CHAPTER 21

THE EARLY ROMAN EMPIRE: DISTRIBUTION

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The mobilization and distribution of resources, human and material, was the key to Roman power. Effective distribution was a prerequisite for successful military campaigns and the maintenance of the frontiers. It underpinned the authority of the emperors, helping them to retain the support of the army and to avoid unrest in the capital by ensuring regular food supplies and occasional largesse. It permitted the elaboration in material form, in particular through large-scale public building in the city of Rome and other urban centers, of an elaborate symbolic system which promoted the legitimacy and ideals not only of individual emperors but of the imperial regime as a whole; indeed, the empire distributed ideas and symbols alongside goods and people. The Roman state was able to draw on the resources of a vast area, which encompassed regions rich in all the different goods required by the imperial project – metals, stone, grain, oil, and other foodstuffs. The task was to move these resources to where they were needed.

Successful distribution was equally important for the land-owning elite, especially as they too came to draw on resources from an ever wider area. The produce of their scattered estates needed to be collected together for consumption, sale, or redistribution in the cities of the empire, to provide for their dependents, support their chosen lifestyles, and further their political ambitions. To a greater extent than the emperors, they also relied on systems of distribution to provide them with goods that they could not obtain from their own holdings: materials for their building projects, for example, the "luxury" goods that played a vital role in the arena of social differentiation and competition, and slaves. As for the mass of the population, some experienced the expansion of Roman power and the concomitant development of systems of distribution as an opportunity; there were fortunes to be made in supplying the needs of the state and the aristocracy, and of the cities which prospered under their rule. The urban population was dependent on the efficiency of such systems, including the market, for its sustenance; even the rural producers, who supplied most of their needs from their own produce, were to some extent drawn, willingly or not, into the world of the traders and ship owners. The political and cultural integration of the empire went hand in hand with, in the broadest

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sense, its economic integration, as widely separated regions came to be connected through the movement of goods.

I THE LOCATION OF DEMAND

Although it continued to be presented as a basic principle of the good life, complete self-sufficiency was always an unrealizable ideal in antiquity; goods were always being transferred in one way or another between individuals, households, and localities. The conventional picture of ancient trade as small scale, focused on "luxury" goods for the elite, and economically insignificant stresses the homogeneity of the Mediterranean environment and hence the ubiquity of its key crops, as well as the high cost of transport, especially land transport, in a pre-industrial economy. Both of these factors can easily be exaggerated. Recent studies have argued that land transport was perfectly economical for goods which were relatively compact and fetched a reasonable price per unit weight – not only spices and unguents but textiles and wine – especially when used in conjunction with other forms of transport (as Varro depicts mule trains carrying goods down to the coast).[1] Some geographers have rejected the idea of a homogeneous "Mediterranean" environment and climate altogether, but recent accounts argue that its homogeneity lies precisely in the extraordinary degree of variation, in terrain and weather patterns, at the micro-regional level: the Mediterranean evinces "unity in diversity."[2] Small-scale, local distribution of resources between the innumerable micro-environments that made up each region – above all between coast and hinterland, highlands and valleys, and arable land and desert – therefore provided a constant background to the patterns of growth and decline of more visible economic activity.[3] Distribution, whether organized through networks of kinship, friendship, or patronage, or through the market, was one means of managing risk in the face of a highly capricious environment characterized by glut and dearth.[4] Furthermore, a number of essential resources – metals, most obviously, but also products like pitch, and stone suitable for millstones – were clearly not distributed evenly throughout the Mediterranean, while certain "ubiquitous" crops (vines above all) were not cultivated in some regions until well into the Roman period: some form of distribution of such goods was always necessary.[5] The surplus production of an individual peasant household was small; the aggregate demand of the ancient peasantry was considerable. The key question for this chapter is not therefore whether

[1] Polfer 1991; Morley 1996: 63–8; Varro, *Rust.* 2.6.5; Laurence 1999.
[2] Horden and Purcell 2000: 10–25; King, Proudfoot and Smith 1997.
[3] Horden and Purcell 2000: 124–43.
[4] Horden and Purcell 2000: 151, 175–203; Garnsey 1988: 55–63.
[5] Horden and Purcell 2000: 344–51; Peacock 1980.

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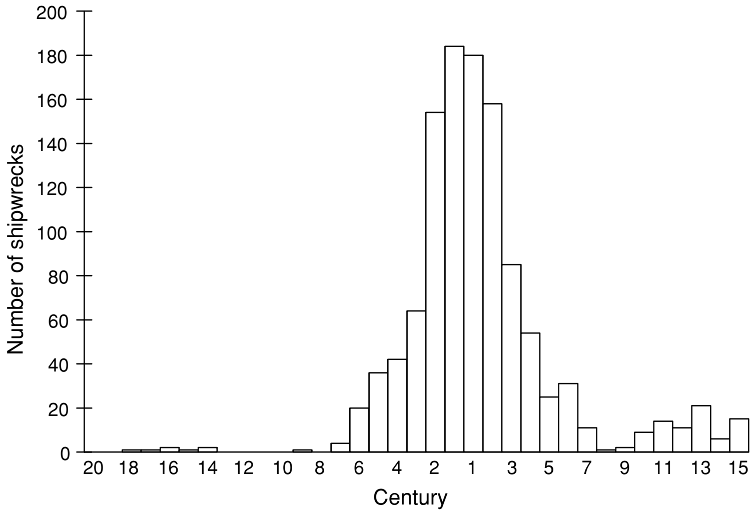

Figure 21.1 Distribution of Mediterranean shipwrecks, twentieth century BC to fifteenth century AD
Source: Parker 1992: 549 fig. 3

there was significant trade and exchange under the Roman empire, but how far distribution under the empire differed in volume and nature from the constant "Brownian motion" of *cabotage* and periodic rural markets that had long characterized the Mediterranean region.

Archaeology has provided striking and conclusive evidence for a dramatic increase in the volume of goods being distributed within the Roman empire, eclipsing anything that had gone before. Far more Mediterranean shipwrecks are datable to the period 200 BC – AD 200 than for any other period before the sixteenth century (see Figure 21.1).[6] These data cannot be taken wholly at face value. The geographical distribution of wrecks discovered so far shows a clear bias towards certain areas (the south coast of Spain and France, above all), which reflects the activity of archaeologists and other divers as much as ancient trade routes. The widespread use of amphoras in the Roman period also makes such wrecks more visible to prospectors than those which carried their cargo in more perishable containers. Nevertheless, the contrast between the numbers of known Roman wrecks and those from earlier and later periods, as well as literary and epigraphical evidence for Roman trading activities along the African coast and in the eastern Mediterranean, make it unlikely that more data from other regions would greatly alter the picture. Improved prospecting techniques,

[6] Parker 1992; cf. above, Chapter 19, Table 19.1.

