1-11.

- Cunliffe, B. W. (2008) *Europe between the Oceans: Themes and Variations: 9000 BC-1000 AD*; New Haven: Yale University Press.

- Cunliffe, B. W. (2010) *Iron Age Communities in Britain*, (4th edition); London: Routledge.

- Cunliffe, B. W. & de Jersey, P. (1997) *Armorica and Britain: Cross-Channel Relationships in the First Millennium BC*; Oxford University Committee for Archaeology, Monograph No 45; Oxford: Oxbow Books.

- Cunliffe, B. W. & Miles, D. (editors) (1984) *Aspects of the Iron Age in Central and Southern Britain*; University of Oxford Committee for Archaeology; Monograph No 8; Oxford: Oxford University School of Archaeology; pp 191-204.

- Cunliffe, B. W. & Rowley, T. (editors) (1976) *Oppida: the Beginnings of Urbanisation in Barbarian Europe*; BAR (Supplementary Series) Monograph No 11; Oxford: British Archaeological Reports.

- Cunliffe, B. W. & Rowley, T. (editors) (1978a) *Lowland Iron Age Communities in Europe*; BAR (Supplementary Series) Monograph No 48; Oxford: British Archaeological Reports.

- Cunliffe, B. W. & Rowley, T. (1978b) *Settlement and Population in the British Iron Age: Some Facts, Figures and Fantasies*, in Cunliffe, B. W. & Rowley, T. (editors) (1978a) *Lowland Iron Age Communities in Europe*; BAR (Supplementary Series) Monograph No 48; Oxford: British Archaeological Reports, pp 3-24.

- Czinkota, M; Ronkainen, I; Moffett, M; Marinova, S & Marinov, M. (2009) *International Business - European Edition*; Chichester: John Wiley & Sons Ltd.

- Dannell, G. B. (1977) *The Samian from Bagendon*, in Dore, J. & Greene, K. T. (editors) (1977) *Roman Pottery Studies in Britain and Beyond*; BAR (Supplementary Series) Monograph No 30; Oxford: British Archaeological Reports; pp 229-234.

- Dannell, G. B. (1979) *Eating and Drinking in Pre-Conquest Britain: the Evidence of Amphora and Samian Trading and the Effect of the Invasion of Claudius*, in Burnham, B. C. & Johnson, H. B.(1979) *Invasion and Response: the Case of Roman Britain*; BAR (British Series) Monograph No 73*;* Oxford: British Archaeological Reports; pp 177-184.

- Dannell, G. B. (2002) *Law and Practice: Further Thoughts on the Organization of the Potteries at La Graufesenque*, in Genin, P. & Vernhet, A. (editors) (2002) *Céramiques de la Graufesenque et autres productions d'époque romaine: nouvelles recherches*; *hommages à Bettina Hoffmann*; Montagnac: Editions Monique Mergoil; pp 211-242.

- Dannell, G. B. & Mees, A. W. (2013) *New Approaches to Samian Distribution*, in Fulford, M. G. & Durham, E. (editors) (2013) *Seeing Red: New Economic and Social Perspectives on Gallo-Roman Terra Sigillata*, Institute of Classical Studies; Supplement No 102; London: Institute of Classical Studies; pp 165-187.

- Darling, M. J. (1977) *Pottery from the Early Military Sites in Western Britain*, in Dore, J. & Greene, K. (editors) (1977) *Roman Pottery Studies in Britain and Beyond*; BAR (International Series) Monograph No 30; Oxford: British Archaeological Reports; pp 57-100.

- Darling, M. J. (1998) *Samian from the City of Lincoln: a Question of Status*, in Bird, J. (editor) (1998) *Form and Fabric: Studies in Rome's Material Past in Honour of B. R. Hartley*; Oxbow Monograph No 80; Oxford: Oxbow Books; pp 169-177.

- Dark, K. & Dark, P. (1997) *The Landscape of Roman Britain*, Stroud: Sutton Publishing.

- D'Arms, J. H. (1981) *Commerce and Social Standing in Ancient Rome*, Cambridge; Mass: Harvard University Press.

- Daube, D. (1959) *Studies in the Roman Law of Sale*; London: Oxford University Press.

- Davies, B; Richardson, B. & Tomber, R. (1994) *The Archaeology of Roman London, Volume 5: a Dated Corpus of Early Roman Pottery from the City of London*, CBA Research Report No98; London: Council for British Archaeology.

- Davies, J. K. (1998) *Ancient Economies: Models and Muddles*, in Parkins, H. & Smith, C. (editors) (1998) *Trade, Traders and the Ancient City*; London: Routledge; pp 225-256.

- Davies, J. L. (1984) *Soldiers, Peasants and Markets in Wales and the Marches*, in Blagg, T. F. C. & King, A. C. (editors) (1984) *Military and Civilian in Roman Britain*: *Cultural Relationships in a Frontier Province*; BAR (British Series) Monograph No 136, Oxford: British Archaeological Reports; pp 93-127.

- Davies, R. W. (1971) The Roman Military Diet, *Britannia*; Volume 2; pp 122-139.

- de Blois, L. & Rich, J. (editors) (2002) *The Transformation of Economic Life under the Roman Empire*; Amsterdam: J. C. Gieben.

- de Blois, L. & Lo Cascio, E. (editors) (2007) *The Impact of the Roman Army (200 BC - 476 AD): Economic, Social, Political, Religious and Cultural Aspects*; Amsterdam: Brill Publishing.

- de Jersey, P. (1993) The Early Chronology of Alet and the Implications for Hengistbury Head and Cross-Channel Trade in the Iron Age, *Oxford Journal of Archaeology*; Volume 12 (3); pp 321-335.

- de la Bédoyère, G. (1991) *The Buildings of Roman Britain*; Stroud: Tempus.

- Delage, R. (2001) *Les structures de production des ateliers de potiers à Lezoux du I'er au IV' e sicle. Reflectes de l'evolution des strategies commerciales et de l'organisation du travaile'* in Polfer, M. (editor) (2001) *L'artisant romain: évolutions, continuités et ruptures (Italie et provinces occidentals)*; Monographies Instrumentum No 20; Montagnac: Éditions Monique Mergoil; pp117-135.

- de Ligt, L. (1993) *Markets and Fairs in the Roman Empire: Economic and Social Aspects of Periodic Trade in a Pre-Industrial Society*; Netherlands: Brill Academic Publishers.

- Detsicas, A. (editor) (1973) *Current Research in Romano-British Coarse Pottery*; CBA Research Report No 10; London: Council for British Archaeology.

- Dickinson, B. M. (1999) *Samian Stamps*, in Symonds, R. P. & Wade, S. (1999) *Roman Pottery from the Excavations at Colchester, 1971-1986*, Colchester Archaeological Report No 10, Colchester: Colchester Archaeological Trust, pp 120-136.

- Dickinson, B. M. & Hartley, K. F. (1971) *The Evidence of Potters' Stamps on Samian Ware and on Mortaria for the Trading Connections of Roman York*, in Butler, R. M. (editor) (1971) *Soldier and Civilian in Roman Yorkshire*; Leicester: Leicester University Press; pp 127-142.

- Dickinson, B. M. & Hartley, K. F. (2000) *The Samian*, in Rush, P; Dickinson, B. M; Hartley, B. R. & Hartley, K. F. (2000) *Roman Castleford Excavations; 1974-1985, Volume III, the Pottery*; Leeds: West Yorkshire Archaeological Service; pp 5-88.

- Dibb, S; Simkin, L; Pride, W. & Ferrell, O. (2006) *Marketing; Concepts and Strategies*, (5th edition); Boston, Ma: Houghton Mifflin.

- Dixon, D. F. (1979) Prejudice v Marketing? An Examination of Some Historical Sources, *Akron Business and Economic Review*; Volume 10 (3); pp 37-42.

- Doole, I. & Lowe, R. (2004) *International Marketing Strategy – Analysis, Development and Implementation*, (4th edition); London: Thomson.

- Dominguez, J. S. & Jimenez, L. N. (2014) Horrea, Representations in Roman Mosaics; Problems and Identification, *Lucentum*; Volume 33; pp 201-214.

- Dore, J. & Greene, K. (editors) (1977) *Roman Pottery Studies in Britain and Beyond*; BAR (International Series) Monograph No 30, Oxford: British Archaeological Reports.

- Dowling, J. H. (1979) The Goodfellows vs. the Dalton Gang: the Assumptions of Economic Anthropology, *Journal of Anthropological Research*; Volume 35; pp 292-308.

- Doyle, P. & Stern, P. (2006) *Marketing Management and Strategy* (4th edition); Harlow, Essex: Prentice Hall.

- Drinkwater, J. F. (1983) *Roman Gaul*; Beckenham: Croom Helm Ltd.

- Drummond, S. K. & Nelson, L. H (1994) *The Western Frontiers of Imperial Rome*; New York: M. E. Sharpe.

- Duncan-Jones, R. (1974) *The Economy of the Roman Empire: Quantitative Studies*; Cambridge: Cambridge University Press.

- Duncan-Jones, R. (1990) *Structure and Scale in the Roman Economy*; Cambridge: Cambridge University Press.

- Dunnett, B. R. K. (1975) *The Trinovantes*; London: Duckworth.

- Dunning, G. C. (1945) Two Fires of Roman London; *Antiquaries Journal*; Volume 25; pp 48-77.

- Durant, G. M. (1970) *Britain: Rome's Most Northerly Province - a History of Roman Britain, AD 43-AD 450*; London: G Bell and Sons Ltd.

- Easterby-Smith, M; Thorpe, R. & Lowe, A. (2002) *Management Research – an Introduction*, (2nd edition); London: Sage.

- Edbury, C. (2012) *Roman Shipwreck at Pudding Pan Rock, Kent*; [online]. Available from: http://britisharchaeology.ashmus.ox.ac.uk/highlights/pudding-pan.ht.

- Ellmers, D. (1978) *Shipping on the Rhine during the Roman Period; the Pictorial Evidence*, in Taylor, J. du Plat & Cleere, H (editors) (1978) *Roman Shipping and Trade: Britain and the Rhine Provinces*; CBA Research Report No 24; London: Council for British Archaeology; pp 1-14.

- Erdkamp, P. (1995) The Corn Supply of the Roman Armies during the Third and Second Centuries BC, *Historia*; Volume 44 (2); pp 168-191.

- Erdkamp, P (editor) (2002) *The Roman Army and the Economy*; Amsterdam: J. C. Gieben.

- Esmonde Cleary, S. (1990) *The Ending of Roman Britain*; Savage, Maryland: Barnes & Noble Inc.

- Espérandieu, E. (1907) *Recueil Général deBas-reliefs de la Gaule Romaine*; Paris: Imprimerie Nationale.

- Ettlinger, E. (1987) How was Arretine Ware Sold? *Rei Cretariae Romanae Fautorum Acta*; Volume 25/26; pp 5-19.

- Ettlinger, E; Hedinger, B; Hoffman, B; Kendrick, P. M; Pucci, G; Roth-Rubi, K; Schneider, G; Schnurbein, S; Wells, C. M. & Zabehlicky-Scheffenogger, S. (1990) *Conspectus Formae Terra Sigillatae Italico Modo Confactae*; Bonn: Rudold Habelt GMBH.

- EUROSTAT (2014) *File: Gross Value Added at Basic Prices 2001 and 2011 (% Share of Total Gross Value Added)* [online]. Available from: http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/File:Gross:

- Evans, A. K. B. (1981) *Pottery and History*, in Anderson, A. C. & Anderson A. S. (editors) (1981) *Roman Pottery Research in Britain and North West Europe*; BAR (International Series) Monograph No 123, Oxford: British Archaeological Reports; pp 517-535.

- Evans, J. (1989) *Crambeck: the Development of a Major Northern Pottery Industry:* in Wilson, P. R. (1989) *The Crambeck Pottery Industry*, Leeds: Yorkshire Archaeological Society.

- Evans, J. (1991) *Pottery in the Later Roman North: a Case Study*, in Jones, R. F. J. (editor) (1991) *Roman Britain – Recent Trends*; Sheffiel d: J. R. Collis / University of Sheffield Press; pp 49-52.

- Evans, J. (1993) Pottery Function and Finewares in the Roman North, *Journal of Roman Pottery Studies*; Volume 6; pp 95-118.

- Evans, J. (2002) *Pottery from the CfA Excavations*, in Wilson, P. R. (editor) (2002) *Caractonium: Roman Catterick and its Hinterlands, Excavations and Research, 1958-1997; Volume 1*; CBA Research Report No 128; London: Council for British Archaeology; pp 352-496.

- Farrar, R. A. H. (1973) *The Techniques and Sources of Romano-British Black-Burnished Ware*, in Detsicas, A. (editor) (1973) *Current Research in Romano-British Coarse Pottery*; CBA Research Report No 10; London: Council for British Archaeology; pp 67-103.

- Faulkner, N. (2001) *The Decline and Fall of Roman Britain*; Stroud: Tempus.

- Fearns, P. (1980) *Business Studies: an Integrated Approach*; London: Hodder and Stoughton.

- Ferguson, K. (2002) *Essential Economics*; Basingstoke: Palgrave.

- Fincham, G; Harrison, G; Holland, R. & Revell, L. (editors) (2000) *TRAC 99 - Proceedings of the Ninth Annual Theoretical Archaeology Conference*; Oxford: Oxbow Books.

- Findlay, R; Henriksson, R. G. H; Lindgren, H. & Lundahl, M. (editors) (2006) *Eli Heckscher, International Trade and Economic History*; Cambridge, Mass: MIT Press.

- Finley, M. I. (1965) Technical Innovation and Economic Progress in the Ancient World; *Economic History Review*; Volume 18 (1); pp 29-45.

- Finley, M. I. (1973) *The Ancient Economy*; London: Chatto & Windus Ltd.

- Finley, M. I. (1979) *The Ancient Economy*; London: Chatto & Windus Ltd.

- Finley, M. I. (1987) *Ancient History: Evidence and Models*; London: Peregrine Books Ltd.

- Finley, M. I. (1999) *The Ancient Economy*, (2nd edition); London: University of California Ltd.

- Fitzpatrick, A. P. (1985) The Distribution of Dressel 1 Amphorae in North West Europe, *Oxford Journal of Archaeology*; Volume 4 (3); pp 305-340.

- Fitzpatrick, A. P. (1989) *Cross-Channel Relations in the British Iron Age: with Particular Reference to the British Archaeological Evidence*. Unpublished Ph D Thesis, University of Durham. Available from: http://www.ethos.bl.uk/236322.

- Fitzpatrick, A. P. (1993) *Ethnicity and Exchange: Germans, Celts and Romans in the Late Iron Age*, in Scarre, C. & Healey, F. (editors) (1993) *Trade and Exchange in Prehistoric Europe*; Oxbow Monograph No 33; Oxford: Oxbow Books; pp 233-244.

- Fitzpatrick, A. P. (2003) Roman Amphorae in Iron Age Britain, in Plouviez, J. (editor) (2003) Amphorae in Britain and the Western Empire; *Journal of Roman Pottery Studies*, Volume 10; Oxford: Oxbow Books; pp 10-25.

- Fitzpatrick, A. P. & Timby, J. R. (2002) *Roman Pottery in Iron Age Britain*, in Woodward, A. B. & Hill, J. D. (editors) (2002) *Prehistoric Britain: the Ceramic Basis*; Oxford: Oxbow Books; pp 161-172.

- Forbes, H. A. & Foxall, L. (1978) The Queen of all Trees; Preliminary Notes on the Archaeology of the Olive; *Expedition*, Volume 21 (1); pp 37-47.

- Fowler, P. J. (1978) *Lowland Landscapes: Culture, Time and Personality*, in Limbrey, S. & Evans, J. G. (editors) (1978) *The Effect of Man on the Landscape: the Lowland Zone*; CBA Monograph No 21; London: Council for British Archaeology, pp 1-12.

