

Land transport in Roman Italy: costs, practice and the economy¹

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Introduction

Reading the work of ancient historians on the Roman economy, we are presented with a paradoxical situation. All historians recognise that the Roman state was involved in the development of an extensive transport network of roads from the fourth century BC. The purpose of these roads is seen by many historians to have been political and militaristic, and even later as having no significant economic impact (Finley 1973, 126–7). The reason for this explanation is given in terms of the cost of transport by land in comparison to the far cheaper forms of transport by river or sea (Finley 1973, 126–7; Duncan-Jones 1974, 1; Garnsey and Saller 1987, 44, 90). This paradoxical situation of high investment in the transport infrastructure and seemingly high cost of land

¹ The theoretical framework for this chapter is drawn from recent geographical thinking. In particular, the work of H. Lefebvre (1991), M. Castells (1972) and D. Harvey (1973) and (1990) has been particularly influential in the development of ideas and concepts that underlie the argument of the chapter. There is not space to discuss these fully here, but a full discussion will appear in due course in R. Laurence (forthcoming), *The City and the Road: Land Transport in Roman Italy*. I would like to thank Helen Parkins for her helpful comments on a draft of this chapter and suggestions drawn from her unpublished Ph.D. thesis. Of course, any errors and misconceptions that remain are my own responsibility.

transportation relative to sea and river transport costs has led many historians to view Roman Italy and the Roman Mediterranean generally as dependent on the sea as the primary form of transportation for most agricultural produce. This generally held view of Roman economic practice is repeated at conferences and seminars with an almost doctrinal regularity, in spite of criticism (notably by Hopkins 1978, 107; and Isager and Skydsgaard 1992, 106). However, no overall reassessment of the role of land transport in the economy has been made and it is with this end in mind that this chapter has been written.

The assertion that land transport was prohibitively expensive can be traced back from very recent scholarship through Finley's *Ancient Economy* (1973) and Jones's *Later Roman Empire* (1964) to an article by Yeo published some fifty years ago entitled 'Land and sea transportation in imperial Italy'. This article set up the nature of the discussion of land transport for the next fifty years – the discussion sought to compare the relative costs of land and sea transport. The basis of Yeo's analysis will be examined to investigate what the evidence suggests about the economics of transportation. In fact, I will argue that Yeo's data suggest, instead, that there was little difference in terms of transport costs in Roman Italy from other better documented societies that had undertaken road improvement schemes with similar gains in transport efficiency. Further, later in the chapter I will suggest in terms of economic practice, documented in the agricultural writers, that Roman Italy from the third century BC was developing a system of agricultural production that could only be maintained by the development of a road system for the marketing of produce, and that owners of villas actively improved the road system to facilitate the transport of produce. Finally, the chapter sets out to understand these developments in the context of change in the space economy in Roman Italy.

Transport costs: figures and calculations

Yeo (1946) presented an account of the relative costs of land and sea transport drawing on the ancient sources, primarily Cato's *De Agricultura* (22. 3) and Diocletian's Price Edict. From these sources he attempted to establish the actual costs of transport for

imperial Italy. His analysis was detailed and made frequent reference to other costs in Italy by way of comparison. However, at times, he misses the significance of some of the evidence and certainly decontextualises the evidence to create a standard cost for the transportation of items in relation to cost at the point of purchase. There would seem also to be a number of errors in his calculations that cause the transport costs to escalate. Therefore, at this point, it is worth reviewing the figures again.

To deal with Cato's evidence first, he discusses the cost of buying and transporting an olive-oil mill overland from Suessa a mere 25 miles away and, by comparison, a similar mill from Pompeii some 75 miles distant. He tells us that the mill and 50 pounds of oil purchased at Suessa would cost 425 sesterces, that there was an additional cost of the bar for the press of 72 sesterces, and there would also be a cost of 60 sesterces for assembly. The transport cost for this short journey of 25 miles was estimated by Cato as six days' wages for six men using oxen and carts from his estate, which would amount to a cost of 72 sesterces. Therefore, the total cost of the mill and its assembly would have been 557 sesterces and the cost of transport would have been 72 sesterces. Cato also gives another figure for the cost of a similar mill bought at Pompeii, for which he would have paid 384 sesterces for the mill and 280 sesterces for its transport to his farm and a further charge of 60 sesterces for its assembly.