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to identify wrecks which did not carry amphoras, would probably discover as many if not more Roman ships (those carrying grain, for example) as ships from other periods. Since there is no evidence for a drastic decline in the quality of Roman shipbuilding, these figures imply a significant increase in the volume of activity on the Mediterranean.

In addition there is the sheer volume of amphoras and other pottery dated to the period, much of it recovered from shipwrecks but much more found on all kinds of sites throughout the empire.[7] The wide geographical distribution of certain forms is impressive; for example, Lamboglia 2 amphoras from Apulia are found throughout the western Mediterranean, while some African amphoras occur almost everywhere from Britain to Egypt.[8] Amphoras were specialized storage containers, designed for stacking in ships' holds, ideally suited to transporting goods over long distances. The extent to which the forms from a particular region became standardized is another indicator of the regularity with which goods were being moved – as are the occasional cases of amphoras from one area imitating the distinctive forms of another. Other types of container are less visible archaeologically, which does tend to exaggerate the contrast between the level of activity under the Roman empire and that of earlier and later periods which relied more on wood, cloth, or skin containers (a move to wooden barrels has been suggested as the explanation for the disappearance of Italian wines from the archaeological record in the second century).[9] However, the abandonment of mass-produced amphoras and the use of more perishable, less standardized containers might itself be taken as evidence for a decline in the regularity and volume of inter-regional distribution compared with the Roman period.

Amphoras were used mainly to transport wine, oil, *garum*, and other foodstuffs; relatively cheap, relatively bulky in relation to their value, relatively ubiquitous over much of the Mediterranean. The same may be said of the pottery, from Italy and later Africa, which is found throughout the western half of the empire and beyond; given the ubiquity of both raw materials and manufacturing techniques, the lack of any basis for a comparative advantage in pottery production for any given region, one would not normally expect such goods to be widely distributed beyond the immediate locality.[10] This does represent a change in the nature as well as the volume of inter-regional distribution. To describe this in terms of a distinction between "luxuries" and "staples" as objects of trade is, although conventional, generally unhelpful, carrying a great deal of baggage from the moralizing tradition: virtually any good might be defined as a "luxury"

[7] Paterson 1982; Peacock and Williams 1986; Panella and Tchernia 1994.
[8] Peacock and Williams 1986: 99, 157, 170. [9] Tchernia 1986: 285–99.
[10] Cf. de Ligt 1990 on Weber's theory of industrial location.

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(even grain, in certain circumstances: fine bread wheats, for example), while ancient historians tend to use the term unthinkingly as a synonym for "economically insignificant."[11] We certainly cannot assume that the expansion of the trade in spices, incense, and other goods from Arabia and India during this period was devoted purely to the needs of the wealthy elite, while the scale of finance involved shows that this was scarcely an insignificant activity even if the number of individuals directly involved was relatively small.[12] Nevertheless, it is true to say that objects of high value per unit weight had always been traded through the Mediterranean, while the costs of transport tended to restrict large-scale trade in cheaper, bulkier goods like grain to special cases like Athens and to emergency famine relief.[13] What archaeology shows us in the Roman period is the regular, large-scale, inter-regional redistribution of foodstuffs that were staple but not essential and manufactured goods like pottery tablewares and lamps: products which were consumed by the mass of the population, but which in the past had generally been produced locally or not consumed at all by the majority.

The key to understanding this transformation is a study of changes in the scale and location of demand in this period; a greater number of people under the Roman empire chose or found themselves compelled to obtain a greater proportion of their needs (nutritional and social) from outside their immediate locality on a regular basis. In part this reflects changes in habits of consumption in many regions, which created a significant demand for goods that could not (at least for the moment) be produced locally, or which were desirable precisely because they were not produced locally; the development of an appetite for Italian wine in Gaul, for example, and changing tastes in fine pottery.[14] In the process of cultural change often referred to as "Romanization," many provincials articulated their new identity through new patterns of consumption.[15] This is most visible in the case of the elites who could afford to invest heavily in the process of acculturation and advertising their new allegiance, but it was not confined to them. Even if an individual peasant could afford wine only occasionally, and bought a single piece of fine pottery or a few pinches of incense every year, the resulting increase in aggregate demand would be sufficient to support a greater volume of inter-regional distribution.[16] In some cases this trade in "consumer goods" rode piggy-back on other systems of distribution, above all supplies to the army, which effectively subsidized the costs of transport.[17] In many cases local production eventually expanded to meet demand; Gaul provides a good example, both in the expansion of viticulture and in the

[11] Cf. Berry 1994; Morley 1999: 98–101. *Contra* e.g., Rostovtzeff 1957: 36; Jones 1974: 149–50.
[12] Young 2001. [13] Garnsey and Whittaker 1983; especially Hopkins 1983a.
[14] Tchernia 1983; Woolf 1997: 169–205.
[15] For a survey and critique of the concept of "Romanization," see Woolf 1997: 1–23.
[16] De Ligt 1990; 1991. [17] Middleton 1983.

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way that Italian Arretine ware was succeeded by a series of local finewares (some of which briefly enjoyed extra-local distribution).[18]

The expansion of distributive activities may also reflect an overall increase in the population of the empire.[19] This is to assume that population increase was supported through increased production (above all through expanding the cultivated area by exploiting previously marginal land) so that per capita income remained steady and aggregate demand expanded. Insufficient work has been done – and most likely the evidence is inadequate – to explore whether the areas in which population growth was most striking during this period correlate with those areas with the greatest apparent increase in economic activity; the western provinces would seem the most likely candidates.[20] However, most of the needs of this expanding population could still have been met locally; we would expect an intensification of the small-scale, local distribution described above, rather than any great expansion of inter-regional distribution. The explanation for that change is found in the development – one might almost say creation – of centers of demand for foodstuffs and other basic materials that could never be fully supplied locally, necessitating the development of more elaborate systems for the inter-regional distribution of such goods. That development was the direct result of the ways in which the two groups that commanded the greater proportion of the surplus production of the empire, the state and the great landowners, chose to invest that surplus in their pursuit of power.

