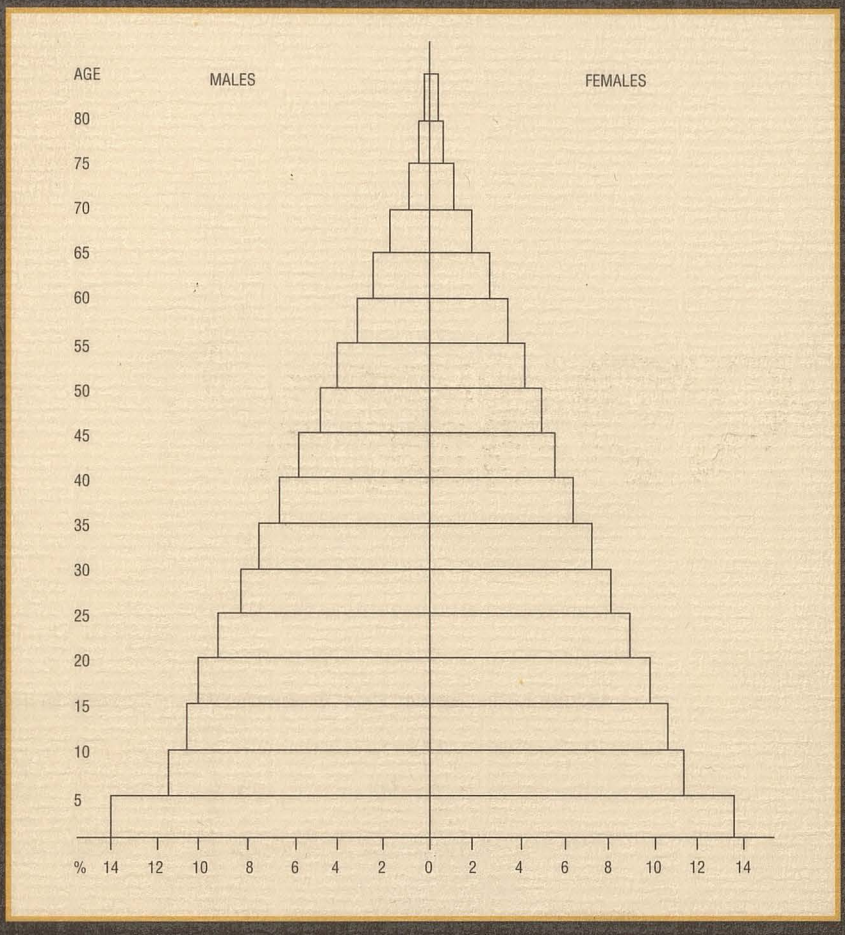

Studies in the Population of Aigina, Athens and Eretria

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Historisk-filosofiske Meddelelser 94

Det Kongelige Danske Videnskabernes Selskab
The Royal Danish Academy of Sciences and Letters

Copenhagen 2006

Abstract

The three studies printed here investigate three problems in the demography of the ancient Greek city-state.

(1) From the size of Aigina's fleet in 480 the population of the island has been estimated at ca. 35,000-45,000 people, which corresponds to a population density of 410-530 persons per km^2. A re-assessment of how the Aiginetans manned their triremes suggests a total population of ca. 20,000, corresponding to a population density of 235 per km^2, a figure which is still surprisingly high but perhaps just possible.

(2) The number of Athenian citizens in the 4th century B.C. is still a bone of contention among ancient historians. In recent years my estimate of no less than ca. 30,000 adult male citizens has been contested by those who still prefer a total of ca. 20,000. The present study is a defence of the higher number and is focused on four issues: (a) the number of citizens required to run the Council of Five Hundred; (b) the number of ephebes; (c) the number of citizens during the period 322-307; (d) the demographic aspects of the carrying capacity of Attika and the import of grain.

(3) A prosopographical study of some very large and almost completely preserved rosters of Eretrian citizens from two of a total of six tribes indicates that in ca. 300 B.C. Eretria had a declining population, that a significant number of citizens may have resorted to adoption to uphold the family line, and that the rosters probably comprise only a part of all citizens by birth, which points to a population census in the late 290s when Eretria seems to have had an oligarchic constitution.

Cover illustration. Age pyramid. A.J. Coale and P. Demeny, *Regional Model Life Tables and Stable Populations* (Princeton 1966): model west, mortality level 4, growth rate 0.5%.

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Printed in Denmark by Special-Trykkeriet Viborg a-s
ISSN 0106-0481 ISBN 87-7304-626-5

I. The Population of Aigina in 480 B.C.

The study of the size of the population of Aigina in the early fifth century B.C. is an outstanding example of how ancient historians deal with two fundamental problems in the demography of the ancient Greek *poleis*: can we trust the information about army and navy figures reported by the historians, in particular Herodotos, Thucydides and Xenophon? And: how can we convert navy and army figures into population figures? That these two questions have been answered differently by different historians is amply demonstrated by the information about the population of Aigina one can find in the literature. The total varies from a minimum of 13,000 to a maximum of 80,000. Kirsten (1964) followed by Kalcyk (1996)[1] suggested some 13,000-20,000. In the longest and most thorough study of the issue, Figueira (1981) followed by Hornblower (1996) and Horden & Purcell (2000) assessed the population at 35,000-45,000[2] whereas Cavaignac (1912) followed by Salmon (1959) went up to 50,000.[3] Beloch (1886) envisages the possibility of 80,000 in all.[4] Ste. Croix (2004) suspends judgement.[5] The sources behind the various estimates are as follows.

(1). In the war between Aigina and Athens in the 490s the major engagement was a naval battle in which an Aiginetan fleet of 70 ships (Hdt. 6.92.1) was defeated by an Athenian fleet of the same size (Hdt. 6.89.1).

(2). A major outbreak of *stasis* occurred on Aigina in connection with the war against the Athenians. The confrontation was between the rich (οἱ πάχεες) and the common people (ὁ δῆμος), of whom 700 were killed and others exiled (Hdt. 6.90-91).

(3). In 480 eighteen Aiginetan ships fought in the battle of Artemision (Hdt. 8.1.2) and thirty of their best sailing ships fought in the battle of Salamis, while other ships were kept in reserve to protect the island (Hdt. 8.46.1). Pausanias (2.29.5) says that the Aiginetan contingent was the largest after the Athe-

nian. If we can trust Pausanias we can infer that the Aiginetan contingent must have outnumbered the forty ships provided by the Corinthians (Hdt. 8.1.1 & 43.1).

(4). 500 Aiginetans hoplites fought in the battle of Plataiai (Hdt. 9.28.6) and probably the same number served as light armed (Hdt. 9.29.2). At the same time, however, an unknown number of Aiginetan ships may have been among the 110 ships (Hdt. 8.131.1) which fought under Leotychidas in the battle of Mykale (Hdt. 9.96-100).

(5). In ca. 459 yet another war between the Aiginetans and the Athenians culminated in a naval battle fought between the Aiginetans and their allies against the Athenians and their allies.[6] The Aiginetans and their allies were defeated and lost 70 ships (Thuc. 1.105.2), and next year when the Aiginetans capitulated after a long siege of their city they had to surrender what was left of their fleet (Thuc. 1.108.4).

(6) In the *Constitution of the Aiginetans* Aristotle – or one of his pupils – reports that there were 47 myriads = 470,000 slaves on Aigina (Ath. 272C and Schol. Pind. *Ol.* 8.30 = Arist. fr. 427, Rose = fr. 475.1-2, Gigon).

What can be inferred from these pieces of information about the size of the population of Aigina? We can disregard the 470,000 slaves. In the ancient Greek city-states slaves were never counted since they were neither taxable nor liable to military service. The ancient Greeks did not know the number of slaves in the *poleis,*[7] and we shall never come to know the number either, no matter how many and how valuable the sources we may still recover. On the other hand, the Greeks never refrained from producing rough estimates of the number of slaves. Apart from the 470,000 slaves on Aigina we hear in the same passage from Athenaios' *Deipnosophistai* about 460,000 slaves in Corinth and 400,000 slaves in Athens.[8] The figure for Athens matches Hypereides' estimate of 150,000 (adult male) slaves.[9] These figures stem from good sources but cannot, of course, be trusted. They are just guesses, not even guesstimates. For example, for Aigina to have 470,000 slaves, it must have had a population density of about 5,500 per

km^2 of slaves alone![10] Thus we must reject the incredible slave number we have[11] and we cannot infer much either from the 700 Aiginetans killed in the *stasis* or the (probably) 1,000 Aiginetans who fought at Plataiai. It is the astonishing size of the Aiginetan fleet that must be analysed: according to Herodotos the Aiginetans manned 70 ships in ca. 490 and over 40 in 480.

In a very thorough and judicious account of this evidence and the issues involved, Thomas Figueira concludes that "in the light of these considerations it is not inconceivable that the Aiginetans could man a minimum of 50 triremes from the island's resident population. Each trireme would have a complement of 200 men, giving approximately 10,000 as the strength of the fleet. If these 10,000 men were all those available for military service on Aigina, it is possible to offer an approximate estimate of the pool of males out of which this mobilizable force came. If the population was stable, life expectancy at birth was 25 years, and the number of women equal to the number of males, the total population of Aigina was c. 42,000." After some further discussion Figueira's overall conclusion is that "perhaps a reasonable, but speculative minimum estimate would give the island a total population of between 35,000 and 45,000, with 7000-10,000 slaves and freedmen". In the entry on Aigina in the Copenhagen Polis Centre's inventory of Archaic and Classical *poleis* he repeats this conclusion with due reference to his own investigation quoted above.[12]

This is in principle a fair calculation and it is on such lines that the population of numerous Greek *poleis* have been calculated since Böckh. The problem is that, in my opinion, this total is impossible. Aigina is an island of 85 km^2, and with a total of 35,000-45,000 inhabitants the density of population was a minimum of 410 persons per km^2 and a maximum of 530. Even the minimum figure surpasses the population density of modern Holland, the most densely populated of all European nations with 375 inhabitants per km^2. In ancient Greece the average population density is commonly estimated at ca. 40 persons per km^2 in the plains and ca. 15 in the mountains.[13]

If we start from what we know about the island of Aigina and

its urban centre, and if we treat it as an average *polis* we cannot even reach a five-digit population figure. The walls of Aigina city enclosed an area of 52 ha. If – on a cautious estimate – we assume that the space used for habitation constituted 50% of the intramural area and that the population density was 150-200 persons per ha,[14] we get an urban population of between 3,900 and 5,200. For a small *polis* with a territory of under 100 km^2 it seems reasonable to assume that – roughly – two thirds of the population lived in the city and one third in the countryside.[15] On this assumption the total population of the island comes to between 5,850 and 7,800 or – in rounded numbers – 6,000 and 8,000.

That is, on the other hand, a minimum figure. There can be no doubt, I think, that the city of Aigina was much more densely populated than an average *polis*, and there are indeed attestations of more densely settled cities which we can use as models. It seems, for example, that in Halieis in the southern Argolid no less than 83% of the intramural space was used for habitation and that the number of persons per ha inhabited space was ca. 250.[16] If Aigina city had a similar density of town-dwellers, the population of the urban centre comes to 43 x 250 = 10,750 persons, the rural population comes to 5,375 and the total population to 16,125. Furthermore, there may have been substantial suburbs (προάστεια) outside the walls. No excavation or survey has been conducted and we are deplorably ignorant of the townscape of Aigina city. There has not been any survey of the countryside either, but, as far as I know, there is no sign of any substantial settlement of the Archaic or Classical periods to be found on the rest of the island. What we know to date about Aigina seems to conform to what we can assume for most small *poleis*: that the majority of the population was settled in the city behind its walls and a minority only in the countryside. But let us envisage the possibility that city – with suburbs (?) – and countryside together had a population of ca. 20,000 people.

So where do we stand? The little we know about Aigina's walled *polis* centre and countryside can be interpreted to match a maximum of ca. 20,000 persons, which corresponds to a popula-

tion density of 235 per km^2; but how can a maximum population of ca. 20,000 inhabitants be reconciled with the 35,000-45,000 inhabitants calculated on the basis of the size of the Aiginetan fleet? We must return to the conversion of ships into population figures and reconsider each step in the conversion.

(1). Can we trust Herodotos' information about the size of the Aiginetan fleet? If he – and his audiences – could believe that the Persian army numbered 1,700,000 men (Hdt. 7.60.1), they may – erroneously – have believed in inflated figures for the number of ships that fought in the battle of Salamis. I confess that – by and large – I tend to trust the army figures reported by Herodotos, Thucydides and Xenophon. The size of the Persian army is a case apart, as are the numbers of slaves reported in some sources, see *supra* 6. Furthermore, in this particular case Herodotos' figure is supported by the discovery in the military harbour of Aigina of extended remains of shipsheds. The military harbour and at least the north shipshed complex are contemporary with the city wall of the early fifth century and antedate the Athenian conquest of Aigina in 457.[17]

(2). Were the ships mentioned by Herodotos triremes, each with a complement of 200 men, or pentekonters, each with a complement of less than a hundred? It has been suggested that at least the 70 ships that fought against the Athenians in ca. 490 were pentekonters.[18] It cannot be ruled out that at least some of them were. But what about the Aiginetan fleet at Salamis? It is true that, listing the various contingents which the *poleis* provided for the Greek fleet at Salamis, Herodotos invariably speaks about ships (νέες) but towards the end of the passage he explicitly states that all the *poleis* provided triremes except the Melians, the Siphnians and the Seriphians who provided pentekonters (Hdt. 8.48). Again the archaeological evidence supports Herodotos' account. At least the north shipshed complex was most probably built for triremes, not for the smaller pentekonters.[19]

(3). To sail a trireme is a task that makes heavy demands on the rowers, and we have to assume that a number of men, especially those in their thirties and forties, were unfit for this kind of ser-

vice.[20] Given what was at stake in 480 we may presume that perhaps as many as 90% of the year classes in question were called up, instead of the 80% which I have suggested as a maximum in my treatment of the relation between army figures and population figures.[21] Figueira makes no explicit allowance for people of military age but unfit for military service. In this respect, my figures are higher than his.

(4). The physical force required to row a trireme sets a limit too for the age group liable for service as rowers. The age group serving on board a trireme may have been the same as that serving as hoplites in the field army, i.e., apparently the year classes from 20 to 49. Figueira assumes that, on this occasion, men up to 55 years old had to serve.[22] That is possible given the desperate situation in 480, and for my calculation *infra* I will apply the same age limit.

(5). Until a generation ago the orthodox view was that the Greeks did not use slaves to row their ships.[23] Today very few historians doubt that a significant fraction of the rowers were of servile status.[24] So, like Figueira, I presume that many of those who manned the Aiginetan triremes were slaves, and that a master and his slave both were on board the same ship as rowers, the masters probably serving on the top deck, the slaves on the second and third. If it can be presumed that a substantial part of Aigina's wealth was based on overseas trade, cf. *infra*, it can be presumed too that a large part of the – allegedly – large slave population was familiar with ships and seamanship.