- Foxall, G. R. (2000) *The Psychological Basis of Marketing*, in Baker, M. J. (editor) (2000) *Marketing Theory and Practice*; London: Thomson Learning; pp 86-101.

- France, N. E. & Gobel, B. M. (1985) *The Romano-British Temple at Harlow*; Gloucester: Alan Sutton.

- Frank, T. (1933-1940) *Economic Survey of Ancient Rome*; New York: John Hopkins University Press.

- Frank, T. (1937) *Economic Survey of Ancient Rome, Volume 3*; New York: John Hopkins University Press.

- Frank, T. (1962) *An Economic History of Rome*, (2nd Edition); New York: Cooper Square Publishers Incorporated.

- Frayn, J. (1993) *Markets and Fairs in Roman Italy: Their Social and Economic Importance from the Second Century BC to the Third Century AD*; Oxford: Clarendon Press.

- Frere, S. S. (1967) *Britannia – a History of Roman Britain*; London: Routledge & Kegan Paul.

- Frere, S. S. (1972) *Verulamium Excavations, Volume I*; Society of Antiquaries Research Report No 28; London: Society of Antiquaries.

- Frere, S. S. (1974) *Britannia – a History of Roman Britain*; London: Cardinal – Sphere Books.

- Fulford, M. G. (1973) The Distribution and Dating of New Forest Pottery, *Britannia*; Volume 4; pp 160-178.

- Fulford, M. G. (1975) *New Forest Roman Pottery: Manufacture and Distribution, with a Corpus of Pottery Types*; BAR (British Series) Monograph No 17; Oxford: British Archaeological Reports.

- Fulford, M. G. (1977a) *Pottery and Britain's Foreign Trade in the Later Roman Period*, in Peacock, D. P. S. (editor) (1977) *Pottery and Early Commerce: Characterization and Trade in Roman and Later Ceramics*; New York: Academic Press; pp 35-84.

- Fulford, M. G. (1977b) *The Location of Romano-British Pottery Kilns: the Institutional Trade and the Market*, in Dore, J. & Greene, K. (editors) (1977) *Roman Pottery Studies in Britain and Beyond*; BAR (International Series) Monograph No 30; Oxford: British Archaeological Reports; pp 301-316.

- Fulford, M. G. (1978) *The Interpretation of Britain's Late Roman Trade: the Scope of Medieval Historical and Archaeological Analogy*, in Taylor, J. du Plat & Cleere, H (editors) (1978) *Roman Shipping and Trade: Britain and the Rhine Provinces*; CBA Research Report No 24; London: Council for British Archaeology; pp 59-69.

- Fulford, M. G. (1981) *Roman Pottery: towards an Investigation of Economic and Social Change*, in Howard, H. & Morris, E. L. (editors) (1981) *Production and Distribution: a Ceramic Viewpoint*; BAR (International Series) Monograph No 120; Oxford: British Archaeological Reports; pp 195-208.

- Fulford, M. G. (1984) *Demonstrating Britannia's Economic Dependence in the First and Second Centuries*, in Blagg, T. F. C. & King, A. C. (editors) (1984) *Military and Civilian in Roman Britain*: *Cultural Relationships in a Frontier Province*; BAR (British Series) Monograph No.136; Oxford: British Archaeological Reports; pp 129-139.

- Fulford, M.G. (1989a) *The Economy of Roman-Britain*, in Todd, M. (editor) (1989) *Research in Roman Britain: 1960-89*; Britannia Monograph Series No 11; London: Society for the Promotion of Roman Britain; pp 175-201.

- Fulford, M. G. (1991) *Britain and the Roman Empire: the Evidence for Regional Long Distance Trade*, in Jones, R. F. J. (editor) (1991) *Roman Britain – Recent Trends*; Sheffield: J. R. Collis / University of Sheffield Press; pp 35-47.

- Fulford, M. G. (1992) Territorial Expansion and the Roman Empire, *World Archaeology*; Volume 23 (3); pp 294-305.

- Fulford, M. G. (2000) *The Organisation of Legionary Supply: the Claudian Invasion of Britain*, in Brewer, R. J. (editor) (2000) *Roman Fortresses and their Legions*; London: Society of Antiquaries of London; pp 41-49.

- Fulford, M. G. (2007) *Coasting Britannia: Roman Trade and Traffic Around the Shores of Britain*, in Gosden, C; Hamerow, H; de Jersey, P & Lock, G. (editors) (2007) *Communities and Connections: Essays in Honour of Sir Barry Cunliffe*; Oxford: Oxford University Press; pp 54-74.

- Fulford, M. G. (2013) *Gallo-Roman Sigillata; Fresh Approaches, Fresh Challenges, Fresh Questions*, in Fulford, M. G. & Durham, E. (editors) (2013) *Seeing Red: New Economic and Social Perspectives on Gallo-Roman Terra Sigillata*, Institute of Classical Studies; Supplement No 102; London: Institute of Classical Studies; pp 1-17.

- Fulford, M. G. (2014) Shop, Stalls and Stores: Pre-Consumption Deposits and Centrally Organized Distribution in Antonine Britain, *Britannia*; Volume 45; pp 279-284.

- Fulford, M. G. & Bird, J. (1975) Imported Pottery from Germany in Late Roman Britain, *Britannia*; Volume 6; pp 171-181.

- Fulford, M. G. & Durham, E. (editors) (2013) *Seeing Red: New Economic and Social Perspectives on Gallo-Roman Terra Sigillata*, Institute of Classical Studies; Supplement No 102; London: Institute of Classical Studies.

- Fulford, M.G. & Hodder, I. R. (1974) A Regression Analysis of Some Late Romano-British Pottery - a Case Study, *Oxoniensia*; Volume 39; pp 26-33.

- Fulford, M. G. & Huddleston, K. (1991) *The Current State of Romano-British Pottery Studies*; English Heritage Occasional Paper No 1, London: English Heritage.

- Fülle, G. (1997) The International Organization of the Arretine Terra Sigillata Industry: Problems of Evidence and Interpretation, *Journal of Roman Studies*; Volume 87; pp 111-155.

- Fullerton, R. A. (1988) How Modern is Modern Marketing? Marketing's Evolution and the Myth of the Production Era, *Journal of Marketing*; Volume 52 (1); pp 108-125.

- Funari, P. P A. (1994) Baetica and the Dressel 20 Production: an Outline of the Province's History; *Dialogues d'Histoire Ancienne*; Volume 20 (1); pp 78-105; [online]. Available from: http://www.persee.fr/web/revues/home/prescript/article/dha0755.

- Funari, P. P. A. (1996) *Dressel 20 Inscriptions from Britain and the Consumption of Spanish Olive Oil*; BAR (British Series) Monograph No 250; Oxford: British Archaeological Reports.

- Funari, P. P. A. (2002) *The Consumption of Olive Oil in Roman Britain and the Role of the Roman Army*, in Erdkamp, P. (editor) (2002) *The Roman Army and the Economy*; Amsterdam: J. C. Gieben; pp 235-263.

- Fusfeld, D. B. (1957) *Economic Theory Misplaced: Livelihood in Primitive Societies*, in Polanyi, K; Arensberg, C. M. & Pearson, H. W. (1957) *Trade and Market in the Early Empires*; New York: The Free Press; pp 342-356.

- Galliou, P. (1984) *Days of Wine and Roses? Early Armorica and the Atlantic Wine Trade*, in Macready, S. & Thompson, F. H. (editors) (1984) *Cross-channel Trade between Gaul and Britain in the Late Pre-Roman Iron Age*; Society of Antiquaries Occasional Paper No 4; London: Society of Antiquaries; pp 24-36.

- Galliou, P. & Jones, M. (1991) *The Bretons*; Oxford: Basil Blackwell Ltd.

- Galliou, P; Fulford, M. & Clément, M. (1980) La Diffusion de la Céramique 'à l'Éponge' dans le Nord-Ouest de l'Empire Romain, *Gallia*; Volume 38 (2); pp 265-278 [online]. Available from: http://www.persee.fr/web/revues/home/prescript/article/gallia_0016-4119_1980_num_38_2_1802.

- Garcia Vargas, E. (2010) *Formal Romanisation and the Atlantic Projection of Amphorae from the Guadalquivir Valley*, in Carreras Monfort, C. & Morais, R. (editors) (2010) *The Western Roman Atlantic Façade: a Study of the Economy and Trade in the Mar Exterior from the Republic to the Principate*; BAR (International Series) Monograph No 2162; Oxford: British Archaeological Reports; pp 55-65.

- Gardner, A. N. (2001) *'Military' and 'Civilian' in Late Roman Britain: an Archaeology of Social Identity*, Unpublished Ph D Thesis, Institute of Archaeology; University College London. Available from: http://www.ethos.bl.uk/248234.

- Garnsey, P. (1983) *Grain for Rome*, in Garnsey, P; Hopkins, K. & Whittaker, C. (editors) (1983) *Trade in the Ancient Economy*; London: Chatto & Windus; pp 118-130.

- Garnsey, P; Hopkins, K. & Whittaker, C. (editors) (1983) *Trade in the Ancient Economy*; London: Chatto & Windus.

- Garnsey, P. & Saller, R. (1987) *The Roman Empire, Economy, Society and Culture*; Berkeley: University of California Press.

- Garnsey, P. & Whittaker, C. (editors) (1983) *Trade and Famine in Classical Antiquity*; Cambridge: Cambridge Philological Society.

- Genin, P. & Vernhet, A. (editors) (2002) *Céramiques de la Graufesenque et autres productions d'époque romaine: nouvelles recherches*; *hommages à Bettina Hoffmann*; Montagnac: Editions Monique Mergoil.

- Gerrard, J. (2008) *Feeding the Army from Dorset: Pottery, Salt and the Roman State*, in Stallibrass, S. & Thomas, R. (editors) (2008) *Feeding the Roman Army: the Archaeology of Production and Supply in N W Europe*; Oxford: Oxbow Books; pp 116-127.

- Ghauri, P. & Grønhaug, K. (2002) *Research Methods in Business Studies* (2nd edition); Harlow, Essex: Financial Times / Prentice Hall.

- Gianfrotta, P. A; Nieto, X; Pomey, P. & Tchernia, A. (1997) *La Navigation dans L'Antiquité*; Aix-en-Provence: Édisud.

- Gillam, J. P. (1973) *Sources of Pottery Found on Northern Military Sites*, in Detsicas, A. (editor) (1973) *Current Research in Romano-British Coarse Pottery*; CBA Research Report No 10; London: Council for British Archaeology; pp 53-62.

- Gleason, M. (1999) *Elite Male Identity in the Roman Empire*, in Potter, D. & Mattingly, D. (editors) (1999) *Life, Death and Entertainment in the Roman Empire*; Michigan: University of Michigan Press; pp 67-84.

- Going, C. J. (1992) Economic Long Waves in the Roman Period? A Reconnaissance of the Romano-British Ceramic Evidence; *Oxford Journal of Archaeology*; Volume 11 (1); pp 93-117.

- Goldsmith, R. W. (1984) An Estimate of the Size and Structure of the National Product of the Early Roman Empire, *Review of Income and Wealth*, Volume 30; pp 263-288.

- Goodchild, R. G. & Kirk, J. R. (1954) The Romano-Celtic Temple at Woodeaton, *Oxoniensia*; Volume 19; pp 15-37.

- Goodman, P. J. (2013) *The Production Centres: Settlement Hierarchies and Spatial Distribution*, in Fulford, M. G. & Durham, E. (editors) (2013) *Seeing Red: New Economic and Social Perspectives on Gallo-Roman Terra Sigillata*, Institute of Classical Studies; Supplement No 102; London: Institute of Classical Studies; pp 121-136.

- Gosden, C; Hamerow, H; de Jersey, P. & Lock, G. (editors) (2007) *Communities and Connections: Essays in Honour of Sir Barry Cunliffe*; Oxford: Oxford University Press.

- Greene, J. P. (1975) *Bath and Other Small Western Towns*, in Rodwell, W. & Rowley, T.(editors) (1975) *Small Towns of Roman Britain*; BAR (British Series) Monograph No 15; Oxford: British Archaeological Reports; pp 131-138.

- Greene, K. T. (1973) *The Pottery from Usk*, in Detsicas, A. (editor) (1973) *Current Research in Romano-British Coarse Pottery*; CBA Research Report No 10; London: Council for British Archaeology; pp 25-37.

- Greene, K. T. (1978) *Roman Trade between Britain and the Rhine Provinces: the Evidence of Pottery to c. AD 250*, in Taylor, J. du Plat & Cleere, H (editors) (1978) *Roman Shipping and Trade: Britain and the Rhine Provinces*; CBA Research Report No 24; London: Council for British Archaeology; pp 52-58.

- Greene, K. T. (1979a) *Invasion and Response: Pottery and the Roman Army*, in Burnham, B. C. & Johnson, H. B. (editors) (1979) *Invasion and Response: the Case of Roman Britain*; BAR (British Series) Monograph No 73; Oxford: British Archaeological Reports; pp 99-106.

- Greene, K. T. (1979b) *Report on the Excavations at Usk, 1965-1976: the Pre-Flavian Fine Wares*; Cardiff: University of Wales Press.

- Greene, K. T. (1982) Terra Sigillata: Imitations and Alternatives, *Rei Cretariae Romanae Fautorum Acta*; Volume 21/22; pp 71-78.

- Greene, K. T. (1986) *The Archaeology of the Roman Economy*; London: Batsford.

- Greenfield, E. (1963) The Romano-British Shrines at Bridgstock, Northants; *Antiquaries Journal*; Volume 43; pp 228-263.

- Grew, F. & Hobley, B. (editors) (1985) *Roman Urban Topography in Britain and the Western Empire*; CBA Monograph No 59; London: Council for British Archaeology.

- Griseri, P (2002) *Management Knowledge – a Critical Review*; Basingstoke, Hampshire: Palgrave.

- Grønhaug, K. (2000) *The Sociological Basis of Marketing*, in Baker, M. J. (editor) (2000) *Marketing Theory and Practice*; London: Thomson Learning; pp 102-118.

- Hanson, W. S. & Macinnis, L. (1991) *Soldiers and Settlement in Wales and Scotland*, in Jones, R. F. J. (editor) (1991) *Roman Britain – Recent Trends*; Sheffield: J. R. Collis / University of Sheffield Press; pp 85-92.

- Harris, N. (1980) *The Greeks and Romans*; London: Hamlyn / W. H. Smith.

- Harris, W. V. (editor) (1993a) *The Inscribed Economy: Production and Distribution in the Roman Empire in the Light of Instrumentum Domesticum*, Journal of Roman Archaeology: Supplementary Series No 6; Portsmouth, Rhode Island: Journal of Roman Archaeology.

- Harris, W. V. (1993b) *Between Archaic and Modern: Some Current Problems in the History of the Roman Economy*, in Harris, W. V. (editor) (1993a) *The Inscribed Economy: Production and Distribution in the Roman Empire in the Light of Instrumentum Domesticum*, Journal of Roman Archaeology: Supplementary Series No 6; Portsmouth, Rhode Island: Journal of Roman Archaeology; pp 11-29.

- Harris, W. V. (editor) (2011) *Rome's Imperial Economy: Twelve Essays*, Oxford: Oxford University Press.

- Hartley, B. R. (1969) *Samian Ware or Terra Sigillata*, in Collingwood, R. G. & Richmond, I. R. (1969) *The Archaeology of Roman Britain*; London: Methuen & Co Ltd; pp 235-251.

- Hartley, B. R. (1977) *Some Wandering Potters*, in Dore, J. & Greene, K. (editors) (1977) *Roman Pottery Studies in Britain and Beyond*; BAR (International Series) Monograph No 30; Oxford: British Archaeological Reports; pp 251-261.

- Hartley, B. R. (1982) *Pottery Stamps on Samian*, in Leach, P. (1982) *Illchester, Volume 1: the Excavations, 1974-1975*; Bristol: Western Archaeological Trust, pp 131-132.