The first such center of demand was the army. Army costs were the most important aspect of imperial expenditure, absorbing perhaps 450–500 million HS (over half of the likely imperial budget) by the mid-first century.[21] Supplying 400,000 or so soldiers with food and pay was a prerequisite for the security of the empire as a whole, hence for the legitimacy and prosperity of the imperial regime, and was equally important for the security of individual emperors, fearful of revolts and discontent that could be exploited by potential usurpers. Most of these troops were stationed in the sparsely settled margins of the empire, where they could obtain at best only part of their basic requirements locally. It has been estimated that the four legions on the Rhine frontier would have consumed the equivalent of a tithe on 40,000 square miles of land, whereas the region comprised only 20,000 square miles; in the region of the Cananefates in southern Holland, meanwhile, 16–22,000 military personnel could scarcely have been supported from the surplus production of the 14,000 or so natives.[22] Logistics had played their part in determining the limits of imperial expansion; Roman frontiers tended to become established in marginal regions, towards the

[18] Woolf 1997: 189–202. [19] Frier 2000: 811–16; above, Chapter 3.
[20] See generally Curchin 1991: 130–53; Woolf 1997; below, Chapter 24.
[21] Duncan-Jones 1994: 36; Hopkins 1995/6: 46. [22] Whittaker 1983b: 118; 1994: 99–104.

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limits of cereal agriculture, and were focused on lines of communication and supply rather than on ethnic divisions, natural boundaries, or ecological watersheds.[23] Over time, the army might hope to be able to obtain a greater proportion of its grain supplies locally, as domestic cereal production increased; this certainly was the case in Britain, to judge from the decline in volume of imported *terra sigillata* (generally agreed to be a "marker" for imports of food) by the mid-third century.[24] However, many frontier regions, especially in the east, were at the margins of successful cereal cultivation, and so it must always have been necessary to bring in supplies of grain from elsewhere.[25]

The army naturally consumed more than just cereals. The soldiers' diet included wine or *posca*, olive oil, and pork, not to mention condiments like *garum* and pepper; they needed horses, pack animals and animals for sacrifice, all of which required fodder; the replacement of equipment called for leather (the army of northern Britain needed 12,000 calves per annum simply to repair and replace its tents) and metals (a single legionary fortress in Britain has yielded 20 tons of iron nails).[26] Some of these goods presumably followed a similar pattern to that of grain; mass imports in the early years of occupation followed by a gradual shift towards local supplies as domestic production developed. Others – notably Mediterranean products like olive oil and wine – would always have to be transported to troops on the northern frontiers. Whether the state dealt with the problem by redistributing products collected through the *annona* to the frontier regions or by leaving local governors and military personnel to employ contractors, this represents a net transfer of resources from the wealthy, tax-producing inner provinces to the frontiers, and involved significant investment in the task of distribution. The same is of course true for the deployment of human resources, transporting recruits to where they were required.

The second center of demand was the city of Rome, whose population had grown dramatically in the last century of the Republic from around 200,000 – already an impressive figure for a pre-industrial city – to about a million.[27] The expansion of Rome had been due entirely to its role as the focus of the political activity of the Roman elite, who competed with one another for prestige and popular support through public and private building, largesse, patronage, public entertainments, and conspicuous consumption. The establishment of the Principate brought changes in the nature of the competition but not its consequences: the elite now competed for prestige and imperial favor, but continued to spend, while the emperors sought to establish a monopoly on large-scale public euergetism, and

[23] Whittaker 1994: 60–97. [24] Fulford 1984: 135–6. [25] Whittaker 1994: 102.
[26] Breeze 1984; Pitts 1985; Drummond and Nelson 1994: 80. [27] Morley 1996: 33–54.

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spent still more lavishly. They continued to develop the city as a symbol and showpiece, magnifying the glory of the empire in general and individual emperors in particular through ever more spectacular public buildings, which were then advertised in their coinage.[28] These activities, especially the building projects, required an astonishing quantity of raw materials; some produced locally (brickworks in the immediate hinterland of the city), others transported hundreds of miles (marbles from Egypt and the Aegean, for example, not to mention thousands of tons of lead for aqueducts and bathhouses, thousands of slaves and animals, and a cornucopia of exotic foodstuffs, spices, and textiles).[29] These activities, especially the building projects, also employed a significant number of people and thus created a demand for all kinds of foodstuffs and raw materials; the task of supplying their needs gave employment to others, whose needs also needed to be supplied.[30]

Rome's demands for grain have been estimated at a minimum of 150,000 tonnes per year; its consumption of wine at perhaps 75 million liters per year, with a million liters of olive oil for lighting and 20 to 30 million liters for cooking and washing.[31] These demands could never be met from the city's immediate hinterland, which came instead to be dominated by the intensive and profitable cultivation of perishable foodstuffs for the urban market and by the leisure activities of the elite.[32] Rome drew in grain from Italy, Sardinia, Sicily, Africa, and Egypt; wine from Italy, Gaul, Spain, and the Aegean; olive oil from Italy, Spain, and Africa; other goods from every part of the known world. Ancient authors rhapsodized about the city's appetite:

> . . . merchandise of gold, and silver, and precious stone, and pearls, and fine linen, and purple, and silk, and scarlet . . . and wine, and oil, and fine flour, and wheat, and cattle, and sheep; and merchandise of horses and chariots and slaves; and souls of men.[33]

> Whatever the seasons make grow and whatever countries and rivers and lakes and arts of Hellenes and non-Hellenes produce are brought from every land and sea . . . Whatever is grown and made among people cannot fail to be here at all times and in abundance . . . Cargoes from India and, if you will, even from Arabia the Blest, one can see in such abundance as to surmise that in those lands the trees will have been stripped bare and that the inhabitants of those lands, if they need anything, must come here and beg for a share of their own.[34]

[28] Zanker 1988; Edwards 1993: 163–72; Purcell 1996: 782–811.

[29] Horden and Purcell 2000: 350; Fant 2001; D'Arms and Kopff 1980; Wiedemann 1992: 59–61.

[30] Brunt 1980; Whittaker 1993.

[31] Garnsey 1988: 191; Purcell 1985: 13–15; Mattingly 1988a: 33–4; 1988b: 159–61; generally, Pucci 1989. See also above, Chapter 19.

[32] Morley 1996: 83–107.

[33] Revelation 18.11–19.

[34] Aristid. *Or.* 26.11–12, 13; generally, Morley 1996: 1–4.

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Rome was the archetypal consumer city, the majority of its inhabitants employed directly or indirectly in the task of magnifying the glory of the Roman empire and its rulers, supported directly or indirectly from the revenues of the state and the produce of the landed estates of the elite. Its demand for goods was enormous, and it had the power and wealth to satisfy its needs and cravings. Part of these demands were met through state redistribution, but the *annona* did not cover all of Rome's grain requirements, let alone its demand for other goods.