(6). Whereas it can be presumed that almost all the citizens had a family, some foreigners and perhaps even the majority of the slaves were single. Without much supporting evidence it is commonly held that in a Greek *polis* the majority of the slaves were adult males who did not have a family.[25]

(7). Was the Aiginetan fleet manned with Aiginetans – citizens, metics and slaves – or was some part (perhaps even a substantial part) of the oarsmen hired foreigners? The much better sources we have for the Peloponnesian War and later periods show that not only Athens but other city-states too relied on hired manpower when they had to launch a squadron.[26] Figueira be-

lieves that "Aigina, in this year of mobilization in the eastern Mediterranean by Greek and Persian alike, was not able to draw to any great extent upon external sources of experienced Greek rowers".[27] There is no support in the sources for this *a priori* assumption. It may be correct but we do not know; and a case can be made for a different view.

Aigina was a wealthy *polis* which from 457 to 431 could pay the crushing fine of thirty talents of silver to Athens.[28] During the Archaic period the Aiginetan silver coinage attained a very wide circulation, especially in the Aegean, and the Aiginetan weight standard was widely adopted for coinage in the Greek world.[29] The grain fleet which sailed through the Hellespont in 480 was bound for Aigina and the Peloponnese, not for Athens (Hdt. 7.147.2). The Aiginetans must have had substantial economic resources based on a flourishing long distance trade,[30] and a strong network of connections with other *poleis* all over the Greek world.[31] Therefore, I can see no objection to assuming that Aigina in 480 was in a position to do what is better attested for the later period, *viz.* to hire a large number of the oarsmen required to row their triremes.

We can now make a new calculation on the basis of the revised list of suppositions, and my point of departure will be that the Aiginetans in 480 had altogether 45 triremes, *viz.* 30 triremes at Salamis and some more in reserve to protect the island. We do not know their number but there were apparently so many that the Aiginetan squadron outnumbered the Corinthian squadron of 40 triremes. A total of 45 triremes matches what Herodotos tells us.

It takes 9,000 men to man 45 triremes. Let us suppose that 3,000 were hired oarsmen and 6,000 Aiginetans, and let us suppose too that of the Aiginetans 2,500 were citizens, 500 metics and 3,000 slaves, most of them owned by the Aiginetan citizens and metics but some of them presumably public slaves.

To convert this army figure into a population figure I use the same model population as Figueira, *viz.* Coale and Demeny (1966), Model West, mortality level 4 (life expectancy of 25 years) and zero growth rate.[32]

On the assumption that most of the citizens and metics had families we can make the following calculation. 3,000 males aged 20-49 + a total of 10% unfit for military service = 3,333. Males 20-54 constitute 47.6% of all males (from cradle to grave). Total males come to 7,000. Males and females together to 14,000. But this figure may be a little on the high side because it can be presumed that some of the metics were single. If we suppose that the majority of the slaves were single we can add a further 6,000 to the ca. 14,000 citizens and metics. The total is now 20,000 people altogether instead of 35,000-45,000, corresponding to a population density of ca. 235 per km^2, still a suspiciously high figure but perhaps not impossibly high.

There are two main reasons for the difference between Figueira's calculation and mine: First, Figueira assumes that the foreigners and slaves who rowed the ships were heads of families, as were most of the citizens; second, Figueira believes that almost all the rowers on board the Aiginetan triremes were Aiginetans. The difference between the two calculations can be formulated as a dilemma: (a) in 480 the Aiginetan fleet must have been manned by Aiginetans – citizens, foreigners and slaves – and the number of hired rowers must have been insignificant. Consequently, Aigina must have had a population density of 400-500 people per km^2. (b) A population density of 400-500 people per km^2 is unbelievably high. Consequently, the Aiginetans must have hired a significant fraction of those who rowed their triremes in the battle of Salamis. Figuira takes the first horn of the dilemma, I prefer the second.

Appendix

In an essay composed in 1965-66 Ste. Croix did his utmost to discredit the view that Aigina was a commercial *polis* and that its wealth was derived from overseas trade (Ste. Croix (2004) 371-420). As usual he carefully collected and discussed the relevant sources (he could not know about the Gravisca inscription, *LSAG*^{2} 439 no. E), but he attempted to re-interpret or explain away so much of the evidence that, in the end, his contribution

seems to support the opposite view: that a substantial part of the wealth of the Aiginetans was in fact derived from long distance trade. For example: to belittle the remarkable circulation of Aiginetan "turtles" Ste. Croix argues – correctly – that "the use of coinage to meet the needs of foreign trade was a secondary development" (394), but by 480 Aigina can be supposed to have reached the second stage. From Herodotos' information about the corn fleet bound for Aigina and the Peloponnese Ste. Croix infers: "*that the island of Aegina* – not "the Aeginetans" – played a significant part in the early fifth-century corn trade between the Pontus and the Peloponnese" (406). But there is nothing in Herodotos' text to support the view that *all* the corn ended up in the Peloponnese, or the rather strange view that the Aiginetans had next to nothing to do with the overseas trade that went on in their own harbour. Demosthenes' mention of the *emporion* in Aigina and Aristotle's description of the *demos* of Aigina as *emporikos* are passed over in silence.[33]

It is, however, the carrying capacity of the island compared with the size of the population which constitutes the most serious objection to Ste. Croix's view of the Aiginetan economy. Figueira prefaces his study of the population of Aigina with an estimate of the carrying capacity of the island. His conclusion is that Aigina could support 4,000 people at the level of subsistence.[34] All the important studies in food production and carrying capacity published since 1981 have not changed the total obtained by Figueira significantly. With the prevailing more optimistic assessments of cultivable area, yield per ha, and annual food consumption per person, one can get up to ca. 5,000.[35] But if one takes into account that part of the crops may have been barley rather than wheat, 4,000 is still the most likely total, and the new Athenian grain law has shown that the weight of dried wheat and barley was somewhat below the optimistic estimates suggested by several scholars.[36]

If Aigina could sustain a population of 4,000 max., over two thirds of the population had to buy their staple food in the market,[37] and this calculation is based on the minimalist view of the size of the population, i.e. a total of 13,000. The Aiginetans

must have produced goods and/or services with which they could pay for all this grain, and the inevitable conclusion is that trade and/or production of manufactured products must have been the backbone of the economy of the island. One can understand why Ste. Croix preferred to suspend judgement on the size of the population of Aigina (387-8, 409).

Notes

1. Kirsten (1964) 160; Kalcyk (1996) 320.
2. Figueira (1981) 22-64: ca. 42,000 or between 35,000 and 45,000. Hornblower (1996) 17: ca. 40,000. Horden and Purcell (2000) 119: ca. 35,000 min.
3. Cavaignac (1912) 274; Salmon (1959) 457-58.
4. Beloch (1886) 123 suggests a total of 2,000-2,500 adult male citizens which corresponds to, roughly 8,000 persons, or perhaps 10,000 including metics. Like everybody else, he rejects the number of slaves reported in the Aristotelian *Aigineton Politeia*, see *infra*, but believes that 70,000 slaves (obviously 7 myriads instead of 47) is not impossible. Thus, a total of ca. 80,000.
5. Ste. Croix (2004) 387-88 with the editors' comments 414.
6. For the chronology, see Figueira (1991) 106-9.
7. One exception is a census conducted in Megalopolis in 318 in which were counted citizens, foreigners and slaves of military age and fit for military service (Diod. 18.70.1). See *infra* 54 n. 119.
8. Ath. 272B-C = Timaios (*FGrHist* 566) fr. 5 (Corinth) and Ktesikles (*FGrHist* 245) fr. 1 (Athens).
9. Hyp. fr. 33, Sauppe.
10. Isager and Hansen (1975) 15-17.
11. I am not persuaded by Sekunda's attempt (2002) to defend the 470,000 slaves by arguing that Aigina must have had a number of colonies, of which only two are known (Kydonia in Crete and one in Umbria), and that the 470,000 slaves is the sum of the slave populations in Aigina and all the colonies.
12. Figueira (1981) 37-38; Hansen and Nielsen (2004) No. 358 p. 620.
13. Corvisier and Suder (2000) 32.
14. Hansen (2006) (a) (habitation area = 50% of intramural area, (b) (ca. 30-33 houses per ha inhabited space), (c) (5-6 persons per household).

15. Hansen (2004) 11-16 and (2006).
16. Jameson, Runnels and van Andel (1994) 548-51.
17. From Dr. Kalliopi Baika, a member of the project *Ship-Sheds in the Ancient Mediterranean*, I have received the following report: two complexes of at least 24 shipsheds were reported by Welter, 15 on the north side and 9 on the south side (Welter (1938) 482; Knoblauch (1972); Gerding (forthcoming) in Blackman and Rankov). The complexes can be reconstructed to a maximum of 16 shipsheds on the north side and 14 on the south. In addition, the harbour could have held 26 more shipsheds, i.e. a total of 56, if a third complex existed in the east side of the basin, though no archaeological remains have been found yet (Plan Aigina of J. McKenzie in Blackman and Rankov (forthcoming)). Investigations of the remains indicate that the north complex was structurally connected to the north mole of the military harbour and used it as a back wall. The presumption is that these walls were those which protected the city of Aigina during the siege of ca. 459-458. Thus at least the northern shipshed complex antedates the Athenian domination of Aigina and must have been built for the Aiginetan triremes, not for an Athenian squadron of triremes stationed on Aigina when the island was turned into a klerouchy.
18. Winterscheidt (1938) 34; Amit (1973) 34-35, but see Figueira (1981) 30.
19. Dr. Baika (*supra* n. 17) writes: the archaeological remains of the two shipshed complexes (north and south) indicate that the shipsheds are not necessarily of the same size. However, the shipsheds of the north complex have a considerable interaxial width (6.6 m), one of the largest when compared with other shipsheds in the Classical Mediterranean that mostly must have held triremes (and could also accommodate other types of ship, e.g. pentekonters and possibly later quadriremes). The width is only matched by the remains of shipsheds at Zea in Peiraieus which date from the Classical period (Dragatses and Dörpfeld (1885)) and the shipsheds at Oiniadai (Sears (1904)). Thus, these Aiginetan shipsheds were most probably built for triremes (Baika (forthcoming)). – This archaeological evidence correlates well with Thucydides' account at 1.14.3, where he states that, before the Persian war, the fleets of Aigina and Athens included a few triremes only. It was the Themistoklean shipbuilding programme of the 480s which provided Athens with the bulk of the triremes that fought at Salamis (Arist. *Ath. Pol.* 22.7).

20. Rowing triremes in battle would have been a job for the well-trained and relatively young. A fleet's battle efficiency would have been undermined by the use of too many men in their late thirties or older, who would have needed more time to recover after long physical exertion (e.g. voyaging to the sphere of operations) and who would have been more susceptible to muscular injury. In particular, it would have made it harder for crews to achieve the marginal superiority in speed and manoeuvring at the limit which would have been all-important at the crucial stage of a "dog-fight" between triremes (Boris Rankov, personal communication and Rankov (1994); see also Gabrielsen (1994) 118-20). In 352/1 the Athenians decreed that forty triremes be manned with men till the age of 45, and in 347/6 the Athenians decreed that fifty triremes be manned with men till the age of 40 (Aeschin. 2.133).
21. Hansen (1985) 19-20.
22. Figueira (1981) 60-61 n. 34.
23. Sargent (1922) 264-79. Still maintained by, e.g., Casson (1971) 322. For a full *Forschungsbericht*, see Welwei (1974) 66 n. 4.
24. Welwei (1974) 65-104; Graham (1992), (1998); Ste. Croix (2004) 288 n. 46; Gabrielsen (2002) 208 with n. 28.
25. Klees (1998) 156ff.
26. Thuc. 1.121.3 and 143 1 (Athens); Thuc. 1.31.1 (Corinth); Xen. *Hell.* 1.5.4; Isoc. 8.48. For other sources and a good discussion of the issue, see Gabrielsen (2002) 208.
27. Figueira (1981) 33.
28. Thuc. 1.108.4; *IG* I^3 259.VI.18 etc. See Figueira (2004) 621.
29. Thompson, Mørkholm and Kraay (1973) 394; Figueira (2004) 622.
30. The *emporion* of Aigina is mentioned at Dem. 23.211 and Aristotle describes the *demos* of Aigina as *emporikos* (*Pol.* 1291b20).
31. For Ste. Croix's different view, see the appendix 12-14 *infra*.
32. In Hansen (1985) 12 I suppose a growth rate of 0.5% per year. Figueira (1981) 60-61 n. 34 prefers a stationary population. For this calculation there is a small difference between the two models: the year classes 20-54 constitute 47.6% of all males in the stationary population but 45.6% in a population with an annual growth rate of 0.5%. The preferable model would probably be one with an annual growth rate of 0.25%, see Scheidel (2003) 122-23.
33. See n. 30. Ste. Croix's essay was left unfinished, cf. the editors' comment p. 376 n. *, and he had probably intended to treat the evidence of the *emporion* and the *demos emporikos*.

34. Figueira (1981) 22-26.
35. See, e.g. Horden and Purcell (2000) 119: "By conventional calculations its [Aigina's] own resources can support at minimal nutritional levels only some 5,000 people."
36. See 44 with n. 124 *infra*.
37. Cf. Horden and Purcell (2000) 119: "Aigina was heavily dependent on a complex, reliable and large scale trade in staples."

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II. The Size of the Athenian Citizen Population in the Fourth Century B.C.

The size of the population of Attika and in particular the number of Athenian citizens, is still one of the controversial issues in ancient history and will undoubtedly remain a bone of contention among ancient historians unless some important new source is recovered. That is, I confess, unlikely but not impossible. The problem of whether there were two or three myriads of adult male Athenians in, e.g., 338 B.C. may perhaps be settled if one day we find, e.g., a papyrus with the speech by Hypereides in which he defended himself in the *graphe paranomon* brought by Aristogeiton against his proposal to manumit all slaves and grant Athenian citizenship to all metics,[1] or if we get fuller and more reliable information about the population census conducted by Demetrios of Phaleron.[2] Again, the recovery of large bouleutic and ephebic inscriptions may contain the clue to the minimum number of citizens required to run the *boule*,[3] or the number of a year class of ephebes.[4] A fragment of the accounts of the *sitophylakes* may provide us with reliable information about the amount of grain imported into Athens in a particular year,[5] and from that we may decide whether the total population of Attika was ca. fifteen myriads or rather twenty-five to thirty myriads.

