

SLAVERY AND ATHENS' ECONOMIC EFFLORESCENCE: MILL SLAVERY AS A CASE STUDY

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ABSTRACT: Following a recent wave of literature arguing for significant growth in the ancient Greek economy, several ground-breaking books have sought to explain this phenomenon through the lens of New Institutional Economics (NIE). The undeniable prevalence of slavery throughout ancient Greek history, however, has not been substantially integrated into these new analyses. This essay intends to address this problem, by elucidating some of the ways in which slavery contributed to the economic efflorescence of Greece's late archaic and classical period (600–300 BC) within an institutionally focused approach. Examining specifically the state of Athens, this study contends that not only did the system of slavery import a vast amount of labour from other areas of the Mediterranean into the Athenian polity, but it also directed labour towards economically productive aims that were otherwise limited by Athens' societal framework. The use of slaves in milling operations provides a key and often overlooked example, which will here be used as a case study.

KEYWORDS: Slavery; Institutions; Economic Growth; Milling; Exploitation.

Over the past 15 years or so, academic discussions of the ancient Greek economy have radically changed. In previous decades, historians widely accepted a model of the ancient economy that emphasised the subordination of economic forces to political and social ones throughout classical history, resulting in a low level of economic growth.² Over the past twenty years, however, scholars have argued the contrary: that the Athenian economy was driven by economically rational behaviour (e.g. Loomis, 1998, p. 253-254; Christesen, 2003) and many studies have now argued that the economies of archaic and classical Greece did see considerable growth.³ Several new syntheses of the ancient economy have followed this change in focus, including two edited volumes on the ancient world generally (Scheidel *et al.*, 2007; Droß-Krüpe *et al.*, 2016) and Alain Bresson's *The Making of the Greek Economy* (2016). These studies all lean heavily on the

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² This model was championed by Moses Finley (1973). Cf. Austin and Vidal-Naquet, 1977; Meikle, 1996; Millet, 2001.

³ A comprehensive overview can now be found in Bresson, 2016, p. 203-208, *passim*.

perspective of New Institutional Economics (NIE) to explain the basis of this economic growth in classical Greece's particular state institutions (Ruffing, 2016). Another notable contribution, Josiah Ober's *The Rise and Fall of Ancient Greece* (2016), also incorporates NIE analysis into his overall argument that during the classical period, the Greek economy and Greek society experienced a period of "efflorescence" (p. 5-6, *passim*).

However, whereas the prevalence of slavery in ancient Greece was central to the older view of the ancient economy (e.g. Finley, 1973, chapter 2), the NIE School has insufficiently incorporated it into its analysis. This has been noted in reviews of Ober (Vlassopoulos, 2016a) and of Bresson (Lewis, 2017). To be sure, both authors mention slavery numerous times in these works, but its effects are lacking any extended discussion in their narratives, as they are in the NIE-focused edited volumes. As Lewis (2017, p. 241) writes, "the upbeat tone of recent [economic] work [...] is yet to reckon fully with the contribution of that parasitic institution, imported slave labour, which surely ranks as one of the major institutional factors that drove the efflorescence of the [Greek] city-states". What follows are a few remarks I think are relevant in correcting this problem. I have restricted my purview to Athens, due to considerations of space and also to the comparatively large amount of evidence from Athens, which puts us in a good position to study in detail the relation of a Greek state's slave system to its economy.

I will clarify in a preliminary section what I understand "the institution of slavery" to mean and its place within a NIE-focused approach to Athens' economy. After this, I will first discuss the basis of the Athenian economy in individual households and the consequent role of slavery in providing a permanent labour force within this structure, beyond the immediate family. My final section will discuss slaves in industrial milling enterprises. This is partially because milling is a good example of labour which slave exploitation can make particularly productive and partially because its significance in this regard has so far received little attention.

1. *The Institution of Slavery in Athens*

In order to define what we mean by an institution, we might turn to Bresson (2016, p. 19-20), who, drawing on the work of Douglass North, defines institutions as follows:

Institutions include all the forms of constraint used by humans to regulate their mutual relationships. Institutions are in fact both formal and informal: legal rules, simple conventions, codes of conduct— all of these can fall under the rubric of “institutions.” Institutions can be created, like the Constitution of the United States, or they can evolve over time, like British Common Law. Institutional constraints include both the forbidden and the permitted. They are comparable to the rules of playing a game.

In Athens, theoretically unlimited power over a person could be acquired through methods of property transaction, as Lewis (2018, p. 39-48) has recently set out.⁴ Persons subjected to this condition were legally defined as a single status of person: *doulos*. That is not to say, as far as we can tell from what survives of classical Athenian law, that *douloi* were so explicitly defined by Athens' legal code. Rather, Athenian law sanctioned, protected, and regulated the right of persons to treat people as property in particular ways. Differences between slaves and freedmen according to penal, judiciary, and contractual law further enforced the second-class status of slaves.⁵

The laws surrounding slavery in classical Athens are a reflection of the fact that slave-ownership was a prominent social convention. There is not the space here to discuss the extent of slave-ownership in classical Athens, which has been the subject of intense debate over the past 50 years.⁶ However, few would argue against the notion that amongst Athens' wealthy at least, slave-ownership was near universal. All wealthy Athenians owned slaves, at least partially because

⁴ Cf. Todd, 1993, p. 184-185; Harrison, 1968, p. 164-177.

