CHAPTER 17

HELLENISTIC GREECE AND WESTERN ASIA MINOR

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I INTRODUCTION

The conventional boundaries of the "Hellenistic period" – the death of Alexander the Great in 323 BC and the Battle of Actium in 31 BC – were unquestionably important political events, but their relevance for understanding economic history is less clear. In many ways the third century shows more economic links to the preceding hundred years than to the following two hundred. After 200 the increasing presence of Italian troops, traders, and settlers in the Aegean world and western Asia Minor transformed much of the political, social, cultural, and economic life of "old Greece." Several markers point to new economic configurations after 200 BC – activity that may represent new, trans-Mediterranean links between west and east (perhaps groundwork for the more integrated Mediterranean of the first three centuries AD) and perhaps some real, though slight, productivity growth.

Politically, the Hellenistic world saw first the creation of great new Greco-Macedonian empires on the ashes of the Persian empire and second the intrusion of Rome. Van der Spek and Manning (Chapters 15–16) review the impact of these phenomena on southerly and eastern parts of the Middle East. In this chapter I focus on "old Greece" – the southern Balkans, the Aegean islands, and western Asia Minor. Greek-speakers had settled this region centuries earlier. The *polis* remained the basic political unit, although earlier formations persisted, especially in Asia Minor and northwestern Greece, and new, or re-configured old, political arrangements like the federations of the Aetolians or Achaeans complicated the scene. Non-Greeks like the Carians and Lycians remained in much of Asia Minor, but their identities, which had taken on Greek features across earlier centuries, weakened further in Hellenistic times. All these entities had to confront large land empires claiming direct or indirect sovereignty, and with the economic implications of those claims – most notably, warfare and taxes.

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II DEMOGRAPHY AND URBANIZATION

Greeks had always moved around the Mediterranean, but mobility has been argued to have accelerated between 350 to 250 BC. Archaic and classical movements are attested by documents as diverse as the Persepolis Fortification Tablets, with Greek artisans in Persian pay, and the soldiers' graffiti at Elephantine on the upper Nile.[1] But Scheidel's estimate that 2–3 percent of Greeks moved to colonies between 750 and 650 BC[2] reminds us that few people ever strayed far from where they were born. It is worth asking whether the modalities of movement changed in Hellenistic times – did people move for different reasons, did their options change (particularly for members of different social classes), or did the numbers of migrants differ? But these questions are difficult to address.

The most obvious cause of large-scale, long-distance movement was war. Alexander's army averaged perhaps 100,000 people, including camp followers. Some returned home, but others stayed as settlers in Alexander's new cities (see below) or as corpses in his cemeteries. After Alexander, however, there were no analogous large-scale conquest-driven permanent movements. The boundaries of the successor empires were relatively stable, excepting places like Coele Syria and Caria, and the loss of the eastern Seleucid empire (see above, Chapter 15). Armies that operated beyond the frontiers, like Antiochus III's forces in his war against Rome, typically returned home after hostilities ended. The military mechanism that did generate continuing movement in Hellenistic times was the demand – especially by the Seleucid empire – for fresh faces from Greece and Macedon. Within Greece and western Asia Minor military demands continued to fuel smaller-scale movements, as the occasional listing of garrison troops with their ethnics attests.[3] In general, it seems that the great burst of migration driven by military demands played itself out in the century ending by roughly 250 BC, and that thereafter the scale of such movement is likely to have contracted.

However, another engine drove movement in later Hellenistic times – Italian penetration of the East. Once again hard numbers are lacking, but literary sources for the Mithridatic Wars stress the visibility of Italians – including women and children – in cities like Ephesus and Delos during the first century BC. They also appear in inscriptions from Delos and elsewhere. In absolute terms they remained a minority in the Aegean, but they

[1] Hallock 1969 with Root 1997 on the Fortification Tablets; Porten 1996. [2] Scheidel 2003b.

[3] Here are three examples: (1) *IG* IV 854 with the correction of [T]i[m]aios to [Ei]renaios; see Foxhall et al. in Mee and Forbes 1997: 270 no. 8. In a dedication from Thera the same Eirenaios is called "secretary of the troops and fighters in Krete and Thera and Arsinoe [= Methana] and *oikonomos* of the same places"; *IG* XII 3 466 (Foxhall et al. in Mee and Forbes 1997: 271 no. 12); see *Pros. Ptol.* 15103*. (2) Thera: *IG* XII 3 325 with p. 230, and 3 Suppl. p. 283, explicated by Robert 1963: 388, 411–18. (3) Delphi: *ISE* 2 81.

nevertheless made important contributions to the economic life in the later Hellenistic period.

But how far were these movements pulled by social and political demands, or pushed by actual population growth? Recent demographic research (Scheidel, this volume) shows the constraints on secular growth for pre-transitional populations. Appeals to "growth" are suspect without very good data. Two lines of evidence seem worth considering, though neither provides definitive answers. Archaeological surveys in Greece (which remains better documented than western Asia Minor) reveal a fairly consistent pattern of changes in settlement sizes and numbers between the fourth and first centuries BC. Generally, there was notable growth in the numbers and sizes of settlements – especially rural settlements – from about 350 through the late third century. Thereafter numbers and sizes declined. This can be linked with comments in literary authors – most notably, Polybius – suggesting rural depopulation in Greece after roughly 200 BC.[4]

We might conclude that fourth- and third-century population growth put pressure on subsistence, fueling Alexander's conquering armies, then petered out, perhaps as the demand for troops outstripped the Greek world's ability to provide them. This might also explain the apparent pressure on landholding in third-century Greece and struggles over debt relief and land redistribution (see below).[5] The state of our evidence prevents us from saying whether the same story might apply to western Asia Minor.[6]

But the evidence for this interpretation is fragile. Survey results have come under scrutiny. Rural sites are usually dated from extremely small numbers of diagnostic sherds. The methods whereby sites are identified vary from survey to survey, and even within a single survey. Distinguishing between "early" and "late" Hellenistic (at c. 200 BC) may sometimes be overoptimistic. The reality of the change and links between the "facts on the ground" and the ambiguous written evidence have been questioned.

Improvements in our understanding of the Macedonian kings' recruiting practices may clarify the issue. New and newly reinterpreted inscriptions from Macedon reveal the kings' urgent concern with assuring steady, reliable supplies of troops. Fifteen-year-old boys were registered by household and eligible for call-up from sixteen; exemptions based on family needs were carefully laid out, but the state tried to guarantee that every family contributed at least one soldier. The state's interests reflected in these texts perhaps parallel Philip V's famous orders to Larisa to enroll new citizens (*SIG*[3] 543) – presumably Philip's desire to find soldiers, not abstract concerns for Larisa's welfare, drove his intervention. But again, the demographic implications are hard to read. Availability of troops and systems for calling them up were always fundamental concerns of Hellenistic states. There is

[4] See Reger 2003b for a summary. [5] Fuks 1984. [6] Hatzfeld 1919; Mavrojannis 2002.

still no clear evidence for new urgency after 200 BC, or that numbers had declined.[7]

(a) *Urban foundations*

Royal creation of new cities was not a Hellenistic innovation, or even Alexander's brainchild, though his precedent came to be tantamount. Isocrates had urged Philip II, significantly, to found new cities in Asia Minor and populate them with unemployed Greeks (*Phil.* 120). Philip himself refounded Krenides as Philippi in 356; Diodorus says that "by founding noteworthy cities in appropriate places he put an end to the Thracians' audacity" (16.71.3). Philip's activities involved population transfers,[8] effecting movement of people first by immigration (forcible or otherwise) of Greeks and Macedonians to establish the "Greek" core of cities; second, by moving people into new cities from the countryside around them; and third, by taking people away from Greece.