Cato's information on the cost of transport of an oil mill provides us with two working examples of the proportion of transportation costs from two places over different distances. The transport cost over the 25 miles from Suessa was equivalent to 11 per cent of the total cost of the mill (Yeo 1946, 221–2 gives transport cost as 17 per cent of total cost), whereas the transport cost of the mill from Pompeii, over 75 miles, was more than 73 per cent of the total cost. Yeo (1946, 224) converts these costs for the oil mill into cost equivalents for wheat and other staple goods to create a standard cost for all transport over land. In doing so, he decontextualises the original prices to refer to a different product and universalises the specific data into a general rule of thumb. However, this misses the point of what Cato was attempting to illustrate by giving the two examples. He wanted to compare the different costs of buying a mill for his estate. Interestingly, he considers buying a mill from one local location 25

miles away and another location at some distance, 75 miles away. In terms of total cost, the mill from Suessa was 629 sesterces, whereas that from Pompeii cost 724 sesterces. To buy the mill from Suessa would have made a saving of 95 sesterces. This would mean that the cost of the mill and its transport from Pompeii was only 15 per cent more expensive than the cost of a mill and its transport from a much closer location. This relatively small margin of cost demonstrates a number of economic factors that would have been present in the Roman empire that have been ignored or passed over by historians writing since Yeo (1946). First, prices for goods varied across Italy, and goods from further afield could compete with those produced at a closer location. Moreover, the journey from Pompeii to Cato's farm was three times the journey from Suessa to the farm. However, it must be stressed that the overall cost of the mill from Pompeii was only 15 per cent more than that of the mill from Suessa even though its transport costs were nearly four times greater. Clearly, the costs of mills would vary according to the local geology and whether the mill had been transported prior to its sale. Pompeii was ideally located for such a trade, since it had direct access to suitable stone for mill production (on the petrology of mills in Italy see Peacock 1980, 1986, 1989; Williams-Thorpe 1988).

Yeo (1946) also makes a number of deductions about the speed of transport from Cato's evidence. Cato calculates the transport cost from Suessa based on transport by oxen accompanied by six men. He says that it would have taken them six days to transport the mill a mere 25 miles. It should be pointed out initially that the mill was an unusual load, which would have required exceptional efforts. Yeo stresses that the time taken (six days) was calculated for a round trip, because the men use Cato's own carts for the transport of the mill. Therefore, it should be assumed that the total distance was 50 miles and that it took six days to make this journey. Yeo suggests rightly that the average speed was about 8 miles per day. This is true of this example, but Yeo extends this speed to all land transport. In doing so, he backs up his argument with reference to a journey from Brundisium to Rome recorded by Ovid (*Pont.* 4. 5. 8) as taking a total of ten days, which he suggests must have been done at a speed of 6 miles per day. Here, Yeo has made a mistake in his calculations. The journey by his reckoning would have been a total distance of 60 miles, but the

distance from Brundisium to Rome was 360 miles. Therefore this error causes us to underestimate the speed of transport by six times – Ovid would have covered about 36 miles per day to travel from Brundisium to Rome on the Via Appia over a distance of 360 miles. The speed of 36 miles per day would not appear to be that exceptional (Pliny, *HN*, 3. 100; Pliny, *Ep.* 2. 17), but we might wish to take the time allowed for journeys to appear in court of 20 miles per day as a standard speed whether by road or track (*Dig.* 11. 1. 1). The adjustment to Yeo's calculations places a control upon the figures from Cato for the transport of a mill. The transport of the mill was exceptional: it took a particularly long time because oxen were used for the transport of particularly heavy loads (Yeo suggests it weighed 3,000 pounds) and a large input of human labour (six men). The use of oxen is significant, because they travel at 2 miles per hour – about half the speed of a mule (Hyland 1990, 261. The mule would appear to have been the animal most widely used for pulling carts in the Roman empire, see Mitchell 1976; Adams 1993, 1995). Further, we do not know if the transport of the mill was over a road surface or not. This would have made a significant difference to the speed at which the item could be moved. Therefore, Cato's figures need to be regarded for what they are – exceptional in every way and not to be used to estimate a cost for land transport generally.