Exact figures are, of course, impossible to obtain. The demography of ancient societies is indeed a discipline in which we shall never have precise information because we lack not only sources that have been lost but also sources that never existed, for example *Statistical Yearbook of Athens and Attika 323 B.C.* I would happily sacrifice a tragedy by Euripides – not one of the best of course – if, instead, we could get access to the data to be found in a statistical yearbook. But such a source will never be recovered because it never existed. Therefore none of the ancient Greeks themselves, not even Aristotle, would have been able to come up with an answer to the question: how many slaves live in

Attika? It is remarkable that Aristotle – or his pupil – seems to have believed that there were 470,000 slaves on Aigina.[6]

So we have to be satisfied with what I have called "the shotgun method": To study ancient history is like hunting hares. The hunter uses a shotgun instead of a rifle. His weapon does not hit the bull's eye and is not constructed for big game, but the spreading out of the pellets to cover a broader field is very efficient when used against smaller animals. Similarly, the quantifications presented by the ancient historian are never precise but within certain limits they can provide us with extremely valuable information about ancient societies. The shotgun method" is a term I coined in the 1980s, but the method it describes has been used by many ancient historians whenever they have to quantify their data.[7]

For the number of adult male Athenian citizens in the 4th century B.C. there are two different shots, one by historians who aim low with their shotgun and argue in favour of a total of ca. 21,000, and one by historians who aim high and prefer a total of ca. 31,000. As usual in historical studies – and in other disciplines as well – a *Forschungsbericht* reveals a continuous swing of the pendulum. In 1886 Beloch preferred the lower number, but he changed his mind and in 1922 he supported the high figure.[8] He was followed by Gomme (1933),[9] but the lower number was revived by Jones (1957)[10] followed by Ruschenbusch in a number of studies from 1979 to 1999.[11] In 1985 in *Demography and Democracy* I defended the high number against what was then the orthodoxy. Many historians were persuaded by the argumentation,[12] and there is still strong support for a total of 30,000 rather than 20,000 citizens,[13] but in recent years there have been several attempts to move the pendulum back towards the lower figure.[14]

The purpose of this article is to argue that the evidence we have fits a total number of 30,000 adult male citizens better than one of 20,000. Some may ask: what does it matter? To understand the nature of Athenian democracy or the nature of the Athenian economy we must have at least a rough idea of the population of Athens. Did the quorum of 6,000 required for some of the

decisions made by the Assembly constitute ca. one third of all adult male Athenians, or one fifth? Was the Council of Five Hundred manned by citizens who volunteered and sometimes even competed for a seat? or did the Athenians have to resort to conscription in order to run the *boule*? Could the Athenian population in most years be sustained by the grain grown in Attika? or did the Athenians normally have to import at least half of the grain consumed by the population of Attika? It is obviously important to shed light on these questions, but can they be answered?

To carry on the debate about the number of citizens and the population of Attika is not just to put old wine into new wineskins. During the last decade the discovery of new inscriptions has provided some new evidence: (a) to be able to serve three times on the *boule* instead of two is now attested for the 3rd century B.C. It was not a reform of the Roman period but probably introduced in 307/6 in connection with the new council of 600, see 25 *infra*. (b) Some ephebic lists of the 330s and 320s have been found in Panakton, and one of ephebes of Hippothontis 333/2 is the shortest so far attested, so short in fact that it is unbelievable that it records a whole cohort of nineteen-year-olds from the *phyle*.[15] (c) The grain law of 374/3, published in 1998, has for the first time ever provided us with information about the weight of a *medimnos* of wheat and barley.[16] We are now in a much better position to estimate the amount of grain consumed per person per year. (d) The roster of 250 councillors from the Athenian klerouchy on Samos[17] sheds new light on the relation between Athens and its klerouchies and favours the view that the klerouchs were not absentee landlords but settled in the klerouchies, though not necessarily for the rest of their lives.[18]

Other new pieces of the jig-saw puzzle, however, stem from re-interpretation of sources known for over a century. (a) Dionysios of Halikarnassos' use of the term ἐξέτασις to describe the revision of all lists of citizens in 346 has reopened the issue whether Demetrios of Phaleron's ἐξετασμός was a census of all citizens or of all citizens of military age and fit for military service.[19] (b) Comparing the number of 4th century tombstones

commemorating metics (650 of whom 40% were women) with those commemorating citizens (2,110 of whom 35% are women) we can infer that most of the 10,000 metics counted by Demetrios of Phaleron must have been heads of families and not single traders or craftsmen who stayed in Attica for a shorter or longer period.[20] (c) Further investigation of the prosopographical evidence seems to conform that many Athenians served on the *boule* in their forties, fifties and sixties, and to serve on the *boule* in one's thirties was less common than one would expect from the age distribution of a population which, we presume, had a life expectancy of ca. 25 years and a growth rate of 0.5% max., see 26-27 *infra*.

In this study I am not going to treat all aspects of the problem. One of my main reasons for preferring the high numbers is the Athenian military strength during the Lamian War. I dealt with the issue in Hansen (1985) and (1994)[21] and on this particular count I have nothing to add. The problems I want to take up here concern: (1) the number of citizens required to run the Council of Five Hundred; (2) the number of ephebes; (3) the number of citizens during the period 322-307; (4) the demographic aspects of the carrying capacity of Athens and the import of grain.

1. The Council of Five Hundred

In *Demography and Democracy* 51-64 I argued that 21,000 adult male citizens were not enough to run the Council of Five Hundred according to the rules, but the very good epigraphical evidence we have shows that the Athenians each and every year succeeded in filling all the 500 seats in the *boule*. The counterblast has been to question the veracity of these rules, *viz*., (1) that the *boule* had to be recruited from citizens over 30; (2) that the *boule* was recruited from citizens who volunteered; there was no compulsory enrolment of citizens for service on the *boule*; (3) that no citizen could serve on the *boule* more than twice in his life (and not in two consecutive years); and (4) that no citizen could serve as *epistates ton prytaneon* more than once in his life.

Re (1). In his contribution to the *Second International Colloquium on Ancient Historical Demography* Wlodzimierz Lengauer argues that there is no reliable evidence for an age-limit of thirty years for councillors and that citizens in their twenties may have served on the *boule*. But if all adult male citizens were eligible for the *boule*, it follows that a total of 21,000 citizens might be enough to run the *boule*.

Lengauer is right that almost all the sources we possess about an age-limit of thirty years for councillors does not concern democratic Athens but (a) the imagined constitution of Drakon (Arist. *Ath. Pol.* 4.3), (b) the oligarchic council of Four Hundred in 411 (Arist. *Ath. Pol.* 31.1), (c) the council in the draft constitution of 411 (Arist. *Ath. Pol.* 30.2), (d) the council under The Thirty in 404 (Xen. *Mem.* 1.2.35), and (e) the constitution which the Athenians drew up for Erythrai in ca. 450 (*M&L* 40.11). The only explicit information is to be found in Libanios' hypothesis to Demosthenes' speech *Against Androtion* (hyp. Dem. 22.1.1) in which he refers to a βουλευτικὴ ἡλικία; and that is not explicit enough. Libanios – a late source – indicates that there was an age-limit but does not say that it was thirty years.

There is, however, one source – not discussed in Lengauer's article – which does show that citizens had to be thirty before they were allowed to serve on the Council of Five Hundred. It is apparent from Dem. 39.10 that bronze allotment plates (*pinakia*) were used at the sortition of councillors as well as other magistrates, of whom the *thesmothetai* are mentioned *exempli gratia*. It is also apparent that the same *pinakion* was used for both kinds of sortition. So, if a citizen had to wait till he was thirty before he was issued with a *pinakion* for the sortition of magistrates, there must have been the same age-limit for councillors.[22]

Now, an age-limit of thirty years for magistrates is not particularly well attested either.[23] It is attested as a requirement for some *athlothetai* (*SEG* 10 2.25-26) and some *epimeletai* (*SEG* 30 61.31). But in both cases the requirement may be specific and not just a repetition of a general rule. However, the preserved bronze *pinakia* show that, in the second quarter of the fourth century, the same *pinakion* was used for sortition of magistrates (including

councillors) and sortition of jurors.[24] There is no doubt that jurors had to be over thirty (Arist. *Ath. Pol.* 63.3) and it follows that there must have been the same age-limit of thirty years for councillors, other magistrates, and jurors. Thus, the generally accepted view of a minimum age of thirty years for councillors can be vindicated by combining the information obtained from Dem. 39.10 with the preserved *pinakia*.

Prosopography can also be adduced in support of the age-limit of thirty for magistrates (including councillors). We have a three-digit number of examples of citizens who served as magistrates and/or councillors in their thirties, or forties, or fifties, or sixties. If it had been possible for a citizen to serve on the *boule* or on some other board of *archai* in his twenties there ought to have been a number of indisputable attestations in the very good sources we have.[25] True, Lengauer believes that he has found an example: he argues that Timarchos, who served on the *boule* in 361/0, must have been born after 390 and thus served on the *boule* in his twenties.[26] The year of birth of both Timarchos and Aischines is a matter of some dispute and I shall here restrict myself to referring to the very full treatment of the issue by Nick Fischer in his commentary on Aischines' speech. Following Harris, he argues that Aischines is probably lying about the homosexual relationship between Timarchos and Misgolas, including the reference to the age difference, and that Aischines, Misgolas and Timarchos were "in fact much the same age".[27] Fischer takes it for granted that Timarchos was thirty when he served on the council in 361/0 but that is just one piece of the complicated jigsaw puzzle. I conclude that Timarchos cannot be adduced as an unquestionable example of a councillor who served in his twenties, and – to the best of my knowledge – there is no other example. The prosopographical evidence we possess strongly supports the age-limit of thirty for Athenian *archai* including *bouleutai*.

Re (2). According to Ruschenbusch the demes based their sortition of councillors on the deme's *lexiarchikon grammateion*. All citizens were eligible and all citizens (over 30) would sooner or later have to serve on the *boule*. Ruschenbusch bases his view

on a questionable interpretation of a dubious lexicographical note found in Photius and the *Suda*.[28] On the other hand, Ruschenbusch is right in arguing that a total of 21,000 citizens implies that the Athenians must have resorted to conscription to fill the *boule* and cannot have relied on a system based on voluntary candidature.[29] But if every deme, year in and year out, was forced to draft the required number of candidates in order to fill its quota of seats in the *boule*, there cannot have been any rivalry between the *demotai* about winning one of the deme's seats. Yet the sources we have testify to competition to be one of the deme's *bouleutai*.[30] The inference is that candidature must have been voluntary and a further inference is that there must have been more than 21,000 adult male citizens. This view is in no way incompatible with the observations (a) that many can have come forward because service on the Council of Five Hundred was felt to be a civic duty,[31] and (b) that social pressure may have been applied in a deme that was proportionally underpopulated and had difficulties in finding enough candidates for its quota of seats.[32]

Re (3). As far as I know no one has (yet) questioned the requirement that, in the period of ten *phylai*, a citizen could serve on the Council of Five Hundred only twice in his life.[33] But a careful examination of the third-century epigraphical evidence indicates that the rules were changed when in 307/6 the Council of Five Hundred was changed into a Council of Six Hundred. The increased political participation may in itself have been enough to entail that the maximum of two years' service on the council had to be lifted and that, consequently, a number of citizens served three times.[34] A concomitant factor was, I think, the general decline of population in the Hellenic world in the third and second centuries B.C., which probably affected Athens too.[35]

Not only was it possible after 307/6 to serve three times on the *boule*, the epigraphical evidence suggests too that more citizens than previously served more than once. In spite of the fact that proportionally fewer bouleutic inscriptions of the third and second centuries have been preserved, there is more evidence of citizens who served twice. The examples "include 6 men of

Aegeis who served both in 256/5 and in 254/3, 7 men of Hippothontis who served both in 178/7 and in a year shortly afterwards, and 5 men of Hippothontis who served both in 178/7 and in some other year" (Rhodes (1980) 193 n. 9). The evidence suggests that the Athenians had abandoned the requirement that a *bouleutes* could be *epistates ton prytaneon* only once in his life along with the requirement that a *bouleutes* could serve only twice.

Re (4). In principle, every citizen over thirty was entitled to serve twice on the *boule*, but how many did serve twice? Some historians have contested my view that no more than ca. 100 of the seats in the *boule* can have been filled by citizens who served a second time.[36] We cannot, of course, name a precise figure, but the rule that no one could be *epistates ton prytaneon* more than once in his life[37] puts a limit to the number of councillors who actually availed themselves of the possibility to serve a second time. The Attic year had 354 days but in the course of nineteen years there would be seven intercalary years of 384 days. It follows that, on average, 365 councillors who served their first term would be *epistates ton prytaneon* in the course of the year. So if all citizens served a second term as well, three out of four would be prevented from serving as *epistates ton prytaneon* during their second term. To run the council constitutionally in an ordinary year of 354 days there would have to be a minimum of 300 first-year councillors. If the remaining 200 were all serving their second term, some 50 would, on average, be eligible for the post as *epistates ton prytaneon* and it would be possible to run the council constitutionally, but only in an ordinary year. In an intercalary year there would have to be some 350 first-year councillors as against some 150 second-year councillors, of whom, on average, 37 would not have served as *epistates ton prytaneon* during their first term. Now, we can be pretty certain that the Athenians did not make all these calculations and, since the selection of councillors was made by sortition, they could not control – if they had wanted to – that second-year councillors constituted a maximum of ca. $^{3}/_{10}$ of the total. The system must have worked simply because there were so few who served twice

that the problem never arose. The inference is that, in any year, there cannot have been more than ca. 100 second year councillors.

In 1980-84 Peter Rhodes studied the prosopographical evidence for citizens who are attested as having served twice, and he concluded that very few did, since altogether no more than 2% are attested in the numerous bouleutic inscriptions we have preserved.[38] Studying the same material and concentrating on the inscriptions in which we can expect repetition of the same name, I concluded that perhaps as many as $^1/_5$ of the *bouleutai* may have served a second term, but this much more optimistic conclusion is still compatible with the rule that no citizen could serve as *epistates ton prytaneon* more than once in his life.[39]

Alternatively, one may argue that the Athenians did not care and did not control whether a man who was appointed *epistates ton prytaneon* had actually served once before, perhaps 10 or 20 years earlier. My answer is that no formal check was necessary. If any citizen ventured to be appointed for a second time, he ran the risk that an enemy would indict him by, e.g., a *graphe epistatike*,[40] or pass on the relevant information to one of those who frequently acted as public prosecutors. As in most other aspects of politics in Athens, the system of public actions to be brought by any citizen would be enough to ensure that the rules for appointing an *epistates ton prytaneon* were, by and large, respected without any formal check.[41] The inference is that, in any year, no more than ca. a fifth of all councillors served their second term, and that a quarter is an absolute and not very likely maximum.[42]

On the assumption that the legal requirements were as described above and that they were enforced, we can calculate the minimum citizen population required to run the council constitutionally.[43] The calculation is based on the following three assumptions: (1) The model population used is Coale and Demeny Model West, mortality level 4, growth rate 0.5%.[44] (2) One *bouleutes* out of five served twice, i.e. every year some 400 Athenians served their first term and some 100 their second.[45] (3) The minimum age was 30, and the age distribution of *bouleutai* who

served their first term was the same as that of the whole male citizen population over 30,[46] i.e. of the 400 who served their first term 38% were between 30 and 39, 29% between 40 and 49, 19% between 50 and 59 and 14% over 60. To run the council constitutionally in accordance with these three assumptions requires a minimum of 17,800 adult male citizens (aged 18 or more).[47]

Thus, from a strictly constitutional point of view it is just possible to run the *boule* with a total of 21,000 adult male citizens. But in addition to the qualifications discussed above there were economic and geographical factors which affected the minimum number of citizens required to run the *boule*. (1) As to wealth, the members of the *boule* did not constitute a cross-section of the population. (2) Each deme was entitled to fill a fixed number of seats in the *boule*, and the bouleutic inscriptions show that virtually all the demes year in and year out did furnish the required number of *bouleutai*. (3) The prosopographical evidence indicates that Athenian citizens did not normally serve on the *boule* as soon as they turned thirty. (4) The sending out of thousands of klerouchs in the mid-fourth century reduced the available number of citizens fit for service in the *boule*.