But there were also foundations within old Greece. According to Strabo (7.21), Cassander founded Thessalonica by "destroying about twenty-six settlements (*polismata*) in Krousis and on the Thermaic Gulf and resettling them in one place."[9] He also refounded Potidaea as Cassandria in 316.[10] Strabo (9.5.15) also tells us that

> Demetrius Poliorcetes founded Demetrias, named after himself, between Nelia and Pagasae on the sea [in Thessaly], resettling in it the nearby towns (*polichnai*) Nelia and Pagasae and Ormenion and Rhizous, Sepias, Olizon, Boibe, and Iolkos, which are now villages (*komai*) of Demetrias. This was moreover for a long time a naval station and palace (*basileion*) for the kings of the Macedonians, and it controlled Tempe and both mountains Pelion and Ossa, as mentioned already.[11]

Such foundations (or resettlements, for all three are called *synoikismoi*) must have had profound local economic consequences. Even when no population was added, the act of concentration in a new or enlarged urban center created a new locus of demand for food and other essentials, and new markets (both in the physical and metaphorical sense). Another, often cited, example of this and royal interests in it comes from the failed *synoikismos* of Teos and Lebedos in Asia Minor, ordered by Antigonus the One-Eyed.[12] Moreover – and surely this was always one of the kings' chief interests – a new city was also a new source of taxes and manpower.

[7] Hatzopoulos 2001.
[8] See Cohen 1995: 15–17 on Philip's policies, with further references. [9] Cohen 1995: 101–5.
[10] Diod. Sic. 19.52.2, *IG* XII 444.117 (*FGrHist* 239); Strabo 7.25; further details in Cohen 1995: 95–9. Buraselis (1982: 37) discusses whether Cassander founded Cassandria and Thessalonica to draw north Aegean trade.
[11] See Cohen 1995: 111–14. [12] Welles 1934 nos. 3–4.

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(b) *Taxation*

Kings were always interested in taxes, as the first two books of the pseudo-Aristotelian *Oeconomicus* show. Kings were prodigious consumers of money. In 315 Antigonus the One-Eyed apparently enjoyed an annual income of 11,000 talents in addition to 10,000 that had just fallen into his hands (Diod. Sic. 19.56.5). Ptolemy II reportedly had an annual cash income of 14,800 talents (*FGrHist* 260 F42). This money supported the army and underwrote the expenses of kingship. Kings were expected to be generous to their friends and subjects. In the same passage in which Porphyrius of Tyre (as transmitted by Jerome) reports Ptolemy's income he also lists the king's armed forces: 200,000 infantry, 20,000 cavalry, 2,000 chariots, 500 elephants, 1,500 warships, and 1,000 supply ships. Even allowing for exaggeration, the numbers are impressive.

Money also flowed out of the royal treasuries as gifts. Alexander famously gave Phocion 100 talents (Plut. *Phoc.* 18), and Livy (35.18.1) explicitly mentions an Acarnanian who left Philip V's service for Antiochus III's because the latter had more money. Grants of property and/or tax exemptions (representing a loss to the treasury) could also be gifts. Granting (or re-granting) of several parcels of land to Perdiccas, Cassander "gives also to him and his descendants exemption from taxes (*ateleia*) when he imports or exports items related to the property,"[13] that is, for personal use; such restrictions on tax exemption are common in grants.

The huge tax revenues that kings required flowed from multiple sources, big and small – but a good portion must have been raised by imposts on *poleis* under their authority. An inscription from Miletus in Ionia gives a sense of the scale of demands a king might place on a *polis.* In 283/2 the Milesians found themselves unable to pay the second installment of money owed to king Lysimachus, and turned to Cnidus for help. The Cnidians lent 55,000 drachmas (9 1/3 talents), part at interest, part interest free.[14] It has been suggested that many loans taken out by *poleis* as corporate bodies – particularly a series by Cycladic islands in the early third century – were intended to pay taxes to their sovereigns.[15]

Of course the *poleis* themselves also raised money by imposing taxes. We hear of various tithes on agricultural production, taxes on land sales, import and export dues, and so on; sales of citizenship and priesthoods become mechanisms for raising money.[16] Most famous – but very difficult to contextualize – is an inscription from Cos listing civic taxes in the

[13] *SIG*^{3} 332.27–31, to be read in Hatzopoulos' new edition (1988: 22–5).
[14] *Milet* I 3 138; Migeotte 1984: 299–304, no. 96.
[15] Migeotte 1984: 156–7; discussion: Reger 1994: 37–8.
[16] Jonnes and Ricl 1997: 4 lines 46–7 (*SEG* 47 1745); Lambert 1997, on Athens; on sales of priesthoods, Parker and Obbink 2001. A full study of Hellenistic taxation remains a *desideratum.*

context of obligations owed by the farmers who bought them.[17] A series of inscriptions from Athens records payment of a 1 percent tax on land sales.[18] The mechanisms by which *poleis* raised money seem as varied as those of the kings.

From an economic point of view it remains hard to assess the meaning of all this taxation. In general, kings could apparently raise money whenever they needed to, including money for wars, lavish spending, and to pay indemnities. Aperghis argues that the tax burden on the Seleucid empire was, relatively speaking, not heavy.[19] Be that as it may (see above, Chapter 15), only after the Roman civil wars of the first century BC do the literary sources speak broadly of economic exhaustion in the Greek world. There were certainly economic problems in Hellenistic Greece, but the economy's continued ability to support wars through taxation suggests that burdens were manageable. We should not assume that the need to pay royal taxes lay behind every loan that *poleis* took out in these centuries. Loans were often taken out, especially from the citizen and metic body of a *polis*, for local purposes – be this self-defense, as in a famous case on Cos during the First Cretan War, supporting building activity, creating grain-buying funds, or for any other possible civic purpose.[20]

III AGRICULTURAL PRODUCTION

Agriculture remained the chief economic activity for most people in Greece. Outside of the northern kingdoms (Macedon, Epirus) this took place on land belonging to *poleis*, the "independent" city states that were sometimes linked, strongly or weakly, into various kinds of federations.[21]

Of the fifty-two writers of agricultural manuals named by Varro in his *De agricultura*, all but a few seem to have been Hellenistic; unfortunately, their works are lost.[22] Some historians argue that regulations in certain leases implying "scientific" farming reflect the contents of these manuals. For example, a series of fourth- and third-century Attic leases attests to renting and regulation of use of land in private (often corporate) hands; some of these leases include explicit instructions about land use, planting, and other matters.[23] A fourth-century lease from Arkesine on the island of Amorgos (*IG* XII 7 62; *SIG*^{3} 963) regulated the frequency of ploughing and the digging of the vines and figs on the property, and imposed fines for failing to follow

[17] *SIG*^{3} 1000. For problems with tax-farmers at Colophon, see Etienne and Migeotte 1998 (*SEG* 48 1404).

[18] Lambert 1997. [19] Aperghis 2001.

[20] See the splendid collection of evidence and analysis in Migeotte 1992.

[21] For the Aetolians, see Scholten 2000; Grainger 1999a; on the emergence of the federal state in Greece, see Corsten 1999.

[22] Varro, *Rust.* 1.7–9; see, briefly, Flach 1996: 225.