⁵ On the harsher treatment of slaves in Athens' law see Hunter, 2000, p. 70-94, 154-184; 1992; Todd, 2000; Mihardy, 2000; Thür, 1977. On the legal lack of slave agency see Dem. 53.20; Lewis, 2018, p. 46-47; Todd, 1993, p. 187.

⁶ The debate is well summarised by Fisher, 1993, p. 37-47; Tordoff, 2013, p. 16-23; Lewis, 2018, p. 180-183.

their contemporaries did, as had their ancestors. Though we cannot quantify it numerically, it is clear that this resulted in a sizeable amount of labour being imported into Athens throughout the classical period and in the earlier sixth century as well.⁷ We can also fairly hypothesise that social convention would have played a role in dictating the work to which slaves were set and how they were treated beyond what was specified in law. A set of preconceived ideas about slaves and slaveholding shared amongst Athens' residents, in other words, strongly influenced the reality of Athenian slavery.

The social conventions of slave-owning, reinforced by Athenian laws surrounding the ownership of slaves, comprise the institutionalised elements of slavery in Athens.

The institutions of a given society can be classified in four main sectors: the political (the state or other forms of collective authority), the symbolic (religion and other worldviews), the reproduction of persons (kinship and demography), and the production of material goods (economics) (Bresson, 2016, p. 26).

As Bresson (2016, p. 28) further argues, the divide between these categories is often arbitrary and they are all closely interlinked. This is well demonstrated by the institution of slavery. As a system regulating the commodification of persons, it is economic. But because slaves are human beings, slavery is equally a political institution (by excluding slaves from political decision-making processes and the coverage of Athens' civil rights) and concerned with the reproduction of persons (by assimilating slaves into their master's *oikos* and denying them formal rights to normal aspects of kinship).⁸ The existence of slavery also had a profound impact on the symbolic institutions of the *polis*. Concepts of slavery and freedom developed in relation to real-life slavery acquire a wider significance that permeates Greek thought on e.g. interstate relations (Vlassopoulos, 2011, p. 117-118) and conversely on the idea of freedom and citizenship, which we will discuss below.

⁷ On the Athenian slave trade, see most recently Lewis, 2011.

⁸ Also connected to the political are rules about who cannot be a slave. Sixth century Solonian legislation forbade the enslavement of Athenian citizens for debt (Harris, 2002a) and the enslavement of a freeperson in Athens was punishable by death (Hansen, 1976, p. 47).

Slavery is prominent in what remains of Athens' cultural output, a fact reflecting the importance of this particular institution to its society at large. This was most famously articulated by Moses Finley (1959; 1980, chapter 2), to whom Athens qualified as one of the few "slave societies" of history. Scholars have now shown that Athens was not so unique in this regard as Finley thought and have questioned the usefulness of the term "slave society" at all (e.g. Lenski, 2018). Nevertheless, the centrality of slavery to Athenian society is not in dispute (e.g. Hunt, 2018, p. 66-77). Though, as I mentioned above, accurate demographic data for Athens' slaves are non extant, many historians now believe them to have made up approximately a third of Athens' population (*ibid.*; Ober, 2016, p. 92).⁹

That slavery was important to the Greek economy is not in dispute either. Ober (2016, p. 8-9), for example, considers exploitation an important factor in Greece's economic growth, although not a unique enough factor to be an explanatory one. Bresson (2016, p. 221) writes that Greece's

successes should not make us forget the cruel exploitation of slaves, which was one of the pillars of the system [...]. Initiative, inventiveness, the quest for the most profitable institutional solution, and at the same time the limitless exploitation of slaves: such were the driving forces in the economy of the Greek city-states.

Bresson (2016, p. 123, 126-127) rightly emphasises the large-scale importation of slaves into Chios during the archaic and classical period, as crucial to the development of its economy based on inter-state wine trading.

However, as I noted in my introduction, the importance of slavery is lacking a structured analysis in the work of Bresson and others. Bresson's many insightful observations about the role which slavery played in the Greek economy are generally underdeveloped and limited to an afterthought – a qualification on the role which ecology, competition, and markets protected and regulated by law played in Greece's economic development. Now that economic growth driven by economically rational goals has been returned to our analysis of the Greek economy, the place of slavery in facilitating this growth is due more emphasis than has recently been afforded it.

⁹ Bresson (2016, p. 459-460 n. 144) stresses uncertainty and fluctuation above all.

In the sphere of agriculture, Michael Jameson (1977-8) argued long ago that slave-ownership allowed intensive Athenian land use that fully exploited limited land for high crop returns. His position found further support in survey archaeology published by Lohman (1992; Jameson, 1992) as well, I would argue, as the more recent findings of Moreno (2007).¹⁰ Jameson's conclusions also fit better with the recent revision of the Greek economy.¹¹ I have decided in this essay not to focus much extended discussion on agriculture, well studied as it is. That being said, many of the conclusions I draw in the following paragraphs should be seen as applying to farming as much as to other economic activities.

2. Slavery, the Athenian Household, and Permanent Labour Forces

The NIE School has frequently pointed to the equal protections afforded to those of adult male citizen status in Greek laws – observable above all in Athens' democracy – as a key driver behind the efflorescence of Greek culture and economic growth. This is further attributed to an ideology that stressed equality amongst Athens' citizens, as most fully articulated by Ober (2016, p. 110–117, *passim*). The editors of the *Cambridge Economic History of the Ancient World* made a similar observation in their introduction (2007 10–11). “On the other hand,” they add, “the ideology of egalitarian male citizenship drove many forms of economic activity to the margins of respectable society”. Indeed, the same ideology that fashioned a citizen body whose property and investments were equally protected in law also, by its limitations on the extension of this equality, fashioned a labour system heavily influenced by legal status boundaries.