Re (1). According to the letter of the law, councillors were magistrates (*archai*)[48] and had to belong to one of the upper three Solonian census classes.[49] But in the fourth century the law had become a dead letter and even thetes were allowed to serve as *tamiai tes Athenas* although these treasurers officially were selected from among the *pentakosioimedimnoi*.[50] In fact, if there were no more than 21,000 adult male citizens, almost every citizen over thirty must have served on the *boule* at least once. Thus, the social composition of the *boule* must have been exactly the same as for the entire citizen population. But the prosopographical evidence suggests that the social composition of the *boule* was top-heavy, and that men from families with trierarchic fortunes served in more than their due proportion. For this issue I refer to what I wrote in *Demography and Democracy* 58-60.

Re (2). It is unbelievable that, in the fourth century, every deme had a population that matched its bouleutic quota to perfection. That may have been the case when the bouleutic quotas

were introduced, perhaps already in the late sixth century. If – as is commonly believed – they were not revised until 307/6,[51] a significant discrepancy between population and bouleutic quota must have developed in the course of two centuries during which Athens experienced dramatic expansions and contractions of its population. Nevertheless, the epigraphical evidence shows that in the second half of the fourth century all demes – apart from a few of the smallest – still provided the number of *bouleutai* assigned to the deme.

If the population of the demes did not match the bouleutic quotas any longer but, nevertheless, almost all demes could still supply the required number of *bouleutai*, the inference is that every deme must have had a number of citizens which was large enough to provide the required number of *bouleutai* and that many demes must have had a smaller or larger population in excess of the minimum required to fill its bouleutic quota. With a total of 31,000 citizens the average number of citizens per seat in the *boule* would be 62; with 21,000 citizens it would be 42. The inescapable variations in the relation between bouleutic quota and number of *demotai* can be illustrated by a study of two of the demes, one larger and one smaller than the average.

(a). Halai Aixonides belonged to the tribe of Kekropis and had six seats in the *boule*,[52] i.e. an average population of 375 adult male citizens if there were a total of 31,000 as against 250 if there were 21,000. Of these ca. 12 and 8, respectively, would turn eighteen in the course of a year and be enrolled in the deme as citizens. At the ages of 30 and 40 ca. 10 and 8 would still be alive if there was a total of 31,000 citizens, ca. 7 and 5 if the total was 21,000. The ephebic inscriptions of Kekropis testify to a total of 36 or perhaps 37 ephebes from Halai in the years 334/3, 333/2 and, perhaps, 332/1, i.e. an average of 12 per year. Thus, with 31,000 citizens, Halai was indisputably one of the demes which had a significantly higher population than necessary to supply 7 *bouleutai*, especially if we take into account that far from all the young citizens served as ephebes. With 21,000 citizens the deme would still have no difficulty in filling its bouleutic quota, but, on the other hand, we have to face the problem that more served as

ephebes (12 per year) than the demographically expected number of nineteen-year-olds (8 per year). That Halai was a relatively overpopulated deme is apparent too from the reform of 307/6 by which Halai was one of the demes that got four extra seats in the new Council of Six Hundred.

(b). Halimous belonged to the tribe of Hippothontis and had three seats in the *boule*, corresponding to an average population of 186 adult male citizens if there were a total of 31,000 citizens, as against 126 if there were 21,000. According to the speaker of Dem. 57, however, the total number of Halimousioi in 346/5 was ca. 85. The speaker says he was the sixtieth to be voted on in the *diapsephismos* conducted by the deme (Dem. 57.10) and that no more than twenty were still left to be voted on in a meeting convened on the following day (Dem. 57.15). If Euxitheos is telling the truth, the Halimousioi would hardly be able to fill the deme's bouleutic quota. Of 85 *demotai* an average of 2.8 would be inscribed in the deme every year and of them no more 2.3 would survive to the age of thirty and 1.8 to the age of forty. Thus, the deme could fill its bouleutic quota of 3 only if all Halimousioi surviving to the age of thirty served on the *boule* as soon as they turned 30 and if half of them served a second time.[53] Yet, no less than three bouleutic inscriptions testify to three *bouleutai* from Halimous.[54] In this case social pressure must have been necessary.

The above calculation, however, rests on the supposition that the speaker is telling the truth, and that can be questioned. He claims that when, late in the day, it was his turn to be voted on, no more than 30 *demotai* were present, but over 60 votes were cast against him and that each voted twice or even three times.[55] All his friends and relatives had left. To confirm his account of what happened, he has to ask some of those who actually voted against him to come forward as witnesses but they have refused on oath to testify.[56] Are we really to believe that not one single honest Halimousios was left when the vote on the speaker was taken? I fear that the explanation is rather that Euxitheos is simply misrepresenting what happened during the *diapsephismos*, and since, as I have argued, it is in his interest to minimise the total

number of Halimousioi, we simply cannot trust his total of a maximum of 85 *demotai*. There can be no doubt, however, that Halimous was one of the "underpopulated" demes, and that is confirmed by the list of ephebes of Hippothontis of 324/3 in which not one single Halimousios is to be found in spite of the fact that it is the longest of the preserved ephebic lists.

I conclude that almost all demes – except two or three of the smallest – must have had a number of citizens over thirty which was so large that the deme could provide the stipulated number of *bouleutai*, and that many demes must have had a sometimes smaller and sometimes larger number of citizens in excess of the minimum.

Re (3). The age requirement of thirty years did not mean that a large number of citizen served their first term soon after they had turned thirty.[57] A study of Athenians who were politically active in the period 403-322[58] provides us with the exact or approximate age of altogether 38 *bouleutai*, of whom 6 (= 16%) are attested as having served twice.[59] Taking all the 44 councillorships together, the mean age of the councillors is 45 years, the median is 44 years and, if we divide the councillorships into five-year groups, the mode is 40-44 years. The mean age of those who are attested as *bouleutai* only once plus the first councillorship of those who served twice is 44 years, the median is 40 years. When they served their second term, the mean age of the six *bouleutai* who served twice is 59 years.

According to the demographic model I use, the age distribution of the whole adult male population over 30 is 38% in their thirties, 29% in their forties, 19% in their fifties, and 14% over sixty. The age distribution of the 38 councillors is 27% in their thirties, 38% in their forties, 15% in their fifties, and 20% over fifty. Compared with the expected age profile of the entire population over thirty, the prosopographical material I have studied indicates that men over forty were better represented in the *boule* than in the entire population over 30.

Politically active citizens can be expected to have served on the *boule* sooner rather than later and to have served twice more often than the average Athenian. An investigation of all attested

fourth-century *bouleutai* is a major task for which I have not yet got the time but, as a test case, I have studied the list of *diaitetai* of 325/4 (*IG* II^2 1926). Of 103 arbitrators aged 59 in 325/4, 7 are attested as members of the *boule*, all in the period before the year in which they served as arbitrators. The mean age is 45. It must be remembered, however, that the prosopographical evidence we have for *bouleutai* is rich after ca. 344 but scarce for the decade 354-344 and the decade 324-314. Consequently *bouleutai* serving in their thirties and sixties must be underrepresented in this material. Nevertheless the inscription testifies to the fact that many Athenians served as councillors in their forties and fifties.

Re (4). In the second quarter of the fourth century the Athenians sent out an astonishing number of klerouchs.[60] A naval inscription records klerouchs to be sent to an unknown destination, probably in 370/69. Three contingents were sent to Samos in 366/5, 361/0 and 352/1. Poteidaia was conquered in 364/3(?) and settled with klerouchs who were probably reinforced by a second contingent sent out in 362/1. When Chares destroyed Sestos in 353, the whole Chersonesos, apart from Kardia, had to accept Athenian klerouchs.[61]

A fragmentary catalogue of klerouchs to an unknown destination indicates that several hundred were sent out on this occasion,[62] and one of the contingents sent to Samos is said to have involved 2,000 citizens.[63] The population of Sestos was partly killed, partly enslaved and simply replaced by klerouchs.[64] Similarly the Samians were expelled and the whole island taken over by Athenian citizens.[65]

We are best informed about the klerouchy on Samos. Two large inscriptions of the mid-fourth century provide us with information about the identity of over 300 of the Samian klerouchs. One is an inventory of the valuables in the temple of Hera in which a number of treasurers and councillors are listed.[66] The other is a roster of all members of the council and some other magistrates.[67] The roster of the councillors shows that the constitution instituted by the Samian klerouchs was a half-size copy of the Athenian democracy: nine archons, but five *strategoi* and a council of 250.[68] The editors toyed with the idea that the popula-

tion of the klerouchy amounted to roughly half of the Athenian citizens in Attika.[69] That is, in my opinion, impossible,[70] but there can be no doubt that klerouchs were sent out by the thousand and I stand by what I wrote in 1985: "if we focus on Samos and the Thracian Chersonesos alone, I believe that a total of 5,000 adult male klerouchs sent out between 365 and 351 is a cautious estimate".[71]

A prosopographical study of the 250 Samian councillors attested in the roster of ca. 350 testifies to some mobility among the klerouchs: some of them were buried in Samos, but others returned to Athens and were buried in Attika. There is no indication that a considerable number of the klerouchs returned before the Athenians were expelled from Samos in 321.[72] Four of the Samian klerouchs are attested as members of the Council of Five Hundred in the period ca. 350 to 321;[73] but we do not know whether they returned to Athens for one year only or had already returned to Athens for good when they became councillors. Other Samian klerouchs are attested as Athenian arbitrators,[74] and they had probably returned to Athens for good before the klerouchs were expelled.

If the Athenian adult male citizen population in 366 B.C. totalled no more than ca. 21,000, only some 16,000 can have been left in Attika by the mid-fourth century and they were certainly too few to man the Council of Five Hundred. It is bad enough to have some 5,000 emigrants out of 30,000, i.e. a sixth of the total population, and to have about a quarter of all citizens sent out of Athens in the 360s and 350s is in my opinion unbelievable.[75]

2. The Ephebes

In 336/5 the *ephebeia* was reformed,[76] and I agree with Ruschenbusch that, at least after the reform, all citizens and not just the members of "the hoplite class" were liable to ephebic service.[77] In the Aristotelian *Athenaion Politeia* it is taken for granted that all young citizens served as ephebes, and at Lycurg. 1.76 it is explicitly stated that all citizens took the ephebic oath when they came of age and had been inscribed as citizens.[78]

But to be liable to ephebic service is not the same as performing ephebic service. Our knowledge about the number of ephebes stems from lists of names appended to honorary decrees either for ephebes or passed by ephebes or set up by ephebes. Now each year each *phyle* set up its own monument, and we have preserved ten lists of names, most of them fragmentary, but eight in such a state of preservation that the number of ephebes recorded in the inscription is known or can be estimated.

334/3	Kekropis	ca. 42	R. no. 2; *IG* II^2 1156; cf. *SEG* 51.7. *RO* no. 89.
333/2	Erechtheis	ca. 50	R. no. 13; *IG* II^2 2401 and 3105; *SEG* 39 184-85.[79]
[333/2	Pandionis	30-32	R. no. 8; *IG* II^2 2976].[80]
333/2	Kekropis	52	R. no. 5; *SEG* 41 107.[81]
333/2	Hippothontis	ca. 34	Unpublished, cf. *SEG* 38 67.[82]
333/2	Leontis	ca. 44	R. no. 9
[332/1	Pandionis	ca. 30	R. no. 10].[83]
332/1?	Kekropis	65?	*SEG* 36 155; *Agora* 15 494.[84]
330/29?	Oineis	ca. 56	R. no. 12
324/3	Leontis	62	R. no. 15

The number of ephebes from a *phyle* ranges from under 40 to over 60,[85] and it is normally inferred from the evidence we have that a year class of ephebes must have numbered ca. 500 persons.[86]

What are the demographic consequences of supposing – with Ruschenbush and others – that the total number of a year class of ephebes is identical with the cohort of nineteen-year-old citizens? In a population like the Athenian a year class of eighteen- to nineteen-year-olds constituted ca. 1.9% of all males and ca. 3.3% of all males from eighteen upwards.[87] A year-class of 500 *ephebes* would correspond to some 15,000 adult males altogether, and some 11,000 aged 20-49. According to Thucydides (2.13.7) Athens had 13,000 hoplites in the field army when its population peaked in 431, and I find it unlikely that there were as many as 11,000 in the 330s and perhaps even 13,000 in the 320s.

On the other hand, 500 ephebes per year – corresponding to a total of ca. 15,000 citizens – are too few to match Ruschenbusch's preferred number of 21,000 adult male citizens.[88] So even those who prefer a total of 21,000 citizens in fourth-century Athens ought to allow for a considerable number of young Athenians who did not serve as ephebes, and – *a fortiori* – all those who prefer a total of ca. 30,000 adult male citizens have to ask why so many of the young citizens do not appear in the preserved lists.

First, the preserved ephebic inscriptions indicate that it took some time for the reform to catch on. On the whole, early lists are shorter than later lists, and it can be assumed that a year class of ephebes – with variations from *phyle* to *phyle* – totalled ca. 450 to 500 in the first years after the reform but perhaps over 600 a decade later.[89] But the cohort of eighteen- or nineteen-year olds which matched 21,000 is ca. 700, and it is ca. 1,000 if we go for a total of 30,000 citizens. So even in the 320s there must have been a substantial number of citizens aged eighteen or nineteen who did not serve as ephebes or – perhaps – did serve as ephebes but were not recorded among those who published the honorary decree passed by the *boule* and the *demos*. It is *a priori* reasonable to suppose that all the ephebes participated in the publication of the honours but we have no proof, and registration in the ephebic inscriptions of only some of the ephebes could be a possible explanation of the very surprising variations from tribe to tribe,[90] from deme to deme within the same tribe, and from year to year within the same unit, both tribe and deme.