[23] *IG* II^2 2490–2504 (2495 = *Agora* XIX L10; for a translation of 2492, see Burford 1993: 231–2).

the regulations. The Athenian Androtion served as governor on the island at roughly the same time (*IG* XII 7 5; *SIG*³ 193), and his writings on farming may have inspired the detailed conditions of this lease and another from Rhamnous in Athenian territory.[24] The Rhamnous lease, which ran for ten years from 338 BC, specifies the frequency of ploughing ("alternately," *enallax*), that half should be planted in wheat (*pyroi*), a quarter in pulses, and a quarter left fallow. Regulations govern the care of olives, figs, other fruit trees, manuring, and irrigation of the garden. The owners of this property – a group controlling a sanctuary at Herme – were anxious to guarantee that the renter took care of the property and returned it at the end of his lease in a condition that would permit easy re-rental. Leases of various kinds survive from many communities, with various terms and types of obligation, including "sacred" leases from places like Delos.[25]

Some cautionary remarks are in order. First, the leases with detailed stipulations about land-use all come from public or quasi-public contexts. Only one Greek lease deals strictly with privately owned land rented to private individuals (*SIG*³ 302, of 326/5). We therefore cannot say whether the surviving leases' interest in regulating the kinds of agricultural activity undertaken reflect the responsibilities of corporate bodies to keep their land in good condition. For example, Apollo's agents sometimes required the lessees of sacred land on Delos to undertake specific activities, like the planting or extirpation of vines, or to allow sacred animals to graze on land they rented – even if such grazing might be detrimental to the renter's interests (*ID* 503.21–26, *IG* XI 2 287A58). The conditions probably at least partly relate to the terms of the leases. On Delos renters held estates for ten years; leases up to forty years are known (*IG* II² 2492.2–3), but the land ultimately reverted to the owner, who will have wanted it returned in a condition that would be attractive to a new lessee. (One may contrast the permanent leases of certain properties at Mylasa in Caria, granting renters the rights of owners.[26]) But Xenophon's advice in the *Oeconomicus* should alert us to private owners' interest in getting the most out of their land; it would be surprising if the same men who scrupulously stipulated conditions for renting land in Herme failed to exercise similar care on their own properties. However, these leases do not necessarily mean either that there were efforts to increase productivity or that there were fundamental changes in agricultural regimes in Hellenistic Greece.

[24] For the Rhamnous texts, see now Petrakos 1999: 143–6, no. 180 (*IG* II² 2493 + 2494; a newly discovered fragment bearing lines 39–63 remains unpublished) with Jameson 1982; 1987; the fragments of Androtion's *Georgika* are presented in *FGrHist* 324 F75–82. See Walbank 1991: 157: "some of its [the Amorgan lease's] terminology and provisions may derive from Androtion's work." The Amorgan lease is republished with English translation and commentary in Rhodes and Osborne 2003: 282–6, no. 59. On pasturage in leases, see Chandezon 2003. I am preparing a study of Hellenistic land-leases in connection with a larger work on agricultural writers and practices.

[25] Osborne 1985b; 1988; Sosin 2000. [26] For example, *IK Mylasa* 206.20 and 801.16.

The strong evidence from archaeological surveys for increased rural settlement in the fourth and third centuries, followed by a striking drop in the numbers of such sites after about 250–200 BC,[27] may help explain these leases. In the southern Argolid, the number of small ("third-order": 0.05–0.30 hectares) rural sites increased rapidly between c. 350 and 250 BC, until there were ten (98 in total) for each first-order site. Press-beds and other traces of olive culture abound, and increased investment in olives may have been linked to the new dispersed settlement pattern. Around Flamboura it has even been possible to trace out the likely boundaries of seventeen properties, ranging from 5.5 to 22.5 ha. – too large for simple subsistence agriculture. This pattern changed drastically after about 250, as the number of third-order sites dropped to seventeen and soil deposition in valleys suggests increased erosion, possibly due to failure to maintain upland terraces. Population decline may have caused the changes, provoked consolidation of land-ownership in fewer hands, and stimulated the emergence of a large non-citizen population at Epidaurus, as inferred from a casualty list of 146 (*IG* IV 1^2 28).[28]

Polybius famously remarked on Greek depopulation in the Hellenistic period: "In our time the whole of Greece has been subject to a low birth rate and a general decrease of the population, owing to which cities have become deserted and the land ceased to yield fruit, although there have neither been continuous wars or epidemics." Polybius attributes decline to greed: people refused to have children, or had only one or two, to preserve their patrimony. Then, if they died prematurely, "houses must have been left unoccupied . . . so by small degrees cities became resourceless and feeble" (36.17.5–6). Philip V's famous letters ordering Larisa to enroll more citizens so the city would be strong and the land not deserted seem to support this view (*SIG*^{3} 543). However, Polybius' views are framed in moral, not economic, terms, and do not relate exclusively to the countryside. For Philip, Larisa's problem lies not in low population in general, but a lack of citizens to farm the land (which only citizens could own); he even threatens to enroll freed slaves, after the Roman model. Other factors may lie behind the decrease in evidence for rural settlement, from actual decline of rural population, to loss of property by citizens (who may have become landless rural laborers), to misreading of the evidence.[29]

Other explanations are possible. In the Athenian deme of Atene a fourth-century increase in rural houses associated with land apparently planted

[27] For example, at Thespiae and Thisbe in Boeotia, Bintliff and Snodgrass 1985: 31–3; in the Nemea valley, Wright et al. 1990; and on Keos, Cherry et al. 1991. Generally, see Alcock 1993: 33–92.

[28] Jameson et al. 1994: 383–400.

[29] Mark Lawall has cautioned me about the difficulties of dating Hellenistic pottery as precisely as some surveys claim to do (for example, the Keian survey: Cherry et al. 1991), meaning that the reality of the phenomenon described may not yet be established. See also Corvisier and Suder 2000: 112–17.

with olives has been attributed to a local export-oriented specialization in olive culture, and population decline at the end of the century to the collapse of "free and unhindered commerce . . . guaranteed by the imperial supremacy of Athens in the Aegean."[30] Still other explanations, like possible competition from Argive olive groves, can be imagined. Multiple causes are possible and must be tested for.

Some documents that are not typically brought into the discussion provide evidence that the well-attested classical practice of owning multiple, non-contiguous properties as protection against highly localized crop failures remained important in Hellenistic Greece. In one case, the Macedonian Perdiccas son of Koinos owned properties in three different places; in another, Lysimachus awarded three separate estates (*agroi*) to Limnaios in 285/4: one, of 1,200 plethra, with trees (probably olives); another with trees of 630 plethra; and the third with 900 plethra in trees and 20 in vines.[31] These estates covered roughly 120, 63, and 92 hectares – well beyond the size of the farms identified in the southern Argolid, and clearly on the scale of sizeable, slave-operated estates.

IV PRICES AND MARKETS: LINKING PRODUCTION TO CONSUMPTION

Multiple interests converged in the process of bringing agricultural commodities to consumers. The least visible are the producer-consumers: farmers feeding their families directly off the production of their land, who certainly dominated production and consumption throughout Hellenistic times. Growing their own food, however, did not mean they were isolated from market and non-market forces that moved agricultural commodities off farms. In the first place, urban centers acted as magnets for food. Large urban centers exercised strong demand (because they housed so many non-producers and because they controlled so many of the mechanisms by which food products were distributed), to the extent that during periods of stress urban dwellers may have had more access to food than rural folk.[32] But urban centers were also loci of wealth and power, which exercised decisive control over the distribution of food. A good portion of the land in many *poleis* was in the hands of wealthy urban dwellers who insisted on making money from their holdings and so moved a substantial portion of their annual production through the market. Second, even the poorest, most isolated subsistence farmer needed cash to buy food in hard times and items he could not produce himself, like large storage *pithoi* which required

[30] Lohmann 1992: 56.
[31] Hatzopoulos 1988: 17–54 (*SEG* 38.619), with details on the estates at 36–43.
[32] See generally Garnsey 1988.

special skills to make, and to pay taxes.[33] The problem, again ultimately intractable, is to gauge how far the agricultural world was "plugged into" and influenced by market (and non-market) transactions.

