

A MEDIEVAL CAPITAL AND ITS GRAIN SUPPLY: AGRARIAN PRODUCTION AND DISTRIBUTION IN THE LONDON REGION c. 1300

**Bruce M.S. Campbell, James A. Galloway, Derek Keene
and Margaret Murphy**



**A London baker and his oven c. 1300
(Corporation of London Records Office, Liber de Passa Panis)**



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IN THE LONDON REGION *c.* 1300**

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Derek Keene, and Margaret Murphy

The Queen's University of Belfast and the
Centre for Metropolitan History, Institute of Historical Research,
University of London

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PREFACE AND ACKNOWLEDGEMENTS

Most of the research upon which this monograph is based was undertaken as part of two collaborative projects with the generic title 'Feeding the City'. The projects arise from cooperation between the Centre for Metropolitan History (CMH), based at the University of London's Institute of Historical Research, and the Department of Economic and Social History at The Queen's University of Belfast.

The aim of 'Feeding the City' is to investigate the impact of London's demand for food and other supplies on the agriculture and on the distribution systems of the metropolitan hinterland. 'Feeding the City I' (FTC I for short) is concerned with the period around 1300, when London reached an early peak in its population and was one of the largest European cities. In terms of the available source material, this is one of the best periods for such an investigation of this crucial aspect of the relationship between town and country. It is certainly the earliest period for which a wide-ranging approach is possible using documentary sources. 'Feeding the City II' (FTC II) is concerned with the same issues in the later fourteenth century, when, following the Black Death and other catastrophes, the city and the region which supported it contained a much reduced population with a very different pattern of consumption. Both projects follow the same methodology, and deal, so far as possible, with the full range of agrarian production, including the pastoral, arable, and woodland sectors. Each of them has compiled two regional databases which will ultimately be available for consultation. The accounts databases (e.g. 'FTC I accounts database') concern the details of agrarian production and distribution as revealed by manorial accounts, and the Inquisitions *post mortem* databases (e.g. 'FTC I IPM database') concern land use and land values. In addition, the two projects draw on other materials concerning London's markets and regional trade. In due course a book will explore the entire system of production and distribution and its evolution over the fourteenth century. The present monograph explores many of the issues concerning the grain sector around the year 1300.

'Feeding the City I', co-directed by Derek Keene and Bruce Campbell, has been funded by the Leverhulme Trust. 'Feeding the City II', co-directed by Derek Keene, Bruce Campbell, James Galloway, and Margaret Murphy, has been funded by the Economic and Social Research Council (grant number R000233157). We are grateful to those bodies for making the work possible, and are especially grateful to Richard Britnell and Harold Fox, who as advisers to the two projects, and as friends, have contributed many insights and wise judgements.

Analysis and mapping of the IPMs was carried out on mainframe computers using the SIR database management system and the GIMMS mapping package. Analysis and mapping of the accounts database was undertaken at the CMH using the personal computer systems dBASE IV, dBASE Stats, MAPICS QuickMap, and Autodesk Autosketch. We have benefited from the help and experience of colleagues at the CMH and the University of London Computing Centre. Craig Spence of the CMH helped solve many mapping and graphics problems.

For permission to consult manuscripts, and for help and advice from the staff concerned, we would like to thank the following institutions: Bedfordshire Record Office, Berkshire Record Office, Buckinghamshire Record Office, Bodleian Library, British Library, Cambridge University Library, Canterbury Cathedral Archive, Centre for Kentish Studies (Maidstone), Corporation of London Records Office, Essex Record Office, Eton College Library, Greater London Record Office, Guildhall Library, Hampshire Record Office, Hertfordshire Record Office, King's College Cambridge, Lambeth Palace Library, Merton College Oxford, National Register of Archives, New College Oxford, Northamptonshire Record Office, Norfolk Record Office, Oxfordshire Record Office, Public Record Office, Surrey Record Office, Westminster Abbey Library.

In engaging in this enterprise, each of the authors is conscious of having entered territory previously unfamiliar to them. In that context we are grateful for information, advice, assistance, and encouragement generously given by the following friends and colleagues: Judith Bennett, Patrick O'Brien, Margaret Crawford, Christopher Dyer, Larry Epstein, Vanessa Harding, Knut Helle, Franz Irsigler, Maryanne Kowaleski, John Langdon, Jim Masschaele, Mark Overton, John Power, Richard Unger, and Adriaan Verhulst. The members of the special seminar on grain prices, held in February 1991 with the support of the Nuffield Foundation, contributed much to the evolution of the methodology. Charles Withers, as editor of the Historical Geography Research Group Monograph Series, has been supportive and forebearing throughout.

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LIST OF ABBREVIATIONS

<i>AgHR</i>	<i>The Agricultural History Review</i>
Bd	Bedfordshire
Bk	Buckinghamshire
BL	British Library, London
Bodl.	Bodleian Library, Oxford
Brk	Berkshire
BRO	Berkshire Record Office
CCA	Canterbury Cathedral Archives
CLRO	Corporation of London Records Office
CUL	Cambridge University Library
<i>EconHR</i>	<i>The Economic History Review</i>
<i>EHR</i>	<i>The English Historical Review</i>
ERO	Essex Record Office
Ess	Essex
Eton Coll.	Eton College, Berkshire
GL	Guildhall Library, London
HertsRO	Hertfordshire Record Office
HRO	Hampshire Record Office
Hrt	Hertfordshire
IPM	Inquisition <i>post mortem</i> , see pp. 17-18
K	Kent
kcal	kilocalories
King's Coll.	King's College, Cambridge
LPL	Lambeth Palace Library
Merton Coll.	Merton College, Oxford
Mx	Middlesex
NCA	New College Archives, Oxford
Np	Northamptonshire
NpRO	Northamptonshire Record Office
NRO	Norfolk Record Office
O	Oxfordshire
PRO	Public Record Office, Chancery Lane, London
RS	Rolls Series
Sr	Surrey
<i>TRHS</i>	<i>Transactions of the Royal Historical Society</i>
U.P.	University Press
WAM	Westminster Abbey Muniments

WEIGHTS, MEASURES, AND MONEY

ENGLISH MEASURES AND METRIC EQUIVALENTS

Length

1 foot		=0.3048 metres (m.)
1 yard	=3 feet	=0.9144 m.
1 mile	=1,760 yards (yds.)	=1.6093 kilometres (km.)

Area

1 acre	=4,840 square yds.	=4046.9 square m.	=0.4047 hectares (ha.)
1 square mile	=640 acres	=259 ha.	=2.590 square km.

Volume

Liquid:

1 pint (Imperial, introduced in 1824)		=0.5683 litres
1 gallon (Imperial)	=8 pints	=4.546 litres

Dry:

1 bushel (English, see p. 23)	=8 gallons	=35.238 litres
1 quarter (English)	=8 bushels (see p. 195)	=281.904 litres
		=2.819 hectolitres (hl.)

Volume by area (a measure of yield)

1 bushel (English) per acre	=87.072 litres per ha.	=0.8707 hl. per ha.
1.1485 bushels (English) per acre		=1 hl. per ha.

Mass (weight)

The English weights are based on the pound avoirdupois; for other types of pound, see Appendix II.

1 pound (lb.)		=0.4536 kilogram
1 ton	=2,240 lb.	=1.016 tonne

SOME USA EQUIVALENTS

<u>Liquid measure:</u>	1 pint (Imperial)	=1.2009 pint (USA)
<u>Dry measure:</u>	1 bushel (English, see p. 23)	=1.0027 bushels (USA)

MONEY

The pre-decimalization sterling currency is used:

1 penny (1d.)	
12 pence (12d.)	=1 shilling (1s.)
20 shillings (20s.)	=1 pound (£1)

GLOSSARY

affer	an adult work-horse, principally used for ploughing
brotcorn	a mixture of grains, presumably used for making bread
cornmeter	one who measures and carries corn (grain)
cornmonger	one who deals in corn (grain) and in legumes
demesne	land and other real property under the direct control of its lord; also used to denote land controlled by manorial lords as opposed to land belonging to lesser persons or peasants
dredge	a mixture of oats and spring barley
extraction rate	the proportion by weight of the whole grain which is used to make flour
forestall	buy up goods before they reach the market place in order to profit by enhanced price; see Britnell (1987)
<i>inhok</i>	a part of the fallow course used for cultivation
ley farming	an intensive system involving the alternate growing of grain crops and grass
mancorn	a mixture of rye and winter barley
marl	apply a mixture of clay and lime (marl) as a fertilizer
maslin	a mixture of rye and wheat
regrate	buy up goods in order to sell them again retail
seigneurial	pertaining to manorial lords
shout	a large boat used for carrying grain and other goods on the River Thames
staple	a market to which a particular category of goods in a region is bound to be brought for sale
stot	adult work-horse, usually male, principally used for ploughing

I

INTRODUCTION

ISSUES AND CONCEPTS

The urban grain market

Feeding cities required great effort from pre-industrial societies. The greater the city, the more elaborate was the response needed to produce and transport essential supplies. As centres of concentrated demand cities stimulated specialization, intensification, and innovation within agriculture, but the extent of that influence was limited by the size of the city. Conversely, the constraints of a technology which was predominantly organic and animate resulted in levels of land productivity which were low by modern standards, and that set limits to the population that could be supported from a given area of land.¹ Correspondingly low levels of labour productivity ensured that only a minority of that population was able to engage in non-agricultural activities and reside in towns.² Slow and cumbersome transportation could further limit the size of agglomerations. The growth or otherwise of cities, of the urban systems of which they were part, and of the agriculture which supported them, were thus inextricably interlinked.³ Moreover, change was slow. In England as late as 1750, on the eve of the Industrial Revolution, only 21 per cent of the population of 5.8 million lived in towns of at least 5,000 inhabitants. Fifty-six per cent of that urban population was concentrated in London, which, with approximately 675,000 inhabitants, was by far the largest city of Christian Europe.⁴

Foodstuffs were supplied to pre-industrial towns by a variety of means: as rents in kind or seigneurial dues, by direct transfer from rural estates to their owners resident in the town, and above all, in the more developed economic systems, by trade. Transport services exacted from country dwellers sometimes played a part in all these systems.⁵ The larger the town the more likely that trade would prevail over alternative methods of supply, and the more complex and extensive the marketing network required. However, the particular financial, legal, and military powers of appropriation associated with a town could greatly

¹ Wrigley (1962); Wrigley (1988), 34-50; Bairoch (1988), 3-70.

² Wrigley (1985); Overton and Campbell (1991); Grantham (forthcoming).

³ Langton and Hoppe (1983).

⁴ Wrigley (1985), 688. Istanbul was probably larger than London: Bairoch (1988), 378-9.

⁵ Grantham (1989), 190; cf. Hale (1858).

influence the form of its supply network.⁶ The institutional structure of demand was also important. Thus, even in the seventeenth century, nearly a quarter of the grain destined for a city as great as Paris bypassed the market, almost entirely in the form of non-market transfers to the city's religious houses.⁷

By the late eleventh century in England, major religious institutions, including those based in cities, had evolved methods of provisioning their households directly from their estates. This characteristically assumed the form of food farms for the supply of the household and of the enforced carriage of demesne produce to the estate headquarters by customary tenants.⁸ The latter type of arrangement tended to persist in some form for as long as serfdom remained an institution and particularly while landlords managed their estates directly.⁹ Such direct provisioning, which in the case of grain sent to London extended over distances of up to 40 miles (60 km.) by land, and over greater distances for other commodities, contributed to the diet of the servants and the poor maintained by the great households, but seems not (at least by 1300) to have made a significant contribution to that of the traders, artisans, and labourers who increasingly congregated in urban centres. It was their demand which induced farmers producing within a day or so's journey of the community to market their surplus goods directly in the town. A. P. Usher and N. S. B. Gras termed this 'local marketing'. G. Grantham has calculated that such local marketing was cumbersome beyond a distance of 10 miles, although at moderate medieval levels of yield it was capable of sustaining urban centres with as many as 10,000 inhabitants.¹⁰ At certain times and in certain regions on the Continent many such towns, as well as larger cities, imposed local trading regulations in order to reserve the surplus produce of their immediate environs to themselves. Subsequently, this could inhibit the evolution of more extensive inland marketing networks.¹¹ England, however, was a uniform and extensive polity, with a relatively unrestricted market system.¹² That was one factor which promoted the growth of London and the early dynamism of English agriculture.¹³

Such simple forms of provisioning and marketing were adequate as long as towns remained small. But as towns grew and their provisioning zones extended, it became impractical for cultivators to supply towns directly, and intermediaries became involved who bought commodities in local markets and

⁶ Cf. Gamsey (1988); Abulafia (1981); Lane (1973), 305-7.

⁷ Usher (1913), 84-5; Boislisle (1881), 657; cf. Grantham (1989), 190-1.

⁸ Hale (1858), esp. xxxix, 140-52; Neilson (1910), 15-47, 60-7; Gras (1915), 4-10; Smith R A L (1943), 128-9; Biddick (1989), 36-40.

⁹ Postles (1984); see below, 24-5, 54-5, 149.

¹⁰ Grantham (forthcoming). See also below, 173.

¹¹ Dodgshon (1987), 233-9; Scott (1992); Usher (1913), 3. See below, 103-4.

¹² The only restraint which London enjoyed on the distribution system outside the square mile of its jurisdiction was the prohibition of markets within seven miles of the city established by its royal charter of 1327: Birch (1887), 58.

¹³ Wrigley (1967); Langton and Hoppe (1983); Overton and Campbell (1991), 38-44.

then sold them on, either in intermediate markets or in the central urban market itself. Usher, clearly influenced by the example of the growth of the Chicago grain market in the nineteenth century, outlined a persuasive set of paradigms which define successive stages in the evolution of such systems of exchange.¹⁴ In the all-important grain trade, Usher regarded the appearance of specialized middlemen, such as *blatiers* or 'commongers', as 'the outward sign of the transition from the purely local market to a market engaged in trade with other markets'.¹⁵ From small beginnings, this 'inter-market trade' was capable of growing to a significant scale and some of the merchants engaged in it rose to become men of substance.

At a sufficient scale, however, trade in certain commodities tended to forsake local markets for alternative channels which offered lower costs and bigger profits. It was at this stage that wholesale and inter-regional trading became significant. In the urban grain trade Usher and Gras associate this with the emergence of a supply system based on granaries located both at key assembly points within a city's hinterland and within the consuming centre itself. The former might be owned by residents of the producing region, who bought directly from local producers (some of whom themselves maintained granaries) and then sold on to merchants from the central city, or by merchants from the shipping or consuming centre who employed factors and agents to buy for them. So long as there was no serious problem with supply, the merchants using the granaries were often content to make no energetic canvass of the country to obtain grain, and merchants from the shipping or consuming centre remained satisfied with the supplies available in the granaries. But as demand grew the granary trade assumed a more dynamic aspect and urban grain merchants and their agents began to play a more active role in forming and provisioning granaries, buying directly from producers and sometimes seeking out supplies from a wide area.¹⁶

When towns grew beyond the provisioning capacity of local and inter-market trade or drew provisions from beyond the hinterland under their control, the risk of dislocation to food supplies became considerable. Civic authorities sometimes found it expedient to play a more active role in securing and maintaining supplies, often establishing and provisioning public granaries as a hedge against shortage and the threat which that posed to civil order.¹⁷ With the

¹⁴ Usher (1913); cf. Cronon (1991). Gras (1915) followed Usher's approach, and laid particular emphasis on the eventual role of the 'metropolitan market': cf. Gras (1922), 181-340. Appleby (1976) and Jones W O (1976) are case-studies of recently-developed marketing systems which complement Usher's work.

¹⁵ Usher (1913), 16. In this study the term commonger is used to denote those London dealers who were described by that term or its equivalent in other languages. The term grain is generally used in preference to corn as the collective noun to denote the food-grasses or their fruit, or a particular species of corn.

¹⁶ Usher (1913), 69. See below, 79-110.

¹⁷ Gras (1915), 71-80. The construction of public granaries was not necessarily associated with persistent grain shortage: see below, 103-4.

emergence of cities of several hundred thousand inhabitants, which for Usher was a feature of seventeenth-century Europe, the pull of major urban markets became so strong that supplies flowed into them in anticipation of demand, and the anticipation was so keen that practically all the available supply came to market without any special canvassing. It was at this stage that there was a real danger that metropolitan markets would be provisioned at the expense of local and intermediate markets, especially in years of harvest shortfall when metropolitan supply lines were dramatically, if temporarily, extended. This was only occasionally a problem in England, but in France, as J. Meuvret has diagnosed, it was the magnetic pull of the Parisian grain market along established lines that led to the emergence of a major subsistence problem in the towns and country of its hinterland in the late seventeenth and early eighteenth centuries. At a subsequent stage of integration between the circuits of exchange, the subsistence problem was resolved.¹⁸

The assumptions of both Usher and Gras concerning the size of medieval urban populations in relation to those of the seventeenth century differ from those held today. Moreover, neither of them had access to a wide range of information on the medieval period, and both tended to interpret detailed and case-specific records of the grain market in too categorical and literal a fashion.¹⁹ Thus, while the stages of market evolution they defined provide a useful interpretive model - most notably in their centring of the problem of subsistence on the transition from a system of local markets to the wholesale market of the nineteenth century - their interpretation of the evidence as defining a particular stage, and their attribution of a stage to a particular chronological period, is often now no longer acceptable. Meuvret's work has particular value in providing a more subtle account of the grain trade in seventeenth-century France than that advanced by Usher, emphasising its segmented character, its multiple markets, the varied interests of those who participated in it, and the difficulty, in practice, of distinguishing wholesale from smaller-scale dealing.²⁰ This was a system which could provision a metropolis of up to 400,000 souls without apparent strain. In Meuvret's view, this *ancienne économie frumentaire* was essentially that of the later Middle Ages. His portrait of it thus provides a standard against which other episodes and periods can be measured.

Agrarian responses to metropolitan demand

The influence of major urban centres upon patterns of agriculture within their hinterlands was obviously considerable. This influence operated primarily via its effect upon economic rent. In effect, economic rent is the return due for the use of the land alone as a factor of production. It represents that part of a farmer's revenue above production costs, but excluding remuneration derived

¹⁸ Grantham (1989).

¹⁹ For the work of Gras, see Kneissel (1954) and Ponko (1965).

²⁰ Meuvret (1956); Meuvret (1977) i, 30-2; Meuvret (1988) i, 97-145.

from the three other main factors of production, namely labour, capital, and enterprise. Economic rent is partly a function of land quality and of population density. But, as J. H. von Thünen long ago demonstrated, it is also a function of distance from the market as determined by transport costs.²¹

In a market economy economic rent underlies all questions of competition for the use of land and provides the means by which that competition is resolved to produce patterns of land use. Economic rent also varies according to the facility with which a commodity can be transported and its perishability. Bulky or perishable goods thus both yield an economic rent that declines very sharply with distance from the market. Economic rent further affects production costs and thereby determines the type of farming system which is employed, so that although the crops being grown and livestock kept may remain the same, the manner of their cultivation and management may vary. This particularly affects the intensity of their production, which tends to decrease with distance from the market, since lower production costs are necessary to offset higher transportation costs.

In a famous illustration of these relationships, von Thünen constructed an idealized model of the pattern of farming systems likely to be generated by a large central market. To isolate the influence of economic rent as determined solely by land-transport costs he assumed that the town was situated at the centre of a level plain of uniform fertility, that the plain was crossed by no navigable river or canal, and that the town was isolated from the outside world and was served by a uniform marketing net. The result was a series of concentric zones characterized by different patterns and intensities of land use.

Nearest the town, and occupying less than 1 per cent of the productive land area of the 'isolated state', was Zone 1, a narrow band of intensive 'free cash cropping' which specialized in the commercial production of perishable horticultural crops, hay, fodder grains, straw, and milk. The intensity of production was reflected in heavy applications of manure, which was readily available for purchase in the town, in the elimination of fallows, and in stall-feeding of livestock. Beyond this lay the similarly narrow Zone 2, devoted to forestry, where the inner districts supplied firewood and the outer districts building timber, both of which were high in bulk relative to their value and therefore unable to bear the cost of transportation over long distances. The significance of this zone, which occupied a little over 1 per cent of the productive area, has not always been appreciated, yet the difficulty of securing a sustained supply of fuel was one of the major constraints upon pre-industrial urban growth.²² It was only beyond these two zones that commercial grain production was to be found.

Commercial grain production assumed its most intensive form in Zone 3, with what von Thünen termed 'crop alternation'. This was a husbandry system in

²¹ Hall P (1966); Chisholm (1962), 20-32; Grigg (1982), 135-40.

²² Wrigley (1988), 52-60.

which manure-intensive mixed farming was taken to its limits: fallows were eliminated, leguminous fodder crops cultivated, and livestock managed intensively with the object of maximizing the recycling of nitrogen to the soil. Von Thünen acknowledged, however, that such systems only developed 'where the soil is very much more fertile than we have assumed it to be for the Isolated State'. Since such soils were in limited supply, 'crop alternation' occupied less than 2 per cent of the total land area.²³ At a further distance, and on less favoured soils, the 'improved system' of his Zone 4 represents the limit attained by intensive mixed husbandry. This occupied no less than 21 per cent of the land area. Features of this system and of this zone were ley farming and the recycling of nitrogen via the alternation of land between arable and pasture, some flexibility of cropping, and the combination of commercial grain production with commercial dairying. The last was developed both as a source of manure and because it was only at this distance from the town, with lower production costs and more favourable per unit costs of transportation, that pastoral production began to become as commercially viable as grain. Nevertheless, within this zone, dairying (the most intensive form of pastoral husbandry) yielded far larger returns from land than rearing or fattening, so much so that there was a strong incentive to obtain replacement animals from rearing farms at a greater distance from the market.

The 'improved system' blended almost imperceptibly into von Thünen's Zone 5, the 'three-field system', where commercial grain production assumed its most extensive form. This occupied a further 15 per cent of the land area. Here there was virtually no fodder cropping. Instead, a proportion of the land was set aside permanently as pasture and each year a third of the tillage was left fallow, to be grazed and manured by the livestock of the township. As far as output was concerned, this was a low productivity regime, and crop yields and stocking densities were both below those attained by the more intensive mixed-farming systems found closer to the market.

Finally, beyond the point at which grain could be profitably produced to sell in the town, was Zone 6, which was devoted to extensive systems of stock rearing and wool production, and occupied 60 per cent of the productive land area. Here, only enough grain was grown to feed those engaged in stock farming. Economic rent did not warrant the cultivation of fodder crops and hence only as many animals were over-wintered as could be fed on the small quantity of straw produced from the arable and on the hay harvested from natural meadows. As von Thünen observed, 'compared to its size, this ring sends a very small quantity of animal products to the Town'.²⁴

Von Thünen was well aware that such perfect zonation was never encountered in reality and demonstrated the complicating effect which access to a navigable river, with its lower transport costs, would have upon land use. But

²³ Hall P (1966), 141.

²⁴ Hall P (1966), 156.

there were, of course, many other intervening influences - the presence of intermediate and overlapping centres of demand, spatial inequalities in the evolution of marketing networks, physical variations in terrain, soil and climate, and structural and institutional variations in the size, tenure, and organization of the farms which were the basic units of production - all of which distorted the predicted pattern of his model still further.

Von Thünen's model and the basic ideas which it embodies nevertheless provides a starting point for any investigation of the inter-relationship in pre-industrial times between concentrated urban demand on the one hand, and land use and farming systems on the other. With a few significant exceptions,²⁵ this relationship has attracted little detailed historical attention, which is surprising given both the relative antiquity of von Thünen's model (the first edition of *Der isolierte Staat* was published in 1826) and the existence of a substantial historical literature which equates agricultural progress with the stimulus provided in a commercialized economy by concentrated urban demand.²⁶ The latter, it is held, promoted investment in more intensive and productive methods: enterprise and innovation were stimulated and land and labour productivity benefited as farmers specialized, maximized comparative advantage, and thereby brought about a greater spatial division of labour.

This raises a fundamental conundrum concerning the economic relations of town and country before the technological breakthrough of the Industrial Revolution. Which was the greater constraint? Agriculture's ability to provision towns? Or the towns' ability to provide farmers with sufficient market incentives to specialize and adopt improved methods?²⁷ Furthermore, to what extent was the potentially dynamic inter-relationship between agricultural progress and urban growth inhibited by the time and costs involved in establishing and operating efficient transport and marketing links?

Creating an effective trading infrastructure demanded time, money, and a degree of social and political cohesion. Markets had to be founded and granaries constructed; money had to be minted and systems of credit established; and adequate means of transportation had to be provided, involving investment in roads, bridges, vehicles and draught animals, plus boats and port facilities. Operating the infrastructure incurred further costs. The transactions costs involved in transferring goods between rural producer and urban consumer included those of obtaining market information, of local tolls, of negotiation and contract, of physical protection, and of the assurance of property rights. 'Most of these contained very large fixed costs, so that the "transactions sector" in long-distance trade enjoyed considerable economies of scale'.²⁸ The cheaper and bulkier the commodity, as with grain and fuel, the greater therefore the unit

²⁵ Bull (1958); Irsigler (1985).

²⁶ Hall P (1966); Langton and Hoppe (1983); Persson (1988), 73-82. See also Wrigley (1990); Bairoch (1990).

²⁷ Overton and Campbell (1991), 41-2; Campbell B M S and Overton, (1994).

²⁸ Munro (1991), 120.

costs of maintaining commercial connections over a distance. Commercial connections were thus built up slowly, being concentrated at nodes and along the established routes linking them.²⁹ The accidents of history therefore compounded those of geography in producing spatially uneven marketing networks as initial patterns of local markets were reshaped into larger networks of trade.

How these links evolved, and with what consequences for agriculture and land use, has yet to receive systematic historical investigation. Most work has been done on early modern France, where Meuvret in particular has revealed the complexity of many of these issues.³⁰ In England, on the other hand, there has been little explicit investigation of the links between agricultural production and urban consumption. The current study therefore attempts to rectify this deficiency with an empirical investigation of grain production, distribution, and consumption in the London region c.1300. The period is richly documented, coincides with an early peak in London's development, and is the earliest for which these relationships may be explored systematically and in some detail.

EXCHANGE, URBANIZATION, AND AGRARIAN PRODUCTION IN MEDIEVAL ENGLAND

In England, the eleventh, twelfth and thirteenth centuries witnessed the rapid growth of an already well-established mutual dependence between rural and urban economies. Towns grew in size and number and their rank order became more clearly articulated.³¹ Central to the process lay the increasing vigour of an exchange economy. If this commercialization found its most conspicuous expression in the growth of towns, it was in the countryside that its consequences were perhaps the most profound, as exchange progressively, if selectively, displaced consumption as the determining principle of agricultural production.³²

The proliferation of chartered markets during the twelfth and, more particularly, the thirteenth centuries, testifies to the growth of exchange.³³ Part of the impetus behind this movement came from increasing seigneurial demands for payments in cash rather than in kind. Consequently, peasants were induced to produce and market surpluses in order to obtain cash to pay rents, fines, amercements, and taxes. Population pressure lent further momentum to these developments. As the population expanded so the number of commercial transactions within rural society increased. Occupational specialization occurred

²⁹ Grantham (1989), 196.

³⁰ Meuvret (1977-88); Grantham (1989).

³¹ Reynolds (1977), 22-65; Haslam (1984); Clarke and Ambrosiani (1991); Maddicott (1991); Biddle (1976a), 500-4; Biddle (1976b); Keene (1976); Campbell J (1986), 142-3; Beresford (1967); Hilton (1982a, 1982b, 1984).

³² Spufford (1988); Britnell (1993); Dyer C (1992). On production strategies geared towards consumption see, Biddick (1989, 1991).

³³ Britnell (1981), 209-21. Dyer C (1992) shows that a significant volume of trade nevertheless bypassed these formal markets.

and economic expediency led smaller farmers and poorer families to sell their produce and services and buy their food.³⁴ While the bulk of trade was of this localized character, spatially-concentrated market demand was unlikely to disrupt or complicate the traditional relationship between farming and the land.³⁵ Land-use and farming systems therefore remained largely a function of the balance between population and resources, as influenced by the requirements of feudal landlords.³⁶ For subscribers to this viewpoint 'technology and exchange had not progressed far enough by the early fourteenth century to allow much agricultural specialization'.³⁷

Yet there is a growing body of evidence which suggests that the medieval exchange economy went considerably further than this, and that as an agent of change commercialization possessed a momentum of its own. Between 1100 and 1300 the real value of currency in circulation per head of the population approximately doubled, and its nominal value increased about seven times.³⁸ This growth provides a clear sign of the growing volume of exchange and the widening range of monetary transactions. As the market grew so transaction costs fell and the centripetal forces latent within all trading systems began to take effect.³⁹ This process is most apparent in the expansion and fuller elaboration of an ordered hierarchy of trading centres,⁴⁰ of which London and the leading provincial cities were the most conspicuous members. Indeed, one of the most significant of recent historical revisions has been to demonstrate that c.1300 the largest English towns and cities were all probably much larger than had hitherto been suspected, doubtless because the proportion of their inhabitants represented by the impoverished has been underestimated.

Winchester, the most thoroughly investigated of medieval English cities, has been shown to have had a population of between 10,000 and 12,000 c.1300.⁴¹ By implication, other towns higher up the urban league table must have been larger.⁴² Norwich, one of the largest of the provincial cities, may have had a population of approximately 25,000 in 1330.⁴³ Norwich was nevertheless substantially smaller than the capital. London had long been firmly established as England's foremost city and during the twelfth and thirteenth centuries its

³⁴ Britnell (1993); Miller and Hatcher (1978), 64-83.

³⁵ On the importance of this change see, Dodgshon (1987), 223-5, 233-9, 287-351.

³⁶ Campbell B M S (forthcoming a).

³⁷ Glasscock (1973), 167.

³⁸ The estimates are problematic, but indicate that the rate of increase may have been greater over the twelfth century than the thirteenth: Mayhew (1987), 125; Mayhew (forthcoming); Hatcher (1977),

³⁹ Cf. Britnell (1993), and Spufford (1988), 240-63.

⁴⁰ North (1981).

⁴¹ Garner (1968), 306-35.

⁴² Keene (1985b), 366-70.

⁴³ Keene (1985b), Fig. 4. On this basis, the towns with 10,000 or more inhabitants were, in ascending order by taxed wealth in 1334, Chester, Winchester, Ipswich, Coventry, Salisbury, Lynn, Shrewsbury, Oxford, Norwich, Lincoln, Yarmouth, Boston, Newcastle, York, Bristol, and London. The ranking in terms of population was probably different: see below, 10.

⁴⁴ Rutledge (1988), 15-30.

primacy evidently grew, so that by the close of the latter century the dominance of the metropolis was already firmly established as a fact of English urban life.⁴⁴ About 1300 London attained its medieval peak of physical and demographic expansion. Comparison of site values and the density and extent of building at that time with conditions in the sixteenth-century city suggest that London's population in 1300 may have approached 100,000, placing it on a par with Florence and some other Italian cities, and second, after Paris, among European cities north of the Alps.⁴⁵

Compared with later centuries, urban growth in general and metropolitan growth in particular may appear modest, but the degree of urbanization attained in medieval England was nonetheless significant.⁴⁶ All measures of urbanization are problematic, especially when associated with an attempt to measure change over the long term. Nevertheless, by taking the 1334 Lay Subsidy and 1377 Poll Tax as guides to relative size, and by calculating the urban proportion of a national population total estimated as between four and seven millions, it can be hazarded that in 1300 between 105,500 and 373,500 people lived in towns of at least 10,000 inhabitants, amounting to between 2.6 and 5.3 per cent of the national population. This method provides ranges of estimates for the size of London of between 67,100 and 137,000 inhabitants, for Norwich of between 6,700 and 20,000, and for Winchester of between 4,400 and 10,900.⁴⁷ An alternative approach is to take as a starting point a 'firm' Winchester population figure of 10,000, and to calculate the total number of inhabitants in all towns of that size or larger, using the figures for 1334 and 1377 as indicators of relative size. This suggests that between 324,800 and 417,200 people (according to the figures for 1377 and 1334, respectively) lived in towns of 10,000 or more inhabitants.⁴⁸ These estimates represent as little as 4.6 per cent of a national population of seven millions, or as much as 10.4 per cent of a population of four millions. They indicate population totals for London of between 107,900 and 176,000, and for Norwich of between 15,000 and 18,300. Despite the many uncertainties associated with these calculations, it seems likely, on the basis of

⁴⁴ Keene (1989c), 99-102; Russell (1972), 23-30 and 121-30.

⁴⁵ Keene (1984), (1985a), and (1989a), 202-3, 216.

⁴⁶ On post-medieval developments, see Wrigley (1967), 44-70; Wrigley (1985).

⁴⁷ The calculations are based on subsidy valuations in Glasscock (1975), and on the 1377 poll tax figures in Topham (1785). The misleading figure for Plymouth in 1377 is omitted from consideration: Kowaleski (forthcoming a). The figure for the city of Winchester in 1377 has been increased by 50 per cent so as to allow for the suburban jurisdiction of the soke: Keene (1985b), 366. The 1334 figures derive from assessed wealth and therefore will exaggerate the position of London, and that of some ports and other towns, in terms of size; the 1377 figures provide a better guide to relative population size, but define a group of leading towns which differs from that identifiable in 1334 (the figures and conclusions in Dyer A (1991) are not all soundly based). There are no figures for Chester, which, however, has been included in the calculation of the higher estimate, with a population of 10,000. The lower estimate involves a total of three towns, and the higher estimate fifteen.

⁴⁸ There were 16 towns in this category according to the figures for 1334, and 14 towns according to those for 1377. Both totals include Chester with 10,000 inhabitants.

this type of evidence,⁴⁹ that in 1300 London contained well over 70,000 inhabitants, and that towns with 10,000 inhabitants or more contained at least 5 per cent of the national population. By this measure, England was probably as urbanized in 1300 as it was to be in 1600, when, as F. J. Fisher long ago demonstrated, London's provisioning needs were making a distinctive impact upon a progressively widening hinterland.⁵⁰ By the latter date, however, a far greater proportion of that urbanized population was to be found in London, which may have been twice the size it had been three centuries before.

Underpinning the urbanization which had occurred in England by 1300 was an impressive stock of the infrastructure which facilitated exchange. That included a uniform and tightly managed currency, systems for the validation of commercial contracts (both well before 1100 and elaborated thereafter),⁵¹ a developed road system with substantial investment in bridges,⁵² national standards of weights and measures which initially were associated with dominant urban centres,⁵³ and at London and elsewhere provision of substantial quays and harbour installations.⁵⁴

The possibility that overall England was as urbanized in 1300 as in 1600 stands as a valuable corrective to some of the more pessimistic verdicts on the proficiency of medieval agriculture, since urbanization was only made possible by a commensurate rise in agricultural output and labour productivity.⁵⁵ There were several routes by which such productivity growth could have been achieved, of which one of the most important, according to one view, was a growing specialization of production.⁵⁶ In this context, the realization that English medieval towns constituted an increasingly significant market for the produce of the countryside has coincided with the recognition by historians of medieval agriculture that the latter was more differentiated and in places more developed than had hitherto been supposed.⁵⁷

A systematic classification of demesne-farming systems across the country as a whole reveals an agricultural sector still more extensive than intensive in its methods of production, but at the same time exposed to forces of specialization

⁴⁹ But see below, 44-5, 77.

⁵⁰ The relative numbers and proportions resident in towns of at least 10,000 inhabitants (drawing on Houston (1991), 32, and Fisher (1935), 46-64) can be estimated as:

1300	105,500-417,200	2.6-10.4%
1500	80,000	3.1%
1550	112,000	3.5%
1600	255,000	5.8%
1650	495,000	8.8%

⁵¹ Campbell J (1986), 155-70.

⁵² Harrison (1992).

⁵³ Nightingale (1985, 1987); Biddle (1976a), 556-7.

⁵⁴ Milne and Milne (1982); Dyson (1989); Keene (1989b).

⁵⁵ Wrigley (1985); Persson (1991); Campbell B M S and Overton (forthcoming).

⁵⁶ Persson (1988), 30-1.

⁵⁷ Langdon (1986); Campbell B M S (1988b), 94-8. The diversity of medieval husbandry systems is amply documented in Hallam (1988). For case studies of particularly progressive systems see, Brandon (1971a); Campbell B M S (1983a and b); Mate (1985).

and intensification.⁵⁸ These forces appear to have exerted their greatest influence in East Anglia, the East Midlands, and the South East, for it was there that farm enterprise was most differentiated and assumed its most developed and intensive forms.⁵⁹ It is tempting to attribute this pattern to the role of market expansion in general and the growth of concentrated urban demand in particular. Certainly, Kent and Norfolk, the two counties in which agriculture was most progressive and productive, enjoyed access to a variety of urban markets both at home and overseas. Norfolk, too, has revealed a chronology of grain yields which runs counter to that commonly assumed to have prevailed during the Middle Ages, with yields rising down to the middle of the fourteenth century, as husbandry increased in intensity, and falling thereafter as labour was withdrawn from agriculture.⁶⁰

Taken together, this new evidence for medieval urban populations, farming types, and productivity trends raises important questions about the scale and nature of the impact of concentrated urban demand upon agricultural production at this early peak in population growth. How extensive were the provisioning zones of medieval cities, given known patterns of land use, yield levels, and methods of transportation? By what means did cities obtain food and essential supplies such as fuel, fodder, building materials, and industrial raw materials? Could they rely upon direct provisioning by farmers producing within their immediate hinterland? Or was it necessary to obtain supplies from further afield, requiring more elaborate trading arrangements involving intermediaries and specialist dealers? Did urban demand promote greater agricultural specialization and intensification, and hence higher levels of productivity, in areas exposed to its stimulus? And, if so, does its limited scale overall provide a partial explanation of the low intensity and low productivity of agriculture in those parts of the country remote from major urban centres?⁶¹ This monograph attempts to address some of these issues, with reference to the impact of London upon grain production and distribution in the agrarian hinterland of the city at the peak of its medieval development.

⁵⁸ Power and Campbell (1992).

⁵⁹ Campbell B M S (forthcoming a and b).

⁶⁰ Campbell B M S (1991a).

⁶¹ Astill and Grant (1988), 216; Campbell B M S (forthcoming a).

II

SOURCES AND METHODS

The late thirteenth and early fourteenth centuries are remarkable for the range and quantity of records which survive in English archives, both central and local. The documents concern the judicial and administrative actions of the Crown and of municipalities, including the city of London; tax assessment and collection; and the composition and management of the rural estates of a wide range of landlords. Inevitably, there are defects of survival and coverage (information on peasant farming and marketing is particularly scarce), but for no earlier period is it possible to study both the operation of the grain trade in London and the production and disposal of grain in the surrounding hinterland.

The quantity and complexity of these records impose constraints upon the chronological and geographical scale of analysis. In this study attention is focused primarily on the period between c.1290 and 1315, one well-served by the principal classes of record, and coinciding with the time when the populations of London and the country at large appear to have attained their medieval peaks. At this time the London grain trade was at the zenith of its operational intensity, before disruption by the continuing effects of heavy taxation, purveyance, and, from 1315 onwards, famine and price deflation.

Geographically, attention has been restricted to London and a group of ten counties around it, collectively identified for the purposes of this monograph as the 'London region' (Fig. 1). The ten counties encompass agricultural environments which were diverse physically, institutionally, demographically and commercially. They include most of the principal districts known at that time to have supplied food to London, as well as others where London's impact on arable production was slight. Even so, the region was not the exclusive source of London's grain supplies, since some is known to have been obtained from outside.¹ Moreover, in other sectors of the capital's food supply system, most notably with livestock, the networks of production and distribution for the London market are likely to have extended well beyond the limits of the region. Nor was London the only centre of concentrated demand which influenced agriculture within its hinterland. There were two other important but much smaller cities within the region (Oxford and Canterbury), and others just outside. Urban demand from overseas may have been a further significant factor.

¹ See below, 69-71.

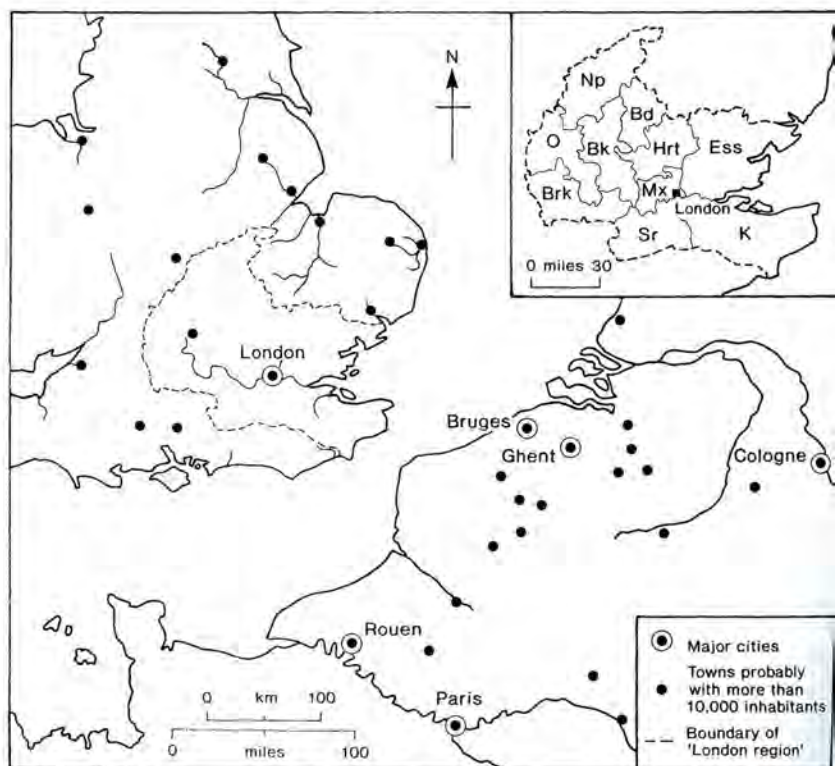


FIG. 1. The London region in its international context, c.1300

The principle navigable rivers are shown. The ten counties of the London region are identified on the inset map as follows: Bd, Bedfordshire; Bk, Buckinghamshire; Brk, Berkshire; Ess, Essex; Hrt, Hertfordshire; K, Kent; Mx, Middlesex; Np, Northamptonshire; O, Oxfordshire; Sr, Surrey.

No single group of sources, and no single methodological approach, allows these issues to be addressed in a comprehensive manner. This study rests on three main foundations: an investigation of the London grain trade; a systematic reconstruction of rural land uses and values within the region; and a detailed analysis of agrarian practice at the sites of production.

RECORDS OF THE LONDON GRAIN TRADE

The city of London

The city's concern to regulate the grain trade is evident in its records from c.1200 onwards. The degree of its intervention fluctuated with the scarcity of grain, but it is evident from the quantity and detailed character of the surviving

records that the later thirteenth and early fourteenth centuries were a period of special concern, certainly by comparison with a century later. By about 1300 many of the customary regulations which governed the trade had been established. For the most part, the power of the mayor and citizens to influence the trade extended only to the square mile of the city's jurisdiction. However, the judicial and administrative records arising from the exercise of that power are highly informative on the actual practice of the trade by Londoners, country people, and merchants from overseas, on their other commercial and financial activities, and on the complex regional network of trade.²

The city's formal customs enshrine a body of regulations on the grain trade which had a more immediate and practical expression in its series of judicial and administrative records.³ The latter also identify many individuals who were active or interested in the grain trade, and provide evidence of their debts, office-holding, properties and other interests. There are two valuable taxation returns for the period covered by the study which reveal the wealth of the city's commonsongers.⁴ For the most part, these records have been used in printed and calendared versions: a search of the manuscript records would reveal more relevant material. One manuscript civic record which has been used is the *Liber de Assisa Panis*, which provides both a series of London wheat prices⁵ and the names of more than fifty commonsongers active in the city between 1283 and 1320.⁶

From these city records, from chronicles, and from the judicial and administrative records of the Crown⁷ it has been possible to compile a prosopographical database of London commonsongers (hereafter referred to as the 'commonsongers database'),⁸ containing details of the careers and interests of 146 Londoners who traded in corn between about 1280 and 1350. Most of these individuals were explicitly identified at some point in their careers as *bladarii* or *cornemongere*. Even for the period of this study there is much more to be discovered about these and other men and women involved in the trade; nevertheless, sufficient material has been assembled to cast considerable light on both the nature of London's grain trade and the region from which the city drew its supplies.

² For the city's records, see Jones and Smith (1951), and for a more analytical account, Keene and Harding (1985), nos. 1-15. For the use of these types of urban record in reconstructing local commercial networks for the later fourteenth century, see Keene (1985b), Britnell (1986), and Kowaleski (1990, forthcoming a).

³ Keene and Harding (1985), nos. 1, 2, 4.

⁴ Ekwall (1951).

⁵ See Appendix IV.

⁶ CLRO, Cust. 4. For printed extracts, see *Liber Albus* ii, 411-29. The detached portion of the *Liber de Assisa Panis*, now bound as fols. 110-29 of CLRO, Letter-Book A, has also been used.

⁷ Mostly in printed calendar versions, but some important manuscripts have been used.

⁸ Individual source references are cited for particular incidents only. It should be noted that the prosopography which underlies much of Williams G (1963) is often erroneous.

Purveyance and other accounts

From the 1290s onwards the king regularly used his sheriffs or other agents to make large purchases of grain and other supplies for use mainly in connection with military expeditions, but sometimes for household or other purposes. Many of the financial accounts rendered for these purveyances survive among the public records, in original or in enrolled form.⁹ Historians have used them in studies of the social and economic impact of the demands of the Crown,¹⁰ in studies of the victualling arrangements for particular garrisons or occasions,¹¹ for information on agrarian patterns as revealed by the produce supplied from particular localities,¹² and in studies of transport networks and costs.¹³

For this study, one group of such accounts has a special value as a source of information on the costs of transporting grain by cart, and of shipping it to London from various points on the river Thames and its estuary.¹⁴ Another provides an overview of the availability of different types of grain in Hertfordshire and Essex. London sometimes served as a collection point for grain purchased in southern England for the king's military purposes, and London commonsongers themselves both sold grain to royal agents and were commissioned to seek it out and purchase it for the Crown. Two sets of accounts associated with these activities provide vivid insights into the scale and organization of London's grain trade. One concerns a series of grain purchasing expeditions undertaken by several syndicates of London commonsongers in the spring and early summer of 1295.¹⁵ Through its records of the quantities and types of grain purchased it reveals the character of some of the principal local markets which supplied London with grain, as well as providing information on the costs of transport and the hire of granaries for storage. The second concerns large purchases of corn for use in Scotland made by a Florentine merchant from men in London and Boston, and from the archbishop of Canterbury's estates in Kent and Sussex in March 1323.¹⁶

RECORDS OF LAND USE AND OF THE PRODUCTION AND DISPOSAL OF GRAIN IN THE LONDON REGION

Systematic, quantifiable information of land use, grain production, and grain disposal is available in the form of extents, manorial accounts, and other related manorial and estate documents. Although such documents begin to become

⁹ They are to be found mainly among the Army and the Sheriffs' Administrative Accounts in 'Accounts, Various' (PRO, E101) and among the 'Enrolled Miscellaneous Accounts' (PRO, E358); see PRO (1963), 50, 54, 72.

¹⁰ Maddicott (1975).

¹¹ Pelham (1951-2).

¹² Britnell (1988); Masschaele (1989).

¹³ Pelham (1931), 167-75; Langdon (1993).

¹⁴ See Appendix III.

¹⁵ PRO, E101/5/13, 14.

¹⁶ PRO, E101/16/18.

available from quite early in the thirteenth century it is only towards the end of that century, and particularly from the 1270s onwards, that they survive from a representative range of different estates and types of landlord, and in sufficient numbers to provide reasonably comprehensive spatial coverage. This arises both from a greater elaboration in government and in estate administration and from an increase in the volume and sophistication of record keeping.¹⁷

Small land-owners and peasant producers tended to be excluded from these administrative developments. According to the incomplete and regionally-biased evidence of the Hundred Rolls of 1279, they were certainly the main producers and possibly the main commercial suppliers of grain, cultivating approximately two-thirds of all arable land.¹⁸ What they produced and how they disposed of it shows up occasionally in records, but such information is usually indirect in nature and patchy in coverage.¹⁹ Nor is the interpretation of such evidence straightforward. It is perhaps best undertaken within a framework provided by an analysis of the more systematic and detailed evidence available for the *demesnes* which made up the estates of more substantial landowners (hereafter referred to as the 'demesne sector'). Certainly, patterns of *demesne* production (if not necessarily those of disposal) tended to conform to those prevailing within the locality in which a *demesne* lay rather than to a pattern established for the estate as a whole.²⁰ The practices of the lesser lords and of the peasants, however they were determined, presumably played an important part in setting these local patterns. If so, patterns of agrarian specialization identified within the *demesne* sector may be taken as broadly diagnostic of the rural economy as a whole.

Inquisitions post mortem

Information on the size, value, and composition of *demesnes* is provided by the class of documents known as *extents*. These were compiled both by individual lords and their officials for their own purposes, and by royal officials concerned to establish whether the Crown had, or might have, any interest in the property concerned. By far the single greatest and most comprehensive collection of *extents* is that associated with the class of documents known as the *Inquisitions post mortem* (hereafter *IPMs*).²¹ These relate to the holdings of deceased lay tenants who were believed to hold from the Crown in chief. Upon the death of such a tenant royal officials known as *escheators* were ordered to

¹⁷ Clanchy (1979).

¹⁸ Kominaky (1956), 87ff. Cf. Britnell (1980, rep. 1987).

¹⁹ Biddick (1987); Hallam (1988), 818-25; Dyer C (1988b), 13; Dyer C (1989), 109-50; Bailey (1989), 135-42.

²⁰ Strong regional patterns emerge in practices such as density of seeding and crop specialisms, which transcend ownership and size of *demesne*: chapter 7 below, esp. 141-4; Campbell B M S (1983b); Mate (1985).

²¹ *Cal Inq Post Mortem*. This calendar selectively summarizes the information contained in the *inquisitions*, which are organized in files in the Public Record Office: PRO (1963), 27-8.

enquire into the tenure, and to compile 'extents' or brief surveys, of the holdings. For each holding the escheator, aided by a local jury, recorded the amount and value of the principal land types and other resources belonging to the lord, typically arable, meadow, pasture, and wood, with perhaps a capital messuage, mill, and dovecot.²²

IPMs with extents survive in increasing numbers from the 1270s onwards, and are particularly numerous around 1300, both for the London region and for the country as a whole. Despite some uncertainty as to the basis of the quantitative information which they contain, and some criticism in the past of their overall reliability as a source, IPMs can be used to reconstruct the land use of individual demesnes and estates, and to indicate broad contrasts between places and regions.²³

For this study of the London region a database has been compiled (hereafter referred to as the 'IPM database') containing basic land-use information from a total of 1,966 IPM extents spanning the period 1270 to 1339. For each holding information has been consistently recorded on the amount, total value, and unit value of each of the principal land uses. Analysis of this database provides a basic picture of land use and land values in the London region.²⁴ Despite an exclusive bias towards the estates of lay lords, the picture obtained is remarkably comprehensive, except in a few localities where the holdings of large ecclesiastical estates predominated.

Manorial accounts

During the thirteenth century most landlords chose to take advantage of the generally buoyant market for agricultural produce by managing their demesne lands directly.²⁵ Responsibility for the day-to-day management of the demesne was placed in the hands of a bailiff or reeve, who annually rendered account of the stock and other resources in his charge and of the monetary receipts and expenditure associated with them. From early in the century it became the practice on the greatest estates, especially those in ecclesiastical hands, to render these accounts in written form, and during the final quarter of the century that practice became widespread.²⁶ By 1300 the compilation of annual manorial accounts had become a routine instrument of administration on most classes of

²² Campbell B M S, Galloway, and Murphy (1992), 10-13.

²³ Large-scale quantitative analysis of IPMs was pioneered by Ambrose Raftis (1974). See also Campbell B M S (1990), and Campbell B M S, Galloway, and Murphy (1992). The project 'The geography of seigniorial land-ownership and use, 1300-49', funded by the Leverhulme Trust and based at The Queen's University of Belfast, is currently compiling a database of all IPM extents for the country as a whole during the first half of the fourteenth century.

²⁴ For a detailed description of the composition of the IPM database, and indications of some of the ways in which it can be used, see Campbell B M S, Galloway, and Murphy (1992).

²⁵ Miller and Hatcher (1978), 210-13.

²⁶ For an exemplary edition of a series of such accounts for a manor within the London region in the period covered by this study, see Harvey P D A (1976).

estate throughout much of the country.²⁷ However, accounts compiled for the major ecclesiastical institutions have tended to survive in the greatest numbers and have attracted the greatest attention from historians. The many isolated accounts and fragmentary series for other classes of estate, dispersed through a wide range of public and private archives, have received less attention. The most comprehensive guide to the existence of accounts is provided by the Manorial Documents Register at the National Register of Archives²⁸, but many accounts not listed there can be discovered, not least among the Public Records in both original and enrolled form.²⁹

Manorial accounts form the single most important source for the study of English agriculture in the thirteenth, fourteenth, and fifteenth centuries, although their numbers and utility diminish from the late fourteenth century onwards, as direct management gave way to the leasing of demesnes. They provide, in a more or less standardized form, highly detailed information on most aspects of agricultural practice. Historians have used them in a variety of ways: as a source for serial information on prices, labour costs, and yields;³⁰ in studies of technological innovation and building;³¹ for the detailed investigation of particular manors or estates;³² and for the reconstruction of regional agrarian systems.³³ In this study of grain production and disposal they have been used to construct a snapshot picture of practice within the London region in the period between c.1290 and 1314. Within a typical manorial account, the grange account provides quantifiable data on acreages under different crops, seeding rates and crop yields, and the relative quantities sold or used by each demesne and its lord; while the stock account provides comparable information on livestock and other items. From the receipts section of the cash account comes information on the sale of different crops, unit prices, and sometimes dates and places of sale. The expenses section gives details of grain purchases and occasionally contains information regarding selling techniques and transport costs.³⁴

²⁷ Stitt (1953); Harvey P D A (1976, 1984); Hilton (1955). For the national coverage of accounts, see Langdon (1983), 416-41.

²⁸ National Register of Archives, Quality Court, Chancery Lane, London.

²⁹ The Feeding the City project (see above, iii) has compiled handlists of surviving accounts for the London region and a full catalogue of Kentish accounts up to 1350, the latter to be published as Galloway, Murphy, and Myhill (forthcoming).

³⁰ Rogers (1866-1902); Beveridge (1955); Farmer (1957, 1988, 1991); Brandon (1972); Titow (1972); Postles (1979); Campbell B M S (1991a).

³¹ Langdon (1982, 1986, 1991); Holt (1988); Farmer (1992); Currie (1976).

³² Davenport (1906); Page (1934); Hilton (1947); Harvey P D A (1965); Britnell (1966, 1977); Du Boulay (1966); Finberg (1969); Searle (1974); Harvey B F (1977); Biddick (1989, 1991); Thornton (1991).

³³ Campbell B M S (1983a); Britnell (1980 rep. 1987); Bailey (1989); Fox (1991a); Mate (1991); Power and Campbell (1992); Campbell B M S and Overton (1994).

³⁴ Harvey P D A (1984), 27.

The information thereby obtained has been compiled into a database (hereafter known as the 'accounts database').³⁵ In compiling the database priority was given to obtaining information for as many different demesnes and estates as possible, maximizing geographical coverage within the London region. Careful sifting through the various archives resulted in the location of usable accounts for 204 different manors in the period 1288-1315 (Fig. 2). For 58 of these demesnes only one usable account survives for this period, for 39 demesnes there are two, and for a further 107 there are at least three, giving a total of 460 usable accounts.³⁶ Where possible three accounts were used from each manor. If more than three survived (several of the best documented demesnes have virtually continuous runs of accounts), preference was given to accounts from the early 1290s, the mid 1300s and the years 1313-15. Although the use of consecutive accounts might have afforded certain advantages, particularly in the calculation of crop yields, it would have brought with it the danger of focusing on a narrow and potentially unrepresentative period in a manor's history.³⁷

As will be seen from Figure 2, the resultant geographical spread of database demesnes within the region is, in general, good. There are, however, some areas for which coverage is sparse or totally lacking. The most serious of these gaps is the area comprising north-east Buckinghamshire, south-east Northamptonshire and most of Bedfordshire, a county which is known to have supplied grain to London.³⁸ Other areas poorly covered include the Kent and Surrey Weald, south-eastern Berkshire, and west-central Essex. Most of those are to be attributed to the vagaries of document survival, but some clearly reflect the genuine sparseness of seigneurial demesnes in areas of woodland or heath. The uneven coverage of the database needs to be borne in mind when interpreting the distribution patterns reconstructed from it.

The 204 demesnes in the database were held by 41 different lords. One hundred and twelve were in conventual and collegiate, 19 in episcopal, 29 in lay, and 44 in royal ownership (Fig. 2 and Appendix I). None of these four ownership categories forms homogenous datasets. The 'conventual and collegiate' grouping is particularly varied, including the demesnes of large and small monastic houses, alien priories, and secular colleges. In many ways these estates differed from each other as significantly as they differed from 'lay' or 'royal' estates. An abbot might use his demesnes in a way very different from that employed by the monks of his convent, let alone the warden and fellows of an Oxford college. 'Lay' demesnes, too, ranged from the far-flung holdings of

³⁵ Data were collected on laptop computers using Turbo Pascal and then converted into a dBASE IV database.

³⁶ For three demesnes four accounts have been used. See Appendix I for a summary list.

³⁷ This danger is, of course, unavoidable when dealing with demesnes for which only one or two accounts can be used: some types of analysis have therefore been restricted to demesnes with three accounts.

³⁸ See below, 46, 54.

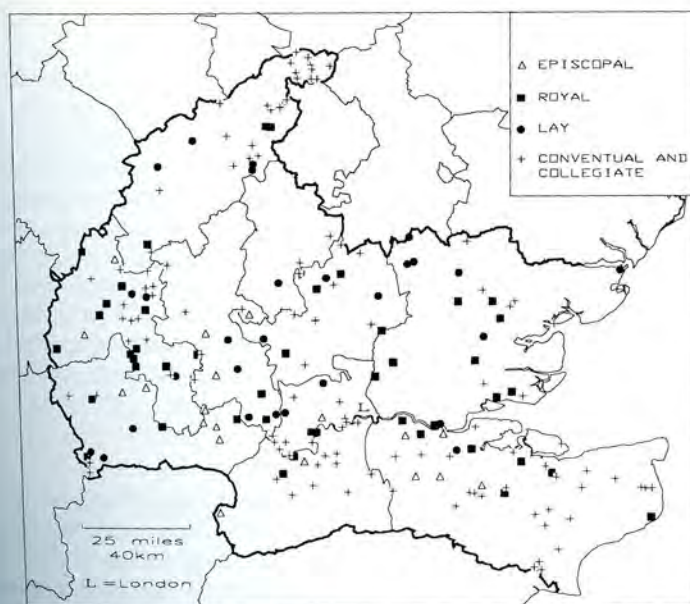


FIG. 2. The London region, showing the manors in the accounts database by ownership category, 1288-1315

Source: Appendix I.

such important baronial families as the Bigod earls of Norfolk, to the more localized properties of lesser lords, like John de Cobham and Roger de Barley. Similarly, the category 'royal' includes not only demesnes forming part of the Crown estate but also lay and ecclesiastical lands temporarily in the king's hand for various reasons. Notwithstanding such complications, these broad categorizations are useful at certain levels of analysis and encapsulate some fundamental contrasts in estate policy.³⁹

It follows that spatial analysis of grain production and disposal must everywhere be informed by knowledge of internal estate management. This is particularly the case in those localities where a large proportion of recorded demesnes belonged to the same landlord and are thus unlikely to be representative of the demesne sector as a whole, especially in matters concerning the disposal of grain. This applies particularly to the Soke of Peterborough and much of northern Northamptonshire, dominated by the demesnes of Peterborough Abbey, and to eastern and southern Kent, where much of the available evidence relates to demesnes belonging to Canterbury Cathedral Priory. Elsewhere there is a greater mix of demesnes from different

³⁹ See below, 147-56.

estates, and the dominance of ecclesiastical demesnes (comprising 55 per cent of the total) is less marked (Fig. 2).

Spatial analysis also needs to take account of ecological factors, and in particular, variations in soil type. Almost three-quarters of database demesnes were situated on loamy or silty soils, of varying degrees of depth and heaviness (Fig. 11).⁴⁰ Of the remainder, a substantial number were characterized by heavy clay soils, especially demesnes in Essex, Middlesex, northern Hertfordshire, the central parts of Buckinghamshire and Oxfordshire, and those parts of Surrey immediately south of the Thames terraces. Overall, roughly 40 per cent of demesnes were on heavy soils and 55 per cent on medium to light soils. Of the remainder, three demesnes (Esher in Surrey, and Bexley and Lessness in north-west Kent) were on sandy soils of limited fertility, and five, largely confined to coastal Kent and Essex, were on alluvial or marshy soils which often required distinctive forms of management.

Other estate records

The picture obtained from the IPMs and manorial accounts can be augmented by reference to other types of estate records, including manorial accounts from outside the main period or area of study, custumals, and central estate accounts. The last are particularly useful for the light they shed on the consumption or disposal of produce sent from individual demesnes to estate headquarters. Central accounts used in this study include those for Canterbury Cathedral Priory, Peterborough Abbey, Westminster Abbey, and the Dean and Chapter of St Paul's Cathedral, London.⁴¹ Accounts for royal and lay households can sometimes be used in the same way.⁴² All offer considerable scope for more systematic analysis than has been possible here.

STATISTICAL AND METHODOLOGICAL PROCEDURES

Despite the quality of the data derived from IPMs and manorial accounts, various methodological problems occur in their analysis. The first concerns methods of aggregation. Whereas analysis of individual IPM extents and manorial accounts is straightforward, aggregation of results from several different records is less so. The procedure followed here has been to strike all totals, means, ratios, and percentages at the level of the individual extent or

⁴⁰ The six soil categories employed on this map are derived from the 1:250,000 *Soil Map of England and Wales* (Soil Survey of England and Wales, 1983), augmented, for the built-up parts of Greater London, by G. W. Bacon's *Geological Map of London and Environs ... compiled from the Geological Survey Maps* (G. Philip and Son, London, c.1890). Demesnes have mostly been classified according to the predominant soil type in the parish or, if there was a balance between several types of soil, according to that type which predominated in the neighbourhood of the parish church. This method cannot give weight to the advantages which some demesnes undoubtedly derived from a combination of soil types.

⁴¹ See Appendix V.

⁴² Cf. Weinbaum (1933) ii, no. 3; Thurgood (1982); Mertes (1988).

account in the first instance, and then to mean those across all extents or accounts for a particular place or demesne to obtain a 'place' or 'demesne mean'. The latter can then, in turn, be used to derive mean figures at higher levels of aggregation, according to ownership type, Ordnance Survey grid square, county, or all ten counties of the London region.⁴³ In a similar way, annual means can be derived from the individual extent or account means, and can then be used to construct time series.

Damage to documents and variations in the detail with which information is recorded often means that not all types of information are available for each extent or account. In order to maximize the available data, different calculations often have to be based on different selections of extents and accounts. For this reason the 'N' values of different results will often be found to vary.⁴⁴ In some cases missing information, for example concerning sown acres or seeding rates, can be inferred from other data, or interpolated from neighbouring demesnes.

For purposes of spatial analysis each IPM extent and manorial account has been identified by a grid reference. In the absence of more precise locational information, this is usually that of the parish church of the place where the holding or demesne was situated. With the accounts this is the level at which most mapping has been carried out. In the case of the IPMs, however, the great number of recorded places requires choropleth rather than point mapping, the units chosen being 10-km. grid squares. The values for each grid square were calculated using the system of aggregation outlined above.⁴⁵

Finally, there is the problem of variations in measures of capacity and area, which has long exercised historians of agriculture. On the whole, the London region c.1300 was one of relatively uniform standards in measures used, compared to the north or west of England, and to earlier periods.⁴⁶ In those instances when the use of non-statute measures can be identified in IPMs and accounts, the practice has been to exclude them from analyses unless an unambiguous conversion to standard statute measures can be made. Usually, however, there is no explicit mention of the units used. Whenever possible, therefore, analyses have been based upon ratios and proportions rather than absolute quantities; in this way many of the potential pitfalls created by such variations are avoided. Where quantities of grain are given in this monograph the units used are, unless otherwise stated, the Winchester or English standard bushel (35.238 litres or 0.969 of the Imperial bushel in use since 1824) and the quarter made up of eight such bushels.

⁴³ Campbell B M S, Galloway, and Murphy (1992), 8-9.

⁴⁴ For example, Tables 1, 2, and 15.

⁴⁵ Campbell B M S, Galloway, and Murphy (1992), 9.

⁴⁶ Beveridge (1927); Farmer (1957), 207-10; Jones A (1979).

III

THE SCALE AND NATURE OF LONDON'S DEMAND

GRAIN MARKETS IN LONDON

The London grain trade

The London grain trade, drawing supplies from the immediate environs of the city and from further afield, was substantial from an early date. London was a large, densely occupied commercial settlement in the eighth century, and by 1100 probably had a population of 20,000 or more, which doubled over the next century, and doubled again by 1300.¹

Grain made a massive contribution to the medieval diet, especially around the year 1300,² yet the internal grain trade does not really become visible to historians before the thirteenth century. By then the London market exercised a powerful pull and influenced the marketing strategies of great landlords. Merchants from Rye appear to have been supplying grain to London by 1198, and by 1220 Ware was established as a shipping point for grain destined for London via the River Lea.³ Large quantities of grain came to London from the upper Thames valley district. Wheat dominated the market. Thus, in 1210-11, when the bishop of Winchester shipped large quantities of grain from his Thames valley manors for sale in London, 86 per cent was wheat, 10 per cent oats, and 5 per cent the rye and wheat mixture known as maslin.⁴ A wide variety of other grains was grown in the London region, and consumed in the city, to varying degrees. They included barley and rye, as well as mixtures of rye and winter barley (mancorn) and of oats and spring barley (dredge). A mixture of wheat and barley is known to have been sold, but not in the London region.⁵ In the London region wheat and rye were the principal bread grains, but all these grains and mixtures, except for oats on their own, probably were used on occasion for making bread.⁶ Wheaten flour was also used for pies and pastries.

One pattern of grain consumption in London is revealed by the food farms of the canons of St Paul's Cathedral, established by the late eleventh century and drawing on manors in Middlesex, Hertfordshire, Essex, and Surrey up to 40

¹ Lobel (1989), 26-7; Keene (1989c).

² Dyer C (1989), 151-4; see below, 32-6.

³ *Pipe Roll 10 Richard I*, 182-3; *VCH Hertford*, iii, 383.

⁴ *Pipe Roll of Winchester, 1210-11*, 57, 61, 153.

⁵ In Boston in 1323, but not in London or Kent: PRO, E/101/16/18.