To turn to the figures for the cost of land transport taken from Diocletian's Price Edict (sections 17 and 35; Lauffer 1971; Giacchero 1974; Crawford and Reynolds 1979). Duncan-Jones (1974, 366–9) summarises the calculation for the cost of land transport from this source. Although these figures have been subject to revision with the discovery of further fragments of the Price Edict (Crawford and Reynolds 1979; Giacchero 1974, 45), the overall interpretation of the relative cost of sea, river and land transport has not significantly altered (DeLaine 1992, 126). The edict informs us that the cost of transporting 1,200 pounds in a wagon was charged at 20 *denarii* per Roman mile. To place a scale upon calculations over distance, such figures have to be comparable. To do this, the figures used tend to be a *modius* of wheat (22 pounds), therefore the wagon would carry 54.5 *modii*. This means that for every mile a *modius* of wheat was carried, the cost would have been 0.4 *denarii* per *modius*. If the wheat cost 100 *denarii* a *modius*,

the transport cost of the wheat in proportion to its actual cost would increase by about 40 per cent of the value over a distance of 100 miles (Duncan-Jones 1974, 368 calculates this cost at 36.7–73.4 per cent using the same figures – variation may be accounted for due to *kastrensis modius* being viewed as equivalent to either one or two Italian *modii*; I have viewed it as equivalent to one Italian *modius*). The cost of sea transport for wheat can also be calculated. The journey from Alexandria to Rome of 1,250 miles would have cost 16 *denarii* per *modius*. The cost per mile would be equivalent to 0.013 *denarii*. Therefore, the transport costs of a *modius* of wheat (cost 100 *denarii*) per 100 miles would have been 1.3 *denarii*, representing an increase in cost of 1.3 per cent as compared with about 40 per cent for transport over the same distance by land. These comparative figures can be seen to show the different relative costs of sea and land transport.

However, we need to understand these figures in context before we can be sure of readily accepting their value as economic indicators. First, it should be recognised that the figures do not compare like with like. The figure for sea transport was for a bulk cargo over a long distance, whereas the figure for land transport in the Price Edict refers to the calculation of a journey with a smaller load. The modern literature frequently alludes to the fact that the cost of transporting wheat over a sea journey from Alexandria to Rome was the same as transporting the same wheat over a distance of 100 miles overland. However, this comparison seldom takes into account the transport costs for the wheat from Alexandria which would have already been incurred in transporting the goods to that city. Colin Adams's Ph.D. thesis study of transport in Egypt is now showing that agricultural goods incurred land transport costs prior to their shipment from the river ports of the Nile down to Alexandria. This example illustrates how, in the Roman empire, the transport of wheat involved a complementary system of land, river and sea voyages, rather than suggesting that the lower cost of sea transport precluded the possibility of land transport.

What the figures in Diocletian's Price Edict do show though is a variation in cost according to the form of transport taken. This produces a cost ratio of sea to land transport of 1:31. For comparison, in the first half of the eighteenth century a ratio of 1:23 is recorded (quoted in Duncan-Jones 1974, 368). It may well be that

we should view Diocletian's Price Edict as the maximum cost and that often costs could be less than those recorded in the Edict. Equally, the figures may be referring to a very particular form of transportation and to the fact that the sums charged covered wages and expenses for the carters, as well as the hire of the vehicle and traction animals. No doubt costs of land transport would have been lower if the carts, traction animals and labour power were owned by the person with goods to be transported. In Egypt, a cost for the transport of wheat by river over 13.6 miles is given for the year AD 42, which Duncan-Jones (1974, 368) sees as an equivalent of a cost of 6.38 per cent per hundred miles, which he converts into a ratio of transport costs sea:river as 1:4.7 (compare DeLaine 1992, 125–6: 1:3.9 for downstream journey and 1:7.7 for upstream journey). The ratio of river transport to land transport based on these figures would have been 1:5. Significantly, these figures are not markedly different from the early modern period in Europe or the period of the early Industrial Revolution in Britain during the eighteenth century. Therefore, the figures for the cost of land transport in the Roman empire do not appear to be exceptional when compared to those of other societies. Indeed the figures in fact demonstrate costs for transport of a very similar order of magnitude.