If – after all – we accept to carry on a demographic analysis on the basis of estimated averages, we have to infer that a year class of 500 nineteen-year-olds is too small to match a total population of 21,000 adult male citizens, see *supra*, and – to be discussed now – it is too small too to run the *boule*.

In 334/3 Kekropis provided a maximum of 42 ephebes, and in the following year the number of ephebes from Leontis totalled ca. 44. Of 42-44 ephebes aged eighteen, the average number surviving to the age of thirty would be ca. 35 and no more than ca. 28 would still be alive when they reached forty.[91] If, every year,

each of the *phylai* had to provide ca. 35-40 who served their first time in the *boule*, some 40 to 42 ephebes would not suffice, not even if they all served at the age of thirty. Furthermore, we would have to suppose that the bouleutic quota assigned to each of the demes matched the population of the deme to perfection; but that was far from often the case, as is apparent from a study of the number of ephebes from the deme of Xypete.[92]

We know from the bouleutic inscriptions that Xypete had seven seats in the *boule* and, like all other demes – except a few of the smallest – it filled its bouleutic quota and provided 7 *bouleutai* annually.[93] Xypete belonged to the tribe of Kekropis for which we possess no less than three ephebic inscriptions which record the ephebes enrolled in 334/3,[94] 333/2[95] and, presumably, 332/1.[96] The three inscriptions record altogether 10 ephebes from Xypete, *viz* 2 in the first year, 5 in the second and 3 in the third. On average, only 8 or 9 of these would still be alive when they turned 30 and became eligible for a seat in the *boule*, i.e. a maximum of 3 per year. To fill the 7 seats in the *boule*, the annual increment of eligible citizens must have been 5, of whom 2 served twice,[97] i.e. a total of 15 in the three-year period. And this calculation presupposes that all served on the *boule* as soon as they turned 30 and that no less than 40% of them served twice. With an average age of ca. 40 for citizens serving their first term in the *boule*, and about a fifth serving twice, the average number of new citizens to be inscribed every year would be 9 and not 3. The conclusion is that in the late 330s less than half the young Xypetaioi served as ephebes.

How can we explain the discrepancy between the literary and the epigraphical sources? By Lykourgos and the author of *Ath. Pol.* we are told that all young Athenians served as ephebes apparently for two years during which they were supported by the public and received a daily allowance of four obols. But the ephebic inscriptions indicate that far from all did serve, and that can be inferred from the inscriptions no matter whether one prefers a total of 21,000 or 30,000 citizens. The number of ephebes ranges from a minimum of ca. 450 to a maximum of ca. 600. The minimum seems to be the more likely figure in the first

years after the reform whereas the maximum may have been reached in the course of the 320s. If all young Athenians aged eighteen and nineteen did serve as ephebes we should expect a year class of ca. 700, if the total number of citizens was ca. 21,000, and close to 1,000 if the total number was ca. 30,000. Who were the young Athenians who did not enrol for the *ephebeia*?

First, there must have been a not insignificant number who for reasons of health were unfit for military service. I have assumed that at least 20 to 25% were not conscripted when the field army was called up for a campaign, some because they were unfit, some because they were needed elsewhere.[98] But this percentage applies to Athenians aged from 20 to 50. We can suppose that at least 90% of the eighteen-year-olds would be fit to go through the *ephebeia*. Assuming that 10% were exempted from ephebic service for reasons of health, the cohort of young Athenians inscribed in the demes would be ca. 500 in the first years after the reform and perhaps ca. 660 in the 320s.

Since, after all, we have to use the shotgun method, a year class of 660 ephebes corresponds to a total of 20,000 adult citizens, which is close to a total of 21,000, but, on the other hand, we have to admit that in the 330s some 30% of all young Athenians and in the 320s still a minimum of 10% obtained full citizenship without serving as ephebes. Contrary to what Ruschenbusch assumes, serving as an ephebe was not an inescapable condition for obtaining citizenship.

So, alternatively, we may return to the view that the *ephebeia* was open to members of the hoplite class only and that all thetes were excluded. But 30 year classes of hoplites between 20 and 49, starting with a year class of ca. 500 at the age of 20, would add up to a field army of 11,000, corresponding to a "hoplite class" of ca. 15,000, and if, for the 320s, we start with a year class of ca. 600 aged 20 we get a field army of ca. 13,000 aged between 20 and 49. As mentioned above, I find it unlikely that the Athenian field army of hoplites was as strong in the 320s as it was in the first year of the Peloponnesian War.

I repeat that, as the evidence stands, the best solution to the

problem seems to be that the ephebic service was open to all Athenians (as indicated by Lykourgos and the *Ath. Pol.*) but that far from all served. When the eighteen-year-olds had been inscribed in their demes they probably all took the ephebic oath, which was in fact a citizens' oath as much as an ephebic oath,[99] and for the next two years they were technically *epheboi*, but not all of them performed the complete two-year programme, and only those who did were listed in the honorary decrees passed by *demos*, *boule* and *phyle*. Most of those who served may have belonged to what modern historians call the hoplite class. But there was no longer a proper "hoplite class" in the fifth-century sense. We know from *Ath. Pol.* that the ephebes were all trained both as hoplites and as light-armed, and all ephebes were issued with a hoplite shield and spear after the first year. Hence hoplite service no longer depended on having sufficient means to buy the equipment. All Athenians irrespective of wealth could serve. This was, I think, the Athenians' way of creating a "hoplite democracy" in connection with the reform of the *ephebeia* in 336.[100]

No matter whether this explanation of the missing nineteen-year-olds among the ephebes is the right one or we have to find a different explanation, the conclusion is that the ephebic inscriptions cannot be used as evidence for the total number of citizens, but by matching some of the lists with what we know about bouleutic quotas it can be inferred that a total of 21,000 is too small to run the *boule*.

3. The Number of Citizens 322-307

For the size of the Athenian citizen population in the period 322-307 we possess two sources which, in fact, are the cornerstones of the view that during the fourth century the number of adult male Athenian citizens totalled ca. 21,000 and not ca. 30,000 or perhaps even more.

1. In the Autumn of 322 the democracy was abolished and replaced by an "ancestral Solonian constitution" which turned out to be an oligarchy based on a property census of 2,000

drachms. According to Diodoros 18.18.5 the number of full citizens after the reform came to 9,000 whereas over 22,000 were disfranchised (πλείους δισμυρίων καὶ δισχιλίων). According to Plut. *Phoc.* 28.7 the number of Athenians deprived of full citizenship totalled over 12,000 (ὑπὲρ μυρίους καὶ δισχιλίους).

2. At some point during his rule of Athens from 317 to 307 Demetrios of Phaleron conducted a review (ἐξετασμός) of the population of Attika (τῶν κατοικούντων τὴν Ἀττικήν) and found that there were 21,000 Athenians, 10,000 metics and 400,000 slaves (Ἀθηναίους μὲν δισμυρίους πρὸς τοῖς χιλίοις, μετοίκους δὲ μυρίους, οἰκετῶν δὲ μυριάδας μ'). The source is Athenaios (272C), who quotes an otherwise almost unknown and undated historian by the name Ktesikles (*FGrHist.* 245) fr. 1.

Re (1). One of the main points of Luigi Gallos contribution to the *Second International Colloquium on Ancient Historical Demography* is a new interpretation of these two sources and the connection between them.[101] The first issue is to establish the relationship between Diodoros' and Plutarch's accounts of the demographic effect of the property census of 322. If 9,000 citizens were left after the reform, the total number of citizens before the reform was 9,000 + 22,000 = 31,000 if we follow Diodoros or 9,000 + 12,000 = 21,000 if we prefer Plutarch. Gallo agrees with me and many others that Plutarch and Diodoros must have used the same source and that the difference between 12,000 and 22,000 must be due to an error in the transmission of the text:[102] it has always been fashionable to correct Diodoros by deleting the first syllable in [δισ]μυρίων. Strangely enough, historians who prefer Diodoros' account to that of Plutarch have not suggested the opposite emendation, i.e. in Plutarch to read <δισ>μυρίων, although the addition of δισ- in Plutarch is as easy a conjecture as the omission of the same syllable in Diodoros. My conclusion was to reject both Plutarch *Phoc.* 28.7 and Diod. 18.18.5 as sources for the number of citizens *until we have established the true number from other sources.*[103]

Gallo (2002) 39 adduces two arguments in support of the view that the preferable figure is 12,000 + 9,000 = 21,000 altogether: (1) neither source is precise but states that the number of disfran-

chised citizens is *over* 12,000 or 22,000 respectively. (2) The total 21,000 is identical with the total of 21,000 Athenians found in Demetrios' population census of 317-307. In Gallo's opinion the only possible explanation is that the common source used by Diodoros and Plutarch reported the number of citizens under the oligarchical constitution but did not know the number of citizens disfranchised in 322. Instead he used the information he had about Demetrios' census and deduced that the number of disfranchised citizens must have been *over* 21,000 minus 9,000 = *over* 12,000 disfranchised Athenians. It follows that it is Plutarch who reports the correct figure but also – as duly emphasised by Gallo – that we do not know how many citizens there were in 322 before the reform. The 21,000 obtained by adding up 9,000 and 12,000 are, in fact, yet another source for the 21,000 counted by Demetrios of Phaleron and the figure does not provide us with any information about the total number of citizens in 322.

I do not think that Gallo's line of argument is the only possible explanation – I have little doubt that other interpretations will be suggested in future studies – but Gallo does provide a very persuasive clue to a problem noted already by Beloch, who found it rather suspicious that the total number of citizens could be the same in 322 and in the period 317-307, given the major migrations of Athenians attested in the period 322-317.[104] As the evidence stands, I find Gallo's explanation convincing but note too that one of the two cornerstones of the total of 21,000 Athenian citizens in the fourth century has vanished. We are left with Demetrios of Phaleron's census.

Re (2). In *Demography and Democracy* and again in my 1994 article I suggested that what Demetrios of Phaleron organised was not a census of all citizens but a review of citizens of military age and fit for military service.[105] I argued that the count is called an ἐξετασμός and that this term indicates that it was a military review and not a population census. I adduced some 30 passages in which the meaning is "military review", not "population census".[106] Gallo (1991) 374 contested my observation and in note 24 he listed 32 passages from various authors in which the meaning of ἐξετασμός and ἐξέτασις is not "rassegna militare"

but "esame" or "verifica".[107] Now, I have never contested that ἐξετασμός and ἐξέτασις can mean "examination" or "investigation" and can signify an examination of, e.g., a person's character or a philosophical problem *vel sim.*[108] My point is that whenever these two terms are found in a demographic context in connection with a count of a group of persons, the sense seems invariably to be a "review", "muster" or "roll-call", and almost invariably in connection with a military review of some kind. Therefore, Gallo's list of attestations of the broader meaning is, strictly speaking, irrelevant. But, I have to admit, there is one source in which the "review" is not of soldiers but of citizens, *viz.* the examination conducted in 346 of all Athenian citizens in all the demes.[109] The technical term found in contemporary sources is διαψηφισμός or διαψήφισις[110] but in Dion. Hal. the term used is ἐξέτασις.[111] As is apparent from the context, the examination is still a review or roll-call, *viz.* of the *demotai* in all the 139 demes. Now, in the literal sense to make a review of all who lived in Attika would be impossible, whereas a review of those of military age and fit for military service was a feasible undertaking. But it cannot be ruled out that the *exetasmos* under Demetrios – like the *diapsephisis* in 346 – was a review of all citizens and metics conducted locally in all the 139 demes, and that is, in fact, what Gallo believes.[112] He connects the census with Demetrios' introduction of a property census of 1,000 drachms and, accordingly, suggests that the population census was conducted in 317/6 in connection with Demetrios' accession to power.[113]

Assuming that we do have a total of 21,000 adult male Athenians in 317, what can we infer from that about the number of citizens in the period before the abolition of democracy in 322/1? Not necessarily very much, I fear, because in the years 322-317 the Athenian population was affected by major migrations.

The Athenian klerouchs on Samos, undoubtedly several thousand, were expelled in 322/1 when the island was given back to the Samians who had spent 43 years in exile, most of them settled in Anaia on the coast of Asia Minor.[114] Some of the Klerouchs returned to Athens, e.g., Epikouros and his father Neokles,[115] but others seem to have stayed on.[116]

Conversely, according to Diodoros all the citizens disfranchised in 322 were settled in Thrace (we do not know where) on land given to them by Antipatros; according to Plutarch only some of them were relocated, while others stayed on in Athens. Since, accepting Gallo's interpretation, we do not know the number of disfranchised citizens, we do not know the number of relocated citizens either. But the Greeks were used to *synoikismoi*, *dioikismoi* or *metoikismoi* that affected four-digit and sometimes five-digit numbers of persons. Relocations of thousands of citizens was the order of the day especially in troubled periods, and the years after the death of Alexander the Great was a period of unrest. It is perfectly possible that over 10,000 Athenians were in fact sent to Thrace in 322. We do not know. Some of them returned in 318 in connection with the reintroduction of the democracy.[117] Again, we do not know how many. I still stand by what I wrote in 1985: "In the period 322-318 the vast population movements defy calculation",[118] and we have a choice between two scenarios:

(a) If Demetrios' census was a military review of 21,000 Athenians corresponding to a total of ca. 29,000 we have to assume that, in the end, the relocations did not affect the total number of Athenians radically. It was still ca. 30,000 as it had been before the abolition of the democracy. The return of Samian klerouchs must have resulted in an increase in the number of citizens, and many of those who had moved to Thrace in 322 must have returned in 318.

(b) Assuming a total of 21,000 Athenians in 317, we may have a similar scenario: an immigration of klerouchs from Samos was offset by the emigration of those who had been sent to Thrace in 322 and did not return in 318. But, alternatively, it cannot be excluded that the relocation in 322 had affected a five-digit number of families, as stated by Diodoros, and that most of them were still in Thrace in 317. Similarly, the Samian klerouchs were expelled in 322/1 but only some of them had returned to Athens. In that case a total of ca. 30,000 Athenians before 322 was reduced to a total of ca. 21,000 in 317.

So the interpretation of the *exetasmos* as a population census is

compatible with both views: that the total number of adult male citizens in 322 was ca. 30,000 and that it was ca. 20,000.

To conclude: Dionysios of Halikarnassos' use of the term *exetasis* to describe the *diapsephismos* in 346 makes it possible that the *exetasmos* conducted by Demetrios of Phaleron was a population census rather than a military review, but it does not decide the issue. The purpose of Demetrios' census may still have been to obtain exact information about the military resources of Athens, as was the case in Megalopolis in 318 and on Rhodes in 305.[119] In a demographic context an *exetasmos* or *exetasis* is always a review, and almost always a review of those liable to military service, in which case the total number of adult Athenians in the decade 317-307 seems to have been ca. 29,000. If, on the other hand, the 21,000 actually counted by Demetrios were all the adult male Athenians, we are still ignorant of the number of Athenians before the reform of 322 because we are ignorant of the number of Athenians affected by the migrations in the years 322-317.