⁶ Ashley (1928), 6-8, 24-5; Gras (1915), 81n., 91n.; Wilson (1976), 214-29.

miles overland from the city. They were composed 46 per cent by volume of wheat, 46 per cent of oats, and 9 per cent of barley, and were presumably intended to meet the dietary needs of a high-status household. In the late thirteenth century most of the wheat delivered to St Paul's was baked into bread, but the remaining wheat, together with all the barley and the oats, was malted and consumed in brewing.⁷ This use of oats rather than barley as a major brewing grain is striking,⁸ and may have been a conservative practice in London at the end of the thirteenth century, although it continued at St Paul's up to 1400 and beyond. Dredge too was often malted, but it was not a crop which was significant for the London market at this date. Rye alone appears to have been seldom if ever malted in the London region.

The pattern of grain consumption at Westminster Abbey differed from that at St Paul's, and may be a more up-to-date representation of the practice in wealthy London households around 1300. At Westminster 31 per cent by volume of the grain used was wheat, 44 per cent oats, 24 per cent barley, and 2 per cent dredge. The barley, dredge, and much of the oats were used for brewing.⁹ Barley thus may have come into wider use as a brewing grain since the composition of the St Paul's farms was established. About 1300 it represented 15 per cent of the total quantity by volume of grain sold from the demesnes in the London region database overall, while wheat represented 45 per cent, oats 20 per cent, rye and rye mixtures 9 per cent, and dredge 11 per cent. These figures probably under-represent the respective contributions of both barley and rye and rye mixtures,¹⁰ especially since the dredge was not destined for the London market,¹¹ but otherwise may roughly indicate the proportions of different grains which came into London at that time. In the absence of a detailed knowledge of the social composition of London's population, and of its patterns of consumption, it is impossible to be more precise.

In normal years a large proportion of the grain brought to London was brewed, and among English cities at this period London was distinctive for its specialist brewers and brewhouses. There was an enormous demand for barley and oats. Studies of ecclesiastical, noble, and military diets show that the ratio of brewing grains to bread grains required could be as much as two to one.¹² The poorer classes would have consumed much less grain as drink, but even to

⁷ Hale (1858), xlviii.

⁸ On the merits/demerits of ale brewed from oats, see Fox (1991a), 303-7.

⁹ Calculated from Appendix V. There is little evidence to suggest that dredge formed a significant part of the brewing grains supplied to London c.1300, although oats and barley may have been mixed at the malting stage.

¹⁰ Barley was widely grown in Kent, but the database for that county is dominated by the manors of Canterbury Cathedral Priory, the barley from the home manors of which was transferred directly to the priory in Canterbury rather than being sold. Sales of rye and rye mixtures may have been more characteristic of small-scale and peasant landholdings relatively close to London than of the *seigneurial* demesnes which constitute the database. See below, 165-7.

¹¹ See below, 161-3.

¹² See Appendix V.

provide each member of the city's population with just 1 pint of weak ale per day, would have required approximately 36,500 quarters of brewing grains over a year.¹³

Bread, however, was essential for the citizens' survival. It is clear that wealthy lay people and the inmates of religious houses ate wheaten bread in great amounts. In noble households, however, bread made from rye and rye mixtures was baked for consumption by servants, for trenchers, and for distribution as alms,¹⁴ and it is likely that the less well-off London households consumed a high proportion of bread baked from those cheaper grains. Nevertheless, London was probably distinctive for its consumption of high-quality bread. Thus in a list of offenders in 1282, the city's white bakers, who in principle could make only wheaten bread, outnumbered its brown bakers (who made bread out of whole meal and out of the cheaper grains) by more than two to one. In 1304, however, there were 21 white bakers to 32 brown ones.¹⁵ The consumption of wheaten bread indicated by these figures stands in sharp contrast to the diet of Norfolk harvest workers, whose bread was baked largely from barley.¹⁶

The records of the London assize of bread show that in fixing the price and weight of bread the city authorities were concerned mainly with the price of wheat as the premier bread grain. As wheat prices rose so the poorer consumers presumably switched to bread made with grains such as rye, the price of which rose accordingly.¹⁷ The London assize recognized the existence of bread of different qualities: three standards of white wheaten bread were defined, plus wheaten breads made of whole meal and of mixtures of brown and white meal, along with bread of other grains. Maslin was certainly recognized as a bread grain, and in some years was purchased for the London assize, indicating that in London rye rather than barley was the secondary bread grain.¹⁸ Maslin probably contributed substantially to the Londoners' diet. While commongers are first recorded in London documents by about 1200, there is a record there of a dealer in maslin (*mazelinarius*) a few years earlier.¹⁹

Much of the oats brought to London was probably fed to the horses upon which the city relied for haulage. Quantities of straw were also sent to the city for use as stable litter, and there was a substantial trade in hay.²⁰ London commongers dealt in peas and beans as well as corn, although that side of their

¹³ The quantity of brewing grains is calculated on the assumption that 1 quarter of raw grain yielded 1.14 quarters of malt, sufficient to brew 109 gallons of weak ale, containing 160 kcal per pint: cf. Dyer C (1989), 58; McCance and Widdowson (1960), 144. No allowance is made for the fodder requirements involved in carting those grains to London.

¹⁴ Dyer C (1989), 57; Thurgood (1982) 73-5; Appendix V.

¹⁵ *Letter-Book A*, 120-1; *Cal EMC*, 155; Thrupp (1933), 120-1.

¹⁶ Dyer (1988a).

¹⁷ Meuvret (1988) ii, 124-5, 157.

¹⁸ *Liber Albus* ii, 411; CLRO, Cust 4.

¹⁹ *Pipe Roll 8 Richard I*, 291.

²⁰ For Haywharf in the city of London, so-called by 1235, see Lobel (1989), 76-7.

trade is not well recorded. By the early fourteenth century, beans were incorporated into a product known as horsebread,²¹ fed to horses and possibly also consumed by the poor. The very poorest in the city may, as in the countryside, have taken their input of grains (especially oats) and pulses in the form of pottage rather than bread, at a considerable saving both in the cost of fuel and in kilocalories lost by converting the raw grain.²² It is possible that, given their use as fodder, in pottage, and as malt, oats were the grain consumed in greatest volume in London.

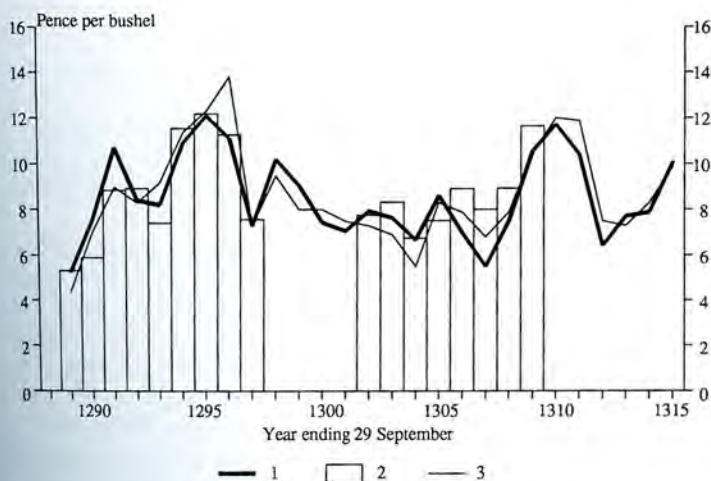


FIG. 3. The movement of wheat prices in London and its region, 1288-1315

1, mean for manors in the London region (from the accounts database); 2, the October price in London (see Appendix IV and Table 18); 3, mean for England (Farmer (1957), 212: the same prices are given as ratios in Farmer (1988), 790-1). Prices are in pence per bushel.

Unlike some other English ports, London did not handle a significant overseas trade in grain. In normal years small quantities were exported and small quantities were imported, presumably as merchants and shipmen identified cargo and market niches. In years of severe shortage in London, large quantities could be imported from overseas,²³ and when there were shortages in the Low Countries or northern France London could export on a comparable scale.²⁴ Years of severe shortage were rare over the period 1280-1315. The movement of London wheat prices (Fig. 3) closely matches that within the

²¹ *Liber Albus* ii, 346; Highfield (1964), 360; Keene (1985b), 274.

²² Cf. Dyer C (1989), 151-4. Peas, beans and vetches were given to the demesne workforce for pottage at Chessington, Surrey, in 1289-90: PRO, SC6/1011/25.

²³ See below, 69.

²⁴ The surviving customs accounts do not provide as good a picture for London as for some other ports, but cf. Gras (1915), Appendices B and C; PRO, E122/69/1, 2, 3; *Customs 1480-1*.

London region as a whole as well as Farmer's national series, and all three show that only two or three years in the mid 1290s can be identified convincingly as ones of difficulty over supplies.²⁵ There had been an earlier period of severe difficulty in the 1250s, and the years 1315-17 were to be a disaster.²⁶

The grain market-places

By 1300 the city of London contained four principal grain markets serving different localities within the city, and sited at strategic nodes in its transport network (Fig. 4). The character of those markets thus reflects the regional origin of the grain sold in them, the means by which it was transported to London, and the other commercial interests of those who dealt in it. In addition, there was what was probably an important grain market in Southwark on the south bank of the river,²⁷ but since that suburb lay outside the jurisdiction of the city little is known of it at this time. Grain was also sold in significant quantities in Westminster, both at the market near the abbey and at the fair of St James near Charing Cross.²⁸

During the disastrous grain shortage of 1315-17, city regulations refer for the first time collectively to the four places within the city which were 'assigned of old' as cornmarkets, and the same places continued to be identified in later ordinances.²⁹ Two of the four main markets lay inland in the upper part of the city, and traders came to them with carts and pack horses loaded with grain. One of those, sometimes known as 'the Pavement' (*pavimentum*), was at the western end of Cheapside, the city's principal market street, and close to St Paul's. By 1223 a parish church there was known as St Michael *ad bladum* (later known as St Michael le Quern).³⁰ The cornmarket in this part of the city extended west towards Newgate, after which it was sometimes named. Thus, there are references to the cornmarket on the pavement in front of the Grey Friars, whose convent stood just within the gate.³¹ The other inland market dealing in grain by 1270, if not long before, was at Gracechurch, by the wall of All Hallows church, where the street leading up from London Bridge intersected with one of the main east/west routes across the city. That market too was sometimes known as 'the Pavement', denoting that it was held in the public street.³² The two riverside grain markets were at the principal points of access to

²⁵ Pearson's Correlation Coefficient indicates a high degree of correlation between the three series. The coefficients, with the numbers of years common to the pairs of series, are as follows: *national* series with London region series, 0.9011 (27 years); *national* series with London city series, 0.8814 (17 years); London region series with London city series, 0.8316 (17 years).

²⁶ Dyer C (1989), 262-4.

²⁷ *Liber Custumarum* i, 278-80.

²⁸ Rosser (1989), 116, 136, 302.

²⁹ *Letter-Book E*, 56; *Cal PMR* 1323-64, 115; *Letter-Book F*, 100-101.

³⁰ *Clerkenwell Cart.*, no. 227.

³¹ Cf. *Liber Albus* i, 261 (in a regulation of 1320 or earlier).

³² *Liber Albus* ii, 237, 247.

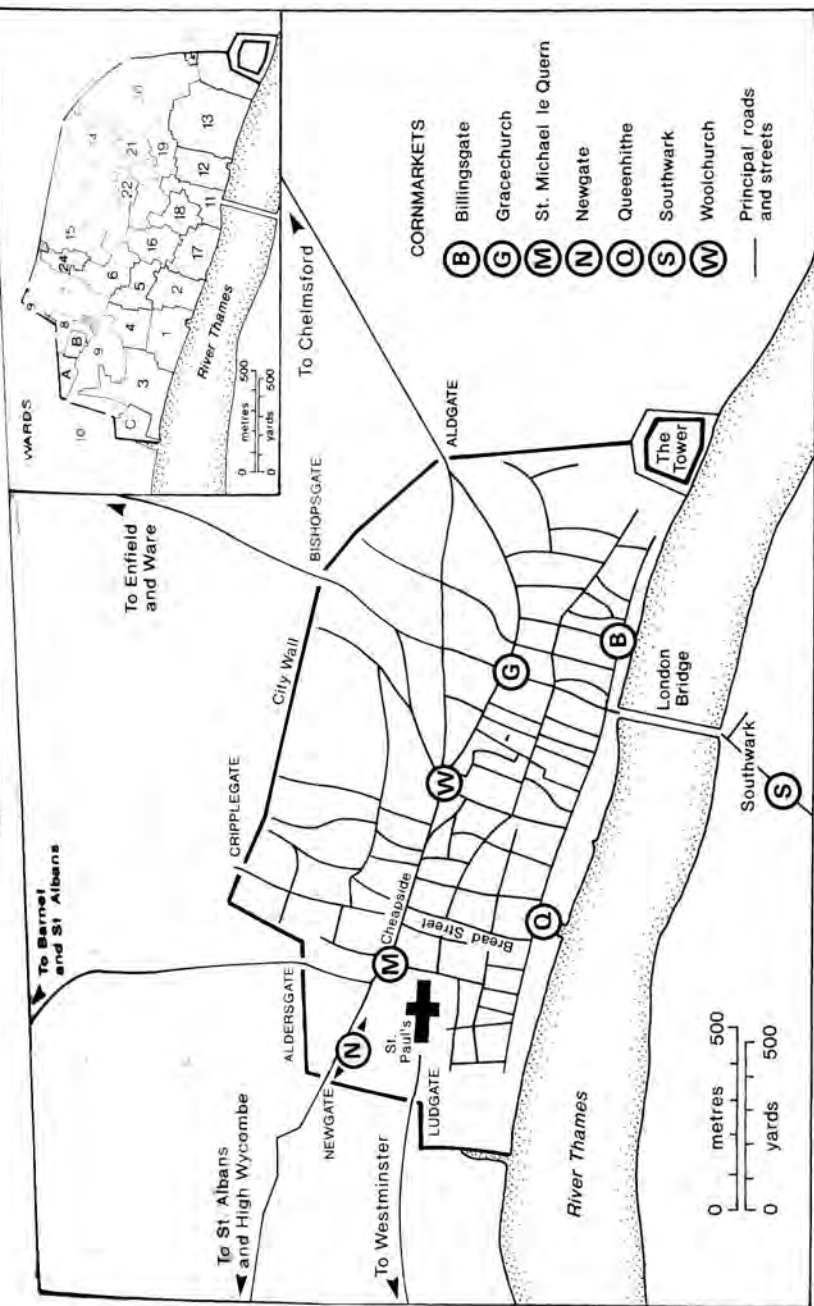


FIG. 4. Cornmarkets and other localities in London, c. 1300

For the markets and other places named, see text (28-31). The ward boundaries on the inset map, which include those of some of the larger religious precincts, are based on Lobel (1989). Wards where cornmongers are known to have been active are identified by the numbers 1-19; for the names of those wards, see Table 5. The other intramural wards shown are: 20, Aldgate; 21, Lime Street; 22, Cornhill; 23, Broad Street; 24, Bassishaw. The following religious precincts are identified: A, Grey Friars; B, St Martin le Grand; C, Black Friars.

the river; at Queenhithe, upstream from London Bridge, and at Billingsgate, just downstream of the bridge. Queenhithe may have been the first of the city's grain markets to be established, and at the beginning of the thirteenth century commongers in London were supposed to trade only there.³³ There was an active grain market at Billingsgate by 1268.³⁴ There seems in addition to have been a minor grain market at Botolph's Wharf 70 yards upstream from Billingsgate, and grain was also sold from boats in the river or on the foreshore.³⁵ The two principal riverside markets were held on public ground which opened from Thames Street on to the river.

The four main markets were evidently recognized as such by the 1280s, when it was the practice to buy the 3 quarters of wheat needed for the city's assize of bread at Cheapside, at Queenhithe, and at Gracechurch or Billingsgate.³⁶ The details of this regulation suggest that at some former time the city was thought to have had three main grain markets, and that Billingsgate or Gracechurch was an addition to them. Over the thirteenth century, then, as London became more populous so its commarkets seem to have become more numerous. By 1300 grain was also being sold in the suburbs and probably at the long-established intra-mural market at Woolchurch.³⁷ Later, the trade in grain seems in principle to have been limited to the four markets, although not one of them specialized in grain to the exclusion of other commodities, principally foodstuffs.³⁸

There were some differences between the markets in the grains that were sold there. Thus the wheat for the assize of bread was purchased at all four markets, while the maslin was purchased only at the two inland markets at Newgate and Gracechurch.³⁹ Malt also seems to have been a specialism of the two inland markets, supplied by maltmen from Barnet in Middlesex and from what appear to have been other centres of specialized malt production and marketing to the north of London.⁴⁰ The two inland markets were perhaps especially frequented by peasants and small-scale dealers supplying the cheaper

³³ Weinbaum (1933) ii, no. 27; Bateson (1902), 724. For the early regulation of trade at Queenhithe, see *Eyre 1244*, nos. 248-68.

³⁴ Madox (1711), 534.

³⁵ *Liber Albus* i, 356.

³⁶ CLRO, Cust. 4, fo. 1; the later version of the text in *Liber Albus* i, 349-50 confuses the issue.

³⁷ *Letter-Book C*, 163; *Letter-Book D*, 244. These references to the trade in corn at the market by St Mary Woolchurch are perhaps ambiguous; for an earlier reference to the market there, but not to its trade in corn, see Madox (1711), 534.

³⁸ For a preliminary survey of the food markets in medieval and early-modern London, see Harding (1988).

³⁹ CLRO, Cust. 4, *passim*.

⁴⁰ *Liber Albus* i, 247, 460; *Cal PMR 1323-64*, 160; *Cal PMR 1364-81*, 191-2; *Letter-Book G*, 77, 103, 123, 167; *Letter-Book H*, 354. In the 1420s maltmen from Barnet and from parts of Hertfordshire and Cambridgeshire appear to have been even more common in the London markets, possibly a reflection of per caput increase in the consumption of ale: Chambers and Daunt (1931), 183; GL, MS 5440 (references provided by Dr Judith Bennett).

grains grown closest to the city. The two riverside markets were perhaps dominated by a larger-scale trade in wheat brought from a greater distance.

THE QUANTITY OF GRAIN REACHING LONDON

While the quantity of grain brought to London by road was almost certainly much less than that brought by water, the one piece of direct evidence on the quantity of grain entering the city at this time concerns carts at Newgate in 1305. In November of that year it was stated that the collector of murage from corn at the gate on some days received the toll from 240 carts, at other times from 200 carts, and sometimes more or less.⁴¹ If an average of 200 carts carrying grain passed through Newgate on 300 days a year, 60,000 cart-loads of grain would have entered the city through one gate alone in the course of the year. That seems a very high figure, and in any case was an exaggeration. The collector at Newgate, who was a cornmonger, was said to have received £16. 0s. 0d. from the levy over the six weeks up to 18 October. On investigation, however, it turned out that the sum actually collected had been £7. 1s. 8d., which at a rate of a penny per cart perhaps represented 1,700 carts over the six weeks,⁴² and 14,167 over a working year of 50 weeks, at a rate of about 47 carts a day or six carts an hour.

If fully laden with a representative sample of the grains sold or consumed in London, this number of carts would have carried about 50,000 quarters of grain, approximately 30 per cent of the city's estimated total requirement for consumption.⁴³ It seems unlikely, even if London had a very great redistributive trade in corn, that so much grain would have come into the city through a single gate. Many of the carts perhaps carried other commodities too. To judge from the importance of the individual markets within the city, carts entering through Newgate cannot have brought more than a quarter of the total grain supply (perhaps 12,000 cart-loads in a year): it is more likely that the proportion was an eighth (6,000 cart-loads) or less. The Newgate evidence may not enable the scale of London's grain consumption to be estimated with any exactitude, but it does convey vividly the contemporary (and probably correct) impression that very many carts were involved.

THE ESTIMATED GRAIN REQUIREMENT OF LONDON C.1300

If London had a population of 100,000 in 1300, how much grain did it require to provision itself? Gras based his estimates for the period 1534-1696 on a yearly requirement per head for drink and bread of 2.5 quarters, and added an

⁴¹ *Cal EMC*, 228.

⁴² Many carts would have paid less, and so the following calculations represent minimum values: each cart carrying corn to the city for sale was supposed to pay ½d. but at Ludgate and Newgate those who were not free of the city were to pay 1d. (*Liber Albus* i, 232).

⁴³ See below, 35. Carts carried 3 quarters of wheat or 4 quarters of oats (below, 193); for this calculation the average load is taken as 3.5 quarters.

allowance for ships' provisions, horses' fodder, and grain exported as beer, equivalent in total to one-tenth that consumed in food and drink.⁴⁴ An alternative approach is to begin with the daily per caput nutritional intake necessary to sustain life, and thence to extrapolate the nutritional requirements of the population as a whole and the quantities of grain necessary to satisfy them.

Nutritionists consider the daily food requirement of an adult male to be in the range 2,000-3,000 kilocalories (kcal), depending upon energy expenditure.⁴⁵ At the end of the eighteenth century, when, as in the late thirteenth century, mean living standards were at a temporal low, the national average intake per adult male may have been 2,500-2,700 kcal.⁴⁶ Adjusting that estimate to take account of the age and sex structure of the population yields a mean per caput intake of 1,700-2,300 kcal. This accords closely with C. Dyer's assumption that peasant diets c.1300 provided a per caput daily allowance of approximately 2,200 kcal.⁴⁷

Whether medieval Londoners consumed more or less per caput than the national average would have depended upon the age and sex structure of the city's population and the nature of metropolitan diets.⁴⁸ Urban populations generally contained a higher proportion of young adults and a smaller proportion of children than the population at large and, other things being equal, this would have resulted in a higher per caput calorific intake. On the other hand, women may have outnumbered men, and a substantial proportion of urban residents, especially at the close of the thirteenth century, were poor and probably subsisted at well below average standards of nutrition. Their enforced abstinence contrasted with the relative indulgence of the wealthy and powerful, who were also represented in greater numbers in the metropolis than in the country at large. A minimum per caput daily intake for the late thirteenth-century Londoner of 2,000-2,500 kcal is, therefore, unlikely to be far wrong. Anything less would imply a serious degree of malnutrition for a significant proportion of the city's population, little margin for protection against food shortages, and low levels of energy expenditure.

Those who could afford it undoubtedly consumed significant quantities of meat and fish, but fruit and vegetables were eaten in only limited quantities, except for the legumes which were incorporated in the cheapest qualities of

⁴⁴ Gras, (1915), 77: the per caput estimate is based upon an estimate of 1528. See also Chartres (1986), 179. The estimates given here supersede those presented by B. M. S. Campbell at the Economic History Society conference in 1992.

⁴⁵ *Manual of Nutrition*, Table 24. We are grateful to Dr E. M. Crawford, Department of Economic and Social History, The Queen's University of Belfast, for advice on these matters.

⁴⁶ Shammass (1990), 134-48; Brown H P and Hopkins (1956).

⁴⁷ Dyer C (1989), 134. Snooks (1990), 15-19, and Snooks (1992), Chapter 5, considers nutritional levels to have been significantly higher c.1300 than in 1086.

⁴⁸ Chartres (1986), 173-6, demonstrates the existence of significant dietary differences between London and the country as a whole by 1700, in favour of London.

bread and were an important component of the pottage consumed by the poor. Dairy produce seems to have made a significant contribution to the diet of the poor, but not to that of the wealthy.⁴⁹ Water was the acknowledged drink of the poor in both town and country; but those who could afford it drank ale of varying strengths, and the most affluent citizens drank wine.⁵⁰ Nevertheless, in aggregate, even in the wealthiest households, ale was the most important drink, and bread was the basis of the diet.⁵¹ In short, grain was the foundation of the food supply in late thirteenth-century London.

Modern experiment indicates that the urban population as a whole would have been healthy and children would have grown well on a diet where wheat supplied 75 per cent of the energy intake, vegetables 20 per cent and foods of animal origin 5 per cent.⁵² It may be postulated, therefore, that in London c.1300, when living standards were at a temporal low and the reliance on cereals correspondingly high, grain is unlikely to have contributed more than 75 per cent or less than 60 per cent of total calories. In fact, nutritional imbalances would have occurred had grain contributed more than 80 per cent of total calories, and the preference for a varied diet was presumably strong.⁵³

A significant proportion of those calories would have been consumed in the form of drink. Thirteenth-century harvest workers derived 80 per cent of their calories from grain, including 4 per cent from ale,⁵⁴ but Londoners in 1300 probably were less dependent on grain for their food and consumed more ale. Nevertheless, if it is assumed that grain contributed 80 per cent of the Londoners' intake, and that 10 per cent of their grain-based kilocalories were consumed as drink, then that would have been sufficient for a per caput daily allowance of roughly 1-1.25 lb. of coarse bread and one pint of weak ale.⁵⁵ It is possible that the calories consumed as ale represented a much higher proportion of the total, for in 1700 Londoners drank an estimated 2.25 pints per caput of small and strong beer each day,⁵⁶ although the implication of rural evidence is that the equivalent rate of consumption in ale in 1300 was substantially less.⁵⁷ How much ale per caput was consumed is a matter of great importance, for the proportion of calories contained in raw grain lost by the process of conversion into ale was very much greater than that lost by conversion into bread.

⁴⁹ Dyer C (1983), 193-6, 207-08.

⁵⁰ On water consumption by the rural poor, see Dyer C (1983), 203-04. For urban wine consumption, see Keene (1985b), 269-77; for the consumption of the publicly-supplied water by the London poor, see Keene and Harding (1987), no. 105/36.

⁵¹ On aristocratic diets, see Dyer C (1989), 55-70; Mertes (1988), 108-14.

⁵² Davidson, Passmore, Brock, and Truswell (1979), 168-9.

⁵³ Cf. Sen (1981), 24-6.

⁵⁴ Dyer C (1988a), 26.

⁵⁵ On the assumption that each Londoner consumed 1,600-2,000 grain-derived kcal a day, out of a total of 2,000-2,500 kcal, of which ale comprised 160-200 kcal.

⁵⁶ Chantres (1986), 175.

⁵⁷ Dyer C (1983), 213-14; Dyer C (1988a), 27.

On the assumption that between 60 and 75 per cent of a per caput daily intake of 2,000-2,500 kcal was derived from grain, London's annual requirement from that source c.1300 would have been between 43,800 and 68,438 million kcal. Ten per cent should probably be added to that to allow for losses arising from damage and waste, raising the total to between 48,180 and 75,282 million kcal. Greater calorific losses were incurred by converting raw grain into food and drink. The removal of the bran probably entailed a loss of 15 per cent for wheat: an extraction rate of 85 per cent.⁵⁸ Extraction rates for other grains were lower, but since wheat was by far the most important bread grain in London, and since significant but unknown quantities of the cheaper grains would have been consumed as pottage, it is reasonable to assume that overall, in the course of processing, the grains destined to be consumed as food lost 15 per cent of their calorific content. Malting and brewing c.1300 probably entailed a loss of about 70 per cent.⁵⁹ The offal redeemed as bran and as malt dregs, recycled through livestock, had some value as food for humans, or could be fed to horses. Its contribution to food supplies overall may have been small, but was perhaps greater in towns than elsewhere since urban bakers were responsible for sifting out the bran, which they then sold. Overall, the conversion of raw grain is likely to have reduced the number of calories available for human consumption by 28 per cent if a tenth of the calorie intake was in the form of ale (38 per cent if a fifth), thereby inflating London's requirement for feeding its human population to between 67,074 and 104,804 million kcal in raw grain, equivalent, perhaps, to between 104,075 and 217,126 quarters.⁶⁰

Additional grain was required for horses and other livestock, not least the cart-horses that drew grain and other commodities to the city. The grain required for human consumption amounted to between 34,692 and 54,282 cart-loads,⁶¹ and if the horses involved in pulling that many carts to London each received one day's allowance of oats while in the city,⁶² at least a further 1,485 to 2,323 million kcal,⁶³ amounting to between 3,077 and 4,813 quarters of oats (769 to

⁵⁸ See Appendix II.

⁵⁹ Malting expands barley by approximately 14 per cent (cf. below, 147, 204) while reducing its weight by 25 per cent (Brown J (1989), 515). 1 bushel of barley containing 66,792 kcal (Table 3) therefore made 1.14 bushels of malt, from which 109 pints of weak or 57 pints of strong ale could be brewed (Dyer C (1989), 58). Each pint of ale contained 160 or 420 kcal, respectively, depending on strength (McCance and Widdowson (1960), 144), thus yielding between 17,440 and 23,940 kcal per bushel of barley. Only 26 to 36 per cent of the kcal contained in the raw barley therefore remained after brewing, i.e. a 'loss', on average, of approximately 70 per cent.

⁶⁰ 104,075 quarters if all 67,074 million kcal were derived from wheat, at 80,560 kcal per bushel. 217,126 quarters if all 104,804 million kcal were derived from oats, at 60,336 kcal per bushel (see Table 3).

⁶¹ On the same assumption as above (31, n. 43), that each cart carried 3.5 quarters.

⁶² At four horses per cart: Masschaele (1989). But there is also evidence that carts carrying grain were hauled by three horses: PRO, E101/550/1.

⁶³ A cart-horse probably consumed 6.65 quarters of oats a year: Langdon (1982), 33. This is equivalent to 3.21 million kcal a year or 8,794 kcal a day. The latter covers time at rest and grazing.

1,203 cart-loads), would be added to the city's provisioning bill.⁶⁴ In fact, well over half the city's grain supply was probably brought by water,⁶⁵ but the amount of horse-drawn road traffic remained substantial, and these figures for the consumption of grain by horses in London may well be an underestimate. In Paris in 1637, for example, oats for horses seem to have represented 32 per cent of the city's total grain consumption by volume.⁶⁶

Late thirteenth-century London's annual requirements for grain-derived energy (if the metropolis had 100,000 inhabitants) are unlikely to have been less than 68,000 million kcal and on the more generous estimates may have reached 107,000 million kcal, equivalent to between approximately 107,000 and 222,000 quarters of assorted grains or between 1 and 2.25 quarters per person. These are very much lower- and upper-bound estimates (the latter exposing the generosity of Gras's annual grain allowance of 2.50 quarters per caput) and the wide gulf between them serves as a reminder of the very approximate nature of the exercise. Perhaps the mean of 165,000 quarters is the best single guide to the general magnitude of London's grain requirements at this date; greater statistical precision is impossible.⁶⁷ If Londoners on average drank as much as a pint of weak ale per day, that would have required raw grain amounting to roughly a quarter (24 per cent) of that estimate of total consumption.

An annual per caput consumption of 1.65 quarters of grain in London c.1300, meeting the entire requirement of the city for food and drink, and the fodder to carry the same, is of the same order of magnitude as estimates for some other cities. A contemporary estimate implies that at about the same time the inhabitants of Florence each consumed 0.91 quarters of bread grains in a year, and another source indicates that the total quantity of grain sold in the city's market over a year amounted to 1.12 quarters per caput.⁶⁸ A contemporary estimate for Paris in 1637 indicates that grains for human consumption amounted to 1.35 quarters per caput, but that if oats for horses were also counted the figure was 2.00 quarters.⁶⁹ In neither Paris nor Florence would a significant quantity of grain have been used for brewing. A contemporary

and therefore represents an underestimate for consumption in London, assumed here to have been 10,700 kcal a day.

⁶⁴ At 4 quarters of oats per cart, see below, 193.

⁶⁵ See above, 28-31.

⁶⁶ See below, n. 69.

⁶⁷ This compares with the estimate in Gras (1915), 77, that in 1534 London, with a smaller population of approximately 60,000 enjoying relatively higher living standards, consumed 150,000 quarters of grain in bread and drink and a further 15,000 quarters in horses' fodder, ships' provisions, and beer exports. These figures imply a daily per caput consumption of grain alone of between approximately 2,380 and 3,180 kcal.

⁶⁸ Piumo (1978), 77-8: reckoning the *moggio* at 584.70 litres or 2.07 quarters (Kelly P (1835), 130), and the population of Florence at 95,000.

⁶⁹ Boisjelle (1881), 656, 658-9 (reckoning the *muid* at 6.64 quarters for bread grains and double that capacity for oats: Kelly P (1835), 133).

estimate of cereal consumption in Nuremberg c.1500 suggests a per caput figure of 1.54 quarters of wheat or its equivalent, or of 2.30 quarters if half the total quantity was in the form of barley or oats.⁷⁰

⁷⁰ Irsigler (1985): Irsigler gives the estimate in *muids*, by which he intends the Nuremberg *simmer* (personal communication); the *simmer* of wheat or rye is equivalent to 9.48 bushels, and that of barley or oats to 18.96 bushels (Kelly P (1835), 271).

IV

THE SCALE OF GRAIN PRODUCTION IN THE LONDON REGION AND THE POPULATION IT WAS CAPABLE OF SUPPORTING

Within what type of agricultural landscape was London situated, and what scale of grain production did it sustain c.1300? The ten counties of the region contained a total of 5.43 million acres.¹ Of these an unknown proportion was occupied by water, roads and buildings. Royal forest, of which there were some extensive tracts, comprised a further unspecified area, together with private parks and chases.² Commons and wastes were a third element of land use. Commons amounted to some 3.1 per cent of the total area at the time of the tithe survey of 1836, when they were fast being eliminated by reclamation and enclosure.³ In 1808, on Arthur Young's reckoning, the equivalent proportion had been 7.3 per cent.⁴ The ten counties of the region had never been as generously provided with commons as the country as a whole,⁵ and in 1300, before the impact of enclosures, commons and wastes are unlikely to have amounted to more than 20 per cent of the total. The remaining area was devoted to agricultural uses of one sort or another: arable, meadow, pasture, and wood. Collectively, these probably amounted to about 70 per cent of the total or some 3.80 million acres.

Inquisitions *post mortem* provide a sound basis for estimating the arable proportion of those 3.80 million acres. The IPM database reveals that arable accounted for 66 per cent of total demesne land use by value and approximately 75 per cent by area,⁶ if sown and unsown arable are both consistently recorded. In fact, fallow arable is often excluded,⁷ hence the latter figure should probably

¹ This figure relates to the areas of the ancient counties as specified in the 1891 census.

² Bazeley (1921), 140-72; Young C R (1979), 62-3; Cantor (1982).

³ Calculated from Kain (1986).

⁴ Young A (1808), 139.

⁵ Williams M (1970), 58-60: Buckinghamshire, Essex, Oxfordshire, Kent, Bedfordshire, and Hertfordshire contained especially low proportions of waste land.

⁶ The area of the different land uses is less consistently recorded in the IPMs than their respective values (Campbell B M S, Galloway, and Murphy (1992), 14); the mean area of each has therefore been derived by dividing its mean total value by its mean value per acre (calculated on those cases where value per acre is known). Allowance has been made for the fact that the more valuable categories of pasture and wood are more likely to have an acreage recorded.

⁷ Campbell B M S, Galloway, and Murphy (1992), 10.

be revised upwards to 80 per cent. This indicates a pronounced land-use bias to arable, the more so as the demesne sector may have been better endowed with grassland and wood than the peasant sector.⁸ Nevertheless, it is consistent with evidence of a strong dietary bias towards grain consumption and with the testimony of the manorial accounts to the primacy of tillage.⁹ It suggests that the region contained approximately 3.04 million arable acres *c.* 1300 (56 per cent of the total land area), which compares with a figure of approximately 3.22 million acres estimated from the tithe files of 1836,¹⁰ at a time when the arable area within the country as a whole was nearing its recorded maximum.

On the evidence of the surviving Hundred Rolls of 1279, demesne arable accounted for roughly a third of all arable.¹¹ How that arable was cropped is revealed by manorial accounts, and for the purpose of this exercise it must be assumed that patterns of cropping on peasant holdings broadly mirrored those on demesnes.¹² Crop rotations varied considerably across the region.¹³ Taking the area as a whole, at least half and probably nearer two-thirds of the arable was sown each year; that is to say some 1.52 to 2.03 million acres. Of those, approximately 9.4 per cent were devoted to legumes (Table 1). This left between 1.38 and 1.85 million acres sown with grain, representing between 25 and 34 per cent of the total land area.

Wheat, the principal bread grain, was also the principal crop, occupying a larger share of the sown acreage than any other (Table 1). Together with the other bread grains (rye and the rye mixtures known as maslin and mancorn), it accounted for 46.8 per cent of the grain acreage, corresponding to approximately between 0.65 and 0.87 million acres, or some 12 to 16 per cent of the total land area. According to Grantham, the equivalent proportion of the total land area around Paris at the end of the eighteenth century (when the imperative to produce bread grains was even greater) was 21 per cent, which he considers to be near the maximum sustainable over a wide area with manure-intensive husbandry.¹⁴ By contrast, barley and dredge, the premier drink grains, were grown both on a smaller scale and by fewer demesnes. Together they occupied 19.5 per cent of the grain acreage, or some 5.0 to 6.6 per cent of the total land area. However, these proportions rise dramatically if oats, widely used for brewing at this date,¹⁵ are included. Oats had a wide range of other uses, and so as a crop was almost on a par with wheat, being cultivated on the same number of demesnes and occupying a third of the grain area.¹⁶

⁸ Postan (1966), 553-6.

⁹ Above, 24-6. Clark (1991), 214-19, estimates a ratio of arable to pastoral production in the lowland counties of England of 3:1 during the period 1300-49.

¹⁰ Kain (1986).

¹¹ Kosminsky (1956), 87-95.

¹² On peasant versus demesne cropping, see Miller (1991), 64-5, 217-18, 228-9, 306; above, 17.

¹³ See below, 128-39.

¹⁴ Grantham (forthcoming).

¹⁵ Above, 24-5.

¹⁶ See Table 4 for corresponding national figures.

TABLE 1

Individual crops as a percentage of the sown acreage and of the grain acreage in the London region, 1288-1315

Crop	Demesnes cultivating crop (198 demesnes)		Percentage (over 198 demesnes) of	
	Number	Percentage	Sown acreage	Grain acreage
Winter grains:				
Wheat	189	95.4	32.9	36.7
Maslin	38	19.2	1.9	2.0
Rye	91	46.0	6.1	6.6
Mancorn	15	7.6	1.4	1.5
Winter Barley	15	7.6	0.4	0.5
Any winter grain	198	100.0	42.7	47.3
Spring grains:				
Spring barley	155	78.3	10.7	12.3
Dredge	108	54.6	6.7	7.2
Oats	189	95.4	30.3	33.1
Other spring mixtures ¹	2	1.0	0.1	0.1
Any spring grain	198	100.0	47.8	52.7
Winter and Spring grains	198	100.0	90.5	100.0
Legumes:				
Grain/legume mixtures	10	5.1	0.2	
Legumes	176	88.9	9.2	
Any legume or mixture	178	89.9	9.4	
All crops	198	100.0	99.9	

Source: accounts database.

¹ Mixtures of oats and brotcorn, and of brotcorn and dredge.

The various grains yielded at different rates (Table 2). Yields can be calculated in a variety of ways: from information on seed sown and grain harvested given in two consecutive accounts (the 'consecutive method'),¹⁷ from the marginal entries of medieval auditors (the 'auditor's method'),¹⁸ and, most approximately, from information contained within a single account concerning the grain harvested in one year and that sown in the next (the 'internal method').¹⁹ Hitherto most studies of medieval yields have relied upon either the 'consecutive' or the 'auditor's method'. Nevertheless, use of these two methods limits the number of demesnes for which yields can be calculated. The 'internal

¹⁷ Trow (1972), 2-9.

¹⁸ Trow (1947), 29-30; Farmer (1977), 555-66.

¹⁹ See the strictures of Lennard (1922), 12-27.

TABLE 2

Mean crop yields (gross and net) in the London region, 1288-1315

Crop	Seeding rate (bushels per acre)	Number of demesnes	Yields (in bushels) ³			
			Gross ⁴		Net per acre	
			Per seed	Per acre	A ⁵	B ⁶
<u>Internal method:</u> ¹						
Wheat	2.8	192	3.8	10.5	7.8	6.7
Rye	2.8	80	4.9	13.7	10.9	9.5
Spring barley	4.2	154	4.1	17.2	13.0	11.3
Dredge	4.0	103	4.0	16.0	12.0	10.4
Oats	4.8	195	2.7	12.8	8.0	6.7
Peas	2.8	122	3.7	10.2	7.4	6.4
<u>Auditor's method:</u> ²						
Wheat	2.8	55	4.1	11.6	8.8	7.6
Rye	2.8	25	4.0	11.2	8.4	7.3
Spring barley	4.2	46	4.1	17.6	13.4	11.6
Dredge	4.0	36	3.7	14.7	10.7	9.2
Oats	4.8	55	2.6	12.2	7.4	6.2
Peas	2.8	40	4.6	12.8	10.0	8.7

Source: accounts database.

¹ Calculated from the internal evidence of seed harvested and seed sown recorded in a single account (see text, 40-1).² Calculated from yields recorded by contemporary auditors, which were based upon consecutive accounts.³ Unweighted means of the relevant number of demesne means.⁴ Inclusive of tithe.⁵ Inclusive of tithe and net of seed.⁶ Net of tithe and net of seed.

method', on the other hand, provides by far the most comprehensive coverage and is employed here. Mean yields for the region (Table 2) are derived from means for all those demesnes for which it is possible to calculate a yield. In examining spatial patterns (Figs. 17, 18) demesne mean yields have only been used when based on yields in at least three years, so as to overcome the inherent uncertainty of the 'internal method'. Even this restriction allows a value to be calculated for just over half the demesnes with accounts surviving. The validity of the method rests on the assumption that on average the amounts and acreage sown remained much the same from one year to the next.²⁰ Yields calculated in this way are consequently approximations, the more so since for some demesnes acreage information is absent and yields have to be obtained by interpolation.²¹

²⁰ Early modern historians have developed a method of yield estimation which involves far greater assumptions: Glennie (1991).²¹ Mean yields per acre have been derived by multiplying the mean yield per seed by the mean seeding rate. Where the relevant acreage information is lacking seeding rates have been interpolated.

As tithes represented an important element of total production and a major potential source of saleable surpluses, yields calculated from the accounts have been corrected for the deduction of tithe on the assumption that this constituted a tenth of the grain actually harvested.²² For comparison, yields per acre are given both net of seed and net of seed and tithe.

TABLE 3

Estimated kilocalories per bushel and per acre in the London region, 1288-1315

Grain	Relative weight		Weight in lb. per bushel		Kcal per lb ⁴	Kcal per bushel	Net bushels per acre ⁵	Net kcal per acre
	AD 1791 ¹	AD 1300 ²	AD 1791 ¹	AD 1300 ³		AD 1300	AD 1300	AD 1300
Wheat	1.00	1.00	57	53	1,520	80,560	7.8	628,368
Maslin	?	?	56	52	1,520	79,040	9.3	735,072
Rye	0.96	?	55	51	1,520	77,520	10.9	844,968
Barley	0.86	0.86	49	46	1,452	66,792	13.0	868,296
Dredge	?	?	43	41	1,564	64,124	12.0	769,488
Oats	0.67	0.75	38	36	1,676	60,336	8.0	482,688

Sources: see notes.

¹ *Statutes at Large*, 31 George III c.30; for other weights c.1800, see Mingay (1989), 1124-5; Collins (1975), 108, n. 1; and below, 192.

² Estimated from carrying capacity of carts in London area c.1290 (see below, 193). Later evidence from Paris, Nuremberg, and Cologne suggests that the relative weight of oats was nearer 0.5: see above, 35-6, n. 69, 70, and Ebeling and Irsigler (1976), ix.

³ For the weight of wheat see Appendix II. Weights for rye, barley and oats are interpolated from that for wheat using their relative weights in 1791. The weights of the mixed crops (maslin and dredge) are calculated from the weights of their constituent grains.

⁴ For wheat (English) and rye at 100 per cent extraction, from McCance and Widdowson (1960), 117 (the figures given in this version are preferable to those given in later editions). Corresponding values for whole barley and oats (both dehusked) calculated on nutrient values as cited in Fisher and Bender (1979), 128.

⁵ Inclusive of tithe but net of seed, calculated by the 'internal method' from the accounts database (Table 2).

Converting these net yields, measured by volume, into their weight and thence into their kilocalorie equivalents (the most convenient standardized measure of their respective food values) is also an approximate affair (Table 3). The number of kilocalories per pound of each of the principal grains has to be taken from modern tables of the composition of foods,²³ on the assumption that these have remained reasonably constant since the Middle Ages. The number of pounds per bushel is then a matter of careful reconstruction, based primarily upon contemporary information concerning the weight of wheat, the weight of

²³ Taken from other accounts for the same demesne or from the seeding rates employed on other demesnes in the same locality.

²⁴ See below, 74; Lennard (1936).

²⁵ McCance and Widdowson (1960); Fisher and Bender (1979), 128.

bread that could be baked per bushel of wheat, and the weights of the other grains relative to wheat.²⁴

TABLE 4

Weighted calorific output per grain acre in the London region, 1288-1315, and in England as a whole, 1275-1324

Grain	London region			England ⁵		
	A: net kcal per acre ³	B: % of grain acreage ⁴	Kcal per grain acre: $\frac{A \times B}{100}$	A: net kcal per acre	B: % of grain acreage	Kcal per grain acre: $\frac{A \times B}{100}$
Wheat	628,368	36.7	230,611	628,368	36.2	227,469
Winter mixtures ¹	735,072	3.5	25,728	735,072	1.4	10,291
Rye	844,968	6.6	55,768	844,968	6.1	51,543
Barley	868,296	12.8	111,142	868,296	16.2	140,676
Spring mixtures ²	769,488	7.3	56,173	769,488	3.5	26,932
Oats	482,688	33.1	159,770	482,688	35.6	171,837
Weighted total kcal per grain acre			639,192			628,736

Source: Tables 1 and 3.

¹ Maslin and mancorn; kcal equivalents calculated as if all maslin.

² Dredge and other spring mixtures; kcal equivalents calculated as if all dredge.

³ Inclusive of tithe but net of seed; calculated from the accounts database for the London region (Table 3).

⁴ Table 1.

⁵ Calculated from a national sample of manorial accounts: Campbell B M S (1991a), 167.

Finally, by linking information on the composition of the grain acreage (Table 1) with the net kilocalorie yield per acre of the individual grains (Table 3), it is possible to calculate the mean net calorific output of a typical grain acre (Table 4). If the net yield of each acre of grain was 639,192 kcal, and if 1.3 to 1.85 million acres were sown with grain, then the total net annual output of the entire grain area of the London region was between 882,085 and 1,182,506 million kcal. Of that total, substantial proportions were consumed by both livestock and humans at the site of production (approaching 45 per cent of the total grain receipt net of seed for demesnes in the database: Table 7), and by livestock elsewhere.

The fodder requirements of the working animals and fatstock on each demesne consumed an almost irreducible proportion of the total quantity of grains available after seeding. Cart-horses were fed on oats for most or all of the year, plough-horses for some six months.²⁵ Unthreshed oats were also

²⁴ This evidence is summarized in Table 3 and discussed in Appendix II.

²⁵ In 1286-7 on the royal manor of Ospringe in Kent the demesne's two cart-horses and 12 oxen consumed three-quarters of the total oats receipt of almost 80 quarters: PRO, SC6/894/3.

sometimes fed to oxen, cows and calves during the winter and demesnes specializing in intensive sty husbandry are recorded as including oats, barley, and dredge in the diet of pigs.²⁶ In the London region, probably an eighth of the net grain harvest (inclusive of tithe, but net of seed) was consumed as fodder by demesne livestock, and possibly as much again was consumed as fodder by all other animals.²⁷

These figures concerning the use of grain for feeding animals indicate that no more than 75 to 80 per cent of the total net grain crop was potentially available for human consumption in the region, amounting to between 661,564 and 946,004 million kcal. But at least 28 per cent, and possibly more, of these kilocalories would have been lost in conversion to food and drink, and of the remainder a further 10 per cent may have been lost through damage and waste.²⁸ This reduces the total supply of *processed* kilocalories to between 428,693 and 613,011 million. On the assumption that grain supplied 60 to 75 per cent of a per caput daily intake of 2,000 to 2,500 kcal,²⁹ this was sufficient to sustain a population of between 0.78 and 1.12 million. In 1377, on the evidence of the Poll Tax returns, the ten counties of the region contained 23 per cent of the national population.³⁰ If the same ratio of regional to national population had prevailed c.1300, then these estimates of the population supported in the London region are consistent with a national population of between 3.39 and 4.87 million. In fact, given the increase during the later Middle Ages of the share of the national wealth (and by implication population, although perhaps not to the same degree) which was located in London and south-east England,³¹ the proportion of the national population contained by the ten counties in 1300 is likely to have been smaller than in 1377. If the proportion in 1300 was 20 per cent, then the corresponding population total for the country as a whole would have been between 3.90 and 5.60 million.

The estimates of available energy are very approximate, but if the mean is taken as a plausible guide it suggests an annual consumable output of grain-derived kilocalories from the ten counties of 520,852 million, sufficient to feed a population of 0.95 million. If the region contained 20 per cent of the national total, then that total would have been 4.75 million. In 1377 the population of

²⁶ Harvey P D A (1965), 47-8; Biddick (1989), 122-3.

²⁷ On the Peterborough estate in 1300-1301 it is estimated that livestock consumed some 21 per cent of the total grain harvest (net of tithe but inclusive of seed): Biddick (1989), 72. For the high proportion of oats consumed on demesnes in the London region, see Table 7, and below, 147.

²⁸ See above, 34.

²⁹ See above, 33-4. The calculation has been made on the assumption that if grain supplied 75 per cent of the intake, then the latter was 2,000 kcal, and that if grain supplied 60 per cent then the intake was 2,500 kcal.

³⁰ Topham (1785); values for missing counties are interpolated from the population densities of adjoining counties (by this method of estimation, if England had a population of 6 million in 1300, London's population would have been 100,800; cf. above, 10). For comparison, the same ten counties accounted for an estimated 27 per cent of the national assessed lay wealth in 1334: Glasscock (1975).

³¹ Stobbs R S (1965), 503-09; Darby, Glasscock, Sheail, and Versey (1979), 256-61.

London perhaps represented 7.3 per cent of that for the ten counties and 1.7 per cent of the national total.³² If the same proportions prevailed in 1300, and if London did not draw grain from outside the region of ten counties, then the available calorific output would have been able to support a population which included a city of approximately 69,000 or 81,000 inhabitants, according to the respective proportions. London's share of the national population may have been smaller in 1300 than in 1377. If it was 1.5 per cent, then the calorific output of the region would have been able to support a population which included a city of 71,000 inhabitants.

A cross-check on the plausibility of these population estimates can be obtained by repeating the exercise for the country as a whole, taking as a basis the arable acreage recorded at the height of the ploughing-up campaign during the Napoleonic War. The 11.50 million acres estimated as having been under cultivation at that time³³ is unlikely to have been less than the area under cultivation c.1300. On the further assumptions that between half and two-thirds of the arable bore crops each year, and that 7.7 per cent of that was devoted to legumes, a maximum total grain acreage can be estimated of 6.35 million acres.³⁴ Extrapolating yield levels from the ten counties of the London region to the country at large,³⁵ and estimating the composition of the grain acreage from a national sample of manorial accounts,³⁶ produces a mean net output per grain acre of 628,736 kcal (Table 4) which is marginally lower than the output estimated for the London region, on account of the different national mix of crops.

On these figures the national net output of grain crops corresponded to some 3,992,474 million kcal, of which, given the lesser importance of fodder crops at a national scale, perhaps 80 per cent (3,193,979 million kcal) would have been potentially available for human consumption. After conversion to food and drink and allowance for loss and wastage that would have been sufficient to feed a population of no more than 3.78 million, at a per caput daily grain consumption rate of 1,500 kcal. This is a smaller estimate than that extrapolated from the figures for the ten counties of the London region, and suggests that a total population figure of 4 million is more credible than one of 4.75 million. It also corresponds closely with J. C. Russell's cautious estimate of 3.75 million,³⁷ long since discounted by most historians in favour of a figure of 5 to 6 million or more.³⁸

³² See above, n. 30.

³³ Cited in Kain (1986), 459.

³⁴ Campbell B M S (1988a), 204.

³⁵ If the mean value per acre of arable is taken as a surrogate for mean output per acre of arable, then, on the evidence of IPMs for the decade 1300-9, arable in the ten counties and in the country as a whole were both worth 4.8d. an acre (calculated from the IPM database and a national sample of 1,179 IPMs for the decade 1300-9).

³⁶ Campbell B M S (1991a), 167.

³⁷ Russell (1966), 1-21.

³⁸ Postan (1966), 561-2; Smith R M (1991), 49. Particular doubt attaches to the population of 7 million conjectured by Hallam (1981), 246-7.

This estimate of the maximum sustainable national population has obvious implications for the size that London might have been. Thus, if London contained 1.5 per cent of a national population of 3.78 million it would have had 57,000 inhabitants, a figure closer to traditional estimates of the capital's population than the 100,000 assumed here. Even if London contained 1.7 per cent of a population of 4 million, it would have had no more than 68,000 inhabitants, and Winchester and Norwich would have had populations of 6,200 and 11,400, respectively, both figures which seem too low.³⁹ How are such discrepancies to be explained? Were England and its leading cities genuinely less populous *c.*1300 than a mounting body of evidence has led historians to suppose? Or did the capital contain a larger share of the national population: 2.6 per cent rather than 1.5 per cent? Perhaps grain was less prominent in medieval diets, with less consumed as drink and more as food (especially pottage); perhaps dairy produce and fish made a larger contribution to the diet; or perhaps nutritional levels were lower, or the extraction rate higher, than those that have been assumed here. Certainly, there is abundant testimony that by the early fourteenth century a significant proportion of the rural population in widely separate parts of the country had become dangerously vulnerable to harvest shortfall.⁴⁰ Maybe the cultivated area was larger than has been estimated. Or is it simply that demesne yields were inferior to those obtained in the much larger non-demesne sector? These are all questions which invite further investigation. The estimates that prompt them are far from robust. Meanwhile, those historians who would favour a population in excess of 5 million need to demonstrate how, on known patterns of land use and productivity, that population could have been fed.

³⁹ See above, 10.

⁴⁰ For the incidence of famine and dearth in this period see, Postan and Titow (1958-9); Kershaw (1973); Razi (1980), 27-98; Campbell B M S (1984).

THE EXTENT OF LONDON'S GRAIN PROVISIONING ZONE

DIRECT EVIDENCE

Regional associations of the London markets and cornmongers

London's markets (Fig. 4) served traders who brought grain to the city from different directions, by land or water. A regulation of 1374 stated that cornmongers from the counties of Cambridgeshire, Huntingdonshire, and Bedfordshire, and those from Ware in Hertfordshire, were to bring their grain to the market at Gracechurch, while those coming from the west of the city, for example from Barnet, were to use the market in front of the church of the Friars Minor within Newgate.¹ The ruling presumably concerned only those who came by road, for it would have been cheaper to bring grain from Ware and parts of Cambridgeshire by water to the riverside markets.² The former group of cornmongers presumably used Ermine Street and entered the city through Bishopsgate, while the latter would have used the Great North Road (entering through Aldersgate), and Watling Street and the Great West Road, entering via Holborn and Newgate. Carts carrying grain also approached the city via Fleet Street and Ludgate.³ It is noteworthy that there is no reference in this connection to Aldgate and to the road which approached it from Essex and the east. Grain supplied to London overland came predominantly from districts to the north and west of the city. Of the two riverside markets, Queenhithe evidently served the Thames valley region, and the boats which descended the river to it with grain or firewood are recorded by 1244 and possibly by 1215.⁴ Billingsgate presumably received grain brought to London up-river from counties adjoining the Thames estuary and by coastal and overseas trade, although some cornmongers brought grain from Kent to Queenhithe by boat. Queenhithe was the focus of the city's considerable river-borne trade with the upper Thames region and the Midlands by AD 900, and Billingsgate was attracting traders from the Low Countries and the Rhineland by AD 1000.⁵

¹ *Letter-Book G*, 330. Barnet lies to the north rather than to the west of London, but cornmongers from there would have entered the city through gates in the western part of the circuit of walls in Fig. 4.

² See Appendix III.

³ *Liber Albus* i, 232.

⁴ *Eyre* 1244, no. 261.

⁵ See Keene (1989c), 100-1 and references there cited.

The interests and activities of the London commongers provide a more detailed picture of their regional contacts, and some indication of the extent of the city's grain-provisioning zone in normal years. The evidence ranges from that of their locative bynames (although that is not necessarily an indicator that grain was supplied to London from the places named) to explicit records of their presence or commercial activity in a particular place. These associations can be roughly classified and mapped according to strength (Fig. 5). Two-thirds of the places mapped lay within 47 miles (75 km.) of London, and 82 per cent within 62 miles (100 km.), a radius which includes almost the whole of the ten-county region. The more distant places were on the Norfolk and Lincolnshire coasts, accessible by sea from London. The significance of water transport is evident even in this insensitive evidence, for there is a clear concentration of places along the line of the Thames. Places up to about 20 miles (32 km.) distant from London might economically have sent grain there by land,⁶ but it seems likely that the rather more distant cluster of places to the north of the city was drawn into its grain-supply region because water transport was available on the River Lea.

The market town of Henley-on-Thames in Oxfordshire (Fig. 5) was by far the most important place of interest to the London commongers. Thirteen out of the 146 in the database are known to have traded or to have had other interests there. Of those, six owned houses in Henley, and four of them owned granaries there. Adam Wade (died in or before 1310), for example, lived in a house in the parish of St James Garlickhithe (close to Queenhithe), which he appears to have inherited from his commonger brother along with granaries at Queenhithe. He also had properties in Fleet Street and Holborn, and granaries at Henley. He bequeathed his old stone house standing 'at the head of Henley bridge for the maintenance of the bridge.'⁷ London merchants were widely recognized as regular visitors to Henley and hired little houses and plots of ground there, wherein to sell the goods they had brought with them and to keep the merchandise they had bought in the town and the region round about.⁸ Henley is the only place outside London where London commongers are known to have owned granaries:⁹ for them it was clearly a major market and collecting point for grain.

By the mid thirteenth century Henley had emerged as the highest point of effective navigation on the Thames, where wine and other bulky goods being sent to Oxford were unshipped in order to continue the journey overland.¹⁰ The town appears to have succeeded Wallingford as the principal market and

⁶ See below 76-7 and Appendix II.

⁷ Ekwall (1951), 184; *Cal Wills* i, 212; *Letter-Book B*, 199, 246; *Letter-Book C*, 58, 172, 183; *Cal EMC*, 153, 244; Harding (1983), 377-8; PRO, E101/5/13,14.

⁸ *Liber Albus* i, 428: a writ of 1313 (cf. *Cal Close R* 1307-13, 517). In 1304-5 the reeve of Long Buckby (Np), some 55 miles from Henley, sent there for timber and charcoal: PRO, DL29/1/2.

⁹ For granaries, see below, 101-4.

¹⁰ e.g. *Cal Lib R* 1251-60, 30; cf. James (1971), 180.

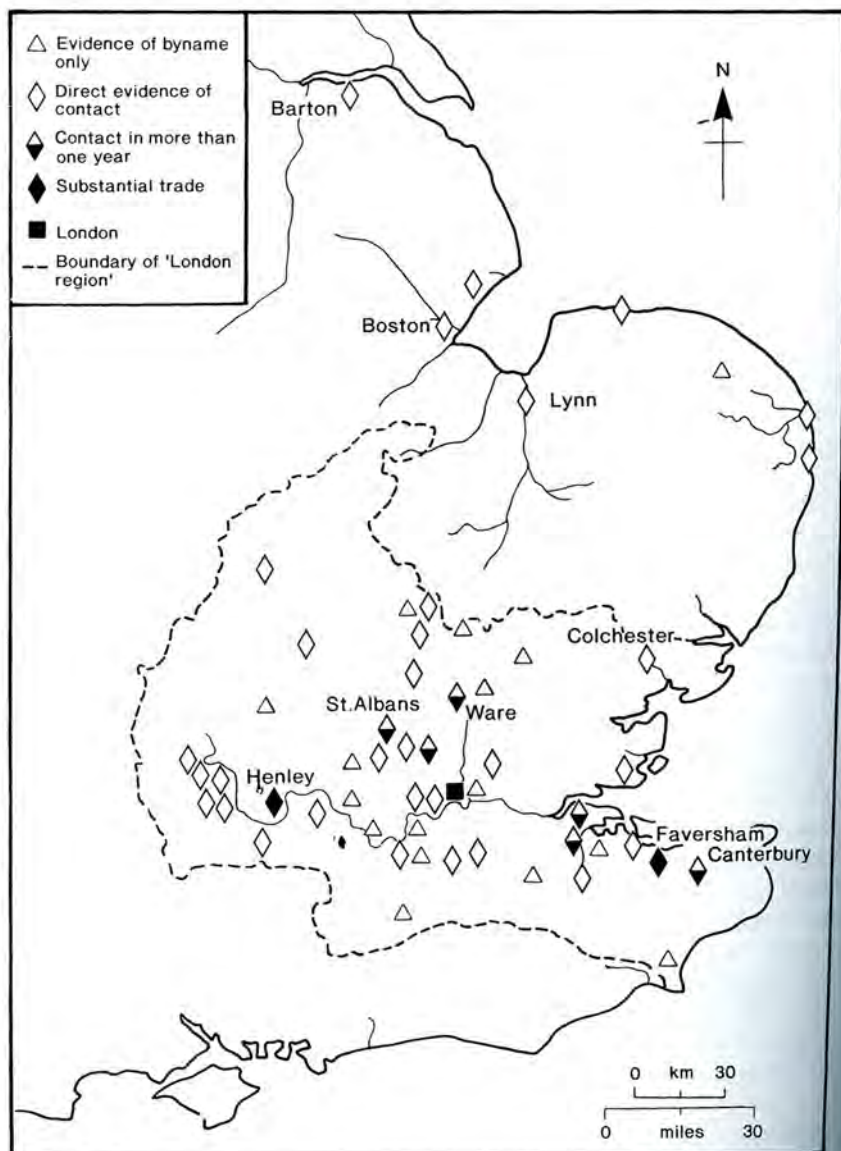


FIG. 5. The regional contacts of London cornmongers, 1270-1365

See text (46-9).

transshipment point on the middle and upper Thames. The river remained navigable above Henley, but at a sharp increase in cost.¹¹ Henley may also have had other advantages as a market for supplying London. It could draw both on the grain-producing regions of southern Oxfordshire and eastern Berkshire and on the woodland resources of the Chilterns. Faggots were shipped in quantity from Henley and London woodmongers, who regularly used the Thames above Taplow, did big business there.¹² This dual demand for the transport of bulky goods perhaps kept the river relatively free of obstructions, and transport costs low. In the sixteenth century, when London once more attained, and then surpassed, the size it had been in 1300, Henley was again recognized as a major market for grain and timber which were shipped to London.¹³

No other place can equal Henley in the extent and scale of its grain-marketing contacts with London. By the 1290s Faversham in northern Kent, from which transport costs to London were almost exactly the same as those from Henley, was evidently an important source of supply (Fig. 5), but only five of the commongers are known to have had interests there, which in the case of four of them are known only from the records of purchases in 1295. Possibly at Faversham local men and foreigners, serving other distant markets as well as London, were relatively more important than at Henley. After Faversham, local grain markets or sources of supply important to London commongers were Ware (Hrt), Rochester and Hoo (on the Isle of Grain, K), Kingston (Sr), and perhaps Dartford (K), all accessible from London by water; along with Barnet (Mx) and St Albans (Hrt), from which grain would have been carried to London by cart (Fig. 5). Canterbury (K) may have been in the same group, but most of the evidence concerns only the purchases made in 1295. Other places where there is direct evidence of contact include market towns such as Chelmsford (Ess) and Uxbridge (Mx), but there is no way of assessing their significance as suppliers to London. In addition, but not well attested in the activities of the commongers, High Wycombe (Bk) was probably a significant market for the supply of London.¹⁴ Overall, the commongers' interests reveal that they operated through a network of local market centres of which perhaps six or seven were significant for the routine supply of London, and of which Henley was outstandingly important. Of the significant markets, only two (Barnet and St Albans) were not accessible by water from London.

The relative significance of some of the regions which supplied grain to London is revealed by the distribution of the commongers within London in relation to the main markets there (Table 5 and Fig. 4). For 130 of them the city ward is known within which their residence or primary interest lay, and the 50 commongers identifiable in the city's subsidy roll of 1319 can be attributed to the ward in which they resided. By this measure Queenhithe was by far the most

¹¹ Davis (1973), esp. 264-5. See Appendix III.

¹² PRO, SC6/1120/11; Burn (1861), 322; *Memorials*, 383; cf. Farmer (1991), 410.

¹³ Burn (1861), 9, 10, 82, 85; Gras (1915), 106; cf. Prior (1981).

¹⁴ See below, 80, 101.

TABLE 5

Distribution of cornmongers' interests within the city of London

Ward ¹	Cornmongers in database ²		Cornmongers in 1319 ³	
	Number	Per cent	Number	Per cent
<u>Queenhithe area:</u>				
1 Queenhithe	36	27	16	32
2 Vintry	6	5		
3 Castle Baynard	8	6	3	6
4 Bread Street	17	13	7	14
5 Cordwainer	3	2		
6 Cheap	3	2		
<u>Newgate area:</u>				
7 Cripplegate Within	4	3	4	8
8 Aldersgate	2	2	3	6
9 Farringdon Within	10	8	5	10
10 Farringdon Without	1	1	2	4
<u>Billingsgate area:</u>				
11 Bridge	5	4		
12 Billingsgate	17	13	8	16
13 Tower	1	1	1	2
14 Bishopsgate	1	1	1	2
<u>Other areas:</u>				
15 Coleman Street	1	1		
16 Walbrook	3	2		
17 Dowgate	2	2		
18 Candlewick	7	5		
19 Langbourne	4	3		
Totals	131	101	50	100

Source: see notes.

¹ The numbers identify the wards on Fig. 4.² From database of 146 cornmongers c.1280-1350.³ From Ekwall (1951), 81-7.⁴ Riverside neighbourhood around Queenhithe⁵ Riverside and inland neighbourhood around Queenhithe.⁶ Inland marketing area within Newgate and in Cheapside.⁷ Billingsgate neighbourhood.

important of the city's markets for grain, and the Thames valley region the most important source of supply. About 30 per cent of the cornmongers were based in Queenhithe ward itself, a figure which rises to 38 per cent if the two adjoining riverside wards are included. The next largest group of cornmongers was in Bread Street ward, immediately north of Queenhithe and extending up to Cheapside. Over half the city's cornmongers were to be found in these three wards, and most of their grain was probably landed at Queenhithe or nearby. The other waterfront trading area, represented by Billingsgate ward, was

next most important corn market, but contained only about half as many commoners as Queenhithe despite occupying about the same area, and there were few grain traders in adjoining wards. The relative interest of the commoners in the Queenhithe and Billingsgate markets seems to parallel that in Henley and Faversham. The city's inland markets were still less significant. The most important of them was within Newgate and at the western end of Cheapside,¹⁵ represented by the traders of Farringdon Ward Within. If to these are added the commoners of the adjacent wards of Cripplegate Within and Aldersgate, that market appears more significant, especially on the evidence of the subsidy roll. But at least three of the Cripplegate commoners lived in St Alphege parish and so may have been associated with a minor market there rather than with the major market near Newgate. Gracechurch corn market, represented by only four commoners in Langbourne ward, is hardly visible. It is possible, however, that some of the commoners in Bridge and Candlewick wards were associated with Gracechurch rather than Billingsgate. If all of them were, then Gracechurch market would have been about the same size as that lying between Newgate and Cheapside. Gracechurch itself, however, does not appear to have been at the focal point of that group of commoners, and so its market was probably the lesser of the city's two principal inland grain markets. The most significant of the districts which supplied grain to London overland thus seem to have been to the north-west and west of the city, with St Albans as perhaps their most important local catchment centre.