- Hartley, B. R. (1994) *The Samian*, in Hartley, B. R; Pengelly, H; Dickinson, B; Cracknell, S. & Mahany, C. (1994) *Roman Alcester, the Southern Extramural Area Excavations 1964-1966; Part 2, Finds and Discussion*; CBA Research Report No 97; London: Council for British Archaeology; pp 93-119.

- Hartley, B. R. & Dickinson, B. M (1982) *The Samian*, in Wacher, J. S. & McWhirr, A. D. (1982) *Early Occupation at Cirencester, Cirencester Excavations Volume 1*; Cirencester: Cirencester Excavation Committee / Corinium Museum; pp 119-146.

- Hartley, B. R. & Dickinson, B; with Dannell, G. (2008-2012) *Names on Terra Sigillata: an Index of Makers' Stamps and Signatures on Gallo-Roman Terra Sigillata*; London: University of London; Institute of Classical Studies.

- Hartley, B. R; Pengelly, H; Dickinson, B; Cracknell, S. & Mahany, C. (1994) *Roman Alcester, the Southern Extramural Area Excavations 1964-1966; Part 2, Finds and Discussion*; CBA Research Report No 97; London: Council for British Archaeology.

- Hartley, B. R. & Wacher, J. (editors) (1983) *Rome and Her Northern Provinces*; Gloucester: Alan Sutton Ltd.

- Hartley, K. F. (1973) *The Marketing and Distribution of Mortaria*, in Detsicas, A. (editor) (1973) *Current Research in Romano-British Coarse Pottery*; CBA Research Report No 10; London: Council for British Archaeology; pp 39-51.

- Haselgrove, C. C. (1976) *External Trade as a Stimulus to Urbanisation*, in Cunliffe, B. W. & Rowley, T. (editors) (1976) *Oppida: the Beginnings of Urbanisation in Barbarian Europe*; BAR (Supplementary Series) Monograph No 11; Oxford: British Archaeological Reports; pp 25-49.

- Haselgrove, C. C. (1982) *Wealth, Prestige and Power: The Dynamics of Late Iron Age Political Centralization in South-east England*, in Renfrew, C. & Shennan, S. (editors) (1982) *Ranking, Resource and Exchange: Aspects of the Archaeology of Early European Society*; Cambridge: Cambridge University Press; pp 79-88.

- Haselgrove, C. C. (1984) *Romanization Before the Conquest*, in Blagg, T. F. C. & King, A. C. (editors) (1984) *Military and Civilian in Roman Britain*: *Cultural Relationships in a Frontier Province*; BAR (British Series) Monograph No 136; Oxford: British Archaeological Reports; pp 5-63.

- Haselgrove, C. C. (1987a) *Culture Process on the Periphery: Belgic Gaul and Rome During the Late Republic and Early Empire*, in Rowlands, M; Larsen, M. & Kristiansen, K. (editors) (1987) *Centre and Periphery in the Ancient World*; Cambridge: Cambridge University Press; pp 104-124.

- Haselgrove, C. C. (1987b) *Iron Age Coinage in South East England*; BAR (British Series) Monograph No 174; Oxford: British Archaeological Reports.

- Hassall, M. W. C. (1978) *Britain and the Rhine Provinces: Epigraphic Evidence of Roman Trade*, in Taylor, J. du Plat & Cleere, H (editors) (1978) *Roman Shipping and Trade: Britain and the Rhine Provinces*; CBA Research Report No 24; London: Council for British Archaeology; pp 41-48.

- Hatton, A. & Oldroyd, M. (1992) *Economic Theory and Marketing Practice*; Oxford: Butterworth-Heinemann.

- Hawkes, C. F. C. & Hull, M. R. (1947) *Camulodunum: First Report on the Excavations at Colchester, 1930-1939*; Society of Antiquaries Research Report No 14; London: Society of Antiquaries.

- Hawkins, C. (2012) *Manufacturing*, in Scheidel, W. (editor) (2012a) The *Cambridge Companion to the Roman Economy*; Cambridge: Cambridge University Press; pp 175-194.

- Hayes, J. W. (1972) *Late Roman Pottery*, Rome: British School at Rome.

- Haynes, I. (2002) *Britain's First Information Revolution: the Roman Army and the Transformation of Economic Life*, in Erdkamp, P (editor) (2002) *The Roman Army and the Economy*; Amsterdam: J. C. Gieben; pp 111-126.

- Heeler, R. M. & Chung, E. K. (2000) *The Economic Basis of Marketing*, in Baker, M. J. (editor) (2000) *Marketing Theory and Practice*; London: Thomson Learning; pp 63-85.

- Hekster, O. (2008) *Rome and its Empire, AD 193-284*; Edinburgh: Edinburgh University Press.

- Helbaek, H. (1964) The Isca Grain: a Roman Plant Introduced in Britain, *New Phytologist*; Volume 63 (2); pp 158-164.

- Henig, M, (1975) *The Character of Ancient Ideals*, in Collins, D. (editor) (1975) *The Origins of Europe*; London: Allen & Unwin; pp 230-235.

- Henig, M. (1995) *Religion in Roman Britain*; London: B. T. Batsford Ltd.

- Hermet, F. (1934) *La Graufesenque (Condatomagus)*; Paris: E. Leroux.

- Higham, N. J. (1989) *Roman and Native North of the Tees*, in Barrett, J. C; Fitzpatrick, A. P. & Macinnes, I. (editors) (1989) *Barbarians and Romans in North West Europe*; BAR (International Series) Monograph No 471; Oxford: British Archaeological Reports; pp 153-174.

- Higham, N. J. (1991) *Soldiers and Settlement in Northern England*, in Jones, R. F. J. (editor) (1991) *Roman Britain – Recent Trends*, Sheffield: J. R. Collis / University of Sheffield Press; pp 93-101.

- Higham, N. J. (editor) (2001) *Archaeology of the Roman Empire: a tribute to the life and works of Barri Jones*; BAR (International Series) Monograph No 940; Oxford: British Archaeological Reports.

- Hill, J. & Rowsome, M. (editors) (2011) *Roman London and the Walbrook Stream Crossing: Excavations at 1 Poultry and Vicinity, City of London; Volume 2*; MOLAS Monograph No 37; London: Museum of London.

- Hill, S. & Ireland, S. (2006) *Roman Britain*, London: Bristol Classical Press.

- Hinchcliffe, J. & Williams, J. H. (1992) *Roman Warrington: Excavations at Wilderspool, 1966-9 & 1976*; Brigantia Monograph No 2; Manchester: Department of Archaeology, University of Manchester.

- Hingley, R. (1985) Location, Function and Status: a Romano-British 'Religious Complex' at the Noah's Ark Inn, Frilford (Oxfordshire), *Oxford Journal of Archaeology*; Volume 4 (2); pp 201-214.

- Hingley, R. (1989) *Rural Settlement in Roman Britain*; London: B.A. Seaby Ltd.

- Hingley, R. & Willis, S. H. (editors) (2007) *Roman Finds: Theory and Practice*; Oxford: Oxbow Books.

- Hirth, K. G. (1978) Inter-Regional Trade and the Formation of Prehistoric Gateway Communities, *American Antiquity*, Volume 43 (1); pp 35-45.

- Hitchner, R. B. (2002) *Olive Production and the Roman Economy: the Case for Intensive Growth in the Roman Economy*, in Scheidel, W. & von Reden, S. (2002a) *The Ancient Economy*, Edinburgh: Edinburgh University Press; pp 71-83.

- Hitchner, R. B. (2005) *The Advantages of Wealth and Luxury*, in Manning, J. G. & Morris, I. (2005a) *The Ancient Economy: Evidence and Models*; Edinburgh: Edinburgh University Press; pp 207-222.

- Hobbs, R. & Jackson, R (2010) *Roman Britain*; London: British Museum Press.

- Hodder, I. R. (1972) *Locational Models and the Study of Romano-British Settlement*, in Clarke, D. L. (editor) (1972) *Models in Archaeology*; London: Methuen; pp 887-907.

- Hodder, I. R. (1974a) Some Marketing Models for Romano-British Coarse Pottery; *Britannia*; Volume 5; pp 340-359.

- Hodder, I. R. (1974b) The Distribution of Two Types of Romano-British Coarse Pottery, *Sussex Archaeological Collection*, Volume 112; pp 86-96.

- Hodder, I. R. (1974c) The Distribution of Savernake Ware; *Wiltshire Archaeological and Natural History Magazine*; Volume 69; pp 67-84.

- Hodder, I, R. (1979) *Pre-Roman and Romano-British Tribal Economies*, in Burnham, B. C. & Johnson, H. B. (editors) (1979) *Invasion and Response: the Case of Roman Britain*; BAR (British Series) Monograph No 73; Oxford: British Archaeological Reports; pp 189-196.

- Hodder, I. R. (1999) *The Archaeological Process*; Oxford: Blackwell.

- Hodder, I. R. & Hassall, M. (1971) The Non-Random Spacing of Romano-British Walled Towns; *Man*, Volume 6 (3); pp 391-407.

- Hodder, I. R. & Orton, C. (1976) *Spatial Analysis in Archaeology*; Cambridge: Cambridge University Press.

- Hodges, R. (1989) *Dark Age Economics*; London: Gerald Duckworth & Co Ltd.

- Hofmann, B. (1974) Les Secteurs de Vente de la Céramiques Sigilée de 1er Siècle de Notre Èra, *Forum*; Volume 4; pp 9-11.

- Holder, P. A. (1982) *The Roman Army in Britain*; London: B. A. Batsford Ltd.

- Hollander, S. C; Rassuli, K. M; Jones, D. G. B, & Dix, L. F. (2005) Periodization in Marketing History, *Journal of Macromarketing*; Volume 25 (1); pp 32-41.

- Hollensen, S. (2004) *Global Marketing – a Decision Oriented Approach*, (3rd edition); Harlow: Pearson.

- Holleran, C. (2012) *Shopping in Ancient Rome: the Retail Trade in the Late Republic and the Principate*; Oxford: Oxford University Press.

- Holman, D. (2005) Iron Age Coinage and Settlement in East Kent; *Britannia*; Volume 36; pp 1-54.

- Hopkins, K. (1978) *Economic Growth and Towns in Classical Antiquity*, in Abrams, P. & Wrigley, E. A. (editors) (1978) *Towns in Societies: Essays in Economic History and Historical Sociology*; Cambridge: Cambridge University Press; pp 35-77.

- Hopkins, K. (1980) Taxes and Trade in the Roman Empire (200BC – AD 400); *Journal of Roman Studies*; Volume 70; pp 101–125.

- Hopkins, K. (1983a) *Introduction* to Garnsey, P; Hopkins, K. & Whittaker, C. (editors) (1983) *Trade in the Ancient Economy*; London: Chatto & Windus; pp *ix-xxv*.

- Hopkins, K. (1983b) *Models, Ships and Staples*, in Garnsey, P. & Whittaker, C. (editors) (1983) *Trade and Famine in Classical Antiquity*; Cambridge: Cambridge Philological Society; pp 84-109.

- Hopkins. K. (1995/1996) Rome, Taxes, Rents and Trade; *Kodai: Journal of Ancient History*, Volume VI/VII; reprinted in Scheidel, W. & von Reden, S. (editors) (2002a) *The Ancient Economy*; Edinburgh: Edinburgh University Press; pp 190-230

- Howard, H. & Morris, E. L. (editors) (1981) *Production and Distribution: a Ceramic Viewpoint*; BAR (International Series) Monograph No 120; Oxford: British Archaeological Reports.

- Howgego, C. (1992) The Supply and Use of Money in the Roman World; *Journal of Roman Studies*; Volume 82; pp 1-31.

- Hughes, R. (2009) *Distribution of Stamped Dressel 20 Amphorae Produced at Axati in Roman Baetica*. Unpublished M.A. Thesis; Ontario, Wilfrid Laurier University. Access obtained courtesy of the author.

- Hull, M. R. (1958) *Roman Colchester*; Society of Antiquaries Research Report No 20; London: Society of Antiquaries.

- Hull, M. R. (1963) *Roman Pottery Kilns of Colchester:* Society of Antiquaries Research Report No 21; London: Society of Antiquaries.

- Hurst, H. (1985) *Kingsholm*; Gloucester Archaeological Reports No1; Cambridge: Gloucester Archaeological Publications Ltd.

- Hurst, H. (1988) *Gloucester (Glevum)*, in Webster, G. (editor) (1988a) *Fortress into City: the Consolidation of Roman Britain in the First Century AD*; London: B. T. Batsford Ltd; pp 48-73.

- James, S. & Millett, M. J. (editors) (2001) *Britons and Romans: Advancing the Archaeological Agenda*; CBA Research Report No 125; London: Council for British Archaeology.

- Jefferson, T. O; Dannell, G. B. & Williams, D. F. (1981) *The Production and Distribution of Terra Sigillata in the Area of Pisa, Italy*, in Anderson, A. C. & Anderson A. S. (editors) (1981) *Roman Pottery Research in Britain and North West Europe*; BAR (International Series) Monograph No 123; Oxford: British Archaeological Reports; pp 161-172.

- Jessop, D. & Morrison, A. (1994) *Storage and Supply of Materials for Commerce, Industry and Public Undertakings*, (6th edition); London: Pitman.

- Johnson, A. (1983) *Roman Forts in the 1st and 2nd Centuries AD in Britain and the German Provinces*; London: A. & C. Black.

- Johnson, S. (1980) *Later Roman Britain*; London: BCA / Routledge & Kegan Paul.

- Johnson, G. & Scholes, K. (2002) *Exploring Corporate Strategy*, (6th edition); Harlow: Financial Times / Prentice Hall.

- Jones, A. H. M. (1964) *The Later Roman Empire, 284-602: a Social, Economic and Administrative Survey*; Oxford: Blackwell.

- Jones, A. H. M. (1974) *The Roman Economy: Studies in Ancient Economic and Administrative History*; Oxford: Blackwell.

- Jones, B. & Mattingly, D. (1993) *An Atlas of Roman Britain*; Oxford: Blackwell Publishers.

- Jones, D. G. B. & Shaw, E. H. (2002) *A History of Marketing Thought*, in Weitz, B. & Wensley, R. (editors) (2002) *Handbook of Marketing*; London: Sage Publications Ltd; pp 39-65.

- Jones, J. E. (2012) *The Maritime Landscape of Roman Britain: Water Transport on the Coasts and Rivers of Britannia*; BAR (British Series) Monograph No 556; Oxford: British Archaeological Reports.

- Jones, M. J. (1988) *Lincoln (Lindum)*, in Webster, G. (editor) (1988a) *Fortress into City: the Consolidation of Roman Britain in the First Century AD*; London: B. T. Batsford Ltd; pp 145-165.

- Jones, M. J. & Darling, M. J. (1988) Early Settlement in Lincoln; *Britannia*; Volume 19; pp 1-57.

- Jones, M. J. & Wacher, J. S. (1987) *The Roman Period*, in Schofield, R. & Leech, J. (editors) (1987) *Urban Archaeology in Britain*; CBA Research Report No 61: London: Council for British Archaeology; pp 27-45.

- Jones, R. F. J. (1990) *Natives and the Roman Army: Three Model Relationships*, in Vetters, H. & Kandler, M. (editors) (1990) *International Limeskongresses (1986): Carnuntum*; Vienna: Verlag der Österreich ischen Akadamie der Wissenschaften; pp 99-110.

- Jones, R. F. J. (editor) (1991a) *Roman Britain – Recent Trends*; Sheffield: J. R. Collis / University of Sheffield Press.

- Jones, R. F. J. (1991b) *The Urbanisation of Roman-Britain*, in Jones, R. F. J. (1991a) *Roman Britain – Recent Trends*; Sheffield: J. R. Collis / University of Sheffield Press; pp 53-65.

- Jongman, W. M. (2000) *Hunger and Power: Theories, Models and Methods in Roman Economic History*, in Bongenaar, C. V. M. (2000) *Interdependency of Institutions and Private Entrepreneurs*; MOS Studies No 2; Leiden: Nederlands Instituut voor het Nabije Ooster District; pp 259-284.