In the context of classical Athens specifically, Osborne (1995) has argued that the belief that Athenian citizens did not have to work under certain conditions that were considered demeaning was key to Athens' democratic principles and that slaves filled the resulting gaps in Athenian labour demands. We can separate Osborne's conclusions into two strands that he discusses at

¹⁰ Moreno has identified an area of some 30 kilometres of cleared and terraced land in the ancient *deme* of Euonymon and those of Halimus and Aixone surrounding it. Much of the construction of which can be dated to the classical period on the evidence of recovered pottery and inscriptions (Moreno, 2007, p. 51-5). Hunt (2018, p. 71–72) and Foxhall (2007, p. 121-124) have also written on the importance of slavery to Greek agriculture.

¹¹ Intensive agriculture lends itself better to market-oriented farming, which scholars now view as a significant feature of Athens' economy (Lewis, 2018, p. 186-193; Harris and Lewis, 2016, p. 12-13).

various points throughout his chapter. 1.) Certain tasks were reserved primarily for slaves. 2.) Athenian citizens rarely worked long-term in the employment of another, whereas slaves regularly did. Neither of these points is now in contention, as far as I am aware, and I would like to develop some of their ramifications on the Athenian economy in a little more detail, beginning with the second.

Though there is good reason to think that free hired labour was an important part of Athens' economy (Vlassopoulos, 2016b, p. 673-675), Athenian sources seem to have distinguished temporary or contracted wage labour from “work that required regular and repetitive service for a single employer on an ongoing basis over a continuing period— what we would term a ‘job’” (Cohen, 2006, p. 100 with references). The latter type of work, which implied dependency on another person, was ridiculed for limiting a person's freedom and was therefore equated in abstract terms to slavery (Osborne, 1995, p. 36-37; cf. Scheidel, 2002, p. 182; Ste. Croix, 1981, p. 40). Aristotle (*Pol.* 3.1278a11–13) defined it as the remit of a slave. In Xenophon's Socratic dialogue *Memorabilia* (2.8.3-5), Socrates suggests that a citizen named Eutherus employ himself as a manager (*epistatēs*) on another's estate to help his recent financial issues. Tellingly, Eutherus replies that he could not do so, as “it would be difficult for me to make myself like a slave”. Of course, we should not assume that the attitudes expressed in these sources would have been sufficiently strong as to stop citizens from making a living in this way (Scheidel, 1990). Indeed, the very fact that Xenophon mentions this at all tells us that it was an option for citizens and other free labourers and suggests that it was a position which some at least occupied.¹² A courtroom speech written by Demosthenes (57.35) describes a citizen woman working as a wet-nurse. At the end of the fourth century, the philosopher Kleanthes supposedly worked as a labourer drawing water for a garden and grinding grain for a flour seller (Diog. Laert. 7.168–9). However, in both cases, this work is portrayed as a mark of poverty; in the former, we learn that it called into question the legal status of the woman who performed it (Dem. 57.45).¹³

¹² It has even been reasonably argued that this passage is a straightforward indication of an increase in permanently hired managers, caused by citizens' financial troubles following the end of the Peloponnesian War (Audring, 1973, p. 114-115).

¹³ Additionally, Kleanthes was a metic immigrant, not a citizen, and he worked part-time in order to engage in philosophy during the day. Nursing, moreover, is a job that requires a relatively lengthy but nonetheless temporary affiliation with an employer.

The general impression we get from our sources is that almost anyone who could afford to would have been self-employed (Lewis, forthcoming 1). This is tied to the fact that “the institutional structures of Greek society were alien to the idea of the corporation, being firmly rooted in alternative institutions, the social relationships of the household” (Foxhall, 2007, p. 39; cf. Davies, 2007, p. 128-129). The prominence of top-down directed labour towards a unified goal in the modern world, facilitated on a large scale by the predominance of firms, was consequently far less prevalent in Athens. However, it did exist within the confines of individual households, above all through the ownership of slaves. Perhaps the strongest indicator of this reality is the absence in our sources of freeborn persons working in managerial positions in elite households. Instead, we find numerous slaves and freedmen occupying these roles, to the extent that the employment of slave managers appears to have been customary amongst wealthy Athenian households.¹⁴

In a chapter on ancient economic institutions, Frier and Kehoe (2007, p. 126-127) note the role which firms play in an economy by restricting transactions and thereby their cost. Moreover, as Harper (2010, p. 213) notes in relation to Roman slavery, the transaction costs involved in acquiring slaves for a role are generally far lower than those of acquiring a freeperson. Davies (2007, p. 354) also observes that slavery

had the overwhelming advantage of providing a means, via the slave trade, of moving men and women efficiently (because forcibly) over long distances and if need be across cultural and ethnic boundaries, to where they could be profitably used.

Slavery cost-effectively re-centred labour towards productive ends, in other words, and this applies not only across state-boundaries but also across households in a single city and even within a household. It is no-doubt true that the protection of Athenian citizens fostered a competitive economic climate that drove growth. But this competitive framework also functioned through the

¹⁴ A few examples: slaves (Aeschin. 1.97; Dem. 36.13; Xen. *Mem.* 2.5.3) freed-persons (Dem. 27.19; 36.4; Isae. 6.19–21). Slaves appear the primary source of agricultural management in Xenophon’s *Oikonomikos* (e.g. 12.2–3) and Pseudo-Aristotle’s *Oikonomika* (e.g. 1.1344a25-26).

forcible direction of a large section of Athens' population, which must surely have played its part in increased production as well.