The third center of demand was the urban population in the rest of the empire. It is generally agreed that there was an increase in urbanization under the Roman empire, in terms both of the establishment of new urban centers (whether founded deliberately, or developing out of other forms of settlement) and of an expansion of both population and infrastructure in many existing cities.[35] It is exceptionally difficult to estimate the size of the urban population at any date, but a rough order of magnitude might be 8–9 million out of a total population of 50–60 million. Perhaps 12 percent of the empire's population, therefore, lived in urban centers, with the greatest density in long-settled regions like Italy and Egypt. Not all of these people would have been involved in non-agricultural activities, but we might still estimate that approximately 10 percent of Roman subjects were dependent for their food and other resources on the agricultural labor of others and on the efficiency of systems of distribution.

Urbanization developed above all as a result of the decision of the elite to invest a significant portion of the surplus they controlled in centralization and the built environment. The city was a means of establishing and reinforcing political, ideological, and economic power.[36] It was the main venue for conspicuous consumption, the display of culture and newly acquired *Romanitas*; it was the arena for the competition between members of the elite for prestige, influence, and office that served at the same time to reinforce their collective dominance.[37] Incorporated into the Roman empire, the city gave access to higher orders of power; it became a node in networks of distribution and information, and served as a forum for mediation between local society and higher order powers, and as a stepping-stone for the ambitious, seeking to make their way to the great provincial capitals or to Rome itself.[38] The city became, or continued to be, the main location of elite expenditure; as in Rome, the demands created by their habits of consumption and their building projects gave employment to thousands of craftsmen and other workers, whose needs also had to be supplied.[39] The economic life of the cities was not of course wholly dominated by elite

[35] Hopkins 1978b; Rozman 1978–9; Jongman 1988a: 65–7, 108–12; Millett 1990: 65–126; Woolf 1997: 126–41; above, Chapter 3.

[36] Mann 1986: 1–28. [37] Patterson 1991; Woolf 1997: 124–6.

[38] Morley 1997; Purcell 2000: 423–32. [39] Hopkins 1978b.

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consumption; the demands of the peasantry, individually small but sizeable in aggregate, made a significant contribution to urban incomes, though it is likely that the concentration of craftsmen in urban centers rather than diffused through the countryside reflects the greater spending power of the elite.[40] Certain cities also prospered because of their role in, or fortunate location in relation to, the major supply routes to the army and the capital; Ostia and Puteoli are the most obvious examples, but there are plenty of other cities in Italy, Gaul, and Britain whose development owed something to their proximity to such routes.[41]

Most of these cities would have obtained most of their basic supplies from their immediate localities, except when a poor harvest forced them to look for supplies elsewhere – which, as Hopkins has argued, implies that a considerable volume of grain was traded or otherwise redistributed every year, given the unpredictability of the Mediterranean climate.[42] Even in a normal year, however, the fact that the population was concentrated in a single location created the need for investment in the means for distributing goods between city and countryside; cities are always more costly to maintain than a dispersed rural population. In addition, there was always demand for goods that could not be produced locally, while the great cities like Alexandria and Antioch (and perhaps even the larger regional centers like Trier, Lyon, and Mediolanum) had to import food and other materials from a wide area on a regular basis. In earlier periods, trading activities were hampered by the unpredictability of demand and the costs of obtaining reliable information, while urban populations might suffer from the fact that the market could take so long to respond to a food shortage; a situation reflected in Cicero's discussion of whether a merchant should reveal that more grain ships were en route to a famine-struck Rhodes, or take advantage of the prevailing high prices.[43] Under the Roman empire, the possibility of such windfalls remained; but merchants might now choose instead the relative security of following a regular route to one of the great cities, perhaps specializing in particular products, with a more or less guaranteed market for their goods and the opportunity of building up connections and regular customers, rather than tramping from port to port with a mixed cargo in search of demand.

Unlike Rome and the frontiers, most cities both sent and received goods; some produce would be exported from the locality, whether just in times of glut or on a more regular basis (to Rome, or the armies, or a larger urban center). That is not to say that payments necessarily balanced; the surplus production of the region might simply be extracted, by the state or by an absentee landlord, to be spent elsewhere. Involvement in the

[40] Cf. de Ligt 1990; 1991; 1993a; 1993b. [41] Morley 1996: 176–8; Woolf 1997: 133.
[42] Hopkins 1983a. [43] Cic. *Off.* 3.50.

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supply of larger centers of demand could be profitable, but it could equally be a disadvantage in times of local food crisis if the pull of more distant markets led to a shortfall for local consumers – just as urban demands might adversely affect the peasantry.[44] What must be stressed is that no part of the Roman empire was ever an isolated, self-sufficient cell; demand for goods that could not be produced locally, or not in sufficient quantity, and hence the necessity of systems of distribution, existed at all levels of the urban hierarchy.

II THE MEANS OF DISTRIBUTION

Goods were distributed through the Roman empire by a variety of means, determined to a great extent by the identity of the ultimate consumer (and how concerned the state or the elite were to ensure that they were reliably supplied) but also by the nature of the good and by the identity of the original producer. Some goods were exchanged directly between producers and consumers in the local marketplace; some never entered the market at all, but were simply moved from their place of production to the place where they were to be consumed (for example, the state's imports of grain and marble into Rome, and the elite's redistribution of goods between different estates and from their estates to their urban residences).[45] Other goods passed through the hands of one or more intermediaries, merchants, and shopkeepers. One of the key debates on trade in antiquity has focused on the relative importance, in terms of volume and value, of this latter category.[46] The theory that the movement of goods in antiquity was dominated by state and elite redistribution, and hence that traders were marginal in wealth, status, and economic importance, has been offered as both a symptom and an explanation of the limited economic development of the ancient world, in comparison with the conditions that nurtured the birth of capitalism and the modern European economy.

Archaeological evidence has proved of limited use in this debate; it can show that goods were being moved, but rarely by whom, or whether the movement represents trade or redistribution.[47] In a number of cases the pattern of distribution of particular forms, such as the Dressel 20 oil amphoras from Baetica, corresponds so closely to army supply routes and areas of military activity that it is almost impossible to interpret this as the result of free market trade – which is not to say that private merchants were not involved, merely that they were working under contract to the army.[48] This pattern

[44] Garnsey 1988: 29, 61; Gal. VI 749ff.; cf. Madeley 2000.
[45] Whittaker 1985: 58; Rathbone 1991: 265–78.
[46] Finley 1985: 59–60, 129–39, 158–63; Hopkins 1983b.
[47] Peacock and Williams 1986: 59–63; Tchernia 1989; Whittaker 1989a.
[48] Remesal 1986; 1997; Middleton 1983.