A slightly different picture of London's grain-supply area is conveyed by the activities of the London commoners who purchased grain for the Crown in the spring and early summer of 1295 (Table 6). There may be several reasons for this. The year was one of relative shortage, even allowing for the effect of the royal purveyances. Purchases were made at the season when prices reached a peak. The commoners, for whom a large sum had been guaranteed by the crown, may not have been constrained by the normal difficulties of raising cash and credit, and would have been intent on acquiring large quantities of grain quickly. Thus, they concentrated their efforts along the Thames, where the larger markets were to be found. They made purchases as far up river as Abingdon in Berkshire, which may have been at the limit of their normal zone of activity.¹⁶ In terms of weight of grain purchased, Faversham equalled Henley on this occasion, perhaps because the commoners' urgent need caused them to seek supplies in a large, specialized market in wheat where they might not usually have been active on such a scale. Moreover, most of the grain purchased in Faversham on this occasion was held there and not shipped to London. North Kent was clearly a major source of grain, with active markets at Maidstone and Rochester. The small district of Essex around Shoebury, which faced the Kent

¹⁵ Above, 28.

¹⁶ For evidence of shipments of wheat from Abingdon and Wallingford to London in 1300, see *Liber Quotidianus*, 104; PRO, E101/582/3.

TABLE 6

Grain purchased on behalf of the king and mostly shipped to London, 1295

Districts and places where grain purchased	Wheat		Oats		Wheat equivalent ⁴		Ratio of wheat to oats by volume
	Quantity ³	Per cent	Quantity ³	Per cent	Quantity ³	Per cent	
<u>Upper Thames:</u>							
Henley	419.6	22	291.9	18	615.2	21	1.4
Reading	42.0	2	491.5	30	371.3	12	0.1
Blewbury	60.0	3	50.0	3	93.5	3	1.2
Abingdon	41.0	2	-	-	41.0	1	-
Sutton Courtney	15.0	1	-	-	15.0	1	-
Waltham ¹	-	-	20.0	1	13.4	<0.5	-
Sub Total	577.6	31	853.4	51	1149.4	39	0.7
<u>London:</u>							
Queenhithe	251.9	14	142.0	9	347.0	12	1.8
<i>in foro</i> ²	-	-	21.0	1	14.1	<0.5	-
uncertain	60.9	3	-	-	60.9	2	-
Sub Total	312.8	17	163.0	10	422.0	14	1.9
<u>North-west Kent:</u>							
Dartford	-	-	100.0	6	67.0	2	-
Plumstead	-	-	100.0	6	67.0	2	-
Sub Total	-	-	200.0	12	134.0	5	-
<u>North Kent:</u>							
Maidstone	40.0	2	83.5	5	95.9	3	0.5
New Hithe	20.0	1	-	-	20.0	1	-
Rochester	-	-	50.0	3	33.5	1	-
Sittingbourne	45.9	2	-	-	45.9	2	-
Faversham	677.8	36	-	-	677.8	23	-
Canterbury	50.0	3	120.0	7	130.4	4	0.4
Sub Total	833.7	45	253.5	15	1003.5	34	3.3
<u>Essex:</u>							
Shoebury	39.4	2	120.0	7	119.8	4	0.3
<u>Uncertain:</u>							
<i>Newetone</i>	30.0	2	-	-	30.0	1	-
Unknown	72.0	4	70.0	4	118.9	4	1.0
Sub Total	102.0	5	70.0	4	148.9	5	1.5
Total	1865.5	100	1659.9	99	2977.6	101	1.1

Sources: PRO, E101/5/13, 14.⁵¹ Probably Waltham St Lawrence (Brk). ² Probably meaning Cheapside or the inland markets.³ In quarters of 8 bushels. ⁴ Counting oats as 67 per cent of wheat by weight (cf. Table 3).⁵ The accounts are incomplete, damaged, and confused. Altogether they account for about £1,100 spent by London commonsongers on buying and transporting grain. That approximate sum accounts for all the grain listed in this table. In addition, about £17 were spent on small purchases amounting to 45 quarters of wheat, but it is not known where they were purchased (PRO, E101/5/14, m 5). Most of the grain was assembled in London, but all that purchased at Plumstead and Canterbury, 60 per cent of that purchased at Dartford, and 87 per cent of that purchased at Faversham, representing overall about 27 per cent by weight of the entire quantity, appears to have been assembled in Faversham ready for direct shipment to Gascony.

markets, was also drawn upon. Reading in Berkshire emerges as a significant supplier of oats to London. The absence of purchases in East Anglia, which was probably drawn upon by London in most years of relative shortage,¹⁷ may reflect the special character of the operation, the purpose of which was to assemble grain in the city for transmission to Gascony. The episode thus probably reveals London's specialist commoners purchasing to a high pitch of intensity along their normal lines of supply and in markets with which they were routinely familiar.

Local evidence for the marketing of grain and its transmission to London

While manorial accounts usually record the quantities of each grain sold with great precision, they rarely specify where the sale took place or who bought it. Sometimes there is evidence of merchants buying direct from demesnes. Other sales are said to be made in the market (*in foro*) or in the district (*in patria*), implying the use of local market networks, but the precise location of the sale remains unclear. Where specific places of sale are stated there may be a suspicion that the document is recording an atypical transaction, and that the demesne is using a different market from usual. Most of the places referred to in this way, however, were close at hand. In 1305 the bailiff of John de Seyton's manor of Maidwell (Np) sold oats and barley at the neighbouring chartered market of Rothwell, some five miles from the manor. A small sale of oats was also made in Northampton, but that may have been incidental to other business in the county town rather than the result of a strategic marketing decision.¹⁸ Likewise, when the Kent demesnes of Canterbury Cathedral Priory recorded the destinations of sales it was usually with reference to small quantities disposed of in local markets or sold to other demesnes on the estate. The destinations of the much larger quantities that were regularly sold by demesnes such as Cliffe were left unrecorded. The allowance of 'advantage' (*avantagium*)¹⁹ on grain sales by the Kent demesnes of Maidstone, Ospringe, and Ebony, as well as Cliffe, indicates that they were selling to merchants, but whether this took place at a market or the manor is not known.²⁰

Elsewhere, decisions on which market to use were sometimes based upon factors other than proximity. The reeve of Coombe (Brk) sold grain at Newbury (Brk) and Andover (Hampshire) on seventeen occasions in 1306-7, both towns which lay further from the manor than the smaller market at Hungerford (Brk).²¹ Again, the market towns of Thame (O) and Wallingford (Brk) were closer to Cuxham (O) than was Henley, while Oxford, Abingdon (Brk), and Whitchurch

¹⁷ See below, 69-71.

¹⁸ NRO, Finch Hatton 408.

¹⁹ A free allowance, generally of 5 per cent, apparently to dealers who purchased produce directly and carried it away at their own charge: Farmer (1991), 375; Britnell (1980); Galloway and Murphy (1991), 6.

²⁰ LPL, ED 658; PRO, SC6/1090/7; DCc, Ebony 27, Cliffe 27.

²¹ King's Coll., MS COM/59.

(O) were more or less the same distance. Yet it was to Henley that Cuxham sent the bulk of its grain for sale, in order to exploit that town's strategic links with the metropolitan market.²² Even more strikingly, the bailiff and carters of Holywell (O) carried grain to Wallingford and Reading in 1296-7 and to Henley in 1298-9, neither year being one of high grain prices, rather than exploiting the immediately neighbouring Oxford market.²³ Faversham likewise captured the north Kent market in wheat.²⁴ The Westminster Abbey demesne of Turweston (Bk) sent malted dredge to Westminster for sale in 1314, as well as using the market at Brackley only a mile away. This may have been to take advantage of the higher price obtaining in the vicinity of the capital, but more probably represents disposal of a quantity of grain found to be surplus to the monastic household's needs after delivery to Westminster.²⁵

Thirteenth-century customals contain many references to tenants' obligations to carry grain to London, perhaps reflecting earlier conditions when local markets were both less numerous and less capable of handling bulk sales and channelling them towards major centres of consumption. Tenants of many of the manors of St Paul's Cathedral were burdened with such obligations in the early thirteenth century. Virgaters on the manor of Caddington (Bd), for example, owed as many as eight carrying services to London each year, a distance of some 30 miles. At the end of the century half-virgaters on the same manor were each obliged to carry 2 quarters of wheat and 2 quarters of oats to London, a service valued at 17 pence.²⁶ Manors of the bishopric of Ely in Essex and Hertfordshire could be required to carry produce to London as well as to Hertford, Ipswich, Cambridge and smaller towns, while the Essex manor of Littlebury was used as a staging post for the carriage of grain from Great Shelford in Cambridgeshire to the bishop's London house at Holborn in the early fourteenth century.²⁷ Tenants of the abbey of Bec's great manor at Ruislip (Mx), and probably also those of the manor of Tooting (Sr), were under obligation to carry grain to London, and the archbishop of Canterbury's Sussex tenants might be called upon to perform a similar service, as well as carrying to Winchester, Guildford, and elsewhere.²⁸ Even thirteenth-century townsmen of Faversham in Kent were obliged to find and pay a steersman to take the abbot of Faversham's grain to London when required.²⁹

While the reeve or bailiff may sometimes have chosen the market with the best price rather than the one named in the customal,³⁰ the frequent appearance

²² Harvey P D A (1965), 103.

²³ Merton Coll., MM 4469, 4474; Postles (1987), 19.

²⁴ See below, 92.

²⁵ WAM, 7772.

²⁶ Hale (1858), 17, 18, 26, 39 *et seq.*; Jones A (1979), 319-20.

²⁷ Miller (1951), 84-5.

²⁸ Morgan (1946), 49; Du Boulay (1966), 167.

²⁹ Murray (1935), 51.

³⁰ Morgan (1946).

of London as a possible destination suggests the importance of the metropolitan market, and sometimes it can be shown that the services were being performed as specified. Thus, the Ramsey Abbey manors of Shillington and Cranfield (Bd) were still using carrying services to bring grain to London for sale in the early fourteenth century, as did the lay manor of Higham Gobion (Bd) as late as the 1370s.³¹ Carrying services might also be drawn upon to bring grain and other provisions to London for a lord's own consumption during a temporary residence in the capital. For example, wheat was sent to London from the Hertfordshire manor of Therfield in 1307-8 for consumption by the abbot of Ramsey and his retinue who were attending the king's funeral.³²

By the later thirteenth century, however, long-distance carriage of grain for sale was probably becoming less common than it had been formerly, as local market networks grew and became more efficient. This may explain the abandonment on the bishop of Winchester's estates after the early thirteenth century of the practice of carrying grain to Southwark for sale on the metropolitan market.³³ How many lords were still enforcing carrying services at the end of the century is impossible to say, but many services had been commuted in return for cash payments. At Dovercourt in Essex less than one in four of all carrying services was actually being used in 1295-6.³⁴ D. Postles, however, has argued from the evidence of the Hundred Rolls that, rather than abandoning carrying services, many lords were adapting them to supply local markets, a process which went hand in hand with seigniorial market foundation.³⁵ Well into the fourteenth century the customary tenants at Cuxham (O) had the duty of carrying grain only to the market towns of Wallingford (Brk) or Henley, and to the nearby manor of Ibstone. A survey of the bishop of Lincoln's estate dating from the second quarter of the thirteenth century shows that, like Cuxham, its Oxfordshire manors, were sending grain to strategic locations rather than taking it directly to London. Virgaters at Dorchester and elsewhere were obliged to carry grain in carts to Oxford and Wallingford from whence, if the bishop wished, it could be shipped to London. In addition, one virgater on the manor of Stadhampton was obliged *inter alia* to go to London with grain for sale or delivery to the bishop's barns. The same obligations applied in 1279, although by then the references to London had been dropped, as if reflecting an increase in the efficiency of the market network.³⁶

It may be that, rather than a 'manorial' system giving way to a 'local market' system, as Gras envisaged, carrying services and market networks evolved in a complementary way during the thirteenth century. Carriage direct to London

³¹ Galloway and Murphy (1991), 7.

³² PRO, SC6/872/17.

³³ Farmer (1991), 354, 368.

³⁴ PRO, SC6/840/9.

³⁵ Postles (1984), 1-2.

³⁶ Farmer (1991), 349; Harvey P D A (1976), 607, 657; Postles (1987); *VCH Oxfordshire* v, 12, 45-6, 97, 74-5, 84.

had become less necessary in order to find a reliable market and a good price, and demesnes instead used their servile tenants' labour to carry grain to the nearest market which was linked into the wider network of supply. As a corollary, the metropolitan market had developed to a point where magnate households, both lay and ecclesiastical, could buy most of what they needed for a stay in London in the markets of the city itself. Consequently, direct transfers of grain to the capital to feed households were probably becoming less common, and were most characteristic of conservative lords like the abbot of Ramsey.³⁷

Transport: methods of conveying grain to market.

The expansion of the English economy in the twelfth and thirteenth centuries has been linked to an increase in the use of horses for hauling. 'In particular horse hauling, by markedly increasing the speed and range of marketing journeys, contributed to a more active interchange between town and country'.³⁸ From the thirteenth century onwards manorial stock accounts reveal an increase in the use of horses as a source of draught power, and a decrease in the ratio of oxen to working horses.³⁹ Many of these horses performed the dual functions of traction and haulage, while others, often fed on a superior diet, were maintained for carting alone. The latter, distinguished in the accounts as cart-horses (*equi carectarii*), reflect both the developing specialization within the demesne equine population and the overall increase in the haulage requirements of manors.⁴⁰ These trends appear to have been particularly marked in the London region. While nationally the ratio of oxen to horses stood at 4.5 to 1.0 in the period 1275-1324,⁴¹ the corresponding ratio for the London region in the period 1288-1315 was 2.8 to 1.0. Furthermore, in the London region at this time, 22 per cent of all recorded adult horses were described as cart-horses,⁴² whereas in Langdon's national sample cart-horses comprised 13.8 per cent of all work horses.⁴³

Over three-quarters of all sampled demesnes in the London region with relevant information maintained horses specified as being used for carting. Nationally there were at this date approximately four cart-horses to every 1,000

³⁷ For the use of direct transfers to supply monastic and other ecclesiastical households, including those based in London, see below, 148-53.

³⁸ Langdon (1984), 66.

³⁹ Langdon (1986); Campbell B M S (1988b).

⁴⁰ Langdon (1986), 86, 95-6. Langdon found only one cart-horse in the twelfth-century sources he examined, compared to 591 in the period 1250-1320 (or 13.8 per cent of total horses recorded) and 513 in the period 1350-1420 (or 21.9 per cent of total horses recorded).

⁴¹ Calculated on the basis of manor means: Campbell (1988b), 93.

⁴² Forty-four of the database manors do not distinguish between plough horses (affers and stots) and other horses. This does not necessarily mean that they did not use horses for haulage.

⁴³ Langdon (1986), 86, 95. Langdon's 'work horse' category cannot be exactly matched in the London region database, but it is less comprehensive than the 'adult horse' category, so that in the London region cart-horses were even more prominent in relation to the rest of the country than these percentages suggest.

sown acres,⁴⁴ but in the London region the corresponding stocking density, at 8.6 was over twice as great.⁴⁵ Ratios of cart-horses to sown acres were particularly high on many demesnes in Middlesex, Surrey, Kent, south Essex, and south-west Hertfordshire, within convenient carting distance of London (Fig. 6). In addition, a band of demesnes extending from mid-Berkshire through central Oxfordshire to north-Buckinghamshire maintained in excess of 15 cart-horses per 1,000 sown acres. The haulage requirements of these manors, situated as they were towards the edge of the area focused on the important grain and wood entrepôt of Henley, must have been considerable. Conversely, in west Berkshire, and north Oxfordshire, areas beyond the normal range of London commongers, many demesnes stocked no cart-horses at all.

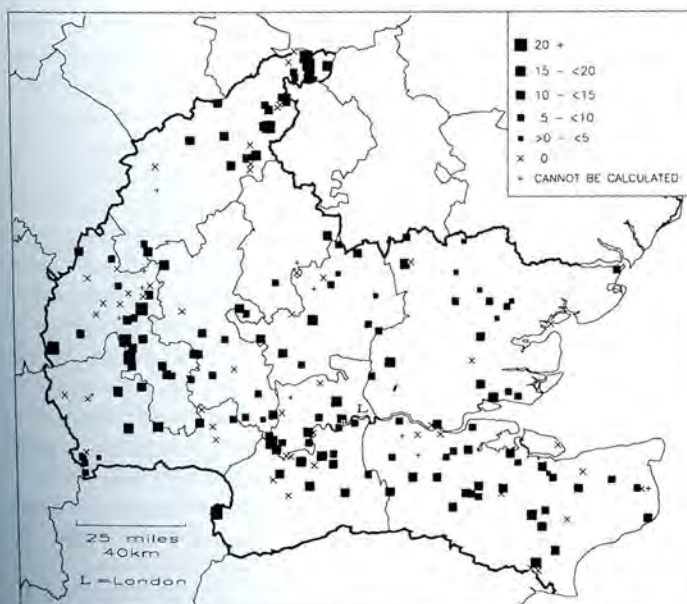


FIG. 6. Numbers of cart-horses per 1,000 sown acres in the London region, c.1300

Source: accounts database. See text (57, n. 45).

Cart-horses, as K. Biddick has stressed, were costly to maintain.⁴⁶ Several of the Peterborough Abbey demesnes in Northamptonshire studied by her stocked significant numbers of cart-horses and are revealed as such in Fig. 6. Although

⁴⁴ Calculated from a national sample of manorial accounts supplied by Dr John Langdon.

⁴⁵ The number of cart-horses in the region has been calculated as the number of *equi carectarii* present on the manor at the start of the accounting year plus *equi* where it is clear that these animals were distinct from ploughing or riding horses. Affers and stots are excluded, although they would also have been used for hauling in many cases.

⁴⁶ Biddick (1989), 116-21.

these are among the least commercialized demesnes in the database, at least as far as sales of grain are concerned, the abbey had good reasons for its investment in cart-horses. With that resource of draught power it both strengthened the links between the central household and the demesnes which provisioned it, and reinforced its links with the market in produce other than grain. The Northamptonshire demesnes of the Peterborough estate were a source of its most important cash crop, wool, which had to be carted to a point of embarkation for shipping to the busy trading ports of the Wash.⁴⁷ Moreover, some non-monastic demesnes in the area also had large numbers of cart-horses,⁴⁸ suggesting that in this as in other aspects of production, the Peterborough demesnes tended to conform to common local practice, which was significantly influenced by commercial considerations.⁴⁹

Whether or not demesnes maintained specialist cart-horses, virtually all owned at least one horse-hauled cart (*carecta*) and some owned two or more,⁵⁰ a distinction sometimes being drawn between iron-bound carts and the less valuable 'nude carts'.⁵¹ The purveyance accounts confirm that such carts, normally drawn by three horses, were widely used in the London region to carry grain, and could readily be hired. In Essex and Hertfordshire they carried 3 quarters of wheat, 3.5 quarters of barley, or 4 quarters of oats, but in some other districts their loads were heavier.⁵² Whereas horse-drawn vehicles are recorded on 84 per cent of the database demesnes, exclusively ox-drawn vehicles are comparatively rare. These included the large *plaustrum*, a two-wheeled vehicle similar to the early modern wain, which seems to have been capable of carrying approximately twice as much as a *carecta* but at slower speeds.⁵³ *Plaustrea* are recorded on only nine of the database demesnes, of which five were Middlesex manors of Westminster Abbey.⁵⁴ The smaller ox-hauled *curtena*, perhaps specifically used for hauling dung,⁵⁵ was similarly restricted in occurrence, being recorded at Woolstone (Brk), Walworth (Sr), Grays Thurrock and Mersea (Ess), and at 14 demesnes in Kent. Fifteen of these demesnes, including 13 in Kent, belonged to Canterbury Cathedral Priory. Nevertheless, demesnes in Kent

⁴⁷ Biddick (1989), 105-7, 130-2.

⁴⁸ Thorpe Waterville (over 20) and Aldwinkle and Maidwell (between 10 and 15).

⁴⁹ See below, 132-3, 139, 143, 151.

⁵⁰ In 1307-08 there were seven carts on the manor of Thorp Waterville in Northamptonshire although it is not known of which type: PRO, E358/13.

⁵¹ The account for Chingford, Essex, for 1308-9 values the *carecta ferrata* at 6s. 8d. and the *carecta nuda* at 18d.: PRO, E358/20, m. 31. According to Willard (1926), 363, carts with wheels protected by iron bands were used for the transportation of heavy goods across country.

⁵² See Appendix III.

⁵³ Langdon (1986), 151. *Plaustrea* were more suitable for carriage of heavy materials such as saw-wood, or coal.

⁵⁴ Ashford, Ebury, Laleham, Staines, Yeoveney (Mx); Hampstead Norreys (Brk), Little Chart (Kt), Sibford Gower (O), Mersham (Sr).

⁵⁵ Langdon (1986), 153, 249.

were notable for their use of horses rather than oxen, especially by comparison with Sussex.⁵⁶

In addition to those carts maintained on demesnes, others, presumably with the horses and carters to drive them, were available for hire. Demesnes seem rarely to have hired carts at this date: if they lacked sufficient transport to carry produce to market, purchasers or merchants presumably provided carts themselves. The records of royal purveyances indicate that throughout southern and eastern England there would have been little difficulty in obtaining carts for hire.⁵⁷

While some manors used carts to transport their surpluses directly to market, or to estate households, others used them to integrate with the water transport network. Boats known as shouts were commonly used for carrying bulk cargoes such as grain, firewood, and stone up and down the Thames, and are recorded at Queenhithe by 1244, if not 1215.⁵⁸ In 1295-6 they were used to carry grain down the River Lea from Thele (just downstream of Ware and by then the effective head of navigation), and from the Essex coast to great ships (*magnae naves*) in the Thames estuary.⁵⁹ The shout was a large boat, perhaps up to 52 feet (16 m.) long, and may often have had a sail.⁶⁰ While many demesnes located near navigable water had their own boats (*batelli*), a term which often denoted a smaller vessel, not one of them had a boat described as a shout, and hence they were probably rarely in a position to transport large quantities of their own produce over any distance by water. Laleham in Middlesex had a boat large enough to carry wheat, hay, malt and cider to Westminster which they hired out 'in time of flood' for 14 pence.⁶¹ Chingford (Ess), on the River Lea, had two boats, and Thorncroft (Sr) on the River Mole purchased one.⁶² There was probably sufficient trade up and down the Thames to maintain a class of professional bargemen who plied for hire with their shouts and other large vessels, relieving lords of the need to provide their own long-distance water transport.⁶³

It was common for boats to be hired for specific journeys even by manors like Grays Thurrock and Halliford in Essex which used the Thames regularly. The commongers' accounts of 1295, for instance, record payments for the carriage of grain 'by water', generally without specifying the type of vessel hired. Among those which were specified were ships (*naves*), which carried

⁵⁶ Du Boulay (1966), 212-13.

⁵⁷ See Appendix III.

⁵⁸ Eyre 1244, no. 261.

⁵⁹ PRO, E101/550/1, E101/556/1, 3.

⁶⁰ Milne and Milne (1982), 64-5.

⁶¹ WAM 27111.

⁶² PRO E358/20 m31; MR 5745.

⁶³ Norwich Cathedral Priory maintained a substantial boat on the River Yare serving the needs of several of its manors: see NRO, DCN1/1/28, for a detailed account of the boat's construction. It is possible (but not on record) that Westminster Abbey had a comparable centrally-owned vessel for use on the Thames.

grain from above Henley, from Faversham, and from Sittingbourne to London; a little ship (*navicula*), which carried grain from London to Faversham, and boats (*batellae*), used to ferry grain from the quay at Faversham to a great ship (*magna navis*), which doubtless was to carry it to Gascony.⁶⁴

Overall, those who wished to move grain by land and water appear to have experienced little difficulty in finding the means to do so.⁶⁵

The London grain-supply region as defined by transport costs

Carts, boats, and ships carried grain at very different costs per unit distance, and since London was accessible by land, river, and sea this to a large extent determined the shape and extent of the region from which the city drew its supplies. The unit-cost of transporting a quarter of wheat to London can be calculated from evidence of shipping, cartage, and handling charges detailed in purveyance accounts from the 1290s and later. This reveals that the cost of carrying a quarter of wheat 10 miles was, very approximately, 3.5 pence by cart, 0.3 pence by boat downstream between Henley and London, and 0.2 pence by coastal shipping. From these and other estimates it is possible to compile an isopleth map of a substantial portion of eastern and south-eastern England depicting the cost, including handling charges, of transporting a quarter of wheat to a granary in London (Fig. 7).⁶⁶

Since cartage costs may have been between twelve and eighteen times greater than those of sending grain an equivalent distance by water,⁶⁷ navigable rivers such as the Thames, the Lea, and the Medway played a crucial part in defining London's grain-supply region, and the rivers which served the hinterlands of Yarmouth and the ports of the Wash were also important. Overall transport and handling costs from the major grain entrepôts of Henley and Faversham (respectively 68 miles up-river from London and at least 62 miles downstream⁶⁸) emerge as virtually identical, at 2.6 pence and 2.7 pence per quarter of wheat, perhaps reflecting the different rates which applied downstream and upstream. From Maidstone, an important market serving northern Kent, the cost was the same. Bringing grain the extra 10 miles down the Thames from Reading raised the cost to 4.5 pence. Unit costs on the Lea were similarly high: a manorial account reveals that it cost 4 pence to transport a

⁶⁴ PRO, E101/5/13,14. In 1313 a ship (*navis*) was hired to carry grain across the Thames estuary from Leigh-on-Sea in Essex to Faversham in Kent: PRO, SC6/847/11.

⁶⁵ Cf. Farmer (1991), 358.

⁶⁶ For the method of compilation and for details of transport costs, see Appendix III. Since there was a very wide variation in both inland and coastal water-transport costs, determined by direction of river flow, water levels, weirs, and tides, the only safe method is to use the known costs for particular journeys. Rates for cartage seem to have been more standardized. For a summary of the various rates in weight-distance terms, see Table 17.

⁶⁷ The differential was much less in the eighteenth century, when river transport cost about a fifth of that on land: Baker D (1970), 137.

⁶⁸ It is not certain which channel would have been used to approach Faversham.

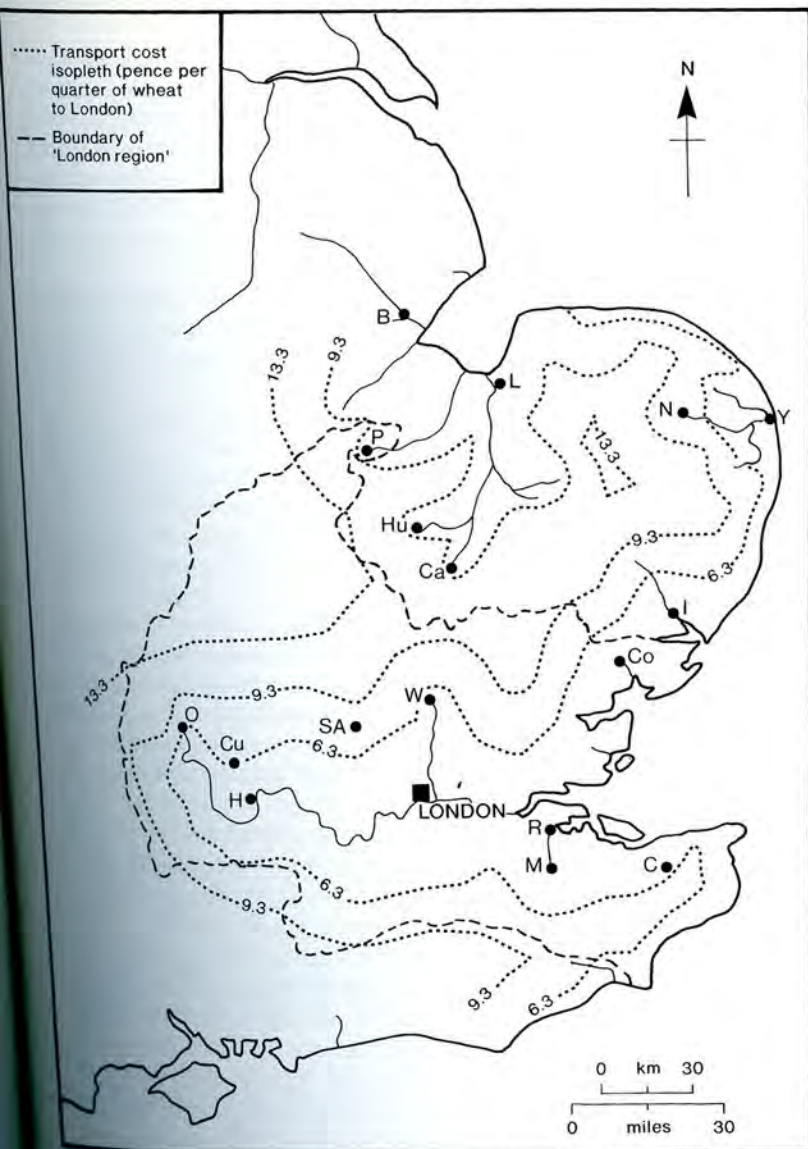


FIG. 7. The cost of carrying wheat to London from within southern and eastern England c.1300

Cost-distance is represented by means of isopleth lines, the values of which express the cost, in pence, of carrying a quarter of wheat to a warehouse in London by the cheapest means available, including costs of cartage, shipping, and handling (for sources and method, see Appendix III). The value 6.3 pence represents the cost from Cuxham (O), a manor which supplied grain to London via the local market at Abing.

The letters represent the following places: B, Boston (Lincolnshire); C, Canterbury (K); Co, Colchester (Essex); Ca, Cuxham (O); H, Henley-on-Thames (O); Hu, Huntingdon (Huntingdonshire); I, Ipswich (Suffolk); L, Lynn (Norfolk); M, Maidstone (K); N, Norwich (Norfolk); O, Oxford (O); P, Peterborough (Herts); R, Rochester (K); SA, St Albans (Herts); W, Ware (Herts); Y, Yarmouth (Norfolk).

quarter of wheat the 35 miles via the Lea from Ware,⁶⁹ a rate per mile three times that from Henley. But when sea routes were available, the rates undercut even those on the river Thames. In terms of the costs which can be calculated by the methods adopted here, the Kent port of Sandwich (3.3 pence) was thus closer to London than either Reading or Ware; Yarmouth (4.5 pence) was no further from London than Reading; while Barton-on-Humber (6.8 pence), at the northern end of Lincolnshire, was closer than Peterborough (8.1 pence) or Cambridge (8.6 pence; see Fig. 7).

The shipping of grain on the Thames appears to have been very efficient. The cost of bringing wheat from Faversham to London, for example, was, at 4 per cent, about the same proportion of the sale price in the London market as in the eighteenth century.⁷⁰

At a cost of 6.3 pence, a quarter of wheat could be transported the 79 miles by road and river to London from Cuxham (O), a manor whose wheat production was geared to the London market, which it served through Henley. The isopleth which defines that cost threshold probably outlines the minimum extent of the region which regularly supplied the capital with grain (Fig. 7). It extended up the Thames almost as far as Oxford (on the assumption that shipments were made from no further upstream than Abingdon); took in northern and eastern Kent; and at its furthest extent just included the ports of Blakeney, Wells, and Brancaster on the north Norfolk coast, and the ports of Rye and Winchelsea on the Sussex coast, but here the territory involved was no more than a narrow coastal strip which excluded most of the grain-producing hinterland of the ports mentioned. Inland from the sea and from the Thames, however, the district extended barely 20 miles at its maximum, except to the north where the River Lea brought in parts of southern and central Hertfordshire. It almost includes St Albans, which was connected by road to London. Comparing this conjectural map of cost-distance with the known purchasing activities of London commoners (Fig. 5) reveals a fair degree of correspondence together with some discrepancies. In particular, London commoners appear to have operated further north and west into Hertfordshire and Buckinghamshire than the pattern of transport costs would suggest. This discrepancy may in part arise from the method of calculating transport costs, since the cartage rate for Essex and Hertfordshire, which has been applied throughout, seems to have been higher than that for some other parts of the region, including Buckinghamshire.⁷¹ Furthermore, the use of carrying services

⁶⁹ WAM, 26260.

⁷⁰ Shipping and handling for a quarter of wheat (2.7d.) was 4 per cent of the mean price per quarter for the period 1288-1315 (Table 14). In the eighteenth century freightage and factorage represented 1 or 6 per cent of the sale price in normal years: Baker D (1970), 137.

⁷¹ See Appendix II. It is not clear why the rate for those counties should have been higher than elsewhere: carts there carried less, but were available at the same daily rate of hire. This suggests that they were drawn by the same number of horses as elsewhere, and that the condition of the roads was

for bringing grain to London (where some of it was sold) from the south Bedfordshire manors of St Paul's and of Ramsey Abbey, over distances which may not otherwise have been economic, could have promoted patterns of circulation which drew that district into the metropolitan market zone. Transport costs, moreover, were not the only factor which determined the purchasing patterns of London commongers, for there were significant differences in grain prices between different parts of the area contained by the 6.3 pence isopleth.

Despite these problems of detailed interpretation, the exercise does throw light on some of the tactical decisions which were made on transport and marketing as the networks evolved up to 1300. Thus, from Cuxham it was cheaper to send goods to London through Henley than through the closer market town of Wallingford, higher up the Thames. From High Wycombe, a market used by London commongers and situated on the main road from Oxford to London, it made sense to cart grain the five miles or so to the Thames at Marlow and then to boat it to London, rather than to send it all the way by road. It is also plain that prices would have to have been well above normal before it would have been worth paying the 9 pence or so per quarter necessary to bring wheat to London from the district immediately west of Oxford, from the intensively-farmed countryside to the north and west of Norwich, or from the extensive hinterland of the Wash ports which extended inland to Cambridge, Huntingdon, and Peterborough (all of which appear to have lain beyond London's regular supply zone). Finally, there can be no doubt that as potential suppliers of grain to London, most of Northamptonshire, the northern parts of Bedfordshire, Buckinghamshire, and Oxfordshire, and even a substantial portion of north Essex, were very remote indeed.

The London price region

One potentially revealing measure of the extent of the London grain-supply region is the price that individual grains commanded. If the metropolitan market for grain was as well developed as appears to have been the case, that should have been reflected in the prices at which particular grains were sold. The effect of market forces should have been to establish an equilibrium price within any given market region. In the case of the metropolitan region, that price, and the opportunities for dealers to profit at that price, had to be capable of commanding a sufficient supply of grain and of inducing farmers to specialize in producing those grains that the city most required. The 'London price' therefore needed to be consistently superior to that available in alternative markets, or, if the markets approached a high degree of integration, then the London price could be the same as or lower than the price elsewhere and yet still draw in grain, on account of the scale and rapid turnover of the metropolitan market. Given what is known of the scale of London's demand, and of the behaviour of even larger

There is a factor. Seasonal differences, as well as the possible use of different quarter measures for different grains in different areas, may complicate the issue.

metropolitan markets at a later date,⁷² the extent of market integration in 1300 is likely to have been little more than moderate, and the London price is likely to have been equal to or higher than that in local markets which supplied the city.⁷³

Analysis of price material was central to Gras's arguments about the evolution of the English grain market from medieval to modern times, and the increasingly central role of London in that evolution.⁷⁴ Gras believed that, in the late medieval period, there were at least fifteen separate price regions, each with its own price for wheat. This pattern, he argued, was broken down during the sixteenth and seventeenth centuries under the impact of the expanding metropolitan market, which operated to impose its own equilibrium price over a progressively widening area of the country.⁷⁵ Deficiencies in Gras's methodology and data mean, however, that his late-medieval price regions are largely illusory.⁷⁶ Most seriously, he derived his set of regions from pre-conceived notions rather than from the price data themselves. Furthermore, he derived local means from prices up to 250 years apart, thus ignoring changes in relative price levels over the later Middle Ages.

The inherent weakness in Gras's attempt to identify price regions does not, of course, mean that real differences did not exist. Subsequent writers on the medieval and early modern economy have continued to discuss the evidence for regional variations in grain price, but have differed in their assessment of its nature and significance. D. L. Farmer identifies such variations, but argues that they were of a limited nature and of lesser importance than the generally national character of grain-price levels and movements.⁷⁷ Moreover, he is, as he recognizes, a prisoner of his own methodology, depending to a large extent, like Gras, upon pre-defined regions, some of which contain very few places with data. His approach implies that such regional variations as there were in grain prices in thirteenth- and fourteenth-century England are most readily explicable in terms of variation in production costs, especially wages.⁷⁸ P. J. Bowden, reviewing the evidence available from the fifteenth to the seventeenth centuries, and drawing upon urban price series rather than series aggregated from a scatter of rural places, is more positive in his identification of regional price variations.⁷⁹ He tabulates wheat prices for a number of towns in the mid fifteenth and mid seventeenth centuries and shows that in the earlier period

⁷² Cf. Meuvret (1988) ii, 123-4, 130-4, 140. Meuvret modifies earlier views that the Parisian and French provincial markets became substantially more integrated between the late seventeenth and the late eighteenth century, and argues that such homogenization as did occur arose from a new monetary stability. For subsequent developments, explained in terms of market evolution rather than of improvements in transport, see Chevet and Saint-Amour (1992).

⁷³ In September 1364 the city authorities were concerned that corn was being sold in a market 1 miles away at a higher price than in London: *Cal PMR* 1323-64, 277.

⁷⁴ Gras (1915).

⁷⁵ Gras (1915), 42ff.

⁷⁶ Kneissel (1954).

⁷⁷ Farmer (1988), 740-5; Farmer (1991), 446-9.

⁷⁸ Farmer (1988), 780-1.

⁷⁹ Bowden (1990).

wheat prices were significantly higher in London and Canterbury than in most other towns in southern England, and were nearly 50 per cent higher than in Oxford or Cambridge. He concludes that London was supplied from the higher-priced region in Kent rather than from the upper Thames valley. In his view wheat prices were 'very local' in the fifteenth century, and were greatly influenced by the local availability of supplies and by production costs, especially wage levels.⁸⁰

None of these analyses, however, takes sufficient account of the effect which transport costs may have had upon price levels.⁸¹ Plainly, whereas prices consistently above those prevailing in London may have been a barrier to provisioning the city, prices that were lower were not. Where two markets were in equilibrium, the difference in price between them would in general correspond to the costs of transport and handling.⁸² The London market, therefore, is likely to have prevailed in a particular locality when the country price differed from the corresponding metropolitan price by no more than the cost of transporting the grain to the city. Areas where such prices pertained are thus likely to have formed part of London's normal grain-supply region. In contrast, districts lying outside that region are likely to have been characterized (after allowance for transport costs), either by prices generally and significantly above or below the London price, or by the absence of any consistent pattern of prices, such as may have occurred where markets for grain were fragmented and imperfect.⁸³

Ideally, these types of relationship should be investigated through price series covering long runs of years for many places in the London region. Such information is rare for the period around 1300. Sale prices for corn, however, are available for many of the places covered by the accounts database, and the most widespread information is available for wheat, the most commercialized of all the grains. Given the scale of both annual and seasonal price fluctuations,⁸⁴ spatial analysis of this sort should preferably be based on temporally comparable information. Unfortunately, the prices contained in the database lack direct comparability: they concern different years for different demesnes, and usually the season of sale is unknown. Comparison between places thus has to be undertaken on an indirect basis, making due allowance for a high degree of 'noise' within the data.⁸⁵ The method adopted has been, first, to calculate a mean sale price per quarter of grain from each account. Since no allowance can be made for the seasonal pattern of demesne sales, these prices are weighted

⁸⁰ Bowden (1990), 29-36; for a more sophisticated methodology, see Meuvret (1988) ii, 115-17, 140.

⁸¹ But see Farmer (1988), 743-4.

⁸² Meuvret (1988) ii, 127.

⁸³ Brunell (1993), 100.

⁸⁴ On seasonal fluctuations see, Farmer (1991), 739-40; below, 95-8.

⁸⁵ Additional sources of 'noise' derive from the unspecified use of customary rather than statute bushels, bushels that were struck rather than heaped, and the inclusion of 'advantage' in the quantities sold.

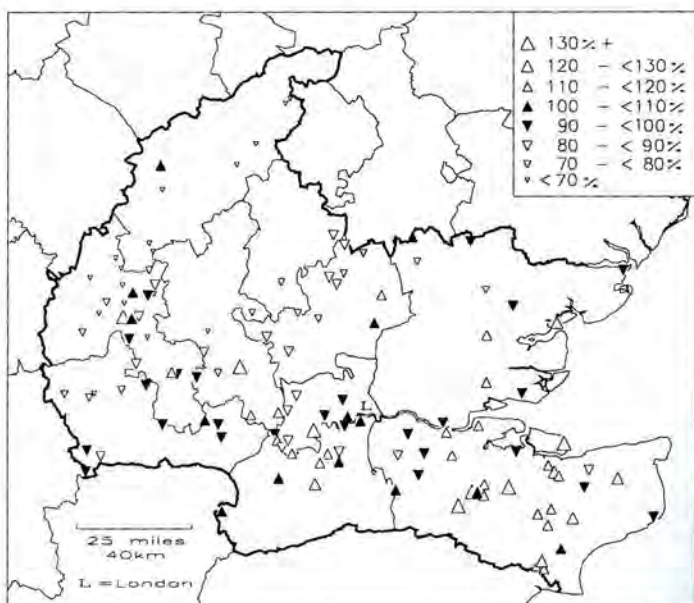


FIG. 8. Prices of wheat sold by demesnes in the London region as a percentage of the London price, 1288-1315

For sources and method, see text (65-6).

means.⁸⁶ Next, these prices are expressed as a percentage of the corresponding London price for that accounting year.⁸⁷ The London price is an October price and therefore relates to the period immediately after the harvest when grain prices tended to be at their lowest; nevertheless, its movement from year to year correlates closely with that of national and regional series of mean annual prices (Fig. 3).⁸⁸ For demesnes with more than one account the mean of the separate annual percentages is then calculated and it is this mean percentage which has been mapped (Fig. 8). Since wheat is the only grain for which a London price series can be established at this period, the exercise is restricted to that grain.⁸⁹

⁸⁶ Prices are weighted by volume of sale, i.e. a sale of 50 quarters has more effect on the manorial mean price than one of 5 quarters. The method has been adopted in preference to an unweighted mean of all the wheat sale prices found in each account, because of the virtual certainty that different accounts record sales in different ways. Thus, accounts which list only one large sale of wheat each year (such as the Winchester Pipe Rolls) may, for the sake of clerical convenience, have combined many smaller sales made at different prices.

⁸⁷ The London October price is used since it is the most consistently recorded. The demesne accounting year most commonly ran from 29 September to 28 September.

⁸⁸ For London prices, see also Appendix IV, Table 18. They did not follow a regular gradient each year, and in some years the October price was the highest recorded.

⁸⁹ Necessarily excluded from consideration are those demesnes for which there are no data on wheat sales for years in which a London price is available. In total 125 demesnes are included in the exercise.

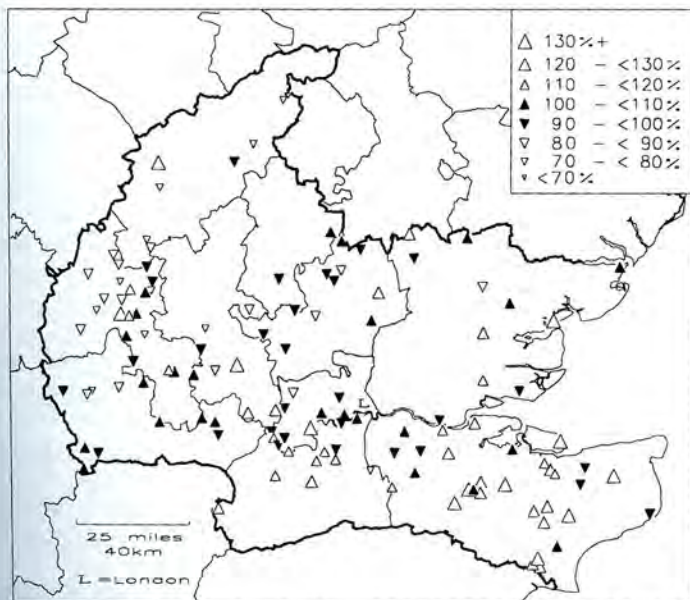


FIG. 9. Prices of wheat sold by demesnes in the London region, plus the cost of transport to London, expressed as a percentage of the London price, 1288-1315

For the sources and method, see text (68).

The distribution of relative local prices for wheat reveals certain clear contrasts within the region (Fig. 8). Forty-eight of the 125 demesnes had mean wheat prices that were above the London price and 77 had prices that were below. Those that were above were heavily concentrated in the south of the region; in Kent and Surrey (where prices were often 30 per cent or more above the London price), just across the Thames into Essex, Middlesex, and south Buckinghamshire, and with outliers in eastern Hertfordshire and the immediate vicinity of the city of Oxford. Elsewhere local prices were below the London price, notably over most of Hertfordshire and adjacent portions of Bedfordshire, and in Northamptonshire, northern and western Oxfordshire, and western Berkshire. Thirty-nine demesnes, however, had prices that lay within 10 per cent of the London price and their general distribution (highlighted on Fig. 8) is both striking and significant. The largest single concentration lay within a 20 mile radius of London (thirteen places, with perhaps a fourteenth at a slightly greater distance in Surrey), a further seven lay on an axis stretching westwards along the line of the Thames valley with a focus on Henley, and four lay within a few miles of Oxford. Of the remainder, four lay on or close to the Kent coast, three on the Essex-Suffolk border, and two in south-west Berkshire, although whether these and any of the four outliers form part of coherent groups is far from clear.

These patterns bear some relation to what is known of the marketing network which supplied London with grain.⁹⁰ Moreover, the generally low price levels in relation to London to be found in some northern and western parts of the region seem to reflect their land-locked character and the cost of transporting grain to the city. That cost can be allowed for by adding the estimated charge for carrying a unit of wheat to London,⁹¹ and then expressing the sum as a percentage of the London price (Fig. 9). For the places known to have had close commercial contacts with London, in north-western and coastal Kent and in the Thames valley, the pattern of similarity to the London price is reinforced but otherwise not changed much by the exercise. There is a significant change, however, in the land-locked area of northern and western Hertfordshire and south Bedfordshire, where a group of local prices moves into the range of similarity to the London price. The same effect occurs at individual manors elsewhere, but not as a general phenomenon.

Even after making allowance for transport costs, therefore, it appears that much of north-west Berkshire, northern and western Oxfordshire, and most of Northamptonshire probably lay beyond London's normal wheat-supply zone. By contrast most of south Oxfordshire and southern and eastern Berkshire probably lay within that zone, linked to the metropolitan market through the entrepôt of Henley. Hertfordshire, and the small part of Bedfordshire for which data are available, seem similarly linked, probably via Ware and the River Lea. Western parts of Hertfordshire may have been drawn into the zone through the market at St Albans. Northern and western parts of Essex, where data are lacking, were probably also drawn in via Ware or other market and embarkation centres further down the Lea, such as Waltham and Barking (Ess). Coastal Essex has some high wheat prices, a feature which may reveal a similarity to northern Kent, but the data are thin. Prices in Surrey seem generally too high for much of the county to have been normally involved in wheat supply, despite proximity to London. This may reflect local scarcity, since wheat was a relatively insignificant crop in the county.⁹²

Prices in large parts of Kent also seem to have been too high for regular wheat supply to London. In this case the explanation cannot be the same as that proposed for Surrey, since Kent was an important producer of wheat, and Faversham was an important local market for London commoners, at least on some occasions. It may be that whereas those parts of Kent nearest to London or on the coast were in strong and regular contact with the city, in some other districts the circuits of exchange were more localized and segmented. Certainly, the high population densities prevailing within the county would have ensured a strong internal demand for bread grains.⁹³ The patterns in Figures 8 and 9

⁹⁰ Above, 46-53.

⁹¹ The transport cost was estimated from a more detailed version of Fig. 7, with contours at $\frac{1}{2}$ mile intervals.

⁹² See below, 124.

⁹³ Smith R M (1988), 198-200.

support that interpretation to some degree, but not entirely. Faversham served one of the most agriculturally productive areas of medieval England, where yield levels, marketable surpluses, and land values were high, and so relatively circumscribed areas had the potential to supply much larger quantities of grain than areas of the same extent elsewhere in the region.⁹⁴ Thus, it would be possible for Kent to play a major role in metropolitan grain supply, while at the same time prices were close to London's in only limited areas of the county.

Despite problems of method and interpretation, of which the possibility of local variations in wheat measures⁹⁵ and the use of the London October price might be the greatest, it seems clear that wheat prices did vary significantly within the ten counties. The impact of the London market was probably the biggest single cause of such variation. Price levels appear to have been in part a reflection of cost-distance from London. A 'break-point' seems to have occurred in the north-west of the area, although its definition is made difficult by the lack of data from Bedfordshire and north Buckinghamshire. It is likely that, in years of shortage, those who sought grain for the metropolis did not canvass much further into that land-locked area, but extended their lines of supply by means of coastal trade. An examination of local price levels and their relationship to the London price outside the region studied here, especially in districts accessible from the coast, should help to clarify these issues.

Distant purchases and the effects of abnormal years

In years of severe shortage grain was brought to England and to London from distant places overseas: from Germany in 1258, the Mediterranean in 1316-17, and Flanders in 1325.⁹⁶ In the two earlier instances royal intervention facilitated the imports, and in the two later ones the need for military supplies may have provided as strong a motive as that of feeding the populace. There is insufficient evidence to say whether during years of less severe shortage London drew significant supplies from closer overseas regions such as the Low Countries and France, although Lynn certainly imported substantial quantities of grain during the high price years of the 1320s.⁹⁷ It is clear, however, that London not infrequently drew grain from outside the region investigated in detail here, and historians have placed some emphasis on East Anglia as a source of London's supply.⁹⁸

During the 1350s there were some large individual shipments of grain to London from Lowestoft, Yarmouth, Brancaster, Lynn, Boston, and even Barton-on-Humber, and a smaller one from Newcastle-upon-Tyne.⁹⁹ Most of the years

⁹⁴ See below, 126-7, 133.

⁹⁵ But in no case is there proof that non-standard measures were used.

⁹⁶ Leard (1880), 673, 690; *Cal Close R 1313-18*, 425, 452; below, 90.

⁹⁷ *Cens* (1915), Appendix B.

⁹⁸ Williams G (1963), 162-4. Evidence that London commonsongers had granaries at Lynn or used the town as 'the centre of their trading empires' (Farmer (1991), 370-1) simply does not exist.

⁹⁹ *Letters*, nos. 16, 21, 59, 86, 133, 163, 168, 205.

in question were ones of high prices.¹⁰⁰ The impression conveyed by a variety of evidence concerning the grain trade at this period, however, is that contacts between London and East Anglia were not regular or strong, except possibly in the case of Yarmouth, although even there the grain trade to London seems to have been characteristic of the later fourteenth century rather than earlier, possibly with a relative increase in the demand for barley as a brewing grain.¹⁰¹ In general terms, this impression conforms with a revised interpretation of the East Anglian coastal grain trade during the second half of the sixteenth century. At that time London again attained, and then exceeded, the size it had been in 1300, but grain-trading contacts between London and Lynn remained exceptional, in contrast to the greater regularity of the trade between Yarmouth and the metropolis.¹⁰²

These impressions can be given more shape by estimating the frequency with which London may have drawn its grain supplies from beyond the counties of its immediate region. This is done by assessing the competitiveness of certain coastal and inland markets and shipping centres in relation to London's main supply centres of Henley and Faversham, taking account of the transport cost of wheat to London, the price of wheat, and the estimated profit which merchants would have made on the transaction. The method is a crude one and employs the formula:

$$\left\{ W \times \frac{(100 - P)}{100} \right\} - (M - T) = S$$

where (W) is the price of a quarter of wheat for the year in question,¹⁰³ (P) is the percentage of the sale price assumed to have been taken as profit by the dealer, (M) is the mean price of wheat per quarter over the years 1280 to 1314 (68.08 pence), (T) is the cost of transporting a quarter of wheat from Henley or Faversham (2.65 pence), and (S) is the sum available for transporting the wheat to London in any given year according to its price and the estimated level of profit. (M - T) is a constant value (65.43 pence) which represents, for the period in question (1280-1314), the mean production cost of a quarter of wheat in areas which normally supplied London (i.e. the districts served by Henley and Faversham) plus whatever profit dealers made on the transaction overall. Thus, if the wheat price was 84 pence per quarter (as it was in 1308-9), and the level

¹⁰⁰ The mean of Lloyd's wheat-price index for those years is 129: Lloyd (1973). The two shipments which took place at times when prices were at a normal level are datable to within the two years 1352-4, for which Lloyd's price index is 107 and 90, respectively. It is noteworthy that the lack of correspondence in *Letters* does not record such shipments, despite a continuing concern to record exports of grain overseas.

¹⁰¹ Saul (1975), 226-7. For the London fishmongers and their interests in both Yarmouth and the grain trade, see below, 85-6. On the corresponding trade in barley and malt in the fifteenth century, see, Brimell (1988), 137-9. At that date the hinterlands of Yarmouth and Brancaster produced a good-quality malting barley than any other locality in England: see national database of manorial accounts (cf. Campbell B M S (1991a), 167).

¹⁰² Williams N J (1988), 150-3, 159-60. See Fig 5.

¹⁰³ Using the prices in Farmer (1988), 790-91.

of profit was 10 per cent, (S) would be 10.17 pence. When (S) is equal to or greater than the transport cost of a quarter of wheat from a given place to London, then that place is competitive as a market supplying wheat to the city with the entrepôts at Henley or Faversham, which are assumed to have supplied London every year.

Thus over the period 1280-1356,¹⁰⁴ if 25 per cent of the final price of wheat was represented by traders' profit, it would have been worthwhile for the commongers to go as far as Yarmouth or Wells on the Norfolk coast, Romney or Winchelsea on the south coast, and up the Thames as far as Abingdon only in one out of every six years. Lynn, Boston, and Barton-on-Humber would have been worth visiting in one out of nine years, and Peterborough, Cambridge, and Newcastle in one out of eleven. On this measure, the year 1295, for which there is good information on the activities of the London commongers,¹⁰⁵ would have been one when it was worth their while going as far as Lynn. With a lower rate of profit, contacts would have been more frequent.¹⁰⁶ These estimates are far from exact, and take no account of local variations in the price of wheat and in transaction costs. Lynn and Boston, for example, traded in such large quantities of grain that they may have attracted London dealers more often than smaller markets which lay closer to London.

Another consideration concerns the nature of grain as a bulk cargo, which would be valued on account of the stability it could provide for sea-going vessels. The profitable cargo on such vessels could have been high-value, light-weight goods rather than grain, which seems rarely to have been the sole commodity carried.¹⁰⁷ This complementarity in the make-up of cargoes would have had the effect of reducing the shipping cost for grain carried in this way, by comparison with the cost of carrying an inherently less-profitable cargo consisting only of grain, on which the estimate used in this exercise has been based. With the proviso that coastal and overseas shipments may have been cheaper, more frequent, and more extensive than they at first appear, the exercise nevertheless provides some explanation of the apparent infrequency of grain-marketing contacts between London and the south coast and parts of East Anglia.

¹⁰⁴ The exercise has been undertaken for the 77 years 1280-1356 covered by Farmer's national wheat price series: Farmer (1988), 790-1.

¹⁰⁵ See above, 51.

¹⁰⁶ Thus at 15 per cent, Reading, Yarmouth, and Romney would have been worth visiting to purchase wheat in one out of four years, and Abingdon, Cambridge, and the ports of the Wash, in one out of five.

¹⁰⁷ That, at least, is the impression conveyed by the available customs accounts for London and East Anglian ports: most shipments of grain were accompanied by other goods, although large quantities were carried by the much smaller number of ships which seem to have carried only grain. The fuller information available for Exeter c.1300 suggests that most grain was carried to that port in the form of specialized cargos, although many ships carried both grain and other goods: Kowaleski (forthcoming b).

Estimated aggregate receipt and disposal of unmalted

Grain	Gross receipt (quarters) ¹	Percentage of gross receipts					
		Gross harvest	Tithe	Net harvest	Received	Bought	Seed
Wheat	20,400	91	9	83	6	3	25
Rye and mixtures	5,300	85	8	78	13	2	23
Barley	11,300	82	8	74	13	5	22
Dredge	5,500	92	10	82	7	1	26
Oats	23,100	86	9	77	7	8	34
All grains:							
A. Total in quarters	65,600						
B. Equivalent in million kcal	36,476						
C. Percentages of B.	100	87	9	79	8	5	27

Sources: accounts database and Table 3.

¹ i.e. gross harvest (which includes tithe), plus grain received and bought, to nearest 100 quarters.

THE ESTIMATED EXTENT OF THE GRAIN PROVISIONING ZONE

London needed an annual supply of between 107,000 and 222,000 quarters of assorted grains to provision itself *c.* 1300.¹⁰⁸ This was equivalent to the net harvest (inclusive of tithes but after deduction for seed) from between 106,400 and 167,400 acres, or between 524 and 825 demesnes with a mean sown acreage of 224 acres (the mean for the ten counties). In reality, however, London would have drawn upon a much larger area, since a substantial proportion of what was produced was consumed outside the metropolis.

How large was the disposable crop? What proportion of it was actually marketed? And what share of it was eventually destined for consumption in London? Partial answers to these questions are obtainable for the demesne sector alone, using quantifiable information from manorial accounts. Demesnes received grain by production on the demesne, by transfer from other producers on either the manor or the estate, and by purchase. Summary statistics for the region as a whole (Table 7) show that the first of these was by far the most important, accounting for 87 per cent of the total gross receipt of grain kilocalories.

In aggregate, 27 per cent of the gross receipt of all grains measured in kilocalorie equivalent was expended as seed; the remaining 73 per cent is defined as the net receipt (Table 7). Grain was also used in servicing the essential fodder requirements of demesne husbandry. This proportion is harder to specify from the information contained in the accounts database and

¹⁰⁸ See above, 35.

grain from 204 demesnes in the London region, 1288-1315

Net receipt (i.e. gross receipt less seed, in quarters) ¹	Percentage of net receipt				Grain
	Retained and/or malted	Tithe	Transferred	Sold	
15,300	28	12	20	40	Wheat
4,100	54	10	6	30	Rye and mixtures
8,800	55	10	12	23	Barley
4,100	41	14	12	34	Dredge
15,200	59	14	10	17	Oats
47,900					All grains: A. Total in quarters B. Equivalent in million kcal C. Percentages of B.
26,570					
100	45	12	14	29	

included within the 45 per cent of total net receipt which was retained and/or malted on the manor. On the Peterborough estate Biddick has estimated that a quarter to a third of the oats harvested (net of seed and tithe) was consumed as fodder.¹⁰⁹ If an equivalent proportion of all grains (in kilocalories) was likewise consumed as fodder on demesnes in the London region, at least half the grain retained or malted on the manor (just under a quarter of the net grain receipt) would have been consumed by animals. But the grains other than oats were fed to animals in smaller proportions, and so probably nearer a quarter of the grain retained or malted on the manor (or an eighth, i.e. 12.5 per cent, of the net grain receipt) was used to feed and fatten livestock.¹¹⁰ Together, seed and fodder therefore consumed approximately 36 per cent of gross grain receipts and 41.5 per cent of the gross harvest.

After husbandry's requirements of seed and fodder had been satisfied, approximately 87.5 per cent of the net receipt was available for disposal, a proportion defined hereafter as the 'disposable grain'. Some of the disposable grain was consumed directly on the manor or estate, both by the lord and the household and by the agricultural workforce. Additional quantities were retained for malting, after which the malt was consumed on the manor, transferred

¹⁰⁹ Biddick (1989), 76, 120.

¹¹⁰ On the five Norfolk manors of Martham, Hemsby, Sedgeford, Tivetshall, and Thorpe Abbots the proportions of seed and fodder comprised respectively 5.0 per cent, 5.3 per cent, 11.1 per cent, 26.7 per cent, and 29.2 per cent of total grain receipts, inclusive of tithe but net of seed. The proportions are smallest at Martham and Hemsby where yields were highest, and greatest at Tivetshall and Thorpe Abbots, where yields were lowest. The mean for all five manors is 15.5 per cent. NRO: DCN 60/23, 62/1-2, 60/15, 60/33; L. Range 1B 1-4/4; WAL 288x1, 288x2, 274x3, 274x6.

elsewhere, or sold. Overall, the grain retained on the manor for use other than as fodder comprised 32.5 per cent of the net receipt. A further 14 per cent of the net receipt was transferred elsewhere, on or off the estate. Many of these transfers arose from the provisioning requirements of seigneurial households; others were made to offset natural shortages of grain or to take advantage of the purported benefits of using seed obtained from elsewhere;¹¹¹ and some were intended to move surpluses to a place more strategically situated for making sales.¹¹²

Twelve per cent of the net receipt was lost to the producer as tithe.¹¹³ The tithe grain, however, was an important source of commercial supply. Since it was deducted from demesne and peasant crops alike it amounted to a substantial quantity of grain, sometimes exceeding in volume the amount sold directly by the demesnes. Except where tithes had been appropriated to religious houses, rectors had only modest households to support and hence were in a position to sell most of their grain. Thus rectors are to be found selling large quantities of wheat to London commongers, both in local markets and in London itself.¹¹⁴

The remaining grain, amounting to 29 per cent of the net receipt, was sold directly off the demesne by manorial officers. The proportion which eventually entered commercial exchange, however, was greater than this. A small allowance should be added for the unmeasurable quantity of grain sold after malting (within the category 'retained and/or malted' in Table 7),¹¹⁵ and larger allowances for grain deducted as tithe and subsequently sold, and for grain sold after transfer to a different manor or location. The proportion of the net receipt which ultimately was sold may therefore have been 40 per cent or more. This is a very high figure, given the extent to which lords met the grain requirements of their households and workers directly from their estates, and represents 46 per cent of the 'disposable grain' (i.e. the net receipt less fodder). Moreover, this proportion is derived from a sample of demesnes in which manors belonging to conventual institutions, which tended to consume more and sell less of their grain than many other types of producer, are disproportionately represented.¹¹⁶

¹¹¹ Oschinsky (1971), 325.

¹¹² Gras (1915), 20-1; Farmer (1991), 367.

¹¹³ Tithe grain was normally deducted in the field at the rate of every tenth sheaf: Lennard (1930), 174ff. Demesnes which were in receipt of tithe might still have tithe deducted from their own harvest of crops and animals.

¹¹⁴ In 1295 the rector of Chalgrave (O) sold 30 quarters of wheat at Henley and the rector of Burnham 20 quarters at New Hithe near Maidstone (K). In 1323 the rector of Ivinghoe (i.e. the bishop of Winchester, who was in Avignon at the time) sold 90 quarters of wheat and over 20 quarters of barley in London (below, 89). In comparison, the mean annual quantity of wheat sold from the bishop of Winchester's demesne at Ivinghoe (Bk) for the three years covered by the accounts database was 30 quarters. The fact that the bishop had an established base in London probably encouraged these sales: he managed the rectory to sell grain in the city. For a very large sale from the rectory of Wingham see below, 99. For the significance of tithe grain in Exeter's supply, see Kowaleski (forthcoming).

¹¹⁵ See below, 146-7.

¹¹⁶ See below, 149-53.

Across the demesne sector as a whole perhaps as much as a half of the 'disposable grain' was eventually sold.

TABLE 8

Estimates of the extent of London's grain provisioning zone, c.1300

Percentage of 'disposable grain' sent to London ¹	Area necessary to supply 68,000-107,000 million kcal of grain			
	Area sown with grain (000s acres)	Arable area (000s acres)	Total land area (Sq. miles)	Radius from London (miles)
5	2,432-3,826	4,021-8,417	11,247-23,542	59.8-86.5
10	1,216-1,913	1,994-4,209	5,578-11,770	42.1-61.2
15	811-1,275	1,330-2,805	3,720- 7,845	34.4-50.0
20	608- 957	997-2,105	2,789- 5,889	29.8-43.3
25	486- 765	797-1,683	2,230- 4,708	26.6-38.7
30	405- 638	664-1,404	1,858- 3,925	24.3-35.3
35	347- 547	569-1,203	1,592- 3,366	22.5-32.7
40	304- 478	499-1,052	1,394 2,941	21.2-30.6
45	270- 425	443- 935	1,239- 2,616	19.9-28.8
50	243- 383	399- 843	1,114- 2,356	18.8-27.4
55	221- 348	362- 766	1,014- 2,141	18.0-26.1
60	203- 319	333- 702	931- 1,963	17.2-25.0
65	187- 294	307- 647	858- 1,809	16.5-24.0
70	174- 273	285- 601	798- 1,680	15.9-23.1
75	162- 255	266- 561	744- 1,569	15.4-22.3
80	152- 239	249- 526	697- 1,470	14.9-21.6
85	143- 225	235- 495	656- 1,384	14.4-21.0
90	135- 213	221- 469	619- 1,311	14.0-20.4
95	128- 201	210- 442	588- 1,238	13.7-19.8
100	122- 191	200- 420	559- 1,175	13.3-19.3

Source: see text.

¹ Assuming that 87.5 per cent of the net grain receipt was 'disposable' after on-the-farm deductions for fodder, i.e. 559,293 kcal per grain acre. For these terms, see Table 7 and text.

If 87.5 per cent of the net grain receipt was potentially 'disposable', and London, with a population of 100,000 persons, required between 68,000 million and 107,000 million kilocalories in grain to feed it over a year,¹¹⁷ the scale of London's grain-provisioning zone may be estimated according to the proportion of the 'disposable grain' which the city may actually have received (Table 8). If all the producers in these ten counties followed the practice of the demesnes, then around half of this 'disposable grain' was eventually sold. If, furthermore, half of the quantity sold eventually reached and was consumed in London as food, drink, and fodder, then the city would have received 25 per cent of the

¹¹⁷ For these estimates, see above, 35.