Prices can be a measure of the integration and productivity of the agricultural sector (see above, Chapter 15), if a smoothly functioning market sets them. Greece and western Asia Minor have provided nothing comparable to the price series from Hellenistic Babylon – prices all the more precious because they come from a major city with a massive, fertile hinterland. Van der Spek concludes from these prices that "the integration of the food market of Babylonia with the rest of the (Seleucid) world was poor." It is hard to say how far this was true of Greece and western Asia Minor. Some studies suggest that local markets set prices with relatively little integration between *poleis* even at relatively short distances,[34] while others see a more integrated market that at least set prices for grain across a broad region.[35] The disagreements stem in part from the lack of data – the best price series comes from Delos, which is in many ways a special case. However, there was apparently a general sense of what prices for staple grains *ought* be, especially following the harvest. That price was typically around 5–6 dr per *medimnos* of wheat.

Market integration depends on reliable flows of information, so judging market integration in Hellenistic times requires consideration of how information about prices moved. Information transfers had to involve movement of people – whether traders themselves or others to whom they entrusted letters or verbal accounts of market conditions. The Hellenistic data (including Egypt as well as Greece and western Asia Minor) suggest two fundamental poles. First, there were efforts to transmit data about prices from place to place, especially between major centers of sea-borne traffic like Rhodes, Alexandria, and Athens. Second, the unpredictability of travel conditions made the effectiveness and timeliness of these transmissions highly uncertain.[36]

Thus these views may not be wholly irreconcilable. On the one hand, the movement of traders, travelers, and information around the Aegean assured that people everywhere had a general sense of where prices tended to sit. Such general knowledge could account for a fairly widespread sense that (say) wheat should sell for so many drachmas after harvest. But delays due to weather, shipwrecks, war, etc., could frustrate timely transmission of information (and goods) over even short distances, so that local conditions – crop failure, war, sudden tax demands, etc. – could create short-term but strong price differentials. The Hellenistic market was probably only partially, imperfectly, and transitorily integrated – it linked local markets which

[33] Note the model of Gallant 1989.
[34] Reger 1994: 124–5, but see now also the critique of Sosin 2002.
[35] Bresson 2000.
[36] The classic case, frequently cited, is Ps.-Demos. 56.3 (with Reger 1994: 75–82).

exercised mutual affects on each other, but acted only slowly, and sometimes not at all, to correct price fluctuations.[37]

Finally, public entities also sought to control prices by non-market intervention. These practices are too widely attested to be dismissed as exceptional.[38] Public actors also tried to influence pricing by less direct means, such as dumping publicly held commodities – especially foodstuffs – on the market at times of price stress, stockpiling and public sale at reduced prices (which may have been motivated by non-economic considerations), and through persuading private actors to moderate prices. These activities reconfirm the importance of the market – unless prices *were* subject to market fluctuations, the state would not feel compelled to intervene – but also hint at belief in a doctrine of "fair prices" such as Aristotle laid out in the late fourth century.[39]

V MONEY AND MONETIZATION

Below the radar screen of our sources, many economic transactions doubtless still took the form of barter between individuals. Their agreement to swap so much *x* for so much *y* may have been influenced by a sense of what the goods might fetch for money, but doubtless also reflected social and personal considerations. Non-monetarized transactions also occurred on a larger scale. Taxes were collected in kind as well as in money, and the state could requisition large stocks of agricultural commodities. We cannot quantify this sector, but it must have been important throughout Hellenistic times, and surely influenced people's sense of what goods were "worth" in the market as well, in ways that are difficult to uncover.

But many Hellenistic exchanges were definitely mediated through money. Money's role in exchange in classical Greece has become much clearer, and the trends in place in the fourth century definitely continued thereafter. States needed coined money to pay troops, war indemnities, and numerous other expenses. Many private transactions were also monetarized, and the increasing spread of coins in "bronze" – actually copper alloys – which were introduced in the fifth century permitted the monetarization of even quite small exchanges. An inscription from Cos about the sale of a priesthood offers a typical example, in which cash payments may replace traditional offerings in kind.[40] Two aspects of money's influence on the economy require deeper investigation: the impact of inflation on prices, and the role of standardized coinage in facilitating exchange and market integration.

[37] See also the regional model in Horden and Purcell 2000.

[38] Migeotte 1990; 1991; Bresson 2000. [39] Reger 1993; Migeotte 1990; 1991.

[40] See Reger 2003b: 347–9 for examples. For the Coan inscription, Parker and Obbink 2000; it is hardly the only example. Shipton 2000 argues that fourth-century Athens was already highly monetized.

Discussion of inflationary pressures must begin with the impact of Alexander's seizure of the Persian treasuries. According to the literary sources,[41] Alexander seized roughly 180,000 talents in the form of about 312 tons of gold and 2,000 tons of silver, mostly from Persepolis and Susa.[42] At least some of this metal was later coined. It has been estimated that between roughly 330 and 290 the drachma equivalent (in staters, tetradrachms, and drachms) of over one billion coins was struck on the Attic standard (4.3 gr/dr). This represents roughly 170,000 talents of silver – strikingly close to the total taken by Alexander.[43] The equivalence cannot be pressed, since other sources of metal continued to be exploited for coinage, most notably Macedon's mines (see below). Nevertheless, the new coinage put into circulation in the early Hellenistic period was considerable. On average, it represents roughly the equivalent of adding 25 million drachmas per year (4,167 talents) to the money supply – roughly four times the annual revenues of the fifth-century Athenian empire.

Unless balanced by equivalent productivity gains, adding such huge quantities of money to the Greek world was a recipe for inflation. Prices from early Hellenistic Babylon may reflect this.[44] Babylon, of course, was by far the most important city in Mesopotamia and – equally important – Alexander had been spending profligately there in preparation for his next expedition.[45] The concentration of spending in time and space could easily have driven inflation.

The story in Greece and western Asia Minor is more complicated. Not all the money Alexander seized can have returned to the west. He must have spent heavily in the Middle East, on his wars and civic foundations (even if our sources grossly exaggerate their number).[46] The money that did return to Greece did so over several years, as discharged soldiers returned home and coins put into circulation in the Middle East made their way west. It is hard to know what percentage of the coinage in circulation the new coins struck off Alexander's plunder represented. For some sense of scale, Athens' estimated annual public income under Lycurgus after 338 totaled about 1,200 talents,[47] roughly 30 percent of the total coinage being added annually. We

[41] Diod. Sic.17.66.1–2, 71.1, 74.5, 80.3; Plut. *Alex.* 36.1; Strabo 15.3.9; Arr. *Anab.* 3.16.7; Curt. 5.2.11, 6.9–10, 6.2.10; Just. *Epit.* 9.14.9.

[42] De Callataÿ 1989a. [43] De Callataÿ et al. 1993: 13–18.

[44] Grainger 1999a; Van der Spek 2000b; Temin 2002; and see Chapter 14.

[45] Arr., *Anab.* 7.19.3–5 reports the construction of a new fleet requiring the cutting down of all the trees in Babylonia, excavation of a harbor to hold 1,000 warships and docks, and the dispatch of Mikkalos to Phoenicia with 500 talents (30,000,000 drachmas) to hire crews. These operations alone will have put an enormous amount of money into circulation at Babylon in a very short time.