The absence of ancient firms and dominance of the household as an economic unit, as Frier and Kehoe (2007, p. 127-137) go on to observe, is reflected in the absence of laws facilitating the designation of agency by a primary to third parties outside his household in Greek and Roman law. Instead, dependents (in Athens, slaves or freemen), performed the vital role of agents (Harris, 2013a, p. 112, *passim*). Frier and Kehoe focus on the banking industry, which relied on both slaves and freedmen as far as we can tell from our evidence (cf. Cohen, 1992, 73-101). This is an important point. Harris (2013b; 2015, p. 130-133) has rightly drawn attention to the importance of readily available capital investment in the Athenian economy as both an indicator of markets and as a driver of growth. The vital role that slaves played in facilitating capital loans, however, is also clear. Athens' banking industry is the most prominent example, but even outside the banking world, we find slaves heavily involved in the process of managing loans, where their inevitably wealthy masters (i.e. those with money to invest) were unable. Thus, it was a slave who, while his master was away from Athens, collected the rent on an indebted workshop and seized it when the rent was not paid (Dem. 37.25).¹⁵ In another instance, a slave placed in the Bosphorus was tasked with examining the cargo of a ship, to whose voyage his Athenian master had made a loan (Dem. 34.8).

Athens' household-structured economy also affected the city's artisanal sectors. Particularly noteworthy are the sizeable manufacturing workshops we know of, which were staffed (both workers and management) entirely with slaves. Admittedly, our detailed examples are quite limited.¹⁶ However, several of Athens' political leaders in the second half of the fifth century made their money through craftwork and it is commonly thought that they did so through the employment of slaves (Acton, 2014, p. 16; Davies, 1971, p. 404; Lind, 1990 88-

¹⁵ That this slave collected the rent is plausibly inferred by MacDowell (2004, p. 175).

¹⁶ Demosthenes inherited 32 or 33 blade and 20 furniture-manufacturing slaves (27.9) and Timarchos 9 or 10 shoemakers (Aeschin. 1.97). In the fifth century, Lysias' family owned 120 or so slaves (Lys. 12.19), many of which were likely involved in their shield-making business (12.8). Apollodorus also owned a sizeable shield-manufacturing business in the fourth century (Dem. 36.11). Xenophon's *Memorabilia* (2.7.6) also describes wealthy individuals who made their money through slave manufacturers.

93).¹⁷ These workshops amount more or less to the entirety of our evidence for mass production in Athens' classical history. Though the total output of these operations at a given time is difficult to quantify, it probably made up a large proportion of the non-agricultural goods sold on Athens' markets.

It is important that these operations facilitated (or rather, forced) a great deal of cooperation between craftworkers; workers would have shared tools and facilities (workspace, marketing stalls, and necessary natural or fixed resources) as required. Such operations would have required considerable organisation, but even a single craftsman operating on his own would have needed to organise his supply of materials and tools and interact with a buyer or buyers for his products. A single workshop head, such as that of Demosthenes' blade-making workshop (27.19), could handle the organisational side of the enterprise, while artisans remained focused on their work. As Xenophon (*Oec.* 20.16) put it:

it makes a great difference to the profitability of agriculture, when labourers are available, and plenty of them too, that one man is concerned about whether the labourers are working during the working hours, whereas another is not concerned about this (translation by Pomeroy, 1994).

Agriculture was not as unique in this regard as one might take this passage to suggest.

Slave workshops also would have allowed specialisation of manual labour. Harris (2002b) noted that while the Athenian economy included significant horizontal specialisation throughout the city, it lacked notable vertical specialisation within a single enterprise.¹⁸ This should be seen partially as arising from the predominance of the independent household in Athens' economy, though Harris (2002b, p. 80-81) argues that the low level of technology generally, which reduced the possible steps in a given process of production, also contributed by providing little incentive to organise a high degree of vertical specialisation (80-81). This is true in comparison to industrialised economies

¹⁷ Kron (1996, p. 131-174) has discussed at length evidence that Athens' elite commonly owned such operations.

¹⁸ "Horizontal specialization is created by the diversity of goods and services produced by a given level of technology... Vertical specialization refers to the number of skills or work-roles required to produce a single product or line of products." (Harris, 2002b, p. 70).

generally and of many of Athens' specific manufacturing processes. Yet, vertical specialisation still had significant value in boosting production in certain processes, as Xenophon noted in a now well-known passage of his *Cyropaidia* (8.2.5). The kind of specialisation Xenophon had in mind, furthermore, is most productive in an environment where transactions between different specialists are minimized, like a workshop. Bresson (2016, p. 188-189) notes how specialisation likely had a profound effect on, for example, weapons manufacturing, based on the large number of Athenian workshops we know of staffed by slaves (2016, p. 188-189). The key point, however, is that such workshops only existed in Athens through its institution of slavery.