'disposable grain', and would have had to draw upon an area with a radius of between 26 and 39 miles to secure its supply. In reality, however, the proportion of demesne grain reaching the metropolis is likely to have been smaller. Moreover, the small-scale, non-demesne producers who contributed about two-thirds of total grain production probably marketed a significantly smaller share of their crop. London, therefore, is unlikely to have received more than 15-20 per cent of the 'disposable grain' from within the area which produced its grain, which would have extended the provisioning radius to between 30 and 50 miles.¹¹⁸

ESTIMATES AND REALITY

The clearest direct evidence of the area from which London obtained its grain is provided by the pattern of regional contacts of London commoners. The picture this presents is reinforced by the pattern of local wheat prices adjusted for transport costs. Both identify a land area, roughly 4,000 square miles in extent, which was a regular source of grain for the city. This area was irregular in shape, reflecting the availability of water transport, and at its furthest extent included several ports on the south and east coasts which were 100 miles or more distant from the city by the cheapest available route. Nevertheless, about 80 per cent of places with which commoners had connections lay within 60 miles of London as the crow flies, and two-thirds of them lay within 45 miles. Henley and Faversham, probably the two local grain markets which were most significant for London, lay 35 miles west and 46 miles east of the city, respectively, as the crow flies, although by the cheapest route the distances were much longer. Other local markets through which London is known to have been supplied with grain, principally High Wycombe (Bk), Ware and St Albans (both Hrt), and perhaps Maidstone and Rochester (both K) were even closer. Markets which regularly supplied grain to London overland were, like St Albans, probably not much more than 20 miles from the city.

According to Table 8, if London did indeed have a population of 100,000 and was to satisfy its total grain requirement from an area of 4,000 square miles, it would need to have received between 15 and 25 per cent of the 'disposable grain' produced in that area. That is a very large proportion, although perhaps not impossible. A more realistic initial approach to the problem may be to assume that the ten counties of the London region comprised a more-or-less self-contained system of grain production and consumption. The population of London was about 7 per cent of the total for the region, and it is unlikely that Londoners consumed per caput more than twice as much grain as the other inhabitants. Thus, the city may have taken grain amounting to between 10 and

¹¹⁸ According to Grantham (forthcoming), with 21 per cent of the land area devoted to bread grains and a mean gross wheat yield of 9.2-11.5 bushels per acre, a city of 100,000 inhabitants would have required a provisioning radius of 36.4-44.3 km. (22.6-27.5 miles).

15 per cent of that potentially available for human consumption and produced within the region. That would have required a provisioning radius of between 34 and 61 miles and a production hinterland of between 3,700 and 11,800 square miles (see Table 8), an area which may be compared with the 8,481 square miles covered by the ten counties.

Much of the ten-county region, however, was not readily accessible from London, and so a more appropriate comparison would be with land areas defined according to the transport-cost isopleths shown in Fig. 7. For instance, Cuxham (O) was one of the more distant demesnes (41 miles as the crow flies) which are known regularly to have supplied the London market with grain, in this case via Henley. It lay on the 6.3 pence isopleth, which contains a land area of 3,200 square miles within the region, plus a further 1,000 or so square miles beyond, if relevant parts of Sussex and East Anglia are added. London's population (100,000 persons) may have amounted to about 14 per cent of the population of the entire area defined by the 6.3 pence isopleth, and thus would have required at least 15 per cent and probably in excess of 20 per cent of the 'disposable grain' produced in that region. At such a rate of consumption, according to Table 8, London would have required a production hinterland of between 3,720 and 5,889 square miles, an area barely contained within the 6.3 pence isopleth.

In broad terms, this seems in agreement with the picture obtained from the empirical evidence, that London's normal grain-supply area extended some distance beyond that defined by the 6.3 pence isopleth, especially to the north of London, and probably included some coastal districts outside the ten counties of the region. At that range perhaps 10 to 15 per cent of all 'disposable grain' was ultimately destined for consumption in London. This seems to have been well within the productive capacity of the region defined in this way, which appears to have experienced little difficulty in sustaining a city roughly of London's estimated size. This conclusion cannot be tested further until more systematic information is available for the counties outside the London region. Nevertheless, it differs from that implied by the estimates of maximum sustainable populations put forward at the end of Chapter IV, which suggest that English agriculture was unlikely to have sustained a population of more than 4.75 million, and hence an urban system in which the metropolis had as many as 100,000 inhabitants. Reconciling these two views, and refining the estimates of the productivity and output of the different agrarian sectors, provides a challenge for the future.

VI

LINKS BETWEEN PRODUCERS AND CONSUMERS

MODES OF TRANSFER

Grain could be transferred to consumers in London in a variety of ways. Producers close to the city might themselves carry it to market in the city, or use an agent or servant to do so. London commoners operating on a small scale might buy from such producers at the farm gate. More distant producers might sell their grain in local markets such as Henley or Ware, to local commoners or to Londoners who had gone there to purchase grain. The local commoners might themselves carry the grain they had bought to London, or sell it in their own market-place to visiting London merchants. In either case granaries would be needed in the town for the system to operate effectively. Both London and local commoners might also seek out grain in the hinterlands of the local markets and there make farm-gate purchases, especially when supplies were short and there was an opportunity for exceptional profit.

Wealthy lords with a base in London might transfer grain directly from their demesnes to the city, thus bypassing local market networks, although over the thirteenth century that practice became less common as the networks became more efficient. This was probably not a common practice among lay lords,¹ and the accounts database contains only one example of a substantial non-market transfer of wheat, the most marketable grain, from a lay manor: in 1304-5, the de Clare manor of Standon (Hrt), sent 109 quarters of wheat to the keeper of the lord's wardrobe. It is possible that the wardrobe in question was in London and that this is an example either of the direct provisioning of a metropolitan household or of a direct transfer of grain for sale in the London markets.² By contrast, some of the major ecclesiastical institutions in the city were provisioned by direct transfer. The monks of Westminster made large transfers, but in this period the abbey did not rely only on its own produce. The abbot drew heavily on the market for supplies, and while the monks obtained 81 per cent of their wheat from their estates, they purchased 79 per cent of their other grain needs, presumably in the markets of London or Westminster.³ Usher and Gras both considered direct seigniorial transfers an important means by which

¹ Below, 148-53.

² PRO, SC6/868/17. In 1306-7 the large de Clare property at the heart of the city, near Woolchurch Market, was described as the 'wardrobe of the earl of Gloucester': CLRO, HR 35(50).

³ See below, 149-50 and Appendix V.

London and Paris received their provisions in this period.⁴ The London evidence, however, shows that while direct transfers might involve substantial quantities of grain, even the best-endowed of the ecclesiastical households could obtain a significant proportion of their grain from the London market. Moreover, there is no indication that those institutions sold large quantities of grain in London. In the 1280s the canons of St Paul's, who received by transfer all the grain that they needed in London, put on the London market just over 130 quarters of wheat a year (15 to 18 per cent of their annual receipt in the city, and sufficient to feed 227 people for a year), but no other grain. Even if those institutions were entirely self-sufficient, the proportion of London's population that they fed, including ecclesiastics, servants, and almspeople, was small, probably a good deal less than 10 per cent.⁵ Some other servants, such as those of cornmongers and bakers, may have received wages in kind, and some of the wealthier mercantile families may have supplied themselves from their country estates, but there can be little doubt that the great majority of Londoners relied on the market for their supplies of grain and its products.

The greatest purchasers of grain in London were probably the city's bakers and brewers, so that most grain had already been processed when it finally passed into the hands of those who actually consumed it. While the large-scale professional brewers of London were distinctive, there was in addition a large number of small-scale or domestic brewers.⁶ Bakers were less numerous and probably, on average, operated larger businesses, with substantial bakehouses, and with shops and other fixed retail outlets from which they sold their bread.⁷ The requirements of these groups were the main force in determining the structure of the trade in grain within London. It was an established practice in fourteenth-century London for countrymen (and probably women too) to bring flour to the city, and one forestaller of the cornmarket was known as Robert *flourman*, evidently a precursor, if not the exact equivalent, of the mealman of three centuries later.⁸ The trade in flour, however, was probably not on a large scale, and certainly did not dominate the metropolitan market in the way that the trade in grain did.⁹ Some London houses contained mills and millstones, but

⁴ See above, 2.

⁵ Contemporary evidence and back-projection from the clerical poll tax of 1379 (McHardy (1977)) suggest that the religious population of ecclesiastical institutions in London and its immediate environs in 1300 which might have lived off the produce of their estates totalled about 650, which with servants and others might represent a total of 6,500 persons fed from that source.

⁶ *Chronicles*, 267; for the organization of urban brewing at this time and for the distinctive character of the London brewhouses, see Keene (1985b), 265-9, and Keene and Harding (1987), nos 95/2-5, 105/26, 104/13, 105/26, 145/39.

⁷ See CLRO, Cust 4, fos. 28v, 39. For urban bakehouses, see Keene (1985b), 254-5.

⁸ *Letter-Book G*, 167; *Cal PMR 1323-64*, 165; Fisher (1935).

⁹ In the Paris market, grain did not cede its dominance to flour until well into the eighteenth century, a development that was probably associated with an improvement in milling technique which more effectively removed the element of fat in whole grain and so made a flour which was less likely to go rancid: Kaplan (1984), 339-45; Davidson, Passmore, Brock, and Truswell (1979), 170.

most of those were probably hand-mills used for grinding malt rather than flour for bread.¹⁰ The greater part of London's grain was ground at tidal and other water-mills in the suburbs, just beyond the city limits, and above all at an important group of mills near Stratford on the River Lea three miles to the east of the city.¹¹ The city's bakers played an important part in organizing the milling industry.

Large quantities of grain reached London in other processed forms. By 1300 demesnes in the London region sometimes sold part of their grain as malt, and at least as early as the 1340s specialized dealers supplied malt to the city's markets just as the maltmen did in the sixteenth and seventeenth centuries.¹² This malt was probably sold to housewives who brewed on a small scale, for the professional brewers (both men and women) in the city and in the great ecclesiastical and magnate households had their own malting kilns.¹³ Much grain also arrived as bread. In seventeenth-century Paris half the cereal supply took the form of bread baked by bakers who worked in villages and small towns within about 15 miles of the city, using grain they had purchased in markets which were at a greater distance.¹⁴ The state of affairs in London c.1300 was very similar. Bread was brought in cart-loads to the city's markets from Bromley (by Stratford, Ess) and from Stepney (Mx). That relatively large-scale baking industry to the east of the city was associated with the mills on the River Lea, but the wives of bakers in several other villages close to London also supplied the metropolis. These bakers may have purchased their grain in local markets at a greater distance from London, or possibly in the city itself. In addition, there seems to have been a regular trade in bread from St Albans (Hrt) to London, and perhaps also from High Wycombe (Bk).¹⁵ Both towns lay in important wheat-producing districts.¹⁶ At these more distant places, it was presumably advantageous to transform the heavy raw materials (wheat and firewood) on the spot into a high-quality product which would bear the cost of transport to London. High Wycombe was renowned for its production of *simnel*, a twice-baked bread of very high quality which presumably would keep in good condition for an extended period.¹⁷

¹⁰ Keene and Harding (1987), nos. 95/3, 105/14.

¹¹ *Letter-Book A*, 2; McDonnell (1978), 73-83; Lobel (1989), map of c.1270. There were also ~~also~~ mills on the Southwark bank of the Thames: Carlin (1983); below, 89 n. 51.

¹² See above, 30, 54, below, 164, and Fisher (1935).

¹³ For malting by city brewers, see *Letter-Book E*, 77, and Keene and Harding (1987), no. 95/3.

¹⁴ Boislisle (1881), 657. Usher (1913) misrepresents this document in his statement (pp. 119-20) that half the city's supply in 1637 arrived in the form of flour.

¹⁵ *Liber Albus* i, 232-3; Thrupp (1933), 56; see also the references cited by McDonnell (1978), 77-8 for High Wycombe, see Ashford (1960), 38-40, and Rothwell (1977), 881.

¹⁶ See Fig. 16 and below, 124-5.

¹⁷ Cf. below, 112.

THE LONDON CORNMONGERS

The characteristics of those who were active in the London grain trade reveal several key features of the system by which London was supplied.

Their number and group identity

The number of commongers active in London around 1300 testifies both to the scale of London's demand for cereals and to a degree of specialization by traders in the grain market which was unmatched in any other English city. It was common in medieval towns for merchants, dealers, and craftspeople, especially those engaged in the supply and processing of foodstuffs, to pursue more than one trade or specialism.¹⁸ Many of the 146 London commongers in the database are known also to have engaged in other business. Even so, 54 of them appear to have practised the trade as their sole or primary occupation.¹⁹ Several sources reveal the commongers as among the most numerous of the occupational groups which can be identified in early fourteenth-century London. Thus in the lists of tradesmen accused of selling too dear in 1300, the 39 commongers were the next largest group after the 58 cordwainers and the 58 fishmongers.²⁰ The 50 commongers in the comprehensive city tax roll of 1319 were comparable in number to the goldsmiths, mercers, and skinnners, who each represented 5 per cent of the 1,086 taxpayers whose occupations can be identified. Significantly, the only larger occupational group was made up of the fishmongers, who represented 8 per cent of the total, or 10 per cent if stockfishmongers are included. Butchers, vintners or taverners, and tanners or curriers each represented 4 per cent.²¹ By 1328, to judge from the number elected to govern their craft, the commongers may have been relatively less numerous or influential than formerly.²²

London was unique among English towns in having an organized commongers' guild in the early fourteenth century, and about 1310 the commongers were one of those groups of craftsmen which sought a formal role in city government and recognition of its status as a means of access to

¹⁸ Keene (1985b), 326-7; Swanson (1989), 9-25.

¹⁹ i.e. their only known commercial activity is the grain trade: in some cases that is indicated by the occupational title 'commonger', but not all of them were so described. The total does not include all those described as *bladarius* in the city's *Liber de Assisa Panis* when they swore to the price of corn: some of the jurors were primarily engaged in other occupations.

²⁰ Cal EMC, 59-65.

²¹ Figures calculated from totals provided in Ekwall (1951), 81-7. Ekwall was a little generous in his identification of trades. According to the narrower criteria adopted in compiling the database of commongers, 33 of those listed in the 1319 return were primarily commongers, while a further 12 individuals practised the trade in addition to another occupation.

²² *Letter Book E*, 232-4 (the 'bladers' are wrongly described as 'beaders' in the text). The numbers sworn for the mercers, woolmongers, and cheesemongers each equalled the number for the commongers, and those for the saddlers, vintners, skinnners, and tailors and linen-armourers exceeded

citizenship.²³ The commonsongers maintained a distinctive identity as a guild throughout the fourteenth century, but after 1350 Londoners who styled themselves 'citizen and commonsonger' were many fewer than previously and probably represented a diminishing proportion of the citizen community. There are signs, too, that towards the end of the century the role and purpose of the craft became less clear. Trade in grain continued, presumably in the hands of less specialized dealers, but soon after 1400 the guild of commonsongers faded away.²⁴ These developments reflect the contraction of the market which accompanied the general depopulation of the fourteenth century. They throw into sharp relief the high degree of specialization in the grain trade which had emerged in London around the year 1300, when the city's population was at a peak and depended heavily upon grain for its survival, making the corn trade an especially profitable one. By 1400, with changes in patterns of consumption and in standards of living, other victualling trades had become relatively more prosperous: the guilds of bakers, brewers, butchers, and fishmongers continued to flourish.

Wealth and status of the commonsongers

It is impossible to classify the trades of London c.1300 in any straightforward manner according to their wealth. Nevertheless, the uppermost rank was occupied by merchants who dealt primarily in imported luxury goods, such as spices and fine textiles, and in wool and woollen cloth; the wealthiest fishmongers were among those who occupied the next rank down, and in the third rank were to be found the wealthiest commonsongers.²⁵ In 1319, so far as can be judged, the mean tax assessment for those Londoners whose main business was as a commonsonger was close to the mean for the taxpayers as a whole, and the mean for all those who are known to have traded in grain was substantially above that figure (Table 9). Since the taxpayers probably represented no more than 10 to 20 per cent of the heads of household in London, the commonsongers can be identified as one of the wealthier groups of inhabitants. The 1319 tax roll was drawn up shortly after a period of severe famine and grain shortage, and a comparison of the assessments of that year with those of 1292 shows that the disaster had brought great profit to the commonsongers, increasing their wealth in relation to other groups (Table 9). The commonsongers of Queenhithe ward, where the city's largest grain market was situated, did especially well. The Billingsgate and Newgate commonsongers were probably less well off in 1319, but in normal times, as represented by 1292, the Billingsgate commonsongers seem to have been wealthier than their more numerous counterparts at Queenhithe. The

²³ *Cal PMR* 1364-81, 1-11.

²⁴ See *Cal Wills* ii, *passim*; the failure of the commonsongers' guild to survive, in contrast to other victualling guilds, is most clearly demonstrated in the index entries in *Testamentary Records in the Archdeaconry Court* i, 434-8 and *Testamentary Records in the Commissary Court* i, 210. For the uncertain standing of the guild in the later fourteenth century, see *Letter-Book H*, 206, 443.

²⁵ Ekwall (1951), 105-11.

TABLE 9

The relative wealth of the London cornmongers in 1292 and 1319

Locality	Assessments (values in shillings)						Value of goods (shillings) ⁴		
	1292			1319 ³			1292 mean	1319 mean	1319 as a percentage of 1292
	Number	Mean value	% of mean	Number	Mean value	% of mean			
Twelve wards¹:									
all taxpayers	738	21.0	100	823	15.0	100	105.0	180.0	171
those primarily cornmongers	18	13.1	62	34	11.7	78	65.5	140.4	214
other traders in corn	8	19.5	93	12	19.2	128	97.5	230.4	236
all traders in corn	26	14.4	69	46	14.0	93	72.0	168.0	233
Queenhithe ward:									
all taxpayers	68	11.1	53	76	11.0	73	55.5	132.0	238
those primarily cornmongers	6	6.5	31	8	21.2	141	32.5	254.4	783
other traders in corn	1	13.3	63	2	40.0	267	66.5	480.0	722
all traders in corn	7	7.5	36	10	25.0	167	37.5	300.0	800
Billingsgate ward:									
all taxpayers	65	12.9	61	57	16.1	107	69.5	193.2	278
those primarily cornmongers	1	40.0	190	6	8.0	53	200.0	96.0	48
other traders in corn	3	16.7	80	-	-	-	83.5	-	-
all traders in corn	4	22.5	107	6	8.0	53	112.5	96.0	85
Within Newgate²:									
all taxpayers	-	-	-	326	7.6	51	-	91.2	-
those primarily cornmongers	-	-	-	8	7.3	49	-	87.6	-
other traders in corn	-	-	-	1	25.0	167	-	300.0	-
all traders in corn	-	-	-	9	9.3	62	-	111.6	-

Source: Ekwall (1951).

¹ The twelve wards for which there are tax assessments in both years: Ekwall (1951).² Comprising the wards of Farringdon Within, Cripplegate Within, and Aldersgate. For 1292, only the returns for Cripplegate Within survive.³ In 1319 there are returns for all the wards except Vintry, and the overall mean assessment was 10.5 shillings.⁴ Assuming that the rate of assessment in 1292 was a fifth; in 1319 it was a twelfth: Ekwall (1951), 102-3.

Billingsgate men may normally have had a more diversified trade in fish and other goods, but the grain specialists at Queenhithe may have been better placed to corner the market in 1315-17.²⁶

Civic office-holding by the commongers in the database confirms this picture of their standing: they could rise to positions of power and influence, but as a group were not in the first rank. Over the period 1285-1337, fourteen of them attained the office of sheriff, of whom nine were primarily commongers. Over the period 1292-1338, ten achieved the rank of alderman, of whom six were primarily commongers; while only two were elected as mayor, of whom neither was primarily a commonger. Minor city offices held by the commongers reflect the interests of their trade: they collected or farmed murage and tolls, supervised the corn markets, had charge of city gates (especially Newgate), kept the ports of Queenhithe and Billingsgate, and acted as auditors and wardens of London Bridge. Two of them represented the city in parliament, and it is probably significant that one of them did so in 1316 during the famine, and the other in 1320 during the mayoralty of the politically adventurous fishmonger and occasional commonger, Hamo de Chigwell.

Other commercial interest of the commongers

The other commercial interests of the commongers reveal some important aspects of the organization of the trade. There was a significant connection between the commongers and the baking trade: ten of them were at one time or another also described as bakers, and a further four are known to have owned bakehouses in the city. Bakers often had interests in milling,²⁷ and it would have been an obvious business strategy for a baker to move into the grain trade or for a commonger to make the opposite move. Walter Neel, one of the most prominent specialist commongers in London at this period, appears to have begun as a baker. Roger le Palmer, who like Neel achieved aldermanic rank, began as a commonger, a trade in which he was active by 1295, and in 1302 acquired bakehouses in St Mary Aldermay parish close to Bread Street, where he later lived. His principal business, however, remained the trade in grain, and he was active in the market at Queenhithe, owning a wharf nearby in partnership with another commonger.²⁸ Bread Street ward itself contained a notable concentration of commongers (Table 5), and the name testifies to a long-standing association between the baking trade and what was probably the earliest and most important of the city's grain markets at Queenhithe (Fig. 4).

Brewing was another important business interest of the commongers. Many private households brewed, but eleven of the commongers (of whom three were also bakers) are known to have owned specialist brewhouses, and a further three

²⁶ Too few commongers can be identified in the subsidy list of 1332 for a comparison to be drawn with a later period.

²⁷ Keene (1985b), 62-3, 254; *Letter-Book A*, 2.

²⁸ *Letter-Book B*, 114; *Cal EMC*, 79, 103; Harding (1983), 373.

were also described as brewers. Commonger-brewers of this type, or their wives who might often have run the brewing side of the family business on their own account, evidently brewed and sold ale on a substantial scale. In 1302 five of the commongers in the database, one of whom is known to have owned a brewhouse, supplied ale to the king's household. Bakers and brewers both used large quantities of firewood, and that would have given them a common interest, along with the commongers, in shipping on the River Thames.

Their interests in baking and brewing show how some commongers managed to control several stages in the processing and distribution of grain within the city. The close connection in London between the trade in grain and that in fish reveals some features of the distributive network outside the city. Ten fishmongers and five stockfishmongers were also described as commongers, or occur as dealers in grain. Their primary business seems to have been in fish, although some are known also to have traded in wool, hides, wine, and other commodities. Like many merchants with a range of interests, they would deal in grain when prices and other conditions made it profitable to do so. The sheer number of fishmongers who entered the grain trade, however, shows that it was particularly advantageous for them. The reasons for this are clear. Fishmongers owned ships²⁹ and regularly traded at the great herring port of Yarmouth, and at Boston and Lynn, where imported stockfish were to be found. All three ports had hinterlands which were important grain growing areas. When the time was right, and London needed to draw heavily for grain on areas outside its normal supply zone,³⁰ fishmongers could build on their existing trading contacts and use their ships to carry grain to London from the places where normally they would buy fish.

The leading fishmonger, Hamo de Chigwell, has been claimed as a characteristic and even dominant figure in the London grain market of the earlier fourteenth century, and it has been further suggested that vintners, who sent wine to consumers up the Thames, may have been responsible with the fishmongers for the development of the extensive system of grain shipment to London down the river and along the East Anglian coast.³¹ That picture does not tally with the evidence, and derives essentially from misreadings of the sources and cavalier identifications of the family relationships and trading specialisms of individuals.³² Wine merchants of any sort, let alone specialist ones, seem rarely to have intervened in the grain trade, and then only in connection with Gascony.³³ Fishmongers were certainly active in the grain market from time to time, and sometimes on a large scale; but the frequency of their involvement in the long-distance trade beyond the confines of the Thames estuary, and their

²⁹ Three of the five commongers in the database who are known to have owned ships were fishmongers.

³⁰ See above, 69-71.

³¹ Farmer (1991), 370, 373.

³² In Williams G (1963), 162-3, 279; this is a feature of the entire book.

³³ James (1971), 165, 167-8.

were also described as brewers. Cornmonger-brewers of this type, or their wives who might often have run the brewing side of the family business on their own account, evidently brewed and sold ale on a substantial scale. In 1302 five of the commoners in the database, one of whom is known to have owned a brewhouse, supplied ale to the king's household. Bakers and brewers both used large quantities of firewood, and that would have given them a common interest, along with the commoners, in shipping on the River Thames.

Their interests in baking and brewing show how some cornmongers managed to control several stages in the processing and distribution of grain within the city. The close connection in London between the trade in grain and that in fish reveals some features of the distributive network outside the city. Ten fishmongers and five stockfishmongers were also described as commoners, or occur as dealers in grain. Their primary business seems to have been in fish, although some are known also to have traded in wool, hides, wine, and other commodities. Like many merchants with a range of interests, they would deal in grain when prices and other conditions made it profitable to do so. The sheer number of fishmongers who entered the grain trade, however, shows that it was particularly advantageous for them. The reasons for this are clear. Fishmongers owned ships²⁹ and regularly traded at the great herring port of Yarmouth, and at Boston and Lynn, where imported stockfish were to be found. All three ports had hinterlands which were important grain growing areas. When the time was right, and London needed to draw heavily for grain on areas outside its normal supply zone,³⁰ fishmongers could build on their existing trading contacts and use their ships to carry grain to London from the places where normally they would buy fish.

The leading fishmonger, Hamo de Chigwell, has been claimed as a characteristic and even dominant figure in the London grain market of the earlier fourteenth century, and it has been further suggested that vintners, who sent wine to consumers up the Thames, may have been responsible with the fishmongers for the development of the extensive system of grain shipment to London down the river and along the East Anglian coast.³¹ That picture does not tally with the evidence, and derives essentially from misreadings of the sources and cavalier identifications of the family relationships and trading specialisms of individuals.³² Wine merchants of any sort, let alone specialist ones, seem rarely to have intervened in the grain trade, and then only in connection with Gascony.³³ Fishmongers were certainly active in the grain market from time to time, and sometimes on a large scale; but the frequency of their involvement in the long-distance trade beyond the confines of the Thames estuary, and their

²⁹ Three of the five commoners in the database who are known to have owned ships were fishmongers.

³⁰ See above, 69-71.

³¹ Farmer (1991), 370, 373.

³² In Williams G (1963), 162-3, 279; this is a feature of the entire book.

³³ James (1971), 165, 167-8.

engagement in the grain trade upstream of London are far from clear. Hamo de Chigwell, for example, is recorded primarily as a fishmonger, shipowner, and wine merchant. He lived near Queenhithe, but so too did many other fishmongers who traded at the important fishmarket in Old Fish Street. His servant Martin is recorded as purchasing herring on his behalf at Great Yarmouth.³⁴ The one occasion when he is known to have dealt in grain was in 1323, when with two others he supplied it to the sheriff of London, who was to ship it on to Scotland for the king's use. De Chigwell's role on that occasion was as mayor of London and as a merchant substantial enough to be entrusted with royal funds for purchasing grain, rather than as a commonger.³⁵ He had taken his surname from his master, the leading fishmonger Richard de Chigwell. Richard's son Robert appears to have been a commonger. In 1295 a Henry de Chigwell sold wheat in London, in 1328 Martyn de Chigwell (possibly identical with Hamo's former servant Martin) and Thomas de Chigwell were trading at Henley-on-Thames, and there were other de Chigwells with unknown or different trades.³⁶ The relationship, if any, between most of these individuals is not known. On balance it seems likely that some of Hamo's relatives or dependents were commongers, although not very prominent ones, and that he himself intervened in the trade only rarely.

Another misleading assumption has been that commongers whose interests lay in the neighbourhood of Billingsgate were necessarily fishmongers.³⁷ Of the 22 commongers who seem to have been based in that area, only nine are known to have been fishmongers, while most of the others were primarily commongers or bakers. A prominent member of the latter group was John de Romene, who presumably regularly traded along the Kent coast to the port of New Romney. Three in that group are known to have dealt in woad, and their shipping contacts, extending to the River Somme and Picardy, would have resembled de Romene's. There was an established trade in grain between the English south coast ports and those of Picardy and Ponthieu, and extensive shipment of firewood from the Sussex ports.³⁸ It seems that on occasion London tapped into those circuits of exchange for supplies.³⁹ The commongers at Billingsgate may thus have fallen into several groups: bakers with an interest essentially in the London distributive trade; regular shippers of grain whose interests extended along the coast of Kent, and sometimes further; and the fishmongers who traded regularly in fish and Baltic goods from Yarmouth, Lynn, and Boston, but only in grain in times of relative dearth, and perhaps then on a large scale.

³⁴ *Cal PMR* 1323-64, 34-5.

³⁵ *Cal Close R* 1318-23, 636.

³⁶ Ekwall (1951), 149, 153, 270, 332-3; *Cal PMR* 1323-64, 62; *Letter-Book B*, 205, *PRO* E1201/5/14.

³⁷ Williams G (1963), 163.

³⁸ Gras (1918), 334-46; Pelham (1928); Pelham (1929).

³⁹ For the occasional shipment of Sussex firewood destined for London, see *Letters*, nos. 27, 174.

After the dealers in woad and other dyestuffs (five in all), the next most significant group of commongers with other identifiable interests were those who were also described as corders (dealers in rope and hemp). They had an obvious interest in shipping, and probably also contacts with the East Anglian ports and with the Hanse merchants, whose headquarters lay at the heart of the city's cordage district and not far from Queenhithe. Another three commongers were involved in the salt trade. One, John de Grantham, was primarily a pepperer or spice merchant, and shipped salt from Poitou. The other two were Roger le Palmer and his partner who initiated a seizure of salt brought by boatmen from Sarre in Kent. The proximity of 'Saltwharf' (where Roger le Palmer had his wharf) to Queenhithe, as well as other evidence, suggests a long-established association between the trade in grain and that in salt, perhaps especially from Kent.⁴⁰ Other significant interests of the commongers were the trade in wool and that in wood and charcoal, where three and two of them, respectively, are known to have been active.

THE CHARACTER OF THE MARKET

While the associations of the commongers convey a sense of the structure of London's grain market, there are no readily-quantifiable measures of the degree of sophistication that it had achieved by the early fourteenth century. Nevertheless, certain features of the market can be described in ways which allow comparison with larger grain markets in later periods, and hence an assessment of whether the London market in 1300 was in any important respect different from them. These features include specialization within the trade, the role of intermediaries or middlemen, the size of transactions, speculation and the seasonality of business, investment in storage and warehousing, and credit and other commercial practices. There are many general indications that by 1300 England, and especially London, had developed a highly commercialized economy.⁴¹ The metropolitan grain market provides an exceptional opportunity to examine that economy in action.

Dealers and transaction sizes in London

Meuvret, commenting on the progression which Usher believed he had identified from the supposed small-scale dealing in the grain market of medieval Paris to the larger transactions of the seventeenth-century, noted the difficulty in practice of distinguishing between the wholesale and the retail sectors in the traditional grain economy, even for a city as large as Paris.⁴² The same observation holds true for medieval London. Dealers participated in both large and small transactions, and may at different stages of their careers have specialized in one sort or the other. Nevertheless, contemporaries distinguished

⁴⁰ Cal EMC, 79; cf. *Chronicles*, 238, 279.

⁴¹ Britnell (1993).

⁴² Meuvret (1988) i, 97-143.

between large-scale (*in grosso*) and other deals, and it is possible to identify in broad terms the two types of market by which London was supplied.

Small transactions were very common and may have been the most obvious face of grain dealing in the city, especially at the inland markets supplied by road from places close to London. Thus in 1370 a cornmonger from Fulham (Mx) exposed 3 bushels of corn for sale within Newgate, and a man from Shenley (Hrt) offered too high a price in the same market for 5 bushels of grain belonging to a cornmonger from St Albans (Hrt).⁴³ In 1300 sixteen individuals, apparently all Londoners, some of them described in other records as cornmongers, and three of them women, were through their male and female servants selling all kinds of grain 'by the bushel' on the pavement (probably within Newgate). Among other offences, these people had forestalled grain.⁴⁴ These cases reveal the prevalence of small-scale dealing by intermediaries (both men and women) who had gone out into the country to buy grain, or who were based in market towns and supplied London. A good example is the unnamed man and his boy who in 1305 went to 'divers places' in Middlesex, bought a total of 76 quarters of wheat, and had it carried to London for the sheriff.⁴⁵ One of the purchases for the king made by London cornmongers in the country and local markets of the lower Thames region in 1295 comprised 45 quarters of wheat bought from fourteen individuals (including at least two London cornmongers and one woman), in twenty-one transactions, with a mean size of 2 quarters 1 bushel each.⁴⁶ In the city, country-based cornmongers might be difficult to distinguish from the peasant producers who also supplied small quantities of grain directly to London. A common size of transaction in such cases may have concerned about a cart-load of grain. In 1305, for example, a city baker owed money to a man of St Albans for 3 quarters of wheat, payable on delivery, and in 1343 a woman purchased grain equivalent in value to about 4.5 quarters of wheat from a man of Fenny Stratford (Bk) in the market within Newgate.⁴⁷ This scale of dealing was common in English towns.⁴⁸

As some of these cases show, women had a distinct role as dealers in the London grain markets, but it does not appear to have been a prominent one. They may have been relatively more active as retailers of grain in its processed form as flour, malt and bread, selling in the street to householders who wished to satisfy their immediate needs, as was the case in smaller cities in the later fourteenth century, but the evidence for London is not as good as for those places. Certainly there were many women street traders in London, yet even

⁴³ *Letter-Book G*, 261.

⁴⁴ *Cal EMC*, 59.

⁴⁵ PRO, E101/571/5.

⁴⁶ PRO, E101/5/14, m. 5. The vendors' bynames denote places in Kent, Middlesex, ~~Essex~~ Hertfordshire, and Surrey; the grain was to be delivered to a ship rather than to London.

⁴⁷ *Letter Book G*, 261; *Cal EMC*, 59, 173; *Cal PMR* 1323-64, 90, 198; PRO, E101/571/5.

⁴⁸ Cf. Kowaleski (forthcoming c).

around 1400 the city's trade in malt seems to have been more in the hands of men than it was elsewhere.⁴⁹

The larger transactions were probably characteristic of the river-borne trade and the waterside markets, but not exclusively so. As in Paris, there were specialized measurers of corn (commeters), whose job was to measure the grain in these markets, apparently both as commongers brought it in and as it was distributed in smaller lots to vendors. They also arranged for it to be carried to the houses of the bakers and brewers at standard rates. Inevitably, they themselves also acted as small-scale dealers in corn. At Queenhithe in 1300 there were nine master commeters, with 23 servants, and some of the latter occur in other circumstances as commongers on their own account. Moreover, it was the authorities' policy to protect small-scale dealing in this market.⁵⁰ Nevertheless, all the evidence points to the domination of the riverside markets by large-scale dealing from an early date. The bishop of Winchester in 1210-11 sold from his house on the south bank of the river opposite Queenhithe 935 quarters of wheat, 60 quarters of maslin, 26 quarters of barley, and 110 quarters of oats, in a number of sales spread over the accounting year.⁵¹ The bishop did not persist in this practice, but lords probably continued to sell large quantities of grain in London, at least from time to time. On 9 April 1323 the agent of the rector of Ivinghoe sold 90 quarters of wheat and 20.25 quarters of barley in London to an Italian merchant who was purchasing grain on behalf of the king for use in the Scottish war. The same royal agent made much larger purchases from London merchants and commongers, who presumably had brought the grain to London themselves or had built up stocks by purchasing in the city markets. On 8 April the pepperer John de Grantham sold this agent 136 quarters of wheat and 16 quarters of barley, while on 28 March a partnership of two city commongers sold him 900 quarters of wheat, 675 quarters of barley, 620 quarters of oats, and 460 quarters of beans, all transactions said to have taken place in London. This particular operation reveals the importance of London as to some degree a national market and stockpile of grain, for while substantial purchases were also made in Boston (which was much more convenient for Scotland) and from the archbishop of Canterbury's manors in Kent and Sussex, London contributed over 60 per cent of the wheat and barley purchased, 56 per cent of the beans, and all the oats.⁵²

The year 1322-3 was one of high prices for grain. At such times of general shortage the purchasing power concentrated in London, and the inclination of city merchants to hoard and to speculate in grain, attracted to the London

⁴⁹ Koeze (1985b), 255, 390; Kowaleski (forthcoming c); *Memorials*, 435, 437; cf. above, 30-1.

⁵⁰ *Liber Albus* i, 272; *Letter-Book A*, 217-18 (the reference here to a cemetery indicates that the commeters and porters also operated at the inland markets); *Cal EMC*, 102-3; Lespinasse and Burdett (1879), 18, 20; below, 104-6.

⁵¹ *Pipe Roll of Winchester 1210-1211*, 153; the totals included practically all the surplus grain from the bishop's Thames valley manors and 150 quarters of wheat received as dues at the Southwark mill.

⁵² *PRO*, E101/16/18; only Boston contributed malt and maslin (140 quarters of each).

markets a greater quantity of foodstuffs than usual. That possibility was anticipated in 1258, and in April 1325, another time of shortage, large quantities of grain were said to be hoarded in the city, having been imported from Flanders. Early in 1316, a time of serious dearth, honey and wheat were said lately to have come into London in great quantity, and later that year a Genoese merchant, who was presumably an importer or speculator, sold 1,000 quarters of wheat in London to an agent of the king.⁵³

Italians were probably drawn into the London grain market because of their financial resources, their established links with the Crown, and the royal need to draw on distant Mediterranean sources of grain during the crisis of 1315-17. But alien merchants generally seem to have played a significant, though not quantifiable, part in the London trade. During the 1258 famine grain had been shipped from Germany, and by the 1280s Hanse merchants seem habitually to have warehoused and sold grain in London, although they could as easily have supplied it from English sources, especially Boston, Lynn, or Yarmouth, as from overseas.⁵⁴ Picardy was perhaps another source of supply. By 1237 merchants of Amiens and its region sold grain in London along with other foodstuffs and commodities, and in 1300 the London commonger Robert le Treyhere was warehousing and selling in the city 120 quarters of wheat which he had received from an Amiens merchant.⁵⁵ As with the Germans, it is possible that Picards brought English grain to London, which in their case they may have acquired at Kent or Sussex ports. It may often have been the alien merchants' interest in shipping rather than that in exporting grain from their home countries which drew them into the London market.

Aliens provided a small part of the wheat purchased in London for the Scottish war in 1323: 4 per cent of the total was obtained from an Italian and a Spaniard. By contrast, men with German or Flemish names had supplied at least 36 per cent by value of the wheat purchased in and around London for the use of the royal household in the summer of 1302. This was a year of relatively low prices, and so it does not seem that their presence in the London market was to be explained by their exceptional role as importers. One of the suppliers on that occasion, who provided 18 per cent of the total, was from Cologne. Most of the rest of the total was supplied by known London commongers. One of the Londoners, John de Ditton, supplied about 42 quarters, a quantity comparable with that supplied by individual aliens, although the overall mean was about 15 quarters per person.⁵⁶ In the size of their transactions, the greater London commongers were not overshadowed by alien merchants.

⁵³ *Letter Book E*, 196; *Cal Close R 1313-18*, 267, 380; Luard (1880), 673.

⁵⁴ Above, 69; *Liber Albus i*, 485-6; Lloyd (1991), 42.

⁵⁵ *Liber Custumarum*, 64-6; *Cal EMC*, 71. On the contemporary involvement of Picards in the export of grain to Exeter, see Kowaleski (forthcoming b and c).

⁵⁶ Weinbaum (1933) ii, 261; the sums of money given in the account have been converted into approximate quantities according to the Queenhithe price for June 1302 (Appendix IV); the Cologne merchant supplied about 54 quarters.

Quantities ranging from 50 to 200 quarters, and sometimes more, were perhaps typical of transactions associated with coastal and overseas shipments to London, and with exports from the city. Some of those transactions may have concerned an entire shipload of grain. Thus, ships entering Exeter in the early fourteenth century with cargos composed entirely of grain rarely carried less than 100 quarters and sometimes carried as much as 500 or 600 quarters, representing a normal maximum burden of about 100 tons. Ships carrying grain from Lynn appear to have been no larger, although a few of the bulk carriers serving English ports at that time, including the largest Hanse ships, were two or three times that size, and one ship arrived at Exeter with 1,023 quarters of wheat, barley and peas. It was rare, however, for quantities of grain larger than 200 quarters to be shipped by a single merchant, and many shipments of less than 50 quarters are also recorded, illustrating the coexistence in the market of both small- and large-scale traders.⁵⁷ The scale of individual shipments from English sources to London does not seem to have been much different in the eighteenth century.⁵⁸

London and the local markets

In 1295 the king's treasurer made £1,500 available for the purchase of wheat and oats, undertaken by several syndicates of London commoners in the city and its tributary markets, where, between early March and mid May, they acquired more than 3,500 quarters of grain. The scale of this activity reveals the importance and sophistication of London as a market for grain. The fact that this was a high-price year, and that in the same months of 1323, another year of high prices, 3,957 quarters of grain were also purchased for royal military purposes in London, Kent, and Sussex, raises the question as to whether these heavy purveyances significantly distorted the market and contributed to shortages. The purchases in 1295 represented only about 2 per cent of London's estimated annual requirement of 165,000 quarters, and no more than 12 per cent of what the city needed over the period when the purchases took place. Since those months were the ones when most demesne grain came on to the market, the impact of the purveyance on the price and availability of grain in London was probably not very great, although away from the city the effect may have been more severe.⁵⁹ Moreover, the purchases in 1295 do not appear to have had an unusual effect on wheat prices in the Henley market, which the Cuxham accounts show did not rise as sharply between January and May as they had

⁵⁷ For fourteenth-century London evidence, see: *Cal Letters*, nos. 16, 21-2, 59, 86, 133, 163, 168, 215; *Letter Book F*, 41; PRO, E122/69/1-3. The picture is similar at Boston and Lynn, and in fifteenth-century London: Gras (1918), 273-88, 465, 472, 526-53; *Customs 1480-1*, *passim*. For Exeter, see Kowaleski (forthcoming b and c), and for tonnages Unger (1980), 29, 30, 163, 184 (employing the English ton of 2,240 pounds). The mean shipment per importer at Exeter was 79 quarters.

⁵⁸ Baker D (1970), 132.

⁵⁹ Below, 104; cf. Maddicott (1975), 30-2, 53-6.

done in the previous year.⁶⁰ What these two purveyances may show is that in years of relative shortage, arising from harvest shortfall, those who needed large quantities of grain in a hurry, and who could afford to pay for it, would turn to the London markets and their supply system rather than to provincial sources of supply.

The accounts for 1295 do not name those in London from whom the London commoners made their purchases, and so reveal nothing of the role of aliens in the trade. Nevertheless they illuminate many other aspects of the commoners' business, not least that in a large-scale operation of this sort they used only those local markets which were accessible by main water routes from London.

There was a clear pattern of market specialization within the region. The geographical distribution of purchases (Table 6) may represent the normal pattern of business among those London commoners who dealt on a large scale, with the proviso that, on account of the large sum of money available, the generally high price level, and the aim to assemble the grain for shipment to Gascony, north Kent may have provided a greater share of the supply than normally. While on this occasion north Kent and the upper Thames Valley seem to have been about equally important as sources of supply, those two districts differed in important ways. North Kent was not a significant source of oats, while the upper Thames area supplied over half the oats purchased. Moreover, Faversham supplied only wheat, while Henley, though principally a wheat market, also supplied a significant quantity of oats. Reading's specialization in oats cannot be explained in transport cost terms, and may perhaps reflect the ecology of its hinterland. Economic rent was probably important too, since Henley's immediate hinterland resembled London's for its specialization in the cheaper grains rather than growing wheat.⁶¹ North-west Kent, lying close to London, may have specialized more than the rest of the county in the production and marketing of oats, the only grain purchased at Dartford and Plumstead. The markets at Maidstone and Rochester, which supplied some oats, perhaps drew respectively on the northern margins of the Weald and areas to the north west. By contrast, Faversham, like Henley, drew on a wheat-producing district relatively distant from London. Faversham, however, exercised a specially strong pull as a market for wheat, the most commercialized of all grains, for the *custos* of Plumstead chose to sell 60 quarters of wheat at Faversham,⁶² but sold 100 quarters of oats at his manor.

There were also differences between the markets in term of transaction size. Wheat purchases (Table 10) seem to reflect both the degree to which each market was dominated by wholesalers, as well as local patterns of landownership and production. Each of the three main markets (London, Henley, and Faversham) was dominated by large sales of more than 60 quarters.

⁶⁰ Harvey P D A (1976), 231-2, 250-1. The previous year had been one of slightly lower prices.

⁶¹ Evident in both production and disposal: below, chapters 7 and 8.

⁶² This is not stated explicitly, but can be deduced from the summary arithmetic in another part of the account: PRO, E101/5/13, mm. 1-3.

TABLE 10

Sizes of wheat purchases by London merchants, 1295

Size of purchase in bushels (8 bushels = 1 quarter)	Number of purchases									
	Main markets								Other places ³	
	London		Henley		Faversham		Total			
	A ¹	B ¹	A	B	A	B	A	B	A	B
<80	5	10	2	2	3 ²	30	10 ²	18	3	2
80-<160	1	4	4	14	2	4	7	7	4	12
160-<240	1	7	1	6	2	8	4	7	8	35
240-<320	1	12	2	16	1	4	4	9	3	21
320-<400	1	13	2	20	1	6	4	12	1	8
400-<480	-	-	-	-	1	8	1	4	1	10
≥480	2	54	2	41	3	40	7	43	1	12
Total	11	100	13	99	13 ²	100	37	100	21	100
mean size	227		258		294 ²		282 ²		187	
median size	112		192		216 ²		192 ²		160	
range in size	3-809		17-706		½-880		½-880		3-480	

Sources: PRO, E101/5/13, 14.

¹ A=number of purchases. B=percentage of total purchased. For total quantities purchased, see Table 6.² Excludes the Faversham purchases in bushels and half bushels totalling 200 quarters (1,600 bushels): see 93, n. 64.³ For these places, see Table 6.

Elsewhere, the predominant size was between 20 and 30 quarters. As might be expected, large transactions were most dominant in London, followed by Faversham, which was the site of the largest transaction of all.⁶³ Small-scale dealing in wheat coexisted with wholesale mercantile activity in all the markets. Faversham was remarkable, however, for the very high proportion (30 per cent) of the total which was purchased in the market there 'from divers men' in small lots of a bushel or half bushel each.⁶⁴ The Faversham grain market was evidently an exceptionally busy one, held on four days a week and comprehending many small sales, as well as large individual sales from

⁶³ Transactions of more than 100 quarters represented 9 per cent of the total number of transactions and accounted for 32 per cent of the total quantity purchased at London; the corresponding proportions at Faversham were 12 per cent and 31 per cent.

⁶⁴ The account (PRO, E101/5/13) states this explicitly in two entries, each of which concerns a total of 60 quarters of wheat; the two following entries, each concerning 40 quarters, state that the wheat was purchased on market days in the same place and imply that the purchases were also made in small lots. If the total purchased in small lots at Faversham was only 120 quarters, the wheat purchased there in lots of less than 10 quarters each would have represented 19 per cent of the total rather than the 30 per cent indicated in Table 10.

manorial lords and from local merchants who had presumably purchased grain in the vicinity.⁶⁵ The small sellers may often have been local producers, a pattern which would fit with what is known of the significance of small-scale freeholders in Kentish agriculture.⁶⁶

On the face of it, this degree of activity and specialization stands in sharp contrast to Henley, where there was only one market day a week, where there is no direct evidence that the London commongers purchased in small lots, and where transactions concerning less than 10 quarters of wheat accounted for a smaller proportion of the total purchased than at either London or Faversham. Henley's grain market appears to have been less intensive than Faversham's, and to have been notable for its transactions of middling to large size (30 to 50 quarters). This could reflect the pattern of agrarian production in its hinterland, where large institutional holdings predominated. It is possible, however, that the apparent absence of small-scale purchases at Henley is to be explained by the way in which the record was compiled rather than by the character of the market.⁶⁷

Much less information is available on the workings of the market in oats. Individual transactions were much larger by volume than those in wheat, the overall mean for 28 purchases being, at 59.25 quarters, twice that for wheat, and there is no evidence for sales in small lots. In monetary terms, however, the wheat transactions tended to be the more valuable. Thus, the value of the overall mean size of transaction in oats was 72 per cent of that in wheat, and that of the largest transaction (160 quarters) 52 per cent.⁶⁸ There was a particularly sharp contrast between the markets in the two grains at Henley, where the mean size of transaction in oats was worth 46 per cent of that in wheat, and the largest

⁶⁵ Those named as selling wheat at Faversham included William de Gatton (30 quarters), perhaps a landlord at Throwley, Wormshill, and Boughton Malherbe; the sergeant of Bokton (2 quarters, probably Boughton Aluph); the *custos* of Plumstead (60 quarters); Robert Dod (100 quarters, perhaps a landlord at Wichling, and certainly a leading Faversham merchant who owned a ship and granaries and dealt in fish and cider as well as corn; Nicholas de Brenle (110 quarters), a grain owner and man of Faversham; and the Faversham burgesses Walter de Upmanton (14 quarters) and John de Brenle (2 quarters): *Feudal Aids* iii, 2, 6, 34-5; HMC (1877), 501-6, 508; Giraud (1882), 100. Two named individuals cannot be identified. For other granary owners in Faversham, see below, p. 100.

⁶⁶ Cf. Hallam (1981), 91-3; Baker A R H (1964); Du Boulay (1966), 150-6.

⁶⁷ From the accounts of one of the sets of wheat purchases (those made by Adam Wade & Co.) it is possible to identify some of the Henley purchases as having been made *in grosso* and others as having been made *in mercato*. The latter include some large purchases (85.25 quarters and 100 quarters). Since the account (unlike that for Faversham) ranks the purchases according to value paid, it is possible that the large *in mercato* purchases were in fact each made up of many small purchases. It is not possible exactly to calculate the quantity purchased *in mercato* at Henley, but it is estimated at 141 quarters 3 bushels. If that quantity was purchased in transactions of less than 30 bushels each, the pattern of trading at Henley would have been markedly different from that shown by Table 10, being characterized by the dominance of very small and of middling-sized transactions, and by the absence of transactions greater than 50 quarters. On that interpretation, the distribution of transactions would have been, in quarters: <10, 36 per cent; 10-20, 12 per cent; 20-30, 6 per cent; 30-40, 16 per cent; 40-50, 31 per cent.

⁶⁸ Using values derived from Farmer (1988), 790.

transaction 41 per cent. The trade in wheat evidently attracted the biggest merchant dealers, with ready access to capital and credit. The market in oats at Reading had more of a wholesale character than that at Henley, where the mean transaction size was 41 quarters 3 bushels, by comparison with 98 quarters 2 bushels at Reading.

Barley was not purchased during the operation of 1295, although, as has been demonstrated, London was an important market for the grain. It is possible, given the scale of barley production in northern and eastern Kent,⁶⁹ that among the regional markets which supplied the metropolis Faversham was at least as significant for barley as it appears to have been for wheat.

The size of transactions in the local markets is also revealed in some of the records of sales by demesnes. The Cuxham (O) wheat sales in the market, for example, were commonly of between 3 and 5 quarters on each occasion,⁷⁰ representing perhaps a single cart-load sent to the weekly market at Henley. Such evidence as there is suggests that the scale and pattern of sales in London's inland markets was very similar, and that those markets were supplied in the same sort of way as Henley's. At Henley, however, much of that grain would have been stockpiled ready for transmission to the metropolis, while the grain sold in London's inland markets would probably have passed more directly into the hands of bakers and other consumers.

The seasonal pattern of sales and price movements

Demesnes seem to have conformed to a common seasonal pattern in the quantity of wheat sold.⁷¹ In most cases 75 per cent or more of the annual total was sold after Christmas, with the peak period for sales being in March and April, or sometimes in May and June. The published accounts for Cuxham show that over the period between 1290 and 1314 as a whole, 38 per cent of the total of wheat sold was put on to the market in March, April, and May. Evidently the aim was to sell the greatest quantity at the time of highest prices. Wealthy lords could afford to postpone their income in this way, as well as the investment required to build granaries on the demesne. Moreover, grain may well have required some time in the barn to mature before being threshed, and in any case there may have been insufficient labour to devote much time to threshing before Christmas. This suggests that before then markets may have been supplied with grain principally by small-scale and peasant producers. On the other hand, the prevalence of sales in small lots at Faversham in March and April 1295 demonstrates that some small producers or dealers could hold on to significant stocks of grain until then. If that was so, stocks held over from the previous year

⁶⁹ See below, 120-1.

⁷⁰ Harvey P D A (1976).

⁷¹ This discussion is based on evidence from 26 accounts in the database plus that from a further 6 accounts, concerning Cheddington (Brk) and Malden (Sr) in Rogers (1866), 32-73, and on a more detailed tabulation for Cuxham based on Harvey P D A (1976). See also, Britnell (1980, rep. 1987), 18-21; Farmer (1988), 739-40.

TABLE

Seasonal variations in wheat

Season ¹	Demesne							
	Cuxham (O)		Feering (Ess)		Kelvedon (Ess)		Kinsbourne (Hrt)	
	A ²	B ³	A	B	A	B	A	B
Autumn 1313	82	78						
	88	84						
	98	94						
Christmas	105	100					88	100
			88	100	79	100	88	100
Purification (2 February)	105	100						
Easter (23 March)	105	100			92	117		
	108	103					118	133
			92	104				
Pentecost (11 May)	118	112					159	180
	123	117	99	112				
June	126	120			92	117		
	157	150						
July 1314								

Source: accounts database.

¹ The accounts for each demesne date the sales in different ways ('Lent', 'after Easter', 'October', 'around Christmas', etc). The table is intended to provide a simple chronological framework which will allow comparison between the series for each demesne. Vertical rules indicate the longer periods within which a sale was made.

may have made some contribution to feeding London and other cities during the Autumn and early Winter. All those who produced for the market, and not just the larger producers, may thus have conformed to a common seasonal pattern of sales, as was the case in later periods.⁷²

The unusually detailed accounts for Cuxham reveal changes in the seasonal pattern of sales over the 1290s. In 1290-1, 91 per cent of the Cuxham wheat that was sold was disposed of between March and June, a figure that fell to 28 per cent by 1297-8. Over the same period the proportion sold before Christmas rose from 9 per cent to 40 per cent, and in 1299-1300 to 59 per cent. This appears to have been exceptional,⁷³ and to have been a deliberate response to particular circumstances, since the change was progressive over the seven years for which figures are available. After 1300, however, the policy was reversed, so that in

⁷² Meuvret (1988) i, 13-16; Labrousse (1933), 158-64.

⁷³ Only in one other instance, Shillington in 1313-14, did the quantity sold before Christmas exceed that sold afterwards; but since the total quantity sold was no more than 2 quarters, the case is probably not significant.

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prices for eight demesnes, 1313-14

Demesne						Season		
Malden (Sr)		Shillington (Bd)		Turweston (Bk)		Westwell (K)		
A	B	A	B	A	B	A	B	
		98	88					Autumn 1313
		111	100					Christmas
				65	100	88	100	Purification (2 February)
								Easter (23 March)
111	-			75	115	98	111	Pentecost (11 May)
111	-					108	122	
124	-							
157	-					118	133	June
								July 1314

¹A = Index value calculated from Farmer's standard: Farmer (1988), 790.

²B = Index value taking Christmas 1313 as 100.

1307-8 and 1313-14 the percentages sold before Christmas were no more than 8 and 25 per cent, respectively. Since Cuxham sold its wheat through Henley, and so depended heavily on the metropolitan market, these changes may reflect some change in the operation of London's supply network, but it is far from clear what that could have been.

The seasonal movement in wheat prices appears to have been consistent throughout the region in trend if not always in degree. This is revealed clearly for the year 1313-14, when it is possible to compare trends for eight demesnes (Table 11). The general pattern was for prices to rise gradually from November to a peak in March, April, May, or June, which was often followed by a slight fall. Demesnes had usually completed their sales by midsummer, so that there is little evidence for prices on the eve of harvest. In some years, when a harvest worse than the last seems to have been anticipated,⁷⁴ prices continued to rise into July: this was the case in 1307-8, 1313-14, and 1314-15. Occasionally, as in 1291-2 and 1298-9 at Cuxham (O), the price dipped in February or March

⁷⁴ As indicated by the wheat price index for successive years: Farmer (1988), 790-1.

TABLE 12

Seasonal movement of London prices of wheat compared with manorial sale prices

Date	Place			
	London	Cuxham (O)	Cheddington (Bk)	Coombe (Brk)
1298-9:				
December	100	100		
March	127	124		
May	118	115		
1304-5:				
October	100	100	100	
February	162	166	150	
1306:				
c. February	100	100		100
c. May	89	81		83

Sources: accounts database; Appendix IV; Harvey P D A (1976); Rogers (1866), for Cheddington.

Note: prices are expressed as index values, taking the earliest price for the year as 100.

before climbing again to an early-summer peak. These were years when the mean price was close to the norm for the period as a whole but a little lower than in the previous year: the dips may have been caused by holders of wheat unloading their stocks on the market earlier than usual in anticipation of a continuing low price. In 1299-1300, when prices continued at the relatively low level of the previous year and stocks were presumably large, there was a notably early peak. At Cuxham it occurred in December. At Ibstone (Bk), Maidstone, and Bexley (both K) it occurred in February to March and was followed by a 50 per cent fall in prices. Cuxham again sold at a peak price in December 1306, a year when prices remained at a relatively low level. In all cases where it is possible to compare the seasonal movement in London prices with those of demesne sales, the prices moved in the same way and to about the same degree (Table 12). The wheat market thus seems to have responded readily both to levels of supply and to its participants' perceptions of profitability. It also probably operated in a more or less integrated fashion across the region as a whole.

Purchases outside the market and at the farm gate

The allowance of advantage (*avantagium*) on a sale might indicate that it was being made at the farm gate or outside the market.⁷⁵ In 1323 London merchants and others allowed advantage on sales of grain made in the city to a royal

⁷⁵ Above, 53.

purveyor.⁷⁶ The London sales, in the case of one mercantile partnership amounting to 1,200 quarters of grain, were almost certainly made outside the market, and perhaps included an element of bribery. The occurrence of the practice might indicate districts or demesnes where merchants and relatively large-scale transactions were to be expected. To judge from the accounts database, sales *cum avantagio* were most common along the lower Thames and its estuary, certainly an area where the grain market was very active, although in other comparable districts, such as the hinterland of Henley, the term does not commonly occur.

In 1295 the London commongers made substantial purchases at Blewbury, Sutton Courtney (both Brk), and Shobury (Ess; cf. Table 6). These seem to have been 'farm gate' sales. Some of the purchases at the latter two places were described as being *in grosso*, and at Shobury the purchase was made from the bailiff of Sir John Giffard. In the Cuxham accounts sales of this type were described as taking place on the farm (*in curia*), and in 1293-4 and 1294-5 44 per cent and 27 per cent, respectively, of the wheat sold was disposed of in that way. It may have been the merchants' practice to seek out grain at the farm gate in times of shortage as the market neared its peak, for those *in curia* sales were made in April and June 1294 and in Lent 1295. In 1296, however, a substantial but unquantifiable *in curia* sale was made at Cuxham at a low price early in December.

In 1295 some of the purchases which the London commongers made in Henley were said to have been wholesale (*in grosso*), while others were said to have been made in the market. In the case of Faversham only the purchases in small lots were said to have been made in the market, while the larger purchases from named vendors were said simply to have been made 'at Faversham'. In these last cases, and with the Henley *in grosso* sales, it is likely that the grain being sold was not physically present in the market-place, and that the sale itself took place outside the formal market. Such a deal may have been conducted in an inn or similar location, as in later periods.⁷⁷ Grain sold in this way may have been present in a granary in the town, or may have been represented by a sample. An arrangement of the latter type probably accompanied the sale from the rectory of Wingham (K) in 1278 of 420 quarters of wheat and barley and 63 quarters of legumes to 'certain merchants of London', since the vendor seems to have borne the charge of carrying the grain to Sandwich.⁷⁸

Credit and financial arrangements

The lords of some manors were willing to advance quantities of grain on credit to small-scale traders.⁷⁹ In the London trade there is evidence for more

⁷⁶ PRO, E101/16/18.

⁷⁷ Cf. Baker D (1970); Kowaleski (forthcoming c).

⁷⁸ CCA, DCc/RE1.

⁷⁹ Britnell (1980), 37-50; Farmer (1991), 370-5; Galloway and Murphy (1991), 6.

substantial and extensive arrangements, but while commongers are recorded quite often as debtors or creditors, the significance of the debts is often not clear. Delayed payment, the most widespread form of credit in medieval trade, was common. Thus it was the practice of the broker and the larger purchasers in London to make a down-payment in the market, and then to be unobtainable when the country vendor came to claim the balance due.⁸⁰ Several commongers are known to have contracted debts to men in the country. The network of contacts which might be associated with such arrangements is illustrated by the case of John Blaket from St Albans (Hrt), who joined the London commongers' guild and owed money to a man in Buckinghamshire.⁸¹ One London commonger owed £33. 6s. 8d. to Hugh Despenser the younger in 1317,⁸² a time of grain hoarding and profiteering. He may have purchased a large share of the grain from Hugh's estates, Hugh offering substantial credit in the hope of a comparable return.

Commongers also occur as creditors to country landowners.⁸³ In such cases they may have made loans in advance of the harvest to men from whom they regularly bought corn. They also had credit arrangements with other merchants and Londoners.⁸⁴ Bakers were commonly in debt to commongers, often for small sums but in one case for as much as £35 to be repaid over several years, a total which would have represented about 143 quarters of wheat. Staged repayments were common. Another baker borrowed from a goldsmith a sum equivalent to about 120 quarters of wheat, then found that his debt had been made over to a commonger, to whom he had to lease his bakehouses for three years, apparently as a means of repaying what he owed.⁸⁵ These two bakers were not prominent men in the city, but were evidently engaged in substantial business, for the wheat equivalent of the larger debt was more than four times the mean annual quantity of wheat sold by each demesne in the region, and equal to that sold by Cuxham, a demesne which specialized in the commercial production of that grain.⁸⁶ Debts between commongers seem also to have been common, the largest known being of £20.⁸⁷ They might represent charitable loans within the guild, but they could equally well have arisen from commercial arrangements such as the purchase of stock by one commonger from another, a trading partnership, or the widespread practice of delivering into the hands of an agent a sum of money with which he was to trade.⁸⁸

⁸⁰ *Liber Albus* i, 261-2.

⁸¹ *Cal Close R* 1313-18, 343, 609; *Letter-Book A*, 129.

⁸² *Cal Close R* 1313-18, 448.

⁸³ *Cal Close R* 1307-13, 127, 572; *Cal Close R* 1313-18, 600.

⁸⁴ *Cal PMR* 1323-64, 8, 9.

⁸⁵ *Letter-Book B*, 111, 114, 230.

⁸⁶ The mean quantity sold for all demesnes in the database is 33 quarters, and 95 per cent of demesnes sold less than 110 quarters a year. The mean for Cuxham over the five years 1290-1, 1293-5, and 1296-8 was 143 quarters (calculated from Harvey P D A (1976)).

⁸⁷ *Letter-Book B*, 203, 209, 211, 231.

⁸⁸ *Letter-Book E*, 57; *Cal PMR* 1323-64, 56.

These sets of relationships reveal the ways in which commoners could accumulate capital and extend their business interests, as well as the importance of land, houses, and rents for securing the loans or for banking the capital associated with the trade.

The flow of market information

A single record throws light on what for London commoners was probably a vital aspect of their trade, the acquisition of market intelligence from the country towns where they purchased grain. Walter Neel, one of the most prosperous of them, in his will of 1351 left money for the repair of the highways between Newgate and (High) Wycombe, Aldgate and Chelmsford, Bishopsgate and Ware, and Southwark and Rochester. The destinations may all have been corn markets in which Neel himself operated, although he is otherwise known to have traded only at Henley, where he had a house, and possibly at Hoo (K). Yet from each of those places, it would have been cheaper to transport grain to London by water than by road. He may simply have had a charitable concern for the roads close to London used for the carriage of grain by lesser commoners than himself, but it is noteworthy that he paid no regard to the road between London and the significant, but land-locked, grain markets at Barnet and St Albans. His interest may rather have been in the roads as a rapid means of obtaining information on the state of local markets. He may also have used the roads for the express transmission of grain samples to the London market. Once the deal had been settled on the basis of the sample, the main consignment would be sent to London by boat.⁸⁹

Granaries

A marketing system as sophisticated as that which existed in the London region by 1300 could not have operated without extensive storage capacity. The royal purveyance accounts of this period indicate that granary space could be hired in virtually any market town in southern England without apparent difficulty.⁹⁰ The accounts for the purchases in 1295 mention granaries at every place where grain was bought, except for Blewbury and Waltham, probably the smallest settlements at which purchases were made. The wheat said to have been purchased at Blewbury seems already to have been in a granary at Streatley (or was delivered there at the vendor's charge), where it was loaded into a boat for London. In 1295 the London commoners hired granaries at London, Faversham, and Sittingbourne for periods of up to 21 weeks between March and August. Other sources reveal that London commoners owned granaries and stone houses at Henley, where they probably dominated the

⁸⁹ For selling by sample in London, see below 106. For the express shipment of grain samples to a metropolitan market, see Cronon (1991), 122-3.

⁹⁰ We are indebted to John Langdon for letting us see his extensive notes on this material. See also Du Boulay (1966), 211-12.

market to a greater degree than at Faversham. They are likely to have owned or rented granaries at other market centres too. They probably also kept large stocks of grain at or near the mills just outside London.⁹¹

At least two of the men who rented out granaries at Faversham in 1295, Robert Dod and Nicholas de Brenle, were substantial merchants of the town and sold large quantities of wheat to the London cornmongers as well as engaging in other trade.⁹² Three other men also rented out granaries there. Faversham had a larger and more extensive trade than Henley, and its grain merchants probably enjoyed a much greater degree of independence of the London market, stockpiling grain at Faversham ready to sell it to Londoners or to ship it elsewhere.

London granaries near Queenhithe and Billingsgate cost 3d., 4d., and 6d. a week to hire. At Faversham and Sittingbourne they cost between 4d. and 6d., and at Faversham a great stone house was hired as a granary for 12d. a week. A granary near Billingsgate hired from Cristina Box for 19 weeks at 6d. a week appears to have held 120 quarters of oats. This suggests that in key London locations it cost 5d. a week, or £1. 1s. 8d. a year, to store 100 quarters of grain. In 1294-5 the cost of storing wheat for a year close to the Billingsgate market thus would have been no more than 2.6 per cent of its mean sale price for the year, and 2.3 per cent of its maximum price in the city. This was a little less than the cost of transport from Henley or Faversham. By 1340-1, when property prices in the city had fallen sharply, it cost no more than 1.7d. a week per 100 quarters to store 420 quarters of oats in a granary near Queenhithe.⁹³ The actual costs of storing London's grain would have been less than this, for over a part of the year much of it would have been held in cheaper locations: after harvest in the barn or demesne granary, then in a granary at one of the intermediate market towns.

While there is no indication that in London, or in other medieval cities, grain stocks were carried over from year to year on a scale sufficient to even out the effects of harvests of varying quality,⁹⁴ it seems unlikely that the costs of storage would have inhibited the accumulation, for at least some part of the year, of large stocks of grain by the dealers who supplied the London market. At the beginning of the thirteenth century it was envisaged that London cornmongers might build up stocks of grain in their cellars (*celliers*) rather than sell it openly in their shops.⁹⁵ At the end of the century Hanseatic merchants

⁹¹ An arrangement suggested by a large debt to a cornmonger for wheat at Bromley by Bow: *London Book B*, 199; cf. McDonnell (1978), 50 (probably in error concerning the tenancy of the manor).