[46] Fraser 1996.

[47] Plut. *Mor.* 842F gives the figure of 1,200, which, however, sits uncomfortably with the total that Lycurgus is said to have been in charge of over his term, 14,000 or 18,650 talents (841B and 852B). Burke (1985: 251–2 n. 5) offers a reasonable, if not wholly satisfactory, solution.

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cannot determine what percentage this represented of the money circulating at Athens, but if, as has been argued, Lycurgus generated most (perhaps two-thirds) of this income from commercial traffic, then these 1,200 talents may have been just 10 percent of the coinage in circulation. Such wealth was not typical of Greek cities – even after the Social War Athens was a major power, capable of fielding considerable forces in 338 – but does offer a sense of scale. In general, we might suppose that the coins struck from Alexander's plunder had some impact on prices, but that impact is hard to read in our sources,[48] probably because it was spread over a long period and acted differently in different places, due to variations in the "pull" of different centers on the coinage (presumably places well connected to long-distance trade and regions from which soldiers were heavily recruited would have attracted more of this money than places not so situated) and to the imperfect integration of the market already discussed.

However, there were two apparent far-reaching consequences of this spate of minting. First, the coins produced appear to have largely satisfied demand for coins until about 225 BC. There were relatively few royal or *polis* issues in these decades. After about 225 civic and royal mints came back into play, producing new issues with increasing frequency; in the first third of the second century, Athens re-entered the market for coins by issuing the so-called "New Style" coinage, probably irregularly at first but certainly annually after 145.[49] Much of the third century, therefore, apparently enjoyed sufficient pre-existing coinage to satisfy demand. Second, the Alexanders and similar issues (Lysimachoi, Demetrioi, etc.), all struck on the Attic standard, came to serve as the "common currency" (to borrow a phrase of Pl. *Leg.* 742a) of the Greek world. Payments were often stipulated in Alexanders or coins of Attic weight.[50] The last phase of monetary changes in Greece came late in the Hellenistic period, starting with Sulla but accelerating only with Marc Antony, as large numbers of Roman *denarii* entered Greece.

VI INSTITUTIONS

The Hellenistic world inherited from classical times a wide array of institutions that continued to serve central economic functions, but also saw the emergence of new institutions and some important changes to pre-existing

[48] De Callataÿ 1989a, De Callataÿ in De Callataÿ et al. 1993; Reger 2003b: 347.

[49] Thompson 1961 remains indispensable, but her dating is universally rejected. Most scholars today accept Mørkholm's 1984 dates of 145/4–78/7 for issues 20–87. Many reject his starting date of 185–180 in favor of a date of c. 168 (e.g., Mattingly 1990; Price 1989; see also Touratsoglou 1993: 31–40). The views of Dreyer 2000 seem to me unlikely to be right.

[50] Knoepfler 1997; Marcellesi 2000.

institutions. Identifying what drove these changes, and whether they reflect new economic conditions, are central questions.

One old institution saw extraordinary growth in the Hellenistic period – euergetism, the practice of individuals giving gifts, in money or kind, to public institutions, especially *poleis*, in return for recognition and status.[51] Euergetism had long been a mainstay of Athenian public finance as a mechanism for building and maintaining its fleet (until new financial arrangements were introduced in the mid-fourth century) and for financing civic displays like the annual dramatic festivals. Its spread throughout Greece and western Asia Minor in the Hellenistic period was a distinctive feature of the age. Two new developments should be noted. First, kings and their families emerged as outstanding *euergetai* for many *poleis*, making gifts on scales unimaginable to even the wealthiest fifth- or fourth-century Athenian. For example, around 299 the eldest son of Antiochus I financed the construction of a stoa one *stadion* (about 200 m.) long at the sanctuary of Didyma near Miletus, emulating gifts of his father. A second-century royal gift to Miletus of 160,000 *medimnoi* of grain and wood to build a gymnasium represented a value, in the grain alone, of between 130–260 talents – a huge sum.[52] In exchange for such gifts, kings received honors – most notably, cult. These gifts were moves in the complex dance between kings and cities that formed one of the chief features of the political, social, cultural, and economic life of the Hellenistic world.[53] Wealthy individuals adopted the model provided by royal euergetism. Particularly after about 200 BC, their gifts came to resemble the royal version especially in the honors extracted from *poleis*. The implications ran beyond the economic sphere, but as an institution euergetism surely played a fundamental (though unpredictable) role in the finances of Greek and western Asia Minor *poleis.*

Banks had of course existed in classical Greece, although their roles have been disputed in the debates over the "primitiveness" of the economy.[54] Private Hellenistic banks are well attested, such as the Delian banks that took over the treasury of Apollo in the early second century. Public or state banks also existed, and were sometimes used to administer funds given to *poleis* by *euergetai* (*Milet* I 3 145; *SIG*^{3} 577). Banks both "stored" funds and made loans.[55]

It remains to consider whether Hellenistic Greece saw the emergence of new institutions (whether public or private – and the degree to which this distinction applies is debatable), or the reconfiguration of old institutions, to serve economic ends. One institution that seems to be reconfigured is

[51] Gauthier 1985 remains fundamental, but see also Bringmann and van Steuben's massive (1995) collection of evidence.

[52] *OGIS*213, Bringmann and van Steuben 1995: 338–41 no. 281; *idem* 346–8 no. 284.

[53] A perennial topic for historians – see Ma 2003.

[54] Millett 1991; Cohen 1992. [55] For example, Beschi 1992–3: 263.

proxenia. Originally a "guest-friend" in one *polis* who served the interests of another (hosting ambassadors, standing surety, providing access to the machinery of the state), the role of the *proxenos* expanded in Hellenistic times. Some inscriptions are laconic, like this one: "The Aetolians have given *proxenia* according to the law to Lysikles son of Phaidros the Athenian" (*IG* IX I 4.3–4), but others are more informative: "Parmeniskos son of Alexidikos is *euergetes* and *proxenos* of the Kalymnians, both himself and his family (*genos*), forever, and they have the right to own property on Kalymnos and exemption from taxes on things imported and exported in both war and peace" (*Tit. Cal.* 1A, fourth century BC). It would be a mistake to see economic motives ("promotion of trade") behind all proxeny decrees. Many were granted for other purposes.[56] But some did serve economic ends. The proxeny awarded by Geronthrai in Laconia to a citizen of Lacedaemon granted him the right "to own land and a house and to pasture animals and freedom from seizure in war and peace and all the other benefits accorded to the other *proxenoi* and *euergetai*" (*IG* V.1. 1112). *Poleis* jealously guarded the right to pasture animals, as many texts adjudicating disputes or awarding mutual pasturage rights attest. The Lacedaemonian granted rights here would have hoped to draw economic benefit; his tax exemption on imports and exports would have added value to the award. Moreover, the award of *proxenia* and other honors sometimes recognized tangible economic benefits to the *polis*:

> Since Peitas son of Kratesinikos of Asopos is well disposed toward the *polis* of the Kotyratans through his ancestors, and now, when the city had need of funds to expend (*diaphoroi*) and men appointed with the ephors came to him from the city and explained the need, he promised to lend the city money and he gave as much as the city needed without interest. . . .