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ties in with the distribution of inscriptions commemorating *negotiatores* in Gaul, the majority of which are found on the Rhône-Rhine axis.[49] Stamps on amphoras may indicate the name of the producer of the contents or the owner of the workshop that made the container (who might of course be the same person); the name on the stopper might be that of the producer or the merchant; *tituli picti*, where they appear, often include the name of the *navicularius*, the shipper.[50] The fact that in many cases there is little or no correspondence between the names appearing on different parts of the amphora implies a separation and specialization of roles – but still does not rule out redistribution, if the *navicularius* was simply a ship owner rather than combining that activity with trade on his own account.

The previous section emphasized the ways in which state and elite spending created centers of demand that depended upon and encouraged the development of systems of distribution; this section will argue that most of the actual task of distribution was entrusted to private individuals. For the sake of argument, I will distinguish between three stages of distribution: the initial "mobilization" of goods from their producers, their transport to the place of consumption, and their distribution to the consumer. In some cases, of course, the same individuals were involved in all three stages, especially when the producer consumed his own produce; in other cases the process was more elaborate and involved a greater number of intermediaries.

The state could acquire some of the goods it required for Rome and the army directly at the point of production, from its own estates and possessions (marble quarries, mines), by compulsory requisition, and by collecting taxes in kind. The extent to which taxes were collected in cash rather than kind is hotly debated: a crucial point in Hopkins' argument that Roman tax demands, levied on the "inner" provinces and spent on the frontiers and at Rome, forced the subjects of the empire to produce for the market and so helped to promote economic development and an expansion of trade.[51] If the bulk of supplies were requisitioned in kind, there would be little incentive for provincials to alter their farming practices, and little scope for traders; if peasant producers had to sell produce to obtain cash to pay taxes, they might be tempted to try to increase their marketable surplus through more intensive labor inputs or the cultivation of different crops. There is evidence for both systems in different areas of the empire, but with some indication that money taxes had become predominant in most regions by the second century AD. However, it must be noted that the amount of grain collected as tax in Egypt alone far exceeded the amount which the state required for its distributions to the privileged recipients of

49 Middleton 1979. 50 Paterson 1982; Peacock and Williams 1986: 9–14.
51 Hopkins 1980; Duncan-Jones 1990: 30–47, 197; Hopkins 1995/6.

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the corn dole in Rome and for feeding the entire army.[52] In other words, the state did not simply consume all the goods it had collected as tax in kind; significant quantities must have been sold, mainly in the region of production (though there is a little evidence that some state grain may also have been sold in Rome) to local consumers or merchants.[53]

Having disposed of what was felt to be surplus, the state was left with various goods (marble, metals, grain, olive oil from the second century) that needed to be shipped from their place of production to Rome or to the frontiers. It obtained the rest of its requirements through the market or by employing contractors.[54] There is little indication of how far any calculation was made on the relative merits of redistribution and trade as means of obtaining army supplies. Certainly there is no evidence that the cost of transport was a factor.[55] The employment of *publicani* under the Republic, followed by the gradual extension of the *annona* in the later Principate, might be interpreted as showing that the state was happy to rely on traders and contractors until they proved unable to supply its needs reliably, whereupon it turned increasingly to requisition and redistribution of an ever wider range of goods.

Elite landowners were in a similar position to the state, looking to meet their needs by making the best use of the produce of their directly managed estates and of any rents collected in kind. Some of these goods were consumed by the owner and his dependants; the bulk was sold, to judge from the advice of the Roman agronomists on estate management, to obtain cash to buy goods and distribute largesse in the cities.[56] Landowners might market their produce themselves or through their dependants, and some certainly owned ships for this purpose.[57] They could also sell directly to merchants at the farm gate, choosing to make a smaller but more reliable profit by passing on the costs and risks of transporting and marketing the produce. The evidence of Cato's agricultural treatise and the legal sources shows that it was common practice to sell crops before they were harvested; the landowners passed on even the risks associated with an unreliable climate to the traders, preferring an assured income to the possibility of maximizing profits, as well as maintaining their social distance from the sordid activity of market trade.[58] The fact that such practices were common suggests that there was fierce competition between merchants for the produce of estates; the demand for goods like wine and oil in the cities, especially the city of Rome, was sufficiently large and dependable to offset the costs and risks involved for the traders, even on such unfavorable terms.

Such large estates aimed at producing a large marketable surplus. The majority of farmers disposed of only a small portion of their produce,

[52] Hopkins 1995/6: 55–6. [53] Garnsey 1988: 238–9. [54] Whittaker 1994: 106–10.
[55] Whittaker 1994: 100. [56] De Ligt 1993a: 163–5; Morley 1996: 160–1.
[57] Cf. Petron. *Sat.* 191; D'Arms 1981: 31–9; Aubert 1994. [58] Frier 1983a; Morley 2000: 217–19.

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to obtain cash to pay taxes or rents and to obtain goods that they could not produce themselves.[59] Comparative evidence suggests that merchants might prefer not to invest time and effort collecting together such small surpluses from different farms; instead, the farmers shouldered the costs of transport and sold their produce in the local urban center, above all through the periodic markets, the *nundinae*.[60] They certainly made an important contribution to the food supplies of the local city; in one case in Italy, the municipal authorities apparently opposed the establishment of an estate market because of their concern for the likely effect on urban consumers.[61] Peasants would then sell directly to urban consumers or to merchants, some of whom might "bulk" their surpluses for export to more distant markets; a study of the development of the *nundinae* in Campania has suggested that they came to form a dendritic network, siphoning out produce for export to Rome as well as performing their more traditional functions of local exchange between country and city.[62] It is impossible to quantify the contribution which peasant farmers may have made to the supply of Rome and the other great centers of demand; it seems likely that the bulk of such supplies were purchased from the market-oriented estates of the elite, who invested a certain amount of time and resources in establishing personal relationships (and building up ties of obligation and dependence) with the traders.[63]

Finally, a few brief comments on the mobilization of goods from outside the empire. Northern regions produced furs, amber, leather, and above all slaves once conquest ceased to be a viable source of supply: Roman pottery, glass, metalwork, and coins are found in significant quantities outside the empire – though some of these were probably gifts or the spoils of raiding parties – while exchange might take place anywhere within the "buffer zone" to either side of the notional frontier.[64] Roman traders regularly headed east to Arabia and India to obtain spices, incense, perfumes, and other exotic items in exchange for various Roman goods (the *Periplus Maris Erythraei*, a guide to the route, includes information about what cargoes might be sold at different ports) and coins and bullion.[65] A temple of Augustus at Muziris in southern India points to the presence of some sort of permanent trading outpost, and there may have been another on the east coast. The goods were mainly imported in unprocessed form, and turned into usable products within the empire; rhetorical complaints that the "luxury trade" was draining wealth from the empire were probably based on the price of

[59] De Ligt 1990: 36–9, 47–9; 1993a: 136–42; Duncan-Jones 1990: 187–98.
[60] De Ligt 1993a: 106–54. [61] Pliny *Ep*. 5.4, 5.13; de Ligt 1993b.
[62] Morley 1996: 168–74; cf. Ziccardi 2000. [63] Plin. *Ep*. 8.2.6–7.
[64] Whittaker 1983b; 1994: 113–30; below, Chapter 27. On the slave trade, see Harris 1980b; 1999; Scheidel 1997; 2005a; forthcoming, c.
[65] Casson 1989; Young 2001.