An industry which Bresson and similarly Acton (2014, chapter 3) highlight as one which entailed a high degree of specialisation is the pottery industry.¹⁹ It would appear from archaeological finds and vase paintings that starting in the sixth century and continuing throughout the classical period, much of Athens' pottery was constructed in workshops consisting of around six people; perhaps occasionally more (Acton, 2014, p. 84-86 with references). Arafat and Morgan (1989, p. 317, 327-328) suggest that these operations were organised around extended families, a suggestion I find feasible but unlikely to have been the norm. The shoulder of a black-figure hydria²⁰ printed in Arafat and Morgan's (1989, p. 317, fig. 2) essay and dated to the penultimate decade of the sixth century depicts a bustling pottery workshop, overseen by a workshop head who, clothed in a chiton, appears to be of a higher status than the other workers who are naked. There is nothing in this scene to suggest a family business of the kind the authors imagine. Businesses shared by brothers, let alone other relatives, are virtually non-existent in our classical evidence, and households generally seem to have been based around a nuclear family.²¹ Much more likely was that these workshops were staffed by slaves.²² More generally, because of Athenians' distaste for dependency on others, wherever specialisation was possible in the

¹⁹ Acton's chapter is often well informed and insightful, but also contains many factual inaccuracies that Rostroff (2015) has listed in a review.

²⁰ Munich, Staatliche Antikensammlungen und Glyptothek, Inv. 1717.

²¹ Scholars have pointed to a number of legal disputes between blood relatives to support this point (Foxhall, 2007, p. 51-52; Roy, 1999, p. 3).

²² The names of several sixth-century vase painters, indeed, strongly suggest that they were slaves (Sparkes, 1996, p. 110-111).

Athenian economy it would have been facilitated most easily by slavery, even in the case of a single free worker with a slave.

Neither should we forget that a permanent staff of publicly owned slaves (*demosioi*) was key to the function of Athens' state. Throughout its classical history, the implementation of Athens' laws and policies were overseen by temporary magistracies occupied by citizens – whose secretaries, even, were bound by term limits ([Arist.] *Ath. Pol.* 54.3-5). The state relied on public slaves to (amongst other things) provide the protection of property, trade, and investments which scholars now tout as an explanation for ancient Greek growth. A good example are the *dokimastai*, public slaves tasked with judging the authenticity of coins circulating in Athens (Stroud, 1974, p. 165–7).²³ Similarly, Harris (2016, p. 120-124) argues that state records of land transactions kept by Athens' *poletai* would have helped facilitate an active market for land. The copying and keeping of these records, as others, was also dependent on *demosioi* (Ismard, 2017, p. 38-40; Sickinger, 1999, p. 144).²⁴

To summarise, the Athenian economy was built around the idea of the independent household. For this reason, slavery provided an otherwise limited means of creating permanent employees that allowed the efficient direction of large labour forces towards mass production, management of capital investment, and a system of expert bureaucrats able to facilitate the protection of economic activity through law. I hope it is obvious that none of this constitutes a defence of the institution of slavery, which I take to be indefensible on account of its high human cost. Besides the restriction of slaves' free will and dishonouring of their position in society, one could fill an article many times longer than this one with discussion of the injustices and cruelties of Athenian slavery. Indeed, this will be even more apparent as we move on to the subject of the following section.

²³ Ismard (2017, p. 40-41; cf. 83-86) finds further evidence that their role existed (though not as a formal position) at least as early as the end of the fifth century.

²⁴ Pseudo-Aristotle (*Ath. Pol.* 47.5) mentions *demosioi* as record keepers in connection specifically to the *poletai*.

3. *Slave Labour and Commercial Milling*

As mentioned above (see p. 30-31 *supra*), Osborne argued that slavery protected citizens from participating in work that was particularly undesirable. He mentions mining as one example. Indeed, few historians of ancient Greece will need reminding of the importance of silver mining to the Athenian economy. Its scale was tremendous – archaeologists have uncovered some 140km of excavated mineshafts in Attica's mining region, according to Rihll (2001, p. 116), and the bulk of this was probably performed in and around the classical period by a workforce consisting almost entirely of slaves.²⁵ We suspect that mining was dangerous as well as unpleasant labour and that slaves were therefore the ideal workforce to conduct this work.²⁶ Osborne (1995, p. 37) also argued that economic rationality can be observed from the fact that “any of the jobs which slaves were employed to do were jobs which were either only worth having performed if they cost no more than minimal maintenance”. Another example is grain grinding, which, though not discussed by Osborne, covers both his categories of ideal slave labour – it was undesirable and was likely to have earned (in market value) only marginally more than a person's maintenance. In what follows, therefore, I will discuss industrial milling in Athens, its importance to the Athenian economy, and the crucial role that the Athenian institution of slavery played in its development.

Like other pre-industrial, grain-based societies, that of Athens relied on a huge amount of manpower for the grinding of grain into flour and we have some considerable evidence for commercial mills. Two individuals are identified by their profession as a miller (*mulothros*) in fourth-century law-court speeches (Dem. 53.14; Din. 1.23) and a mid-fourth-century comedy by Eubulus was titled the milleress (fr. 65 K-A).²⁷ Xenophon's (*Mem.* 2.7.6) Socrates claimed that a certain Nausikydes became rich from setting slaves to make barley flour

²⁵ In his *Poroi* (4.1-32), Xenophon envisages state exploitation of these mines purely through the purchase of slaves, which he justifies by pointing to the many Athenian citizens who were already doing so privately (4.14).

²⁶ Xenophon seems to imply that such work would result in a high death rate (*Vect.* 4.14). In later periods, mining continued to be primarily the reserve of slaves and convicts (Millar, 1984, p. 137-143). Discussing mining slaves in the Pontus, Strabo (12.3.40) was explicit about the terrible conditions and high death rate amongst them.

²⁷ Epigraphy provides some further examples (*IG* II² 10995; *IG* III 3.68a.1-2). I am indebted to the list of professions in Lewis for these references (forthcoming 2).