Peitas was rewarded with a series of benefits, starting with *proxenia* and including *isopoliteia*, pasturage rights, and complete freedom from taxation (*IG* V.1.962). It has been suggested that the Athenians in the late fourth century explicitly granted the right to own property to merchants and traders to attract commerce. Some scholars see Athens' needs to encourage grain imports at good prices as lying behind honorary decrees from the later fourth and early third centuries.[57]

Asylia was another largely new institution which had, or could have, economic effects.[58] In general, declaring *asylia* involved the recognition by others of a sanctuary and its territory, or a sanctuary and the city in which it stood, as "sacred and inviolable," standing outside the traditional right of corporate entities and persons to "seize . . . goods . . . as reprisal for an alleged wrong."[59] The earliest examples of declarations of *asylia* on inscriptions date

[56] See Reger 1994: 63–74 (but with a narrow Delian focus).
[57] Peçirka 1966: 59–61; Bresson 2000. [58] Rigsby 1996. [59] Jones 1999: 56.

to the 260s; Tacitus provides the latest, in AD 22–3.[60] A recent major study of *asylia* insists that its only purpose was to bring honor to the sanctuary and city.[61] While *asylia* did bring its subject honor, the texts suggest that other motives, some broadly economic, also played a role. A decree of the Amphictyonic Council for the sanctuary of Apollo Ptoios in Akraiphia declared inviolability for five days for persons coming to and departing from the god's *panygeris* and "while the *panygeris* is going on for them and their servants and the goods (*chremata*) which they have, everywhere; and if anyone, in violation of these provisions, seizes (*agei*) anyone or robs him, let him be subject to prosecution before the Amphictyonians."[62] This declaration enhanced the security of the festival and encouraged attendance. Other texts relating to festivals show the economic advantages accruing to the cities that sponsored them.[63] When the Phocaeans recognized *asylia* of the sanctuary of Poseidon and Amphitrite on Tenos and of the whole island, they also contributed five *mnai* (500 drachmas) toward work on the temple, and promised further contributions once their own affairs and a war were dealt with.[64] In this case the relationship, *oikeiotes*, between the cities facilitated the contribution.[65] Here, then, was an institution whose fundamental purpose was non-economic but whose side effects at least sometimes entailed economic advantages for the honorand.

We should also note institutions that facilitated the movement of persons or groups: in particular, *isopoliteia* and the various forms of *sympoliteia*.[66] Declarations of *isopoliteia* permitted citizens of one *polis* to immigrate to another and claim citizenship rights (sometimes with temporary conditions). For example, an agreement negotiated with Aetolian help established *isopoliteia* and the right of intermarriage (*epigamia*) between Messenia and Phigaleia in the mid-third century (*StV* III 495). A more detailed agreement between Pergamon and Temnos in Asia Minor specified:

> There is to be citizenship [*politeia*; the more precise *isopoliteia* is used earlier in the text] for Temnians in Pergamon and for Pergamenes in Temnos, participating in the things that the other citizens also participate in, and there is to be the right of ownership of land and house for the Temnian in Pergamon and the Pergamene in Temnos. In Pergamon the Temnian is to pay tax at the same rate the Pergamene pays, and the Pergamene in Temnos at the same rate as the Temnian pays. . . .
> (*OGIS* 265, *StV* III 555.17–24)

[60] Rigsby 1996: 580–6; Tac. *Ann.* 3.60–3, 4.14.

[61] Rigsby 1996: 22–5; but see Jones 1999: 56, recognizing implicitly the economic dimensions of the institution.

[62] Rigsby 1996: 63–7 no. 3; *SIG*[3] 635; Rigsby's translation, adapted.

[63] For example, the famous regulations of the festival at Andania, *SIG*[3] 736. For the festivals of sanctuaries, see De Ligt 1993a with the brief but useful remarks of Andreau 2001: 121–2 on the historiography; for Asia Minor, Dignas 2002.

[64] Rigsby 1996: 154–6 no. 53; Etienne 1990: 93–5.

[65] Cf. Curty 1995.

[66] For *isopoliteia* see Gawantka 1975; for *sympoliteia*, Reger 2004.

A similarly explicit agreement between Hierapytna and Priansos on Crete specified the right to buy and sell, to lend and borrow money, and to exchange all other things in accord with the laws in each *polis*.[67] The economic benefits could not be clearer. The increasing incidence of such agreements between Hellenistic *poleis* eased movement and facilitated trade, making access to courts and other local institutions easier. But there was also a price, in the form of surrendering citizenship in the home country.

Sympoliteia was a more complex phenomenon, by which two neighboring *poleis* were united politically, creating one community where there were previously two. These unions, however, were not always complete or permanent. The best known is the failed *sympoliteia* of Lebedos and Teos in Asia Minor, promoted by Antigonus the One-Eyed and heartily resisted by the two cities.[68] Because, unlike *isopoliteia* agreements, *sympoliteiai* linked neighbors, their impact on the movement of persons and on economic activity tended to be limited to a local or regional scope. Nevertheless, the economic implications could be profound. An inscription recording the absorption of Pidasa by Miletus emphasizes the agreement's economic implications: the Pidaseans were granted a series of concessions, including temporarily reduced taxes on many agricultural products and the promise of a road connecting Miletus and the former territory of Pidasa.[69]

Sanctuaries were another institution with a substantial economic role. Sanctuaries might control significant wealth in the form of dedications, buildings, and landholdings, and because of the protection of their gods, served as storehouses for public wealth and as banks. The fifth-century Athenians had kept their public surplus in the Parthenon, but they were hardly unique; in the third and second centuries the Delian state stored its funds, largely in cash, in Apollo's temple. The lines between the god's wealth and the city's sometimes blurred. In 248 the priests of Heracles at Beroia in Macedon complained to king Demetrius that "some of the god's income had been diverted into civic income"; the king ordered the practice stopped.[70] Sanctuaries also received income from practices like manumission, typically when manumitted slaves were required to make thank-offerings to the god.[71] Many sanctuaries rented out land or other real estate. And, of course, they acted as banks. It has even been suggested that the sanctuary at Delos acted as a source of funds to free up civic monies for more speculative loans.[72] Sanctuaries in Asia Minor may have sought to keep their financial interests separate from the *poleis* that controlled them,

[67] *IC* III iii 4.16–18; Chaniotis 1996: 255–64, no. 28, and see his discussion of *isopoliteia* at 101–4.
[68] See Reger 2004, with further references.
[69] *Milet* I.3: 149. See especially Gauthier 2001; also Reger 2004.
[70] Hatzopoulos 1996: 2.28–30, no. 8.4–8.
[71] E.g., *IG* II² 1553–78, *SEG* 25.180; Hatzopoulos 1996: 2.28–30, no. 8.9–13; see also Meyer in press.
[72] Gabrielsen 2005.

reflecting differences in interests between cities and sanctuaries (as represented by families of priests who controlled them and sought independent relations with sovereigns, for example).[73]

"Private" institutions also facilitated economic activity. A number of merchant associations are attested on Delos in the period of Athenian control after 167.[74] In 153/2, for example, the association (*koinon*) of *emporoi* and *naukleroi* of Tyre who worshiped Heracles honored one of their number who had served as ambassador to Athens to request a place on Delos to build a sanctuary of Heracles (*ID* 1519). An association of "merchants and ship-captains and warehousers" of Berytus who worshiped Poseidon (*emporoi kai naukleroi kai endocheis*) is perhaps the best known. They left a long decree honoring the Roman banker Marcus Miatius (*ID* 1520). Starting in 121, other associations of private persons came together on Rhodes to facilitate their economic activities. The group of "those who live in the Lindian *polis* and who farm in the Lindia," later expanded to "those who live in the Lindian *polis* and farm and sail in the Lindia" (*Lindos* 300a4–6, 384b15–16), embraced both citizens and non-citizens. This group may have pooled resources to transport, store, and ship agricultural products they produced in the *chora* of Lindos; citizen members could use their access to Rhodian state institutions to protect all members' interests. Indeed, archaeological evidence for storage and shipping facilities within Lindian territory may be associated with these groups.[75] An inscription of probably 146 BC from Troezen may provide another example of this sort of institution. Among forty-one groups giving their property to the city for its "fortification and preservation" were the *patriotai* of the Arcadians, who had received the right to own land, but not citizenship. The right of non-citizens to own land in Troezenia is reminiscent of the story (mentioned above) of Philip V's attempt to increase cultivation at Larisa in Thessaly in the late third century by pressuring the city to grant citizenship – and so the right to own land – to resident aliens.[76] These institutions – and more examples could be adduced – reinforce the impression of economic distress and a general decline in population in Greece after roughly 250 BC.