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the goods at Rome, whereas in fact much of the profits remained in the hands of Roman merchants and perfumiers, and of course the financiers who invested in such trading ventures.[66]

In general, the mobilization of produce reflected the interests of the powerful. The state commanded enormous resources scattered over a wide area; it retained control of certain essential goods for redistribution, and converted the rest into cash with which to buy other goods and employ contractors. The landowning elite were more concerned – obsessed, even – with making a regular profit while minimizing their costs, and so tended to pass on the costs and risks of transport and marketing to merchants. The latter held the inferior position in such exchanges, but could force peasant farmers to assume the costs of bringing their produce to market. For various reasons, peasants might be at a disadvantage in the market – in particular the fact that they might lack sufficient storage facilities and so would have to sell their surplus immediately, regardless of the state of the market – but it could still represent an opportunity for them as much as an unavoidable imperative.[67]

The second stage of distribution is transport. The picture here is of a great variety of different practices. As noted above, peasants generally moved their own produce. The elite might do the same, whether for redistribution or marketing purposes. They owned wagons, mules, and ships, and some invested resources (not necessarily their own: one magistrate was criticized for using state funds to build a quay near his own estate) in improving transport facilities near their landholdings.[68] Such developments might equally be intended to encourage merchants to visit the estate to buy produce. Some merchants owned their own ships, as can be seen when the same name appears on the anchor and the lids of the amphoras in the Dramont A shipwreck; the roles of *negotiator*, *mercator* and *navicularius* could be combined, as seen in inscriptions from ports like Ostia.[69] Others hired contractors for overland transport and put their goods on board ships owned and managed by others, either hiring the whole vessel and its crew or contracting for the transport of their goods alongside those of other merchants.[70] A papyrus from the Fayyum, *P. Bingen* 77, is a fragment of a mid-second century register of the ships arriving at an Egyptian port (probably Alexandria): of nine cargoes listed, four belonged to the ship owner and five to someone else who had contracted his services. Inscriptions show that some ship owners concentrated on particular routes, just as many merchants specialized in particular goods or goods from particular regions; others, perhaps the majority but perhaps also less likely

[66] Young 2001: 23; e.g., *P.Vinob.* G 40822.
[67] On storage, de Neeve 1984b: 29–35; 1984a: 31–62, 130–42.
[68] *Dig.* 33.7.12.1; Livy 40.51.2; Potter 1979: 108.
[69] Paterson 1998: 160–1. [70] Martin 2002; Rathbone 2003.

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to have become prosperous enough to afford epigraphic commemoration, continued the tradition of *cabotage* and short-haul tramping.[71]

The same papyrus offers some evidence of the size of Roman ships: of the eight ships for which the tonnage is listed, one was a local ship of 30 tonnes, five were seagoing vessels of 45 to 75 tonnes, one was of 210 tonnes and one, arrived from Ostia and so probably a grain transport, was of 375 tonnes.[72] Archaeological evidence and the requirements for ship owners contracted to the Roman supply (one ship of at least 330 tonnes or several of at least 65 tonnes) supports the idea that the majority of ships plying the Mediterranean were of medium size, mostly around 60 to 80 tonnes, not greatly different from those of previous centuries.[73] On routes which serviced large, dependable markets, however, especially the city of Rome, much larger vessels of 200 to 400 tonnes became relatively common. Ancient maritime technology was capable of constructing thousand-tonne monsters for special tasks (such as transporting an obelisk from Egypt), but these were clearly not economical for regular traffic.[74] The patchy ancient evidence for construction costs suggests that even a large ship cost no more than a modest agricultural estate in Italy, and a medium ship only HS 57,000 to 68,000, much less than the property qualification for municipal office; the typical shipowner was a man of only modest wealth and status, who might have sold a share in an estate or (if a slave or freedman) been set up in business by his master or patron.[75] Those who owned and managed mules or camel trains were doubtless of the same order of society, making a reasonable living but liable for significant costs if things went wrong: in Roman law, the contractor was held responsible if the cargo was lost through his fault, and there was no form of insurance in case of shipwreck.[76]

As noted above, landowners and merchants might own their own means of transport or rely on contractors. The one economic player that invariably relied on others to carry its produce was the state; there is no evidence of any state merchant fleet at any date. Papyri and other documentary evidence attest to the complexities of transporting stone from Mons Claudianus in Egypt, requisitioning camels and ships, and to the role of both requisition and civilian transport contractors in the supply of the army in Egypt and Britain.[77] Equally copious evidence covers the transport of the *annona* to Rome, and the range of incentives (privileges of citizenship, exemption from *munera* in the provinces) that were offered to encourage ship owners to enter into contracts with the state for the transport of its produce and to promote the building of new ships for the service of the emperor.[78] The attraction of some of these incentives is made clear by the laws issued to

[71] Harris 2000: 730; *CIL* XIV 409. [72] Rathbone 2003.
[73] Parker 1990: 341; *Dig.* 50.6.6.3, 50.5.3. [74] Plin. *HN* 16.201–2.
[75] Rathbone 2003; cf. Hopkins 1983a. [76] E.g. *Dig.* 14.2.6.
[77] Adams 2001; Mitchell 1976; *Tab. Vindol.* II 192, 218; *AE* 1956: 124. [78] Sirks 1991.