⁹² Above, 94, n.65.

⁹³ Harding (1983) ii, 40-1; for the trend in property prices, see Keene (1985a) and (1989a).

⁹⁴ For the latest contribution to the largely theoretical debate on the significance of grain storage in medieval England, see Komlos and Landes (1991). Even in Florence and Venice the public stocks of grain seem to have been used to even out the price fluctuations within years rather than those between years: La Roncière (1982), 557; Lane (1973), 306.

⁹⁵ Bateson (1902), 724. The term *cellier* might denote a storehouse or a stone building, rather than a structure which was entirely below ground: Biddle (1976a), 347-8; Keene (1985b), 165.

were entitled to sell the grain they had brought to London from their dwellings and their granaries (*hospitia et granaria*).⁹⁶ Individual granaries, however, need not have been very large. If stored in sacks piled 6.5 feet high, 420 quarters of grain would occupy a floor area of about 764 square feet, and 120 quarters about 215 square feet.⁹⁷ If the grain was stored loose, the floor areas needed may have been about 3,400 and 1,108 square feet, respectively.⁹⁸ Stone houses in London and other towns would readily have been able to accommodate quantities such as these, certainly if more than one floor was used, since a common type of stone structure had an internal area of about 540 square feet, and much larger buildings, used at least in part for storage, are known.⁹⁹ A merchant wishing to store grain acquired in a single large transaction would probably have had little difficulty finding the space to put it in London. In the summer of 1295 granaries in London were hired from at least eight landlords, all of them prominent citizens (including fishmongers, cornmongers, a corder, and a lawyer) and known to have been property-holders in waterfront parishes, where clearly the city's grain storage capacity was concentrated. Granaries are rarely mentioned in the records of London property-holding, perhaps because most of them were not specialized structures. Around Queenhithe, however, in the city's greatest cornmarket, there were a few distinctive, privately-owned buildings which were described as granaries.¹⁰⁰

It is noteworthy that in this period London had neither a public granary nor a grain staple system of the type possessed by Ghent, Cologne, and some Italian cities.¹⁰¹ London's lack of a common granary, even after the crisis of 1315-17 (which seems to have prompted the foundation of one in Ghent), probably means that the city was more assured of its grain supply than some of its continental counterparts. That could reflect purely the relationship between the demands of the city and the productive capacity of its hinterland. It seems likely, however, that the political and territorial structures within which the cities were situated also constituted an important factor. Ghent and Cologne drew grain from lands which were outside their political control, while London and its grain supply region were under the rule of a single lord. The cost of grain storage in London was presumably high by comparison with elsewhere, and space in the city could be more profitably used for storing other more valuable items of trade. It therefore made sense for grain which was destined to supply London to be stored for part of the year at local marketing centres such as

⁹⁶ *Liber Albus* i, 487.

⁹⁷ 10 quarters is equal to 1027 cubic feet; it is assumed that storage in sacks would add 20 per cent to the overall volume occupied by the grain.

⁹⁸ Assuming that the grain was piled 1.5 feet high, and that to allow for ventilation and access it occupied no more than 68 per cent of the floor area of any structure; cf. Meuvret (1988) i, 16-18.

⁹⁹ *ibid.* (1976a), 345-8; Keene (1985b), 155-6, 587; Schofield J (1984), 77; Keene and Harding (1981) 104/20, 105/19, 145/14-15; Keene (1989b).

¹⁰⁰ *Hanning* (1983) ii, 40-1.

¹⁰¹ *Nicolas D* (1987), 241-4; Irsigler (1985), 121; La Roncière (1982), 555-64, 572-3; Lane (1973), 107.

Henley, Faversham, Ware, or St Albans. Since the Londoners' grain at such places was not liable to be impounded by a hostile power, there was little need for the citizens to maintain a common supply in the city.

In this light, the city's first common granary, begun at Leadenhall in 1440 following a severe but short-term dearth in a period generally characterized by a plentiful grain supply,¹⁰² requires some explanation. The social and political atmosphere in the city at that time was more conducive than in the thirteenth century to civic investment of that sort, and the entitlement of the poor to assistance in times of difficulty, as well as the possibility of riot, may have been more widely recognized. It may be, too, that the less extensive and less specialized internal networks and systems of production which supplied grain to the smaller metropolis of the fifteenth century were less capable of responding to a crisis than those of the early fourteenth.¹⁰³ Moreover, in hard times, early fourteenth-century London (where there was a concentration of merchants with exceptionally large financial resources) perhaps tended to feed itself by inflicting starvation on its hinterland or on countries overseas which depended on English supplies.¹⁰⁴ In the fifteenth century the city was able to draw on grain-trading networks which extended into the Baltic region (also drawn on by countries once dependent on English grain) and which had come into being since about 1320. This more extended system of metropolitan supply, vulnerable to interruption, was one for which, in an emergency shortage, a central public granary may have been especially appropriate.

London trading practices and their regulation

Within London the grain market was subject to a high degree of customary control, reflecting an underlying concern to secure adequate supplies. Whether or not they were effective in practice, the existence of the regulations, their reiteration as circumstances such as dearth demanded it, and their evolution over time all reveal aspects of the day-to-day behaviour of the participants in the market and of their response to economic conditions. The main aims of the regulations, as in towns throughout medieval Europe,¹⁰⁵ were to ensure that the market in grain in the city was an open one and not subverted by dealing in secret places; that the market should be accessible to the common people of the city, who should be able to meet their needs for sustenance by buying in small quantities and not be excluded by wholesale dealers; that prices be not enhanced by successive sales of the same grain; and that the respective roles of strangers (*forinseci*) from outside London and of residents (*intrinseci*, *prives*) or citizens be clearly defined. The regulations used the term *commonger* (*mango bladi*,

¹⁰² Thomas (1923), 17-19. Other European cities responded to the crisis in a similar way: *Irigler* (1985), 121.

¹⁰³ Cf. Farmer (1991), 375-6.

¹⁰⁴ Cf. Helle (1967).

¹⁰⁵ For parallels to London, see La Roncière (1982), Nicholas D (1987), *Irigler* (1985), *Roover* (1968), 286-8; Usher (1913), chapter 2.

cornmongere, *bladarius*) in a variety of ways according to context and date. It could denote a retail dealer based in London, a London dealer who travelled further afield, a stranger who brought corn to the city, a merchant on a substantial scale, and, by 1300 or soon after, a member of the *cornmongers'* guild who thereby enjoyed the freedom and citizenship of London.

By the early thirteenth century some of the principal features of the medieval London grain market were well established. *Cornmongers*, evidently retail dealers who at that date were supposed to restrict their activities to Queenhithe, were to buy no more than four bushels at a time and to sell that openly from their shops before they bought any more.¹⁰⁶ Presumably merchants (either Londoners or strangers) and the agents of manorial lords supplied grain in quantity to the Queenhithe market, whence the *cornmongers* distributed it to consumers. It was clearly the *cornmongers'* practice to attempt to corner the market by stockpiling grain. The other grain markets in the city, which are not mentioned at this early date, probably operated on a smaller scale and with a more direct relationship to consumers than the one at Queenhithe. There is no clear later evidence concerning the retail distribution of grain in medieval London through shops,¹⁰⁷ although bakers may have sold small quantities of unprocessed grain from theirs.¹⁰⁸

There is plenty of later evidence concerning a retail trade in corn purchased in the London markets. In the 1270s no regrator (*regratour*) of corn or other victuals was to purchase before prime (sunrise), and not before the good men of the city and round about (*les prodes hommes de la terre et de la citee*) had met their own needs.¹⁰⁹ Later, similar restrictions on general trading in the corn markets were said to be intended to allow the common people and the good men of the city to supply their needs.¹¹⁰ The two riverside markets tended to be dominated by wholesale dealing more than the others, and rules to contain that tendency were progressively tightened up. By 1320 it had been ordained that boats bringing grain for sale at Billingsgate and elsewhere on the Thames should remain on common sale without selling anything wholesale (*en groos*) for a whole day after arrival. In 1339 and 1344 it was ordered that grain was not to be exposed for sale before half prime at Billingsgate and Queenhithe, and not before prime at Newgate and Gracechurch. It was further stated that this was to be the case on three days a week, Monday, Wednesday, and Friday.¹¹¹ That may simply be a reference to the customary days for trading in grain, but it may also be a first, obscure formulation of a rule more clearly expressed, with minor variations, in 1357, 1370, and 1380 that no merchant of corn, *cornmonger*, or

¹⁰⁶ *Dutton* (1902), 724.

¹⁰⁷ The shops owned by later *cornmongers* seem to have been sources of rental income rather than from which they traded.

¹⁰⁸ *Ibid.*, 79.

¹⁰⁹ *Letter-Book A*, 217; *Liber Albus* i, 270.

¹¹⁰ *Liber Albus* i, 261; *Letter-Book G*, 77, 170.

¹¹¹ *Liber Albus* i, 261; *Cal PMR 1323-64*, 115; *Letter-Book F*, 101.

anyone else was to buy for resale, either wholesale or retail, any grain, malt (or barley) or salt which had come to the city until that which had come by water had remained on open sale for three market days at Billingsgate and Queenhithe.¹¹² Those two markets clearly dominated all London dealing in corn. Traders went there to find out when grain was scarce.¹¹³ At Queenhithe in 1375 wholesale dealers seem to have been given preferential treatment over lesser people, for the cornmeters were accused of giving fuller measure for corn purchased at the granaries of the merchants than for corn purchased by the common people elsewhere. Such was the pressure of big business at Billingsgate in 1367-8 that special provision was made for boats coming up river with corn in sacks of one, two or three bushels only, to discharge their loads at Botolph's Quay, one hundred yards upstream of Billingsgate.¹¹⁴

The ordinance of 1380 indicates that after the three days during which grain was to be publicly exposed for sale it was expected that the grain would be sold to dealers who would store it in their houses.¹¹⁵ The subsequent sale of grain stockpiled in this way was regarded as a cause of unjustifiably high prices, but was common. By 1320 there was a general regulation against putting and selling grain in private houses and in secret places (*en measouns ou en muscettes*), evidently a common practice near the principal markets.¹¹⁶ Some of the Londoners who broke this rule also allowed commoners from out of town to sell grain in their houses, or sold such grain as if it was their own, a practice first explicitly forbidden during the famine of 1315-17.¹¹⁷ The fact that the Hanse merchants, by an agreement of 1282, had the special privilege of storing and selling grain in their dwellings and granaries reveals both that large-scale dealing often took place in such settings outside the public markets, and that the attempt to restrict the practice was of long standing.¹¹⁸

A good deal of the grain sold in London markets was not actually present there, but was represented by a sample, a further sign of the commercial sophistication of the system. Selling grain by sample is first known to have been forbidden in 1315-16, but its customary prohibition may have been long established by then.¹¹⁹ From subsequent prohibitions it seems that selling by sample was a practice especially associated with 'merchant strangers' who came to the city by land and by water and dealt in large quantities. Sometimes the merchants entrusted the samples to agents or servants, both Londoners and others, and then themselves purchased their own corn as a means of enhancing

¹¹² *Letter-Book G*, 77, 103; *Cal PMR 1364-81*, 124; *Letter-Book H*, 147; *Liber Albus* i, 460-1.

¹¹³ *Cal PMR 1323-64*, 160.

¹¹⁴ *Letter-Book G*, 225; *Cal PMR 1364-81*, 189-90.

¹¹⁵ *Letter-Book H*, 147: the term used is *hospitare*.

¹¹⁶ *Liber Albus* i, 261-2; the phrase *en musettes* is sometimes wrongly translated as 'in cellars': *Letter-Book G*, 225. See also *Letter-Book H*, 354.

¹¹⁷ *Letter-Book E*, 56; *Cal PMR 1323-64*, 160.

¹¹⁸ *Liber Albus* i, 487.

¹¹⁹ *Letter-Book E*, 56; *Liber Albus* i, 260-1.

the price. The latter practice, sometimes described as that of affeering (*afforare*) grain, was common among citizen commongers and bakers. In 1300, for example, a group of commongers put out grain on the Pavement to be sold by the bushel by their male and female servants, and then purchased it themselves. The affeering of grain appears to have been especially prevalent during years of relative plenty when prices were low. Londoners were guilty of the offence both with grain exposed in the market and with samples of stocks held elsewhere. By these methods grain was sometimes sold several times over in a single market-place.¹²⁰

In their attempt to police such transactions, especially between strangers, the authorities ordered freemen and strangers to stand apart from each other in the inland markets. Associated with that prohibition was another concerning the mixing of grain or malt.¹²¹ Apart from a concern over quality, that may point to the existence of yet another practice indicative of a developed market, namely that of intermediaries selling as a uniform commodity grain acquired from separate suppliers, whose ownership of a particular sack in the London market could thus no longer be identified.¹²²

While forestalling was strictly forbidden, it was recognized that London-based and other dealers should be free to buy grain in the country. In 1315-16 the authorities forbade what appears to have been the established practice among Londoners and strangers in the city of giving money to commongers who would buy grain in the country, and of paying the commongers a commission on their purchases. Later, commongers and retailers were forbidden from buying for resale in the city markets or outside, but if they wished to be corn merchants they were free to go and buy in the country, at the farm or in a barn, and to sell the grain in London, or, if they were free of the city, to keep it in a granary there.¹²³ The highly-profitable business of storing grain in the city so as to release it at peak demand was thus reserved to members of the citizen community, and to the Hanse merchants who had for long enjoyed many of the same privileges in London trade.

THE MARKET IN ITS HISTORICAL CONTEXT

In many respects the London grain market in 1300 resembles that described by F. J. Fisher for a period some three centuries later,¹²⁴ when London was at least twice the size it had been in 1300: the coexistence of suppliers and dealers on both a large and a small scale; wholesale and retail markets, each with distinctive characteristics; mercantile activity by both Londoners and outsiders;

¹²⁰ Cal EMC, 59; Letter-Book C, 58; Letter-Book E, 197; Letter-Book F, 101, 165-6; Cal PMR 1323-64, 160; Letter-Book G, 33, 103, 156, 196, 330; Cal PMR 1364-81, 124, 175, 221; Letter-Book H, 13.

¹²¹ Letter-Book G, 330; Liber Albus i, 433.

¹²² Cf. Cronon (1991), 107-19.

¹²³ Letter-Book E, 57; Letter-Book F, 102; Letter-Book G, 103.

¹²⁴ Fisher (1935).

and the distinctive role of middlemen. Buying and selling by sample, without the displacement of grain, regarded by Usher as a sign of a developed market,¹²⁵ was certainly practised in London c.1300. Fisher's suspicion that much of what he described existed 'in embryo' at an earlier period is more than justified. At least in grain, which was probably more crucial to the survival of the city in 1300 than in 1600, the London food market had reached a high level of sophistication. It is impossible, however, to estimate the degree to which the supply of grain to London in 1300 was in the hands of each of the several categories of dealers which participated in the trade. Superficially, it seems that in 1600 intermediaries based in market towns away from London occupied a greater share of the trade than at the earlier date. In 1300 the prominent figures seem to have been the London commongers, the most substantial of whom went out to the country markets and established bases there. On the other hand, it may be that with the increase in the consumption of ale and beer, and a shift towards the more expensive brewing grains, a new type of intermediary came to the fore. Moreover, the medieval sources are much less informative than later ones about dealers from the country, who on the whole remain anonymous in the London records. It is possible, for example, that the Faversham merchant and shipowner, Robert Dod, supplied grain directly to London as well as selling it to Londoners in Faversham, as he did in 1295. In the sixteenth and seventeenth centuries, with London's unprecedented growth as a national centre, the interests of such substantial local merchants were drawn more in the direction of the metropolitan market.

Even in the scale of their transactions, the greatest London commongers perhaps did not differ greatly from their counterparts c.1600. Usher contrasts the small size of transactions recorded for medieval Paris (for which he provides a very slender body of evidence), with seventeenth-century cases where merchants dealt with several hundred *muids* and had boats which carried 20-30 *muids* of corn.¹²⁶ These boatloads corresponded to between 129 and 193 quarters by English measure, a quantity which it would not have been uncommon for a London commonger of c.1300 to handle in a single transaction (Table 13). Commongers in partnership are known to have supplied to the English king with quantities equivalent to about 350 *muids* (2,250 quarters) on a single occasion, and so in total probably handled much larger quantities over the year. The records of coastal shipments of grain to London between 1580 and 1638 show that in any one year no more than six of the suppliers involved were responsible for more than 1,000 quarters in the course of a year, although there are indications that during the seventeenth and eighteenth centuries London's expanding grain trade was coming to be controlled by dealers who were

¹²⁵ Usher (1913), 120.

¹²⁶ Usher (1913), 45-6; Meuvret (1956).

TABLE 13

Grain purchases made by syndicates of London cornmongers on behalf of the Crown, 1295

Cornmongers' syndicates	Quantity purchased (to nearest quarter)		Areas where purchases made				
	Wheat	Oats	London	Berks. & Oxon	Kent	Shoebury (Ess)	Not known
1. John de Romene Geoffrey Hurel Adam Simmond	660	450	x	x	x	x	
2. Adam Wade Roger Hosebunde Robert Hod Roger le Palmer	464	573	x	x		x	
3. William de Ware	70	120	x	x	x		
4. John Wade John de Cantuaria	33	28					x
5. Richard le Barber	218	-	x		x		
6. Simon Bolmer Robert Bolmer	-	598					x
7. Adam de Hallingbury	168	160				x	
8. Henry le Boole	40	158					x

Sources: PRO, E101/5/13, 14.

increasing their share of the market.¹²⁷ Fisher concluded that by 1640, when London had perhaps 300-400,000 inhabitants, a 'class of grain merchants' had not emerged in London. In contemporary Paris, which was about the same size, no more than 20 persons could be described as merchants in grain, and they kept little in the way of stocks in reserve. Somewhat later, the Paris grain market was characterized by its numerous small-scale dealers, many of them bakers, who traded at local markets of all types in the region, and by its small number of merchant dealers, who traded on an irregular basis and tended to confine their activities to the country markets served by water transport.¹²⁸ That description could equally well apply to the distribution system which served late thirteenth-century London, a city which was less than a quarter the size of Paris in 1700. Indeed, the only really striking contrast between medieval London and

¹²⁷ Fisher (1935); Chartres (1986), 185-6.

¹²⁸ Boislsie (1881), 657-8, 661; Fisher (1935); cf. Kaplan (1984), 80-3, 123, 159-62.

seventeenth-century Paris in terms of their grain supply seems to lie in the proportion which bypassed the market by being sent directly to religious institutions, a figure which is likely to have been much higher for Paris than for London.

On the basis of these comparisons with much larger cities, it seems likely that very few substantial specialist cornmongers operated in medieval London at any one time. The scale of their mercantile activities cannot be estimated with any accuracy, but it might be hazarded, from the prosopographical evidence, that around 1300 no more than two or three London cornmongers handled more than 1,000 quarters of grain a year, the rest of the city's needs being supplied by a host of smaller or occasional dealers, including bakers, brewers and others. That seems in proportion to what is known of seventeenth-century London and Paris. While the 'middleman' may have been more obvious in the London grain market in 1600 than three centuries before, that development probably reflected the increased scale of the city's demand for grain rather than any radical innovation in the organization of the trade.

VII

LONDON'S IMPACT ON THE SPATIAL PATTERN OF GRAIN PRODUCTION

By the close of the thirteenth century London appears regularly to have drawn on an area of over 4,000 square miles to obtain an annual grain requirement estimated at between 107,000 and 222,000 quarters.¹ In years of shortage London commoners probably ranged far along the east and south coasts to obtain supplies, and in emergency supplies were imported from abroad,² but in normal years the city seems to have been able to satisfy its requirements from within a 60 to 90 mile radius. A sophisticated infrastructure had developed to service this trade, linking rural producers to urban consumers by means of a complex hierarchy of markets and dealers. The interaction between supply and demand expressed itself in the price at which grain was sold, with a 'London price' prevailing across a wide area. By implication, levels of economic rent similarly bore the imprint of London's influence. By that mechanism, London should in part have determined what was produced and the manner of its production. To what extent was this, in fact, the case? Did the choice of crops produced and the intensity of their production vary with transport-cost distance from London as von Thünen's model suggests they should?

The model incorporates two separate but related theories: a crop theory and an intensity theory.³ The former argues that with increasing distance from the central market it pays farmers to replace one crop with another. The latter demonstrates that economic rent is maximized if producers farm intensively near the central market and more extensively as distance from it increases. Obviously, specialization and intensity are interrelated, but it is nevertheless helpful to consider separately these two different aspects of London's potential impact upon grain production in the surrounding region c.1300.

CROP SPECIALIZATION

The overall pattern (Fig. 10)

The essence of von Thünen's crop theory, as clarified and elaborated by A. Lösch and E. S. Dunn, is that 'the crop that produces the greatest economic

¹ See above, 76.

² See above, 69-71.

³ Ongg (1982), 136-9.

TABLE 14

Mean sale prices of the principal grains in the London region, 1288-1315

Grain	Mean price in pence ¹		Relative price		Relative transport cost by volume ³	Relative price by volume corrected for transport
	By volume (per bushel)	By weight (per stone of 14 lb.) ²	By volume	By weight		
Wheat	8.6	2.27	100	100	100	100
Rye	7.1	1.95	83	86	96	86
Barley	6.5	1.98	76	87	86	88
Dredge	5.1	1.74	59	77	76	78
Oats	3.7	1.44	43	63	67	64

Sources: accounts database and Table 3.

¹ Calculated from sale prices in the accounts database over the period 1288-1315.² Based on the estimated weight of the grains c.1300: Table 3.³ Based on the estimated weight of the grains, although evidence from the 1290s suggests that the relative transport costs for wheat and oats (by land or water) were 100 and 75, respectively: Appendix III.

rent per unit area will occupy sites nearest the town; crops that yield a lower economic rent will be displaced to greater distances'.⁴ The rent-gradient of any one crop or commodity is largely a function of production costs, perishability, and transport costs as a proportion of the value of the crop at market. As far as the rent-gradients of the individual grains c.1300 are concerned, production costs in relation to the volume of output, at this date largely a function of labour inputs, were roughly constant. Ploughing and harvesting together accounted for the bulk of labour inputs: there was little difference in the labour requirements of the different grains for the former, although there were significant differences in the costs of threshing.⁵ Perishability, too, can be largely discounted as a source of rent-variation between the grains, except when they were processed into the perishable commodities represented by most types of bread and to a lesser extent by flour, whose rent-gradients declined abruptly with distance from the market.⁶ This leaves transport costs, reflecting the weight of the product, as the principal source of differences in the rent-gradients of wheat, rye, barley, and oats and their various mixtures. Here, as Table 14 demonstrates, there were some very real differences.

The principal grains differed from one another in both weight and value. Wheat, the preferred bread grain, commanded the highest price both per unit

⁴ Lösch (1954); Dunn (1967): as cited by Grigg (1982), 136.⁵ At Berkhamsted (Hrt) in 1296-7 wheat and maslin were threshed at 2.5d. per quarter, barley at 1.5d., dredge at 1.25d., and oats at 0.75d.: Midgley (1942), 20. At Malden (Sr) in 1300-1 barley was threshed at 2.5d. per quarter and oats at 1d.: Merton Coll., MM 4647. See also Campbell B M S and Overton (1991), 267.⁶ See above, 79-80.

volume and per unit value. Of all the grains it was therefore the most able to withstand the costs of transport and its rent-gradient was consequently the shallowest. Rye, the closest substitute for wheat, was the next highest in unit value. Barley and oats, by contrast, were significantly bulkier. Moreover, they yielded lower extraction rates than wheat and rye when milled into flour, and particularly low extraction rates when brewed into ale.⁷ Oats, the bulkiest and least valuable of the grains, had the steepest rent-gradient. As with other bulky, low-value commodities, such as hay, straw, and firewood, their commercial production needed to be concentrated close to the urban market.

Compensating to some degree for these differences in unit prices were differences in unit transport costs, for wheat and rye, as the densest grains, were the costliest per unit volume to transport, and oats the cheapest (Table 14). Moreover, the transportability of that portion of the barley and oats destined for brewing could have been further improved by first malting it. Both grains lost weight when made into malt and gained 'added value' from the malting process;⁸ this meant that it was cheaper to transport the malt than the unprocessed grain. By 1300 a significant quantity of barley produced in Norfolk, already established as England's premier barley-producing county, was marketed as malt.⁹ Barley cultivation in the county continued to expand; by the fifteenth century Norfolk barley was certainly sent to London from time to time, and it seems likely that the later practice, whereby London brewers obtained much of their barley in processed form as malt from Norfolk, was on the way to being established.¹⁰ Malting served to reduce the rent-gradient of brewing grains, yet it seems that at the beginning of the fourteenth century demesnes in the London region sold grain as malt only to a limited degree.¹¹ Likewise, evidence concerning London brewhouses suggests that they commonly malted their own grain. It is possible that the practice of sending already-malted grain to the London market developed first among the relatively small-scale traders who supplied the city overland from the north, and for whom the cost of transport would be especially significant.¹²

The effect of these differences in unit transport costs was marginally to narrow the gap between oats and the other grains and to endow rye and barley with very similar rent profiles, thereby bringing them into closer competition with each other; in other respects the basic order of the grains remains unchanged. Accordingly, other things being equal, if London was a major influence upon spatial patterns of cropping in its hinterland c.1300, oats should have attained its greatest relative importance closest to the city in transport-cost

⁷ Appendix II.

⁸ For a description of the malting process see, Brown J (1989), 504-5.

⁹ PRO, E101/574/4, 7, 8, 11.

¹⁰ Hallam (1988), 295; Britnell (1988), 134-9; Brown J (1989), 515.

¹¹ Cuxham, however, sold much of its barley and dredge in malted form after 1300, Harvey P D A (1985), 48. For other indications, see above, 54, and below, 164.

¹² See above 30, 80.

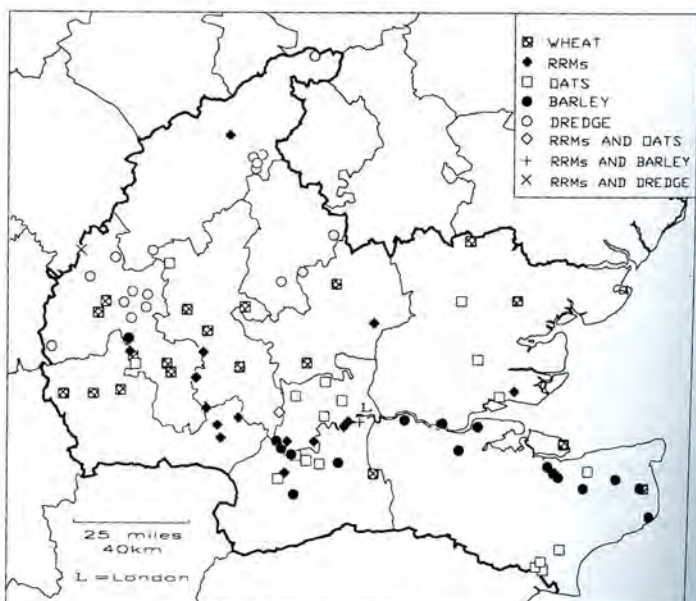


FIG. 10. Grain cultivation in the London region: demesnes above the top decile for the percentage of grain acreage under the principal grain crops, 1288-1315

Source: accounts database. The top decile values for each crop are: wheat, 50.6 per cent; rye and rye mixtures (RRM's), 33.5 per cent; barley, 31.5 per cent; dredge, 23.2 per cent; oats, 50.8 per cent. For the mean values, see Table 1.

terms, and wheat furthest, with barley and rye occupying intermediate locations. To what extent was this actually the case?

The simplest and most effective way of measuring the degree of crop specialization within the grain sector is in terms of each crop's share of the total grain acreage. A summary picture can be obtained by identifying those demesnes which specialized most in a particular grain, by comparison with other demesnes in the London region. Figure 10 maps, for each of the principal grain crops and grain mixtures, the 10 per cent of demesnes¹³ cultivating that crop which had the most pronounced bias towards its cultivation, as measured by percentage of total grain acreage. A picture of considerable spatial differentiation is thereby revealed. Only dredge cultivation (a specialism of Northamptonshire, Bedfordshire, and north and west Oxfordshire) exhibits little relation with the London market. So far as it is possible to tell, dredge was not marketed in any quantity in London at this period.¹⁴ Consequently, the distribution of those demesnes where it assumed some significance may

¹³ Those with values greater than the top decile.

¹⁴ See above, 25 and below, 161-3.

demarcate those parts of the region where London's influence on grain production was weak or non-existent. In contrast, and with remarkably few exceptions, those demesnes which grew rye and rye mixtures, barley, and oats on the largest scale were concentrated within the 6.3 pence transport-cost isopleth of London (Fig. 7). Within this area large-scale cultivation of rye and rye mixtures (the cheaper bread grains) was very much a specialism of Thames valley demesnes upstream of London. Between London and Staines the cultivation of rye and rye mixtures vied with that of barley, but below London, and extending into northern and eastern Kent, barley attained greatest prominence. Several of these barley-producing demesnes were at a considerable remove from London, but may have benefited from the fact that transport costs per bushel were lower for barley, especially in its malted form, than for rye and wheat. Some of those demesnes may also have benefited from the lower cost of coastal than river transport, although the voyage up the river would still have occupied the greater part of the journey.¹⁵ More important, perhaps, was the fact that the low costs of shipping (Table 17) opened them to the influence of substantial markets overseas. Transport costs as a proportion of the mean price per bushel were lowest of all for oats, hence the many demesnes in Middlesex and Surrey, close to London in cost-distance terms, which grew oats on an exceptionally large scale. In this respect the contrast with wheat could not be more complete. Those demesnes which sowed the largest proportion of their grain acreage with wheat were located at some remove from London and sometimes at a remove from the river arteries which served it (cf. Fig. 16).

The spatial dichotomy between oats and wheat is underlined by the pattern of a purveyance in Essex and Hertfordshire in 1296-7, when the grains were assembled in great ships lying well out in the Thames estuary. Oats were purchased in larger quantities than wheat close to the points of embarkation (which included places on the River Lea and along the Thames and its estuary), while wheat was purchased in larger quantities at a distance. This seems to indicate both the local availability of the grains (itself at least in part determined by the demands of London) and the appropriate strategy for purchasers on that occasion.¹⁶ Patterns of production and sale around Henley-on-Thames reveal a similar discrimination between wheat on the one hand and oats, along with rye and rye mixtures, on the other. In this case the 'metropolitan pattern' was perhaps reproduced on a small scale around a distant market centre, upon which the demands of the city had a special impact.

While the identification of demesnes above the top decile for relative acreage devoted to a particular grain is a useful measure of the extremes of specialization, it cannot bring out the subtle balance between crops which characterized most demesnes. Moreover, the presence of a demesne among the top 10 per cent growing a particular grain does not necessarily mean that that

¹⁵ See above, 60-3; and Appendix III.

¹⁶ *MO*, E101/556/3.

grain was the most important one on that demesne. This is confirmed by systematic analysis of each of the principal grains.

Oats (Fig. 12)

Oats were required in great quantity by London and by the market centres of its hinterland which serviced the traffic generated by the city. They were used both for fodder and for brewing, and were the grain least able to withstand the costs of transport. For commercial production, therefore, they should have been most closely tied to locations near London. On-the-farm requirements of fodder and food livery ensured that oats were grown on most demesnes in the region (Tables 1, 7, 16), and on 61 out of the 198 database demesnes they occupied the largest sown acreage. Those western parts of the region which retained a heavy reliance upon oxen rather than horses for traction grew relatively little oats,¹⁷ but on many of the demesnes there, and on others in Bedfordshire and north-eastern Northamptonshire, the limited importance of the crop was also in part a reflection of the greater importance of dredge (cf. Fig. 13). On demesnes where both crops were grown oats were probably reserved exclusively for fodder, with dredge being substituted for brewing. But some demesnes were so oat-deficient that dredge may also have been used for fodder. In parts of the Thames valley and northern Kent, where horses made a significantly greater contribution to haulage and traction, and there was a high demand for fodder grains, pure barley seems to have been preferred to both dredge and oats as the malting grain. Nevertheless, in areas where the share of acreage sown with oats was larger (much of Essex, Hertfordshire, Middlesex, and possibly around the margins of the Kent and Sussex Weald), the crop retained its traditional dual function as a fodder grain and one which though not often malted on demesnes was probably ultimately used in brewing. Oats are more tolerant of heavy or water-logged soils than the other grains, and it is possible to interpret the substantial acreages devoted to the crop in those districts as a response to this environmental factor (Fig. 11). That was most clearly the case on the Romney Marsh demesnes of southern Kent and on the coastal marshes of Essex. Here, physical conditions strongly influenced crop choice, for large-scale cultivation of oats was an integral component of the reclamation process: only as the land dried out did the initial cultivation of oats give way to that of wheat and barley.¹⁸

Elsewhere, however, environmental factors alone are an insufficient explanation of the scale of oats cultivation. Over the country as a whole oats occupied an estimated 36 per cent of the grain acreage,¹⁹ and in the London region the proportion was 33 per cent. Yet, on 23 of the 198 database demesnes for which the calculation can be made oats occupied at least 50 per cent of the grain acreage. These 23 demesnes embraced a variety of soil types, from light

¹⁷ See above, 56-7.

¹⁸ Smith R A L (1943), 177-8; Smith A (1963), 152.

¹⁹ Campbell B M S (1991a), 167.

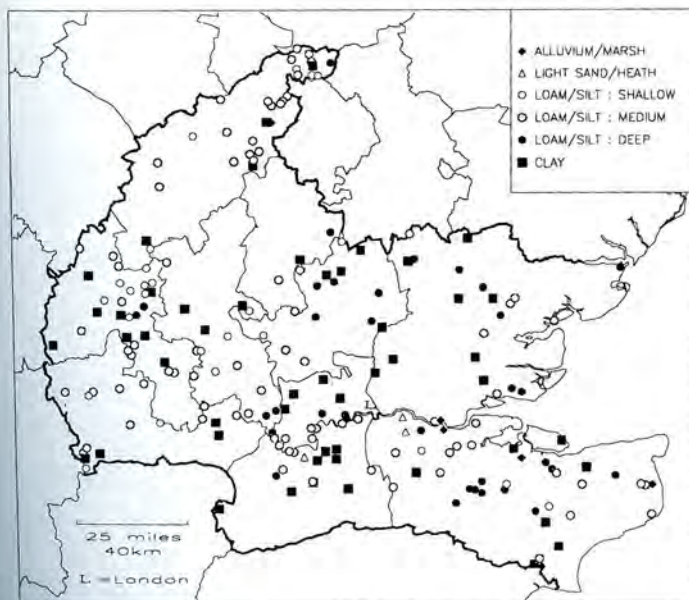


FIG. 11. Soil types in the London region

Source: see text (22 and n.).

sand through to clay, although with deep loams and clay predominating on 19 of them (Fig. 11). Nevertheless, by no means all heavy-soil demesnes grew oats on this scale. In Middlesex and northern Surrey, where some of the largest proportions of acreage devoted to oats are recorded, the range of soil types involved was particularly wide, although in both counties demesnes on clay soils were associated with the cultivation of oats while those on lighter soils (especially in south-west Middlesex) had other specialisms. Such a heavy concentration on the cultivation of oats (well above the national average and comparable with levels prevailing in the cooler and damper north and west of the country), is without parallel in lowland England. Ruislip, Edgware, and Hampstead (all on clay soils in Mx) had respectively 58 per cent, 60 per cent, and 65 per cent of their grain acreages under oats. The highly-individual cropping regimes implied by these proportions were presumably the product of an interplay between soils and the special market conditions created by the need to satisfy London's requirement for fodder with grain produced as close as possible to the city. The patterns of disposal from these three demesnes do not suggest that they were geared exclusively, or even largely, towards production for the market, rather the demesnes appear to reflect a local specialism which had been moulded by metropolitan demand. A similar imperative may account for the small group of demesnes near Oxford where large proportions of the

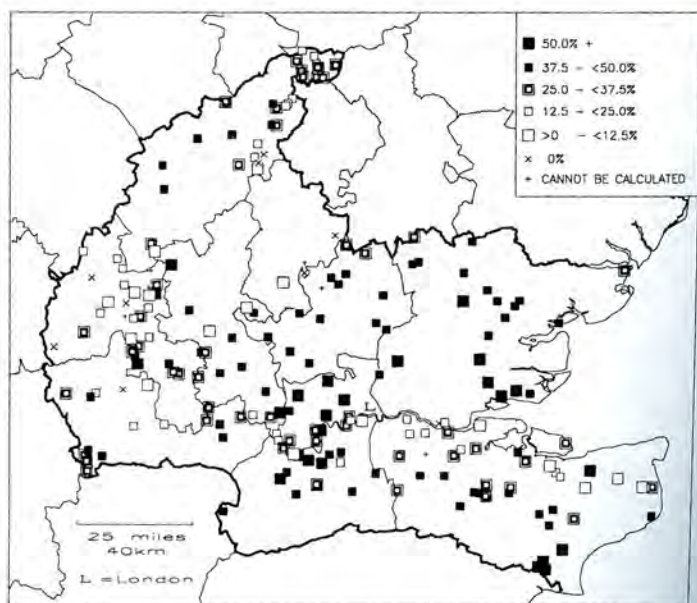


FIG. 12. Acreage sown with oats as a percentage of the grain acreage on demesnes in the London region, 1288-1315

Source: accounts database.

sown acreage were devoted to oats,²⁰ and perhaps for the single manor in the same category two miles from Canterbury.²¹ The demands of the traffic passing through the countryside *en route* to London, and probably also to intermediate markets such as Henley which supplied the city by water routes, as well as the city's own requirements, may have permeated Essex (perhaps especially the south-eastern part of the county), Hertfordshire, southern Buckinghamshire, and even parts of east Berkshire, where oats were also grown in above-average quantities as the spring course within a predominantly three-course system of cropping.²² At these greater distances there would have been a corresponding incentive to send it ready-malted for brewing rather than unprocessed for fodder, but by 1300 this seems only to have had a limited effect.²³

²⁰ The highest proportion was at Nuneham, the most distant of the manors from Oxford, but the only one to include a substantial area of clay.

²¹ Blean, situated on loam next to an area of clay.

²² In 1295 London commoners were able to buy large quantities of oats in the markets of Henley and Reading: see above, 92 and Table 6. In the purveyance of 1296-7, oats represented 45 per cent of the grain purchased in Essex and 28 per cent of that in Hertfordshire: PRO, E101/556/3.

²³ On the trade in malt sent to London, see above, 30, 54, 80, 113.

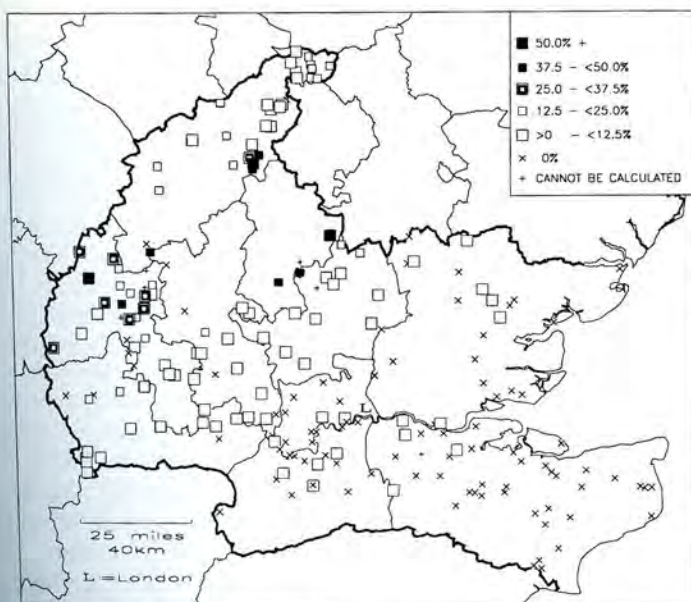


FIG. 13: Acreage sown with dredge as a percentage of the grain acreage on demesnes in the London region, 1288-1315

Source: accounts database.

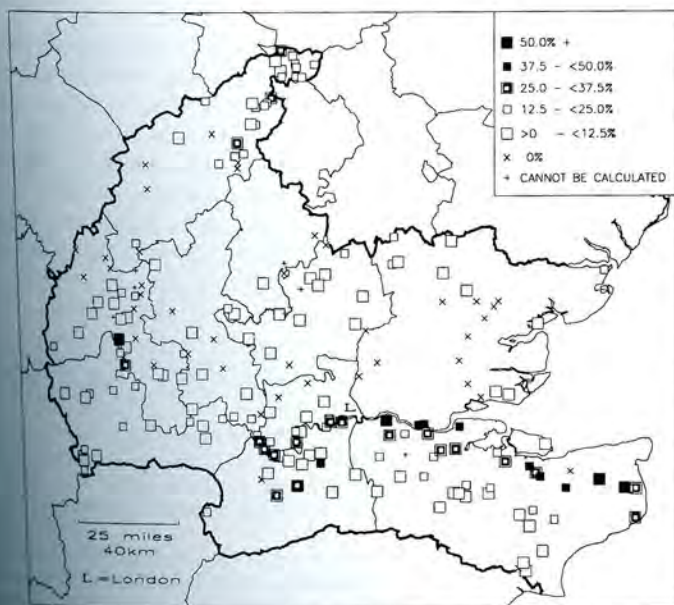


FIG. 14: Acreage sown with barley as a percentage of the grain acreage on demesnes in the London region, 1288-1315

Source: accounts database.

Dredge and barley (Figs. 13, 14)

By the late thirteenth century the substitution of barley for oats in brewing was well under way.²⁴ In some parts of the country this was effected by devoting an increasing proportion of the grain acreage to dredge, a mixture of the two grains. But this found little favour in London's immediate hinterland. On no database demesne south-east of the Chiltern scarp did dredge occupy more than an eighth of the grain area, and in much of Essex, Middlesex, Surrey, and Kent the crop was absent. Only in Bedfordshire, parts of Northamptonshire, and western and northern Oxfordshire did dredge assume greater significance, and on seven demesnes there it was the leading crop in terms of sown area.²⁵ Nearer to London, it appears that barley was the preferred substitute for oats in brewing.

Barley occupied an estimated 16 per cent of the grain acreage in the country as a whole, but only 13 per cent in the London region. While the cultivation of oats was almost universal in the region, one out of five demesnes grew no barley at all. As a crop it was least important in those areas where the alternative spring-sown grains, oats and dredge, were most firmly established. This was partly due to the natural environment, for barley did best on light to medium silts and loams; indeed, 14 of the 19 demesnes which grew most barley were located on such soils (cf. Fig. 11). Considerations of economic rent also placed a premium upon cultivating the lower-valued oats closer to the London market. In some areas, notably in Surrey, large-scale barley production thus seems to have been associated with areas of appropriate silt and loam soils at a slightly greater remove from the city.

Within the London region the foremost area of barley production took the shape of a band which followed the Thames valley and estuary 90 miles eastwards from Staines (Mx) to Sandwich (K), and extended inland a distance of about 10 miles from the river and coast.²⁶ Here was a distinctive group of demesnes which devoted over 25 per cent of their grain acreage to barley. While the accounts evidence is fuller for the Kent than the Essex side of the estuary, it is plain that an emphasis upon barley production was a feature of both sides of the river.²⁷ Grays Thurrock and West Thurrock (Ess) had respectively 39 per

²⁴ See above, 24-5.

²⁵ The demesnes where the largest share of the grain acreage was devoted to dredge were Kirtlington (O) and Pegsdon (Bd), both 49.6 per cent; Millow (Bd), 50.6 per cent; and Little Thre (O), 54.1 per cent.

²⁶ The coastwise distribution of barley production for the London market possibly extended yet further, as witnessed by the heavy emphasis upon production of high-quality malting barley in the immediate hinterlands of the Norfolk ports of Yarmouth and Blakeney, with which London had regular contact, although perhaps not in the grain trade before the later fourteenth century: Campbell B M S and Overton (forthcoming); above, 113.

²⁷ London was a major market for barley, much of which may have been shipped from the East ports (above, 25, 89, 95). Since the inland markets in the city were the ones where malt is known to have been traded in this period, it would appear that much of the barley shipped to London was to be

cent and 45 per cent of their grain acreages under barley, and the purveyors of grain in Essex and Hertfordshire in 1296-7 concentrated their purchasing of barley in the Essex hundreds along the Thames rather than the inland parts of the county.²⁸ Barley was the leading crop on many Kentish demesnes, occupying a greater share of the sown acreage than any other grain, and at Lessness, Ickham, and Eastry it occupied over half of the grain acreage. The single most barley-oriented demesne lay outside this zone: on the Merton College demesne of Holywell just outside Oxford 65 per cent of the grain acreage was under the crop. As the home farm of a major urban household, however, this is possibly a manifestation of a general rule that specialization in barley production in the London region was largely a response to urban demand. London's demand was much greater than that of Oxford, and seems to have had a particular influence in the vicinity of the capital. The pattern of barley production in Kent, however, seems to have been influenced by forces in addition to London's demand, perhaps including markets which lay to the east rather than to the west of the county. The easterly focus of the demand for barley, in areas of Kent more distant from London than the focus of the demand for wheat, is indicated by the decision of Canterbury Cathedral Priory to devote large acreages to the crop on its east Kent demesnes. Much of that barley was consumed by the priory, which nevertheless purchased over 40 per cent of its total requirement, a further indication of the scale of the barley market in east Kent.

Rye and rye mixtures (Fig. 15)

The demesnes which devoted substantial proportions of their grain acreages to rye and to mixtures of rye and wheat and rye and winter barley (known as maslin and mancorn, respectively) also had a Thames-side distribution, but were concentrated upstream of London. While rye and maslin predominated in Surrey and Middlesex, a cluster of demesnes near Henley specialized in the cultivation of mancorn, which at Culham (Brk) occupied 45 per cent of the grain area. These grains would have been widely used by the bakers who produced the cheaper grades of bread, and would have been required in some quantity by London.²⁹ Nationally, rye and rye mixtures were minority crops on seigneurial demesnes: they occupied only 8 per cent of the grain acreage, were the leading crop on only 2 per cent of demesnes, and generally only attained any significance in parts of the country such as the sandy Breckland of East Anglia which were unsuitable for the cultivation of wheat.³⁰ Within the London region, however, rye and its mixtures were the leading crop on 9 per cent of demesnes,

²⁸ malted form (above, 30), although the large-scale trade in raw grain at the riverside markets may have rendered invisible a smaller trade in malt.

²⁹ PRO, E101/556/3.

³⁰ See above, 26.

³¹ Campbell B M S (1991a), 167 (and national sample of accounts on which these figures are based); Bailey (1989), 138-9.

and roughly six out of ten demesnes grew some rye in pure or mixed form, often as a food livery for the manorial workforce (Table 15). Overall, they accounted for 10 per cent of the total grain acreage. On a significant group of demesnes, moreover, the acreages sown were well above the national and regional averages. On 22 demesnes rye and rye mixtures occupied over a quarter of the grain acreage, on nine over 37.5 per cent, and on Sibford Gower (O) and West Thurrock (Ess) over half.³¹ Twenty-eight of these 33 demesnes lay well within provisioning range of London: 24 were located in or near the Thames valley upstream of London, extending as far west as Hampstead Norreys (Brk) and Bledlow (Bk); three were on the Essex coast; and one, Great Amwell (Hrt), was on the River Lea. Of the few remaining demesnes which devoted substantial proportions of their acreage to rye and rye mixtures, Kennington (Brk) was strategically located close to Oxford.

As with oats and barley, these specialist rye-growing demesnes were closely associated with a particular soil type, in this case the shallower and lighter silts and loams, including those of inferior quality.³² But there were some notable exceptions, and demesnes with equivalent soils elsewhere in the region rarely cultivated rye on the same scale; so soils alone, although a predisposing factor, cannot explain this specialism. A decisive influence was access to the London market.³³ Virtually all those demesnes which specialized in rye and rye mixtures lay at a relatively low transport-cost distance from London, or perhaps had a similar relationship to Henley, and were well placed to take advantage of the cheap bulk transport afforded by the Thames. A group of demesnes to the west of London may have used the market at Uxbridge and the main Oxford road as the means of transferring their substantial produce of rye to the capital.³⁴ In fact, in transport-cost terms these rye-producing demesnes were located at much the same distance from London as those which concentrated on barley, and in Middlesex and Surrey there was an overlap between the two specialisms. This underscores the close similarity in unit price (Table 14) and rent-gradient between the two crops. Whether demesnes developed either or both specialisms therefore depended in part upon predisposing environmental factors, but also upon other attributes of the husbandry systems of which grain production formed part. Thus on the barley-producing demesnes of Kent, where rye was of little or no significance, husbandry was generally more intensive than that on the rye-producing demesnes of the Thames valley above London.³⁵ Moreover, Kent was open to a wider range of market influences than that inland area.

³¹ West Thurrock, however, was a very small demesne, with only 21.5 sown acres.

³² Rye is normally viewed as a hardy crop able to withstand cold, a short growing season, and sandy, poor, or acid soils: Ashley (1928), 199-200.

³³ Urban demand for animal bedding may also have been a factor, as rye straw was considered superior to wheat for the purpose: Ashley (1928), 199-200.

³⁴ Indicated by the substantial proportions of the acreage devoted to rye crops at Colham (Mx) and Iwer and Langley (Bk).

³⁵ See below, 138-41.

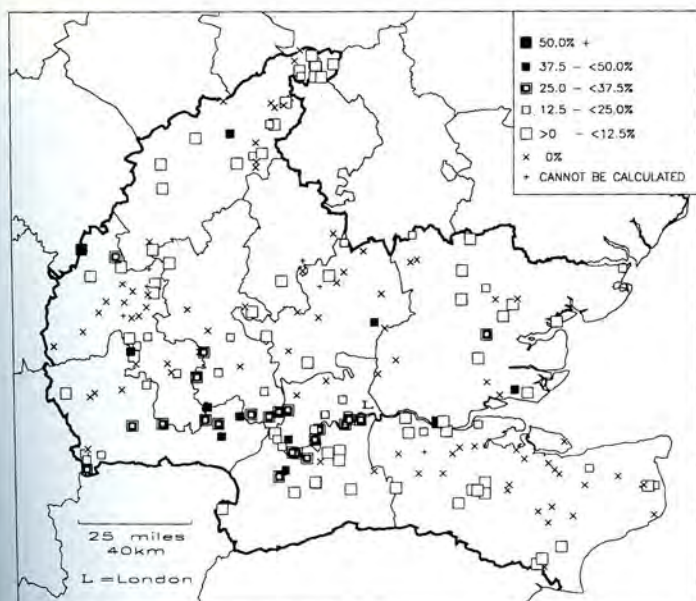


FIG. 15. Acreage sown with rye and rye mixtures as a percentage of the grain acreage on demesnes in the London region, 1288-1315

Source: accounts database.

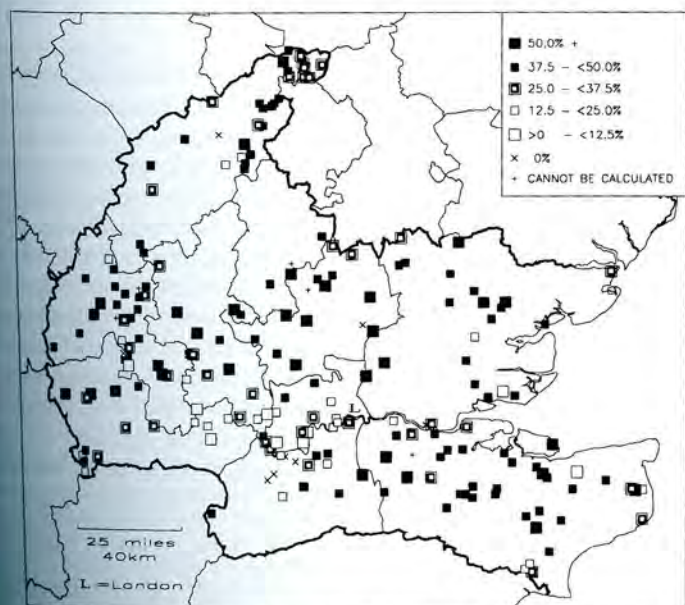


FIG. 16. Acreage sown with wheat as a percentage of the grain acreage on demesnes in the London region, 1288-1315

Source: accounts database.

Wheat (Fig. 16)

Wheat and rye, both winter-sown and both occupying the same basic place in rotations, were alternative specialisms, in the same way as were oats and barley. There was a clear inverse relationship between the cultivation of wheat, the premier bread grain, and its cheaper rye-based substitutes (cf. Fig. 15). Specialist rye production close to London complemented large-scale wheat production further out.³⁶ Exceptionally large sowings of spring-sown oats and barley on demesnes close to the capital were similarly related to the more distant winter-sown sector (Fig. 19). The most striking feature of the pattern of wheat production in the London region, therefore, was its relative insignificance on demesnes in the immediate vicinity of the city and on those within the Thames valley area downstream from Reading. Most demesnes in this district devoted less than a quarter of their grain acreage to the crop, several less than 12.5 per cent, and Byfleet, Esher, Pyrford and Walton-on-Thames (all Sr) grew no wheat at all in the years sampled. There seems also to have been a distinctive absence of wheat cultivation in the immediate neighbourhood of Henley. This is the opposite of Gras's assertion that from an early date 'wheat predominated in the Thames valley'.³⁷

Wheat, the grain commanding the highest price and with the shallowest rent-gradient, was therefore the crop which attained its greatest scale of cultivation at the furthest remove from the city where it was most in demand. This accords with the predictions of von Thünen's crop theory. Nevertheless, wheat's high status as a bread grain ensured its widespread cultivation on demesnes throughout the region. It was grown on 95 per cent of database demesnes, occupied 37 per cent of the total grain area (a proportion almost identical to the national average of 36 per cent),³⁸ and was the most important grain crop on 102 of the 198 database demesnes where this can be measured. In all ten of the counties of the London region there were some demesnes which sowed an above average proportion of their grain acreage with wheat; in Kent, Essex, Hertfordshire, and Oxfordshire, however, this was true of the great majority.

At more than 50 per cent of the grain acreage, however, wheat cultivation ran into constraints imposed by the nature of prevailing rotational systems. Up to that level wheat functioned well as the winter course in a three-course system of cropping, as was plainly the case in parts of Kent and much of Essex and Hertfordshire.³⁹ Significantly larger proportions, such as the 62 per cent and the 69 per cent at Cheddington (Bk) and Wantage (Brk), respectively,⁴⁰ were only

³⁶ The superior economic rent generated by rye cultivation and, therefore, its profitability close to the city is borne out by the valuation of 37 acres sown with wheat on the bishop of London's demesne of Fulham in 1304 at 2s. 8d. an acre, compared with 85 acres sown with rye valued at 3s. 0d. an acre: Hale and Ellacombe (1874), 61-2.

³⁷ Gras (1915), 37.

³⁸ Campbell B M S (1991a), 167.

³⁹ See below, 138-9.

⁴⁰ There was a similarly large proportion at Ham (K), where there were only 18 sown acres.

compatible with some version of the more extensive two-course rotation.⁴¹ The presence of such rotations possibly helps to explain the high proportions sown with wheat on certain demesnes in west Berkshire, mid Oxfordshire, and mid Buckinghamshire.⁴² These demesnes lay at the western, inland limit of the hinterland from which London regularly derived its grain supplies and may have responded to the demands of the metropolitan market by maximizing the area sown with the crop most able to withstand transport costs. A part of the outer limit of that supply zone seems to be defined by the band of demesnes with substantial proportions of their acreage devoted to wheat which extends along the foot of the chalk scarp (but also includes some manors in the Chiltern Hills) from the Vale of White Horse in the west to the Vale of Aylesbury, and thence into north-eastern Hertfordshire and northern Essex. There seems to have been a corresponding band of wheat-producing demesnes to the south of the city, with a similar relationship to the southern edge of the North Downs.

The wider geographical extent of large-scale wheat production, as compared with that of the other crops which London required, bears witness both to the scale of the capital's demand for wheat and its greater capacity to bear the costs of carriage. It is striking that in both Kent and Essex the proportions sown with wheat tend to increase with distance from the coast. Five centuries later, in the 1830s, London imported high-quality wheat from a distance up to two-and-a-half times greater than that from which fodder crops were obtained.⁴³ On the evidence surveyed above a similar spatial relationship existed in the London region c.1300.

Yields of wheat and oats (Figs. 17, 18)

Specialization was, however, in part a function of the rate of production as well as of the proportion of the area devoted to a particular crop. Many demesnes that sowed large acreages reaped low yields, and vice versa. Net yields per acre of wheat and oats (the most widely grown and therefore most representative winter and spring grains), calculated by the 'internal method' and classified into quartile groupings, illustrate the range and pattern of yield variation that existed within the London region.⁴⁴ Demesne yield levels show no clear correspondence with the relative acreages under wheat and oats. Low yields characterized many of the demesnes in Essex and Hertfordshire which sowed above average proportions with wheat. Similarly, demesnes in Middlesex and Surrey which devoted exceptionally large shares of the acreage to oats obtained yields per acre which were mostly well below the median for the region as a whole.

⁴¹ Differences between the regimes at these two demesnes are indicated by the distinctive use of legumes at Cheddington. On two- versus three-course rotations, see Fox (1986).

⁴² Gray (1915), 450-509.

⁴³ Peet (1969), 295; Peet (1972), 6.

⁴⁴ See above, 39-41.

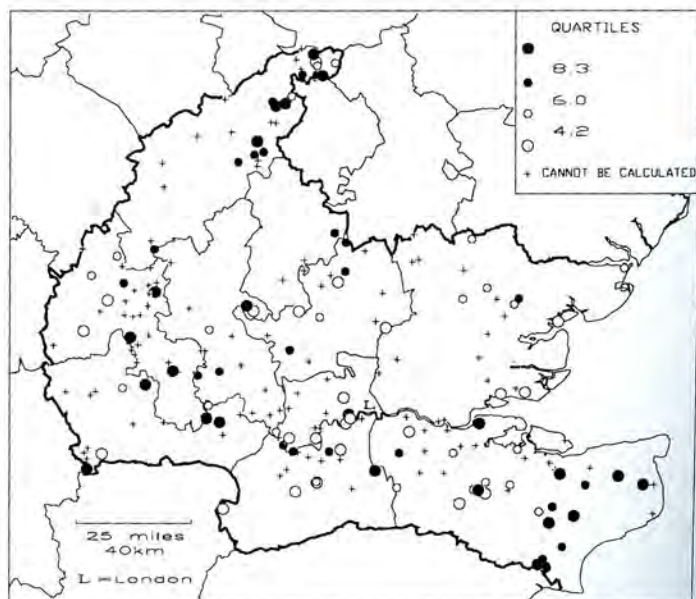


FIG. 17. Estimated yields of wheat, in bushels per acre net of seed and tithe, on demesnes in the London region, 1288-1315

Source: accounts database. Calculated by the 'internal method' (see 39-41).

Two areas, at the northern and eastern limits of the region, are distinctive for yields of both wheat and oats above the median. Northern Northamptonshire was a district which in most years was well beyond the bounds of London's supply zone, although it was open to the influence of international markets through the ports of the Wash. Eastern Kent was probably a major supplier to London and to other large markets, as is indicated by the evidence concerning Faversham, Sandwich, and other busy ports in the county. In the former area, yields of both crops were often twice those obtaining on lower-yielding demesnes elsewhere in the region, and in the latter often three times as high. Ickham (K), for instance, obtained a wheat yield of 17.8 bushels per acre net of seed and tithes, which compares with yields of 10.5 and 9.3 bushels at Cuxham (O) and Brightwell (Brk), respectively, in the moderately high-yielding countryside on both sides of the Thames near Wallingford (Brk), and with 6.0 bushels at Wheathampstead (Hrt). Ickham, like other demesnes in east Kent, was only just above the mean for the region in terms of the proportion of its acreage devoted to wheat,⁴⁵ but it more than made up for that with the high yields it obtained. Thus, it took 104 sown acres to produce at Cuxham the same quantity of wheat produced from 100 sown acres at Ickham. At Brightwell,

⁴⁵ At Ickham 38.7 per cent of the grain acreage was devoted to wheat.

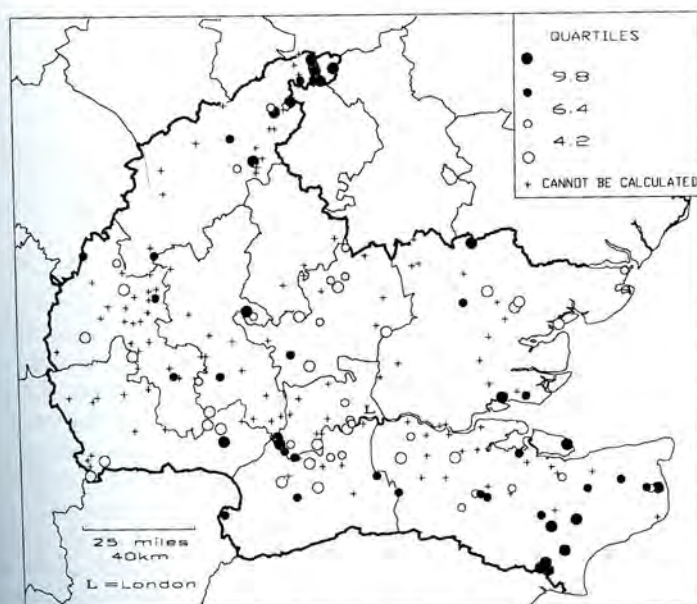


FIG. 18. Estimated yields of oats, in bushels per acre net of seed and tithe, on demesnes in the London region, 1288-1315

Source: accounts database. Calculated by the 'internal method' (see 39-41).

where yields were lower, it took 145 sown acres to produce an equivalent quantity, and at Wheathampstead, where yields were lower still, the corresponding acreage was 179.⁴⁶ In terms of acres sown with wheat, it took 170 acres at Cuxham, 191 at Brightwell, and 297 at Wheathampstead to produce the same quantity as that produced by 100 acres at Ickham. High yields transformed east Kent into a major producer of wheat which could well have been more important than those parts of Essex, Hertfordshire, Buckinghamshire, and Berkshire which devoted a larger proportion of the acreage to the crop.

London, England's greatest single market for grain, was situated in the midst of a countryside where yields of wheat and oats were relatively low. They were particularly low in Middlesex and Surrey, apart from the string of demesnes along the Thames terraces. Nor were yields much better in Essex and Hertfordshire, from which the city drew grain. Yields of both crops were generally better further west, in those parts of Buckinghamshire, Oxfordshire, and Berkshire for which Henley provided a convenient market. The mechanism of economic rent, in combination with predisposing environmental factors and the opportunity for bulk transportation, may have promoted better-yielding

⁴⁶ At Ickham 30.1 per cent of the sown acreage was devoted to wheat, at Cuxham 49.2 per cent, at Brightwell 41.3 per cent, and at Wheathampstead 49.8 per cent.

systems in those areas, and the complementary evolution of Henley as an *entrepôt*.

The moderate yields of these western districts nevertheless contrast sharply with the higher yields of the eastern parts of the elongated region, with an east-west axis, which transport costs and other evidence indicate constituted London's primary grain provisioning zone. To what extent did London influence the adoption of the more productive systems of cultivation in those localities where its demand for grain is known to have been concentrated?

INTENSITY OF CROPPING

According to von Thünen's land-use model, the intensity of crop production changes with distance from the town. 'Farmers who wish to maximize profit will increase their inputs until the cost of the marginal input equals marginal revenue. As prices rise going towards the town inputs will thus be increased; as the price received by the farmer falls with increasing distance from the town, inputs will be reduced'.⁴⁷ Of the six basic zones of commercial agriculture that he identified, four (Zones 1, 3, 4, and 5) produced grain for sale in the town.⁴⁸ Of the combined area of these four zones, Zone 1 ('free cash cropping') represented 2 per cent, Zone 3 ('crop alternation') 4 per cent, Zone 4 (the 'improved system') 54 per cent, and Zone 5 (the 'three-field system') 40 per cent.⁴⁹ For von Thünen, a farmer who employed predominantly organic and animate techniques on his own estate near Rostock in Germany, what differentiated these four husbandry types was their contrasting levels of labour input per unit area. This derived in the first instance from the frequency with which the land was cropped, for each of these four grain production systems differed in their fallowing practices and in the associated methods employed to maintain soil fertility.⁵⁰

Fallowing was eliminated in Zones 1 and 3. Soil fertility was maintained in the former by heavy applications of urban manure, and in the latter by 'on-the-farm' methods. Prominent among the latter methods was the cultivation of leguminous fodder crops, which both helped maintain nitrogen levels within the soil and enabled higher densities of livestock to be supported, with consequent benefits for manure supplies.⁵¹ The systems employed in both zones involved a heavy demand for labour. Von Thünen acknowledged that the intensive crop alternation regime of Zone 3 was only supportable on the most fertile soils. Consequently, while many of the same methods were also a feature of Zone 4, they were not there taken to such extremes, and fallowing was retained.

⁴⁷ Grigg (1982), 136.

⁴⁸ For the Zones, see above, 5, 6.

⁴⁹ Calculated from the radii given in Grigg (1982), 139.

⁵⁰ See above, 5, 6; cf. Boserup (1965), 15-27, for a classification of farming systems and agricultural intensity based on the frequency of fallowing.

⁵¹ For a discussion of the importance of nitrogen supplies and methods of maintaining them, see Shiel (1991).

although on an irregular basis and often in the periodic form associated with convertible husbandry and highly flexible rotations. Only in Zone 5 did fallowing occur on a regular and relatively frequent basis in conjunction with rotations of corresponding regularity. The recurrent, triennial fallow course, open to communal use, was the organizing principle of the commonfield system in this zone, and was the principal means by which soil fertility was maintained, while manuring and fodder cropping were of limited importance.⁵²

Fallowing practice as a measure of intensity

Manorial accounts generally contain information only on the land that was being sown. Occasionally they provide details from which it is possible to reconstruct rotations and to infer fallowing arrangements,⁵³ but that is a time-consuming task possible only for a few demesnes. More helpful as a source for the incidence of fallowing are the IPMs, which sometimes state when land could be sown every year or give the proportion that lay fallow. There are sufficient references to demonstrate the range of practice within the region. Thus, two-course cropping is implied at Dunton (Bd) and Langham (Ess), where half the arable was sown and half left fallow.⁵⁴ Sulham (Brk) sowed two-thirds of its arable and fallowed the remainder in a classic three-course rotation, and at Wilderton (K) the whole of the arable could be sown every year.⁵⁵

Medieval farmers generally lengthened cropping sequences and reduced the incidence of fallowing by increasing the number of spring courses in the rotation. This was partly because the winter grains (wheat, rye, winter barley, and mixtures of the same) demanded higher soil fertility, but also because the spring-sown grains (barley, oats, and dredge) offered the opportunity of half-year fallowing, and allowed more time for soil preparation between successive courses. For instance, under two-course cropping, one of the least intensive systems, winter-sown bread grains usually occupied well over half of the grain acreage.⁵⁶ Within the more intensive three-course system, however, equal proportions of winter and spring grains were sown, while within the most intensive medieval rotations which are known between two-thirds and three-quarters of the grain acreage was devoted to spring grains.⁵⁷ This suggests that the relative acreage of winter and spring grains may be used as an indirect but readily-calculated and widely available measure of the frequency and, therefore, of the intensity of cropping. It has been computed for all 198 demesnes with relevant crop information in the accounts database (Fig. 19).