4. The Carrying Capacity of Attika and the Import of Grain

A different line of argument which I have not pursued before in this context is to look at the carrying capacity of Attika and the import of grain into Athens. Numerous recent investigations have adjusted earlier more pessimistic assessments of the number of persons Attika could sustain: the percentage of arable land was larger than previously assumed (35-40% rather than just 20%), more intensive forms of cultivation might result in higher yields per ha, and conversely, the average amount of grain consumed by a person in a year was lower than once believed (some 200 kg per year or perhaps even less, instead of ca. 230 kg per year). It is Peter Garnsey who in 1985 questioned the then orthodox view advanced by Jardé in 1925.[120] He suggested that Attika may have sustained as many as ca. 130,000 persons instead of the ca. 80,000 calculated by Jardé.[121] In the following years Osborne argued in favour of an even higher carrying capacity and

suggested that "the whole Athenian population [ca. 150,000 persons] could have been supported from the territory of Attika itself alone",[122] while Sallares preferred a slightly lower number, namely between 84,000 and 124,000.[123] One new piece of information provided by the Athenian Grain Tax Law of 374/3 is the weight of wheat and barley, and for both cereals the figures are lower than those conjectured by Garnsey.[124] In a forthcoming study Alfonso Moreno will present a critical survey of the whole issue and argue, in my opinion persuasively, that Attika could sustain between 52,000 and 106,000 people and that a figure in the upper end of the range seems preferable.[125]

Now, if we assume that, in the second half of the fourth century B.C., there were 21,000 adult male citizens corresponding to a total of ca. 150,000 persons,[126] the Athenians would need to import grain to feed no more than ca. 50,000 persons, and this low figure is incompatible with what we know about the massive import of grain into Athens.[127] In the Leptines speech Demosthenes claims that the annual import from the Bosporan Kingdom amounted to 400,000 *medimnoi*.[128] One may question Demosthenes' contention that the grain imported from the Pontic region constituted about half the total Athenian import of grain. But the 400,000 *medimnoi* imported from the Bosporan kingdom come from the accounts kept by the *sitophylakes* and could easily be checked.[129] The grain grown in the Crimea was mostly wheat (*triticum*)[130] and 400,000 *medimnoi* of wheat was enough to sustain a population of ca. 75,000 persons of both sexes and all ages.[131]

That Demosthenes is not exaggerating is indicated by another source from the same period. The incident that triggered the war between Athens and Macedon in 340 was Philip's capture near Hieron of the grain fleet on its way from the Bosporos to Athens.[132] According to Theopompos, Philip seized 180 ships. If these ships carried an average of 3,000 *medimnoi* of grain, the total amount of grain seized by Philip came to 540,000 *medimnoi*.[133]

The grain grown in Attika supplemented with the grain imported from the Bosporan Kingdom would be more than enough

to sustain a population of ca. 150,000 persons, and in addition to what they imported from the Pontic region the Athenians shipped grain to Athens from their possessions in the Aegean (Skyros, Lemnos and Imbros),[134] from Libya, from Sicily and from the Adriatic.[135] To quantify these imports is impossible but the numerous sources we possess show that very large quantities were involved. Adding these imports to the grain grown in Attika and imported from the Bosporan Kingdom, I infer that the resident population of Attika in the third quarter of the fourth century must have totalled at least 200,000 and perhaps many more,[136] and a further inference is that the number of adult male citizens must have been 30,000 or more[137] rather than just 21,000.

Appendix 1
The Age of Bouleutai (Addenda to Hansen (1985) 80-82

Ἀλεξίμαχος Χαρίνου Πήληξ (*PA* 545), born before 401 (ca. 405?), *bouleutes* in 371/0 (*Hesperia* 47 (1978) 90/91 line 54), aged 30-35? (moves decree in 347/6, Aeschin. 2.83, 85).

Ἀρχίας Ἀκεστορίδου Χολαργεύς (*PA* 2481, *APF*), syntrierarch in the 330s (*IG* II^2 1624.93-4), *bouleutes* in 356/5 (Dem. 22.40), aged 30-40.

Ἔμπεδος Ὀῆθεν (*PA* 4696a), envoy 361/0 (*IG* II^2 175.2-3), *bouleutes* 328/7 (*Agora* XV 49.13), aged 55+.

Θεοζοτίδης Ἀθμονεύς (*PA* 6913 + 6914, *APF*), born ca. 450 (by the turn of the century he had two grown-up sons, cf. *APF* 222-3), *bouleutes* in 403/2 (*SEG* 28 46), aged 45+.

Μειδίας Κηφισοδώρου Ἀναγυράσιος (*PA* 9719, *APF*), *bouleutes* in 348/7 (Dem. 21.111, 116, 161), aged ca. 50 (Dem. 21.154).

Περίανδρος Πολυαράτου Χολαργεύς (*PA 11*800, *APF*, 464 E) born ca. 405 (*APF* 464 E), moves *IG* II^2 112, a non-probouleu-

matic decree (Rhodes, *boule* 68-9, 75, 76, 77n4, 81n6, Tod 144), but probably being a member of the *boule* (cf. the enactment formula), aged 40+.

Πύρρανδρος Ἀναφλύστιος (*PA* 12496), addresses the assembly in 347/6 (Aeschin. 1.84) and is still alive in 330 (Aeschin. 3.180), *bouleutes* in 378/7 (*IG* II^2 44.7), aged ca. 30.

Ταυρέας Πυθοκλέους Πιθεύς (*PA* 13430), addresses the assembly before 324 (Dem. *Ep.* 3.16), *bouleutes* in 303/2 (*Agora* XV 62.220), aged 42+.

Ἀλκίμαχος [.....]ου ἐγ Μυρρινούττης (*PA* 622) add: *bouleutes* in 335/4, aged 53 (*Hesperia* 67 (1998) 219-21 = *SEG* 48 101).

– Delete Πάνδιος Σωκλέους ἐξ Οἴου, cf. M.H.Hansen, *The Athenian Ecclesia* II (Copenhagen 1989) 68-9.

– What we know about the age of councillors indicates that the age distribution of the *bouleutai* was roughly the same as that of the entire citizen population over 30. If there was a difference it was that the councillors were, on average, older.

Appendix 2
Diaitetai 325/4 Attested as Bouleutai

Καλλιτέλης Κυδαντίδης (*PA* 8211), *diaitetes* in 325/4 (*IG* II^2 1926.28), *bouleutes* in 336/5 (*Agora* XV 42.128), aged 48.

Νικήρατος Νικοκράτους Ἀλαιεύς (*PA* 10734, *APF*), *diaitetes* in 325/4 (*IG* II^2 1926.34), *bouleutes* in 343/2? (*Agora* XV 36.10), aged 41.

Δωρόθεος Θεοδώρου Διομειεύς (*PA* 4609), *diaitetes* in 325/4 (*IG* II^2 1926.42), *bouleutes* in 341/0 (*Agora* XV 38.71), aged 43.

Στέφανος Δημύλου Προβαλίσιος (*PA* 12892), *diaitetes* in 325/4 (*IG* II^2 1926.49), *bouleutes* in ca. 350-40 (*Agora* XV 32.59), aged ca. 35-45.

Νικόστρατος Προσπάλτιος (*PA* 11048-49), *diaitetes* in 325/4 (*IG* II^2 1926.76 or 77), *bouleutes* in 336/5 (*Agora* XV 42.324), aged 48.

Φιλοκράτης Πόριος (*PA* 14627, *APF*), *diaitetes* in 325/4 (*IG* II^2 1926.86), *bouleutes* in 336/5 (*Agora* XV 42.282), aged 48.

'Αρχέδημος Φειδιάδου Αἰγιλιεύς (*PA* 2318), *diaitetes* in 325/4 (*IG* II^2 1926.168), *bouleutes* in 334/3 (*Agora* XV 44.31), aged 50.

Notes

1. Hyp. fr. 32-43, Sauppe.
2. Ktesikles (*FGrHist.* 245) fr. 1, cf. 40-43 *infra*.
3. Cf. 22-33 *infra*.
4. 33-38 *infra*.
5. Dem. 20.32, cf. 43-45 *infra*.
6. Ath. 272D, cf. schol. Pind. *Ol.* 8.30 = Arist. fr. 427, Rose, cf. Hansen (1985) 30-31 and 6-7 *supra*.
7. Hansen (2006).
8. Beloch (1886) 99, 106; (1922) 268, 273.
9. Gomme (1933) 17-18, 26.
10. Jones (1957) 79-81.
11. Ruschenbusch (1979), (1984), (1988a), (1988b), (1999).
12. M.H. Hansen, *Demography and Democracy. The Number of Athenian Citizens in the Fourth Century B.C.* (Herning 1985) reviewed in *TLS* 19.12. 1986 (Cartledge); *GaR* 33 (1986) 212 (Fischer); *ADH* (1986) 463-67 (Corvisier); *CR* 37 (1987) 64-65 (Hornblower); *LCM* 12 (1987) 157-59 (Harding); *MusHelv* 44 (1987) 295 (Ungern-Sternberg); *JHS* 107 (1987) 233 (Osborne); *AntCl* 56 (1987) 449-50 (Labarbe); *Phoenix* 42 (1988) 443-46 (Golden); *Mnemosyne* 41 (1988) 461-64 (de Blois & van Loon); *CW* 81 (1988) 228 (Scully); *RivFil* 116 (1988) 254-55 (Musti); *AnzWien* 42 (1989)

204-7 (Chaniotis); *RBPhil* 67 (1989) 211-12 (Straus); *Gnomon* 62 (1990) 170-72 (Duncan-Jones); *REG* 103 (1990) 722-23 (Demont); *Eos* 88 (1990) 404-7 (Turasievicz); *HZ* 255 (1992) 433-34 (Bleicken). *Idem*, *Three Studies in Athenian Demography*. Historisk-filosofiske Meddelelser. Det Kongelige Danske Videnskabernes Selskab 56 (København 1988), reviewed in *RPhil* 61 (1988) (Menu); *Mnemosyne* 44 (1991) 487-90 (Naerebout).

13. Burckhardt (1996) 39; Whitby (1998) 109-14; Rhodes and Osborne (2003) 454; Oulhen (2004) 257-70.
14. Garnsey (1988) 90; Sekunda (1992); Ruschenbush (1999); Corvisier and Suder (2000); Gallo (2002); Lengauer (2002). Sallares (1991) 53 suggests a range of 20,000-30,000 and finds it likely that the adult male citizen population "lay towards the upper rather than the lower end of the range".
15. I am grateful to Mark Munn for having sent me a transcript of these unpublished inscriptions, with permission to discuss them in this study.
16. Stroud (1998), cf. *SEG* 48 96.21-25.
17. *IG* XII.6 262.
18. Hallof and Habicht (1995) 293-303.
19. Gallo (1991) 375; (2002) 35-36, see 40-41 *infra*.
20. Hansen *et al.* (1990) 26.
21. Hansen (1985) 37-40; (1994) 308-10.
22. I used the argument in Hansen (1980) 167-69, and again in (1992) 60-61.
23. See Hansen (1992) 60-61 discussing the contrary view held by Develin in (1985) and, more cautiously, in (1989) 1.
24. Kroll (1972) 56, 103.
25. See Hansen (1985) 80-82; (1992) 61; (1994) 306-7 n. 41.
26. If Aischines is right about the homosexual relationship between Timarchos and Misgolas, Timarchos must have been some years younger than Misgolas, who was born in the same year as Aischines, i.e. in 390.
27. Fischer (2001) 11; cf Harris (1988).
28. The note on λῃξιαρχικὸν γραμματεῖον in Photius (Λ 276) and the *Suda* (Λ 462), cf. Hansen (1985) 57.
29. Ruschenbusch (1979) 180.
30. Plato Comicus fr. 182, *PCG*; Lys. 31.5, 33; Dem. 39.10; Aeschin. 3.62, cf. Hansen (1985) 57-58.

31. E.g. Sokrates in 406 (Pl. *Ap.* 31c-32b), cf. Hansen (1985) 58; Whitehead (1986) 320-21.
32. E.g. Halimous, cf. 30 *infra* and Hansen (1991/1999) 249.
33. Attested in Arist. *Ath. Pol.* 62.3, cf. Rhodes (1981) 696.
34. Tracy (2003) 152-53. One example is Lykomedes Diocharou Kontylethen who served in 259/8 (*Agora* XV 89.23), in 256/5 (*IG* II^2 769.9-10 + 441) and in 353/2 (*IG* II^2 777.6-7). For the dates, see Osborne (2000) 515.
35. The principal source is Polyb. 36.17.5-7, a much discussed passage, cf. Walbank (1979) 680; Salmon (1959) 468-76. The veracity of Polybios' account has been questioned but has repeatedly been confirmed by the landscape surveys, cf. e.g. Jameson, Runnels and van Andel (1994) 553-54.
36. Duncan-Jones (1990) 171; Gallo (2002) 41.
37. Arist. *Ath. Pol.* 44.1. See Hansen (1979) 56; (1985) 52; Rhodes (1981) 531.
38. Rhodes (1980); (1981b); (1984); a few addenda in Hansen (1985) 104 n. 178.
39. Hansen (1988)
40. For the *graphe epistatike*, see Arist. *Ath. Pol.* 59.2; Harp. s.v. ῥητορικὴ γραφή (P 3) = *Suda* P 151.
41. Hansen (1985) 52.
42. *Contra*: Gallo (2002) 40 referring to the prosopographical evidence only, without mentioning the rule about the *epistates ton prytaneon*.
43. See Hansen (1994) 9.
44. See Hansen (1985) 11-13.
45. Hansen (1985) 51-55.
46. See *supra* n. 41.
47. Calculated at the National Statistical Office by Lars Pedersen.
48. Hansen (1991/1999) 226-27, 247.
49. Arist. *Ath. Pol.* 7.4.
50. Arist. *Ath. Pol.* 7.4; 47.1. See Hansen (1991/1999) 44-45, 226-27, 247.
51. I still think that we must consider the possibility of a revision of the bouleutic quotas in connection with the re-introduction of the democracy in 403/2, see Hansen (1989b) 231
52. *Agora* XV 31.9-15.
53. In most cases the Halimousioi who served their second term would have had to abstain from participating in the daily sortition of the *epistates ton prytaneon*, see 26 *supra*.