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prevent people trying to claim them without having a sufficient portion of their fortune invested in shipping.[79]

This had enormous significance for all kinds of distribution in the Roman empire. The state effectively subsidized the cost and assumed part of the risk of transporting goods to many regions; there is no evidence that contractors were paid below market rates, and they could make additional profits by transporting private goods alongside their official cargoes (and occasionally attempting to claim tax exemption on such goods as well as on state supplies).[80] State demands for transport encouraged the building of more and larger ships, which could also be used for private enterprise.[81] The emperors also invested in the infrastructure, above all in developing the port facilities at the mouth of the Tiber.[82] All this created a more hospitable environment for the development of trade in the Mediterranean – but it should not be forgotten that the state's initial preference for contracting transport rather than building a merchant fleet presupposed the existence of suitable ships and navigational experience, if only those of the short-haul *caboteurs*.[83]

Finally, there came the distribution of goods to consumers. The smaller the city, the more likely it was that this process was simple and direct, transactions taking place in the market or in the specialized *macellum*.[84] Peasants continued to obtain goods above all through periodic markets, held in the local center or, on some large estates, set up locally by the landowner.[85] In a city like Rome the process could involve a succession of wholesalers (in areas like the Forum Vinarium), retailers, millers, and tavern owners, to say nothing of the complexities of the distribution and processing of *annona* grain.[86] Every additional stage involved extra costs; some could be passed on to the consumer, others would eat into the profits of the traders (note the Hadrianic law seeking to control fish prices in Attica by limiting the number of intermediate traders, to put an end to "shameful profit-seeking").[87] One explanation for the relatively low status of most traders in antiquity might be that the process of distribution was too fragmented, with too many intermediaries taking a share of the profits. The group which was involved in every stage of the process, profiting from production, trade, and the leasing of commercial properties, was the traditional landowning elite.[88] However, we should be wary of judging Roman distribution in terms of the absence of merchant princes and trading companies; for the high empire, the existing structures were clearly adequate for the purpose of keeping the army and cities regularly supplied. It is notable that the

79 *Dig.* 50.6.6.8; Sirks 1991: 60–1. 80 *Dig.* 39.4.4.1; Mitchell 1976.
81 Casson 1995: 171–2; Houston 1988. 82 Meiggs 1960; Rickman 1991.
83 Paterson 1998: 157. 84 De Ruyt 1983; Frayn 1993: 12–55. 85 De Ligt 1993b.
86 Van Berchem 1939; Rickman 1971; Kleberg 1957; La Torre 1988.
87 *IG* II^2.1103; de Ligt 1993a: 214.
88 On elite ownership of *tabernae*, Garnsey 1976 and Wallace-Hadrill 1991.

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state was generally content to ensure Rome's supply through incentives to merchants and ship owners, rather than through the punitive regulation of traders, retailers, and millers that characterized many mediaeval and early modern cities with similar concerns about placating the hungry masses.[89]

III INSTITUTIONS

The same can be said of the institutional structures that supported distribution: the Romans lacked certain practices (limited companies, for example, and bills of exchange) that have sometimes been identified as prerequisites for the economic development of early modern Europe, but it is not clear that they lacked the commercial structures that they actually needed.[90] The money supply was more than adequate, supporting all levels of transactions: bronze and silver coinage circulated widely at regional level (and the expansion of the volume of silver coinage in the early empire suggests that more surplus production was becoming monetized), while the development of gold coinage and various forms of paper transactions (the transfer of debts, for example) made it easier to move significant sums of money between regions.[91] The evidence is inconclusive as to whether the state ever managed the money supply with the economy in mind, but whatever its motives the production of coinage certainly oiled the wheels of distribution.[92]

As far as the financing of trading ventures was concerned, the basic form of maritime loans had been established back in the fourth century BC.[93] A passage in the *Digest* provides evidence of development in this field during the Roman period. Money was lent to finance a voyage under the usual terms of *pecunia traiecticia* (the lender being liable in case of shipwreck, but therefore charging a much higher rate of interest), provided that the venture was completed within the "safe" sailing season; otherwise the borrower was liable to repay the whole loan and any expenses, regardless of whether the ship was wrecked.[94] It is impossible to say how common such an arrangement may have been, but its clear purpose is to reduce the risks involved for lenders by combining different sorts of loans in a single contract; such safeguards might have encouraged more people to become involved in financing trade as a profitable and not too risky investment.[95] Others may have followed Cato's example in lending money to *societates* of traders rather than risking all on a single venture.[96]

[89] Cf. Ringrose 1983; Kaplan 1984. [90] Harris 2000: 735, *contra* Finley 1985: 141.
[91] Duncan-Jones 1990: 30–47; 1994: 168–70; Howgego 1992; 1994; Hopkins 1995/6: 61–2.
[92] Lo Cascio 1981 and Chapter 23; Howgego 1992: 8–16.
[93] Andreau 1999; Sirks 2002a. [94] *Dig.* 45.1.122.1; Sirks 2002a.
[95] Cf. the notorious risk-aversion of many Roman texts; Cato, *Agr.* 1.1; Kehoe 1997.
[96] Plut. *Cat. Mai.* 21.6; Rathbone 2003.

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The Murecine tablets from Pompeii show that some of the money was advanced by slaves or freedmen of the imperial household, and other members of the senatorial elite must similarly have been involved in lending money through intermediaries (though of course not every freedman was working on behalf of a patron).[97] There is little evidence for the existence of "merchant financiers" both operating and financing trade (the Sulpicii of Puteoli, who appear on the Murecine tablets, may be the exception). The financier in the Muziris papyrus, which records a maritime loan connected with a cargo from India valued at nearly seven million sesterces, closely monitored the enterprise through his agents but still preferred to leave the business to an independent merchant.[98] The vast sums of money that financed trade – ships were relatively affordable, but most cargoes were purchased using loans – remained largely in the hands of the landowning elite. Merchants regularly combined forces for particular ventures, but there is little sign of ongoing investment in commercial enterprises, which seem to have lasted at best for a few decades.[99]

There are more signs of significant development in the field of law.[100] The Roman state had long enforced standard weights and measures and played a part in settling disagreements in the marketplace, and the jurists developed increasingly elaborate and sophisticated guidelines to deal with the intricacies of exchange and contract, above all in the sale of wine.[101] Such measures might play a part in encouraging exchange through lowering transaction costs, as the state assumed the costs of policing and enforcing the contract. The jurists showed considerable ingenuity in adapting the precepts of Roman law to the sorts of problems that arose in the course of economic activity. It has been suggested that such regulations were developed with the intention of stimulating trade; but even if they are seen instead as reactive rather than proactive, as responses to the kinds of cases which magistrates had to deal with, this does imply that transactions were becoming more frequent and complex.[102] Of course, the elaboration of laws to cover every permutation of events created a problem of uneven access to specialist legal knowledge and associated costs; the compilers of Justinian's *Digest* themselves complained that earlier generations had rarely made use of the whole range of laws, either through lack of reference books or through ignorance.[103] As ever, we have evidence only for how the law was intended to work, not for its results; it is likely that extra-legal measures, such as traditional religious oaths and attempts at developing more personalized relationships between buyer and seller (as Pliny attempted to do in

[97] Andreau 1999: 71–9, 9–29; Crawford 1980; Casson 1989; Garnsey 1981. [98] *SB* XVIII 13167.
[99] Rougé 1966: 423–35; Andreau 1999: 50–7; Harris 2000: 734. [100] Johnston 1999: 77–111.
[101] Frier 1983a; Frayn 1993: 117–32. [102] Sirks 2002a: 136–7.
[103] See Chapter 5. *Dig. De Conf.* 17.