These tentative calculations of the cost of land transport have been frequently used to explain features of Roman economic action that they do not refer to. For example, high transport costs have been used to explain why famines in inland areas were not relieved:

Despite the existence of a comprehensive network of trunk roads, land transport remained so costly and inefficient that it was often impossible to relieve inland famines from stocks of grain elsewhere.

(Duncan-Jones 1974, 1)

Such analysis ignores outside factors, for example lack of transport animals and carts for the purpose or, simply, a lack of political will (see Garnsey 1988, 22–3, and compare famines in Ireland in the nineteenth century). Moreover, the 'high' transport costs of goods by land have been used to determine and explain the ideology of self-sufficiency in Italian agriculture (Duncan-Jones

1974, 38) as a functional means of maximising resources. Spurr (1986, 144–6) is critical of the use of these figures from the Price Edict as deterministic of behaviour in agriculture, since they refer to hired transport. Moreover, Spurr argues that the economics of self-sufficiency in agriculture extended to the field of transport, which allowed costs to be reduced by the use of farm animals and farm slaves, both of which would have undertaken much of the transport of goods to market. However, even if we do accept these figures as typical, it does not imply that land transport was an alternative seldom undertaken. To suggest that land transport was too expensive to undertake reduces human activity in the Roman empire to the rationality of modern cost–benefit analysis (a rationality or ideology alien to the ancient world). True, the transport costs by road were more expensive than those by sea, but this does not imply that land transportation was seldom undertaken (Isager and Skydsgaard 1992, 106; see also Garnsey 1988, 23 for examples of long-distance transport of staples in Thessaly and North Africa). Our current knowledge of transport costs in the Roman empire is limited to the creation of an order of magnitude for prices, which would appear to be closely comparable to those in Britain and Europe from 1700 to 1800, and it is to a comparative example from this period that I now turn.

A comparative example: eighteenth-century Britain

Britain between 1700 and 1800 saw a period of rapid change in the efficiency of road travel with the introduction of maintained toll roads, which provides us with an important parallel to the establishment of a road network in Italy from the late third through to the early first century BC. Both periods would appear to have been accompanied by an increase in the circulation of goods and both periods should be viewed as times of rapid economic change. The dynamics of transport in the eighteenth century demonstrate the significance of improved communications for the economy. Increasingly, we are becoming aware that in the eighteenth century the improvement in transport made by the toll roads and canals of Britain stimulated economic growth and can be linked with the technological innovation and reorganisation of labour that we associate with the Industrial

Revolution (Pawson 1977, 4–7). Generally, in this period the improvement in transport conditions overcame many of the constraints placed upon local economies by the factor of distance. Adam Smith, in *The Wealth of Nations*, summarises a contemporary view:

Good roads, canals and rivers, by diminishing the cost of carriage, put the remote parts of the country more nearly upon a level with those in the neighbourhood of the town.

(Smith 1904, 148)

This has important implications for the interpretation of land transport in the Roman economy. The action of road-building, canal-building and the improvement of river navigation all reduced the cost of transport. The presence of a sophisticated road system in the Roman empire would have reduced the costs of transport; similarly the construction of canals and the control of rivers would also extend the local economies of Italy (on inland waterways see Boffo 1977; Fernandez Casado 1983, 553–91; Uggeri 1987, 1990a, 1990b; Calzolari 1992; Laurence 1998). Moreover, the road systems of Italy caused distant towns to become less remote (to use Smith's terminology). In effect, just as in Britain in the eighteenth century, the road system of Italy in the second and first centuries BC created a new space economy that linked places together.