⁵² Fox (1984).

⁵³ Cf. Brandon (1971a), 71-8. Fifteen per cent of the accounts in the database specify the names of the fields within which crops were sown; in order to reconstruct rotations, however, runs of consecutive accounts with such information are needed.

⁵⁴ PRO, C135/31(24), 44(4).

⁵⁵ PRO, C135/35(35), 56.

⁵⁶ Hallam (1988), 329.

⁵⁷ Campbell B M S (1991a), 166-7; Campbell B M S and Overton (forthcoming).

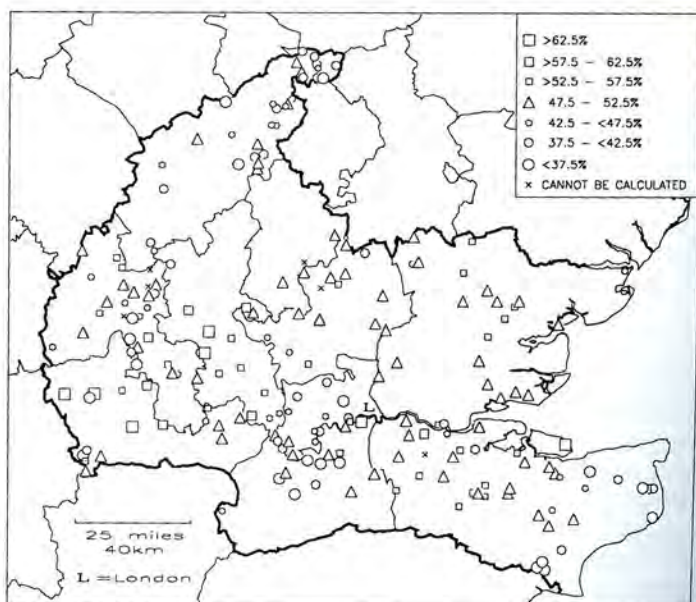


FIG. 19. Acreage sown with winter-sown grains as a percentage of the grain acreage on demesnes in the London region, 1288-1315

Source: accounts database. The winter-sown grains are wheat, rye, and rye mixtures; barley is assumed to have been sown in spring, except in the small number of cases where it is stated to have been sown in winter.

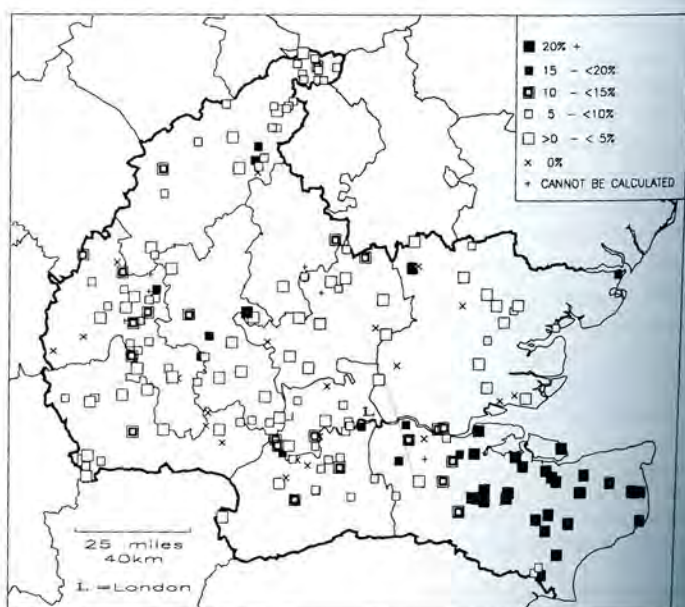


FIG. 20. Acreage sown with legumes as a percentage of the sown acreage on demesnes in the London region, 1288-1315

Source: accounts database.

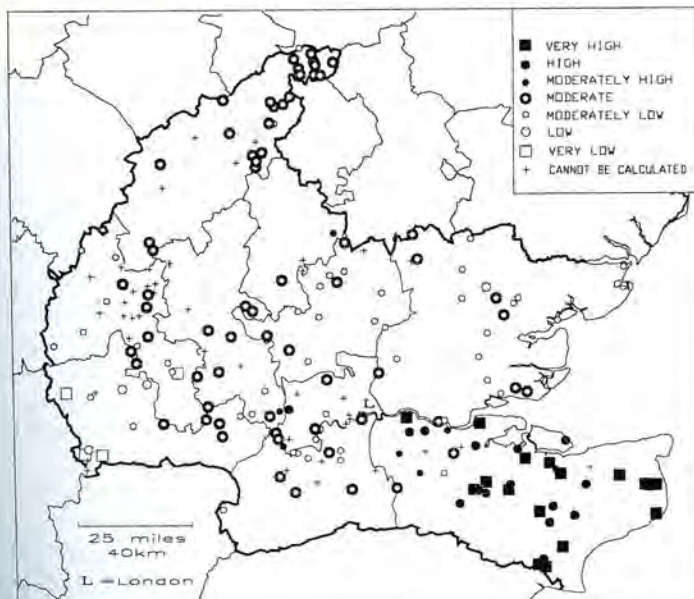


FIG. 21. Seeding rates for grain on demesnes in the London region, 1288-1315

Source: accounts database. For the method of estimating seeding rates, see text (136).

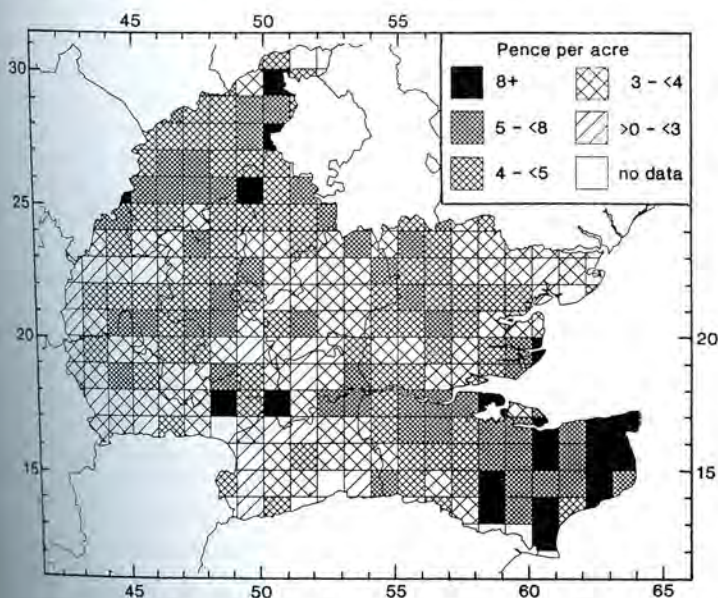


FIG. 22. Mean value of arable land in the London region by 10 kilometre squares, 1270-1339

Source: IPM database. For the method of meaning by grid squares, see Campbell B M S, Galloway, and Murphy (1992), 9. The marginal numbers denote 50-kilometre intervals in the British National Grid.

Only 14 of the 198 demesnes devoted more than 57.5 per cent of their grain acreage to winter grains, and in half of these the proportion was over 62.5 per cent. Such exceptionally high proportions indicate a relatively extensive rotational regime probably based upon a version of the two-course system of biennial fallowing. Significantly, 10 of these demesnes lay within the bounds of the Midland commonfield system.⁵⁸ Along with other demesnes which had a less pronounced bias towards winter grains, they dominate much of the Berkshire clay vale, parts of mid Oxfordshire and the greater part of central and southern Buckinghamshire.⁵⁹ The only significant outliers beyond this area are Walworth (Sr), Dartford, and Leysdown (both K), which, although strategically located relative to the London market, are, with their pronounced bias towards winter grains, also likely to have been more extensive than intensive in their production methods.

The 71 demesnes cultivating roughly equal acreages of winter and spring grains (between 47.5 and 52.5 per cent) were the most numerous group, and were widely distributed throughout the London region. A third of them were in the regular commonfield country of Northamptonshire, Bedfordshire, Hertfordshire, Buckinghamshire, Oxfordshire, and Berkshire and therefore probably practised a conventional three-course rotation of crops, comprising winter grain, spring grain, and then fallow.⁶⁰ Others, in Hertfordshire and Essex, also probably adhered to a three-course rotation, although independently of a regular commonfield regime and with greater irregularity in the sequence of cropping.⁶¹ A few demesnes with this pattern of cropping were also to be found in Surrey and south-west Middlesex, intermixed with others with a strong bias to spring grains. This juxtaposition suggests a more irregular and, possibly, a more intensive system of cropping. The latter is certainly true of Kent. Significant numbers of demesnes in central and western Kent, especially along the southern edge of the North Downs, sowed roughly equal areas with winter and spring grains, but here other evidence leaves little doubt that with some exceptions this was in rotations of greater intensity than conventional three-course cropping.⁶²

In sharp contrast, those demesnes which exhibited a strong bias towards spring grains, and so may have been characterized by intensive systems, were concentrated in four distinct areas. The first covered much of Northamptonshire, but especially the Soke of Peterborough. This was one of the most dynamic and intensive areas of commonfield farming, notable for the subdivision of fields

⁵⁸ For the distribution of the Midland system, see Gray (1915).

⁵⁹ For evidence of two-field systems in this area, see Gray (1915), 450-509; Hallam (1988), 327-3, 341; Miller (1991), 254-5.

⁶⁰ On the distribution of three-field systems in this area, see Gray (1915), 450-509; Hallam (1988), 327-9.

⁶¹ On three-course cropping in Hertfordshire and Essex and field systems in these counties, see Gray (1915), 369-94; Roden (1969); Miller (1991), 194-98, 256-9.

⁶² See below, 140; Hallam (1988), 317-25; Miller (1991), 268-80.

into smaller subsidiary cropping units and the incorporation of a greater variety of crops into rotations,⁶³ perhaps partly under the commercial influence of the ports of the Wash. The second area was in Oxfordshire, particularly in the immediate vicinity of Oxford, where the strong bias towards spring grains of demesnes such as Nuneham and Holywell may merely reflect the extent of their specialization in barley and oats, but was perhaps reinforced by the adoption of more intensive rotations under the stimulus of demand from the second urban centre in London's region. The third was in the environs of the metropolis. In Middlesex and northern Surrey, the strong specialization in the oats and barley that London required in quantity for fodder and malt can only have been accommodated within rotations of a decidedly unconventional nature, although it is unlikely that they included the complete elimination of fallows. Only in the fourth area, eastern Kent, was the excess of acreage sown with spring grains over that sown with winter grains unequivocally a manifestation of a high frequency and intensity of cultivation.⁶⁴ Here a block of nine demesnes sowed significantly larger acreages with spring than winter grain,⁶⁵ as did a further four demesnes on the margin of Romney Marsh. Many of these demesnes belonged to Canterbury Cathedral Priory and are known to have been among the most intensively cultivated in medieval England.⁶⁶

The high yields in eastern Kent, in combination with the system of cropping in every year, would have led to outputs much higher per unit of arable than those achieved where periodic fallowing was employed. Thus, to pursue the comparison made earlier, the quantity of wheat produced over a period of six years by 100 arable acres at Ickham (K) would require 156 arable acres at Cuxham (O), 290 at Brightwell (Bk), and 269 at Wheathampstead (Hrt). In terms of acres sown each year with wheat, the corresponding areas would have been, again, 100 acres at Ickham, but 254 at Cuxham, 383 at Brightwell, and 445 at Wheathampstead.⁶⁷ This method of comparing productivity cannot yet be widely applied, but it does indicate the very high level attained in eastern Kent by comparison with the rest of the London region.

Marling and manuring

In Kent the high yields and virtual elimination of fallows were partly achieved by regular manuring, marling, and liming.⁶⁸ On the manor of Ebony,

⁶³ Campbell B M S and Power (1989), 35; Hall (1982).

⁶⁴ Smith R A L (1943); Mate (1985); Hallam (1988), 317-25.

⁶⁵ At Blean, Eastry, and West Cliffe these proportions were respectively 66.3 per cent, 66.1 per cent, and 73.6 per cent.

⁶⁶ Smith R A L (1943); Mate (1985).

⁶⁷ For yields at these places, see above, 126. Outputs have been calculated on the basis that there was no fallow at Ickham, that a third of the arable was fallow in each year at Cuxham and Wheathampstead, and that a half was fallow at Brightwell. For the characteristics of Brightwell and Cuxham, see also below, 137.

⁶⁸ Smith R A L (1943), 135-8.

for instance, the use of these techniques seems to have facilitated a progressive increase in the acreage devoted to wheat in the first two decades of the fourteenth century, with limed land evidently yielding a third better than untreated land.⁶⁹ The stimulus to adopt these methods presumably came partly from within the region, which was densely populated, and partly from the influence of London and other major markets accessible by water.

Marling, manuring, and the folding of sheep on the arable are widely recorded in the London region, although the proportions of the grain acreage that benefited are not yet quantifiable.⁷⁰ Little direct evidence has been found that in the immediate environs of London town refuse was spread on the fields on a scale sufficient to sustain anything approaching continuous cropping, although around other cities and in later periods around London that strategy was certainly employed.⁷¹ There are references in the accounts to the purchase of dung at Westminster and at other places near London, and its use on manors near by. A similar purchase was made at Faversham. Battersea, close to London, had a dung boat which may have been used to bring night soil from the city.⁷² It is not yet possible to go further than this.

The cultivation of legumes (Fig. 20)

A more consistently measurable index of the intensity of cultivation, capable of being compared with the proportions of winter and spring grains (Fig. 19), is the percentage of the sown acreage occupied by legumes: beans, peas, and, increasingly, vetches.⁷³ Legumes were an important source of food for animals and humans: they were a significant cash crop on some demesnes, and London commoners dealt in them as well as grain. In addition, they restore rather than reduce levels of nitrogen in the soil,⁷⁴ so that in the most intensive medieval rotations they took the place of fallows. In less intensive regimes they might be used to vary cropping sequences and were often sown as *inhoks* from the fallow.

Legumes were grown widely in the London region,⁷⁵ but overall were a minority crop, occupying less than 5 per cent of the sown acreage on many demesnes. The impression that many of the Berkshire and Buckinghamshire demesnes which specialized in winter rather than spring grains were mostly two-course demesnes, relying upon extensive rather than intensive methods of

⁶⁹ Marling was undertaken on newly-embanked and reclaimed land to reduce the acid content of the soil and infuse it with nitrates: Smith R A L (1943), 137-8.

⁷⁰ Data on the costs of manuring and marling have not been systematically collected in the present study.

⁷¹ Keene (1982), (1983); Campbell B M S (1983a), 34.

⁷² WAM, 16843, 16382, 16912, 27506, 26857; Merton Coll., MM 4655, 4477; CCA, DCo/Copman 9, Walworth 3, 4.

⁷³ Campbell B M S (1988a).

⁷⁴ Shiel (1991), 54-5; Chorley (1979).

⁷⁵ Ninety per cent of demesnes in the accounts database for the London region included legumes in their rotations: 51 per cent grew beans, 53 per cent vetches, and 83 per cent peas.

cultivation, is reinforced by their relatively small proportions of sown acreage devoted to legumes. On the few demesnes in this category where more substantial proportions (at least 10 per cent) of legumes were sown⁷⁶ the crop, being mostly spring-sown, may have been used to offset the winter bias of grain cropping within an overall three-course rotation. Elsewhere, in north Oxfordshire and in most of Hertfordshire and Essex, where the close balance struck between winter and spring grains strongly implies three-course cropping, the scale of legume cultivation was small and did little to alter the basic symmetry of rotations in a system which was essentially extensive.⁷⁷ On some northern Essex and Hertfordshire demesnes, at the limits of the region studied,⁷⁸ a bias towards spring grains was combined with a significant cultivation of legumes, possibly denoting the existence of an area of more intensive cultivation in the adjoining counties outside the region.

In the valleys of the Nene (Np) and of the Cherwell to the north of Oxford, where a bias towards spring grains suggests that demesne rotations were becoming more flexible and intensive, legumes were sown on a marginally larger scale, but rarely exceeded 10 per cent of the sown area.⁷⁹ At this scale few of the demesnes could have afforded to dispense with regular fallowing as a means of maintaining soil fertility and supporting livestock. The same would have been true of most demesnes in the vicinity of London. Here, a strong bias towards spring grains, especially towards oats for which there was a vigorous local demand, denotes the operation of a strikingly asymmetrical system of cropping, but the modest scale of legume cultivation on most demesnes in this area implies that fallowing remained important, in contrast with the practice of continuous cropping attributed by von Thünen to his innermost zone of intensive fodder cultivation. On a few demesnes close to the Thames legumes occupied more than 10 or even 15 per cent of the sown acreage,⁸⁰ and may have comprised part of a more intensive rotational regime associated with the river terraces extending upstream from the city as far as Staines. They appear to have been intermixed, however, with demesnes where no legumes were sown in the years for which accounts have been sampled.⁸¹

Kent was by far the most distinctive area for legume cultivation within the London region. Only there was it compatible with a high frequency of cropping and the virtual elimination of fallowing. In much of central, northern, and eastern Kent over 20 per cent of the sown acreage was devoted to legumes. At

⁷⁶ Cheddington (32 per cent devoted to legumes), Moreton (16 per cent), and Westcott (13 per cent) in Bk, and Hampstead Norreys (11 per cent) in Brk.

⁷⁷ In these areas demesnes rarely devoted more than 10 per cent of sown acreage to legumes, and on most the proportion was less than 5 per cent.

⁷⁸ Wicken Bonhut (49 per cent devoted to legumes) and Dovercourt (16 per cent) in Ess, and Thirfield (11 per cent) in Hrt.

⁷⁹ Exceptions were Werrington in the Soke of Peterborough, Higham Ferrers, and Addington (Np); Merton, and Stratton Audley (O); Kennington (Brk).

⁸⁰ Walworth (Sr); Yeoveney, Staines, Laleham, and Isleworth (Mx).

⁸¹ Nyflect, Esher, and Walton-on-Thames (Sr).

Lydden, Barksore, and Elverton, demesnes close to the grain ports of Faversham or Sandwich, the proportion reached 31 per cent, 32 per cent, and 36 per cent, respectively. At this scale nitrogen-fixing and fodder-producing legumes became a virtually direct substitute for fallows. The correspondence of large sowings of spring-sown legumes with the strong spring bias of cropping patterns in north-east Kent is particularly striking, and suggests that demesnes elsewhere in the county which were sowing roughly equal acreages with winter and spring grains were doing so within a rotational scheme which was decidedly more complex and intensive than that of straight three-course husbandry.⁸² Only in the west of the county, and on two marsh-edge demesnes where oats were a major crop, did the proportion sown with legumes commonly fall below 15 per cent, indicative of a lesser intensity of cultivation. On this evidence, which indicates that in Kent the intensity of cropping attained its maximum furthest from London, von Thünen's model would suggest that any concentrated demand which may have structured the pattern of production lay to the east, across the sea, rather than in the direction of London.

Seeding density (Fig. 21)

A further indicator of cropping intensity is the density with which seed was sown. In the most extensive cropping systems and on the poorest soils seed tended to be sown thinly, less than 2 bushels an acre for wheat and rye, and 4 bushels an acre for barley and oats. This often bore fruit in above average yield ratios but at best produced only moderate yields per unit area.⁸³ Conversely, the most intensive cropping systems on the best soils sowed seed thickly: this may have helped to smother weed growth and was usually rewarded with high yields per unit area.⁸⁴

Classifying seeding rates on a seven-point range from very low to very high, an exercise which involves some interpolation and estimation,⁸⁵ reveals marked variations in practice within the London region. Seeding rates were lowest in those parts of western Berkshire and south Oxfordshire where arable husbandry can be identified by other means as most extensive. In a band of manors in western Berkshire and south Oxfordshire, at the foot of the chalk scarp to the south and bisected by the Thames, both seeding rates and the proportion of sown acreage devoted to legumes were low.⁸⁶ Several of these demesnes also devoted a high proportion of the acreage to winter grains, but in this case the correlation is less clear-cut. Brightwell (Brk), however, a two-course demesne of the bishop of Winchester, devoted over 57.5 per cent of its grain acreage to winter grains, less than 5 per cent of its sown acreages to legumes, and

⁸² See above, 132-3.

⁸³ Campbell B M S (1983b), 387-92; Thornton (1991), 188, 203-4.

⁸⁴ For example, Thornton (1991), 191-3.

⁸⁵ See above, 41.

⁸⁶ Woolstone, Wantage, Letcombe, and Brightwell in Berkshire; Cuxham, Warpsgrove, Watlington in Oxfordshire.

employed low seeding rates. Although Brightwell achieved yields per acre which were among the highest on the bishopric estate, they did not compensate for the generally extensive nature of the husbandry.⁸⁷

Seeding rates were also low in north-west Oxfordshire and most of Hertfordshire and Essex, where extensive three-course cropping appears to have been the norm. In all these areas yields per acre of wheat and oats were similarly unimpressive (Figs. 17, 18).

Higher seeding rates (classified as 'moderate' in Fig. 21) characterized a zone extending through Buckinghamshire, Bedfordshire, and parts of Hertfordshire, including demesnes both at the foot of the Chiltern scarp and on the dip slope to the south-east. Demesnes in the Thames valley near Henley may have been part of the same coherent group. Other areas distinctive for moderate seeding rates were the Cherwell valley and the whole of Northamptonshire. This reinforces the other indications that in parts of these areas three-course commonfield cropping took on a relatively dynamic and intensive guise.

Moderate to high seeding rates were characteristic of a handful of demesnes to the west and south-west of London. Some of these also devoted substantial proportions of sown acreage to legumes⁸⁸ and a number were rewarded with above average yields per acre (taking account of both wheat and oats). At other demesnes in the neighbourhood, however, the high seeding rate was the only significant indication of intensity.⁸⁹ Insofar as London encouraged the adoption of intensive methods of production in its vicinity, it was in the zone of lighter soils close to the river that such methods were to be found. For the most part seeding rates in the immediate area of the metropolis tended to be low, a further indication that, overall, fodder-cropping systems in the neighbourhood of London were distinguished more by flexibility and irregularity than by intensity.

As with the cultivation of legumes, Kent was the area most distinctive for high seeding rates, which were clearly associated with intensive systems of cropping. Thirty-one of the 32 demesnes with high or very high seeding rates⁹⁰ were in Kent. Within that county only six demesnes, all in western Kent, had lower seeding rates.⁹¹ Cropping systems appear to have attained their greatest pitch of intensity at the opposite end of the county. Here were the only three demesnes in the whole London region (Eastry, West Cliffe, and Fairfield) which fall into the highest category of intensity by all three measures: cultivation of spring grains, cultivation of legumes, and seeding rates. It was also in this general area of eastern Kent, and on the margin of Romney Marsh that the

⁸⁷ Tuow (1972); Campbell B M S (1991a), 172. See also above, 126-7, 133.

⁸⁸ Yeoveney, Staines, Laleham, and Isleworth (Mx).

⁸⁹ At Coleham (Mx) and Iver (Bk), where the high seeding rates may reflect the demand of London for the cheaper bread grains exercised through Uxbridge market: see above, 122.

⁹⁰ At least 3.5 bushels an acre for wheat and rye, 5 bushels for barley, and 6 bushels for oats.

⁹¹ The lowest rates were at Westerham, Meopham, and Wrotham. For a discussion of the husbandry system at Westerham, which appears to have employed a version of convertible husbandry, see Bishop (1938).

greatest concentration of high yields per acre of wheat and oats were to be found (Figs. 17, 18).

Cropping systems: a summary

The intensive arable husbandry of northern and eastern Kent may possibly be equated with the 'crop alternation' of von Thünen's Zone 3. This was a system which he considered would only develop on soils of superior fertility and the best of the soils in this area were certainly among the easiest and most rewarding to cultivate in medieval England.

In western Kent, closer to London, and in Surrey and Middlesex, arable husbandry was less intensive. Physical conditions were less conducive to the adoption of intensive methods, although some Thames-side demesnes, benefiting from lighter soils and from ready access to the market, adopted semi-intensive systems. Nevertheless, their arable husbandry did not match in intensity that of northern and eastern Kent. While crop specialization was strong in the immediately metropolitan zone, there is no indication that the intensity of cropping was ever more than moderate. This area may have been a major supplier of fodder to London, and associated cropping systems were undoubtedly asymmetrical and irregular, but there is no evidence that fodder cropping approached the intensity of von Thünen's Zone 1. The husbandry in the more intensively cultivated parts of this area possibly equated most closely with that of the 'improved system' of his Zone 4.

In much of the rest of the region some version of two- or, more usually, three-course cropping appears to have prevailed. In Bedfordshire, Northamptonshire, Oxfordshire, much of Berkshire and Buckinghamshire, and parts of Hertfordshire, this took place within the context of the regular two- or three-field system. In most of the rest of Berkshire, Buckinghamshire, and Hertfordshire, and in the whole of Essex, commonfield systems were either irregular or non-existent.⁹² Nevertheless, whatever the field system employed, arable production was in general extensive rather than intensive, although with some variation in degree. Since substantial parts of those counties (apart from Bedfordshire and Northamptonshire) lay within London's grain provisioning zone, it appears that a significant proportion of the city's grain was produced by an extensive arable system, more similar to von Thünen's Zone 5 than to Zones 3 or 4.

Within those counties, characterized overall by extensive cultivation, three regimes can be identified, with modest but significant distinctions between them. The first combined extensive two-course cropping with low seeding rates and limited sowings of legumes, and was practised in the western part of Berkshire at the limit of London's provisioning zone. The second, only marginally less intensive, differed by employing three-course cropping, and prevailed in much of Essex and Hertfordshire. In the third, more developed and

⁹² On types of commonfield system see, Campbell B M S (1981).

variable forms of three-course cropping were combined with moderate seeding rates, modest sowings of legumes, and a bias towards spring grains. This regime characterized the Cherwell valley north of Oxford, the Soke of Peterborough and Nene valley in Northamptonshire, and, possibly, the Thames valley in the vicinity of Reading and Henley. In this context it is striking that commonfield agriculture assumed its most developed, complex, and productive form in the Soke of Peterborough and Nene valley,⁹³ an area exposed to external commercial influences but beyond the normal grain-provisioning range of London. The higher productivity of this area demonstrates that even commonfield agriculture retained considerable potential for intensification within the London region c.1300.

The value of arable land (Fig. 22)

The predominance of extensive over intensive methods of grain production in the London region c.1300 is brought out by an analysis of the value per acre of arable land as recorded by IPMs. These values may be equated with the rental value of the land which, in turn, was a function of the land's fertility, the demand for it, the manner in which it was cultivated, and the profit that could be made from it. That medieval farmers were aware of these factors is apparent from the precision with which the jurors whose statements are recorded in IPMs defined the quality of the land and its value.⁹⁴ Arable values are available on a much more widespread basis than evidence for agrarian practice on demesnes, and so have a special significance in establishing the overall pattern.

Across the London region as a whole, arable values ranged from 1 penny to 36 pence an acre, with a mean of 4.8 pence. Arable worth between 4 pence and just under 5 pence an acre was typical of parts of west Kent, much of Essex (apart from the north east of the county), north Bedfordshire, north Buckinghamshire, mid Northamptonshire, and mid Oxfordshire. It was therefore associated with systems of arable husbandry equivalent in intensity to three-course cropping with moderate productivity, resembling the second and perhaps also the third of the regimes in that group which seem to have corresponded to von Thünen's Zone 5. Systems of this type appear to have occupied approximately 30 per cent of the London region, measuring by the 10 km. squares with those arable values. In a further 40 per cent of the area valuations were lower, indicative of lower levels of intensity and productivity. Mean valuations of less than 4 pence an acre were typical of an area dominated by heavier loams and clay in north-eastern Essex; of the heavy clays of Middlesex and parts of southern Essex; of much of the Chiltern country in Hertfordshire, south Buckinghamshire, and southernmost Oxfordshire, where the heavier loams also tended to dominate; of most of Surrey beyond the river terraces and

⁹³ For developments in this area, see Thirsk (1973), 255-62.

⁹⁴ Campbell B M S, Galloway, and Murphy (1992), 3, 14-15. For an explicit association between high value and the elimination of fallow, see PRO, C135/56.

the immediate influence of London, an area characterized by sandy soils and clays; of areas of Berkshire characterized by heavier loams, clay, and downland; and of north and west Oxfordshire, especially where shallower soils overlaid limestone. These areas embraced a range of cropping types, including irregular spring-course cropping, basic three-course cropping with low yields, and two-course cropping, but their common denominator was their extensive nature and the correspondingly low levels of output per acre of arable. The prominence of low values both close to London in Middlesex and Surrey and in several areas to the west of the city, either adjoining or overlapping districts which supplied grain to London along the Thames, is striking and reinforces the impression that London's impact upon the intensity of grain production in its hinterland was highly selective.

A little under 30 per cent of the London region was characterized by arable values of 5 pence and above, indicating the more intensive and productive systems of arable cropping. Valuations ranging from 5 to just under 8 pence an acre occur in central, northern, and a part of north-western Kent, and in the restricted area around Shoebury (Ess) on the opposite shore of the Thames estuary which was similarly characterized by good soils. They also occur in those parts of the lower Lea and Thames valleys closest to London, in the immediate vicinity of Oxford, in mid Buckinghamshire, and in substantial parts of central and northern Northamptonshire, all localities where good soils are found but to varying degrees. Urban demand was a positive stimulus in several of these areas. Moreover, they had all either taken three-course cropping to its productive limits or developed less regular and more flexible alternatives. A feature common to these districts, and to most of those with even higher values, were the well-drained and generally deep silts and loams classified by the Soil Survey of England and Wales as group 571. Those soils seem to have been associated with lower arable values only in parts of north-eastern Essex, north-western Surrey, and western Berkshire, all areas where the soils were of limited extent and intermixed with other types. Only in Kent did the higher values also extend significantly on to heavier soils.

Only valuations of 8 pence an acre or higher appear to indicate an arable husbandry that attained a degree of intensity and productivity consonant with the near or complete elimination of fallows. Areas with mean values in this range occupied only 7.5 per cent of the region and were highly specific in distribution. They show up in the Thames valley around Staines and to the south-east of Henley, both areas open to London's influence and with indications of semi-intensive agriculture. They also occur in parts of the Ouse valley above Bedford and in the Nene valley in northern Northamptonshire, an area of above-average productivity and at least in part open to commercial influence from the Wash. Above all, they were a feature of the intensively-cropped arable of northern and eastern Kent. Here, much arable was valued at more than 12 pence an acre, and instances occur of demesnes with arable worth 24 pence, 30 pence, and 36 pence, the last value being encountered at Preston

and Ash, both in the vicinity of Sandwich. Not only was husbandry here untrammelled by the institutional constraints of commonfield agriculture, but it enjoyed the benefits of fertile and easily worked soils, of strong local demand from the inhabitants of a densely-settled countryside (themselves necessary to sustain the intensive system) and from a cluster of urban communities, and of ready access by water to major urban markets at home and overseas. It is noteworthy too that the highest arable values in parts of both Kent and Essex occur where good soils adjoined marsh or reclaimed land where the best grassland was to be found, suggesting that the extra livestock which could thus be maintained may have been crucial in raising these systems to a high level of intensity and productivity. Moreover, some of the highest arable values were for land which had itself been reclaimed. Together these factors raised economic rent to a national maximum matched only by the similarly-advantaged countryside of eastern Norfolk where arable was valued at comparable levels.⁹⁵ The level of arable productivity attained in these areas seems to have been at least equal to that attained in parts of Flanders.⁹⁶

CONCLUSION

How does this reconstruction of the arable systems within the London region, and the estimates of the proportion of the region devoted to each of them, compare with von Thünen's estimate of the proportion devoted to each of the four zones which contributed grain within the 'isolated state'?⁹⁷ If London's normal grain supply region is defined as the area within the 9.3 pence transport cost isopleth for wheat (Fig. 7),⁹⁸ then approximately 40 per cent of London's grain-provisioning zone was characterized by relatively extensive cropping systems of a two-course and elementary three-course nature with arable worth less than 4 pence an acre (by comparison with 40 per cent in the equivalent Zone 5 in von Thünen's model). A further 50 per cent of London's grain provisioning zone supported husbandry systems of moderate intensity, comprising the more developed and productive forms of three-course cropping and variations thereon, with arable worth between 4 pence and 8 pence an acre (by comparison with 54 per cent in Zone 4). The final 10 per cent of the grain provisioning zone was occupied by intensive cropping systems with little or no fallow and arable worth at least 8 pence an acre (by comparison with 6 per cent in Zones 1 and 3).

These proportions correspond closely to those predicted by von Thünen and the correspondence might be even closer if analysis were extended to include

⁹⁵ Campbell B M S (1990), 83; Campbell B M S (1993); Power and Campbell (1992), 233-6.

⁹⁶ The net yield for wheat at Ickham (K) of 17.8 bushels per acre is equivalent to 1,550 litres per hectare; cf. Verhulst (1990), 100, where comparable figures for Flanders and near by in the range of 113 to 2,024 litres are quoted.

⁹⁷ See above, 5, 6.

⁹⁸ This is almost certainly an overestimate, but it to a degree compensates for that part of the supply area which lay outside the region studied.

areas which supplied London but were outside the region studied. There is a discrepancy, however, between the husbandry systems described by von Thünen and those that actually existed around London c.1300. The medieval systems are consistently less intensive in character than those observed 500 years later. This is indicated by the presence of the two- rather than three-field system in parts of London's provisioning zone and by the wide distribution of regular and irregular systems which fallowed on a triennial basis.⁹⁹ In part this difference undoubtedly reflects the progress in agricultural technology between the beginning of the fourteenth and the beginning of the nineteenth centuries. Von Thünen presumably saw the systems he described as the appropriate response to concentrated demand. In the case of London in 1300, the agrarian hinterland appears not only to have been capable of feeding the city but to have had considerable capacity for further development. Those later developments, around London and elsewhere, created the world of more advanced systems which von Thünen knew.

The overall balance between agrarian systems in the London region in 1300 thus appears to have been strongly influenced by a spatially-concentrated market demand, and to have conformed roughly to von Thünen's model. The character of agrarian production on any particular demesne seems to have been determined primarily by forces which created an optimum system for that part of the region in which the demesne lay, rather than by the requirements of the estate of which the demesne formed part. Instead of acting directly upon the decision-making process on any given demesne, those forces moulded the economic context within which decisions were taken. Mavis Mate has argued that local knowledge and practice were key influences upon land use at this period.¹⁰⁰ The evidence presented here suggests that prevailing levels of economic rent, as influenced by concentrated urban demand, should be numbered among the factors moulding the development of that practice. In this way, in the ten counties under consideration, the London market was one of the principal influences encouraging the development of local and regional systems of husbandry, which to a significant extent transcended ownership types and estate policies.¹⁰¹

This conclusion is reinforced by the apparent correspondence between the patterns of production revealed by the manorial accounts, among which those concerning the demesnes of monastic and ecclesiastical lords are dominant, and those indicated by land values in the IPMs, which concern a wide range of lay estates. It may be that these patterns were initially determined before the late twelfth century, when the lords of great estates took over direct management of their manors.¹⁰² Before then local tenants would have been free to respond to

⁹⁹ 'Three-course' systems occupied perhaps 70 per cent of London's grain provisioning area.

¹⁰⁰ Mate (1985), 31.

¹⁰¹ Cf. Campbell B M S (1983b), 397-8.

¹⁰² Du Boulay (1966), 204-5; Harvey P D A (1974), 353-8; Britnell (1993), 109-10.

market forces (including metropolitan demand) which were already well-developed, except insofar as their land was burdened with fixed renders of produce for consumption by the lord. Even when demesnes were in hand, it would have made sense to follow local knowledge and practice rather than to impose a radically different system of production aimed primarily at meeting the needs of the household. Such a policy would have allowed lords the flexibility, which they evidently needed from time to time, to let a demesne on lease at the most favourable local rate.

In strictly spatial terms, however, the pattern of production in relation to London conforms to the model in a less straightforward way. There was a sharp contrast between districts to the north, west, and south-west of London and those to the east, especially in Kent. In the former the concentric pattern of specialized production and intensity is readily apparent, structured by levels of economic rent generated by the metropolis and by ease of access to London's markets. The pattern is not uniform, for these forces seem in each locality to have created a predisposition towards specialization which was then put into effect by means of choices made in relation to soils and environmental factors, to field systems, to other manifestations of long-established local practice, and to the character of lordship. Within these inland parts of the region the London market was a uniquely dominant factor, but there are local traces of other market influences. Henley, which gathered grain for transmission to London, seems to have generated a similar pattern of specialization in its own immediate hinterland. Oxford, by far the largest centre for grain consumption in the region after London, appears to have had a similar but more widespread effect: the coincidence of Oxford and metropolitan demand to the south-east of the town may have helped create the particular predisposition to large-scale wheat production in that area. Along the northern margin of the region, perhaps in north-west Essex, Hertfordshire, and Bedfordshire, and more definitely in northern Northamptonshire (despite the dominance there of demesnes belonging to Peterborough Abbey, from which little arable produce was sold) there are signs that the pattern of production was influenced by the commercial demands of the international grain market which focused on the ports of the Wash.

London seems both to have dominated the inland region which supplied it with grain and to have shielded it from other circuits of exchange, for in Kent, which was open to those other influences, the spatial pattern of production was very different. In transport-cost terms much of the county was within provisioning range of London for wheat and barley, and there was an active grain trade between London and Faversham in northern Kent.¹⁰³ Nevertheless, with the exception of the north-western part of the county which was close to the city, the patterns of crop specialization, of intensity, and of land values do not appear to have been generated wholly or even largely by a market situated in London. If anything they seem to have been the product of forces with a focus

¹⁰³ See above, 51, 92-5.

around the Straits of Dover. In Kent, and perhaps also in coastal Sussex, the London commoners appear to have tapped into a system of production and distribution which had developed to a great extent independently of the city, but had the potential to supply large quantities of grain.¹⁰⁴ Thereafter, the expanding metropolis was one of several influences which lent continuing momentum to the system.

¹⁰⁴ See below, 178-82.

VIII

PATTERNS OF GRAIN DISPOSAL IN THE LONDON REGION

Patterns of grain production in the London region in 1300 appear to a large degree to have been those of a market-oriented system. If that was so, then the disposal and sale of grain would have been an integral part of the mechanism by which those patterns came about. To what extent do the patterns of disposal reveal the influence of the market in the region? Do they reveal the particular role of London, whose market at that date, with its supporting networks, was unparalleled in England for its scale and development? And do they throw any light on the evolution from an earlier pattern in which the objective of most producers is presumed to have been the cultivation of grain for their own consumption?

CATEGORIES OF GRAIN DISPOSAL AND SOME OVERALL PATTERNS

The receipt of grain, net of seed and tithe, was disposed of in three ways: by consumption on the demesne; by non-market transfer to another demesne on the estate, to the lord's headquarters, or elsewhere; and by sale. On the larger estates, evidence for which dominates the picture that it is possible to reconstruct, consumption on the demesne was on the whole a necessary and efficient component of the production process, but there was a clear choice to be made between transfer and sale. From the evidence to hand it seems that lords exercised that choice on a rational basis, taking account of their own requirements in consumption, the structure and distribution of their estates, the proximity of their headquarters to a major market, and local patterns of production. Contrasts emerge between the strategies adopted by consumers such as monastic communities, whose substantial needs had always to be met in the same place, and others who were peripatetic or whose needs were less predictable in other ways. Some lords seem to have clung to 'conservative' practices in provisioning which might appear less efficient than those offered by the market. In such cases, however, the lords may have enjoyed legal or customary entitlements which made their conservatism the economically rational choice.

An overall assessment of patterns of grain disposal in the London region is provided by the use of aggregate measures which overcome the differences between demesnes in the proportions of individual grains that they received. The method used, which involves fewest assumptions and is most amenable to

TABLE 15

Mean disposal of grain net of tithe by demesnes in the London region, 1288-1315

Grain	No. of demesnes	Total receipt ¹	Seed		Total receipt net of seed ⁴	Retained and/or malted		Transferred		Sold	
			Amt ²	% ³		Amt ²	% ⁵	Amt ²	% ⁵	Amt ²	% ⁵
Individual grains (unmalted) by volume (quarters):											
Wheat	193	96	26	27	70	22	33	16	18	32	48
Rye and mixtures	127	40	10	25	30	18	69	2	2	10	29
Barley	153	71	17	24	54	33	57	7	11	14	32
Dredge	107	51	15	29	36	17	40	5	12	14	48
Oats	198	106	39	37	67	46	67	8	10	13	22
All grains (malted and unmalted) by value (£s) ⁶ :											
	202	61	17	32	44	18	44	11	18	16	38

Source: accounts database.

¹ i.e. all grain received (from harvest, purchase and other receipts), net of tithe (and therefore a quantity different from the 'gross receipt' in Table 7).² Amount, in either quarters or £s value.³ Percentage of the total receipt. All percentages in this table have been struck at demesne level and subsequently meaned to produce aggregate statistics at ten-county level. They therefore differ from those in Table 7 where percentages were struck at an aggregate level.⁴ A quantity different from the net receipts in Table 7.⁵ Percentages of the total receipt net of seed. See also n. 2.⁶ Using the mean prices for each grain in Table 14, and an estimate for malt. The categories 'transferred' and 'sold' each include some malt. Because of the way in which the data were collected it is impossible systematically to calculate the quantity 'retained' on the demesne. For the problems concerning malt, see text (146-7).

analysis at the level of individual demesnes and groups of demesnes, is to value the quantities and proportions of grains received and disposed of using mean grain prices calculated for the London region as a whole.¹ Monetary values are thus ascribed to the total quantities of grain produced, received, sown, consumed, transferred elsewhere on the estate, or sold on each demesne, and these may be compared with the quantities for each grain by volume (Table 15). The method has the advantage of taking into account those quantities of grain which were malted on demesnes and then disposed of by sale or transfer.²

Malt presents some particular problems of analysis. While accounts generally record the quantity of each type of grain which was malted on the demesne, they do not specify the type of malt which was sold or transferred. Furthermore, quantities of malt transferred were not systematically entered in

¹ For the present purpose, this method is preferable to that of conversion into kilocalorie equivalents adopted in Chapter 5.² See below, 148.

the database. For these reasons, the study of the disposal patterns of individual crops has been largely restricted to unmalted grain. In the case of the aggregate measure the following procedure was adopted to allow for quantities of malt. For each demesne the value of recorded sales of malt was reduced by 15 per cent to allow for the mean difference in price between unmalted and malted grains, and thus to estimate in value terms the quantity of raw grain involved. This sum was then added to the value-equivalent of unmalted grain to produce a value for the total quantity of grain sold. The rest of the malted grain was assumed to have been transferred, and the figures adjusted accordingly. In fact, small quantities of malted demesne grain were consumed by workers on many demesnes, but as this rarely exceeded 3 or 4 quarters a year the resulting distortion is unlikely to be significant.³

The overall value of grain available for disposal in the London region was substantial. On average, and after deduction of tithe, each of the 202 demesnes in the accounts database for which the calculation is possible received grain worth £60. 17s. 2d. from the harvest, by purchase and by transfer from other demesnes. Of this total receipt 32 per cent was expended as seed, leaving a mean net grain receipt valued at £43. 16s. 9d.

Consumption of grain on the manor

On average, 44 per cent by value of all grain that remained after seeding and tithe was retained and consumed on the demesne. The requirements for animal fodder, liveries to the manorial workforce, and other payments in kind, meant that over two-thirds of all oats and rye and half of all barley were consumed at or near the point of production.⁴ In contrast, only a third of the wheat receipt was retained. A proportion of these grains was retained for malting, and on 49 of the demesnes some of that malt was sold.

Intensive farming boosted the demand for grain on the demesne, where it was consumed by horses and by labourers, but the increased output seems to have more than offset the increased consumption. Thus the intensively-farmed demesne at Ickham (K) disposed of 78 per cent of its net receipt of grain by value, by comparison with about 54 per cent and about 76 per cent, respectively, at Cuxham (O) and Brightwell (Brk), where extensive regimes prevailed.⁵ Both Cuxham and Brightwell retained all their oats, while Ickham retained only 34 per cent, a difference which almost certainly reflects the availability of legumes at Ickham. Were legumes to be included in the comparison, the overall percentage of crops by value disposed of at Ickham would probably be smaller, but not as small as at Cuxham.

³ See, for example, Harvey P D A (1965), 48.

⁴ The proportions for grain retained or malted on the manor (Tables 7, 15) concur with the estimate that manorial workers consumed 10 per cent of the total grain harvest on the estate of Peterborough Abbey in 1300-01: Biddick (1989), 72.

⁵ The percentages cover income from malt which was sold at Cuxham and Brightwell; without the malt, which includes an element of 'added value', the percentages are 53 and 74, respectively.

Apart from the requirements of husbandry, some grain was consumed *in situ* by visiting manorial officials and by lords who were either temporarily or permanently resident on their manors. At three manors which seem to have served as the sole or principal residence of laymen exceptionally large proportions of the net grain receipt were consumed: 77 per cent at Cobham (K), headquarters of John de Cobham; 87 per cent at Wicken Bonhunt (Ess), which seems to have been the residence of Roger de Barley; and 100 per cent at Wendover (Bk), the English base of William de Fiennes. Such cases, however, can be the product of exceptional circumstances which are difficult, if not impossible, to reconstruct from the surviving records. At Wendover, for example, all the grain received had been purchased, although there was a large area of arable on the demesne which was sown in the year covered by the single available account.

Transfers of grain

Non-market transfers, to estate headquarters or to another manor on the estate,⁶ are usually clearly distinguished from sales in the grange section of a typical manorial account. On some manors, however, it is clear from the receipts section of the cash account that some sales were fictional and concerned produce which, despite being ascribed a money value, had been consumed or used within the estate. Farmer has pointed out that failure to allow for this accounting device can result in an overestimate of the quantity of grain sold from a demesne.⁷ These fictional sales are generally described as being 'for the lord's household',⁸ and appear to have become more common as the fourteenth century progressed. A small number of sales in the accounts sample for 1288 to 1315 were judged to be of this type and have been classified as transfers.⁹ The problem remains, however, for those accounts which do not make the fictional nature of some sales clear. The following discussion of the relative significance of sales and transfers must be informed by an awareness that this factor may exaggerate the volume of sales and underestimate that of transfers or of consumption on the manor.

Transfers, representing 18 per cent by value of net grain receipt overall, could be for consumption elsewhere by the lord, or they could serve the needs of production on other demesnes on the estate, providing seed, fodder, or cheap grains for consumption by the labour force. Some lay demesnes disposed of as much as a quarter of their net grain receipts by transfer, but the practice was most prominent on conventual and collegiate demesnes. Overall, the latter

⁶ In addition, small amounts of grain were occasionally transferred off the estate as gifts or alms.

⁷ Farmer (1991), 359, 368.

⁸ Phrases commonly used are: *ad hospicium domini*, *ut pro hospicio domini*, and *pro expensis hospicii domini*. For other phrases, see Britnell (1966), 381.

⁹ The 'sales' affected were most often of oats. There were six such 'sales' of wheat and one of dredge. Fictional sales of the *super compotum* type, where a charge was levied against the *baillif* by the auditors, have been totally excluded.

disposed of 29 per cent by transfer, while the corresponding proportion for all other demesnes in the database was 3 per cent.

Most grain transferred was sent to the estate headquarters. On some estates demesnes had a fixed obligation to supply the central household with grain. The dean and chapter of St Paul's Cathedral in London, for example, received all their grain in this way, in the form of the long-established farms, whereby virtually every manor supplied wheat, oats, and barley in identical proportions, delivered to London by an extensive system of carrying services. In 1300 no other ecclesiastical landlord in the region relied on obligatory transfers to anything like that extent, and in most cases the amounts transferred varied from year to year according to policy and need. Canterbury Cathedral Priory, for example, moved away from a rigid system of farms between the late eleventh and the late thirteenth century, by which time 'the monks preferred to receive a diminished food-farm rather than forgo the chance of high market-profits'.¹⁰ Over the half century up to the Black Death, by contrast, the prior and convent of Westminster moved from obtaining by purchase 51 per cent by value (60 per cent by volume) of the grain they consumed¹¹ to a much greater reliance on transfers.¹²

The importance of transfers for meeting conventual needs is reflected in the grains concerned. Substantial quantities of wheat, barley, and oats were transferred from many ecclesiastical demesnes, presumably to provide high-quality bread and ale, as well as fodder for riding horses. Some of the grain transferred in this way was subsequently sold, but the quantities involved seem usually to have been small. There is certainly nothing to suggest that the monks of Westminster transferred grain to the abbey with a view to releasing it on the urban market, and likewise at Canterbury and Peterborough it appears to have been the policy to sell grain from manors and not from a central store.¹³

In terms of both actual quantities and percentages of net receipt, wheat was the grain most commonly transferred. Even so, over the region as a whole less than a fifth of the available wheat was transferred and more than half the demesnes made no transfers of wheat. The significant transfers went to meet the bread needs of conventual households and were distinctively concentrated in specific areas (Table 16 and Fig. 29). Several such households within the London region obtained 80 to 100 per cent of their requirement for wheat from demesne lands.¹⁴ Oseney Abbey near Oxford and Bicester Priory drew heavily upon their nearby demesnes. In the productive areas of eastern Kent and northern Northamptonshire, where substantial quantities of wheat were grown, groups of demesnes belonging to Canterbury Cathedral Priory and Peterborough

¹⁰ Smith R A L (1943), 129-32.

¹¹ Calculated from the proportions consumed and purchased given in Table 19, and from the prices in Table 14.

¹² Harvey B F (1977), 146-7.

¹³ See above, 78-9; Appendix V.

¹⁴ See Appendix V.

Abbey transferred virtually all their disposable wheat to meet the needs of the conventual households which were no more than about 12 miles distant. Sometimes, grain purchased by a demesne could contribute to the quantity transferred, although usually purchases were of small quantities for use as seed.¹⁵ In one, perhaps exceptional, year several Peterborough demesnes close to the abbey made large purchases (apparently in their immediate vicinity) so as to make good a shortfall in the overall quantity of wheat transferred to the abbey which it seems would otherwise have been occasioned by the leasing of two other demesnes in the area.¹⁶ Local purchasing of this type was presumably more advantageous than transferring wheat from more distant manors. Peterborough consistently sold the wheat produced on its distant outlying demesnes in Lincolnshire and Nottinghamshire,¹⁷ and Canterbury pursued a similar policy.

In the case of the monks of Westminster, their closest demesnes were either relatively small, or grew very modest amounts of wheat, and therefore more distant demesnes were called upon to provide the household with bread grain. Feering (Ess), and Wheathampstead, Stevenage, and Ashwell (all Hrt, and the last about 45 miles distant by road) made large transfers to the abbey.¹⁸ Similarly, Merton College's closest demesne at Holywell grew little wheat, and that grain was transferred from the next closest manor, Cuxham. These two examples suggest that the capacity of grain to sustain its transport cost, on the lines of von Thünen's model, influenced patterns of agriculture at estate as well as at regional level.¹⁹ In the case of Cuxham and the Westminster demesnes, however, metropolitan demand as mediated via economic rent was clearly an important factor in the choice and scale of grains produced, and that would have influenced both the pattern of transfers within the estates and the pattern of sales. Wider market influences may likewise have determined the pattern of production in the immediate hinterlands of Canterbury and Peterborough, making it possible for the two communities to meet their wheat needs most economically by transfers from close at hand. Only St Paul's, with its exceptional entitlement to farms and services, pursued a different policy.

Rye and rye mixtures, which were not significant in the monastic or lordly diet, were rarely disposed of by transfer, even when, as in the case of Westminster Abbey, many of its closest properties devoted significant acreages

¹⁵ See Appendix V.

¹⁶ On the abbey's Northamptonshire demesnes purchases in 1309-10, when Toppel and Upton (which normally transferred wheat to the abbey) appear to have been on lease, rose to 25 per cent of total receipt, by comparison with less than 10 per cent in other years.

¹⁷ Biddick (1989), 76 (where the perhaps exceptional character of the large-scale purchases in 1309-10 is not identified).

¹⁸ In the years covered by the database Feering and Stevenage transferred between 40 and 60 per cent of their net receipt of wheat, Wheathampstead between 60 and 80 per cent, and Ashwell over 80 per cent.

¹⁹ Grigg (1982), 139.

to cultivation of these grains.²⁰ At Peterborough the households of neither abbot nor convent appear to have used rye or rye mixtures. Nevertheless, the Peterborough demesne at Kettering (Np) regularly devoted 43 per cent of its grain acreage to rye and transferred 67 per cent of this crop off the demesne. In this instance, during the years for which information is available, the rye went to between seven and twelve other demesnes on the estate, all closer to Peterborough, where it furnished an essential component of food liversies. It was evidently estate policy for one demesne to produce the crop, allowing others to concentrate upon crops such as wheat in which they presumably enjoyed a greater comparative advantage. That advantage could well have been determined by conformity to general patterns of agrarian specialization in the district around Peterborough, which was open to the commercial influence of the ports of the Wash. Viewed in this context, the regular transfer of up to 25 quarters of rye from Wellingborough in Northamptonshire to the abbey at Crowland seems exceptional, although Crowland, which had easy access to the Wash, was in a district where it was probably more advantageous to grow wheat than rye.

Conventual households relied much less upon their estates for supplies of high quality brewing grain than for bread grain of a similar standard. St Paul's, which brewed principally with oats, transferred all its malting grain, but 72 per cent of the demesnes in the London region database which grew barley transferred none. Canterbury Cathedral Priory purchased about 43 per cent of its barley in 1311-12, while Westminster Abbey purchased 78 per cent in 1304-5.²¹ Westminster also purchased grain which was already malted.²² Westminster transferred barley only from three readily-accessible manors,²³ but Canterbury made large non-market transfers of barley from six manors in its immediate vicinity and smaller ones from three more distant manors.²⁴ On both these estates there were few if any transfers of malt, and it was the practice to malt grain centrally. Many of the Peterborough demesnes, however, transferred brewing grains to the abbey ready-malted: in 1309-10 Peterborough obtained all of its drink grain from its estates and got through a staggering 2,388 quarters of malted barley and dredge. The abbey consumed virtually the whole of the dredge produced by its estates and, as with wheat, sold barley from its distant outlying demesnes.²⁵

²⁰ On average, 1 per cent of the net receipt of rye and rye mixtures of the 27 Westminster demesnes in the database was transferred, whereas 17 per cent was sold.

²¹ See Appendix V and Table 19.

²² See Appendix V.

²³ Ashford and Halliford (Mx), and Battersea (Sr).

²⁴ The nearby manors were Chartham, Eastry, and Ickham, all covered by accounts in the database, and Adisham, Godmersham, and Monkton, for which the evidence is provided by the bartoner's accounts used in Appendix V. The more distant manors were Agney, Copton, and Ebony (all K).

²⁵ See Biddick (1989), 76; but there seems to be no evidence to support Biddick's suggestion that in 1309-10 the abbey's Northamptonshire demesnes purchased barley for transfer to the abbey.

Relative to the scale of their cultivation, oats were transferred by fewer demesnes, and generally in smaller amounts, than most of the other grains. This is consistent with their limited capacity to bear transport costs. Thus overall, only 9 per cent of net oats receipts were transferred as compared with 19 per cent of wheat. Peterborough Abbey nevertheless depended almost exclusively upon estate transfers for its oats needs. In 1309-10 the abbey received 634 quarters of oats from its demesnes, the bulk of it from those within 10 miles of the house.²⁶ This was all used to feed the abbey's, or the abbot's, horses and poultry. In the case of Canterbury Cathedral Priory, the available evidence concerns only receipts of oats for use in brewing. In 1311-12, 335 quarters were received, of which about 20 per cent was purchased.²⁷ The biggest transfers in that year came from the home demesnes of Eastry, Monkton, and Adisham, which all lay within about 10 miles of the priory by road, and from the more distant demesnes of Great and Little Chart, Hollingbourne, and Appledore, 15 to 23 miles away. In other years significant amounts were also transferred from the marshland demesne of Ebony, 24 miles distant. The prior and convent of Westminster Abbey regularly purchased large amounts of oats, and depended on their demesnes for only 20 to 30 per cent of their needs, even though these were major producers of oats.²⁸ The abbot of Westminster, whose lifestyle was peripatetic, appears to have relied more heavily on the market for his supplies of oats and other grains.²⁹ This was probably true of most lay and royal households, where no regular supply pattern for oats can be discerned. Occasionally, quantities of oats were sent to lay households, whose fodder requirements could be considerable. In 1301 the Bigod manor of Dovercourt in north Essex sent oats to Framlingham in Suffolk, the East Anglian base of the earls of Norfolk and perhaps a centre for horse breeding and management. In 1297 the bailiff of Grays Thurrock in Essex sent 100 quarters of oats to his lord, Henry de Gray, at Bayonne in Gascony where the latter was on campaign.³⁰

The transfer of grain from their demesnes played a significant part in the provisioning of religious houses, but was less important for lay households whose requirements were not so static. Many estates satisfied consumption needs first,³¹ but that often left substantial quantities to be sold. What is perhaps most striking about the transfer strategies of the religious houses in the London region, however, is the degree to which they appear to have been influenced, both directly and indirectly, by market considerations. The availability of grain on demesnes seems to have reflected the prevailing local practice and commercial advantages rather than estate policy. If a grain needed for consumption was available on a local demesne from which the cost of transport

²⁶ See Appendix V.

²⁷ See Appendix V.

²⁸ See Appendix V.

²⁹ Harvey B F (1977), 134-6.

³⁰ ERO, D/Du 1364/2; PRO, SC6/840/10.

³¹ Cf. Biddick (1989), also Biddick (1991).

was appropriate to the value of the grain, then it was transferred, and if even more of that grain was required it was purchased locally. The same crop on distant manors was sold. Canterbury Cathedral Priory purchased centrally 27 per cent by volume and 26 per cent by value of its grain needs, representing an outlay of about £156 a year which presumably was spent in Canterbury market.³² The priory supplied the bulk of its needs by transfers from its nearby demesnes, which were sometimes used for effecting purchases in the locality, but at the same time sold small quantities of grain from the same demesnes. This pattern suggests a conscious policy of making the best use of the opportunities presented by the resources of the estate and by the local market. It is not yet possible to tell whether Oxford market, which in terms of grain for local consumption would have been larger than Canterbury's, was used in the same way by religious houses in or close to the town. Peterborough Abbey purchased locally as required, but not in its own market, which was far smaller than those at Oxford and Canterbury. For Peterborough, purchasing at the large but distant grain markets of Boston or Lynn could not compete with transfers from local demesnes. Only St Paul's pursued a rigidly 'conservative' policy of fixed transfers.

Evidently, the overall market for grain was neither large enough nor efficient enough to persuade such institutions to sell all their produce at the farm gate or local market, and then to purchase their requirement in a market close to the point of consumption. It is noteworthy, however, that the London market seems to have had most influence in that direction. This is clear in the strategy of Westminster Abbey, which purchased in the London market a share of its grain needs which was twice that purchased by Canterbury, and represented an annual outlay of about £238. But not even the London market seems to have been powerful enough to erode the advantages to St Paul's of its customary entitlement to farms and carrying services, or to overcome the institutional inertia of a cathedral chapter. Even so, by comparison with the much larger Parisian market of the seventeenth century, where almost a quarter of the grain consumed was said to have been supplied in the form of direct transfers from the estates of religious houses, the London market in 1300, and probably also the regions associated with it, appear to have been much more commercialized.³³

Sales of grain

A lord's decision as to whether the produce of a manor was to be used as food and drink or to raise cash was influenced by many factors. Proximity to the household base probably continued from an early date to be the most important influence on the choice of whether to sell or to consume, but the growth of a marketing system and of urban populations presumably caused many lords to

³² Values calculated as in n. 11, above.

³³ See above, 2.

change or modify their supply patterns so as to take advantage of expanding opportunities. Around 1300, 38 per cent of net grain receipts on demesnes in the London region database was sold, over twice the proportion disposed of by transfer. Sales, however, varied considerably in significance between estates, although caution is required in interpreting some of the values since they concern estates represented by a single demesne in a single year (Table 16).

Sale was least important as a method of disposal on the 110 demesnes belonging to conventual and collegiate institutions, which on average sold only 26 per cent by value of their net grain receipts. The 18 database demesnes belonging to Peterborough Abbey effectively sold no grain at all, and those belonging to Bicester Priory, and to Crowland, Oseney, and Waltham Abbeys sold on average less than 10 per cent. Only the home demesnes of the small and possibly exceptional lay estates of Roger de Barley and William de Fiennes sold proportions as small or smaller.³⁴ Over half the conventual estates sold less than 20 per cent of their net receipts, and the 20 demesnes of the prior and convent of Westminster sold 22 per cent overall.³⁵ Of the four estates which sold more than 40 per cent, the demesnes of one, Canterbury Cathedral Priory, lay in an exceptionally productive and commercialized area, and the demesnes of the others (the alien house of Bec, Merton College, and Winchester Cathedral Priory, the last represented by only one account) were for the most part distant from the household.

Episcopal, lay, and royal demesnes collectively sold a proportion of their net grain receipts which was about twice that for the conventual estates. Proportions for episcopal and royal estates were all over 30 per cent, while half of the lay estates sold less than 30 per cent. Notable for the scale of their sales were the estates of the bishop of Winchester, the earldom of Lincoln, and the earldom of Cornwall, where transfers were virtually non-existent. This picture for demesnes in the London region broadly conforms with that indicated by a comparison of entire estates.³⁶ Of the 11 individual demesnes in the London region which sold at least 80 per cent of their grain, four were in episcopal ownership, three in conventual or collegiate ownership, two former Templar holdings in the king's hand, and two in lay ownership (cf. Figs. 2, 23).

Examination of the transfers and purchases indicates that the London market was a significant influence on the supply strategy of Westminster Abbey, but not on that of St Paul's. That, on the measure of sales, Westminster does not appear to have been so attuned to commercial opportunity as Canterbury Cathedral Priory may reflect the location and productivity of the two estates rather than the basic policies of the two houses. The extent and character of the endowment, the degree of productivity it had been able to achieve by 1300, the

³⁴ See above, 148.

³⁵ These proportions obviously would be different if information was available for all demesnes belonging to these estates, but almost all the Westminster Abbey demesnes pertaining to the prior and convent lie within the region: see Appendix V.

³⁶ Britnell (1993), 121.

TABLE 16

Disposal of all grains and malt (net of tithe and seed, and calculated in money-value equivalent) by type of owner in the London region, 1288-1315

Owner and ownership category	No. of demesnes	No. of accounts	Percentage of receipt net of tithe and seed ²		
			Retained	Transferred	Sold
Conventual and collegiate:					
Bec Abbey	6	8	49	7	44
Bicester Priory	5	5	43	50	7
Boxley Priory	1	1	69	14	18
Canterbury Cathedral Priory	34	94	43	13	43
Crowland Abbey	3	10	27	69	5
Merton College	8	24	53	2	46
Oseney Abbey	3	6	36	55	9
Peterborough Abbey	18	47	33	67	<1
Ramsey Abbey	1	1	43	45	12
St Catherine's Abbey, Rouen	1	1	71	29	0
Titchfield Abbey	1	2	47	17	35
Waltham Abbey	1	3	51	43	5
Westminster Abbey (prior and convent)	20	58	51	28	22
Westminster Abbey (abbot)	7	19	63	17	20
Winchester Cathedral Priory	1	1	38	3	59
Mean	110	280	45	29	26
Episcopal:					
Archbishop of Canterbury	5	7	48	15	37
Bishop of London	1	3	46	14	40
Bishop of Winchester	13	39	30	0	70
Mean	19	49	36	5	59
Lay:					
de Argentine	1	2	63	20	17
de Barley	1	1	87	8	6
de Clare	2	2	52	22	25
de Cobham	1	1	77	12	11
Earldom of Cornwall	6	6	38	0	62
Earldom of Lincoln	9	15	33	1	66
Earldom of Norfolk	4	11	40	14	46
le Ferrers	1	1	26	28	47
de Fiennes	1	1	100	0	0
de Gray	1	1	21	20	60
de Hamelton	1	1	43	0	57
de Seyton	1	1	59	27	14
Mean	29	43	44	8	49
Royal:					
The king	17	31	45	3	52
late Holy Trinity Abbey, Caen	1	3	46	0	54
late Templars	18	29	46	1	52
late Walter de Langton	5	7	42	0	58
The queen	3	5	55	4	41
Mean	44	75	46	2	52
All	202 ¹	447 ¹	44	18	38

Source: accounts database.

¹ Number of demesnes or accounts for which the calculation could be done.

² Calculated at demesne level and meaned for all demesnes in the ownership category.

size of the household (which generally did not much exceed its twelfth-century level), and the location of the household in relation to major markets were probably the most important factors in determining the degree of commercialization of a monastic estate. Nevertheless, both the Canterbury and Westminster estates seem on various measures to have been significantly more commercialized in the grain sector than those of Peterborough, Ramsey, and Crowland, which were more distant from London. The contrast would be less striking, however, were the demesnes of those three abbeys which lay outside the region taken into account, for several of those demesnes are known to have sold large quantities of grain,³⁷ and all of them lay in districts open to the influence of the North Sea grain trade.

THE GEOGRAPHY OF GRAIN SALES

Aggregate patterns (Fig. 23)

The impact of different estate policies is immediately apparent in a map of the proportion of grain receipt, net of seed and tithe, sold by each demesne (Figs. 2, 23). Thus, the Northamptonshire demesnes of the abbeys of Peterborough and Crowland stand out as selling little or no grain. Grain production in east Kent, Middlesex, and Hertfordshire was almost certainly more commercialized than is indicated by the map, since much of the evidence for these areas concerns demesnes of Canterbury Cathedral Priory and Westminster Abbey which supplied the households by transfer (cf. Fig. 29). Other demesnes in those areas were actively involved in the grain market. In eastern Kent, for example, substantial grain sales are recorded in accounts for the estates of the archbishop of Canterbury in 1273-4 and again during the vacancy at the end of the century,³⁸ and the archbishop's estates in Kent and Sussex were able to sell large quantities of wheat and barley for a purveyance in 1323.³⁹ Conversely, some demesnes which sold the greater part of their grain lay in districts where commercial influences were weak. Thus Broadwell and Adderbury, in the most land-locked parts of Oxfordshire, sold over 80 per cent of their grain. They belonged to lords, the king and the bishop of Winchester, respectively, whose bases were distant from the manors, and whose need was presumably for cash rather than produce.

Forty-six demesnes sold 60 per cent or more of their grain. This is an exceptionally high proportion to find across the full range of grains. Examples

³⁷ See above, 150-1. The Peterborough demesne of Fiskerton in Lincolnshire, for example, sold grain to the value of £60 in 1309-10 (NpRO, Fitzwilliam 2389); cf. Biddick (1989), 72-7.