- Jongman, W. M. (2002) *The Roman Economy: from Cities to Empire*, in de Blois, L. & Rich, J. (editors) (2002) *The Transformation of Economic Life under the Roman Empire*; Amsterdam: J. C. Gieben; pp 28-47.

- Jongman, W. M. (2007) *The Early Roman Empire: Consumption*, in Scheidel, W; Morris, I, & Saller, R. (editors) (2007) *The Cambridge Economic History of the Greco-Roman World*; Cambridge: Cambridge University Press; pp 592-618.

- Keay, S. J. (1988) *Roman Spain*; London; British Museum Publications Ltd.

- Keay, S. J. (editor) (1998) *The Archaeology of Early Roman Baetica*; Portsmouth, Rhode Island: Journal of Roman Archaeology.

- Kehoe, D. P. (2007) *The Early Roman Empire: Production*, in Scheidel, W; Morris, I, & Saller, R. (editors) (2007) *The Cambridge Economic History of the Greco-Roman World*; Cambridge: Cambridge University Press; pp 543-569.

- Keith, R. J. (1960) The Marketing Revolution; *Journal of Marketing*; Volume 24 (3); pp 35-38.

- Kelley, W. T. (1956) The Development of Early Thought in Marketing and Promotion; *Journal of Marketing*; Volume 21 (1); pp 62-76.

- Kenrick, P. M. (1993) Italian Terra Sigillata: a Sophisticated Roman Industry, *Oxford Journal of Archaeology*, Volume 12 (2), pp 235-242.

- Kenrick, P. M. (1997) Cn Ateius- the Inside Story; *Rei Cretariae Romanae Fautorum Acta*; Volume 35; pp 179-190.

- Kenward, H. K. & Williams, D. (1979) *Biological Evidence for the Roman Warehouse at Coney Street, York: The Archaeology of York, Volume 14/2*; York: Council for British Archaeology.

- Keskinocak, P. & Tayur, S. (2001) Quantitative Analysis for Internet-Enabled Supply Chains; *Interfaces*; Volume 131 (2); pp 70-89.

- Kindleberger, C. P. (1968) *International Economics*, (4th edition); Homewood: Illinois, Richard D. Irwin Inc.

- King, A. (1981) *The Decline of Samian Ware Manufacture in the North West Provinces: Problems of Chronology and Interpretation*, in King, A. & Henig, M. (editors) (1981) *The Roman West in the Third Century*, BAR (Supplementary Series) Monograph No 109; Oxford: British Archaeological Reports; pp 55-78.

- King, A. (1984) The Decline of Central Gaulish Sigillata Manufacture in the Early 3rd Century; *Rei Cretariae Romanae Fautorum Acta*; Volume 22/24; pp 51-59.

- King, A. (1990) *Roman Gaul and Germany*; Berkeley: University of California Press.

- King, A. & Henig, M. (editors) (1981) *The Roman West in the Third Century*, BAR (Supplementary Series) Monograph No 109; Oxford: British Archaeological Reports.

- Knocker, G. M. (1965) Excavations in Collyweston Great Wood; *Archaeological Journal*; Volume 122; pp 52-72.

- Knorr, R. (1952) *Terra-Sigillata-Gefässe des Ersten Jahrhunderts mit Töpfernamen*; Stuttgart: W Kohlhammer.

- Kolb, A. (2002) *Army and Transport*, in Erdkamp, P (editor) (2002) *The Roman Army and the Economy*; Amsterdam: J. C. Gieben; pp 161-166.

- Kotler, P. (1983) *Principles of Marketing*, (2nd edition); Englewood Cliffs; N.J: Prentice Hall.

- Kotler, P; Wong, V; Saunders, J. & Armstrong G. (2005) *Principles of Marketing*, (4th European edition); Harlow: Prentice Hall.

- Kron, G. (2012) *Food Production*, in Scheidel, W. (editor) (2012a) *The Cambridge Companion to the Roman Economy*; Cambridge: Cambridge University Press; pp 156-174.

- Kunow, J. (2002) *Relations between Roman Occupation and the Limesvorland in the Province of Germany Inferior*, in Blagg, T. F.C. & Millett, M. J. (editors) (2002) *The Early Roman Empire in the West*; Oxford: Oxbow Books; pp 87-96.

- Laing, J. (1997) *Art & Society in Roman Britain*; Stroud: Sutton Publishing Ltd.

- Lancaster, G. & Massingham, L. (1988) *Essentials of Marketing: Text and Cases*; Maidenhead: McGraw-Hill.

- Lancaster, G. & Massingham, L. (1993) *Marketing Management*; Maidenhead: McGraw-Hill.

- Langouët, L. (1984) *Alet and Cross-Channel Trade*, in Macready, S. & Thompson, F. H. (editors) (1984) *Cross-channel Trade between Gaul and Britain in the Late Pre-Roman Iron Age*; Society of Antiquaries Occasional Paper No 4; London: Society of Antiquaries; pp 67-77.

- Laubenheimer, F. (2003) Amphorae and Vineyards from Burgundy to the Seine, in Plouviez, J. (editor) (2003) Amphorae in Britain and the Western Empire; *Journal of Roman Pottery Studies*, Volume 10; Oxford: Oxbow Books; pp 32-44.

- Laurence, R. (1998) *Land Transport in Roman Italy: Costs, Practice and the Economy*, in Parkins, H. & Smith, C. (editors) (1998) *Trade, Traders and the Ancient City*; London: Routledge; pp 129-148.

- Laver, P. G. (1926) The Excavation of a Tumulus at Lexden; *Archaeologia*; Volume 26; pp 241-254.

- Lawson, R. W. (2000) *Consumer Behaviour*, in Baker, M. (editor) (2000) *Marketing Theory and Practice*; London: Thomson Learning; pp 132-149.

- Legg, R. (1983) *Romans in Britain*; London: BCA / William Heinemann.

- Lesfargues, J. (1972) Une Industrie Lyonnaise; *Archaeologia*; Volume 50; pp 15-19.

- Leveau, P. (2007) *The Western Provinces*, in Scheidel, W; Morris, I, & Saller, R. (2007) *The Cambridge Economic History of the Greco-Roman World*, Cambridge: Cambridge University Press, pp 651-670.

- Lewis, M. J. T. (1966) *Temples in Roman Britain*; Cambridge: Cambridge University Press.

- Lewit, T. (2013) *The Mysterious Case of La Graufesenque? Stimuli to Large Scale Fine Pottery Production and Trade in the Roman Empire*, in Fulford, M. G. & Durham, E. (editors) (2013) *Seeing Red: New Economic and Social Perspectives on Gallo-Roman Terra Sigillata*, Institute of Classical Studies; Supplement No 102; London: Institute of Classical Studies; pp 111-120.

- Liberati, A. & Bourbon, F. (2005) *Rome – Splendours of an Ancient Civilisation*; London: Thames & Hudson.

- Limbrey, S. & Evans, J. G. (editors) (1978) *The Effect of Man on the Landscape: the Lowland Zone*; CBA Monograph No 21; London: Council for British Archaeology.

- Lipsey, R. G. (1970) *An Introduction to Positive Economics*; London: Weidenfeld and Nicholson.

- Liversidge, J. (1973) *Britain in the Roman Empire*; London: BCA / Routledge & Kegan Paul.

- Livesey, F. (1986) *Economics: an Introduction for Students of Business and Marketing*, (2nd edition); London: William Heinemann Ltd.

- Lo Cascio, E. (editor) (2000) *Mercati Permanenti e Mercati Periodici nel Mondo Romano*; Bari: Edipuglia.

- Lösch, A. (1938) The Nature of Economic Regions, *Southern Economic Journal*, Volume 5(1), pp 71-78. Available from;

- Loughlin, N. (1977) *Dales Ware: a Contribution to the Study of Roman Coarse Pottery*, in Peacock, D. P. S. (1977) *Pottery and Early Commerce: Characterization and Trade in Roman and Later Ceramics*; New York: Academic Press; pp 85-146.

- Loughton, M. E. (2003) The Distribution of Republican Amphorae in France; *Oxford Journal of Archaeology*; Volume 22 (2); pp 177-207.

- Loughton, M. E. (2009) Getting Smashed: the Deposition of Amphorae and the Drinking of Wine in Gaul During the Late Iron Age; *Oxford Journal of Archaeology*; Volume 28 (1); pp 77-110.

- Louwe Kooijmans, L. P. (1971) *Deae Nehallennia, Gids Bij Tentoonstelling, Nehalennia de Zeeuwise Godin Zee-land in de Romeinse Tijd, Romeinse Monumentum Uit de Oosterschelde*: Stadhuis Middleburg.

- Lowe, B. (2009) *Roman Iberia: Economy, Society and Culture*, London: Duckworth.

- Ludowici, W. & Ricken, H. (1948) *Die Bilderschüsseln der Römischen Töpfer von Rheinzabern*, Speyer.

- MacMahon, A. J. (2000) *The Taberna Structures of Roman Britain*, Unpublished Ph D Thesis, University of Durham. Available from: http://www.ethos.bl.uk/322793.

- MacMahon, A. J. (2005) *The Shops and Workshops of Roman Britain*, in MacMahon, A. J. & Price, J (2005) (editors) *Roman Working Lives and Urban Living*, Oxford: Oxford University Press; pp 48-69.

- MacMahon, A. J. & Price, J (2005) (editors) *Roman Working Lives and Urban Living*, Oxford: Oxford University Press.

- MacMullen, R. (1970) Market-Days in the Roman Empire; *Phoenix*; Volume 24; pp 333-341.

- MacMullen, R. (1982) *Paganism in the Roman Empire*; New Haven: Yale University Press.

- Macready, S. & Thompson, F. H. (editors) (1984) *Cross-channel Trade between Gaul and Britain in the Late Pre-Roman Iron Age*; Society of Antiquaries Occasional Paper No 4, London: Society of Antiquaries.

- Magilton, J. (2003) *The Defences of Roman Chichester*, in Wilson, P. (editor) (2003) *The Archaeology of Roman Towns: Studies in Honour of John S. Wacher*; Oxford: Oxbow Books; pp156-167.

- Manacorda, D. (1978) The *Ager Cosanus* and the Production of the *Amphorae* of Sestius; *Journal of Roman Studies*; Volume 68; pp 122-131.

- Manley, J. (2002) *AD 43: the Roman Invasion of Britain*; Stroud: Tempus.

- Mann, J. C. (1985) Two 'Topoi' in the Agricola; *Britannia*; Volume 16; pp 21-24.

- Manning, J. G. & Morris, I. (editors) (2005a) *The Ancient Economy: Evidence and Models*; Edinburgh: Edinburgh University Press.

- Manning, J. G. & Morris, I. (2005b) *Introduction*, to Manning, J. G. & Morris, I. (editors) (2005a) *The Ancient Economy: Evidence and Models*; Edinburgh: Edinburgh University Press; pp 1-44.

- Manning, W, H. (1975) *Economic Influences on Land Use in the Military Areas of the Highland Zone During the Roman Period*, in Evans, J. G; Limbrey, S. & Cleere H. (editors) (1975) *The Effects of Man on the Landscape*; CBA Research Report No 11; London: Council for British Archaeology; pp 112-116.

- Marsden, P. (1980) *Roman London*; London: Thames and Hudson.

- Marsh, G. (1981) *London's Samian Supply and its Relationship to the Development of the Gallic Samian Industry*, in Anderson, A. C. & Anderson A. S. (editors) (1981) *Roman Pottery Research in Britain and North West Europe*; BAR (International Series) Monograph No 123; Oxford: British Archaeological Reports; pp 173-238.

- Marshall, A. (1947) *Principles of Economics*, (8th edition); London: Macmillan.

- Martin, A. (1985) South Gaulish Sigillata in Italy; *Opus*; Volume 4; pp 125-139.

- Martin-Kilcher, S. (2003) Fish-Sauce Amphorae from the Iberian Peninsula: the Forms and Observations on Trade with the North-West Provinces, in Plouviez, J. (editor) (2003) Amphorae in Britain and the Western Empire; *Journal of Roman Pottery Studies*, Volume 10; Oxford: Oxbow Books; pp 69-84.

- Mason, D. J. P. (2001) *Roman Chester: City of the Eagles*; Stroud: Tempus.

- Mason, D. J. P. (2003) *Roman Britain and the Roman Navy*; Stroud: Tempus.

- Masson, G. (1974) *A Concise History of Republican Rome*; London: Thames and Hudson Ltd.

- Mattingly, D. J. (1988a) Oil for Export: a comparison of Libyan, Spanish and Tunisian Olive Oil Production in the Roman Empire; *Journal of Roman Archaeology*; Volume 1; pp 33-56.

- Mattingly, D. J. (1988b) Olea Mediterranea? *Journal of Roman Archaeology*; Volume 1; pp 153-161.

- Mattingly, D. J. (1988c) Megalithic Madness and Measurement: or How Many Olives Could an Olive Press Press? *Oxford Journal of Archaeology*; Volume 7 (2); pp 177-195.

- Mattingly, D. J. (1996) *First Fruit? The Olive in the Roman World*, in Shipley, G. & Salmon, J. (editors) (1996) *Human Landscapes in Classical Antiquity: Environment and Culture*; London: Routledge; pp 213-253.

- Mattingly, D. J. (2004) Being Roman: Expressing Identity in a Provincial Setting; *Journal of Roman Archaeology*; Volume 17; pp 5-25.

- Mattingly, D. J. (2006) *An Imperial Possession – Britain in the Roman Empire*; London: Penguin Books.

- Mattingly, D. J. (2009) *Peopling Ancient Landscapes: Potential and Problems* in Bowman, A. K. & Wilson, A. (editors) (2009a) *Quantifying the Roman Economy: Methods and Problems,* Oxford: Oxford University Press, pp 163-174.

- Mattingly, D. J. & Salmon, J. (editors) (2001a) *Economics beyond Agriculture in the Classical World*; London: Routeledge.

- Mattingly, D. J. & Salmon, J. (2001b) *The Productive Past: Economics beyond Agriculture*; in Mattingly, D. J. & Salmon, J. (editors) (2001a) *Economics beyond Agriculture in the Classical World*; London: Routeledge; pp 3-14.

- Maxfield, V. A. & Dobson, M. J. (editors) (1991) *Roman Frontier Studies*; Exeter: University of Exeter Press.

- Mays, M. (1981) Strabo IV 4. 1, a Reference to Hengistbury Head? *Antiquity*; Volume 55; pp 55-57.

- McCarthy, E. J. (1960) *Basic Marketing: a Managerial Approach*, Homewood, Ill: Irwin.

- McCormick, M. (2001) *Origins of the European Economy: Communications and Commerce; AD300-900*; Cambridge: Cambridge University Press.

- McDonald, M. & Dunbar, I. (2004) *Market Segmentation*; Oxford: Elsevier / Butterworth Heinemann.

- McGovern, P. E. (2013) *Ancient Wine: the Search for the Origins of Viticulture*, Woodstock, Oxon; Princeton University Press.

- McGrail, S. (1983) Cross Channel Seamanship and Navigation in the Late First Millennium BC; *Oxford Journal of Archaeology*; Volume 2 (3); pp 299-337.

- McGrail, S. (1989) The Shipment of Traded Goods and of Ballast in Antiquity; *Oxford Journal of Archaeology*; Volume 8 (3); pp 353-358.

- McGrail, S. (editor) (1990) *Celts, Frisians and Saxons*; CBA Research Report No 71; London: Council for British Archaeology.

- McKendrik, N; Brewer, J. & Plumb, J.H. (1982) *Birth of a Consumer Society*; London: Hutchinson & Co. (Publishers) Ltd.

- McMann, A. M; Bourgois, J; Gazda, E. K; Loeson, J. P. & Will, E.L. (1987) *The Roman Port and Fishery at Cosa, a Centre of Ancient Trade*; Princeton: Princeton University Press.

- McWhirr, A. & Viner, D. (1978) The Production and Distribution of Tiles in Roman Britain with Particular Reference to the Cirencester Region; *Britannia*; Volume 9; pp 359-377.