(*alphita*), a product which two Aristophanic characters bought from the market (*Eccl.* 817-823; *Vesp.* 301). The corpus of Aristophanes also furnishes references to bread sellers (*Vesp.* 238; *Ran.* 112; cf. [Arist.] *Ath. Pol.* 51.3), who would have depended on a regular supply of flour, probably supplied by Athens' mills.

Milling also take place within the domestic setting of Athenian households. According to Halstead's (2014, p. 169-170) study of pre-industrial modern Greek agriculture, milling within individual homes was avoided near universally during this period, despite the unfair prices which mill owners were thought to have charged: so unappealing was the notion of using family members to grind grain. However, the prevalence in classical Athens of domestic slaves, about whom there would have been less qualms about subjecting to this arduous task, made grinding at home a more acceptable solution.²⁸ In order for a milling industry to be viable on a large scale, therefore, it must have had a competitive advantage. Specialised equipment may have provided one. Several hopper mills dated to the classical period have been discovered across Greece (Frankel, 2003, p. 7) and one from the fifth century in Athens (Runnels, 1981, p. 296). They would also have been more expensive than more rudimentary mill stones (though by how much we cannot say) and would have taken up a more considerable and fixed space. Additionally, there are reasons for thinking that the labour necessary for specialised milling enterprises could be acquired and maintained at a comparatively low cost, which I have set out below.

Our evidence provides abundant references to slaves in millhouses (*mylones*). In the early fourth-century, Euphiletos, the speaker of Lysias' *Against Eratosthenesi* (1.18), threatened to throw his slave into a mill (1.18) and nearly 100 years later a distressed slave is presumed to be worried about suffering the same fate when he appears agitated in Menander's *Heros* (2-3).²⁹ A fragment of Aristophanes suggests that the idea of slaves being punished by being sent to the mill was a literary *topos* by the time his *Babylonians* was performed in 426 BC (fr. 95 K-A). In other fragments of old comedy, a reference to "falling into the mill" was attributed to Eupolis (fr. 387 K-A) and Theopompus Comicus supposedly

²⁸ The comic poet Pherecrates imagined an earlier era (one without specifically domestic slaves) in which free women had to mill their own flour (fr. 10 K-A). Theophrastus' "rustic man" (*Agroikos* 4.7) makes sexual overtures to the woman who makes bread for him (*sitopoiος*) and ends up helping her grind grain. The woman is almost certainly his slave.

²⁹ Other Menandrian references to slaves in the mill: *Aspis*, 238-45; *Pk.* 277-8.

linked the mill to the place where slaves were tortured (*basanisterion*: fr. 64 K-A).³⁰ The fragment of Aristophanes comes from the *Etymologicum Genuinem* (s.v. *zetreion*), whose Byzantine compiler believed that this reference to a mill described a place in which slaves were punished, whereas elsewhere it could refer to an actual grain processing operation. The source in which Eupolis and Theopompus were preserved described it as a slave prison (*desmoterion*) in Chios and Achaëa (*Etym. Magn.* s.v. *zetreion*).³¹ Following especially this second source, Hunter (1994, p. 171) has argued that the term *mylon*, when applied to the treatment of slaves, was a euphemism for a slave jail in Athens, in which disobedient slaves were shackled and corporally punished.

Klees (1998, p. 189-192) is right, however, to argue that these passages probably refer to the sale or temporary rental of a slave to a genuine mill, despite the inarguably prominent role this played in discourses on slave discipline (1998, p. 189-192).³² In the case of Euphiletos' threats to his slave girl (Lys. 1.18), sale is implied by the claim that the suffering that his slave, were she to be thrown in the mill, will “never stop” (μηδέποτε παύσασθαι). Unless we understand this as Euphiletos implying that his slave will be held in a cell for the rest of her life – which seems a drastic and uneconomic response – this implies that the “mill” in this instance was not strictly a slave jail. Furthermore, as Klees (1998, p. 240) states, in Euripides' *Cyclops* the Satyr Silenus tries to frighten Polyphemos by claiming that Odysseus intends to enslave him (Polyphemos) and sell him to someone who will use him to remove stones from the ground or have him “thrown in a mill”.³³ Although this prospective fate is meant to horrify Polyphemos (and

³⁰ The word here is *zetreion*, the meaning of which is comparable to *mylon* in its sense as a mill, according to Pollux (7.19.2), who also knew of several words for the mill (including *mylon* and *zetreion*) which could refer to a place in which slaves were punished (3.78).

³¹ The writers of many later thesauri concurred. Georgius Choeroboscus (s.v. *zetreion*) and Aelius Herodianus (3.1.372.7-8) described it as meaning either a prison or a mill. The Suda (citing Eupolis), the lexicons of Hesychius, Photius, Pseudo-Zonaras and the Lexica Segueriana simply list it as a place in which slaves were punished (*kolasterion*, s.v. *zetreion*). Joannes Philoponus' list of synonyms lists one definition of *zetreion* as a place in which slaves were punished, although the second definition appears to have been lost in a lacuna of the manuscript. The *Etymologicum Magnum's* reference to Chios and Achaëa is unique, and there is no suggestion that the term *mylon* could refer to anything other than a mill.

³² This may be the belief of the author of the *Etymologicum Gudianum*, regarding the term *zetreion* (s.v.). This depends on the translation of the conjunction *egoun* that separates its definition of the word as a slave prison and a mill proper in the text. It may mean “or”, but it can also mean “more specifically”, in which case the *zetreion* is described both as a slave prison and a mill.