Significantly, in Britain during the eighteenth century, the cost of transport by sea, water and land did vary with a clear advantage to water and sea transport purely in terms of cost, but the documentation from eighteenth-century Britain shows that the apparent superiority in cost of sea transport did not cause it to be the dominant form of transportation (Pawson 1977, 22–3). This would seem to contradict the logic of prices established for the Roman empire, where it has been argued that land transport was an inferior expensive alternative to maritime transport. Indeed, Pawson (1977, 27–9) points to the key advantages of land transport. It could be cheaper to transport goods solely by land, instead of a journey to port by land and then a coastal journey, because the latter alternative incurred additional costs of handling the goods. Moreover, land transport on the toll roads was reliable in bad weather and the fear of losing valuable cargoes at sea caused many high-cost items to be transported by road. However,

most significant for our understanding of transport economics is Pawson's observation on the integration of the transport network:

Nevertheless, despite the apparently overwhelming economic advantage of trade by water, a well used transport system existed. This land transport system can be classified in two parts: a *complementary* system, which was interdependent with water transport, and performed a feeder and distribution role for it, and a *competitive, independent* system which did not rely on water transport linkages.

(Pawson 1977, 23)

It was the establishment of these two systems of transport in the eighteenth century that radically altered the nature of the economy of Britain, in terms of both the movement of goods and the circulation of ideas. With this in mind, we now need to establish the nature of the transport system in Roman Italy to see if land transport by road had a similar complementary role and significance as it had in eighteenth-century Britain.

Agriculture and land transportation

The connection of roads with the agricultural systems of Italy in the second and first centuries BC through to the first century AD can be demonstrated with reference to literary sources of the time. The agricultural writers Columella and Varro refer to remarks of Cato the Elder on the subject of the buying of agricultural property in the second century BC. Cato was writing in the period when the major roads of Italy had been established and their effect on the transportation of agricultural produce was beginning to be understood. Therefore these remarks of Cato come from a period of change in the human geography of Italy, which can be seen as having an important implication for the Italian economy. Interestingly, these comments of Cato were accepted and reproduced by Varro and Columella, were regarded as still having significance for the selection of viable agricultural properties in the first centuries BC and AD, and should be seen as a general view of the role of road transport for agriculture throughout the period 200 BC to AD 200.

The texts require some discussion to place the importance of the newly established roads in the selection of agricultural property in

context. Columella (1. 3) reports that Cato considered of prime importance the quality of the soil and the nature of the climate. After these two primary considerations, the factors of a similar importance were the road, water and the neighbourhood (*viam, aquam, vicinum*). According to Cato, a road added to the value of land in a number of ways, first by allowing the owner to travel in relative comfort to the property, rather than dreading an arduous journey and, in consequence, seldom visiting. Further, a road aided the bringing in of goods and resources to a property as well as the transporting of produce away from a property: 'a factor which increases the value of stored crops and lessens the expense of bringing things in, because they are transported at a lower cost to a place which may be reached without a great effort' (see also Varro, *RR* 1. 16. 3). Already, in the second century BC, we see a view of the road system as an asset for agriculture. Cato also points to the engagement of agriculture with a wider economy that is often underplayed by modern scholarship on the subject. Much of the modern literature refers to the agriculture of Italy as built upon self-sufficiency but, in Cato, we find that certain needs of the villa were performed by outsiders. Certainly an ideology of self-sufficiency was present in Roman agriculture, yet this did not override a practical necessity to interact with the wider economy.

The integration of the villa economy with that of the town is demonstrated with reference to Varro (*RR* 1. 16. 2–6). He is categorical that it is the ability to transport products from the villa by carts on roads or by river which could make a farm more profitable (*fructuosus*). This would suggest that transport was a major factor in the successful economic integration of the villa into the wider economy. The reasons for a villa needing its transport link are also given by Varro:

Farms which have nearby suitable means of transporting their products to market and convenient means of transporting from there those things needed on the farm, are for that reason profitable. For many have among their holdings some into which grain or wine or the like which they lack must be brought, and on the other hand not a few have holdings from which a surplus must be sent away.