- Meikle, S. (1995) Modernism, Economics and the Ancient Economy; *Proceedings of the Cambridge Philological Society*; Volume 41; pp 174-191.

- Menchelli, S. (2004) *Ateian Sigillata and Import-Export Activities in North Etruria*, in Poblome, J; Talloen, P; Brulet, R. & Waelkens, M (editors) (2004) *Early Italian Sigillata: the Chronological Framework and Trade Patterns*; Supplementary Volume No 10; Bulletin Antieke Beschaving; pp 271-276.

- Mentzer, J. T; DeWitt, W; Keebler, J. S; Soonhoong, M; Nix, N. W; Smith, C. D. & Zacharia, Z. G. (2001) Defining Supply Chain Management, *Journal of Business Logistics*, Volume 22 (2) pp 1-25.

- Merrifield, R. *London: City of the Romans*, London: B. T. Batsford Ltd.

- Meyer, E. (1896) *Die Wirtschaftliche Entwickelung des Alterturms; ein Vortrag Gehalten auf der Dritten Versammlung Deutcher Historiker in Frankfurt, a M am 20 April 1986*; Jena: G. Fischer.

- Middleton, P. S. (1979) *Army Supply in Roman Gaul: an Hypothesis for Roman Britain*, in Burnham, B. C. & Johnson, H. B. (editors) (1979) *Invasion and Response: the Case of Roman Britain*; BAR (British Series) Monograph No 73; Oxford: British Archaeological Reports; pp 81-97.

- Middleton, P. S. (1980) La Graufesenque, a Question of Marketing; *Atheneum*; Volume 58; pp 186-191.

- Middleton, P. S. (1983) *The Roman Army and Long Distance Trade*, in Garnsey, P. & Whittaker, C. (editors) (1983) *Trade and Famine in Classical Antiquity*, Cambridge: Cambridge Philological Society; pp 75-83.

- Miket, R. & Burgess, C. (editors) (1984) *Between and Beyond the Walls, Essays on the Prehistory and History of Roman Britain*; Edinburgh: John Donald Publishers Ltd.

- Miller, L; Schofield, J. & Rhodes, M. (1986) *The Roman Quay at St Magnus House, London: Excavations at New Fresh Wharf, Lower Thames Street London; 1974-78*; LAMAS Special Paper No 8; London: London & Middlesex Archaeological Society.

- Millett, M. J. (1984) *Forts and the Origins of Towns: Cause and Effect?* in Blagg, T. F. C. & King, A. C. (editors) (1984) *Military and Civilian in Roman Britain*: *Cultural Relationships in a Frontier Province*; BAR (British Series) Monograph No 136; Oxford: British Archaeological Reports; pp 65-74.

- Millett, M. J. (1987) Boudicca, the First Colchester Potters' Shop and the Dating of Neronian Samian; *Britannia*; Volume 18; pp 93-123.

- Millett, M. J. (1990) *The Romanization of Britain*; Cambridge: Cambridge University Press.

- Millett, M. J. (1993) Samian from the Sea; *Journal of Roman Archaeology*; Volume 6; pp 415-419.

- Millett, M. J. (1995) *Roman Britain*; London: Batsford.

- Milne, G. (1985) *The Port of Roman London*; London: B. T. Batsford Ltd.

- Milne, G. (1990) *Maritime Traffic Between the Rhine and Roman Britain*, in McGrail, S (1990) *Maritime Celts, Frisians and Saxons*, CBA Research Report No 71, London: Council For British Archaeology; pp82-84 [online], accessed on 20/7/2010.

- Milne, G. (1995) *Roman London*. London: Batsford / English Heritage.

- Milne, J. G. (1931) Woodeaton Coins; *Journal of Roman Studies*; Volume 21; pp 101-109.

- Mitchell, S. (1976) Requisitioned Transport in the Roman Empire: a New Interpretation from Pisidia; *Journal of Roman Studies*; Volume 66; pp 106-131.

- Monaghan, J. (1997) *The Roman Pottery from York: The Archaeology of York, Volume 16/8*; York: Council for British Archaeology.

- Monteil, G. (2005) *Samian in Roman London*; Unpublished Ph D Thesis, Birkbeck College, University of London (online). Available from: http://ethos.bl.uk.422251.

- Morgan, K. O. (editor) (1989) *Roman and Anglo Saxon Britain*; Oxford: Oxford University Press.

- Morley, N. (1996) *Metropolis and Hinterland: the City of Roman and the Italian Economy; 200 BC - AD 200*; Cambridge: Cambridge University Press.

- Morley, N. (2000) *Markets, Marketing and the Roman Elite*, in Lo Cascio, E. (editor) (2000) *Mercati Permanenti e Mercati Periodici nel Mondo Romano*; Bari: Edipuglia; pp 211-221.

- Morley, N. (2004) *Theories, Models and Concepts in Ancient History*; London: Routledge.

- Morley, N. (2007a) *Trade in Classical Antiquity*; Cambridge: Cambridge University Press.

- Morley, N. (2007b) *The Early Roman Empire: Distribution*, in Scheidel, W; Morris, I, & Saller, R. (editors) (2007) *The Cambridge Economic History of the Greco-Roman World*; Cambridge: Cambridge University Press; pp 570-591.

- Morris, E. L. (1981) *Ceramic Exchange in Western Britain: a Preliminary View*, in Howard, H. & Morris, E. L. (editors) (1981) *Production and Distribution: a Ceramic Viewpoint*; BAR (International Series) Monograph No 120; Oxford: British Archaeological Reports; pp 67-81.

- Morris, F. M. (2010) *North Sea Channel Connectivity during the Late Iron Age and Roman Period (175/150 BC - AD 409)*; BAR (International Series) Monograph No 2157; Oxford: British Archaeological Reports.

- Morris, I. (1999) *Introduction* to Finley, M. I. (1999) *The Ancient Economy*, (2nd edition); London: Chatto & Windus Ltd.

- Morris, I; Saller, R. & Scheidel, W. (2007) *Introduction* to Scheidel, W; Morris, I, & Saller, R. (editors) (2007) *The Cambridge Economic History of the Greco-Roman World*; Cambridge: Cambridge University Press; pp 1-12.

- Morris, J. (1982) *Londinium – London in the Roman Empire*; London: BCA / Weidenfeld & Nicholson.

- Morrison, J. (2006) *The International Business Environment*, (2nd edition); Basingstoke: Palgrave / Macmillan.

- Mulhearn, C; Vane, H. R, & Eden, J. (2001) *Economics for Business*; Basingstoke: Palgrave.

- Nash, D. (1984) *A Basis of Contact Between Britain and Gaul in the Late Pre-Roman Iron Age*, in Macready, S. & Thompson, F. H. (editors) (1984) *Cross-channel Trade between Gaul and Britain in the Late Pre-Roman Iron Age*; Society of Antiquaries Occasional Paper No 4; London: Society of Antiquaries; pp 92-107.

- New, S. & Westbrook, R. (editors) (2004) *Understanding Supply Chains: Concepts, Critiques and Futures*; Oxford: Oxford University Press.

- Niblett, R. (2001) *Verulamium: the Roman City of St Albans*, Stroud: Tempus Publishing Ltd.

- Nieto Pietro, J; Jover Armengol, A; Izquierdo Tugas, P; Puig Griessenberger, A. M; Alaminos Exposito, A; Martin Menendez, A; Pujol; Hameluk, M; Palou, Miquel, H & Colomer Marti, S (1989) *Excavations arqueològiques subaquàtiques a Cala Culip; Sèrie Monogràfica No 9*; Girona: Centre d'Investigacions Arqueològiques de Girona.

- North, D. C. (1977) Non-Market Forms of Economic Organization: the Challenge of Karl Polanyi; *Journal of European Economic History*; Volume 6 (3); pp 703-716.

- North, D. C. (1979) A Framework for Analysing the State in Economic History; *Explorations in Economic History*; Volume 16 (3); pp 249-259.

- North, D. C. (1981) *Structure and Change in Economic History*; New York: W. W. Norton & Company Inc.

- North, D. C. (1990) *Institutions, Institutional Change and Economic History*; Cambridge: Cambridge University Press.

- North, D. C. (1991) *Institutions*; Journal of Economic Perspectives; Volume 5 (1); pp 97-112.

- Ohlin, B. (1933) *Interregional and International Trade*; Cambridge, Mass: Harvard University Press.

- Oldenstein, J. (1985) *Manufacture and Supply of the Roman Army and Bronze Fittings*, in Bishop, M. C. (editor) (1985a) *The Production and Distribution of Roman Military Equipment*; BAR (International Series) Monograph No 275; Oxford: British Archaeological Reports; pp 82-94.

- Oliver, E. (1907) *Roman Economic Conditions to the Close of the Republic*; Toronto: University of Toronto Library.

- Orton, C. R. (1993) How Many Pots Make Five? - an Historical Review of Pottery Quantification; *Archaeometry*; Volume 35; pp 30-35.

- Orton, C; Tyers, P. & Vance, A. (1993) *Pottery in Archaeology*; Cambridge: Cambridge University Press.

- Ottaway, P. (2004) *Roman York*; Stroud: Tempus Publishing.

- Oxé, A; Comfort, H. & Kenrick, P (2000): *Corpus Vasorum Arretinum, a Catalogue of the Signatures, Shapes and Chronology of Italian Sigillata*; Bonn: Habelt.

- Palmer, A. J. (2004) *Introduction to Marketing*; Oxford: Oxford University Press.

- Palmer, A. J. & Worthington, I. (1992) *The Business and Marketing Environment*; Maidenhead: McGraw-Hill Book Company.

- Papworth, M. (2011) *The Search for the Durotriges: Dorset and the Wast Country in the Late Iron Age*, Stroud: History Press.

- Parker, A. J. (1990) The Wines of Roman Italy; *Journal of Roman Archaeology*; Volume 3; pp 325-331.

- Parker, A. J. (1992) *Ancient Shipwrecks of the Mediterranean and Roman Provinces*; BAR International Series Monograph No 580; Oxford: British Archaeological Reports.

- Parkins, H. & Smith, C. (editors) (1998) *Trade, Traders and the Ancient City*; London: Routledge.

- Partridge, C. (1979) Excavations at Puckeridge and Braughing, 1975-1979; *Hertfordshire Archaeology*; Volume 7; pp 28-112.

- Partridge, C. (1981) *Skeleton Green: a Late Iron Age and Romano-British Site*; Britannia Monograph No 2; London: Society for the Promotion of Roman Studies.

- Paterson, A. J. (1982) Salvation from the Sea: Amphorae and Trade in the Roman West; *Journal of Roman Studies*; Volume 72; pp 146-157.

- Paterson, J. (1998) *Trade and Traders in the Roman World: Scale, Structure and Organisation*, in Parkins, H. & Smith, C. (editors) (1998) *Trade, Traders and the Ancient City*; London: Routledge; pp 149-167.

- Peacock, D. P. S. (1971) *Roman Amphorae in Pre-Roman Britain*, in Hill, D. & Jesson, M (editors) (1971) *The Iron Age and its Hillforts*; Southampton: Southampton University Archaeological Society; pp 161-188.

- Peacock, D. P. S. (editor) (1977) *Pottery and Early Commerce: Characterization and Trade in Roman and Later Ceramics*; New York: Academic Press.

- Peacock, D. P. S. (1978) *The Rhine and the Problem of Gaulish Wine in Roman Britain*, in Taylor, J. du Plat & Cleere, H (editors) (1978) *Roman Shipping and Trade: Britain and the Rhine Provinces*; CBA Research Report No 24; London: Council for British Archaeology; pp 49-51.

- Peacock, D. P. S. (1982) *Pottery in the Roman World: an Ethno-Archaeological Approach*; Harlow: Longman.

- Peacock, D. P. S. (1984) *Amphora in Iron Age Britain: a Reassessment*, in Macready, S. & Thompson, F. H. (editors) (1984) *Cross-channel Trade between Gaul and Britain in the Late Pre-Roman Iron Age*; Society of Antiquaries Occasional Paper No 4; London: Society of Antiquaries; pp 37-42.

- Peacock, D. P. S. & Williams, D. F. (1983) *The Importation of Olive Oil into Iron Age and Roman Britain*, in Blázquez, J. M. & Remesal, J. (1983) *Producción y Comercio del Aceite en la Antqüedad: Segundo Congreso* Internacional; Madrid: Universidad Complutense; pp 262-280.

- Peacock, D. P. S. & Williams, D. F. (1991) *Amphorae and the Roman Economy: an Introductory Guide*; London: Longman.

- Peddie, J. (1997) *Conquest – The Roman Invasion of Britain*; Stroud: Sutton Publishing.

- Peña, J. T. (2011) *Roman Pottery in the Archaeological Record*; Cambridge: Cambridge University Press.

- Percival, J. (1981) *The Roman Villa*; London: B. T. Batsford Ltd.

- Perring, M. D; Macreth, J. R. & Howe, D. F. (1972) *Roman Pottery from the Nene Valley: a Guide*; Peterborough Museum Occasional Paper No 2; Peterborough: Peterborough City Museum.

- Picon, M; Vichy, M. & Meille, E. (1971) Composition of the Lezoux, Lyon and Arezzo Samian Ware; *Archaeometry*; Volume 13 (2); pp 191-208.

- Pitts, L. F. & St Joseph, J. K. (1985) *Inchtuthil: the Roman Legionary Fortress*; Britannia Monograph Series No 6; London: Society for the Promotion of Roman Britain.

- Pitts, M. & Perring, D. (2006) The Making of Britain's First Urban Landscape: Late Iron Age and Early Roman Essex; *Britannia*; Volume 37; pp 187-212.

- Plouviez, J. (editor) (2003) Amphorae in Britain and the Western Empire; *Journal of Roman Pottery Studies*, Volume 10; Oxford: Oxbow Books.

- Poblome, J; Talloen, P; Brulet, R. & Waelkens, M (editors) (2004) *Early Italian Sigillata: the Chronological Framework and Trade Patterns*; Bulletin Antieke Beschaving.

- Polak, M. (1998) *Old Wine in New Bottles: Reflections on the Production of Terra Sigillata at La Graufesenque*, in Bird, J. (editor) (1998) *Form and Fabric: Studies in Rome's Material Past in Honour of B. R. Hartley*; Oxbow Monograph No 80; Oxford: Oxbow Books; pp 115-121.

- Polanyi, K. (1946) *The Great Transformation*; London: Victor Gollancz Ltd.

- Polanyi, K. (1963) Ports of Trade in Early Societies; *Journal of Economic History*; Volume 23; pp 30-45.

- Polanyi, K. (1977) *The Livelihood of Man*; New York: The Academic Press.

- Polanyi, K; Arensberg, C. M. & Pearson, H. W. (editors) (1957) *Trade and Market in the Early Empires*; New York: The Free Press.

- Polfer, M. (editor) (2001) *L'artisant romain: évolutions, continuités et ruptures (Italie et provinces occidentals)*; Monographies Instrumentum No 20; Montagnac, Éditions Monique Mergoil.

- Pollard, A. M.; Hatcher, H & Symonds, R. P. (1981) *Provenance Studies of 'Rhenish' Wares by Comparison with Terra Sigillata*; Revue d'Archéométrie, Actes du XX Symposium International d'Archéométrie; Volume 5; pp 177-185.

- Pollard, A. M.; Hatcher, H & Symonds, R. P. (1982) *Provenance Studies of Rhenish Wares - a Concluding Report*, in Aspinall, A. & Warren, S. E. (1982) *Proceedings of the 22nd Symposium on Archaeometry*; Bradford: Bradford University Press, pp 343-354.

- Potter, T. W. & Johns, C. (1992) *Roman Britain*; London: British Museum Press.

- Potter, D. & Mattingly, D. (editors) (1999) *Life, Death and Entertainment in the Roman Empire*; Michigan: University of Michigan Press; pp 67-84.