³⁸ The demesne at Wingham, between Canterbury and Sandwich, sold 126 quarters of wheat in 1273-4 while that at Westgate manor, Canterbury sold 89 quarters: BL, Add. Roll 29794; large sales are to be expected during vacancies, but the archbishop's manors nevertheless seem regularly to have sold much of their grain; cf. Du Boulay (1964) and Du Boulay (1966), 211-12.

³⁹ PRO, E101/16/18. The quantities represented 25 per cent of the wheat and 34 per cent of the barley purchased in a purveyance where most of the remainder was acquired in London: see above, 89.

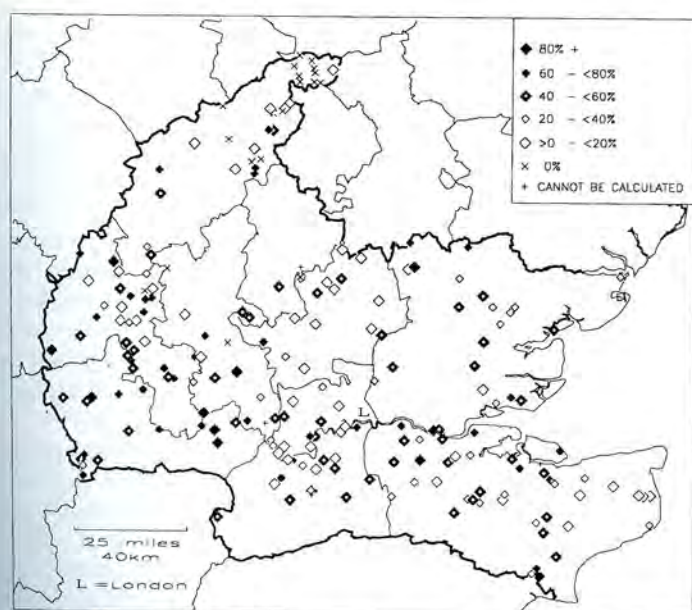


FIG. 23. Sales of all grain and malt as a percentage of the receipt of all grain, net of seed and tithe, by demesnes in the London region, 1288-1315

Source: accounts database. Calculated in money value equivalents (for method, see 145-6).

occur, apparently irrespective of distance from London, in nine of the ten counties.⁴⁰ The distribution is nevertheless uneven. There seems to have been no particular correlation between high sales and the more extensive husbandry systems. Thus in Kent, where at first glance Fig. 23 indicates a concentration of high-selling demesnes in the north-western part of the county with its relatively extensive agriculture, allowance should be made for the block of demesnes in the intensively-farmed eastern part of the county which transferred large proportions of their produce to the Cathedral Priory in Canterbury (Fig. 29). Moreover, on the edge of Romney Marsh and in north Kent near Faversham and Sittingbourne, both areas of intensive agriculture, there were demesnes notable for high sales. Two of the demesnes in the latter group, Milton and Ospringe, adjoined Canterbury Cathedral manors where much smaller proportions of the produce were sold. The picture is similarly distorted in Northamptonshire, where the only demesnes to sell 60 per cent or more of their grain were those that did not belong to the abbeys of Peterborough or Crowland. Critical to the pattern of sales, therefore, was the distance at which a demesne lay from a settled household where its produce might be consumed: the high-selling

⁴⁰The exception is Bedfordshire, the most poorly documented of them.

demesnes of Westminster Abbey, for example, lay significantly beyond the 9.3 pence cost-distance isopleth from London.⁴¹

One method of determining whether demesnes in the London region as a whole displayed a tendency to participate less in the market as distance from London increased, would be to compare the proportions of grain sold with the estimates of cost-distance from the metropolitan market (cf. Fig. 7), but the institutional composition of the database undermines the validity of such an exercise. When all conventual and collegiate demesnes are removed from consideration, more than halving the size of the sample, no particular pattern is apparent. Alternatively, removing conventual and collegiate demesnes within 10 miles of the house to which they belonged does reveal a small decline in sales with distance from London: from 47 per cent of the receipt net of seed and tithe for demesnes within the 3.3 pence cost-distance isopleth, to 38 per cent for demesnes beyond the 9.3 pence isopleth.

After allowing so far as possible for the effects of estate structure, a distinctive pattern for sales as a proportion of net receipt does seem to emerge (Fig. 23). The Thames valley and the territory bordering the estuary, especially on the Kent side, are notable for their concentration of demesnes selling 60 per cent or more of the available grain. Much of Essex and Hertfordshire were not: in both those counties even the manors which were not in monastic ownership tended to sell less than 60 per cent of their net receipt. The relatively low showing of Middlesex and Surrey is to be accounted for partly by the monastic ownership of demesnes close to the Thames, but also by the relatively large cultivation in those counties of rye, barley, and oats, the grains consumed in greatest proportions on the manor. The territory characterized overall by high sales might thus have extended continuously up the Thames above London. It perhaps widened out around and above Henley, to include a band of manors, distinctive for their concentration on wheat, in the Chiltern Hills, south Oxfordshire, and the corresponding part of Berkshire. Other areas distinctive for relatively high sales may be identified to the north of Oxford, where local urban demand could have been a factor, and in the Nene Valley of Northamptonshire, where grain markets to the north-east, adjoining the Wash, could have been an influence. The 11 demesnes where 80 per cent or more of the available grain was sold were for the most part widely scattered, and a number of them seem to owe their position in that group to individual circumstances: Wantage, for example, may have conformed less to a pattern of high sales which prevailed in that part of Berkshire close to the Thames and more to the requirements of the abbey of Bec which owned it.⁴² Nevertheless, the commercial influence of London may possibly be apparent in the two demesnes in this category which

⁴¹ Birdbrook (Ess), Turweston (Bk), Launton (O).

⁴² Moreover, Wantage is represented in the database by a single account which records the use of an exceptionally low percentage of the gross grain receipt as seed.

were downstream of London and close to the river, and more certainly in the three which were close to Henley.⁴³

This picture can be refined by means of a preliminary exploration of the value of the grain put on to the market in each area, as measured by the money values of sales per acre sown with grain.⁴⁴ If an income of 4 shillings or more per acre is taken to indicate those areas where grain production was most valuable in commercial terms,⁴⁵ two such areas clearly emerge, while some of the demesnes more distant from London which sold high proportions of their grain appear less significant. The first of the two areas was the upper Thames district. In the immediate vicinity of Henley, demesnes were much less prominent for the value than for the proportion of grain sold, but further from London, both upstream and overland in Berkshire and south Oxfordshire, there is a group of demesnes, including Brightwell (Brk) and Cuxham (O) which were relatively more significant in terms of value.⁴⁶ Cuxham sold grain worth 3s. 5d. per acre, but was the only database manor in the area which transferred grain as well as selling it. This district was notable for wheat production, and seems to have extended to the north-east to include, in succession, Moreton, Holmer, and Cheddington (all Bk, and selling 3s. 7d., 5s. 0d., and 4s. 4d. per acre, respectively), whose local market centre was probably High Wycombe rather than Henley. Both Moreton and Cheddington appear to have been distinctive in the locality for the cultivation of legumes, one measure of intensive production.

The second area of high-value per acre sales was in north Kent, but it extended less far in the direction of London than the pattern for proportion of grain sold might suggest. There was a concentration of demesnes selling more than 4 shillingworth of grain per acre in the immediate vicinity of Faversham, which, as other evidence also indicates, was thus very different from Henley, both as a grain market and in its effect on the surrounding countryside. This highly commercial area probably extended to the east of Faversham, but is obscured in the data by the presence of demesnes which transferred grain to Canterbury; the evidence suggests, however, that the area did not include the margins of Romney Marsh. The evidence for Northamptonshire is even less representative, but suggests that there may have been a third area for high value sales per acre in the central part of the county, especially in the Nene Valley.⁴⁷

⁴³ West Thurrock (Ess), Farningham (K), and Culham, Billingbear, and Waltham St. Lawrence (all Bk).

⁴⁴ Some methodological problems of this approach have yet to be resolved, and so comprehensive results are not presented. It is unlikely, however, that the conclusions based on extreme values which are given here will subsequently be altered.

⁴⁵ This value is, of course, to be distinguished from the arable land values recorded in the IPMs, which take account of production costs.

⁴⁶ Wantage and Hampstead Norreys (both Brk) are in the same group, but each is represented by a single account for a year in which practice may have been abnormal (cf. above, n. 42).

⁴⁷ Liffham Ferrers and Rushden sold over 4 shillingworth of grain per acre; by this measure the more land-locked Long Buckby, which sold a high proportion of its grain, was much less significant commercially.

If the exercise is extended to cover the 27 demesnes which sold grain worth 3 shillings or more per sown acre, the shape of these two or three areas does not change significantly, although a further area in the Cherwell valley to the north of Oxford emerges as relatively important for high-value per acre sales. The rest of the region, most notably the immediate surroundings of London (especially upstream of the city) was uniformly characterized by low-value per acre sales, mostly less than 2 shillings per sown acre.

In part this pattern reflects the choice of grain cultivated and sold. What, therefore, were the patterns for the individual crops?

Oats (Fig. 24)

Wheat and oats were the most widely-grown grains, but oats were sold in the smallest proportion. Over the region as a whole less than a quarter of net receipts of oats was sold, and two-thirds were retained for consumption on the manor. Oats were the grain least capable of bearing the costs of transport, and so were grown on the largest scale closest to London.⁴⁸ In assessing the significance of the geographical pattern of oats sales, a distinction may usefully be drawn between those demesnes and areas which sold some oats and those which sold little or none. Most manors in Hertfordshire, Bedfordshire, and Northamptonshire and a majority of them in Buckinghamshire, mid and south Oxfordshire, west Berkshire, east-central Essex, and mid Kent sold less than 20 per cent of their net receipt of oats. By contrast, a liberal scattering of demesnes in north and west Oxfordshire, south and east Berkshire, Middlesex, Surrey, north Kent, near Romney Marsh in Kent, and in coastal and north Essex sold at least 40 per cent of their oats. At many of these demesnes, however, the quantities sold were small. Three of the Berkshire demesnes south of Henley sold over 80 per cent of their oats, but as their sown acreages were relatively small the quantities involved were modest, only exceeding 40 quarters in the case of Billingbear. By contrast, at Walton-on-Thames (Sr), a manor ideally suited to exploit the metropolitan market, 104 quarters of oats were sold in 1308, representing over 84 per cent of net receipts. Other database demesnes which sold over 80 quarters of oats per annum were all at a further remove from London, they include Ivinghoe (Bk) and Birdbrook, Felsted, Little Baddow and Eastwood (all Ess).⁴⁹ In terms of the percentage sold, however, all these manors fell significantly short of Walton. Other sources confirm that manors in areas which the database reveals to have been notable for high percentage sales of oats did indeed sell large quantities.⁵⁰

⁴⁸ See above, 116-18.

⁴⁹ Eastwood is close to Shoebury, where royal purveyors purchased 7 per cent of their oats in 1285 (Table 6), and the nearby database manor of Middleton sold at least 40 per cent of its oats, amounting to 44 quarters a year.

⁵⁰ The archbishop of Canterbury's manor at Otford in north-west Kent sold 50 quarters of oats in 1273-4: BL, Add. Roll 29794. The executors of the bishop of London in 1303-4 sold 60 quarters of

Overall, the districts where the production of oats seems to have been most commercialized (including those demesnes which sold 80 per cent or more of their net receipts) seem to have been close to London or to the water routes which led to it. The pattern of sale for oats, however, is less clear-cut than that of their production, in part because of their disposal within estates and in part because of the varying degree to which they were consumed within the demesne production process.⁵¹ On some demesnes, notably in parts of Middlesex and in northern Surrey,⁵² there seems to be a correlation between a specialization in the production of oats, relatively low sales of oats, and the maintenance of large numbers of cart-horses (cf. Fig. 6), perhaps a reflection of the concentrated demand for horsepower in the vicinity of the capital. There are cases of a similar correlation in other areas too: at Cuxham, for example, the high consumption of oats on the demesne was perhaps associated with the regular practice of sending grain by cart to the Henley market and to Merton College in Oxford.⁵³ Apart from those areas under the influence of London, there was a significant cluster of oats sales in central and north Oxfordshire which may betray the influence of Oxford market. A lesser group in north Essex may possibly reveal the influence of Cambridge, but in both those areas there may also have been a special local demand from livestock production or management. This type of interaction between agrarian sectors awaits fuller investigation.

Dredge (Fig. 25)

In sharp contrast to oats, dredge was mostly grown on a small scale, and of its net receipt only 40 per cent was retained for consumption on the manor while 48 per cent was sold. Only wheat was sold in larger proportion. The production of dredge, however, does not seem to have been linked to the London market. The few demesnes in the Thames valley below Reading which sold high proportions of dredge may have been suppliers to London, but the quantities involved were small. Larger-scale production and sale were more characteristic of areas further upstream, and in the north and west of the region as a whole, where the sometimes substantial sales of dredge seem likely to have been destined to slake local rather than metropolitan thirsts. The greatest aggregate demand, especially for the cheaper grains which provided human food and drink, was, after all, to be found in the countryside rather than in London.⁵⁴

from the episcopal demesne at Stepney, 66 quarters from Harringay, and 297 quarters from Fulham: Hale and Ellacombe (1874), 61, 64, 94.

⁵¹ See above, 147, 149, 152.

⁵² Hampstead (Mx), Esher (Sr).

⁵³ See above, 53, 147, 150, 159; Harvey P D A (1965), 47-8.

⁵⁴ Farmer (1991), 329.

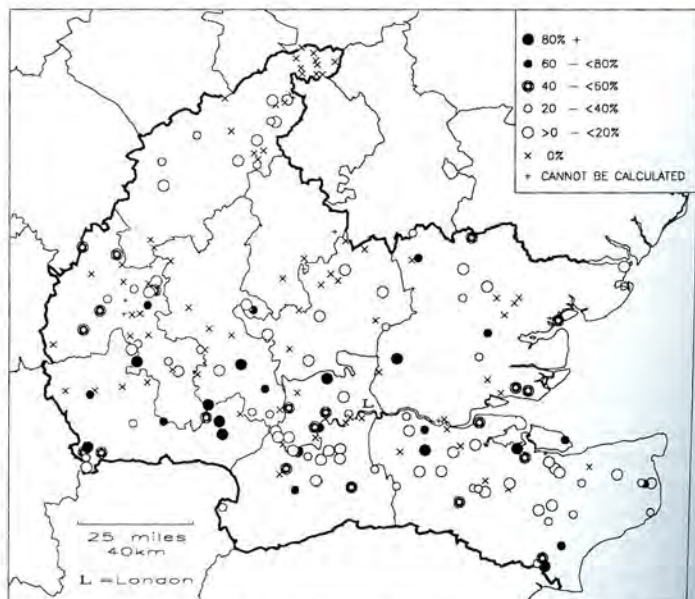


FIG. 24. Sales of oats as a percentage of the receipt, net of seed and tithe, by demesnes in the London region, 1288-1315

Source: accounts database.

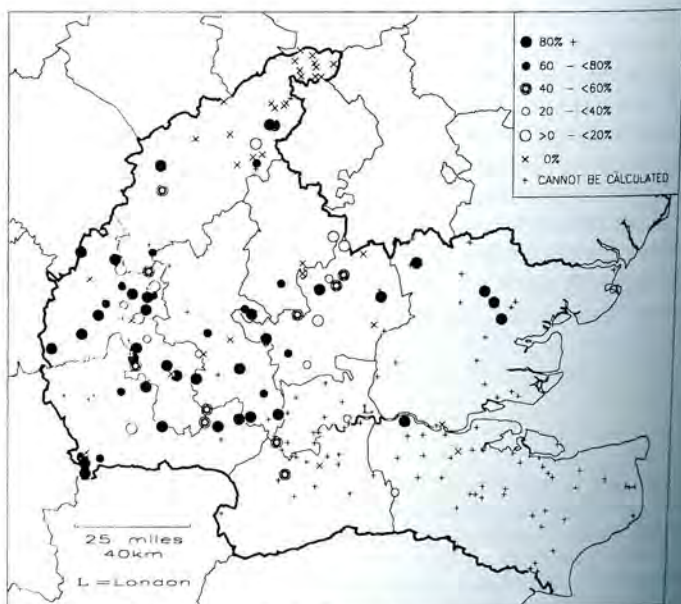


FIG. 25. Sales of dredge as a percentage of the receipt, net of seed and tithe, by demesnes in the London region, 1288-1315

Source: accounts database.

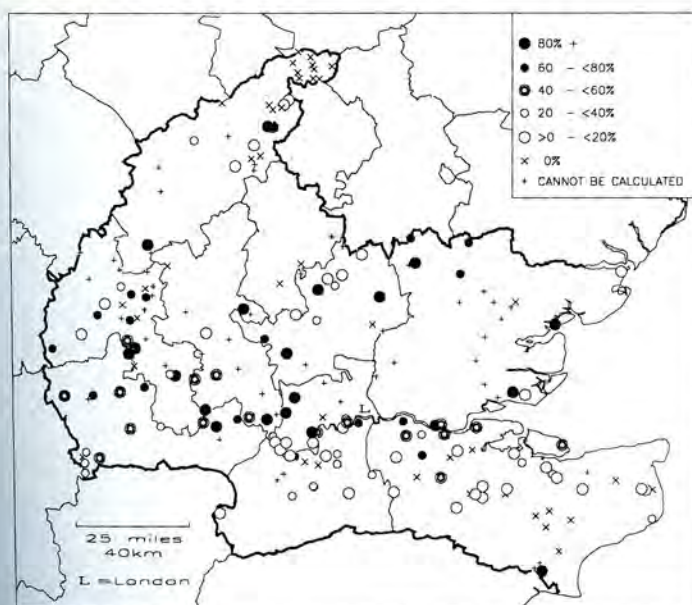


FIG. 26. Sales of barley as a percentage of the receipt, net of seed and tithe, by demesnes in the London region, 1288-1315

Source: accounts database.

Barley (Fig. 26)

London was the centre of an extensive and efficient trade in barley, which was primarily valued in the region as a brewing grain of higher quality than dredge or oats. The distinctively metropolitan character of the barley trade is indicated by the pattern of production and by the considerable direct evidence for sales in the city or near by, the latter including the large central purchases made by Westminster Abbey.⁵⁵ On average demesnes sold a third of their net receipt of barley but, since the acreages sown were usually small, the quantities sold were rarely substantial. Barley sales were significant as a proportion of net receipts in many of the same areas that dredge sales were, presumably for the same reason. In addition, however, they were distinctively distributed along the line of the Thames and its estuary, especially downstream from Henley, although there is some indication of a separate market for barley around Oxford. Only twelve of the database demesnes sold 40 quarters or more of barley and, of these, three were located in western and central Berkshire, and four in the lower Thames valley, while the others were more widely scattered.⁵⁶ Transfers of

⁵⁵ See above, 76, 151, and Appendix V.

⁵⁶ One in each of the following localities: the Nene valley, southern Northamptonshire, near Oxford, southern Buckinghamshire, and north-west Essex.

barley within monastic estates mean that demesnes along the Thames in south-west Middlesex and in northern and eastern Kent do not stand out as much for sales of barley as they do for its production (cf. Fig. 14). Accounts for the estates of the archbishop of Canterbury, however, provide a valuable corrective for Kent. His eastern manors of Reculver, Westgate, and, above all, Wingham sold substantial quantities of barley in 1273-4, and in 1323 his Kent and Sussex manors provided a large quantity of barley for a royal purveyance which was based in London.⁵⁷ Despite the skewed evidence concerning barley sales provided by the database and by some other sources,⁵⁸ it may be that within the London region the most important district for the commercial production of barley was in north-eastern Kent, with markets and shipping centres at Faversham and Sandwich.

Malt

Oats, dredge, and barley were also sold as malt. While oats were used for malt in London, there are relatively few instances of oats being malted on demesnes, and so it is unlikely that substantial quantities were sold in that form.⁵⁹ Forty-nine of the database demesnes sold malt as well as, or in some cases instead of, barley and dredge. Quantities sold, however, were generally small and may represent malt which proved to be surplus to household requirements. Only five manors sold over 20 quarters of malt per annum, and none of them lay in areas where barley was important in acreage terms. The string of manors in the Thames valley where barley occupied over 40 per cent of the grain acreage sold nearly all their surplus in the unmalted state. By contrast, malt sales were more common in north Oxfordshire, and in other northern and western parts of the region where manors were more oriented towards the production and sale of dredge. The trade in malt thus appears to have been local rather than metropolitan in its orientation. Even the small amount of evidence so far available concerning the conveyance of malt to London for sale suggests that it was in small quantities and overland, and that the bulk, water-borne trade in malt to the capital was a development of a later period.⁶⁰

Rye and rye mixtures (Fig. 27)

The cheaper and poorer grades of bread were made from rye and rye mixtures. These grains were grown in quantity only by a limited number of demesnes mostly with ready access to London in and near the lower Thames

⁵⁷ BL, Add. Roll 29794: in 1273-4 Wingham sold 251 quarters of barley and 80 quarters of malt; the linked Wingham Barton sold a further 80 quarters of barley. One-third (400 quarters) of the barley purchased in 1323 came from the archbishop's manors: PRO, E101/16/18; see also above, 157.

⁵⁸ The otherwise valuable records of the purveyance of 1295, for example, say nothing of the market for barley, presumably because ale was not required for an expedition to Gascony: see above 51-3, 91.

⁵⁹ For the malting of oats in London, see 80 and Appendix V.

⁶⁰ See above, 25, 30, 54, 113.

valley (Fig. 15). Overall, rye and rye mixtures were not sold in large proportion (Table 15). In fact, they were the grains least likely to leave the demesne since, on average, 69 per cent of net receipts were retained and consumed on the manor, most of it as liveries and payments in kind. The proportion of rye that was sold was therefore low, 29 per cent, but nevertheless very much greater than that transferred. The geographical pattern of sales indicated by the database is thus less likely to be skewed than that for any other grain.

Demesnes near to and south of the Thames sold the greatest proportions of rye and rye mixtures. Kent demesnes did not grow rye on a large scale, but most of those demesnes that produced it appear to have sold the greater part of their net receipt. A cluster of four demesnes in mid Kent, accessible to London commongers via the River Medway and Maidstone,⁶¹ all sold at least 80 per cent of their net receipt, as did three demesnes along the Thames even closer to London.⁶² Further east, especially in Kent, production and the market were dominated by wheat and barley. Other areas where significant quantities of rye and rye mixtures are likely to have been sold are indicated by a group of demesnes around Henley⁶³ and perhaps another close to Uxbridge in west Middlesex,⁶⁴ both markets which are likely to have supplied the grains to London. Ease of access to London distinguishes these groups. Some more outlying demesnes which sold high proportions of their receipt of the crop actually grew little or none.⁶⁵ A total of 19 database demesnes directly accessible to London by road or river sold at least 40 per cent of their rye and, of these, 13 lay upstream of London in the main area of rye production. In this zone, Hampstead Norreys and Wargrave (both Brk) and Langley Marish (Bk) each sold over 40 quarters of rye and rye mixtures, while Brightwell and Waltham St Lawrence (both Brk) and Byfleet, Sheen, and Walton (all Sr) each sold between 20 and 40 quarters.

Nevertheless, the correlation between relative acreage and percentage of net receipt sold is far from perfect, and it would be misleading to suggest that all the demesnes which grew large amounts of rye and rye mixtures did so with the intention of selling their grain. Rather, it seems that cropping patterns in the middle and lower Thames valley were significantly influenced by the presence of a major centre of demand for rye, maslin, and mancorn, and that this influence extended to demesnes which did not respond directly to market stimuli, for one or more of these crops was grown in significant quantities on

⁶¹ East and West Farleigh, Loose, and Maidstone. For London commongers at Maidstone, see above, 51-2, 92.

⁶² Cliffe and Bexley (K) and West Thurrock (Ess).

⁶³ Wargrave and Waltham St Lawrence (Brk) sold at least 80 per cent; Billingbear (Brk) sold a smaller proportion but devoted a greater share of its acreage to the crop.

⁶⁴ Colham (Mx) and perhaps Langley Marish (Bk); see above 122.

⁶⁵ Leatherhead and Cheam (Sr); the single account for Letcombe Regis (Brk) reveals that most of the previous year's harvest was sold, but that none was sown in the year of the account.

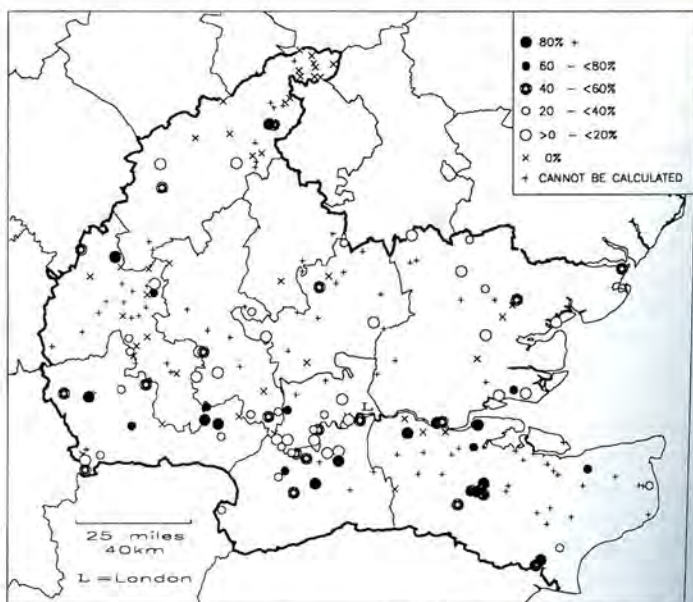


FIG. 27. Sales of rye and rye mixtures as a percentage of the receipt, net of seed and tithe, by demesnes in the London region, 1288-1315

Source: accounts database.

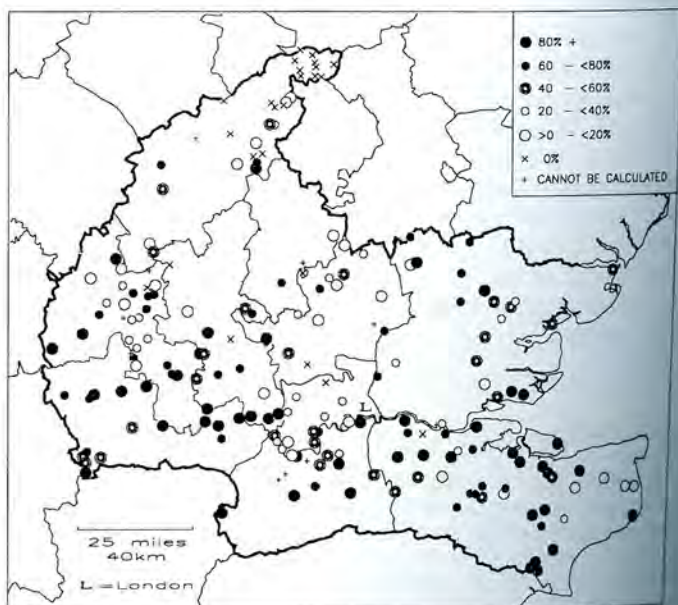


FIG. 28. Sales of wheat as a percentage of the receipt, net of seed and tithe, by demesnes in the London region, 1288-1315

Source: accounts database.

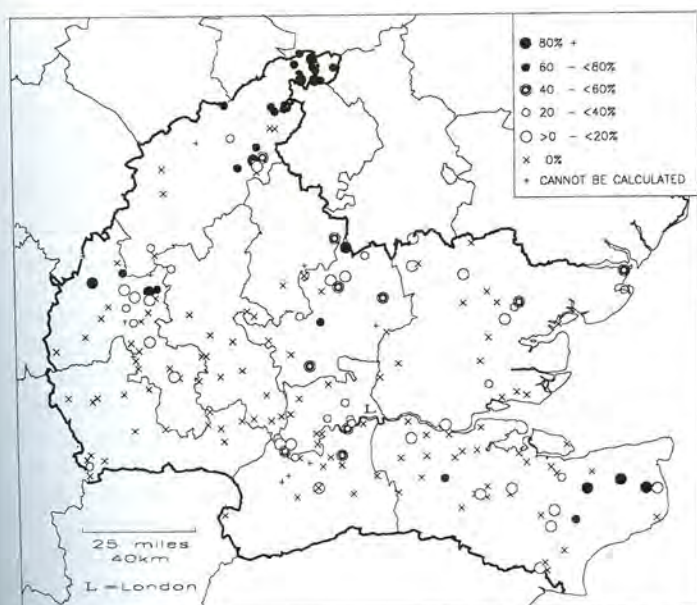


FIG. 29. Transfers of wheat by demesnes in the London region to estate headquarters or elsewhere as a percentage of the receipt, net of seed and tithe, 1288-1315

Source: accounts database.

virtually all demesnes in this Thames valley area above London, irrespective of whether much, if any, was sold.

Wheat (Figs. 28, 29)

Wheat was the grain most widely grown and most commonly sold in the London region. Less wheat than any other grain was retained for consumption on the demesne, and on average 48 per cent of net receipts were disposed of by sale. There were few parts of the London region where wheat was not sold and some demesnes well beyond the range of the London market, as defined by the 3 pence cost-distance isopleth, sold at least 80 per cent of their receipt (cf. Fig. 2). The most distant were Adderbury (O) and Rushden (Np), and there were others closer in at Newport (Ess), Broadwell (O), and Coombe (Brk). All six of these manors were part of estates notable for high sales, belonging to the earldoms of Cornwall and Lincoln, to the bishop of Winchester, and to the king. Altogether 45 of the demesnes sold at least 80 per cent of their wheat and over two-thirds of these were directly accessible to London by river, road, or coast. Many of them belonged to the king, laymen, the bishop of Winchester, or the abbey of Bec, and the others to Canterbury Cathedral Priory.

Not one of the Westminster Abbey manors sold even as much as 60 per cent of its wheat, presumably because the abbey had to transfer the wheat it needed

from its widely-scattered demesnes in the less intensively-cultivated parts of the region. Canterbury, by contrast, could supply almost all the wheat it needed from a compact group of intensively-farmed demesnes in east Kent,⁶⁶ and so was able to sell by far the greater part of the crop on most of its other manors. The distribution of the twelve Canterbury demesnes which sold less than 80 per cent of their wheat is revealing. Apart from the east Kent group which was involved in transfers,⁶⁷ they include a cluster of five demesnes in central Kent in a district which appears to have been distinctive for sales of rye and rye mixtures and, in the context of Kent, for the cultivation of oats. The demesnes had ready access to Maidstone market, which seems to have supplied these cheaper grains to London.⁶⁸ The journey overland from this neighbourhood to the major wheat market at Faversham would have been an awkward one. This serves to emphasise the Thames-side and coastal character of the pattern of wheat sales, and presumably of the overall market network for wheat. The contrast between Maidstone and Faversham, of which the latter was much more open to international trade, shows too that even when transport costs to London were equal, markets relatively close to each other could develop different specialisms which seem both to have responded to and to have influenced local patterns of production and sales.

The distribution of demesnes which sold at least 60 per cent of their wheat complements that of those which sold more, and extends it to the limits of the area where London commoners are known to have operated, and where a London wheat price prevailed (Figs. 5, 9). From Abingdon downstream, the Thames, so central to the commoners' activities, was the axis of the zone of high wheat sales, although between Marlow (Bk) and London, in both proportions and quantities sold, rye displaced wheat as the principal winter grain. Around and upstream of Marlow, in eastern Berkshire and south Buckinghamshire, demesnes also had relatively low acreages under wheat, but generally sold over 80 per cent of their net receipts, suggestive of the influence of the metropolitan market via Henley and Marlow.

Two areas stand out as being most important for the commercial production of wheat, in terms both of proportions sold and of the quantities put on the market. There is no means of measuring the quantity of grain put on the market in any particular locality, but the proportion of the grain acreage devoted to wheat, taken in conjunction with the intensity of production, provides a general indication. The two areas demonstrate the significance of a water-oriented system of metropolitan supply. One focused upon the major entrepôt of Henley, and included demesnes in the lower-lying part of south Oxfordshire, and in the

⁶⁶ In addition to the four database demesnes evident in Fig. 29, other Canterbury manors in the same locality (including Addisham and Monkton) transferred large quantities of wheat to the priory.

⁶⁷ This includes Lydden which was not significant for transfers of grain but seems to have been a pastoral rather than an arable demesne.

⁶⁸ East and West Farleigh, East Peckham, Loose, and Hollingbourne; see above, 52, 165, and Fig. 12, 27.

corresponding district of Berkshire, in the adjoining Chiltern area of Buckinghamshire, and in the commonfield country beyond the Chiltern Hills: it is clear why, in addition to Henley, High Wycombe was a market of interest to London commoners. The second area comprised the north Kent coast, and probably also (although the evidence for demesne sales tends to obscure the picture) the north-eastern part of the county and the margins of Romney Marsh. Important markets here were Faversham, Sandwich and New Romney, the latter two perhaps being less significant for London. A preliminary investigation of the quantities of wheat sold in relation to the area devoted to the grain indicates that these two areas can be defined even more precisely in terms of the only two significant groups of demesnes which sold at least six bushels per sown acre of wheat. The area served by Henley and the river above it seems to correspond to a group defined by Harwell and, perhaps, Wantage (both Brk) to the north-west,⁶⁹ Holmer (Bk) to the north-east, Billingbear (Brk) to the south-east, and Hampstead Norreys (Brk) to the south-west. The north Kent group extended from Northfleet on the west to Blean near Canterbury on the east. The evidence is imperfect for east Kent,⁷⁰ but the group may have extended round the coast to include Appledore, Ebony, and Fairfield on the edge of Romney Marsh.

Away from these two areas of commercial wheat production, the more land-locked parts of the region tended to sell less of the wheat they had available, and at a lower rate per unit area, although there were three demesnes in central Northamptonshire where more than six bushels of wheat were sold per acre sown.⁷¹ Those parts of Essex and Hertfordshire most directly served by the River Lea are relatively poorly represented in the accounts database, which in any case is dominated in those areas by Westminster manors which transferred wheat to the abbey, but even so the non-Westminster manors do not show up as substantial producers of wheat for the market. On the other hand, price evidence suggests that much of these two counties was firmly within the sphere of influence of the metropolitan market for this prime bread grain, and they might show up more strongly were it possible to examine more manors which did not belong to Westminster. A royal purveyance of wheat, oats, and barley in Essex and Hertfordshire in 1296-7 also confirms the importance and availability of wheat in those two counties.⁷² In Hertfordshire 65 per cent of the grain purchased was wheat, and in Essex 48 per cent. The St Albans area and the northernmost hundreds of the two counties seem to have been particularly

⁶⁹ For evidential problems concerning Wantage, see above, 159 and n. 42.

⁷⁰ On account of the transfers to Canterbury from the Cathedral Priory manors; the royal manor of New Cliffe in that area, where the proportion sold was high but the quantity sold per sown acre was low, is represented only by one account, which shows that a very high proportion of the gross receipt was sown, leaving little available for sale.

⁷¹ Higham Ferrers, Long Buckby, and Rushden; the more northerly manors in the database for the county tended to transfer their wheat to monastic households.

⁷² *PL* 6, E101/556/3.

important for wheat, a pattern which broadly accords with that of the accounts database (cf. Fig. 28). St Albans may have been a particularly important market for wheat in this district, for within less than 10 miles there were demesnes which devoted at least half their grain acreage to wheat, sold over 80 per cent of their wheat, or sold more than 6 bushels per acre sown.

CONCLUSION

Patterns of grain sales in the London region c.1300 are, therefore, complex and only partially reflect corresponding patterns of production. That there should be no perfect correspondence between specialization in the cultivation of any particular grain and specialization in its sale is hardly surprising, given the complexity of the institutional structures and the transport-cost framework within which individual demesnes operated. In their choice as to whether to sell the produce of a particular demesne or to transfer it to headquarters for consumption, some of the major estates in the region certainly responded to market forces. Indeed, the coherence of the patterns of production that underpinned the diverse patterns of disposal testifies to the strength of commercial influences in general and of the metropolitan market in particular.

IX

CONCLUSION

This pioneering attempt to investigate the size and operation of the grain market in London c.1300 and the impact of that market on grain production and distribution in the city's region is in many respects an exploration of methodologies. Despite their quantity and richness, the sources upon which it is based are partial in their coverage, uneven in their distribution, and often inconsistent and incomplete in their information. Moreover, the purposes for which the records were compiled are not those for which they have been used in the investigation. While the questions which inform the study have a firm theoretical basis, the process of obtaining answers involves a good deal of experiment with intractable materials, and for some topics the experiment is not yet complete. To focus on the issue of a major city and its grain supply before the Black Death elicits requirements for information which long and productive study of the medieval economy, both rural and urban, has not yet been able to provide. Some initial findings, prompted by this deficiency, are supplied here. Topics which are still at this experimental or provisional stage include the methods of obtaining a wide spread of information on crop yields; of measuring the intensity of cultivation; of comparing the grain output of one demesne with that of another; of estimating transport costs within the region; of measuring the degree of integration between local prices and those of the metropolitan market; of measuring the populations of London and its region; and, at an extreme of estimation, of measuring in calorific terms the overall productive capacity and consumption requirements of the London region.¹

Undoubtedly, future work will enable several of these lines of enquiry to be taken further. There is also a need to investigate that substantial part of agrarian production represented by the peasant sector, for which the systematic findings for demesne agriculture provided by this study will provide a context. Even so, the provisional answers supplied here, in conjunction with the series of securely-founded standard measures of grain production and disposal, and a knowledge of the London marketing system, have already served to generate a series of interlinked hypotheses concerning the operation of the grain economy in north-west Europe at an early peak in its activity. In this way the study provides a bench-mark against which to set the often less well-recorded developments of earlier and later periods.

¹ See above, 9-11, 32-45, 60-9, 126-41.

From evidence concerning some 200 demesnes it is possible to estimate the total grain output of the ten counties of the London region c.1300, and the proportion that probably would have been available for feeding the city. Comparison between those figures and estimates of the annual per caput consumption of grain necessary to sustain London (figures of an order similar to those available for other medieval cities), provides new material for the debate concerning the size of the population in medieval England and its cities.² The recent tendency to increase the estimates of size should perhaps be moderated a little. The new evidence from the London region suggests that England in 1300 is unlikely to have sustained a population of as many as 5 millions and a capital city in excess of 80,000 inhabitants, although the system had the technological and organizational capacity for further expansion. Even so, the range of possible estimates arising from the exercise is not narrow, and changes in their basis (not least concerning the composition of the medieval diet) could result in significantly different figures. Thus, while London drew its grain supplies both from areas which were highly productive and from those which were much less so, the degree to which the city relied on one type of area or another is far from clear. If the city drew its supplies from areas with a higher level of productivity and disposable grain output than indicated by the demesnes in the London region overall, then a metropolis and a general population of a larger size could have been sustained. The converse would also be true. By setting even these approximate parameters and by adding to the stock of hypotheses which may usefully be deployed, the study therefore makes a contribution to the demographic history of England.

London's grain-supply area can be defined by a variety of independent measures, each of which tends to support the others. They include the range of activity of the London cornmongers, the pattern of transport costs to the city, the integration of local and metropolitan prices, and the patterns of production and disposal for the different types of grain.³ London was by far the largest English city, and the cost of transporting grain to it appears to have been the prime (but not the sole) determinant of the shape of its supply region. Transport by water was much cheaper than by land, and so the River Thames and its estuary served as the dominant axis of the supply region, with the rivers Lea and Medway extending it a little to north and south. There was only a partial correspondence between that region and the ten counties around London which are the subject of this investigation. Much of the northern, western, and south-western parts of the ten-county area seem to have been beyond the limits of the area which supplied the city with grain, even in years of relative shortage, although they probably included districts which produced livestock and livestock products for London's markets.⁴ The city seems to have drawn grain from beyond the ten

² See above 43-5, 77.

³ See above, 46-56, 60-9, 111-70.

⁴ Farmer (1991), 384.

counties on a fairly regular basis, especially from a narrow coastal strip in East Anglia, which the cheapness of bulk carriage by ship brought within range. Thus, it appears to have been to an extension of these coastal systems, rather than to the more remote inland areas, that in years of exceptional shortage the city's commongers turned for supplies.⁵

London's grain-supply area in normal years appears to have extended to include market towns up to about 20 miles from the city when only land transport to London was available, and up to about 60 miles as the crow flies when water transport could be used. This provides some basis for comparison with elsewhere. Other English cities were so much smaller than London that it is unlikely that the effect of their demands for grain would be so apparent in their hinterlands. The subject has hardly been investigated, but the influence upon grain production of Oxford, the next largest city within the London region, appears to have been confined to a radius of no more than a dozen miles. Similarly, later fourteenth-century Winchester, then probably smaller than one tenth the size of London in 1300, lacking a navigable river, and in a region of relatively unintensive farming, was supplied with grain from within a radius of about 12 miles.⁶ Exeter in the same period, when it was even smaller than Winchester, seems to have drawn its supplies from up to 20 miles away, but from a hinterland more intractable and less productive than Winchester's.⁷ Colchester, probably smaller than Exeter, seems in this period regularly to have drawn its grain from places up to eight miles distant by road.⁸

Some more appropriate comparisons can be made with Paris. In 1304, a year of great scarcity of grain, when the city may have had twice the population of London, the search for supplies extended to places up to 125 miles from the capital, although the normal radius of the grain-supply zone was perhaps about 40 miles.⁹ In the late seventeenth century, when Paris may have been five or more times the size of London in 1300, market towns named as supplying the city with grain were up to about 35 miles distant if they had no direct access to water transport, and up to about 60 miles distant if they lay on navigable rivers.¹⁰ While far from exact, these comparisons suggest that the methods of estimating grain catchment areas adopted here produce valid results which roughly reflect the scale of demand in each of the cities, and the rates of grain production in their hinterlands.¹¹ It thus seems that despite the differences in size between the towns, the systems of production and distribution which supplied them with grain (the 'traditional grain economy' as Meuvret termed it)

⁵ See above, 69-71.

⁶ Keene (1985b), 251-5, Fig. 27.

⁷ Kowaleski (forthcoming c). The substantial overseas and coastal shipments to Exeter in the early fourteenth century suggest that the city was then an important regional supply centre for grain.

⁸ Brinell (1986), 44.

⁹ Calculated from data cited in Usher (1913), 47-8.

¹⁰ Calculated from data in Boilisle (1881).

¹¹ Especially if differences in the extent of the land available for cultivation in the hinterlands of the cities and the relatively small demand for brewing grains in Paris are taken into account.

were essentially similar.¹² In 1300, however, London stood in sharp contrast to other English towns for the number of intermediate linkages between producers and consumers in its system of grain supply. There seems to have been a distinct resemblance between the grain supply system of London in 1300 and that which met the needs of the city three hundred years later, to the extent that many features which previous writers have associated with the major urban or metropolitan markets of the seventeenth century were present in London by the early fourteenth.¹³ Cities of the size of Paris in 1700, however, were attaining a scale which would create a grain market of a different character.¹⁴

There are some indications of how the system prevailing in London in 1300 had come into being. Obligations to provide fixed quantities of grain to households in London or to carry it to the city for sale or consumption were imposed on some manors which were up to 40 miles distant over land, much further from London than the markets which normally supplied the city by road around 1300.¹⁵ A similar situation can be observed in Exeter's hinterland in the same period.¹⁶ Such obligations probably originated at a much earlier date and thus preserved a shadow of a system in which direct transfer of produce to the metropolitan or regional centre was the best strategy for supplying the household or for selling the surplus. Subsequently, with the development of intermediate markets, a more flexible and efficient system of urban supply evolved, which in the metropolitan hinterland included several market towns specializing as grain entrepôts.

In the London region the clearest example of this evolution is provided by Henley, which by the mid thirteenth century had succeeded Wallingford, some 30 miles further up river, as the principal market centre of the middle and upper Thames region, certainly so far as grain was concerned. There seems to have been a focus of commerce in the neighbourhood of Dorchester and Wallingford from an early date, and this upper Thames region had had trading links with London since at least as early as the tenth century, if not long before.¹⁷ The shift to Henley seems largely to reflect the pull of the metropolitan market, but the process may have been assisted in the mid thirteenth century by the powerful lord of Henley, Richard of Cornwall, who had interests in the grain trade and controlled the Queenhithe market in London.¹⁸ Henley's development as an entrepôt was also promoted by its large trade in firewood, available close to the town and shipped down river to London. In a similar fashion, Maidstone's evolution as a grain market for London was probably assisted by the shipping

¹² A similar point has been made concerning German towns: Irsigler (1985), 124.

¹³ See above, 4, 107-10.

¹⁴ Meuvret (1956), esp. 182, 187, 202-3; cf. Meuvret (1988) i, chapter 3.

¹⁵ See above, 46-56.

¹⁶ Kowaleski (forthcoming c).

¹⁷ Biddle (1976a), 451, 500; Keene (1989c); Scull (1990); Lapidge and Winterbottom (1991), 64-5.

¹⁸ Denholm-Young (1947), 67-8, 165, 167, 169; Richard acquired Henley as part of the extensive royal manor of Benson which lay opposite Wallingford on the Oxfordshire bank of the river (PRO, JUST1/710, m. 23), not under the name of Hambledon as stated by Denholm-Young.

network which served the important quarries near by. Clearly, the grain-supply network was integrated with those for other commodities, as the link between London fishmongers and the grain trade also shows. Other important grain ports which regularly supplied London included Faversham in north Kent, and perhaps on a less regular basis, Sandwich and New Romney (both K), Rye (Sussex), and Yarmouth (Norfolk). While Faversham was directly comparable with Henley in terms of cost-distance from London, its grain market was much busier than Henley's, and that points to an important difference between the western and the eastern (upstream and downstream, respectively) parts of the region which supplied the city with grain.

The markets which supplied London with grain overland, such as Uxbridge (Mx), High Wycombe (Bk), or St Albans (Hrt), were much less important than those with direct access to water transport, although they too could profit from the interplay between their trade in grain and other local resources. In the grain trade there was probably an important complementary relationship between the water and road transport systems, the former serving for the bulk carriage of grain, while the latter provided a network for the rapid flow of information which was necessary for the market to operate effectively. This was just one aspect of the sophisticated and generally well-integrated grain-marketing system which had developed in the London region by the early fourteenth century. Other features included extensive trading by intermediaries and by the agents of grain merchants in London, substantial investment in the storage of grain so as to release it at times of peak demand, trading by sample in grain which otherwise did not enter the formal market-place, and a tendency for supplies to flow into the city in anticipation of demand.¹⁹ A small number of London commoners dealt in very large quantities of grain over the year, and wholesale trading was an important aspect of the market, especially in the water-borne trade. Overall, however, the London grain market was characterized by the very wide range in the scale of business of those who participated in it, so that in practice it is difficult to draw a firm distinction between wholesale and retail traders. This was also a characteristic of grain markets in much larger cities at a later date: it was perhaps only when the market served an urban population of more than 500,000 persons that a specialized wholesale trade in grain came to be a clearly differentiated sector of mercantile activity.

The pattern of grain production in the London region was strongly influenced by concentrated market demand, and in terms of the proportion of land given over to different types of productive system resembles the predictive models of land use derived from the work of Johann Heinrich von Thünen.²⁰ There are several indicators, of which the use of cart-horses is one of the most dramatic,²¹ that the agrarian system in the London region, together with the circulation of its

¹⁹ See above, 46-53, 78-110.

²⁰ See above, 4-7.

²¹ See above, 56-7.

products, was generally more intensive than for the country overall. The grain production systems described by von Thünen were more developed than those evident in the London region some 500 years earlier, but they were nevertheless similar, especially in the spatial relationship between them. Broadly, it seems that in any locality the impact of the market created a predisposition towards an intensity of cultivation or towards a range of crops which then informed the choice that cultivators made as to which crop to grow on any particular type of soil.

Over the region as a whole there seems to have been an association between certain categories of soil and the most productive arable systems, as indicated by land values. Ecology, however, influenced rather than determined the pattern of cultivation. So, too, did the type of field system, to judge from the range of cropping types encountered within the confines of the three-field system. Furthermore, it seems that the pattern of cultivation on a demesne followed the practice of the locality rather than one determined by the estate of which the demesne was part or one which was characteristic of a particular type of owner. That, at least, is true for the wide range of lay and ecclesiastical lords represented in the database of manorial accounts.²² Approximately two-thirds of the cultivated land in the region, however, was in the peasant rather than in the demesne sector. Local practice may have had as powerful an effect on peasant producers as on the greater landlords, but that cannot be examined in the evidence to hand. This issue awaits further exploration. H. S. A. Fox and C. Thornton have pioneered a possible approach in their study of Taunton, Somerset, which uses the composition of tithe receipts and multure payments as a means of assessing whether the output of small-scale producers resembled that of demesnes in the same locality.²³

The disposal of grain in the London region overall was highly commercialized, with perhaps half of the grain produced by the demesne sector (net of seed and fodder) being distributed via the market.²⁴ That was especially so for wheat, which as the premier bread grain played a much larger part in the diet of the inhabitants of London and other large towns than in that of country dwellers. The pattern of sales, however, was much less clearly influenced by concentrated market demand than was that of production. This is readily explained by the practice among the owners of many demesnes in the region of provisioning their households by direct transfer from their manors. This was particularly the case with the large conventual households whose substantial food needs were fixed in one place. Other types of lord tended to sell more of their produce. In the cultivation of its demesnes a monastic house could conform to a local practice which was heavily influenced by commercial considerations, yet at the same time sell little of its produce, except on the most

²² See above, 143.

²³ Fox (1991b).

²⁴ See above, 74.

distant parts of its estate. The market was far short of that state of development in which it was advantageous for producers to sell all their grain and then purchase according to their needs. The grain market in London and in some other large cities, however, did exercise a strong influence on the supply policies of even the largest religious households, and most of the inhabitants of London certainly relied for the grain-derived part of their diet on a market supplied by merchants and lesser dealers. Only the dean and chapter of St Paul's Cathedral persisted in a rigidly traditional system of supply.²⁵

Despite the distortions imposed by estate-oriented patterns of distribution, the geographical patterns of grain sales and of systems of grain production in the region around 1300 show clear signs of having been structured by the concentrated demand of London, through the medium of economic rent.²⁶ This raises the question of whether it is possible to measure the degree of that effect in relation to an earlier pattern of production in which grain may have been grown solely for local consumption. One method would be to measure the divergence of the actual pattern in any particular place in 1300 from the pattern appropriate to a non-commercial system in which the dominant influences would have been the agrarian practice of the region overall, the nature of prevailing field systems and institutional structures, and the soils and other ecological characteristics of the locality.²⁷ In practice, such a counterfactual exercise is as yet impossible. Throughout the region the demesne sector, for which the only systematic evidence is available, was heavily influenced by commercial considerations, and that had probably been the case for a long time: the chances of identifying practices uninfluenced by commerce are therefore limited. Moreover, knowledge of the relationship between soils and crop specialization c.1300 is very imperfect, not least because in the many places where there were soils of several types it is usually not known which of them were cultivated, or with which crops. Nor was it necessarily the case that systems of agrarian production became less influenced by ecological considerations as population and exchange grew, and more clearly-articulated and hierarchical systems of distribution evolved. On the contrary, market specialization released farmers from the obligation 'to produce (on the whole) the same type of crop and tend the same sort of domesticated animals for meat, wool, and pulling power',²⁸ and allowed them instead to concentrate upon producing those products in which they had greatest comparative advantage, a state determined as much by ecology as by the market. Hence the strong association between crop specialism and soil type discernible within the large-scale production of oats, rye, rye mixtures, and barley which characterized those areas most accessible to the London market.

²⁵ See above, 148-53.

²⁶ See above, 111-70.

²⁷ For interpretations of medieval agriculture which nevertheless stress the primacy of these factors see, Hilton (1954), 145; Jackson (1960); Glasscock (1973), 167-8.

²⁸ Hilton (1954), 145.

A concentric pattern of specialization in the production and sale of different types of grain, determined by a single concentrated demand on the lines of that predicted by the von Thünen model, is approximated in only a part of the region which supplied London with grain. This comprised the environs of the city (including the north-western part of Kent), and areas further upstream to the west, and to the north. That pattern lacks the immediate spatial clarity envisaged in the idealized world of his *Isolated State*: differing transport costs by road, river, and sea,²⁹ natural variations in land quality and topography, contrasts in field systems, and the force of varying institutional structures all combined to ensure that no straightforward pattern of rings is apparent. Moreover, patterns of crop specialization are clearer than those of cropping intensity. In terms of cost-distance, however, and in type of crop produced, a sequence of specialization in relation to London does emerge. Oats, the cheapest of the grains and widely used for fodder and as a brewing grain, were grown and sold in quantity closest to London, particularly on heavy-soil demesnes which operated irregular rotational systems. Rye and its mixtures, which in the London region served as the cheaper alternative bread grain to wheat, were associated with districts which lay at a greater cost-distance from the capital. These districts were often characterized by soils of inferior fertility and supported cropping systems of, at most, moderate intensity. Barley shared a similar transport-cost profile to rye and within this part of the region was grown in greatest quantity at a similar distance from London, often within the context of more intensive cropping systems on soils of above average quality. Finally, wheat, which supplied the greater part of London's bread needs, was associated with still more distant areas, in Hertfordshire and northern Essex, and above all with the zone, for which Henley was one of the principal markets, extending along the line of the Chiltern Hills from the upper Thames area of Berkshire into Buckinghamshire. Wheat, both in this part of the region and elsewhere, was grown in bulk on a wide range of different soil types and within the context of a number of different cropping systems.

Overall, the areas around and to the west and north-east of London were characterized by a variety of essentially extensive systems of cultivation. Only in the Thames valley close to London were there some districts of limited extent with semi-intensive systems.³⁰ Within this western part of the London region there are signs that a concentrated demand located in Oxford exercised an influence independent of London's, and that metropolitan demand in the Henley market was so strong that the concentric pattern of crop specialization was reproduced on a small scale in the immediate environs of the town. Well away from these areas, in the Nene Valley in northern Northamptonshire and to a lesser extent along the northern margin of the region studied as a whole, there

²⁹ Table 17.

³⁰ See above, 132-3, 135-7, 141.

are some indications that the systems of cultivation were more intensive, apparently in response to influences from the north and east.

Nevertheless, it was in the south-eastern part of the region, especially Kent and those districts which bordered the Thames estuary and the Channel, that the most intensive systems of grain production had developed. This part of London's grain-supply region, within the ten counties studied, differed radically from the rest. Here arable land values, especially in eastern Kent, were among the highest in medieval England, and the grain outputs of the land seem to have been among the highest in medieval Europe.³¹ This area sometimes may have supplied as much as half of London's bulk grain needs, but it could do so from a much smaller area of land than was required in the western part of the region, which in normal years may have provided the greater part of the city's supply. The northern and eastern parts of Kent were important for their substantial production of wheat. They were also notable for their production of barley, the highest-quality brewing grain, which seems over the twelfth and thirteenth centuries to have been coming increasingly to the fore in south-eastern England. London's demand was certainly an important factor in Kentish agriculture, but the patterns of grain production and sales suggest that the focus of concentrated demand lay to the east rather than to the west of the county. Only in the north-western part of Kent, by contrast with the rest of the county, does the pattern of specialization seem to have been influenced primarily by the city's demand.

Several reasons for the distinctive character of Kentish agriculture, especially in the northern and eastern parts of the county, may be proposed. Those districts were well-endowed with fertile and readily-worked soils, but that was not a sufficient cause; for only in Kent out of the whole London region were the higher levels of productivity, as represented by high arable land values, achieved on the less tractable soils. Dense settlement and a long-established pattern of free land tenure were also associated with high agrarian output, both contributing to it and in part being a product of it. Commercial influences were strong, and are evident especially in the northern and eastern parts of Kent from the seventh century onwards. They included trading contacts across the Channel and the North Sea, but also a monetized economy, and close shipping and road links with London, all within a highly-organized political framework.³² Natural topography and this infrastructure which had developed over a long period appear to have given Kent advantages over Essex (which in some respects was similarly situated) as an area for commercial grain production.³³ The districts with Kent's best soils had ready access to the sea, but were also served by a road system which, by contrast with Essex, provided an efficient link with markets in London and on the Continent. Faversham, whose grain market was of special

³¹ See above 141.

³² Brooks (1989), esp. 67-70; Scull (1990); Kelly S (1992).

³³ It is possible that in Essex the pastoral sector was more responsive to the influence of London's demand than the arable: McIntosh (1986), 141-3; Campbell B M S (1988b), 95-7; Power and Campbell (1992), 236-7. For the significance of the long period of development, cf. above, 7-8.

interest to London dealers, was well placed to benefit from these connections. By 1300 Kent appears to have been a significant exporter of grain, and among the grain exporters who frequented its port of Sandwich, which for administrative purposes extended from Faversham to Winchelsea, there were merchants from Picardy and Flanders, including men from the great city of Ghent.³⁴

To understand London's grain-supply system, and the impact of its demand for grain on the agriculture of southern England, it is necessary, therefore, to place the city and its region in a national and international context. London appears to have obtained its grain by means of three distinct but overlapping circuits of exchange. Within the city these circuits were represented by the principal markets: the inland or 'Pavement' markets served the overland trade in grain carried by pack-horse or cart, while the water-borne trade focused on the markets at Queenhithe and Billingsgate. The river trade fell into two parts: Queenhithe served the more land-locked districts upstream of the city; Billingsgate was open to coastal and overseas traffic, although some vessels carrying grain up the river probably passed London Bridge and landed their cargo at Queenhithe. It is impossible to measure the contribution of each of these circuits to the total quantity of grain which entered London, but the two riverside markets probably provided more than two-thirds of the total. They certainly had a more wholesale character than the inland markets, and their prices were lower.³⁵

In the upper Thames area which supplied the Queenhithe market grain was produced by generally extensive systems of farming. London was not a significant exporter of grain, and so the supply system served by Queenhithe was probably, like the overland one, a more or less closed circuit of exchange. The Billingsgate market, to which some grain was carried from areas with extensive production systems, was probably dominated by supplies from districts of intensive farming such as northern and eastern Kent. Prices indicate that the two riverside markets were usually integrated, but that on occasion the Billingsgate prices were significantly lower than those at Queenhithe.³⁶ This suggests that the Billingsgate circuit of exchange was the more dynamic and efficient one, with a far greater potential than the other two for drawing in substantial supplies in times of need. This was the circuit through which London drew on an international market in grain, where the demands of several major cities and of other populous regions converged.

The two types of grain markets and production systems which served the capital seem to be reflected in the pattern of prices across the London region as a whole. The city drew its bulk supplies from one district to the west where prices were generally about the same as in London, and from another to the east

³⁴ Gras (1918), 334-46.

³⁵ For wheat prices in the London markets, see Appendix IV.

³⁶ Table 18.

where they were generally higher. The price differential probably indicates the great concentration of demand from wealthy cities in the eastern area,³⁷ but perhaps also the greater efficiency of the market links between London and that source of supply which would allow dealers to profit from smaller margins on a higher turnover. Nevertheless, it seems likely that in most years the greater part of London's bulk supply of grain came from the western area. When supplies were short, however, there was probably an increase in the share provided from the eastern area, whose prices became more competitive.

Kent thus owed its commercialized and intensive system of grain production at least in part to the influence of international as well as London demand. Some other areas of southern and eastern England were characterized by similarly intensive systems, high population densities, and high arable land values. They included much of northern and eastern Norfolk and parts of the hinterland of the Wash.³⁸ Within the ten counties which are the subject of this study, the margins of that east Midlands area, where grain production seems to have been under the influence of the market concentrated in the ports of the Wash, are probably just apparent in northern Northamptonshire and possibly elsewhere on the northern edge of the region. Periodically, during the late thirteenth and fourteenth centuries, London drew grain from Norfolk, from the Wash ports and their hinterland, and from even further up the east coast, but only in a minority of years was grain sufficiently scarce for it to be worth the while of a London dealer to obtain it from so far away as Lynn or Boston.³⁹ After the Black Death, with the increasing consumption of barley in the capital, East Anglia probably came to be a more regular supplier of quality barley to London. Before then London's demand appears to have had only a small impact on those rich grain-producing areas.

The principal external demands which influenced grain production in those areas originated from overseas and possibly from northern Britain. Well before the end of the twelfth century the Flemish cities drew on Cambridgeshire, Norfolk, and Suffolk for grain supplies, at least from time to time. The ports of Essex, Kent, and Sussex were drawn into the same supply system, and Norway became heavily-dependent on East Anglian grain, for which it supplied fish in exchange.⁴⁰ Around 1300 the ports of Boston and Lynn intermittently exported large quantities of grain, in sharp contrast to London where large exports were rare.⁴¹ In the 1290s, 1310s, and 1330s it was to these ports and their grain-rich hinterlands that the king's purveyors repeatedly resorted in their quest to obtain

³⁷ English and Low Countries grain prices cannot effectively be compared before 1348, but an initial comparison between English wheat prices and those in Bruges after that date indicates that the latter were usually higher: Lloyd (1973), Table 1; Verhulst (1965).

³⁸ Power and Campbell (1992).

³⁹ See above, 69-71.

⁴⁰ *Pipe Roll 23 Henry II*, 136, 183-5; *Pipe Roll 10 Richard I*, 92, 137-8, 209, 228; Helle (1967); *Annals* (1983).

⁴¹ Gras (1918), 273-88; Gras (1915), Appendix C.

provisions for the royal armies in Scotland.⁴² Shipping costs readily explain the extent to which they were involved in provisioning either London or overseas markets. Thus, for ports facing the Thames estuary southwards from about Colchester in Essex, and westwards from about Faversham in Kent, London was the nearest metropolitan market accessible by water. More distant places, however, had readier access to ports in Flanders, Ponthieu, and Picardy than to London. Thus for Sandwich the whole continental coast between the Schelde and the Somme, and for Yarmouth⁴³ the coast between the Schelde and Boulogne, were closer than London. The ports of the Wash were even more remote from London. For the grain trade of these ports urban demand overseas may well have been more important than demand from London, and that seems to explain the orientation of grain production in Kent.

At the peak of its medieval population c.1300, southern and eastern England evidently had the capacity, without apparent difficulty, to satisfy the grain needs of the inhabitants of its countryside and of an urban system in which the chief city had a population of perhaps 80,000 or more. At the same time the region was able to conduct a significant export trade in grain. Years when London experienced serious shortage were rare, and then the city's superior purchasing power enabled it to draw in grain from outside its normal supply region and even from overseas. Whether in 1300 London enjoyed a more secure grain supply than Flemish cities such as Bruges and Ghent is far from certain, but there are some indications that it did, by virtue of its political position and the resources of the hinterland upon which it could draw. London's influence in structuring the system of grain production appears to have been dominant in an inland direction and upstream of the city, where methods of cultivation were for the most part extensive. Downstream, the city drew on areas where production was more intensive in character, and where overseas demand appears to have had an important impact. Despite London's peripheral position by comparison with some other great trading cities of northern Europe, its demand thus made a substantial contribution to the high peak of intensity in grain production and exchange which in 1300 characterized the region focusing on the Channel and the southern end of the North Sea.

Within the south and east of England this concentration of demand, of which London formed the greatest single element, acted as an important stimulus to land-use specialization and agricultural development. Had London's economy been more developed and its population larger the stimulus of its market would have been correspondingly greater. But within the country as a whole the level and configuration of economic rent, and hence the nature and intensity of land-use and farming systems, continued to owe more to rural than to urban demand. Under these circumstances, extensive methods of production prevailed over

⁴² Maddicott (1975), 28-32, 53-4.

⁴³ Yarmouth's relative proximity to Holland in terms of the grain trade was apparent in the eighteenth century: John (1976), 59-60 and n. 37.

intensive ones and low levels of productivity and low land-values predominated.⁴⁴ Neither the technology for raising output, nor the commercial infrastructure for transferring rural produce to urban consumers were lacking. The concentrated demand which would promote the wider adoption of that technology and the extension of that infrastructure was simply not great enough.⁴⁵ During the seventeenth century, when London was much larger than in 1300 and contained a far greater share of the national population, farmers across a wider area of southern and eastern England responded to the stimulus of its market. In Oxfordshire, much of which by then lay firmly within the orbit of the London grain trade, R. C. Allen has detected a significant rise in yields during the final quarter of the seventeenth century.⁴⁶ In Hertfordshire, closer to London, rising yields were already a feature by 1650: yet, as Glennie remarks, 'the higher crop yields of the later seventeenth century cannot be seen as indicating a decisive break between medieval and modern agriculture, but rather continuity in the techniques by which land productivity could be raised'.⁴⁷ If the progressive redistribution and concentration of urban demand from the sixteenth century onwards provided part of the incentive for the wider adoption of those techniques and the subsequently improved performance of English agriculture,⁴⁸ then the performance of medieval agriculture may correspondingly reflect the smaller scale of medieval cities and, above all, the lesser dominance of the metropolis. In the final analysis, therefore, English medieval urban growth may have been no less constrained by the inadequacies of agriculture than the performance of agriculture itself was limited by a lack of sufficient market incentives to specialize and improve.

Allen and Campbell (1992).

Allen (1972), 42.

Allen (1991), 246-9.

Allen (1988), 155-6.

Allen and Campbell (1991), 38-42.

APPENDIX I

DEMESNES REPRESENTED IN REGIONAL DATABASE OF ACCOUNTS

The information is presented according to the following template:

COUNTY

Manor Name (guide to location): lord; year date of accounts (day and month if not Michaelmas to Michaelmas); archive and documentary references.

Note: Qualifying information as to location is given for those places which either a) do not appear on the Ordnance Survey 1:250,000 series map (1987 edition) or b) do not feature as parishes in the 7th edition of Bartholomew's *Survey Gazetteer of the British Isles* (Edinburgh, 1927).

BEDFORDSHIRE

Millow (nr. Dunton): Waltham Abbey; 1307-8, 1308-9, 1313-14; NpRO, Spencer Roll 26.

Pegsdon (nr. Hexton): Ramsey Abbey; 1313-14; PRO, SC6/741/19.

Shillington: Ramsey Abbey; 1313-14; PRO, SC6/741/19.

Sundon: earldom of Cornwall; 1296-7; Midgley (1942).

BERKSHIRE

Avington: earldom of Lincoln; 1295-6; 1304-5; PRO, DL29/1/1, 2.

Billingbear (nr. Binfield): bishopric of Winchester; 1297-8, 1306-7, 1309-10; HRO, 11M59/B1/54, 62, 65.

Bray: king; 1297-8; PRO, SC6/742/4.

Brightwell: bishopric of Winchester; 1297-8, 1307-8, 1309-10; HRO, 11M59/B1/54, 63, 65.

Coombe (or Combe): Bec Abbey; 1305-6, 1306-7, 1312-13; King's Coll., COM/56, 59.

Culham: bishopric of Winchester; 1297-8, 1306-7, 1309-10; HRO, 11M59/B1/54, 62, 65.

Hampstead Marshall: earldom of Norfolk; 1291-2, 1298-9, 1300-1; PRO, SC6/748/23, 27, 28.