(Varro, *RR* 1. 16. 2–3)

Further, Varro suggests that the villa should be integrated into the local town or *vicus* (village) economy and, if lacking these, an

economic relationship with a large rich villa would have been a practical alternative. These centres were potential markets for the produce of the villa and were also centres of labour and services required by the villa owner (by this I do not intend to imply that these centres were 'service' cities in line with Engels's model: see Engels 1990). In terms of labour provision, these centres were the focus for the provision of specialists, such as physicians, fullers and other artisans; because to own your own artisan was one thing but if that person was to die 'the profit of the farm would have been wiped out' until a replacement was found. Only if the farm was isolated from towns, *vici* and large villas would it be necessary to own specialist craftsmen. Similarly, if a villa was close to a road and had good communications with towns elsewhere, it would have been relatively easy to hire the labour for the transport of goods (Columella, *RR* 1. 3. 4, quoting Cato). Transport, like the harvest of crops, involved additional labour that was cheaper to hire for a short period of time, since it averted the need to own extra slaves for the purpose who might be underemployed for much of the year. It would appear that agriculture was thoroughly integrated into a wider economy, and that a villa's economic viability was increased by a good supply of hired labour, a prospering town, and an adequate transport route for the export of goods either by road or river (Pliny, *HN* 17. 28, referring to Cato). It should come as no surprise that Varro (*LL* 5. 35, discussed by Purcell 1995, 170) made an etymological link between the words 'villa' and 'via'. The villa would simply have been an expensive, but largely non-productive investment without the ability to export goods by road or river.

Villa location and road-building

In terms of the development of Roman agriculture, the location of a villa close to a major artery of the transport system was important. Lacking that location, there was always the possibility of building a road to link the villa to the major transport arteries of Italy. This would seem to have been a relatively common practice. For example in the field survey of the Ager Veientanus in Etruria, selce paving stones were found at sixty-three of the

534 sites (data from Kahane *et al.* 1968). Roads were needed to connect the villa with the wider economies of Roman Italy.

The process of villa development after purchase is well documented in the letters of Cicero to his brother with reference to his brother's properties (*QFr.* 3. 1). Cicero had recently visited his brother's properties and was providing a report on the progress of various building works at these sites. At the first property visited, at Arcanum, a stream had been diverted and was providing water in spite of the drought; at the second property, the architect/builder had failed to align the columns in a straight line but the paving of an area was progressing well; at the recently purchased Fufidian farm (*fundus*), Cicero foresees the irrigation of fifty *iugera*, the construction of fish ponds, a palaestra and a wood. Most interesting for our purposes are Cicero's remarks about the building of roads to the property at Laterium. Quintus Cicero and his neighbours would seem to be improving the local roads around their estates. One of his neighbours, Varro, had built a good road in front of his property, whereas another, Locusta, had not built the section of road that would have adjoined their property. Clearly, some agreement had been made between the neighbours over the construction of this road. In addition, Quintus had built a section of road through his own property avoiding the use of his neighbours' land. This is described by his brother:

I examined the road, which I thought good enough to be a public road, except for 150 paces (I measured it myself) from the little bridge at Furina's temple leading to Satricum. In that stretch, it had a surface of dry clay instead of gravel [*glarea*] (that will have to be altered), and that section had a steep incline, but I understand that it could not be taken in any other direction, especially as you did not want to take it through either Locusta's or Varro's land.

This new road appears to have led from the estate to Satricum (a local town). It was one of Quintus' major developments to his properties outside Rome and would have greatly facilitated access to the property. Significantly, the road connection was being constructed to the highest standard with a gravel surface, which was the technology used on the public roads of the time. Yet the road was a private one and would only have been utilised by the estate. It would have involved considerable investment, but was deemed to have been necessary in order to improve the viability of this property.

In the cases discussed so far, in which roads were built from villas to the major roads of Italy, we are seeing a pattern that emphasises the ideal position of a villa as close to a road rather than on a road (see also Columella, *RR* 1. 5. 6–7). Similarly, there is an emphasis on location of villas that stresses the need to be close to towns but not just outside the walls. The emphasis in the discussion by ancient writers of the location of villas is always to be *close to* rather than *adjacent to* other features of the human landscape. A villa needed to be close to a road to allow for good access and communications; equally a villa needed to be near a town so that it had access to markets and labour; ideally it would also be near a port or river port for the export of produce. This places the villa in a unique position in the Roman landscape. It appears to be separate from the major areas of settlement and might seem to subscribe to an ideology that emphasises subsistence. However, the villa's proximity to towns and roads caused it to be integrated into a wider economy. Moreover, in terms of the Roman space economy, the villas extended the influence of the town over a wider area that economically was integrated with the economy of the local towns and, through ease of transportation away from the local towns, into a wider economic system beyond them.