- Pryor, F. L. (1977) *The Origins of the Economy: a Comparative Study of Distribution in Primitive and Peasant Economies*; New York: The Academic Press.

- Pucci, G. (1983) *Pottery and Trade in the Roman Period*, in Garnsey, P; Hopkins, K. & Whittaker, C. (editors) (1983) *Trade in the Ancient Economy*; London: Chatto & Windus; pp 105-117.

- Purcell, N. (1985) Wine and Wealth in Ancient Italy; *Journal of Roman Studies*; Volume 75; pp 1-19.

- Raepsaet, M. T. & Raepsaet, G. (1988) Aspects de l'organisation du commerce de la céramique sigilée dans le Nord de la Gaule aux IIe et IIIe siècle notre èra: Négociants et transporteurs. La géographie des activities commercialles; *Münstersche Beiträge zur Antiken Handelschichte*; Volume 7; pp 45-69.

- Randall, G. (2001) *Principles of Marketing*, (2nd edition); London: Thompson.

- Rathbone, D. W. (1983) The Slave Mode of Production; *Journal of Roman Studies*; Volume 73; pp 160-168.

- Rathbone, D. W. (2009) *Earnings and Costs: Living Standards and the Roman Economy (First to Third Centuries AD)*, in Bowman, A. K. & Wilson, A. I. (editors) (2009a) *Quantifying the Roman Economy: Methods and Problems*; Oxford: Oxford University Press; pp 299-326.

- Rauh, N. K. (2003) *Merchants, Sailors and Pirates in the Roman World*; Stroud: Tempus.

- Rawson, E. (1986) *The Expansion of Rome*, in Boardman, J; Griffin, J. & Murray, O. (editors) (1986) *The Oxford History of the Classical World*; Oxford: Oxford University Press; pp 417-437.

- Reece, R. (1973) Roman Coinage in Roman Britain and the Western Empire; *Britannia*; Volume 4; pp227-252.

- Reece, R. (2002) *The Coinage of Roman Britain*; Stroud: Tempus Publishing Ltd.

- Remesal Rodriguez, J. (1986) *La Annona Militaris y la Exportacion de Acete Bético a Germania*; Madrid: Universidat Complutense.

- Remesal Rodriguez, J. (1998) *Baetican Olive Oil and the Roman Economy*, in Keay, S. J (editor) (1998) *The Archaeology of Early Roman Baetica*; Journal of Roman Archaeology: Supplementary Series No 29; Portsmouth, Rhode Island: Journal of Roman Archaeology; pp183-199.

- Remesal Rodriguez, J. (2002) *Baetica and Germania: Notes on the Concept of Provincial Interdependence in the Roman Empire*, in Erdkamp, P (editor) (2002) *The Roman Army and the Economy*; Amsterdam: J. C. Gieben; pp 293-308.

- Renfrew, C. (1977) *Alternative Models for Exchange and Spatial Distribution*, in Earl, T. & Ericson, J. (1977) *Exchange Systems in Prehistory*, New York: Academic Press; pp 71-90.

- Renfrew, C. (1993) *Trade beyond the Material*, in Scarre, C. & Healey, F. (editors) (1993) *Trade and Exchange in Prehistoric Europe*; Oxbow Monograph No 33; Oxford: Oxbow Books; pp 5-16.

- Rhodes, M. (1986) *Dumps of Unused Pottery near London Bridge*, in Miller, L; Schofield, J. & Rhodes, M. (1986) *The Roman Quay at St Magnus House, London: Excavations at New Fresh Wharf, Lower Thames Street London; 1974-78*; LAMAS Special Paper No 8; London: London & Middlesex Archaeological Society; pp 199-204.

- Rhodes, M. (1989) Roman Pottery Lost en route from the Kiln Site to the User; *Journal of Roman Pottery Studies*; Volume 2; pp 44-58.

- Ricardo, D. (1817) *The Principles of Political Economy and Taxation*; (Everyman Library edition, reprinted in 1987); London: Dent & Sons Ltd.

- Richardson, B. (1986) *The Pottery*, in Miller, L; Schofield, J. & Rhodes, M. (1986) *The Roman Quay at St Magnus House, London: Excavations at New Fresh Wharf, Lower Thames Street London; 1974-78*; LAMAS Special Paper No 8; London: London & Middlesex Archaeological Society; pp 96-138.

- Richmond, I. R. (1963) *Roman Britain*, (2nd edition); Harmondsworth: Penguin Books.

- Ricken, H. & Fischer, C. (1963) *Die Bilderschüsseln der Römischen Töpfer von Rheinzabern (Textband)*; Bonn: Rudolf Habelt Verlag.

- Rivet, A. L. F. (1958) *Town and Country in Roman Britain*; London: Hutchinson University Library.

- Rivet, A. L. F. & Smith, C. (1979) *Place Names of Roman Britain*; London: BCA / B.T. Batsford Ltd.

- Robbins, G. W. (1947) Notions about the Origins of Trading; *Journal of Marketing*; Volume 11 (3); pp 228-236.

- Rodwell, W. (1976) *Coinage, Oppida and the Rise of Belgic Power in South-Eastern Britain*, in Cunliffe, B. W. & Rowley, T. (editors) (1976) *Oppida: the Beginnings of Urbanisation in Barbarian Europe*; BAR Supplementary Series Monograph No 11; Oxford: British Archaeological Reports; pp 181-367.

- Rodwell, W. & Rowley, T. (editors) (1975) *Small Towns of Roman Britain*; BAR (British Series) Monograph No 15; Oxford: British Archaeological Reports.

- Roscams, S. (1991) *London – a New Understanding of the Roman City*, in Jones, R. F. J. (editor) (1991) *Roman Britain – Recent Trends*; Sheffield: J. R. Collis / University of Sheffield Press; pp 67-68.

- Rosenstein, N. (2008) Aristocrats and Agriculture in the Middle and Late Roman Republic; *Journal of Roman Studies*; Volume 98; pp 1-26.

- Rossiter, J-J. (1981) Wine and Oil Pressing at Roman Farms in Italy; *Phoenix*; Volume 35 (4); pp 345-361.

- Rostovtzeff, M. (1957) *The Social and Economic History of the Roman Empire*, (2nd edition); Oxford: Oxford University Press.

- Roth, J. P. (2012) *The Logistics of the Roman Army at War*; Amsterdam: Brill Academic Publishers.

- Rougé, J. (1966) *Recherches sur l'Organisation du Commerce Maritime en Méditerranée sous l'Empire Romain*; Paris: SEVPEN.

- Rowlands, M; Larsen, M. & Kristiansen, K. (editors) (1987) *Centre and Periphery in the Ancient World*; Cambridge: Cambridge University Press.

- Rule, M. (1990) *The Romano-Celtic Ship Excavated at St Peter Port, Guernsey*, in McGrail, S. (editor) (1990) *Celts, Frisians and Saxons*; CBA Research Report No 71; London: Council for British Archaeology; pp 49-56.

- Rule, M. & Monaghan, J. (1993) *A Gallo-Roman Trading Vessel from Guernsey - The Excavation and Recovery of a Third Century Shipwreck*; Guernsey Museum Service Monograph No 5; St Peter Port: Guernsey.

- Rush, P; Dickinson, B. M.; Hartley, B. R. & Hartley, K. F. (editors) (2000) *Roman Castleford Excavations; 1974-1985, Volume III; the Pottery*; Leeds: West Yorkshire Archaeological Service.

- Saddington, D. B. (1991) *The Parameters of Romanization*, in Maxfield, V. A. & Dobson, M. J. (editors) (1991) *Roman Frontier Studies*; Exeter: University of Exeter Press; pp 413-418.

- Sallares, R. (2007) *Ecology*, in Scheidel, W; Morris, I, & Saller, R. (editors) (2007) *The Cambridge Economic History of the Greco-Roman World*; Cambridge: Cambridge University Press; pp 15-37.

- Saller, R. (2012) *Human Capital and Economic Growth*, in Scheidel, W. (editor) (2012a) The *Cambridge Companion to the Roman Economy*; Cambridge: Cambridge University Press; pp 71-86.

- Salway, P. (1981) *Roman Britain*; Oxford: Oxford University Press.

- Salway, P. (1985) *Geography and the Growth of Towns, with Special Reference to Britain*, in Grew, F. & Hobley, B. (editors) (1985) *Roman Urban Topography in Britain and the Western Empire*; CBA Monograph 59; London: Council for British Archaeology; pp 67-73.

- Salway, P. (1989) *Roman Britain*, in Morgan, K. O. (editor) (1989) *Roman and Anglo Saxon Britain*; Oxford: Oxford University Press; pp 1-59.

- Salway, P. (1993) *The Oxford Illustrated History of Roman Britain*; Oxford: Oxford University Press.

- Samli, A. C. (2004) *Entering and Succeeding in Emerging Countries: Marketing to the Forgotten Majority*; Mason, Ohio: Thomson South-Western.

- Saunders, M; Lewis, P. & Thornhill, A. (2003) *Research Methods for Business Studies*, (3rd edition); Harlow, Essex: Financial Times / Prentice Hall.

- Savitt, R. (1980) Historical Research in Marketing; *Journal of Marketing*; Volume 44, (Fall 1980); pp 52-58.

- Sayer, A. R. (2010) *Method in Social Science: a Realist Approach*; London: Routledge.

- Scarre, C. & Healey, F. (editors) (1993) *Trade and Exchange in Prehistoric Europe*; Oxbow Monograph No 33; Oxford: Oxbow Books.

- Scheidel, W. (editor) (2012a) The *Cambridge Companion to the Roman Economy*; Cambridge: Cambridge University Press.

- Scheidel, W. (2012b) *Approaches to the Roman Economy*, in Scheidel, W. (editor) (2012a) The *Cambridge Companion to the Roman Economy*; Cambridge: Cambridge University Press; pp 1-21.

- Scheidel, W. (2012c) *Slavery*, in Scheidel, W. (editor) (2012a) *The Cambridge Companion to the Roman Economy*; Cambridge: Cambridge University Press; pp 89-113.

- Scheidel, W. & von Reden, S. (editors) (2002a) *The Ancient Economy*; Edinburgh: Edinburgh University Press.

- Scheidel, W. & von Reden, S. (2002b) *Introduction*, to Scheidel, W. & Von Reden, S. (editors) (2002a) *The Ancient Economy*; Edinburgh: Edinburgh University Press; pp 1-8.

- Scheidel, W; Morris, I, & Saller, R. (editors) (2007) *The Cambridge Economic History of the Greco-Roman World*; Cambridge: Cambridge University Press.

- Schiffman, L. G; Kanuk, L. & Hansen, H. (2012) *Consumer Behaviour*, (2nd edition); Harlow: Pearson Education Ltd.

- Schofield, R. & Leech, J. (editors) (1987) *Urban Archaeology in Britain*; CBA Research Report No 61; London: Council for British Archaeology.

- Scullard, H. (1979) *Roman Britain – Outpost of the Empire*; London: Thames & Hudson.

- Sealey, P, R. (1985) *The Roman Amphorae from the 1970 Excavation at Sheepen (Colchester)*; BAR (British Series) Monograph No 142; Oxford: British Archaeological Reports.

- Sealey, P. R. (2009) New Light on the Wine Trade with Julio-Claudian Britain; *Britannia*; Volume 40; pp 1-40.

- Selwood, L. (1984) *Tribal Boundaries Viewed from the Perspective of Numismatic Evidence*, in Cunliffe, B. W. & Miles, D. (editors) (1984) *Aspects of the Iron Age in Central and Southern Britain*; University of Oxford Committee for Archaeology; Monograph No 8; Oxford: Oxford University School of Archaeology; pp 191-204.

- Shaw, E. H. (1995) The First Dialogue on Macromarketing; *Journal of Macromarketing*; Volume 15 (1); pp 7-20.

- Shaw, E. H. & Tamilia, R. D. (2001) Robert Bartles and the History of Marketing Thought, *Journal of Macromarketing*; Volume 21 (2); pp 156-163.

- Shennan, S. (1988) *Quantifying Archaeology*; Edinburgh: Edindurgh University Press.

- Sheth, J. & Garrett, D. M. (1986) *Marketing Theory: Classic and Contemporary Readings*; Ohio: South-Western Publishing Company.

- Shipley, G. & Salmon, J. (editors) (1996) *Human Landscapes in Classical Antiquity: Environment and Culture*; London: Routledge.

- Simpson, G. (1952) The Aldgate Potter: A Maker of Romano-British Samian Ware, *Journal of Roman Studies*; Volume 42; pp 68-71.

- Simpson, G. (1976) Decorated Terra Sigillata at Montans (Tarn) from the Manuscript of Elie Rossignol at Albi; *Britannia*; Volume 7; pp 244-273.

- Simpson, G. (1982) A Revised Dating of the Colchester Samian Kiln; *Essex Archaeology and History*; Volume 14; pp 149-153.

- Sippel, D. V. (1987) Some Observations on the Means and Cost of the Transport of Bulk Commodities in the Late Republic and Early Empire; *Ancient World*; Volume 16; pp 35-45.

- Sirks, B. (2002) *Sailing in the Off-Season with Reduced Financial Risk*, in Aubert, J. J. & Sirks, B (editors) (2002) *Speculum Juris: Roman Law as a Reflection of Social and Economic Life in Antiquity*; Ann Arbor: University of Michigan Press; pp 134-150.

- Sitwell, N. H. H. (1981) *Roman Roads of Europe*; London: Cassell.

- Sloman, J. (2008) *Economics and the Business Environment*, (2nd edition); Harlow: Financial Times / Prentice Hall.

- Smith, A. (1776) *The Wealth of Nations*, (reprinted 1904) The World's Classics, Volume LIV; Oxford: Oxford University Press.

- Smith, C. A. (1974) Economic Marketing Systems: Models from Economic Geography; *Annual Review of Anthropology*; Volume 3; pp 167-201.

- Smith, D. & Kenward, H. (2011) Roman Grain Pests in Britain: Implications for Grain Supply and Agricultural Production; *Britannia*; Volume 42; pp 243-262.

- Smith, R. F. (1987) *Roadside Settlement in Lowland Roman Britain*; BAR British Series Monograph No 157, Oxford: British Archaeological Reports.

- Solomon, M; Bamossy, G. & Askegaard, S. (2002) *Consumer Behaviour – a European Perspective*, (2nd edition); Harlow: Financial Times / Prentice Hall.

- Sommer, C. S. (1984) *The Military Vici in Roman Britain: Aspects of their Origins, their Location and Layout, Administration, Function and End*; BAR (British Series) Monograph No 129; Oxford: British Archaeological Reports.

- Sorrell, A. (1976) *Roman Towns in Britain*; London: B. T. Batsford Ltd.

- Southern, P. (2001) *The Roman Empire from Severus to Constantine*, (2nd edition); London: Routledge.

- Southern, P. (2011) *Roman Britain: A New History; 55 BC - AD 450*; Stroud: Amberley Publishing.

- Stallibrass, S. & Thomas, R. (editors) (2008) *Feeding the Roman Army: the Archaeology of Production and Supply in N W Europe*; Oxford: Oxbow Books.

- Stanlake, G. F. (1983) *Introductory Economics*, (4th edition); Harlow: Longman.

- Stanfield, J. A. & Simpson, G. (1958) *Central Gaulish Potters*; London: Oxford University Press.

- Steiner, R. L. (1976) The Prejudice Against Marketing; *Journal of Marketing*; Volume 40 (3); pp 2-9.

- Stern, H. (1958) Les Mosaiques de L'Eglise de Saint Constance à Rome; *Dumbarton Oaks Papers*; Volume 12; pp157-218; [online] available from; www.jstor.org/stable/1291120.

- Stokes, D. (1994) *Discovering Marketing*; London: D P Publications.

- Storey, J. M; Symonds, R. P; Hart, F. A; Smith, D. M. & Walsh, J. N. (1989) A Chemical Investigation of 'Colchester' Samian by Means of Inductively Coupled Plasma Emission Spectrometry, *Journal of Roman Pottery Studies*, Volume 2, pp 33-43.