54. *Agora* XV 13.10-16 (370/69?); 42.231-35 (336/5); 43.82-88 (335/4). One of the nine attested *bouleutai* is Nikostratos Nikiadou (*PA* 11020) who served on the boule in 335/4, aged 35 or more.
55. Dem. 57.13.
56. Dem. 57.14.
57. That a very high number of citizens served in the *boule* as soon as they turned thirty is nevertheless assumed by several historians in their calculation of the size of the citizen population required to run the *boule*, cf., e.g., Ruschenbusch (1979) 179; Rhodes (1980) 192; Osborne (1985) 43.
58. 80 of the 373 *rhetores kai strategoi* listed in Hansen (1989b) 34-64 are attested as *bouleutai*.
59. Hansen (1985) 55-56, 80-82; (1994) 306 note 41, to which I can add Ἀλκίμαχος ἐγ Μυρρινούττης (second term). The addenda to the list in Hansen (1985) 80-82 are printed *infra* 45-46.
60. See now Cargill (1995) 9-34.
61. For full documentation, see Hansen (1985) 70 with notes 203-7.
62. *IG* II^2 1952, see now Cargill (1995) 219-26.
63. Arist. fr. 611.35 = Heraclides Lembos 35, Dilts; Strabo 14.1.18.
64. Diod. 16.34.3.
65. The sources are Arist. fr. 611.35, Krateros (*FGrHist.* 342) fr. 21, questioned by Cargill (1983) 328, cf. (1995) 39, but trusted by Hallof and Habicht (1995) 286 with n. 7. Shipley (1988) 141-42 and 158 takes up an intermediate position.
66. *IG* XII.6 261 from 346/5.
67. *IG* XII.6 262 from ca. 350.
68. Hallof and Habicht (1995) 288-91.
69. Hallof and Habicht (1995) 288, 302. For a similar view, see Shipley (1987) 14 and 141.
70. The alternative, which I prefer, is to assume that the klerouchs were allowed to serve on the council more than twice.
71. Hansen (1985) 71.
72. Hallof and Habicht (1995) 293-96 with analysis 299-301: three of the Samian councillors are attested on tombstones found in Samos, three on Attic tombstones, perhaps postdating the expulsion of the klerouchs in 321. Four of the Samian councillors are probably identical with Athenian arbitrators (*diaitetai*) of the 320s, an indication that they had returned before the expulsion of the klerouchs.
73. Philokles Phrearrhios and Archebios Palleneus, both listed in *IG* XII.6 261.3 and 63, cf. Hansen (1985) 105 n. 185. Euetion of Sphet-

tos (*PA* 5463) and Pythokles of Philaidai both listed in *IG* XII.6 262 374 and 59, cf. Hallof and Habicht (1995) 294 and 296.

74. *IG* XII.6 262.21, 81, 312, 316, cf. Hallof and Habicht (1995) 294-96.
75. See Sbonias (1999) 224.
76. Harp. s.v. Ἐπικράτης.
77. Ruschenbusch (1979) 173-76; Hansen (1985) 48-49; Burckhardt (1996) 34. For the view that the ephebes were all hoplites, see Reinmuth (1971) 102-14; Rhodes (1981a) 503; Osborne (1985) 44; Rhodes and Osborne (2003) 454.
78. Lycurg. 1.76: ὑμῖν γὰρ ἔστιν ὅρκος, ὃν ὀμύουσι πάντες οἱ πολῖται, ἐπειδὰν εἰς τὸ ληξιαρχικὸν γραμματεῖον ἐγγραφῶσιν καὶ ἔφηβοι γένωνται. Arist. *Ath. Pol.* 42.2-3: ἐπὰν δὲ δοκιμασθῶσιν οἱ ἔφηβοι ... The oath which all citizens had to take is explicitly called "the ephebic oath", see RO 88.5-6: ὅρκος ἐφήβων πάτριος ὃν ὀμνύναι δεῖ τοὺς ἐφήβους. For a judicious account of the problem, see Burckhardt (1996) 33-43.
79. The principal treatment is now Palagia and Lewis (1989), cf. *SEG* 39 184-85.
80. A few names of ephebes are still preserved at the top of the stone, which is broken on all sides except the bottom. Traill (1986) 32 n. 20 and Sekunda (1992) 337 are right in rejecting Reinmuth's conjecture of 30-32 ephebes as pure guesswork.
81. The *editio princeps* and principal treatment is now Clinton (1991), cf. *SEG* 41 107.
82. Found at Panakton and to be published by Mark Munn, who has kindly provided me with a provisional transcript.
83. The stone is broken on all sides except the right-hand edge, and Sekunda (1992) 337-38 is right in rejecting Reinmuth's total of ca. 28-31 ephebes.
84. The principal treatment is now Traill (1986) 1-16, cf. *SEG* 36 155, but see also Clinton (1991) 29-30.
85. The lowest figures are Hippothontis 333/2 (ca. 34), Kekropis 334/3 (ca. 42) and Leontis 333/2 (44).
86. Ruschenbush (1999) 94; Rhodes and Osborne (2003) 454. By excluding the ephebic officers from the number of ephebes Sekunda (1992) 341 reaches an average of 466. For a defence of Mitchel's view (1961) that the ephebic offices were themselves ephebes, see Hansen (1994) 302-4.

87. Hansen (1985) 12, based on mortality level 4 growth rate 0.5%. It would not make a great difference if I preferred mortality level 2 (life expectancy 20 years, nineteen-year-olds constitute ca. 2.0% of all males and ca. 3.3% of all adult males) or mortality level 6 (nineteen-year-olds constitute ca. 1.9% of all males and ca. 3.1% of all adult males), or if I preferred a stationary population at mortality level 4 (nineteen-year-olds constitute ca. 1.9% of all males and ca. 3.0% of all adult males) instead of assuming a growth rate of 0.5%, which is indeed a maximum, cf. Scheidel (2003) 123.
88. Ruschenbusch (1979) 173; (1999) 94, however, is inclined to prefer a percentage close to the minimum he suggests, i.e. a year class of nineteen-year-olds = 2.5% of all adult males, calculated on the basis of nineteenth-century populations. A total of 525 ephebes would then correspond to 21,000 adult males. But to find a population in which the nineteen-year-olds constitute 2.5% of all adult males we have to get up to mortality level 14, growth rate 0.5% (life expectancy 50 years) or, if the population is stationary, to mortality level 10 (life expectancy 40 years).
89. Hansen (1988) 4; (1988) 190; (1994) 302. See Burckhardt (1996) 40.
90. It is often assumed that the ten tribes differed in size, see Traill (1975) 32, 64-65, and from the epigraphical evidence it is inferred, e.g., that Aigeis was the largest and Aiantis the smallest of the tribes. There can be no doubt that units of roughly the same size in 508/7 developed differently in the course of the next two centuries, but ephebic and bouleutic inscriptions constitute a substantial part of the prosopographical evidence used to establish the difference in size between the tribes, and the tribes are so unevenly represented in this body of inscriptions that I prefer to desist from describing any of the tribes as being larger or smaller than the average, see Hansen (1992) 59.
91. See, e.g., Corvisier and Suder (2000) 19.
92. The same line of argumentation applies *a fortiori* to the ephebes of Hippothontis 333/2, but in this case the total number of ephebes is more difficult to establish. Ca. 34 may be too pessimistic and the list may perhaps record those ephebes only who served at Panakton.
93. Traill (1975) Tables of representation. For Xypete, see *Agora* XV 31.1-8.
94. *IG* II^2 1156 = Reinmuth (1971) no. 2, cf. *SEG* 51 7.
95. Clinton (1991) = *SEG* 41.107.

96. Traill (1986) 1-16 = *SEG* 36.155. Because at least one and possibly two of the citizens recorded in this inscription (lines 79 and 101) are already attested as ephebes in the previous year (*SEG* 41 107.48 and 50) Clinton (1991) 30 doubts that the inscription is a list of ephebes, but see Munn (forthcoming).
97. See 26 *supra*.
98. Hansen (1985) 18-20.
99. Cf. *SIG*^{3} 360 (Pontic Chersonesos, late fourth century); Rhodes (1997) 290 (Telos ca. 300).
100. Hansen (1991/1999) 302.
101. Gallo (2002) 34-39.
102. Gallo (2002) 39.
103. Hansen (1985) 28-29 and 67.
104. Beloch (1886) 57-58 and Gomme (1933) 18, both suggesting the same explanation as that offered by Gallo, cf. Hansen (1985) 34-35.
105. Hansen (1985) 33-34; (1994) 302.
106. Hansen (1985) 98 note 106. The examples cover both the term ἐξετασμός and the term ἐξέτασις, often used synonymously with ἐξετασμός.
107. Gallo (1991) does not exist in any of the libraries to which I have access, but Prof. Maurilio Felici of "La Sapienza" in Rome kindly provided me with a copy.
108. I would like here to apologise for not having been more explicit in my earlier publications about this broader meaning of the terms ἐξέτασις and ἐξετασμός, which in this context is irrelevant.
109. Mentioned in Hansen (1994) 302 n. 21, discussed in Gallo (1991) 375.
110. Harp. s.v. διαψήφισις (Δ 50); schol. Aeschin. 1.77; hypoth. Dem. 57; Aeschin. 1.77, 86, 114; 2.182; Dem. 57. 7, 9, 15, 26, 27, 60, 62, 67.
111. Dion. Hal. *Isaeus* 16: ἐγράφη γὰρ δή τις ὑπὸ τῶν Ἀθηναίων νόμος ἐξέτασιν γενέσθαι τῶν πολιτῶν κατὰ δήμους ...
112. Gallo (2002) 35.
113. Gallo (2002) 34-38.
114. Diod. 18.18.6 and 9; Diog. Laert. 10.1; *IG* XII.6 43.8-14.
115. Diog. Laert. 10.1.
116. Shipley (1987) 142: "If the parallels between clerouchs' and Samian names show anything, they may show that numbers of Athenians stayed on after the end of the cleruchy in 322" and 305:

[the onomastic evidence] "tends to confirm that very few clerouchs were former Samians but that many clerouchs stayed on after 322". See also Cargill (1995) 39.

117. Plut. *Phoc.* 33.2; Diod. 18. 66.4 and 6.
118. Hansen (1985) 69.
119. In Megalopolis in 318 the defensive strength was found to be 15,000 *politai*, *xenoi* and *douloi* (Diod. 18.70.1): τῶν δὲ πολιτῶν καὶ ξένων καὶ δούλων ἀριθμὸν ποιησάμενοι μυρίους καὶ πεντακισχιλίους εὗρον τοὺς δυναμένους παρέχεσθαι τὰς πολεμικὰς χρείας. In Rhodes in 305 the defensive force amounted to 6,000 *politai* plus 1,000 *paroikoi* and *xenoi* (Diod. 20.84.1-3): ἀριθμὸν δὲ ποιησάμενοι τῶν δυναμένων ἀγωνίζεσθαι πολιτῶν μὲν εὗρον περὶ ἑξακισχιλίους, τῶν δὲ παροίκων καὶ ξένων εἰς χιλίους. ἐψηφίσαντο δὲ καὶ τῶν δούλων τοὺς ἄνδρας ἀγαθοὺς γενομένους ἐν τοῖς κινδύνοις ἀγοράσαντας παρὰ τῶν δεσποτῶν ἐλευθεροῦν καὶ πολίτους εἶναι.
120. Garnsey (1985) reprinted in 1998 with an addendum by W. Scheidel; Garnsey (1988). For a recent defence of Jardé's lower figures, see Isager and Skydsgaard (1992) 108-14.
121. Garnsey (1998) 204 assumes that 17.5% of Attika was under grain every year (biennial fallow), that the ratio between barley and wheat was ca. 4 : 1, and that the yield per ha was ca. 625 kg of wheat and ca. 770 kg of barley. The annual consumption is estimated at ca 175 kg per person and the result is that Attika could sustain a population of ca. 130,000 (Garnsey (1998) 193). However, the information in the new Grain Tax Law about the weight of wheat and barley (*infra* n. 124) shows that an annual consumption per person of 175 kg is too optimistic (*infra* n. 125).
122. Osborne (1987) 40, 99.
123. Sallares (1991) 79.
124. Garnsey (1998) 193 assumes that one litre of wheat and barley weighed 772 g and 643 g, respectively. The new inscription (*SEG* 48 96.21-25) shows that the weight was ca. 600 g and ca. 500 g, respectively, cf. Stroud (1998) 55.
125. Moreno (forthcoming) assumes that 35-40% of Attika was cultivable and, with biennial fallow, that ca. 17.5-20% were actually cultivated every year. The ratio between barley and wheat was 4 : 1. The total production was between 11,000 and 23,000 tons, and in normal years probably over 20,000. The annual consumption per person was ca. 215 kg (barley and wheat combined in the ratio

4 : 1) The result is that Attika in normal years could sustain a population of ca. 100,000 and had a carrying capacity (persons/km^2) of just over 40.

126. A fourth-century total population of 150,000 is assumed by Osborne (1987) 46; Garnsey (1988) 90; Sallares (1991) 60. – 21,000 adult male citizens (18-80+) correspond to 36,600 male citizens of all ages and 73,200 citizens of both sexes and all ages (cf. Hansen (1985) 12). If we add some 30,000 metics the total number of free persons comes to 103,200 persons and – assuming a ratio between free and slaves of ca. 2 : 1 – the total population of Attika amounts to ca. 150,000.
127. Isager and Hansen (1975) 19-29; Whitby (1998) 118-27.
128. Dem. 20.32.
129. Demosthenes wants to stress the importance of the Bosporan Kingdom to Athens; therefore his claim that the 400,000 *medimnoi* constituted half the imported grain is probably an exaggeration. But, conversely, it is in his interest to minimise the importance of imports from other places (Whitby (1998) 123). So the import from Sicily, Egypt, the Adriatic and other places may in fact have surpassed the import from the Bosporan Kingdom (Gomme (1933) 32-33). It is also worth noting that the 400,000 *medimnoi* come from the Bosporan Kingdom but it is imports from the Pontos which constitute half the Athenian import of grain. Grain imported from the other cities along the coast of the Pontos is not mentioned. Thus if one were to take Demosthenes at his word, the total import of grain into Athens would be 2 x (400,000 + x) *medimnoi* (Isager & Hansen (1975) 19; Whitby (1998) 123).
130. Tsetskhladze (1998) 62.
131. One *medimnos* of dried barley or 5 *hekteis* of dried wheat weighed one talent = 26.2 kg (*SEG* 48 96.21-25). Thus 400,000 *medimnoi* of mainly wheat must have weighed ca. 12 million kg. Assuming an average per capita consumption rate of ca. 160 kg wheat, a total of 400,000 *medimnoi* of wheat were enough to sustain a population of ca. 75,000.
132. Theopompos (*FGrHist* 115) fr. 292: a total of 180 ships; Philochoros (*FGrHist*. 328) fr. 162: a total of 230 ships.
133. Whitby (1998) 124-25. Theopompos reports that Philip gained 700 talents from the sale of the grain. In the mid-fourth century the retail price of a *medimnos* of wheat was ca. 5-6 drachms (Zimmer-

mann (1974) 101-2; Isager and Hansen (1975) 200 n. 3) and 700 talents corresponds to a sale of ca. 700,000 *medimnoi*.