These features can all be seen to be playing an important role at the classic villa site – Settefinestre. The location of this villa could be seen to be ideal and conform to the prerequisites of the agricultural writers. The villa was positioned upon a hill and dominated the valley of the Oro (Carandini and Settis 1979, 43–9). It was close to a *diverticulum* (side road) leading to the Via Aurelia a mere 1.7 kilometres away (Carandini 1988, 121–2). Moreover, the villa was close to the Latin colony at Cosa and its harbour – 4–4.5 kilometres away (Carandini 1988, 126–7). Other urban centres were also nearby, within a day's journey by road, including: Orbetello (12 km), Porto Ercole (14 km), Heba (18 km), Talamone (22 km), Saturnia (35 km) and Vulci (38 km). All of these towns would have provided markets for goods, which could have been transported using the vehicles, animals and slaves from the villa (Cato, *RR* 52). The economic cost of this form of transport was negligible since the labour power was available within the villa itself. It was only if the agricultural produce of the villa was transported further afield that any additional outside cost for

transport was incurred. The villa was integrated into the wider economic system through its proximity to the port at Cosa, which would have allowed for the shipment of produce by sea at a lower cost (we should include the importation of goods as well as export of produce here). The presence of the road (Via Aurelia) should not be ignored in the context of production and export, because the availability of sea transport would have been affected by the weather and was considered to be impractical in winter (from October to April). It would have been in winter that goods produced at Settefinestre would have been transported by land, rather than by sea. Therefore, land transport complemented transportation by sea when the seas did not permit sailing. Further, for short journeys of less than a day we would not foresee the use of shipping due to an extra need for labour in the transshipment of goods from carts or pack animals onto boats. This brings out the complementary nature of land, sea and river transport. Few journeys, if any, would have been entirely water based, because, ultimately at some point, transported goods had to travel overland to reach their final destination. Thus, to discuss water and land transport as competing systems according to price is to misunderstand the economics of transport in the Roman world. It was true that water transport was cheaper, but that did not mean that land transport for the marketing of produce was not possible. Instead, the implication of water transport being cheaper suggests that on a number of routes this form of transport had an advantage. However, it must be stressed that a large proportion of all goods moved in Roman Italy were moved by road. The reason for this can be seen in the availability of water transport, since in no way did navigable rivers and coastal ports service all destinations within Italy. Instead, these rivers and ports were linked to other places and destinations for goods by a sophisticated network of roads, which facilitated overland transport. For example, Terracina, a colony 60 miles south of Rome on the Via Appia, had its port developed at the expense of the Roman state in 179 BC (Liv. 40. 51. 2). This action caused Terracina to become the closest port to Rome. In terms of the importation of goods to Rome these might have been taken by sea to Terracina and then taken the further 60 miles to Rome along the Via Appia. This example illustrates how land and sea transport complemented one another in the long-distance transport of goods.

The space economy of Roman Italy

The evidence from the second century BC that there was a system of land transport that complemented transportation by river and sea, and, as we have seen, that these forms of transport were not exceptionally costly when compared to other economic systems prior to the nineteenth century, has some important implications for our understanding of the Roman economy. Over the last twenty to thirty years we have been taught to think of the Roman economy as underdeveloped and based upon a peasantry living at a level of subsistence, and of cities being places for the consumption of any surplus wealth. A characteristic of this conception of the Roman economy is the lack of integration between its various parts and, certainly, of the maintenance of a minimal level of trade because there are assumed to have been prohibitive transport costs for most products. However, transport costs were a universal in the ancient world and, as Jongman (1988, 140–2) has argued, the more important question is profit rather than cost. Clearly, produce from farms such as Cato's was transported for sale, and it was seen to have been advantageous for the sale of agricultural produce if the farm was close to a town, a river or a road. Therefore, perhaps what we need is a model of the Roman economy that emphasises the interrelationship of the units of production and consumption. To a certain extent we already have a familiar one to hand in Hopkins's (1978, fig. 1.1) model for the growth of slavery in Roman Italy, but this addresses only part of the problem. In what follows, I wish to view Roman Italy in terms of centres of production and consumption to illustrate the interrelated nature of the economic units as both producers and consumers.