Hampstead Norreys: le Ferrers; 1300-1; WAM, 4535.

Harwell: bishopric of Winchester; 1297-8, 1306-7, 1309-10; HRO, 11M59/B1/54, 62, 65.

Inkpen: Titchfield Abbey; 1300-1, 1313-14; BRO, D/EC M66.

Kennington: king; 1310-11, 1313-14, 1314-15; PRO, SC6/752/6.

Letcombe Regis: king, formerly de Langton; 1307-8 (18/11-8/5); PRO, SC6/1132/1.

Templeton (nr. Kintbury): king, formerly Knights Templar; 1311-12, 1312-13; PRO, SC6/1122/26, E358/19.

Waltham St Lawrence: bishopric of Winchester; 1297-8, 1307-8, 1309-10; HRO, 11M59/B1/54, 63, 65.

Wantage: Bec Abbey; 1288-9; Chibnall (1951).

Wargrave: bishopric of Winchester; 1297-8, 1307-8, 1309-10; HRO, 11M59/B1/54, 63, 65.

Woolstone: Winchester Cathedral Priory; 1308-9; PRO, SC6/756/3.

BUCKINGHAMSHIRE

Bledlow: Bec Abbey; 1296-7; Eton Coll., Roll 46/34.

[Temple] Bulstrode (nr. Gerrard's Cross): king, formerly Knights Templar; 1309-10, 1310-11; BL, Harl. Rolls A26, A27.

Cheddington: Merton College; 1298-9 (26/6-26/6), 1310-11 (3/7-3/7), 1314-15 (3/7-3/7); Merton Coll., MM 5532, 5540, 5545.

Cippenham: earldom of Cornwall; 1296-7; Midgley (1942).

Holmer: earldom of Lincoln; 1295-6, 1304-5; PRO, DL29/1/1, 2.

Ibstone: Merton College; 1294-5, 1299-1300, 1300-1 (all 27/7-27/7); Merton Coll., MM 5063, 5068, 5070.

Iver: earldom of Cornwall; 1296-7; Midgley (1942).

Ivinghoe: bishopric of Winchester; 1297-8, 1306-7, 1309-10; HRO, 11M59/B1/54, 62, 65.

Langley [Marish] with Wraysbury: king; 1312-13, 1314-15; PRO, SC6/748/28, SC6/761/19.

Moreton (nr. Stone): bishopric of Winchester; 1297-8, 1306-7, 1309-10; HRO, 11M59/B1/54, 62, 65.

Tingewick: St. Catherine's Abbey, Rouen; 1311-12; NCA, 7086.

Turweston: Westminster Abbey (prior and convent); 1293-4, 1307-8, 1313-14; WAM, 7755, 7768, 7772.

Wendover: de Fiennes; 1296-7; PRO, SC6/763/5.

Westcott: Bicester Priory; 1299-1300; PRO, SC6/763/16.

Wycombe, West: bishopric of Winchester; 1297-8, 1306-7, 1309-10; HRO, 11M59/B1/54, 62, 65.

ESSEX

Raddow, Little: de Hamelton; 1295-6; PRO, SC6/836/6.

Bardfield, Great: de Clare; 1299-1300; ERO, D/DHU M87.

Birdbrook: Westminster Abbey (prior and convent); 1295-6, 1307-8, 1313-14; WAM, 25398, 25415, 25421.

Bocking: Canterbury Cathedral Priory; 1306-7, 1311-12, 1313-14; CCA, DCc/Bocking 6, 8, 10.

Chesterford: earldom of Norfolk; 1293-4, 1294-5, 1304-5; PRO, SC6/837/19, 20, 25.

Chingford: king, formerly Knights Templar; 1308-9; PRO, E358/20.

Cressing [Temple]: king, formerly Knights Templar; 1308-9; PRO, E358/20.

Dovercourt: earldom of Norfolk; 1295-6, 1300-1, 1305-6; PRO, SC6/840/9, 10, 13.

Eastwood: king; 1290-1, 1291-2; PRO, E372/143.

Fanton (nr. Wickford): Westminster Abbey (prior and convent); 1301-2; PRO, SC6/841/3.

Ferring: Westminster Abbey (prior and convent); 1292-3, 1307-8, 1313-14; WAM, 25592, 25618, 25630.

Fetsted: king, formerly Holy Trinity Abbey, Caen; 1294-5, 1295-6, 1296-7; PRO, E372/143.

Hadleigh: queen; 1311-12; 1312-13; 1314-15; PRO, SC6/843/3, 4, 5.

Hamningfield: king, formerly Knights Templar; 1308-9, 1309-10; PRO, E358/20, SC6/844/1.

Kilvedon: Westminster Abbey (prior and convent); 1294-5, 1306-7, 1313-14; WAM, 25779, 25791, 25800.

Mersea: Canterbury Cathedral Priory; 1289-90, 1290-1, 1292-3; CCA, DCc/Mersea 9, 10,

Middleton (Milton, nr. Prittlewell): Canterbury Cathedral Priory; 1293-4, 1302-3, 1313-14; CCA, DCc/Middleton 13, 19, 27.

Newport: earldom of Cornwall; 1296-7; Midgley (1942).

Roydon: king, formerly Knights Templar; 1308-9, 1309-10, 1310-11; PRO, E358/20, SC6/846/19, 20.

Theydon: king, formerly Knights Templar; 1310-11; PRO, SC6/847/22.

Thurrock, Grays: de Gray; 1290-1, 1296-7 (18/10-?); ERO, D/DU 1364/1, 2.

Thurrock, West: king, formerly Knights Templar; 1308-9; PRO, E358/20.

Wicken Bonhunt: de Barlee; 1314-15; ERO, D/DU 36/12.

Witham: king, formerly Knights Templar; 1308-9; PRO, E358/20.

HERTFORDSHIRE

Aldenham: Westminster Abbey (prior and convent); 1295-6, 1307-8, 1312-13; WAM, 26041, 26058, 26063.

Amwell, Great: Westminster Abbey (prior and convent); 1290-1, 1292-3; WAM, 26145, BL, Add. Roll 66722.

Ashwell: Westminster Abbey (prior and convent); 1300-1, 1301-2, 1311-12; WAM, 26256, 26258, 26260.

Berkhamsted: earldom of Cornwall; 1296-7; Midgley (1942).

[Temple] Dinsley (nr. Hitchin): king, formerly Knights Templar; 1311-12; PRO, SC6/865/13.

Kinsbourne (nr. Harpenden): Westminster Abbey (prior and convent); 1292-3, 1306-7, 1313-14; WAM, 8781, 8797, 8803.

Langley, King's: prince, king; 1303-4, 1307-8, 1312-13; PRO, SC6/866/15, 17, 19.

Standon: de Clare; 1304-5; PRO, SC6/868/17.

Stevenage: Westminster Abbey (prior and convent); 1292-3, 1306-7, 1311-12; PRO, SC6/870/12, 19, SC6/871/2.

Therfield: Ramsey Abbey; 1307-8; PRO, SC6/872/17.

Weston: earldom of Norfolk, king; 1292-3, 1300-1, 1306-7; PRO, SC6/873/14, 20, 22.

Wheathampstead: Westminster Abbey (prior and convent); 1291-2, 1304-5, 1310-11; HertsRO, D/ELW M110, M122, M86.

Wymondley: de Argentine; 1292-3, 1301-2, 1308-9; HertsRO, 57521, 57522, 57523.

KENT

Appeldore: Canterbury Cathedral Priory; 1293-4, 1304-5, 1312-13; CCA, DCc/Appeldore 6, 9, 15.

Barksore (nr. Lower Halstow): Canterbury Cathedral Priory; 1294-5, 1302-3, 1311-12; CCA, DCc/Barksore 11, 15, 19.

Bexley: archbishopric of Canterbury; 1299-1300, 1301-2, 1302-3; LPL, ED 237, 238, 239.

Blean: Canterbury Cathedral Priory; 1293-4 (11/11-11/11); CCA, DCc/Blean 1(2).

Brook: Canterbury Cathedral Priory; 1291-2, 1300-1, 1310-11; CCA, DCc/Brook 7, 10, 13.

Chart, Great: Canterbury Cathedral Priory; 1292-3, 1303-4, 1312-13; CCA, DCc/Chart 14, 21, 27.

Chart, Little: Canterbury Cathedral Priory; 1296-7, 1301-2, 1302-3; CCA, DCc/Little Chart 4, 5, 6.

Chartham: Canterbury Cathedral Priory; 1307-8, 1309-10, 1313-14; CCA, DCc/Chartham 4, 6, 9.

Cliffe: Canterbury Cathedral Priory; 1297-8, 1303-4, 1313-14; CCA, DCc/Cliffe 18, 22, 27.

Cliffe, West: queen; 1302-3; PRO, SC6/889/8-9.

- Cobham:** de Cobham; 1290-1; BL, Harl. Roll D1.
- Copton** (nr. Faversham): Canterbury Cathedral Priory; 1291-2, 1310-11, 1313-14; CCA, DCc/Copton 1, 6, 9.
- Dartford:** king, formerly Knights Templar; 1307-8; PRO, E358/18.
- Eastry:** Canterbury Cathedral Priory, 1307-8, 1309-10, 1313-14; CCA, DCc/Eastry 32, 33, 40.
- Ebony** (nr. Stone in Oxney): Canterbury Cathedral Priory; 1292-3, 1302-3, 1313-14; CCA, DCc/Ebony 8, 18, 27.
- Elverton** (nr. Faversham): Canterbury Cathedral Priory; 1295-6, 1297-8; CCA, DCc/Elverton 8, 9.
- Fairfield:** Canterbury Cathedral Priory; 1307-8, 1309-10, 1313-14; CCA, DCc/Fairfield 1, 4, 8.
- Farleigh, East:** Canterbury Cathedral Priory; 1290-1, 1302-3, 1310-11; CCA, DCc/East Farleigh 1, 4, 8.
- Farleigh, West:** Canterbury Cathedral Priory; 1292-3, 1304-5, 1313-14; CCA, DCc/West Farleigh 14, 24, 31.
- Farningham:** Canterbury Cathedral Priory; 1297-8, 1302-3, 1303-4; CCA, DCc/Farningham 5, 6, 7.
- Ham:** Canterbury Cathedral Priory; 1295-6, 1302-3, 1312-13; CCA, DCc/Ham 4, 9, 17.
- Hollingbourne:** Canterbury Cathedral Priory; 1292-3, 1301-2, 1312-13; CCA, DCc/Hollingbourne 13, 20, 25.
- Ickham:** Canterbury Cathedral Priory; 1295-6, 1309-10, 1313-14; CCA, DCc/Ickham 12, 18, 20.
- Leeds:** king; 1309-10; PRO, SC6/1090/7.
- Lessness:** queen; 1309-10; PRO, SC6/1090/7.
- Leysdown:** Canterbury Cathedral Priory; 1290-1, 1301-2, 1313-14; CCA, DCc/Leysdown 8, 14, 16.
- Loose:** Canterbury Cathedral Priory; 1292-3, 1301-2, 1313-14; CCA, DCc/Loose 9, 18, 30.
- Lydden:** Canterbury Cathedral Priory; 1291-2, 1302-3, 1310-11; CCA, DCc/Lydden 11, 19, 29.
- Maidstone:** archbishopric of Canterbury; 1296-7, 1299-1300; LPL, ED 657, 658.
- Meopham:** Canterbury Cathedral Priory; 1292-3, 1301-2, 1313-14; CCA, DCc/Meopham 17, 40, 59.
- Milton Regis:** king; 1287-8; PRO, SC6/893/11.
- Northfleet:** archbishopric of Canterbury; 1303-4; LPL, ED 777.
- Orpington:** Canterbury Cathedral Priory; 1299-1300, 1304-5, 1307-8; CCA, DCc/Orpington 5, 6, 7.
- Orpinge:** king; 1291-2, 1309-10; PRO, SC6/894/7, SC6/1090/7.
- Oxford:** archbishopric of Canterbury; 1296-7; LPL, ED 381.
- Peckham, East:** Canterbury Cathedral Priory; 1292-3, 1299-1300, 1311-12; CCA, DCc/Peckham 13, 20, 26.
- Ruckinge:** Canterbury Cathedral Priory; 1307-8, 1313-14, 1314-15; CCA, DCc/Ruckinge 3, 4, 5.
- Rood:** king, formerly Knights Templar; 1307-8; PRO, E358/18.
- Waterham:** Westminster Abbey (prior and convent); 1293-4, 1307-8, 1313-14; WAM, 26386, 26405, 26411.
- Westwell:** Canterbury Cathedral Priory; 1291-2, 1309-10, 1313-14; CCA, DCc/Westwell 2, 11.
- Wykeham:** archbishopric of Canterbury; 1309-10; LPL, ED 1139.

MIDDLESEX

- Acton:** bishopric of London; 1296-7 (29/9-14/4), 1300-1, 1301-2; GL, 25319/1, 2, 3.
- Ashford:** Westminster Abbey (prior and convent); 1290-1, 1306-7, 1307-8, 1308-9; WAM, 26671, 26695, 26696, 26697.
- Colham:** earldom of Lincoln; 1295-6, 1304-5; PRO, DL29/1/1, 2.
- Ebury** (in Westminster): Westminster Abbey (abbot); 1292-3, 1300-1, 1305-6; WAM, 26857, 26865, 26871.
- Edgware:** earldom of Lincoln; 1295-6; PRO, DL29/1/1.
- Halliford:** Westminster Abbey (prior and convent); 1289-90 (2/11-29/9), 1292-3, 1299-1300; WAM, 27011, 27017, 5017.
- Hampstead:** Westminster Abbey (prior and convent); 1291-2, 1297-8, 1298-9; WAM, 32404, 32373, 32401.
- Isleworth:** earldom of Cornwall, king; 1296-7, 1313-14; Midgley (1942), PRO, SC6/916/11.
- Knightsbridge:** Westminster Abbey (prior and convent); 1291-2, 1306-7, 1312-13; WAM, 16382, 16396, 16402.
- Laleham:** Westminster Abbey (abbot); 1290-1, 1294-5, 1305-6; WAM, 27109, 27111, 27115.
- Ruislip:** Bec Abbey; 1288-9; Chibnall (1951).
- Staines:** Westminster Abbey (abbot); 1291-2, 1300-1, 1303-4; WAM, 16912, 16923, 16926.
- Teddington:** Westminster Abbey (prior and convent); 1300-1, 1307-8, 1314-15; PRO, SC6/918/2, 9, 13.
- Yeoveney:** Westminster Abbey (abbot); 1291-2, 1300-1, 1303-4; WAM, 16842, 16843, 16845.

NORTHAMPTONSHIRE

- Addington:** Crowland Abbey; 1292-3 (2/11-29/9), 1307-8, 1313-14; CUL, QC1 Box 1 no. 13, Box 2 nos. 23, 26.
- Aldwincle:** king, formerly de Langton; 1307-8, 1308-9; PRO, E358/13.
- Ashton:** Peterborough Abbey; 1300-1, 1307-8, 1309-10; NpRO, Fitzwilliam 2388, 233, 2389.
- Biggin** (nr. Oundle): Peterborough Abbey; 1300-1, 1307-8, 1309-10; NpRO, Fitzwilliam 2388, 233, 2389.
- Boroughbury** (Peterborough): Peterborough Abbey; 1300-1, 1307-8, 1309-10; NpRO, Fitzwilliam 2388, 233, 2389.
- Buckby, Long:** earldom of Lincoln; 1295-6, 1304-5; PRO, DL29/1/1, 2.
- Castor:** Peterborough Abbey; 1300-1, 1307-8, 1309-10; NpRO, Fitzwilliam 2388, 233, 2389.
- Cottingham:** Peterborough Abbey; 1307-8, 1309-10; NpRO, Fitzwilliam 233, 2389.
- Elmington:** Crowland Abbey; 1292-3, 1307-8, 1313-14; CUL, QC1 Box 1 no. 13, Box 2 Nos. 23, 26.
- Eye:** Peterborough Abbey; 1300-1, 1307-8, 1309-10; NpRO, Fitzwilliam 2388, 233, 2389.
- Glington:** Peterborough Abbey; 1300-1, 1307-8, 1309-10; NpRO, Fitzwilliam 2388, 233, 2389.
- Higham Ferrers:** earldom of Lincoln; 1313-14; PRO, DL29/1/3.
- Irthlingborough:** Peterborough Abbey; 1300-1, 1307-8, 1309-10; NpRO, Fitzwilliam 2388, 233, 2389.
- Kettering:** Peterborough Abbey; 1300-1, 1307-8, 1309-10; NpRO, Fitzwilliam 2388, 233, 2389.
- Lolham** (nr. West Deeping): Peterborough Abbey; 1300-1; NpRO, Fitzwilliam 2388.

- Longthorpe:** Peterborough Abbey; 1300-1, 1307-8, 1309-10; NpRO, Fitzwilliam 2388, 233, 2389.
- Maidwell:** de Seyton; 1290-1, 1304-5 (29/9-18/4); NpRO, Finch Hatton 519, 408.
- Oundle:** Peterborough Abbey; 1300-1, 1307-8, 1309-10; NpRO, Fitzwilliam 2388, 233, 2389.
- Radstone:** king; 1296-7, 1306-7; BL, Harl. Roll K29, PRO, SC6/962/20.
- Rushden:** earldom of Lincoln; 1313-14; PRO, DL29/1/3.
- Stanwick:** Peterborough Abbey; 1300-1, 1307-8, 1309-10; NpRO, Fitzwilliam 2388, 233, 2389.
- Thorpe Waterville:** king, formerly de Langton; 1307-8, 1308-9 (29/9-3/7); PRO, E358/13.
- Torpel (nr. Ufford):** Peterborough Abbey; 1300-1, 1307-8; NpRO, Fitzwilliam 2388, 233.
- Upton (nr. Ailworth):** Peterborough Abbey; 1300-1301, 1307-8; NpRO, Fitzwilliam 2388, 233.
- Walton (nr. Peterborough):** Peterborough Abbey; 1300-1, 1307-8, 1309-10; NpRO, Fitzwilliam 2388, 233, 2389.
- Warmington:** Peterborough Abbey; 1300-1, 1307-8, 1309-10; NpRO, Fitzwilliam 2388, 233, 2389.
- Weedon Bec:** Bec Abbey; 1288-9, 1290 (7/1-?); Chibnall (1951), Eton Coll., Roll 27/145.
- Wellingborough:** Crowland Abbey; 1292-3, 1305-6, 1307-8, 1313-14; CUL, QC Box 1 no. 13, QC1 Box 2 no. 22, Page (1936), CUL, QC1 Box 2 No. 26.
- Werrington:** Peterborough Abbey; 1300-1, 1307-8, 1309-10; NpRO, Fitzwilliam 2388, 233, 2389.

OXFORDSHIRE

- Adderbury:** bishopric of Winchester; 1297-8, 1307-8, 1309-10; HRO, 11M59/B1/54, 63, 65.
- Bicester:** earldom of Lincoln; 1295-6, 1304-5; PRO, DL29/1/1, 2.
- Broadwell:** king, formerly Knights Templar; 1311-12, 1312-13; PRO, SC6/957/8, E358/19.
- Caversfield:** Bicester Priory; 1310-1311; PRO, SC6/957/15.
- Clifton:** Bicester Priory; 1293-4; PRO, SC6/957/28.
- Combe:** king; 1306-7; PRO, SC6/962/20.
- Cottisford:** Bec Abbey; 1292 (1/1-29/9); Eton Coll., Roll 26/144.
- [Temple] Cowley:** king, formerly Knights Templar; 1311-12, 1312-13; PRO, E358/20, E358/19.
- Cuxham:** Merton College; 1298-9 (20/7-25/7), 1307-8 (26/7-26/7), 1313-14 (26/7-26/7); Merton Coll., MM 5815, 5832, 5838.
- Forest Hill:** Oseney Abbey; 1302-3, 1303-4; Bodl., DD Ch.Ch. OR 23, 24.
- Henton:** king, formerly de Langton; 1307-8 (18/11-8/5); PRO, E358/13.
- Heyford, Upper:** de Fortibus, king; 1291-2, 1296-7, 1306-7; PRO, SC6/959/1, BL, Harl. Roll K29, PRO, SC6/962/20.
- Holywell (Oxford):** Merton College; 1296-7, 1300-1, 1309-10; Merton Coll., MM 4469, 4477, 4486.
- Islip:** Westminster Abbey (abbot); 1295-6, 1297-8; WAM, 14781, 14783.
- Kidlington:** Oseney Abbey; 1290-1; Bodl., DD Ch.Ch. OR 96.
- Kirtlington:** Bicester Priory; 1291-2; PRO, SC6/959/14.
- Launton:** Westminster Abbey (prior and convent); 1305-6, 1306-7, 1307-8; WAM, 15317, 15318, 15319.
- Merton:** king, formerly Knights Templar; 1311-12, 1312-13; PRO, SC6/1122/26, E358/19.
- Middleton Stoney:** earldom of Lincoln; 1295-6, 1304-5; PRO, DL29/1/1, 2.

Nuneham Courtenay: king; 1296-7; BL, Harl. Roll K29.

Oddington: Westminster Abbey (abbot); 1296-7 (11/11-29/9), 1297-8 (30/9-2/9); WAM, 14794, 14795.

Sandford-on-Thames: king, formerly Knights Templar; 1311-12 (30/10-29/9), 1312-13; PRO, E358/20, E358/19.

Sibford Gower: king, formerly Knights Templar; 1311-12, 1312-13; PRO, SC6/961/18, E358/19.

Stratton: Bicester Priory; 1292-3; PRO, SC6/961/22.

Tew, Little: Oseney Abbey; 1288-9, 1305-6, 1306-7; Bodl., DD Ch.Ch. OR 43, 102, 103.

Warpsgrove: king, formerly Knights Templar; 1311-12 (30/10-29/9), 1312-13; PRO, E358/20, E358/19.

Watlington: earldom of Cornwall; 1296-7; Midgley (1942).

Whitchurch: king; 1296-7; PRO, SC6/1090/4.

Witney: bishopric of Winchester; 1297-8, 1307-8, 1309-10; HRO, 11M59/B1/54, 63, 65.

Wootton: king; 1293-4, 1306-7, 1309-10; PRO, SC6/962/13, SC6/962/20, SC6/963/13.

SURREY

Battersea: Westminster Abbey (prior and convent); 1289-90, 1294-5, 1304-5; WAM, 27501, 27503, 27506.

Byfleet: king; 1312-13, 1314-15; PRO, SC6/1011/3, 4.

Cheam: Canterbury Cathedral Priory; 1293-4, 1301-2; CCA, DCc/Cheam/14, 20.

Chessington: Boxley Priory; 1289-90; PRO, SC6/1011/25.

Esher: bishopric of Winchester; 1297-8, 1307-8, 1309-10; HRO, 11M59/B1/54, 63, 65.

Farleigh: Merton College; 1289-90 (26/7-26/7), 1300-1 (25/7-25/7), 1309-10 (29/9-22/7); Merton Coll., MM 4807, 4817, 4822.

Farnham: bishopric of Winchester; 1297-8, 1307-8, 1309-10; HRO, 11M59/B1/54, 63, 65.

Horsley, East: Canterbury Cathedral Priory; 1308-9 (29/9-24/6), 1309-10, 1310-11, 1313-14; CCA, DCc/Horsley 3, 4, 5, PRO, SC6/1013/4.

Leatherhead: Merton College; 1289-90 (25/7-25/7), 1311-12 (22/7-22/7), 1313-14 (25/7-25/7); Merton Coll., MM 5701, 5707, 5708-9.

Malden: Merton College; 1292-3 (25/7-25/7), 1302-3 (29/9-20/7), 1313-14 (23/7-23/7); Merton Coll., MM 4638, 4649, 4655.

Merstham: Canterbury Cathedral Priory; 1300-1, 1311-12; CCA, DCc/Merstham 15, 18.

Morden: Westminster Abbey (prior and convent); 1290-1, 1306-7, 1313-14; WAM, 27289, 27300, 27305.

Pyrford: Westminster Abbey (abbot); 1292-3, 1298-9, 1307-8; WAM, 27398, 27399, 27406.

Sheen: king; 1313-14; PRO, SC6/1014/3.

Thorncroft (nr. Leatherhead): Merton College; 1310-11 (23/7-22/7), 1312-13 (22/7-22/7), 1314-15 (22/7-22/7); Merton Coll., MM 5744, 5743, 5745.

Walton-on-Thames: king, formerly de Langton; 1307-8; PRO, E358/13.

Walworth: Canterbury Cathedral Priory; 1308-9, 1309-10; CCA, DCc/Walworth 3-4, 5.

APPENDIX II

THE WEIGHT OF BREAD AND THE WEIGHT OF WHEAT

In both the thirteenth and the fifteenth centuries, it appears to have been a rule of thumb that a bushel of wheat, or even of mixed grain, would produce 70 lb. troy (57.6 lb. avoirdupois) of coarse bread suitable for servants.¹ Similarly, calculations based on the medieval assize of bread, with the price of wheat at 6 shillings per quarter, indicate that a bushel of wheat was expected to produce 59.5 lb. avoirdupois (72 lb. troy) of wholewheat bread.² These figures are virtually identical with the maximum amount of bread (58.5 lb. avoirdupois) expected from a bushel of wheat in 1813.³

If much the same weight of bread could be baked from identical quantities of grain at these two periods, it follows that the water content of the bread was almost certainly the same. From the results of an official experiment conducted in 1800 it can be calculated that bread was composed 22 per cent by weight of water and 78 per cent by weight of flour.⁴ Modern loaves, by contrast, are composed 35-40 per cent by weight of water; their higher water content being a function of the more absorbent flour produced by the improved milling methods which became widespread in the nineteenth century.⁵ In 1800, therefore, bread weighing 58.5 lb. avoirdupois would have required 45.6 lb. avoirdupois of flour to produce it, and, c.1300, bread weighing 57.6 lb. avoirdupois would have required 44.9 lb. of flour to produce it.

The proportion by weight of the whole grain which is used to make flour is known as the extraction rate. In 1791 a bushel of wheat was defined as weighing 57 lb. avoirdupois, although weights of between 55 lb. and 60 lb. are also recorded at that time.⁶ Milling 45.6 lb. avoirdupois from 57 lb. represents an extraction rate of 80 per cent. Conventional extraction rates in 1801 were for wheat 80 per cent, barley 78 per cent, and oats 56 per cent.⁷ The official experiment made in 1800, which involved first milling a bushel of wheat and then baking bread from it, obtained an extraction rate of at least 81.4 per cent.⁸ This was probably

¹ Hockey (1975), 291; Thurgood (1982), 78. Among other historians, the Webbs (1904), Ross (1956), and Zupko (1985), have assumed that during the Middle Ages bread was weighed by the tower pound rather than the troy pound. Nevertheless, Connor ((1987), 197, 123-5, 204) argues convincingly that the troy pound was in use for this purpose in connection with the assize of bread from at least 1266. Connor's view is followed here. The conversion from the tower pound to avoirdupois in the calculation of the weight of bread in Dyer C (1983), 203, n. 25 is wrong.

² Connor (1987), 204: the formulae of the assize do not work well with higher or lower wheat prices; cf. Zylbergeld (1991). Calculations based on the assize suggest that a bushel of wheat yielded only 38 lb. avoirdupois of the finest wheaten bread known as wastel: the bran and coarser flour which had been sifted off would be used to make coarse bread.

³ Connor (1987), 213, citing *Statutes at Large*, 53 Geo III c. 116.

⁴ *Report on Bread* (1815), Appendix I.

⁵ Davidson, Passmore, Brock, and Truswell (1979), 171; Burnett (1979), 139-40; for France, cf. Kaplan (1984), 393-465.

⁶ *Statutes at Large* 31 Geo III c. 30 (p. 118); Connor (1987), 204; Mingay (1989), 1124-5.

⁷ Collins (1975), 108, n. 1.

⁸ *Report on Bread* (1815), Appendix I; the rate cannot be calculated exactly since a very small proportion of the bread incorporated flour extracted after a second milling of the bran.

a significantly lower overall rate of extraction than was common in 1300 since only 6 per cent by weight of the bread was standard or 'thirds' (presumably wholemeal) and the rest was wheaten, while in 1300 the proportion of wholemeal bread was probably higher. Moreover, the medieval extraction rate for the cheaper bread grains was probably much higher than in 1800, since the London brown bakers who used them were supposed not to bolt (i.e. sift) their meal.⁹ If the extraction rate for wheat c.1300 was 85 per cent, then the estimated 44.9 lb. of flour baked into 57.6 lb. avoirdupois of bread would have been milled from a bushel weighing 52.8 lb. This corresponds closely with the standard established by c.1300 that a bushel of wheat weighed 64 lb. troy (52.7 lb. avoirdupois).¹⁰ A yield of 44.9-46.4 lb. of flour from a bushel weighing 52.7 lb. is equivalent to an extraction rate of 85-88 per cent.

The standard weight of approximately 53 lb. for a bushel of wheat which seems to have been accepted c.1300 can be compared with the standard of 56 lb. avoirdupois accepted from c.1500 onwards,¹¹ and that of 57 lb. stated in 1791. Wheat thus appears to have gained in weight by 8 per cent overall, or 6 per cent by 1500, although at each of the dates there was probably a wide range in the actual weights of wheat. It is possible that the increase in the standard weights arose from changes in the method by which bushels were struck. Alternatively, there may have been some improvement in the density of grain through seed selection,¹² and by the more widespread cultivation of the denser grains. By implication, other grains made similar gains in weight over the same period.

⁹ Thrupp (1933), 120-1.

¹⁰ See Connor (1987), 123-4; Zupko (1985), 56; Hall H and Nicholas (1929), 8.

¹¹ Hall H and Nicholas (1929), 48-9.

¹² For evidence of seed selection after 1660, see Allen (1992), 206-7.

APPENDIX III

THE CALCULATION OF TRANSPORT COSTS

The pattern of London's impact on the production and distribution of grain within its region was moulded by the cost of transporting grain to the metropolis. In order to measure that impact, therefore, it is necessary to establish a standard cost for the carriage of grain, by land and by water, and to know the modes of transport which would have been used from any place within the region to London. The manorial account rolls contain a little information on these topics, but insufficient from which to generalize. Fortunately, a group of royal purveyance accounts from the 1290s and later does provide the necessary information, both on the routes used and on costs, although to establish standard costs some assumptions and some manipulations of the data are necessary. The aim of the exercise has been to establish costs for the carriage of wheat, for which most information is available, but occasionally evidence concerning other grains is drawn into the argument. As will be seen, there almost certainly were some differences in land transport costs between different parts of the region, but they cannot yet be defined in any systematic way. Local topography and the season of the year would also have affected the costs of individual journeys, but there is no way in which those differences can be systematically taken into account.¹ The following, then, should be regarded as a first and approximate attempt at estimating transport costs within the region. Further research will almost certainly modify the picture.

Two sheriffs' accounts for Hertfordshire and Essex in 1295-6 and 1296-7² provide the most useful picture of land transport costs. They concern the carriage of grain from a number of hundreds in those counties to embarkation points from which the grain was carried by boat to ships lying in the Thames estuary. The eventual destination was Gascony. Carts, each of which carried 3 quarters of wheat, 3.5 quarters of barley, or 4 quarters of oats, were hired at a rate of 14 pence a day. Each journey was described as being 'from divers places' within the hundred to the place of embarkation, a distance was given in leagues, and the cost was expressed in terms of the number of days hire needed, to the nearest half day. Distances have been calculated as the crow flies from the central point of each hundred to the named destination,³ and in this way it was possible reliably to calculate the length of a day's journey in some 30 cases. The mean distance was 13.2 miles or 21.2 km. a day, so that it cost on average 0.35 pence to cart a quarter of wheat over a mile or 0.22 pence to cart it over a kilometre.⁴ Cartage costs in Essex and Hertfordshire may have been greater than in

¹ The records of the land journeys cited below do not give the time of year at which the journey was made; the river journeys were made between March and May.

² PRO, E101/556/1, 3.

³ Where possible, distances were calculated from the hundred meeting-place. For the longer journeys the distance as measured in miles corresponded closely with that given in leagues. For the shorter journeys it was usually (but not always) less than that given in leagues, probably because in such cases the distance travelled within the hundred between the 'divers places' where the grain was collected represented a much greater proportion of the entire journey.

⁴ The measured distances travelled in a day ranged from 6 to 24 miles, and the stated distances from 6 to 24 leagues. In terms of stated distance, the mean length of journey per day was 13.9 leagues. If the league was equal to a mile that would indicate a mean length of journey of 22.4 km. a day, and a cost of 0.34 pence or 21 pence to carry a quarter of wheat over a mile or a kilometre, respectively. In view of the uncertainty over

Bedfordshire and Buckinghamshire and other parts of the region,⁵ but since they are the only ones for which there is substantial evidence in this period they have been adopted as the overall standard in this study.

Some records of expenditure on carting wheat from Hertfordshire manors belonging to Westminster Abbey corroborate the standard figure as calculated here, and indicate that, at least for that district, it is not simply a fiction associated with purveyance for the Crown. Thus in 1311-12 it cost 6 pence a quarter to cart wheat from Ashwell to Ware, a distance of 18 miles (27.5 km.) as the crow flies, while the cost according to the standard would have been 6.05 pence. Cartage costs for wheat from other Westminster manors to the abbey correlate with the calculated cost in a similar way. Thus cartage from Ashwell to Westminster in 1311-12 cost 14 pence a quarter (13.25 pence calculated); from Aldenham in 1295-6, 5 pence (5.66 pence calculated); and from Wheathampstead in 1327-8, 8 pence (8.14 pence calculated). Evidence from Kent, however, indicates that cartage costs there may have been lower than in Hertfordshire and Essex. Thus it cost 3 pence a quarter to cart wheat and oats the 14.3 miles (23 km.) from Great Chart to Canterbury in 1292-3, while the cost calculated by the standard would have been 4.30 pence a quarter.⁶

When water transport was available, there could be substantial savings over the cost of road haulage. To cart a quarter of wheat from Ashwell to Ware, and then to ship it down the River Lea and up the Thames to Westminster cost 10 pence, by comparison with 14 pence for cartage over the entire distance. The sheriffs' accounts reveal the importance of Thele, just downstream from Ware, and of Waltham, which lay still further down the Lea, as embarkation points for grain collected throughout Hertfordshire and in north-west Essex during 1295-6 and the following year. On those occasions, however, the destination of the grain was the Thames estuary rather than London, and so Thele would have been a convenient collecting point even for produce from parts of western Hertfordshire which were closer to London by cart. The effective head of navigation on the Lea seems normally to have been at Ware or Thele.⁷

The best evidence for use of the Thames in transporting grain is provided by a group of accounts concerning grain purchased in 1295 by a group of London cornmongers for use on the Gascon expedition, and mostly stockpiled in London.⁸ Throughout the thirteenth century there is evidence that goods, including corn, were shipped downstream to London, sometimes from as far as Oxford but more often from Abingdon and further down the river. By the mid or later thirteenth century Henley had emerged as the effective head of navigation on the Thames, especially for boats going upstream.⁹ This development is clearly revealed in the

the length of the league and over the interpretation of the phrase 'from divers places', the higher cost estimate based on the measured distances, has been adopted for this analysis.

⁵ In 1296-7 oats were carried from Bedford and from Aylesbury to London in carts which cost 14 pence a day to hire, as in Essex, but which carried 6 quarters of oats, by comparison with the 4 quarters carried in Essex and Hertfordshire: PRO, E101/550/1. The carts from Bedford and Aylesbury covered about the same distance in a day as those in Essex and Hertfordshire, averaging 15.8 and 13.3 miles per day, respectively, despite the steep climb over the Chiltern escarpment. These figures would indicate a cartage cost for wheat of 0.24 pence per mile (0.15 pence per km.). The mean figure for six measurable journeys in Norfolk and Suffolk with wheat or with mixtures of grains in 1318-19 and 1324-5 is also 0.24 pence per mile: PRO, E101/534/25, 33.

⁶ CCA, DCc/Great Chart/14. The quantities of each grain and the overall cost of carriage are given; it is thus possible to calculate the overall cost per quarter using the different rates for wheat and oats.

⁷ Langdon (1993), which corrects Edwards and Hindle (1991).

⁸ PRO, E101/5/13, 14.

⁹ Davis (1973); Langdon (1993); *Cal Pat R* 1247-58, 369; PRO, E101/582/3; James (1971), 181; *Libro Quotidianus*, 104.

records of 1295 in terms of the cost of shipping a quarter of wheat¹⁰ to London. The cost for the 68 mile (110 km.) journey from Henley to London was 1.77 pence while the cost from Reading to London, only 10 miles (16 km.) further, was almost twice as much at 3.11 pence. This sharp increase presumably reflects the cost of the labour necessary to manoeuvre boats over the weirs and locks above Henley, and by the difficulty, if not impossibility, of returning them laden upstream.¹¹ Impediments to shipping, however, did not accumulate to the same degree above Reading, for the cost from Abingdon to London, 40 miles (65 km.) further than from Henley, was no more than 3.55 pence. These differences in transport costs demonstrate clearly why, by the late thirteenth century, the lord of Cuxham chose to sell his wheat in Henley, as a way of reaching the London market, rather than at the much closer embarkation point on the Thames opposite Wallingford. Taking account of carting and handling as well as shipping (but not of any granary storage costs in the market town), the cost of sending a quarter of wheat from Cuxham to a London granary via Henley would have been 6.3 pence, while via Wallingford it would have been 7 pence.

The principal downstream market used by the cornmongers in 1295 was at Faversham, from which the shipping cost to London, at 1.78 pence per quarter, was almost identical to that from Henley. Costs from Shoebury, opposite Faversham on the Essex coast, were identical to those from Faversham, as were those from Maidstone, indicating that the Medway was an important artery for the trade in grain as well as that in building stone.¹² Of these embarkation points, Shoebury, a relatively insignificant supplier of grain, was, at about 47 miles (75 km.) by water from London, at least 12 miles (20 km.) closer to the capital than Faversham and nearly 30 miles (50 km.) closer than Maidstone. The greater quantity of trade from the places in Kent probably kept down the cost of shipping goods to London. From New Hithe, just 6 miles (9 km.) downstream from Maidstone, the cost of shipping wheat was 1.33 pence a quarter, markedly lower than from Maidstone itself, presumably because of the obstructions in the river. New Hithe, a small place but probably much frequented by shipping on account of the nearby stone quarries, supplied little corn by comparison with Maidstone. The existence of the large and established market at Maidstone thus overrode considerations of transport cost, at least over a short distance. The costs of shipping wheat to London in 1295 are recorded from several other places along the Thames, and a few more can be added to that number by interpolating a cost based on the recorded cost of shipping oats.¹³

Wheat was sometimes shipped to London from ports more distant than Shoebury and Faversham, but there is no direct evidence as to the cost. For the purpose of this study an estimate of the cost of coastal shipping has been made on the basis of the known cost of shipping grains from Yarmouth, Lynn and Ipswich to Berwick in 1299-1300. The mean cost for these shipments was 0.019 pence per mile (0.012 per km.),¹⁴ a rate which is close to that for shipments along the river Thames.¹⁵ The rate for carting wheat on land in Essex and

¹⁰ In expressing transport and handling costs the accounts sometimes used quarters of nine and of ten bushels, according to local custom. In what follows all values have been calculated for quarters of eight bushels.

¹¹ Langdon (1993).

¹² Saltzman (1968), 128-9.

¹³ The accounts reveal that the cost of shipping oats was 76 per cent of that of shipping the same volume of wheat, virtually the same differential as with cartage costs.

¹⁴ Calculated from PRO, E101/574/7.

¹⁵ Rates in pence per mile (and per kilometre) for a quarter of wheat carried upstream are: from Faversham 0.021 (0.019), from Sittingbourne 0.027 (0.017), from Shoebury 0.039 (0.024), from Rochester 0.021 (0.013), from New Hythe 0.019 (0.012), and from Maidstone 0.024 (0.015); and for downstream journeys from Henley 0.016 (0.016), from Reading 0.040 (0.025), and from Abingdon 0.032 (0.02). The rate from Shoebury may have been high because of the relatively small demand for shipments from there to London.

TABLE 17

Transport costs, excluding handling, in the London region c.1300

Mode of transport	Cost of transport (pence)			
	A quarter of wheat ²		Per ton-mile	Per tonne-kilometre
	Per mile	Per kilometre		
<u>By road (cart):</u>				
Essex and Hertfordshire	0.350	0.220	1.85	1.14
Other parts of London region	0.240	0.150	1.27	0.78
<u>By river:</u>				
Ware to London (downstream on River Lea, upstream on River Thames) ¹	0.094	0.058	0.50	0.30
Rivers Cam, Great Ouse, and Nene, downstream (estimated)	0.039	0.024	0.21	0.12
River Yare, downstream	0.035	0.022	0.18	0.11
River Thames, downstream from Abingdon to London	0.032	0.020	0.17	0.10
River Thames, upstream from Faversham to London	0.031	0.019	0.16	0.10
River Thames, downstream from Henley to London	0.026	0.016	0.13	0.08
<u>Coastal shipment:</u>	0.019	0.012	0.10	0.06

Sources: see text.

¹ Calculated on the basis that the recorded cost of 4 pence for shipping a quarter of wheat included handling charges of 0.91 pence (see text).² Eight bushels, each weighing 53 lb. or 24.04 kg. (Table 3).

Hertfordshire was almost twenty times greater, and that for cartage elsewhere in the region was more than twelve times greater. The true differential between land and water transport costs would not have been as great as this, however, except over long distances, since the cost of transferring the grain from a boat to the granary or vice versa would almost certainly have been much greater than that of a similar transfer from a cart. In estimating the cost of shipments to London from any coastal port the rate of 0.019 pence per mile has been used for the voyage up to a point in the Thames estuary opposite Shoebury or Faversham, and then the recorded cost of shipping from those ports to London (1.8 pence) has been added. In this way it has been possible to bring into consideration the ports of the East Coast up to Barton on Humber and Newcastle, and those extending round the Kent coast as far as Rye and Winchelsea. As a check on the validity of the estimates, the relative costs of shipping wheat from those ports to London have been compared, where possible, with the relative costs of shipping wine between London and the same ports. There is some correspondence between the two, at least for southern England.¹⁶ Table 17 summarizes the different costs of transport by road and water in the London region.

¹⁶ The comparison is based on the freight charges for wine between 1315 and 1351 listed in James (1971), 154. The recorded costs of shipping a tun of wine and the estimated cost of shipping a quarter of wheat from each of the following ports have been expressed as a ratio of the known costs of shipping them between

The 1295 accounts identify the cost of carrying the wheat from the granary at the point of embarkation to the boat (0.25 pence per quarter), and again from the boat to the granary in London (0.66 pence per quarter). On this basis the cost of unloading wheat from a cart into a granary might be estimated at 0.125 pence a quarter. By using the recorded or estimated costs of transport and handling, and assuming that all coastal points of embarkation were used when appropriate and that grain was not shipped to London from further upstream than Abingdon, Ware, and Maidstone on the rivers Thames, Lea, and Medway, respectively, it is possible with some confidence to estimate the cost of transporting a quarter of wheat to London from most parts of the study area by the cheapest possible means. The result of the exercise is expressed as an isopleth map in Figure 7, where 6.3 pence, the cost of transport from Cuxham, is used as a base line. The values represent the cost of moving a quarter of wheat as it stood in a cart at any particular manor to a granary in London. The exercise reveals some of the choices of modes of transport which are likely to have been made. High Wycombe, for example, seems to have been a grain market regularly used by London cornmongers.¹⁷ It would have cost about 12.1 pence to send a quarter of wheat from there to London by cart along the main Oxford road, but the journey by cart to Hedsor or Marlow and then by river to London would have cost no more than about 5 pence. Thus, in the early thirteenth century when wheat was sent from West Wycombe to London, it was said to be carried by water, probably via Marlow or some embarkation point near by.¹⁸

Within the study area the isopleth most distant from London which it is possible to map with any confidence is that representing a cost of 13.3 pence, which passes through northern Buckinghamshire and Bedfordshire, and, were it not for the navigable rivers flowing towards the Wash, would have passed through southern Cambridgeshire. Grain was sent from Cambridgeshire to the London market, and sometimes it is known that the water route via Lynn was used. Some information is available on the costs of transportation by these and other East Anglian rivers, which seem on the whole to have been greater than those on the Thames below Henley at this time. Thus journeys from Norwich to Yarmouth on the River Yare averaged 0.035 pence per mile (0.022 pence per km.) for a quarter of wheat, those from Wroxham and Beccles to Yarmouth 0.047 pence (0.029 pence per km.), and those from Lakenheath to Lynn 0.042 pence (0.026 pence per km.).¹⁹ The evidence is not without problems, however, and so in calculating river transport costs from Cambridge, Huntingdon or St Ives, and Peterborough (the highest points of effective navigation on the Cam, the Great Ouse, and the Nene, respectively) a rate of 0.039 pence per mile (0.024 pence per km.) has been used, equal to the highest known rate on the Thames. By using the standard carting and handling costs it is possible to extend the transport-cost contours to cover the catchment areas of the rivers flowing into the Wash and of those flowing to Yarmouth (Fig. 7). The exercise reveals that at a point about six miles (10 km.) to the south of Cambridge it was equally advantageous (other conditions such as local price levels being equal) to send wheat to London either in a southerly direction or north through Lynn.

Figure 7 reveals the importance of navigation on the Thames, the Lea, and the Medway, and along the coast for defining London's catchment area in transport-cost terms. The 6.3 pence contour line, which just includes Cuxham, seems effectively to define a primary

London and Maidstone (18 pence per tun of wine and 2.70 pence per quarter of wheat): Sandwich, 1.33 for wine and 1.24 for wheat; Winchelsea, 2.00 for wine and 1.50 for wheat; Ipswich 2.20 and 2.60 for wine, and 1.40 for wheat; Hull 2.00 and 3.30 for wine and 2.50 for wheat. The costs given by James concern isolated resources, which could be affected by weather, piracy, and other considerations. As with other aspects of these estimates of transport costs, the investigation of this issue could be carried a great deal further.

¹⁷ See above, 49, 80, 101.

¹⁸ *Pipe Roll of Winchester, 1210-1211*, 80; cf. Farmer (1991), 410.

¹⁹ Calculated from: PRO, E101/574/7, 25, 32; E101/575/13, 32; E358/2, m 2.

catchment zone, which beyond the Thames estuary is limited only to a narrow coastal strip. Beyond that, however, the 9.3 pence line defines an extensive area in East Anglia upon which London cornmongers could draw as readily as upon the immediate neighbourhood of Oxford, assuming that the prices they offered were competitive in the local markets.

As more information concerning the costs of transportation in this period is discovered and analysed, it may be possible to revise the picture, but that will probably not be a substantial revision. If, for example, the figure used for cartage costs proves to be high for the region as a whole, London's catchment area in Buckinghamshire, Berkshire, Oxfordshire and Kent would be enlarged a little.

APPENDIX IV

LONDON WHEAT PRICES

No adequate series of London grain prices for the medieval period has appeared in print. Some prices for sales in London, Westminster, or Southwark are recorded in accounts, but no single group of accounts provides a satisfactory series. The records of the city's assize of bread, however, provide a series of prices, from 1277 onwards, for the wheat which was purchased in the city's markets for the purpose of setting the assize in October each year, and sometimes also at other seasons. In addition, the records contain reports from cornmongers on the price of wheat in the markets at other times of year. Prices thus are recorded at a variety of dates for the markets at Queenhithe, Billingsgate, and Pavement, and sometimes a general London price was given. The term 'Pavement' denoted a variety of locations, which were sometimes further specified as at Gracechurch, in Cheapside (*in foro*), at St Michael le Quern (which was in Cheapside), at Grey Friars (*ad fratres*), or within Newgate (see Fig. 4). From 1336 onwards the Pavement purchases were usually made within Newgate. Prices were cited per quarter. At the Pavement or inland markets the quarter contained eight bushels, and at the two riverside markets it contained nine bushels. This difference may reflect the nature of trade at the markets: those inland being characterized by small-scale trading, and Billingsgate and Queenhithe being dominated by wholesale deals. The cornmongers also quoted prices for maslin from time to time. Table 18 summarizes these London wheat prices in pence per bushel for the years 1277-1319, and incorporates some information on London prices from sources other than those associated with the assize.

The records of the London assize are to be found in the Corporation of London Records Office, on fos. 110-29 of the manuscript Letter Book A, and in the *Liber de Assisa Panis* (CRO, Cust 4).

Some observations on London prices

The prices reveal something of the character of the different markets in the city. At the riverside markets, dominated by large-scale dealing, prices were generally a little lower than at the inland markets. Thus out of the 59 instances when a comparison is possible, the inland price was higher in 39 cases and lower in 20. By contrast, at the two riverside markets of Queenhithe and Billingsgate prices were the same on 33 out of the 42 occasions when comparison is possible. On six out of the nine occasions when the prices differed at those two markets the prices at Queenhithe were higher, by between 7 and 12 per cent, while when the Billingsgate price was higher it was by less than 1 per cent.

Incomplete though these price series are, they seem to indicate that while the London grain markets were broadly integrated in terms of seasonal and annual price movements, the markets nevertheless operated within two or three distinct but partially overlapping circuits of exchange. One circuit involved carriage of grain by cart and pack-horse to the city's inland markets. Another focused on the river Thames, drawing grain from both upstream and downstream of the city into what often seems to have been a single, integrated market conducted at two separate landing places. On occasion, however, and for reasons which are not apparent, the river-based market disintegrated into upstream and downstream markets, the former being characterized by higher prices than the latter, and so displaying some affinity with the city's inland markets.

TABLE 18
London wheat prices, 1277-1319

Year (Michaelmas to Michaelmas)	Day	Price of wheat in pence per bushel at			
		Pavement ¹	Billingsgate	Queenhithe	London
1277-8	20 Oct	8.34	-	8.77	-
	20 Nov	9.09	8.80	-	-
1278-9	9 Oct	8.12	-	8.11	-
1279-80	11 Oct	8.50	-	7.88	-
1281-2	9 Oct	9.00	-	8.66	-
	17 Nov	10.50	-	-	-
1282-3	15 Oct	8.57	-	8.88	-
	19 Nov	10.00	-	-	-
1283-4	16 Oct	9.87	10.00	-	-
	n d	-	-	-	7.34 ²
	n d	-	-	-	9.75 ²
	n d	-	-	-	10.00 ²
	n d	-	-	-	10.34 ²
1284-5	25 Nov	8.31	-	8.44	-
	30 Nov	8.25	-	-	-
1285-6	13 Oct	8.39	-	8.33	-
	25 Jan	9.37	-	-	-
1286-7	21 Dec	8.00	-	7.69	-
	16 Apr	7.12	-	-	-
	n d	-	-	-	6.95 ³
1287-8	4 Oct	5.56	-	5.55	-
1288-9	8 Oct	5.25	-	5.22	-
1289-90	5 Oct	5.93	-	5.88	-
1290-1	13 Oct	9.62	8.05	8.88	-
1291-2	8 Oct	9.00	8.77	-	-
	15 Oct	9.00	-	-	-
1292-3	6 Oct	7.50	-	7.33	-
	after Feb	-	-	-	8.20 ⁴
1293-4	13 Oct	12.00	-	11.11	-
	n d	-	-	-	9.00 ⁴
	n d	-	-	-	10.00 ⁴
1294-5	4 Oct	12.43	-	11.95	-
	c.3 Apr	-	-	-	13.56 ⁵
	Mar-May	-	-	-	12.00 ⁵
	Mar-May	-	-	13.50 ⁵	13.50 ⁵
	Mar-May	-	-	13.75 ⁵	-
	Mar-May	-	-	14.00 ⁵	14.00 ⁵
1295-6	12 Oct	11.25	11.33	11.27	-
1296-7	8 Oct	8.00	8.00	8.00	-
	15 Oct	7.68	7.47	-	-

Continued

Table 18 continued

Year (Michaelmas to Michaelmas)	Day	Price of wheat in pence per bushel at:			
		Pavement ¹	Billingsgate	Queenhithe	London
1297-8	8 Nov	-	-	-	8.25
1298-9	23 Dec	8.25	-	8.66	-
	6 Mar	10.50	10.66	10.66	-
	4 May	9.75	10.00	10.00	-
	n d	-	-	-	8.50 ⁶
1301-2	2 Oct	7.50	7.88	7.88	-
	4 Dec	8.25	8.00	8.00	-
	22 Jun	9.00	9.33	9.33	-
	10 Oct	8.50	8.36	8.33	-
1302-3	12 Oct	8.25	-	-	-
	3 Dec	9.50	9.33	9.33	-
	17 Jan	9.75	10.22	10.22	-
	after Feb	-	-	-	8.30 ⁷
	after Feb	-	-	-	10.00 ⁷
	7 Oct	7.12	7.27	7.22	-
	22 Oct	6.75	-	-	-
1303-4	30 Nov	6.75	6.66	7.33	-
	c.1 Mar	-	-	-	6.00 ⁸
	after 29 Mar	-	-	-	5.30 ⁸
	20 Apr	6.00	6.66	6.66	-
	n d	-	-	-	6.40 ⁹
	8 Oct	7.87	7.33	7.33	-
1304-5	13 Nov	9.25	8.88	8.88	-
	21 Nov	9.25	8.88	8.88	-
	29 Jan	12.00	11.33	11.33	-
	5 Feb	12.75	12.00	12.00	-
	n d	-	-	-	10.40 ¹⁰
	6 Oct	8.75	9.44	9.44	-
1305-6	15 Oct	8.62	-	-	-
	25 Nov	8.78	-	9.09	-
	22 Feb	9.00	9.22	9.22	-
	11 May	8.25	8.22	8.22	-
	10 Oct	8.00	-	-	-
1306-7	3 Dec	-	8.88	8.88	-
	25 Feb	7.25	7.55	7.55	-
	12 Oct	9.00	8.83	8.83	-
1307-8	13 Oct	9.00	-	-	-
	18 Nov	9.00	8.88	8.88	-
	25 Nov	9.75	9.33	9.33	-
	7 Aug	10.00	10.00	10.00	-
	n d	-	-	-	8.30 ¹¹
	n d	-	-	-	9.00 ¹¹
	n d	-	-	-	10.00 ¹¹

Continued/

Table 18 continued

Year (Michaelmas to Michaelmas)	Day	Price of wheat in pence per bushel at:			
		Pavement ¹	Billingsgate	Queenhithe	London
1308-9	7 Oct	12.00	11.50	11.50	-
	16 Dec	12.75	12.00	12.00	-
	13 Feb	12.50	12.00	12.00	-
	14 Apr	14.00	12.75	12.75	-
1316-17	13 Oct	25.50	23.33	25.11	-
1317-18	13 Oct	15.00	14.77	14.77	-
1318-19	11 Oct	8.50	7.55	8.47	-
	15 Dec	6.50	7.11	7.11	-
	18 Dec	7.25	7.55	7.55	-
	13 Jan	6.75	6.66	6.66	-
	26 Mar	6.75	6.22	6.66	-
	28 Apr	8.25	7.55	7.55	-
1319-20	1 Dec	8.00	7.55	7.55	-
	19 Dec	6.75	6.00	6.66	-

Sources: records of the assize of bread (see text), or as stated in notes.

¹ Prices in **bold** are those used to establish the London standard in the analysis of geographical variations in price (above, 66 and Fig. 3). Where there are two October prices, the mean was used. n d = day of sale not known.

² Sales from St Paul's: Hale (1858), 165-6.

³ Sale from St Paul's: Hale (1858), 172-3.

⁴ Sales by Westminster Abbey: WAM, 18962.

⁵ Purchases by cornmongers: PRO, E101/5/14.

⁶ Sale from Southwark: HRO, 11M59/B1/57.

⁷ Purchases by Westminster Abbey: WAM, 19893.

⁸ Sales in London by manor of Shillington (Bd): PRO, SC6/741/16.

⁹ Purchase by Westminster Abbey: WAM, 19894.

¹⁰ Purchase by Westminster Abbey (unweighted mean of several transactions): WAM, 19840.

¹¹ Sales from Southwark: HRO, 11M59/B1/63.

APPENDIX V

QUANTITIES OF GRAIN USED BY ECCLESIASTICAL HOUSEHOLDS

It is possible to estimate with some accuracy the quantities of grain used by five of the large religious households in the London region by using the accounts of central household officials. Religious houses obtained their grain either by transfer from their demesnes or by purchase. At some houses there were rigidly fixed food farms while at others a more flexible system prevailed with the overall amounts received from demesnes changing from year to year.¹ The names and responsibilities of the officials who accounted for receipts of grain varied from community to community. In Peterborough Abbey the baker accounted for receipts, due to both the abbot and the convent, of all grain for baking, brewing, and fodder.² In Westminster Abbey the granger or graner accounted for grain received from the conventual manors, while the treasurer accounted for grain purchased for the convent's use.³ In Canterbury Cathedral Priory the granger accounted for all receipts of bread grains, while the bartoner accounted for all receipts of brewing grains.⁴ Because of the patchy survival of the central accounts from the early fourteenth century, it is necessary in some cases to combine information from different years. The figures presented in Table 19 may underestimate amounts of some grains used. It is unlikely, however, that they overestimate.

The estimates for the prior and convent of Westminster Abbey relate to the year 1304-5 as this is the only full year in the early fourteenth century for which a treasurer's account survives.⁵ This account lists the purchases of grain by the abbey. Information on grain sent to the household from the manors pertaining to the prior and convent's portion comes from the evidence of individual demesne accounts for 1304-5. Manors within the 10 counties of the London region accounted for over 80 per cent of all arable land pertaining to the uses of the prior and convent.⁶ This exercise has been limited to manors within the study area as it is unlikely that manors outside transferred grain to the household. Accounts for 1304-5 survive for 13 of the manors and information regarding transfers from 10 additional manors has been inferred from accounts very close in date. In the case of two manors where no accounts for the decades around 1300 survive, transfer figures have been interpolated from the granger's account for 1348-9.⁷

The figures for St Paul's date from 1286 and come from the regulations setting the annual food farms from the cathedral's manors.⁸ For Peterborough Abbey, the estimates are derived from a central baker's account for 1309-10 listing receipts of each grain from the estate's manors and its division between abbot and convent.⁹

¹ See above, 149.

² NpRO, Fitzwilliam 2389.

³ Harvey B F (1977), 143.

⁴ Smith R A L (1943), 40.

⁵ WAM, 19841.

⁶ Harvey B F (1977), 429-30.

⁷ WAM, 19155.

⁸ Hale (1858), xlviii-li.

⁹ NpRO, Fitzwilliam 2389.

TABLE 19

Annual consumption of grain by five major ecclesiastical households, c.1300

Grain	Household														
	Westminster: prior and convent			St Paul's: dean and chapter			Peterborough: prior and convent			Peterborough: abbot			Canterbury: prior and convent		
	A ¹	B ²	C ³	A ¹	B ²	C ³	A ¹	B ²	C ³	A ¹	B ²	C ³	A ¹	B ²	C ³
Wheat	763	31	19	720	46	0	498	35	0	894	33	0	1025	40	12
Barley	583 ⁴	24	78	135	9	0	913 ⁵	65	0	595 ⁵	22	0	1203	47	43
Dredge	27	1	54	0	0	0	0	0	0	588 ⁵	22	0	0	0	0
Oats	1094	44	80	720	46	0	0	0	0	634	23	0	345	13	18
All grains	2467	100	60	1575	101	0	1411	100	0	2711	100	0	2573	100	27

Sources: see text.

¹ Quantity of grain used in quarters.² A as a percentage of all grains used.³ Percentage of A acquired by purchase.⁴ Includes 102 quarters of barley malt purchased by the treasurer and reduced by 12.25 per cent to allow for expansion of grain during malting.⁵ All barley and dredge was received from demesne manors already malted. The equivalent quantity of raw grain was calculated by reducing the quantity of malt by 12.25 per cent.

The figures for Canterbury Cathedral Priory come from two sources. Quantities of wheat used come from the granger's account of 1307-8 which records receipt from the manors and purchases of bread grain.¹⁰ The bartoner's account for 1311-12 records receipts and purchases of grains brewed into ale.¹¹

Purchase of grain by ecclesiastical households

In the case of neither St Paul's Cathedral nor Peterborough Abbey is there evidence of central purchases of grain in the first decade of the fourteenth century. Grain received from their demesnes appears to have been sufficient to satisfy the consumption needs of these households. On occasion, however, the demesnes themselves purchased a proportion of the grain they transferred. For example, in 1309-10 it is possible that as much as 25 per cent of the wheat transferred from Peterborough Abbey demesnes to the household had been acquired by purchase rather than harvest of demesne land.¹² The central accounts do not distinguish between demesnes which transferred purchased grain and those which did not.

Westminster Abbey demesnes do not appear to have purchased grain in order to send it to the household. Purchases were made centrally and accounted for centrally. These purchases were frequently substantial. In 1304-5 19 per cent of the abbey's wheat and 79 per cent of its cheaper grains were obtained through the market. This latter figure includes the 102 quarters of barley malt which was purchased by the treasurer. In a different exercise, amounts of grain purchased by the conventual treasurer in 1304-5 and 1307-8 were meaned and the result compared with total amounts of grain used in 1348-9. This resulted in estimates that 23 per

¹⁰ CCA, DCc/Granger 1.¹¹ CCA, DCc/Bartoner 4.¹² See above, 150. It is not possible to calculate the exact amount of purchased grain which was transferred off demesnes as it was also used for seed and other purposes.

cent of the wheat used was purchased, and 83 per cent of cheaper grains.¹³ It is possible that in 1304-5 both the quantity of oats used and the percentage bought may have been somewhat higher than in other years. Thus in 1304-5 the treasurer purchased 875 quarters, by comparison with 1,098 quarters in the 16 month period from March 1303 to July 1304.¹⁴

In a letter which Prior Henry of Eastry sent to the constable of Dover Castle in 1323 he asserted that Canterbury Cathedral Priory had to purchase 'a thousand quarters of corn and even more, every year' for the maintenance of the household.¹⁵ Although Eastry was probably exaggerating because he was unwilling to sell grain to the constable, the early fourteenth century accounts of the bartoner and granger of Canterbury Cathedral Priory reveal that 12 per cent of the abbey's wheat and 37 per cent of its cheaper grains were obtained through central purchases. This amounted to over 700 quarters of grain per annum. In addition, the priory's demesnes did on occasion meet the household's demands by purchasing grain for transfer. It is not possible to estimate what percentage of the transferred grain was purchased, but in the case of wheat it appears to have been very small.¹⁶ Substantial amounts of barley were occasionally purchased by demesnes expressly for transfer, but as with the Peterborough Abbey demesnes this appears to have been in response to a particular household need rather than a permanent, formal arrangement.¹⁷

Central grain sales

There is little evidence from the central accounts of these religious houses that grain was transferred from demesnes in order to be sold centrally. Central sales did occur but quantities were generally small and probably surplus to requirements. The canons of St Paul's sold an average of 17 per cent of their receipt of wheat in the 1280s, but the early treasurers' accounts of Westminster Abbey only show sales of *drasc*, the by-product of malting which was used as animal feed.¹⁸ The accounts of the grangers and bartoners of Canterbury Cathedral show that small quantities of wheat and barley were sometimes sold centrally, but rarely over 3 per cent of the priory's receipt of those grains.¹⁹ The transfers of grain to Peterborough Abbey in the early fourteenth century were very large, but there is no evidence that any grain was sold centrally.

The ratio of brewing to bread grains

Because of the large discrepancy between the food value of raw grain and that of the processed product in the case of brewing grains, the latter were required in very large amounts by those households in which ale was an important source of calories. In estimating the ratio of brewing to bread grains in the five households examined it is necessary to know the use to which each grain was put. The Westminster Abbey evidence for 1304-5 does not reveal whether the large amount of oats purchased were for brewing or fodder, or whether grains other than barley and oats were used for brewing. However, in 1225, when the prior and convent's portion was separated from the abbot's, it was agreed that 2.5 quarters of wheat

¹³ Harvey B F (1977), 143-5.

¹⁴ WAM, 19839-40.

¹⁵ Smith R A L (1943), 132.

¹⁶ No Canterbury Cathedral Priory demesne in the database purchased more than 5 quarters of wheat per annum.

¹⁷ In 1307-8 the sergeant of Chartham (K) purchased 30 quarters of barley in Thanet and paid for it to be transported to the priory, and in 1323-4 the sergeant of Hollingbourne (K) sold oats in order to buy barley for sending to the household (*pro ordeo emendo ad mittendum domui*): CCA, DCc/Chartham 4; Smith R A L (1943), 133.

¹⁸ See above, 79, WAM, 19838-43.

¹⁹ CCA, DCc/Bartoner 1-5, DCc/Granger 1-6.

were required daily, and 3 quarters of barley and 6 of oats every other day, for the bread and ale of the monks themselves, their corrodians, guests and all other persons entitled to receive liveries.²⁰ That would have amounted to 912 quarters of wheat, 547 quarters of barley, and 1,095 quarters of oats per annum: a ratio of brewing to bread grains of 1.8:1.

At St Paul's in 1286, 479 quarters of wheat were baked into bread and 1,070 quarters of grain were brewed into ale. The grain malted and brewed was made up of 175 quarters of barley, 175 quarters of wheat and 720 quarters of oats.²¹ The proportion of brewing to bread grains was therefore 2:1. The baker's accounts for Peterborough Abbey also detail the uses to which each grain was put. In 1309-10 all 634 quarters of oats received went to feed the abbey's (or the abbot's) horses and poultry, the wheat was baked, and all other grains were brewed. The ratio of brewing to bread grains overall was 1.5:1. By contrast, the 345 quarters of oats received by Canterbury Cathedral Priory were brewed in a mixture with barley, and the remainder of the barley was also brewed, giving a ratio of brewing to bread grains of 1.5:1.

At these five houses brewing grains were consumed in significantly larger amounts than bread grains, the mean ratio being 1.7:1. Ale consumption in religious houses was extremely high, and care must be taken in relating these figures to the consumption needs of the population as a whole. However, the estimates for soldiers' diets in the early fourteenth century, which might be assumed to be more typical of the lay population, show a similarly high consumption of ale. In 1300 a garrison of 20 men was expected to eat 1 quarter of wheat in a week and to drink ale made from 2 quarters of malt.²² After reducing the quantity of malt to take account of expansion this gives a ratio of brewing to bread grains by volume of 1.75:1. Calculations from lay household accounts indicate that in the fifteenth century a lower status member of a noble household ate one 30 ounce loaf of bread each day and drank 4 pints of medium strength ale. On the basis of a bushel of wheat making 30 such loaves and a bushel of grain making 60 such pints, the annual grain requirement per caput would be 12 bushels of wheat and 24 bushels of brewing grain, giving a ratio of brewing to bread grains by volume of 2:1.²³

²⁰ Harvey B F (1977), 142. In 1348-9 a small amount of the oats received by the abbey was used as fodder but most was brewed: Harvey B F (1977), 144.

²¹ Hale (1858), xlviii-li.

²² Prestwich (1967), 536-7.

²³ Thurgood (1982), 195-6.

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