Another "private" institution with economic aspects is the family. "Family" in the Greek sense embraced a wider range of persons than today's nuclear family; like the *familia Caesaris*, the Hellenistic family might include more distant relatives, slaves, freed persons, and others.[77] The idea of the family as an economic unit is a commonplace in Greek literature and had long been the basis for agricultural and other production.[78] But family

[73] Dignas 2002. [74] Roussel 1987. [75] Gabrielsen 1997: 107; 2001: 233; Reger 2003a: 185–9.
[76] *IG* IV 757 (Maier 1959: no. 32) with Jameson et al. 1994: 565–6; *SIG*^{3} 543, of 217 and 214 BC.
[77] Weaver 1972; Pomeroy 1997; Patterson 1998; Van Bremen 2003.
[78] One need only recall the beginning of Aristotle's *Politics* or the precepts of Xenophon's *Oeconomicus*.

connections also played a part in larger scale, more formal economic activities. For example, consider the family of Tyre known from Delos.[79] Italian traders and merchants in the Hellenistic east also often relied on family ties. The L. Aufidii Bassi who lent money to Tenos in the first century were a father-and-son banking operation. Another Roman family of interest is the Gessi Ampliati. Their name appears on glass vessels at Herculaneum. A family member appears in the *senatus consultum* for Adramytteion and again on Delos, and yet another was procurator in Judea in the 60s AD. This family may have had a long-standing business importing and selling of aromatics in Italy in glass bottles manufactured by or for them.[80]

Institutions could also be physical, including publicly maintained infrastructure that supported economic activity. Ports provide a good example. Athenian investment in improving conditions at the Piraeus in the later fourth century probably contributed to Lycurgus' success in increasing state revenues.[81] Work on the port of Delos is another example (see Duchêne and Fraisse 2001).

VII WARFARE

As it did in earlier and later times, war absorbed an extraordinary amount of the gross product. War was waged on multiple levels. The seemingly endless struggles between the Successors, Seleucids, Ptolemies, Antigonids, and, after 200 BC, the Romans, formed the most spectacular and obvious level. These wars mobilized hundreds of thousands of troops and entailed logistical nightmares in moving and supplying the armies.[82] Regional wars involved smaller kingdoms like Pergamum, Epirus, or various *poleis*; Polybius memorialized the war of Rhodes and its allies against Byzantium in the later third century. These involved fewer troops and less money, but were still expensive for the participants. Finally, the *poleis* of Greece and western Asia Minor never relinquished their right to fight their neighbors. The fiscal and material support that Hellenistic "fighting *poleis*"[83] demanded from their own populations was puny compared to the needs of an Antiochus III or Flamininus, but could nevertheless swamp a small city state's resources. An example has recently appeared in an inscription from Cyme in Asia Minor. Needing weapons to arm as many citizens as possible, the Cymeans asked Philetairos of Pergamum to sell 600 sets of peltast weapons.

[79] Le Dinahet-Couilloud 1997.

[80] *CIL* X.2: 8062.56 with Scatozza Höricht 1986: 48 no. 93; *IK Adramytteion* 18.19 (Sherk 1969: no. 12), *CIL* III Suppl. 14203.4; Joseph. *BJ* 11.277, 284; *AJ* 20.257; Tac., *Hist.* 5.10; Plin. *HN* 12.111–113, all with Scatozza Höricht 1991: 76–8.

[81] Burke 1985: 259.

[82] Austin 1986 remains the classic treatment, but deals more with finances than the economy in general; cf. Launey 1987; Migeotte 2000.

[83] Borrowed from the title of Ma 2000.

Philetairos generously made a gift of the weapons out of a stock of 600 he had at hand.[84] Similarly in 213, after Antiochus III recaptured Sardis, which had been held by a rebel, he had to offer the city concessions, including tax relief and the right to cut wood from royal forests, to recover from the devastation.[85]

VIII IDEOLOGY, TECHNOLOGY, AND STOCK OF KNOWLEDGE

The stock of knowledge that can be used for economic ends includes both strictly "technological" innovations that permit new activities or increase the productivity of old, and information that can be exploited for economic gain. The long-standing view that the Hellenistic world was technologically stagnant is now yielding to research emphasizing the period's creativity, especially innovations at Alexandria in Egypt.[86] In one area – military technology – the Hellenistic world saw major innovations, from siege warfare, to the use of elephants, to the construction of ever-larger ships.[87] War was a central sector of the ancient economy, so such innovations point toward important changes more broadly in the economic scene. But new technologies were also applied to such basic sectors as agriculture. These improvements remain virtually invisible to us because of the paucity or difficulty of written sources and the restricted spheres in which the improvements were felt.

It has recently been argued, for example, that Alexandrians invented new mill technology for raising irrigation water and grinding grains in the third century and exploited it on a broad scale in the Egyptian countryside. The horizontally wheeled water mill may have been invented in the mid-third century around Byzantium, spreading around the Mediterranean over the next two centuries.[88] A poem of Antipater in the *Anthologia Graeca* (9.418) celebrates the overshot water mill as a labor-saving device.

It seems likely that the wedge press was a Hellenistic invention. This press, described by Hieron in his *Mechanika*, was specially adapted to producing fine oils in small quantities for perfumers. The press consisted of a wooden stand with cross pieces that could move vertically. Sacks of olives or other objects for pressing were placed in the rack, and workers drove wedges between the cross pieces to increase pressure on the sacks; the pressed oil flowed through a spout on the press-bed into a collecting basin. The identification of an early first-century BC example on Delos suggests that

[84] Manganaro 2000. [85] Gauthier 1989.

[86] On antiquity in general as a period of stagnation, see Finley 1965b; *contra*, Greene 2000; Wilson 2002.

[87] For siege technology see Garlan 1974; McNicoll 1997; elephants, Holt 2003; Scullard 1974; marine technology, Tarn 1930.

[88] Lewis 1997; Wilson 2002: 11.

this press was indeed a Hellenistic innovation. It permitted perfumers to press fresh oil for each batch of perfume and to control quality carefully; such control presumably compensated for the press's relative inefficiency and low production.[89]

Glass blowing was invented in the Levant (probably Palestine) in the first century AD. Mould-made glass containers were popular in classical and Hellenistic Greece, but the labor-intensive and relatively difficult manufacturing process made them expensive. Blowing glass was faster and easier, and surely brought down prices. No prices survive, but the gradual disappearance of clay *unguentaria* across the first century AD probably reflects the impact of blown glass.[90]

Technological innovation was important in Hellenistic times, but was not the only way that changes in the stock of knowledge affected economic activity. The "discovery" of the Indian Ocean monsoons has long been attributed to Eudoxus of Cyzicus, working in the (rather hazardous) employ of the Ptolemies in the late second century BC. His discovery made it possible to sail to India and back, increasing trade in the spices and other exotica that entered Greece via Alexandria. Sailors in the Indian Ocean had long used these winds for trade, but Eudoxus added their know-how to the stock of knowledge available to Greeks.[91]

The compilation of *periploi* in the later fourth century and Hellenistic period constituted another kind of increase to the stock of knowledge. These sailing guides, describing coastal features and particularly towns and harbors, were again no new phenomenon; Herodotus refers to some. But as new towns appeared and facilities changed, knowledge became outdated and revisions were required. The *periplous* attributed to Pseudo-Skylax is a good example. Some scholars see it as a genuine product of the sixth-century Skylax mentioned by Herodotus, but most now favor compilation in the later fourth century.