³³ As Klees (1998, p. 191-192 com n. 130) also points out, the reference to bread-makers taken on campaign from Athens' mills in Thucydides (6.22) need not refer to freemen, as many have

is surely emblematic of Athens' contemporary slave system), its motivation, in these circumstances, was not punitive. It is clear that the unfortunate fate of mill slaves was a subject of Athenian literature throughout a great swathe of the classical period.

The dejected state of slaves tasked with grinding grain was a reoccurring topic in Greco-Roman writings for nearly a millennium. It appears in possibly the earliest surviving example of this literary tradition, the *Odyssey* (20.107-120), in the words of a slave woman:³⁴

Twelve women worked these mills making flour of barley and of wheat, the marrow of men. The others had gone to sleep, having ground their wheat, but she alone, the feeblest, had not stopped. She stopped working her mill and, standing up, spoke a word, a sign for her master: "Father Zeus, lord of gods and men, you have thundered from the starry sky, yet there are no clouds anywhere: surely you are revealing a sign for someone. Bring to pass this word uttered by my wretched self. May the suitors for the last time feast today in the halls of Odysseus. They bring me sorrow with bitter labour as I make them barley flour, may they dine here for the final time."

By the time of classical Athens the unenviable fate of *Odyssey's* slave was no longer the result of a specific set of circumstances (she is forced to grind large amounts of grain on a regular basis in order to provide food to Penelope's suitors who dine in *Odysseus's* home during his absence) but the permanent reality of many slaves working in commercial mills. The same motifs attached to slavery and milling also appears in Latin and later Greek literature. Cicero (1.4.14) was unsure whether or not a captured runaway slave had been thrown in a mill in a letter to his brother Quintus, the detestable conditions of a flour mill were famously described in Apuleius' *Metamorphoses* (9.12) in the second century AD, and the use of the mill as a punishment for slaves is referenced repeatedly in late antique sources (Harper, 2011, p. 138-139, 231).

assumed from the mention of a payment for their services; this could be a fee provided to their masters.

³⁴ Recent studies arguing for the chattel slave status of the *dmoes* in Homer include Lewis (2018, p. 110-114) and Ndoye (2010, p. 236-237).

Our Athenian sources hint at the large-scale exploitation of slaves for grinding grain and the continuity of representations of slave millers throughout ancient Mediterranean history provide the key to understanding why this was the case. In classical Athens, which never saw the advent of the rotary mill, grinding of grain inevitably represented difficult, repetitive physical labour – a statement that equally applies to the hopper mill.³⁵ By the time of our Roman sources, however, the donkey and later the watermill seem to have (at least partially) supplanted human effort in the milling process (Curtis, 2001, p. 73-101). The dejected slaves of Apuleius' *Metamorphoses* were working in a mill that utilised animal power to turn the millstone. Rather than the labour itself, it is the horrific conditions of their workplace and their treatment by their master that has appalled later readers of this passage (Wiedemann, 1981, p. 176), rather than their exploitation for enervating labour. The slaves are covered in flour and their eyes are swollen from the unclean air. They are dressed in rags, have been tattooed on their foreheads, bear scars from whipping, and are chained as they work. These last set of conditions bear similarities with the slaves sent to the mill in classical Athens, who are whipped (Lys. 1.18) and held in fetters (Men. *Her.* 2-3).

I would argue that this reflects a continuity in the types of slaves employed in mills and the methods of coercing them to do so, explainable by reference to three particular characteristics of ancient mill work, which were true of turning a millstone, driving an animal, or inserting grain into the mill and collecting flour from it alike. Firstly, the tasks required of slave millers were mechanical, repetitive, and generally unskilled. As an occupation, therefore, millwork fits comfortably into the category of “pain-intensive labour”, defined by Fenoaltea (1984) as work which can be effectively coerced by violence and the threat thereof. Secondly, it could have easily been arranged that a mill slave performed their role entirely within the restricted space of a grinding room, in which only some mobility was necessary. As such, slave-owners could shackle mill slaves as they worked and, so long as their owner had enough demand for flour to keep them working day in and day out, it might suit their master's interests to

³⁵ Rotary hand-mills appear to have been used by Carthaginians in the early fourth century BC and examples of these have been excavated in Sicily and dated to the third century (Curtis, 2001, p. 341-343). A mill utilising rotary motion has been discovered in excavations at Delos and dated to the third century (Brunet, 1997), though rotary mills of this particular type have left no further trace in the archaeological record (Curtis, 2001, 288-289). There is therefore no reason to think that classical Athenians possessed this technology.

keep them forcibly held in the same place indefinitely. Both of these factors would have meant that, if they so desired, the master of mill slaves or an appointed supervisor could closely and easily inspect work as it was being performed. Work could also feasibly be evaluated at set points, because (thirdly) the work of mill slaves could be easily assessed by measuring their output.

For mill owners, these factors would have allowed them to exploit slaves as part of a particularly brutal slaving strategy that had several advantages from their perspective. A master's ability to monitor their slaves' work accurately would mean that a slave would have little opportunity to avoid doing the labour assigned to them. Their refusal to do so, moreover, could be met with the threat of severe punishment, without drastically affecting slaves' ability to perform the job they were tasked with. Finally, because slaves could be fettered while they worked, the fear of their attempting to flee would not have inhibited their masters from treating them in whatever way they desired. Unlike some of the slaving strategies which we have evidence for in Athens, no cost beyond the price of their purchase and enough food to keep them alive need have been spent on slaves living in mills, and rather than feeling compelled to promise manumission to slaves, owners could keep them in captivity until they could no longer work.