- Strobel, K. (1987) Einige Bemerkungen zu den historisch-archäologischen Grundlagen einer Neuformulierung der Sigillatenchronologie für Germanien und Rätien und zu wirtschaftsgeschichtlichen Aspekten der römischen Keramikindustrie, *Münstersche Beiträge zur Antiken Handelsgeschichte*; Volume 6 (2); pp 75-115.

- Sumner, H. (1927) *Excavations in New Forest Roman Pottery Sites*; London: Chiswick Press.

- Swaddling, J; Walker, S. & Roberts, P. (1995) *Italy in Europe: Economic Relations, 700 BC - AD50*, London: British Museum Press.

- Swan, V. G. (1981) *Castor-by-Norwich Reconsidered and the Dating of Romano-British Pottery in East Anglia*, in Anderson, A. C. & Anderson A. S. (editors) (1981) *Roman Pottery Research in Britain and North West Europe*; BAR (International Series) Monograph No 123; Oxford: British Archaeological Reports; pp 132-155.

- Swan, V. G. (1984) *The Pottery Kilns of Roman Britain*; Royal Commission for Historic Monuments, Supplementary Research Report No 5; London: Royal Commission for Historic Monuments.

- Symonds, R. P. (1981) *The Application of Chemical Analysis to the Study of 'Rhenish' Wares*, in Anderson, A. C. & Anderson A. S. (editors) (1981) *Roman Pottery Research in Britain and North West Europe*; BAR (International Series) Monograph No 123; Oxford: British Archaeological Reports; pp 359-368.

- Symonds, R. P. (1992) *Rhenish Wares: Fine Dark Coloured Pottery from Gaul and Germany*; Oxford University Committee for Archaeology Monograph No 23; Oxford: Oxbow Books.

- Symonds, R. P. & Wade, S. (1999) *Roman Pottery from the Excavations at Colchester, 1971-1986*, Colchester Archaeological Report No 10, Colchester: Colchester Archaeological Trust.

- Tadajewski, M. & Jones, G. D B (editors) (2008) *The History of Marketing Thought*; London: Sage Publications Ltd.

- Taylor, J. du Plat & Cleere, H (editors) (1978) *Roman Shipping and Trade: Britain and the Rhine Provinces*; CBA Research Report No 24; London: Council for British Archaeology.

- Tchernia, A. (1983) *Italian Wine in Gaul at the End of the Republic*, in Garnsey, P; Hopkins, K. & Whittaker, C. (editors) (1983) *Trade in the Ancient Economy*; London: Chatto & Windus; pp 87-104.

- Temin, P. (2001) A Market Economy in the Early Roman Empire; *Journal of Roman Studies*; Volume 91; pp 169-181.

- Temin, P. (2006) *Mediterranean Trade in Biblical Times*, in Findlay, R; Henriksson, R. G. H; Lindgren, H. & Lundahl, M. (editors) (2006) *Eli Heckscher, International Trade and Economic History*; Cambridge, Mass: MIT Press; pp 141-156.

- Temin, P. (2012) *The Contribution of Economics*, in Scheidel, W. (editor) (2012a) The *Cambridge Companion to the Roman Economy*; Cambridge: Cambridge University Press; pp 45-70.

- Temin, P. (2013) *The Roman Market Economy*; Woodstock: Princeton University Press.

- Terrisse, J. (1968) *Les Céramiques Sigillées Gallo-Romaines des Martres-de-Veyre*; Gallia Supplement No 19; Paris: Éditions de Centre National de la Recherche Scientifique.

- Thomas, A. (2004) *Research Skills for Management Students*; London: Routledge.

- Thomas, R. & Stallibrass, S. (2008) *For Starters: Producing and Supplying Food to the Army in the Roman North-West Provinces*, in Stallibrass, S. & Thomas, R. (editors) (2008) *Feeding the Roman Army: the Archaeology of Production and Supply in N W Europe*; Oxford: Oxbow Books; pp 1-17.

- Todd, M. (editor) (1989) *Research in Roman Britain: 1960-89*; Britannia Monograph Series No 11; London: Society for the Promotion of Roman Britain.

- Todd, M. (1999) *Roman Britain*, (3rd edition); Oxford: Blackwell.

- Todd, M. (editor) (2007) *A Companion to Roman Britain*; Oxford: Blackwell Publishing Ltd.

- Tomber, R. (1993) Quantitative Approaches to the Investigation of Long Distance Exchange; *Journal of Roman Archaeology*; Volume 6; pp 142-166.

- Tomlin, R. S.O. (1988) *Tabellae Sulis: Roman Inscribed Tablets of Tin and Lead Lost from the Sacred Spring at Bath*, in Cunliffe, B. W. (1988b) *The Temple of Sulis Minerva at Bath; Volume 2: Finds from the Sacred Spring*; Oxford University Committee for Archaeology, Monograph No 16; Oxford: Oxford University School of Archaeology; pp 59-277.

- Tomlin, R. S.O. (1993) *Votive Objects: the Inscribed Lead Tablets*, in Woodward, A. & Leach P. (1993) *The Uley Shrines: Excavation of a Ritual Complex on West Hill, Uley; Gloucestershire: 1977-1979*; London: English Hetitage / British Museum Press; pp 113-130.

- Tomlin, R. S. O. (2003) The Girl in Question: a new Text from Roman London; *Britannia*; Volume 34; pp 41-51.

- Trott, K. & Tomalin, D. (2003) The Maritime Role of the Island of Vectis in the British Pre-Roman Iron Age; *Journal of Nautical Archaeology*; Volume 32 (2); pp 158-181.

- Trow, S. D. (2002) *By the Northern Shores of Ocean: Some Observations on Acculturation Process at the Edge of the Roman World*, in Blagg, T. F.C. & Millett, M. J. (editors) (2002) *The Early Roman Empire in the West*; Oxford: Oxbow Books; pp 103-119.

- Twede, D. (2002) Commercial Amphoras: the Earliest Consumer Packages? *Journal of Macromarketing*; Volume 22; pp 89-108

- Tyers, P. A. (1996) *Roman Pottery in Britain*; London: Routledge.

- Tyers, P. A. (2012) *Potsherd: Atlas of Roman Pottery*; [online]. Available from: http://.potsherd.net/atlas.

- University of Southampton (2005) *Roman Amphorae - a Digital Resource*; Available from: http://archaeology/dataservice.ac.uk/archives/view/amphorae_ahrb_2005/c

- Van Arsdell, R. (1989) *Celtic Coinage in Britain*; London: Spink & Son.

- Van Beek, B. L. (1983) Salinatores and Sigillata: the Coastal Areas of North Holland and Flanders and their Economic Differences in the 1st Century AD; *Helenium*; Volume 23; pp 3-12.

- Vance, J. E. (1970) *The Merchants' World: The Geography of Wholesaling*; Englewood Cliffs, N. J: Prentice Hall International.

- Van der Veen, M. (1988) *Carbonized Grain from the Granary at South Shields in North East England*, in Künster, H. (1983) *Der Prähistorische Mensch und Seine Umwelt*, Stuttgart: Kommissionsvarlag K. Theiss; pp 353-365.

- Van Driel-Murray, C. (1985) *The Production and Supply of Military Leatherwork in the First and Second Centuries AD: a Review of the Archaeological Evidence*, in Bishop, M. C. (editor) (1985a) *The Production and Distribution of Roman Military Equipment*; BAR (International Series) Monograph No 275; Oxford: British Archaeological Reports; pp 43-81.

- Van Neer, W; Ervynch, A. & Monsieur, P. (2010) *Fish Bones and Amphorae: Evidence for the Production and Consumption of Salted Fish Products outside the Mediterranean Region*; Journal of Roman Archaeology; Volume 23; pp 161-195.

- Van Waateringe, W. G. (1989) *Food for Soldiers: Food for Thought*, in Barrett, J. C; Fitzpatrick, A. P. & Macinnes, I. (editors) (1989) *Barbarians and Romans in North West Europe*; BAR (International Series) Monograph No 471; Oxford: British Archaeological Reports; pp 96-107.

- Veblen, T. (1899) The Preconceptions of Economic Science; *Quarterly Journal of Economics*; Volume 13 (4); pp 394-426.

- Verboven, K. S. (2002) *The Economy of Friends: Aspects of Amicitia and Patronage in the Late Republic*; Brussels: Éditions Latomus.

- Verboven, K. S. (2007) *Good for Business: The Roman Army and the Emergence of a 'Business Class' in the North-western Provinces of the Roman Empire (1st Century BCE - 3rd Century CE)*, in de Blois, L. & Lo Cascio, E. (editors) (2007) *The Impact of the Roman Army (200 BC - 476 AD) Economic, Social, Political, Religious and Cultural Aspects*; Amsterdam: Brill Publishing; pp 295-313.

- Vernhet, A. & Kumurdjian, A. (1991): *La Graufesenque: céramiques gallo-romaines*; Millau: Ed du Beffroi.

- Vernon, R. (1966) International Investment and International Trade in the Product Life Cycle; *Quarterly Journal of Economics*; Volume 80 (2); pp 190-207.

- Vetters, H. & Kandler, M. (editors) (1990) *International Limeskongresses (1986): Carnuntum*; Vienna: Verlag der Österreich ischen Akadamie der Wissenschaften.

- Vivenza, G. (2012) *Roman Economic Thought*, in Scheidel, W. (editor) (2012a) The *Cambridge Companion to the Roman Economy*; Cambridge: Cambridge University Press; pp 25-44.

- Wacher, J. S. (1974) *The Towns of Roman Britain*; London: BCA / Batsford.

- Wacher, J. S. (1979) *The Coming of Rome*; London: BCA / Routledge & Kegan Paul.

- Wacher, J. S. (1997) *The Roman Empire*; New York: Barnes & Noble.

- Wacher, J. S. & McWhirr, A. D. (editors) (1982) *Early Occupation at Cirencester, Cirencester Excavations Volume 1*; Cirencester: Cirencester Excavation Committee / Corinium Museum.

- Waldron, H. A. (1973) Lead Poisoning in the Ancient World; *Medical History*; Volume 17; pp 391-399 [online]; available from; https://www.ccbi.nlm.nih.gov/pmc/articles/PMC1081502/pdf/medhist0012-0077.pdf

- Wallerstein, I. (2004) *World-Systems Analysis*; London: Duke University Press.

- Walsh, M. (2000) *Roman Maritime Activity around Britain; What is the Evidence and how Might it be Enhanced?* in Fincham, G; Harrison, G; Holland, R. & Revell, L. (editors) (2000) *TRAC 99 - Proceedings of the Ninth Annual Theoretical Archaeology Conference*, Oxford: Oxbow Books; pp 53-63.

- Ward, J. (1997) *Roman Britain*; London: Parkgate Books Ltd.

- Ward, M. (1995) A Summary of Samian Ware from Excavations at Piecebridge; *Journal of Roman Pottery Studies*; Volume 6; pp 14-22.

- Ward, M. (1996) *Samian Ware*, in Cracknell, S. (1996) *Roman Alcester: Defences and Defended Area. Gateway Supermarket and Gas House Lane*; CBA Monograph No 106; London: Council for British Archaeology; pp 74-77.

- Ward-Perkins, J. & Claridge, A. (1976) *Pompeii AD 79*; London: Imperial Tobacco Ltd / Daily Telegraph.

- Watson, B (1998) *Roman London, Recent Archaeological Work*, Journal of Roman Archaeology: Supplementary Series No 24: Portsmouth, Rhode Island; Journal of Roman Archaeology.

- Watson, G. R. (1981) *The Roman Soldier*, (2nd edition); London: Thames & Hudson.

- Weber, A. (1929) *The Theory of the Location of Industries*, Chicago: University of Chicago Press.

- Weber, M. (2013) *A Reassessment of Pre-Consumption Deposits and Samian Export in the Antonine Period*, in Fulford, M. G. & Durham, E. (editors) (2013) *Seeing Red: New Economic and Social Perspectives on Gallo-Roman Terra Sigillata*, Institute of Classical Studies; Supplement No 102; London: Institute of Classical Studies; pp 188-209.

- Webster, G. (1976) *Romano-British Coarse Pottery: a Students' Guide*; CBA Research Report No 6; London: Council for British Archaeology.

- Webster, G. (1978) *Boudica: The British Revolt against Rome AD 60*; London: Batsford.

- Webster, G. (1979) *The Roman Imperial Army*, (2nd edition); London: A C Black.

- Webster, G. (1980) *The Roman Invasion of Britain*; London: Batsford.

- Webster, G. (1981) *The History and Archaeology of Roman Britain in the Third Century*, in King, A. & Henig, M. (editors) (1981) *The Roman West in the Third Century*; BAR (Supplementary Series) Monograph No 109; Oxford: British Archaeological Reports; pp 343-351.

- Webster, G. (1988a) *Fortress into City: the Consolidation of Roman Britain in the First Century AD*; London: B. T. Batsford Ltd.

- Webster, G. (1988b) *Introduction*, to Webster, G. (editor) (1988a) Fortress *into City: the Consolidation of Roman Britain in the First Century AD*; London: B. T. Batsford Ltd; pp 11-23.

- Webster, P. N. (1975) More British Samian from the Aldgate-Pulborough Potter; *Britannia*; Volume 6; pp 163-170.

- Webster, P. N. (1977) *Severn Valley Ware on the Antonine Frontier*, in Dore, J. & Greene, K. (editors) (1977) *Roman Pottery Studies in Britain and Beyond*; BAR (International Series) Monograph No 30; Oxford: British Archaeological Reports; pp 163-174.

- Webster, P. N. (1992) *The Coarse Pottery*, in Hinchcliffe, J. & Williams, J. H. (1992) *Roman Warrington: Excavations at Wilderspool, 1966-1969 & 1976*; Brigantia Monograph No 2; Manchester: Department of Archaeology, University of Manchester; pp 42-43; 124-125

- Webster, P. N. (2001) *Earth, Fire and Water: the Making and Marketing of Roman Samian Ware*, in Higham, N. J. (editor) (2001) *Archaeology of the Roman Empire: a tribute to the life and works of Barri Jones*; BAR (International Series) Monograph No 940; Oxford: British Archaeological Reports; pp 189-302.

- Webster, P. N. (2005) *Roman Samian Pottery in Britain - a Practical Handbook in Archaeology*, York: Council for British Archaeology.

- Wedlake, W. J. (1982) *The Excavation of the Shrine of Apollo at Nettleton, Wiltshire; 1956-1971*, Research Committee for the Society of Antiquaries, Report No 40, London: Society of Antiquaries / Thames and Hudson Ltd.

- Weitz, B. & Wensley, R. (editors) (2002) *Handbook of Marketing*; London, Sage Publications Ltd.

- Wells, C. M. (1972) *The German Policy of Augustus*; Oxford: Clarendon Press.

- Wells, C. M. (1984a) *The Roman Empire*; Stanford: Stanford University Press.

- Wells, C. M. (1984b) Review of 'Die Unverziete Terra Sigillata aus Haltern' by von Schnurbein, S (1982); *Antiquaries Journal*; Volume 64; pp 164-166.

- Wells, C. M. (1992) Pottery Manufacture and Military Supply North of the Alps; *Rei Cretariae Romanae Fautorum Acta*; Volume 30; pp 195-205.

- White, K. D. (1970) *Roman Farming*; London: Thames & Hudson.

- White, R. H. & Barker, P. (1998) *Wroxeter, Life and Death in a Roman City*; Stroud: Tempus Publishing.

- White, R. H. & Gaffney, V. L. (2003) *Resolving the Paradox: the Work of the Wroxeter Hinterland Project*, in Wilson, P. (editor) (2003) *The Archaeology of Roman Towns: Studies in Honour of John S. Wacher*; Oxford: Oxbow Books; pp 221-232.

- Whittaker, C. R. (1985) Trade and the Aristocracy in the Roman Empire; *Opus*; Volume 4; pp 49-75.