Thorough examination of economic ideology lies beyond the scope of this chapter. The loss of so much Hellenistic philosophy renders the task especially difficult; there is no text like Aristotle's *Nicomachean Ethics* against which to measure behavior and belief. But some motors of economic ideology may be proposed. First, the great kingdoms' interests played a major role in shaping attitudes toward economic activity. The kings' fundamental interests lay in the preservation and expansion of their holdings through warfare. Military success rewarded kings with plunder, often in enormous quantity (Alexander was the unmatchable model in this as in every other

[89] Hieron, *Mech.* 2.1.4 in the edition of Carra de Vaux 1988: 46; Brun 1999 with details; for Hellenistic perfuming, Reger 2005.

[90] Israeli 1991; Fleming 1999: 16–17.

[91] De Romanis 1996: 141–6; Eudoxus: *FGrHist* 87; Posidonius F 28 (E K² F 49; Th. F 13); Casson 1989: 12, 224. Strabo 2.98–9 for Eudoxos. Agath. 103, *GGMI*, p. 191.

field), which the kings distributed to their retinues as reward for past and pre-payment for future loyalty.[92] Hellenistic armies were expensive, and kings focused heavily on raising revenues. Pseudo-Aristotle's *Oeconomica* gives example after example of clever, not to say unethical, strategies for raising money. In considerable part, the kings' constant and all too visible hunger for money shaped Hellenistic economic ideology.

Private ideology is harder to get at. The debate over acquisitiveness seems to have run its course; in the Hellenistic period, as in the rest of antiquity, wealth was regarded as positive. Once again, the kings were important models. There is evidence for growing luxury in Hellenistic times, in the form of large, extravagantly decorated houses, taste for fancy precious-metal plate, expensive perfumes, and exotic imports. Such conspicuous consumption may be tied to evidence for larger personal fortunes, including the increased role of a few extremely wealthy euergetists, especially after about 200 BC, and the emergence of large private landholdings, especially by people with ties to kings. Once again, emulation of kings surely lies behind such attitudes. This ideology of wealth had its critics. Diogenes and the Cynics, who rejected not only wealth but also other conventional virtues like marriage, clothing, and personal modesty, are the best known. When Alexander asked Diogenes whether he needed anything (the king clearly had money in mind) Diogenes famously requested the king to move out of the sun (Diog. Laert. 6.38; Plut. *Alex.* 14). Alexander's response – that if he weren't Alexander he'd wish to be Diogenes – was philosophically right but practically wrong: only a tiny minority rejected wealth.

IX GROWTH, STAGNATION, AND STANDARDS OF LIVING

Other chapters emphasize the difficulty of measuring growth in the Hellenistic economy and the theoretical difficulties of applying the concept of growth to the Hellenistic period. I will not repeat these considerations here. In general, though, there are some indications that the third century saw little or no substantial economic growth, while the second and first centuries BC saw if not growth at least intensification of activity affecting some (not all) sectors of the economy. This may have issued more in economic realignments than in real growth – although growth may have occurred in some sectors. The main possible innovation in the agricultural sector was the water wheel in its various guises; otherwise we hear little of new crops[93] or intensification (changes in fallow patterns, more efficient ploughs) that could have substantially increased agricultural productivity. Practices like intercropping (reducing potential maximum yields in exchange for protection against failure of one crop) continued to be standard, even if in some

[92] See Billows 1995. [93] For the different situation in Egypt, see Chapter 16.

cases (such as the Argolid) there may have been moves toward market-oriented monoculture (though even in this case, there are doubts about the claim). Real progress was needed in agriculture for serious growth to occur, since it dominated the economy. Thus whatever growth occurred in Hellenistic times was confined to other sectors, and limited by the constraints of the economy as a whole.

The claim that the third century saw little growth arises from several considerations. Evidence for fiscal crises at many levels – from small *poleis* borrowing small sums to the kings' endless demands for money – suggests there was no substantial growth in the third century. Public building programs seem relatively few in the third century, another indicator that money was tight. The recent conclusion that the coins put into circulation in the first fifty years of the Hellenistic period satisfied demand till after 225 BC militates against substantial growth, which would have required more coins (which could have been satisfied by striking new issues) or by increasing the velocity of circulation (which would probably have driven existing coins out of circulation faster as they wore faster). The rising demand for new coinage after 225 does not necessarily indicate growth, since old coins might have been wearing out.

But after 200 BC other evidence may point to change. Shipwrecks suggest rising maritime trade after about 200 (though the trend began in the third century). Uncertainties surround these data, but the increase in known wrecks is too marked to be a chance result.[94] This period also saw increasing private wealth, at least among the rich, whose growing prominence as *euergetai* points in the same direction. Many *poleis* in Greece and especially in western Asia Minor began major public building programs after 200 – again suggesting that resources were easier to mobilize. But we lack quantifiable evidence that could differentiate between growth and reconfiguration of economic activity; and these two possibilities are, in any case, not mutually exclusive.

Although (for example) numbers of shipwrecks were already rising in the third century and new coinages were appearing by 225 BC, the arrival of the Romans may have been an important engine driving changes in the Hellenistic economy. After 200 BC, Roman armies were increasingly present in the Aegean and western Asia Minor, and their demands for food and other supplies must have strained and reconfigured distribution systems. A Thessalian inscription illustrates how Roman needs for grain affected local distribution and storage.[95] Italian traders also entered the Aegean and western Asia Minor in growing numbers, establishing themselves in centers of trade and diverting goods and money westwards. The resentment they provoked exploded in massacres at the start of the First Mithridatic War.

[94] Gibbins 2001: 279, figure 10.2, 288–90. [95] Garnsey et al. 1984.

That is to say, at least in part an engine behind the changes visible from about 200 BC on may have been this new presence. However, it should be borne in mind that some possible indicators of change appeared before the Romans, suggesting that some underlying changes, perhaps associated in part with a refocus of attention eastward after Alexander, may have already been operating.

Many years ago, Tarn assessed Hellenistic standards of living on the basis of prices recorded on Delos. He concluded that the standard fell in the third century, and connected this to a more general economic crisis that, he argued, struck Greece.[96] His conclusions rest on fragile foundations, and no one attempted a similar global assessment in the following eighty years. It is hard to judge from other, typically anecdotal, evidence – Menander's comedies, Herondas' mimes – whether living standards rose, fell, or stagnated. The indicators of economic stress noted above may suggest that the third century saw new challenges, but I would hesitate to draw sweeping conclusions.

In general, however, we should remember the constraints on growth prevailing at all times in the ancient Mediterranean. Periods of growth and reconfiguration occurred within an "underdeveloped" economy, founded on agricultural production organized mostly at the family scale, supplemented by larger-scale ownership by a tiny elite, and some slave labor. While the distribution of wealth and the capture and distribution of surplus production may have changed in Hellenistic times, the larger structural features persisted. Redistribution – especially concentrating goods in fewer hands – may have caused hardship for the poorer majority. But the limitations of our evidence preclude much detailed discussion of these matters.

[96] Tarn 1923.