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his scheme for compensating wine merchants who had lost money in their dealings with him), were equally important in promoting exchange.[104]

IV PATTERNS OF CHANGE

For the most part, the dynamics of distribution in the early Roman empire followed patterns which had become established under the Republic: the growth of the city of Rome, the expansion and defense of the empire, and the gradual urbanization of the provinces were made possible by and created the necessity for efficient distribution of different goods, underwritten by the purchasing power of state and elite. The rule of the emperors brought the benefits of peace, the unification of the Mediterranean and the development of the legal framework relating to commercial transactions, as well as new incentives to invest in shipping to transport goods on behalf of the state. In reducing some of the risks and subsidizing some of the costs associated with inter-regional distribution, the state had only its own interests in view, but its actions nevertheless created conditions conducive to the further development of market trade. The archaeological evidence – the number of shipwrecks, the sheer volume of goods distributed across the empire, the growth in the money supply – suggests that this period was the high water mark of commercial as well as state distribution.

However, the evidence also raises the question of why this growth was in the end so limited.[105] The numbers of shipwrecks from the period AD 1–200 are only slightly higher than those from the late Republic, and thereafter they decline rapidly. The fact that, as the distribution of amphoras and pottery shows, more goods were coming from Africa during this latter period, a region which is clearly under-represented in the shipwreck evidence, suggests only that the decline may have been less precipitous than it first appears.[106] There is no evidence of the sort of sustained year-on-year expansion of economic activity which is seen in the European economy from the early modern period. The economy of the Principate experienced some measure of growth (and one could argue that the establishment of Roman hegemony in the Mediterranean might have reduced the incidence of shipwreck in relation to the number of voyages and the volume of shipping), but the great expansion of activity had already taken place under the Republic.

This reflects above all the relative environmental uniformity of the Mediterranean, the absence of technological developments that might give a region a comparative advantage in the production of a particular good, and the limits on the expansion of demand. The stimulus of military and

[104] Rauh 1993: 129–50; Plin. *Ep*. 8.2.6–7; cf. Muldrew 1998.
[105] Saller 2002. [106] On African produce, Carandini 1983b.

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urban demand in due course promoted the development of more localized production; goods which had of necessity been moved long distances in previous centuries could now be obtained more cheaply from nearby, and there were no alternative markets for the goods that had previously been exported other than local consumers. The most striking example is the development of wine production in Gaul, so that the region ceased to import Italian amphoras and began to export its own products to Rome (which could happily absorb them in addition to Italian supplies).[107] Similar patterns of local production replacing imports (and sometimes being exported in turn) can be seen in the pottery evidence from Gaul and Britain (where the disappearance of imported fine wares is taken as evidence of local self-sufficiency in grain production).[108] The frontiers became increasingly (if never completely) self-sufficient by the third century, and so one of the key drivers of inter-regional distribution declined in importance.[109] The cities of the empire could also rely on local production for a wider range of goods. The city of Rome continued to draw in goods from a vast area, but it ceased to expand, perhaps because the infrastructure (in particular the bottleneck of the Tiber) could not sustain a larger population.[110]

The patterns of distribution and the structures of inter-regional exchange in the Roman empire were not autonomous and self-supporting; they reflected the needs of the state and the elite. The emperors were concerned with supplying the army and the city of Rome, not with maintaining Italian agriculture and industry.[111] When it became clear that the incentives offered to ship owners to transport state goods were failing to attract enough contractors to ensure the reliable supply of Rome – something which may itself reflect the declining profitability of inter-regional trade – the state turned to compulsion, making the service of the *annona* a hereditary obligation by the fourth century.[112] More goods were included in the distributions, olive oil in the second century and wine and pork in the third, reflecting lack of faith in the reliability of market-driven supplies to the city as much as the emperors' need for popular support. Diocletian's Price Edict of the late third century, and the increasing reliance on requisitions in kind from the fourth century onwards, reveal a similar lack of faith that merchants can be trusted to further the state's interests.[113] When a single capital city became a less effective means of maintaining imperial power, the emperors had little hesitation in redirecting their expenditure to other centers like Arles, Milan, and Trier – each of which became, for a time, a significant center of demand, but far smaller than the concentrated demands of Rome

[107] Panella 1970; 1973; Hesnard 1980; Tchernia 1983; 1989; Carandini 1989b; Morley 1996: 135–7.
[108] Woolf 1997: 193–202; Fulford 1984.
[109] Wickham 1988: 191–2; Whittaker 1994: 103–4. [110] Rickman 1991.
[111] Cf. Tchernia 1986: 221–53 on Domitian's edict on vine-planting in the provinces.
[112] Sirks 1991; *Cod. Theod.* 13.5–7. [113] Williams 1985: 126–39.

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and one that could be more easily satisfied from local sources. Similarly, as civic duty and benefactions became a less effective route to power in the later empire, the elite redirected their resources to their landed estates and to legacies to the church, regardless of the consequences for the urban centers.[114]

Effective distribution, whether inter-regional or local, organized through market incentives or directed through requisition and compulsion, underpinned the power of Rome and its ruling elite, and ensured the stability of the empire. It may also to some extent have undermined it. The elite profited greatly from the state's investment in maintaining the integrity and connectivity of the empire, through their involvement in both production and distribution, so that by the late empire elite power was restricting the ability of the state to raise taxes sufficiently to maintain that integrity and connectivity.[115] The economy of the Roman empire was integrated only to a limited degree. Goods moved between almost every part of the system, but the flows were clearly uneven; whereas in a more fully integrated "world economy" changes in one part of the system have an effect on every other part, in the Roman "world empire" events at local and even regional level might have little effect but changes in Rome or at the frontiers could shake the entire structure.[116] The degree of integration, of the movement of goods, people, and ideas, was sufficient, however, to promote the rapid spread of diseases (such as the Antonine plague) and potentially subversive ideas (such as Christianity). Connectivity had (and has) costs as well as benefits.

114 Barnish 1989; Rich 1992. 115 MacMullen 1988: 122–97. 116 Woolf 1990; 1992.

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