Enterprises capable of profitably exploiting slaves in this way could buy slaves who had shown themselves willing to resist their slavery without the worry that other potential slave buyers may have felt about doing so.³⁶ We can only speculate about the effect that a slave's resistance might have had on his or her price on the market, but common sense suggests that it would have been comparatively low, unless the seller was able and willing to disguise their reason for selling a rebellious slave to a prospective buyer.³⁷ The ability to purchase and productively exploit slaves that others would not, probably meant that mill owners could buy slaves for relatively cheap. This explains the overlap between mills as a commercial enterprise and as a place of slave detention and punishment. Those looking to off-load a rebellious slave could have found a means of doing so in a mill. Millers, in turn, would be able to exploit these slaves through violence. Moreover, the means of disciplining and restraining slaves –

³⁶ Strabo (12.3.40) describes a Roman mine in the Pontus that exploited specifically slaves sold because of their rebelliousness.

³⁷ Lying in the market was illegal by Athenian law (Hyp. 3.14) and might cause unwanted conflict between parties.

whips, chains etc. – might also be included in specialised equipment, which gave commercial millers a competitive advantage over domestic milling.³⁸

Furthermore, the prevalence of commercial milling played a vital role in Athens' increasing urbanisation and specialisation of roles. As Zuiderhoek (2017, p. 134-140) has recently emphasised, one feature of the urbanisation of cities in the ancient world was the growth of specialised of manufacturers and other non-agrarian workers who came to rely on an agricultural hinterland and foreign trade in grain. I think it likely that households that grew their own grain for consumption would find it more profitable to grind it in house, thus minimising market transactions. For example, the agriculturally-based household in Xenophon's *Oikonomikos*, which grew grain (16.9-18.9), retained a number of domestic slaves (e.g. 7.35) which it probably utilised for milling.³⁹ For the increasing number of households that had to buy grain anyway, however, the cost of buying flour instead would have been less to bear. Not every household could buy a slave, and those that could may well have preferred to expend the additional labour elsewhere, such as in the various slave workforces discussed in the previous section.⁴⁰ Storck and Teague (1952, p. 71-75) have argued that the beginning of commercial milling was synonymous with that of industrialisation itself. Indeed, though there is much we still do not know about the processes of flour production and our limited sources point to a variety of differing strategies, it should nevertheless be clear that urban specialisation benefitted from the specialisation of commercial mills.

Nevertheless, the affordability of flour would be vital to success; and here the importance of slavery in facilitating cheap mill labour, as outlined above, is key. On an individual level, slavery allowed millers to profit from the exploitation (in the fullest possible sense) of even the most resistant of slaves. On a societal level, this system would have produced a valuable commodity (flour) at a low

³⁸ Lewis (2018, p. 41 n. 49) has noted a reference to a collar device which prevented slaves from eating the product of their labour (Ar. fr. 314 K-A).

³⁹ Xenophon (*Oec.* 10.10) references a *sitopoiios* in the household, a job description that included the grinding of grain in some circumstances (Theophr. *Char.* 4.7; Thuc. 6.22). It also refers to a *sitopoiikos* (9.7; 9) amongst the inventory of household tools, which could refer to a milling device (Xen. *Cyr.* 6.2.31).

⁴⁰ The inventory of household property Demosthenes (27.9-10) describes in the first of his speeches against his guardians is telling. Demosthenes states that he inherited some 50 male slaves (9), but nowhere does he mention any domestic servants, only skilled artisans. He may have elided a handful of strictly domestic slaves from this inventory (the items of which are usually reckoned in the thousands of drachmae), but not enough to provide flour for 50 slaves.

economic cost for Athenians generally. The true extent of Athens' milling industry is impossible to quantify. It appears, however, to have been quite extensive, a conclusion that fits well the impression we get from the reoccurring trope of slave milling across Athenian literature. Bresson (2016, p. 195-196) has put forward the argument that improvements in milling technology (including the hopper mill) might have further contributed to economic growth by freeing women from the task of grinding grain so that they could focus on other productive tasks. He is right to emphasise the value of removing the need to grind grain to the productivity of a household and his focus on technology's ability to do so is justified. Nevertheless, his analysis is missing a key additional factor associated with the development and function of Athens' milling – the subjection of certain parts of Athens' population to a life of misery in order to generate this increase in production.

Conclusion

This chapter has attempted to set out some specific examples of how the exploitation of slaves contributed to the growth of the Athenian economy. We cannot know how Athens would have developed in the absence of slaves, but what is clear is that slavery was intricately tied to ancient Athens' economy in numerous respects. As well as the fact that slavery forcibly removed individuals from areas around the Mediterranean and utilised their labour within the economies of Greek communities like Athens, slavery, as an extreme form of labour coercion, was able to accomplish things that wage labour was not. As I have argued, any argument for growth during this period consequently cannot be divorced from institutionalised slavery.

If I might be allowed some reflection on the application of this issue to the modern world, I would say that it is important to remember the crucial role which the exploitation of a select group played in the Greek economy. This is all the truer if, as one suspects, ancient Greece has become something of a stand-in amongst economic historians for modern liberal democracies, with their strong egalitarian ideology, institutional protection of property rights, and decentralised political systems. Indeed, though the massive economic growth we have witnessed over the past centuries has had many positive effects, we should not forget that there has been and still is much exploitation in our modern world,

both within our own countries and others, to which we are now inextricably linked in a global economy. Direct comparisons between then and now are problematic, to be sure, but it is nevertheless worth reflecting on the human cost that often accompanies economic growth, when judged on a society-wide scale.

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