- Whittaker, C. R. (1988) Trade and the Aristocracy of the Roman Empire; *Opus*; Volume 4; pp 49-75, reprinted in Whittaker, C. R. (editor) (1993) *Land, City and Trade in the Roman Empire*; Varioum Collected Studies, CS408; Aldershot: Ashgate Publishing Ltd.

- Whittaker, C. R. (1989) *Supplying the System: Frontiers and Beyond*, in Barrett, J. C; Fitzpatrick, A. P. & Macinnes, I. (editors) (1989) *Barbarians and Romans in North West Europe*; BAR (International Series) Monograph No 471; Oxford: British Archaeological Reports; pp 64-80.

- Whittaker, C. R. (editor) (1993) *Land, City and Trade in the Roman Empire*, Varioum Collected Studies, CS408; Aldershot: Ashgate Publishing Ltd.

- Whittaker, C. R. (1994) *Frontiers of the Roman Empire: a Social and Economic Study*; New York: John Hopkins University Press.

- Whittaker, C. R. (1999a) *Rome and its Frontiers: the Dynamics of Empire*; London: Routledge.

- Whittaker, C. R. (1999b) *Supplying the Army: the Evidence from the Frontier Fort at Vindolanda*; in Whittaker, C. R. (1999a) *Rome and its Frontiers: the Dynamics of Empire*; London: Routledge; pp 88-114.

- Whittaker, C. R. (2002) *Supplying the Army: Evidence from Vindolanda*, in Erdkamp, P (editor) (2002a) *The Roman Army and the Economy*; Amsterdam: J. C. Gieben; pp 204-234.

- Wickenden, N. P. (1986) Prehistoric Settlement in the Romano British Small-town at Heybridge, Essex; *Essex Archaeology and History*; Volume 17; pp 7-68.

- Widemann, F; Picon, J; Asaro, F; Michel, H. V. & Perlman, I. (1975) A Lyon Branch of the Pottery Making Firm of Ateius of Arezzo; *Archaeometry*; Volume 17; pp 45-59.

- Wightman, E. M. (1970) *Roman Trier and the Treveri*; London: Harper Collins.

- Wightman, E. M. (1985) *Gallia Belgica*; London: B. T. Batsford Ltd.

- Wild, P. J. (1978) *Cross Channel Trade in the Textile Industry*, in Taylor, J. du Plat & Cleere, H (editors) (1978) *Roman Shipping and Trade: Britain and the Rhine Provinces*; CBA Research Report No 24; London: Council for British Archaeology; pp 79-81.

- Wilkinson, P. (2000) *What The Romans Did For Us*; Basingstoke: Macmillan.

- Williams, D. F. (1977) *The Romano-British Black-Burnished Industry: an Essay on Characterization by Heavy Mineral Analysis*, in Peacock, D. P. S. (editor) (1977) *Pottery and Early Commerce: Characterization and Trade in Roman and Later Ceramics*; New York: Academic Press; pp 163-220.

- Williams, D. F. (1987) *Amphora*, in Cunliffe, B. W. (editor) (1987) *Hengistbury Head, Dorset; Volume 1: the Prehistoric and Roman Settlement, 3,500 BC - AD 500*; University of Oxford Committee for Archaeology; Monograph No 13; Oxford: Oxford University School of Archaeology; pp 271-274.

- Williams, D. F. (1989) *The Impact of the Roman Amphorae Trade on Pre-Roman Britain*, in Champion, T. (editor) (1989) *Centre and Periphery: Comparative Studies in Archaeology*; London: Routeledge; pp 142-149.

- Williams, D. F. (1991) *Amphorae*, in Cox, P. W. & Hearne, C. M. (1991) *Redeemed from the Heath: the Archaeology of the Wytch Farm Oilfield; 1987-1990*, Dorset Natural History and Archaeological Society Monograph No 2; Dorchester: Dorset Natural History and Archaeological Society; pp118-121.

- Williams, D. F. (2003) Cretan Wine in Roman Britain, in Plouviez, J. (editor) (2003) Amphorae in Britain and the Western Empire, *Journal of Roman Pottery Studies*, Volume 10; Oxford: Oxbow Books, pp 26-31.

- Williams, S. (1985) *Diocletian and the Roman Recovery*; New York: Methuen.

- Williams, D. F. & Carreras Monfort, C. (1995) North African Amphora in Roman Britain: a Re-appraisal; *Britannia*; Volume 26; pp 231-252.

- Williams, S. (1985) *Diocletian and the Roman Recovery*; New York: Methuen.

- Williamson, O. E. & Winter, S. G. (editors) (1991) *The Nature of the Firm: Origins, Evolution and Development*; Oxford: Oxford University Press.

- Willis, S. H. (1998) Samian Pottery in Britain: Exploring its Distribution and Archaeological Potential; *Archaeological Journal*; Volume 155; pp 82-133.

- Willis, S. H. (2003) The Character of Lyon Ware Distribution (with particular attention to the evidence from the Midlands and the North of Britain), in Plouviez, J. (editor) (2003) Amphorae in Britain and the Western Empire; *Journal of Roman Pottery Studies*, Volume 10; Oxford: Oxbow Books; pp 125-138.

- Willis, S. H. (2011) Samian Ware and Society in Roman Britain and Beyond; *Britannia*; Volume 42; pp 167-242.

- Wilmot, A. R. (1982) Excavations at Queen St, City of London, 1952 & 1960 and Roman Timber Lined Wells in London; *Transactions of the London & Middlesex Archaeological Society*; Volume 33; pp 1-78.

- Wilson, A. I. (2009) *Approaches to Quantifying Roman Trade*, in Bowman, A. K. & Wilson, A. (editors) (2009) *Quantifying the Roman Economy: Methods and Problems*; Oxford: Oxford University Press; pp 213-258.

- Wilson, A. I. & Bowman, A. K. (editors) (forthcoming) *Trade, Commerce and the State in the Roman World*; Oxford: Oxford University Press.

- Wilson, D. R. (1971) Roman Britain in 1970; *Britannia*; Volume 2; p 248.

- Wilson, P. R. (1989) *The Crambeck Pottery Industry*, Leeds: Yorkshire Archaeological Society.

- Wilson, P. R. (editor) (2002) *Caractonium: Roman Catterick and its Hinterlands, Excavations and Research, 1958-1997; Volume 1*; CBA Research Report No 128; London: Council for British Archaeology.

- Wilson, P. R. (2003) *The Archaeology of Roman Towns: Studies in Honour of John S. Wacher*; Oxford: Oxbow Books.

- Woodward, A. (1992) *Shrines and Sacrifice*; London: B.T. Batsford Ltd / English Heritage.

- Woodward, A. & Hill, J. D. (editors) (2002) *Prehistoric Britain: the Ceramic Basis*; Oxford: Oxbow Books.

- Woodward, A. & Leach P. (1993) *The Uley Shrines: Excavation of a Ritual Complex on West Hill, Uley; Gloucestershire: 1977-1979*; London: English Hetitage / British Museum Press.

- Woolf, G. (1997) *Becoming Roman: the Origins of Provincial Civilisation in Gaul*; Cambridge: Cambridge University Press.

- Woolf, G. (2001) *Regional Productions in Early Roman Gaul*, in Mattingly, D. J. & Salmon, J. (editors) (2001) *Economics beyond Agriculture in the Classical World*; London: Routeledge; pp 49-65.

- Worthington, I. & Britton, C. (2003) *The Business Environment*, (4th edition); Harlow: FT / Prentice Hall.

- Yaron, R. (1959) *The Sale of Wine*, in Daube, D. (1959) *Studies in the Roman Law of Sale*; London: Oxford University Press; pp 171-177.

- Young, *C.* J. (1977) *Oxfordshire Roman Pottery*; BAR (British Series) Monograph No 43; Oxford: British Archaeological Reports.

- Zant, J. (1987) *Excavations at 126 High Street, Winchester: a preliminary survey*; Hampshire Field-club Archaeological Society Newsletter, Series 7 (1987); pp 14-16.

GLOSSARY OF TERMS USED IN THE TEXT

(*Latin* – unless stated)

Acetum	-	Sour-wine or wine-vinegar
Actiones exercitoriae	-	Ship-owners representatives
Actiones institoriae	-	Business managers
Ad hoc	-	As required
Agricola	-	Roman general and statesman (1st century)
Agricultura	-	Farming
Allec	-	Pungent fish sauce (alias'; *alec, alex, allex, halex, hallec* and *hallex*)
Amicitia	-	Friends or acquaintances
Amphorae	-	Large ceramic containers for carrying wine, oil etc
Amurca	-	Water produced as a by-product of olive-pressing
Annona	-	Annual grain crop / agricultural supplies
Annona urbana	-	Public 'welfare' system of the city of Rome
Annum	-	Year
Ante	-	Before
Apparitor	-	Financial administrator concerned with freight movements
Aqua	-	Water
Arretine	-	Early form of samian-like pottery
Ass	-	Small bronze or brass coin
Aureus	-	Gold coin = 25 *denarii*
Baetica	-	Roman province in south-west Spain

Basilica	-	Aisled market-hall
Bello	-	War
Beneficiarii	-	Customs officers at key hubs in the transport network
Britannia	-	Britain
c.	-	Abbreviation of *circa* (approximately)
C	-	Abbreviation of 'Century'
Cabotage	-	Short-haul, down-the-line trade, 'tramping' (French)
Canabae	-	Civilian settlement adjacent to a major fortress
Capitis	-	Monetary wealth
Caveat emptor	-	Roman legal maxim that a buyer should beware
Centurion Regionarius	-	Regional commander
Céramique Èponge	-	Sponge-decorated pottery (French)
Civitas	-	Major town, often a tribal or community capital
Classis Britannica	-	The British imperial fleet
Cognomen	-	Third section of a *tria-nomina*, containing an individual's personal name
Collegium	-	Commercial association or trade-guild
Coloniae	-	Town established as a colony for retired army veterans
Conductores	-	State contractors
Contra	-	Opposite view
Conventus	-	Corporate body administering a town or harbour
Corpus vinariorum	-	Guild of wine merchants
Crater	-	Large bowl used for mixing wine with water (Greek)

Cretariae	-	Pottery or ceramics
De agri cultura	-	The agriculture industry
Decuriones	-	Members of a town's council
Dediticii	-	Conquered subjects
De facto	-	In effect
Defixiones	-	Lead 'curse tablets'
Denarius	-	Sliver or silver-plated coin = 4 *sestertii*
Diffusor	-	Distributor
Dolia	-	Large earthenware storage jar - usually set into the floor
e.g.	-	Abbreviation of *exempli gratia* (for example)
Emporia	-	Market containing many exotic goods (Greek)
En barbotine	-	The application of a trailed slip decoration to pottery
En mass	-	Large-scale or high volume
En Route	-	On the way to a fixed destination
Entrepôt	-	Port where goods may be processed or re-exported (French)
Equites	-	Members of the equestrian class - knights.
et al	-	Abbreviation of *et alia* (and others)
etc	-	Abbreviation of *etcetera* (and the rest)
Ex argentario	-	Metal after its silver content has been removed
Exercitoriae	-	Shipowners
Fabrica	-	Workshop
Familia	-	Members of a Roman family
Figlina	-	Estate or workshop

Filius	-	The son of
Fiscus	-	Taxation system
Forum	-	The central square of a Roman town
Garum	-	Pungent fish sauce of a quality
Geographica	-	Geography
Graffito	-	Written marking scratched onto an object
Historia	-	History
Horrea	-	Warehouse
i.e.	-	Abbreviation of *id est* (that is)
Imbrex	-	Crescent shaped roofing-tile
Indictiones	-	State requisition
Institores	-	Business / workshop managers
Instrumentum Domesticum	-	Domestic objects
Insula	-	Residential block in a Roman town
Keramik	-	Pottery (German)
Laridum	-	Salted pork / bacon fat
Libra	-	1 Roman pound = 12 ounces / 327.45 grams
Logistikê	-	Quantitative calculations related to supplies (Greek)
Macellum	-	Indoor market
Magus	-	Market
Manumission	-	The process of freeing a slave
Mensa ponderaria	-	Table for measuring standard length, weight and volume
Mercatores	-	Export merchants / wholesalers

Modius	-	Dry measure = c. 8.65 litres
Monte	-	Hill or mountain
Monopsony	-	Purchasing cartel (Greek)
Mortaria	-	Ceramic mixing bowl with a gritty interior
Naturalis Historia	-	Natural history
Nautae	-	River boatmen
Navicularii	-	Shippers
Negotiator	-	Commercial entrepreneurs and financiers
Negotiator ars cretariae	-	Pottery merchant
Negotiator salarius	-	Merchant dealing in salt or salted produce
Negotiator vinarius	-	Wine merchant
Nem	-	To organize or administer (Greek)
Nomen	-	Second section of a *tria-nomina*, containing an individual's family or clan name
Noviomagus	-	New market
Nundinae	-	Local markets which took place every 9th day
Oceanus	-	The sea or ocean
Officinatores	-	Administrative manager
Officiis	-	Administration
Oikos	-	Household (Greek)
Oleoculture	-	Olive-growing
Oleum	-	Olive oil
Oppidum	-	Celtic tribal centre

Opus	-	Literary work
Papyri	-	Writing-paper made from reeds, similar to parchment
Pax Romana	-	Roman peace
Peculium	-	Earnings / savings belonging to a slave
Per annum	-	Each year
Peregrini	-	Non-citizens or foreigners
Pers. Comm.	-	Personal communication (English abbreviation)
Per se	-	In itself
Pes monetalis	-	1 standard Roman foot = 11.65 inches = 296 mm
Plebeian	-	People belonging to the common class
Plebiscitum	-	A democratic vote or mandate
Poinçon	-	Punch or stamp used to decorate pottery (French)
Portoria	-	Customs or harbour duties
Posca	-	Sour wine or vinegar
Praefectus annonae	-	Head of the state taxation and supply system
Praenomen	-	First section of a *tria-nomina,* containing an individual's childhood name
Prata	-	Legionary lands - often used for food production
Publicani	-	Privately contracted tax collectors of the Republican era
Regio	-	Region
Regulus	-	Rule to measure 1 Roman foot = 11.65 inches = 296 mm
Repertoire	-	Product-portfolio (French)
Republica	-	Republic

Résumé	-	Brief synopsis (French)
Roulette	-	Roller-die used to decorate pottery (French)
Salezones	-	Generic term for any variety of pungent fish sauce
Sapa	-	Boiled grape juice; used as a sweetening agent
Satisficing	-	To accept an available option as satisfactory (English)
Satyricon	-	A satirical play
Sestertius	-	Bronze coin = 4 *asses*
Sevir Augustalis	-	Civic and religious dignitary
Sextarius	-	Liquid measure (c. 0.54 litres) = 1/16th of a *modius*
Sigillata	-	Samian-ware
Soli	-	Agricultural land
Spruchbecher	-	Motto-beaker (German)
Status quo	-	Existing arrangements
Stylus	-	Pointed implement, similar to a metalworker's scriber
Taberna	-	Retail shop or stall
Tegula	-	Flanged roofing-tile
Terracotta	-	Earthenware
Terra nigra	-	Black-glazed pottery from northern Gaul
Terra sigillata	-	Glossy red pottery; imported from Gaul (samian ware)
Territorium	-	Land under the control of a legionary fort or Romano-British town
Tituli picti	-	Painted inscriptions on products such as *amphorae*
Tria-nomina	-	Three part name, comprising a *praenomen, nomen and cognomen*

Tributum	-	Taxation
Tributum capitis	-	Personal poll-tax
Tributum soli	-	Land taxes
Urbs	-	Urban population of Rome
Vases Métallescents	-	Pottery glazed with a metallic-sheen (French)
Vecturae	-	Transport fees
Venta	-	Market (*Celtic*)
Vestariae	-	Textiles or garments
Vicus / vici	-	Civilian settlement adjacent to a Roman fort
Villa	-	Large Roman house, often a farmstead
Vinum	-	Table wines
Vis-à-vis	-	In relation to