By the early to mid-second century BC, the road system of Italy had been established from the River Po down to Italy's southern coast. It is in this period that we tend to see the development of villa-based agricultural systems similar to those of Cato producing surpluses for sale elsewhere. At the same time, we might wish to identify Rome as the key market for the sale of produce, because the population growth in the city demanded this. Again in the early second century, we find the colonies founded earlier in the third century developing distinctive urban features such as walls, temples and fora, and paved streets (e.g. Liv. 41. 27. 10–11). It

appears that these developments in towns and in agriculture follow on from the development of a road system in Italy. Indeed, we might view the development of large estates at a distance from Rome owned by the Roman elite as a reaction to the reduction in the temporal distance travelled to estates further away from Rome. The physical distance from Rome of these estates remained the same, yet the introduction of a substantial road system reduced the time it took to travel to estates physically further afield. It would also have made the journey less problematic in terms of personal comfort and would have allowed the owner to visit more frequently. Similarly, towns in Italy began to develop architecturally at the same time as the idea of what a town should be was circulated to even the furthest flung colony. Spatially, those places (whether towns or villas) further away were integrated with the cultural and political centre (Rome) because a new road system had developed to link them together.

The spatial integration of Italy by the second century BC has a number of important implications for our understanding of the nature of trade and the economy of Italy. Most of the information refers to actions of the most wealthy (i.e. the elite) of a similar status to Cato. The villa, as we have seen, was a centre for agricultural production with a view to the export of a surplus for sale, either locally or further away. The extent of the trade in agricultural surplus is subject to debate, but for our purposes here it is necessary simply to recognise its existence. The villa was not simply concerned with production, it was in itself a centre for consumption. A glance at Settefinestre demonstrates the amount of consumption that took place at the villa in terms of building materials, and the degree of architectural embellishment that enhanced the lifestyle of the owner and his family. However, in addition, goods that were unavailable in the locality may have been brought to the villa for consumption. Even though there existed an ideology of agricultural self-sufficiency, many villa owners may have needed certain products (e.g. imported wines, etc.) from towns or further afield to maintain a lifestyle that we tend to associate with Roman culture in the cities of Italy (see, for example, Stefani 1994; for a brief discussion of the data see Laurence 1996). However, it is clear that the material conditions of the lifestyle of the elite in their villas were not significantly different from those found in the towns of Italy. In fact, the villa

in Italy should be seen as a place for the display of wealth through storage, whether produced from the villa or imported from elsewhere (see Purcell 1995 on storage and production in villas). Inevitably, the villa could not produce all its own needs and, as we saw above, interacted with towns or *vici* in order to acquire other resources, whether in terms of labour power or material goods. Equally, the villa depended on the town as a place of sale for the surplus produced. Thus, there was a close economic tie between the villa and the town and, importantly, the villa reflected the consumption patterns of the town – though perhaps we should say that the consumption patterns of towns and villas, because of their economic and cultural interaction, were similar.

Finally, to return to transport costs and the economy, the investment of labour and resources in road construction both with public and private monies cannot be entirely related to the conquest of Italy. As I hope to have shown above, by utilising the evidence of economic practice, rather than simple relative costs of land and sea transport, we can begin to understand the significance and success of road building in the Italian economy. Road building allowed for goods to be moved at greater speed, whatever the season. It is true that land transport was more expensive in terms of cost than transport by sea, but that did not prevent goods being transported overland. In fact, in Roman Italy, transport costs did not prevent the movement of goods; significantly, the construction of roads allowed for the movement of goods and the development of a more productive agriculture alongside urbanism.

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