134. Stroud (1998) 37.
135. Isager and Hansen (1975) 19-29; Whitby (1998) 118-27.
136. In (1988) 12 I suggested a fourth-century total of 200,000-250,000. Whitby (1998) 109-14 assesses the total population in the mid-fourth century at 250,000-300,000.
137. 31,000 adult male citizens (18-80+) correspond to 54,000 male citizens of all ages and 108,000 citizens of both sexes and all ages. If we add some 30,000 metics the total number of free persons comes to ca. 140,000 persons and – assuming a ratio between free and slaves of ca. 2 : 1 – the total population of Attika amounts to ca. 210,000.

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III. An Eretrian List of Citizens Inscribed ca. 290 B.C.

From a demographic point of view Eretria's citizen population ca. 290 B.C. is the best known of all *polis* populations of all periods. The reason is that the Eretrians had all the names of their full citizens inscribed on large *stelai* and that an unusually large part of these *stelai* are preserved. Furthermore, the *stelai* record the full name of the citizens. The citizenry of Eretria was organised into six *phylai*, each subdivided into a number of demes.[1] Eretria was one of the few *poleis* that regularly recorded a citizen's demotic.[2] Therefore, for each and every citizen recorded in the preserved lists we know his name, his patronymic, his demotic and thereby the *phyle* to which he belonged.

It is pretty certain that the lists do not include all male citizens from the cradle to the grave. They are lists of adult male citizens only. But we do not know whether they record citizens from when they came of age at 18 or 20 and to the end of their lives. Or, perhaps, whether they record citizens of military age and fit for military service. However, a close analysis of the names may allow us to make a choice between these possibilities. And that is what I intend to do in this study.

My investigation involves the use of demographic models, and the model I prefer is the one I have used before, *viz.*, Coale & Demeny (1966) Model West, males, mortality level 4.[3] Let me add that this investigation is conducted by the shotgun method.[4] Conclusions have to be presented as rough approximations within a minimum and a maximum, not as precise figures, and therefore I might equally well have used mortality level 3 or 5. On the other hand, it does make a difference whether one assumes that the Eretrian citizen population in the late fourth century was growing or stationary or declining. I think the evidence of the rosters indicates a declining population but to substantiate this view I have to make a series of calculations: one assuming

that there was a population growth of 0.5% per year, one assuming a stationary population, and one assuming a population decline of 0.5% per year.[5]

The Eretrian material at our disposal consists of (a) the lists of adult male citizens recorded *phyle* by *phyle*, (b) a few lists of ephebes coming from one *phyle*, (c) a scatter of names from decrees, dedications and tombstones which occasionally can shed more light on some of the citizens attested in the lists of citizens and ephebes. The tombstones are not very helpful because they record just the name of the deceased without patronymic and demotic. Some of the decrees, on the other hand, are important, especially when it comes to dating the lists of ephebes and citizens.

The lists of citizens we have preserved all belong in, roughly, the same period, *viz.* late fourth century to early third century,[6] but they belong to different series and were undoubtedly inscribed in different years. We can distinguish between an earlier and a later way of recording the names. In the older series the citizens are divided into *phylai* and further subdivided into *demoi*. There is one opisthographic *stele* for each *phyle* and the *demoi* appear as headings under which are listed the names and patronymics of the citizens belonging to that *demos*. In the later series the citizens are also divided into *phylai* with one opisthographic *stele* for each *phyle* but there is no subdivision into *demoi*. All citizens belonging to the same *phyle* are listed haphazardly on the stone and identified by name, patronymic and an abbreviated form of the demotic.

The evidence for *phyle* no. 4 indicates that we have fragments of four different series: two that follow the earlier style (*IG* XII.9 248 and 249)[7] and two inscribed in accordance with the later style (*IG* XII.9 244 and an unpublished fragment, see Knoepfler (1997) 398). Some addenda on the left side of *IG* XII.9 249 are inscribed in a mixture of the two styles and may belong to a transitional phase.

Of particular interest for a demographic study are three *stelai* which are inscribed in the later style and undoubtedly belong to one and the same series. The *stelai* have the same measurements

and the same size of letters, *viz.* height: 1.58 m, width: 0.71-0.72 m, thickness: 0.12 m, height of letters 0.005 m.[8] From this series are preserved the *stelai* of *phyle* 1 (*IG* XII.9 245), *phyle* 2 (*IG* XII.9 246), *phyle* 3 (*IG* XII.9 247) and *phyle* 4 (unpublished, see Knoepfler (1997) 398). The two former *stelai* are almost completely preserved and only very few names are missing. Only small fragments survive of the two latter *stelai*. The roster of *phyle* 2 includes the Eretrian philosopher Menedemos son of Kleisthenes from Aigalea (*IG* XII.9 246A.66). He returned to Eretria ca. 307/6 and was exiled in 268/7.[9] The *stelai* must have been inscribed and set up in the course of this period of almost 40 years.

A total of over 2,000 persons are registered in the lists of full citizens and a further 200 in the ephebic lists. In this paper I shall argue that together they constitute at least 50% of all the adult male citizens[10] in the first decade of the third century B.C.[11] A full demographic study of Eretria's population is a neglected but very promising topic. Here I shall restrict myself to an investigation of the largest and best preserved of the inscriptions: *IG* XII.9 245, which records almost all full citizens of the first *phyle* in a year shortly after 300 B.C.

IG XII.9 245

The inscription is opisthographic and the names are arranged in three columns. The name, patronymic and abbreviated demotic of a citizen fills one line and altogether 869 lines are preserved. The upper right corner of the *stele* is broken off but the beginning of the first line of the first column is still preserved so that we know exactly how many names we have lost. When the *stele* was inscribed, 922 citizens were recorded. A total of 438 names were inscribed on the front of the inscription (face A). Of these, 411 are preserved, but 23 of these are broken names from which the demotic is missing,[12] in 16 lines both patronymic and demotic are lost and in 5 cases only some letters of the name are left. On the back of the *stele* (face B) 484 names were inscribed of which 458 are preserved, but 16 are broken names from which the name[13] and sometimes the patronymic too are missing.

So, for our analysis we have 869 names, of which 39 are only partly preserved. Since 922 names were inscribed we have a full identification of 830 persons = 90% of all the full citizens of *phyle* 1, and a partial identification of a further 4%. In ancient onomastics a coverage of 90-94% is unique. But what can be deduced from a naked list of names? Not as much as one might wish, but the identification of persons by both name and patronymic makes it possible to make some inferences about family size and about population growth.

1. If a name appears in the nominative but not in the genitive as a patronymikon it must denote a person who does not have a surviving adult son. Either he has had no sons, or none of his sons has yet come of age, or a son who did survive to become a full citizen has died before his father.
2. If a name appears as patronymic but not in the nominative we can infer that this person has died (on the assumption that the roster comprises all adult male citizens over 18 and not just adult male citizens of military age, i.e. 18-59, cf. 73-74 *infra*).
3. If a name appears both in the genitive as *patronymikon* and in the nominative as *onoma*, there are three possible explanations:
   (a) The same person is registered both in the nominative as a citizen and in the genitive as the father of an adult son who also is registered in the nominative as a citizen.
   (b) The patronymic denotes a grandfather and the name a grandson. In Eretria, as in many other *poleis*, it was customary to name a son after one's father so that grandfather and grandson had the same name, see *infra*.
   (c) The name and the patronymic denote homonymous and perhaps not even related persons.

Homonymity

As is apparent from the three possibilities suggested re. 3a-c, a major problem is how to interpret the numerous attestations of homonymity. We must distinguish between three types: (A)

among the names in the nominative, (B) among the patronymics, and (C) between names and patronymics.

(A) As one would expect there is not one single example of two persons having the same name, the same patronymic and the same demotic.[14] On the other hand, among the 830 different persons there are 143 who share their name with one or more other persons from the same deme, but have different patronymics. An extreme case is the name Paramonos as used in the deme of Dismaros.

Paramonos Dorippou Dism. (A79)
Paramonos Elpinikou Dis. (A397)
Paramonos Hegesandrou Dism. (B86)
Paramonos Kritonos Dism. (A138)
Paramonos Olbiadou Dism. (A102)
Paramonos Paramonidou Dis. (A17)
Paramonos Theagou Dism. (A214)

Here we have seven different citizens with the same name but distinguishable from one another by their patronymic. They may be cousins or more distantly related or they may not be related at all. Of the 830 persons recorded in the inscription, no less than 143 have the same name as one or more other persons from the same deme. Thus, the overall degree of homonymity is 143 : 830 = 17.2% = 1/6.

(B). Next, among 835 attested patronymics[15] 554 are attested only once in combination with the same demotic whereas 281 occur twice or three times or four times within the same deme.[16] In this case the overall degree of homonymity is 281 : 835 = 33.6% = 1/3. The reason for this much higher degree of homonymity is, of course, that two or three or sometimes even four identical patronymics denote the same person who had two, or three or sometimes even four adult sons, e.g.:

Daitodemos Kleonos Dis. (B109)
Klearchos Kleonos Dism. (A363)
Olbiodoros Kleonos Dism. (B182)

In this case one and the same Kleon may be the father of all three citizens, but, alternatively, two different citizens may be recorded of whom one has two sons. There must, of course, be some homonyms among the patronymics just as there are among the names. Therefore, we must consider the possibility that the three attestations of Kleon as a patronymic denote two or – less likely – even three different persons.

(C). There is a third form of homonymity to take into account: some names occur both in the nominative as the *onoma* and in the genitive as *patronymikon*, e.g.:

Koineus Kallikleou Zar. (A304)
Aristomedes Koineos Zar. (A21)

Biottos Apolloniou Zar. (A327)
Kothon Biottou Zare. (B198)

Here we have to choose between two possibilities: (a) the same person is recorded both in his own right in the nominative and in the genitive as the father of another adult citizen. (b) The two different forms of the name denote different persons. The person recorded in the nominative is certainly alive, the person recorded in the genitive may or may not be dead. Again the two persons may or may not be related.

Of the two examples cited above the first may be an example of (a) and the second of (b). Koineus is a very rare name. These two attestations are the only ones to be found in Eretrian inscriptions.[17] Therefore the presumption is that Koineus is registered twice: first as the son of Kallikles and second as the father of Aristomedes. Biottos, on the other hand, is a very common name in Eretria,[18] and Biottos Apolloniou stands a good chance of being different from and presumably even unrelated to Biottos, the father of Kothon.

A special case of homonymity between name and patronymic is made up of no less than 60 occurrences of what I shall call a chiastic combination of name and patronymic, i.e. A son of B in one line and B son of A in another line.[19] One example is:

Prokles Theokleidou Dism. (A94)
Theokleides Prokleou Dism. (B372)

There are two possible reconstructions of the relationship between Prokles and Theokleides:

(a) Proklos A94 is the son of Theokleides who is registered by patronymic, but Theokleides is still alive and his name is accordingly registered in the nominative at B372. Theokleides B372 is the son of Prokles, registered by patronymic at B372. Proklos B372 and A94 are grandfather and grandson, and the presumption is that Prokles B372 has died. We get the stemma:

Prokles (B372)
Theokleides (B372 = A94)
Prokles (A94)

(b) Alternatively, Theokleides at B372 is the son of Prokles who is registered by patronymic, but Prokles B372 is still alive and his name is accordingly registered in the nominative at A94. Prokles A94 is the son of Theokleides, registered by patronymic at A94. Theokleides A94 and B372 are grandfather and grandson, and the presumption is that Theokleides A94 has died. We get the stemma:

Theokleides (A94)
Prokles (A94 = B372)
Theokleides (B372)

One of these two reconstructions must be right, we do not know which,[20] but that is of no consequence for the present investigation. We can deduce that of these 60 chiastic combinations of name and patronymic, one half = 30 must denote the same person, *viz.* the father, recorded both by name and by patronymic, and the other half must denote a grandfather recorded by patronymic and his grandson recorded by name. Thus, the 4 x 30 = 120 names correspond to 3 x 30 = 90 persons.

Exceptionally, the grandfather – probably in his eighties – may

still have been alive and then recorded both as name and as patronymic. One possible instance is Antiphanes Archeou (B252), who may have been the father of Nikophantos Antiphanou (B236), who then was the father of Antiphanes Nikophantou (A137). We get the stemma:

Archeas (B252)
Antiphanes (B252 = B 236)
Nikophantos (B236 = A137)
Antiphanes (A137)

Homonymity among the Patronymics

There are altogether 835 attested occurrences of patronymic with demotic,[21] but they are distributed on 680 different patronymics. Of these, 554 are attested only once whereas 126 are attested twice, three times or four times. 100 patronymics are attested twice, 23 are attested three times, 3 are attested four times. These 126 different patronymics count for 281 of the 835 attestations of patronymic.

These patronymics must be names of citizens of whom the youngest are ca. 48 (younger citizens would not normally have an adult son).[22] But the patronymics record not only living citizens over 48, they also include names of deceased citizens whose adult sons are still alive. The sons are citizens aged 18-80+ and the fathers are citizens who in ca. 290 would be ca. 48-110+. Of these, some aged ca. 48 to ca. 80 would still be alive while almost all aged ca. 80 to 110+ would then have died.[23]

The 554 patronymics attested only once must denote persons who, in the year when the *stele* was inscribed, had got one adult son only or, to be precise, one *surviving* adult son. Of these fathers some had died, some were still alive, cf. *infra*.

On the reasonable assumption that the degree of homonymity among the patronymics is the same as among the names in the nominative, we can infer that ca. 1/6 of the 835 patronymics = 140 patronymics denote homonymous citizens. Thus, of the 281 patronymics attested more than once 140 are names of homony-

mous persons, each attested only once as the father of one son, whereas the other 141 patronymics attested more than once denote citizens who were the father of two or three or perhaps even four sons.[24]

Distinguishing between patronymics attested two, three and four times we get the following result. There are 100 patronymics attested twice = 200 attestations. On a 1 : 1 distribution we get 50 patronymics each recorded twice as the father of two sons, and 50 pairs of homonymous persons = 100 persons each recorded as the father of one son only. The patronymics attested three or four times allow of several possible reconstructions and the following is suggested *exempli gratia*. There are 23 patronymics attested three times = 69 attestations. On a ca. 1 : 1 distribution we get 35 : 34 attestations, e.g., 9 persons each recorded three times as the father of three sons, 4 persons each recorded twice as the fathers of two sons, and 34 persons recorded as the father of one son only (i.e. 9 + 4 + 34 = 47 persons as against 27 + 8 + 34 = 69 attestations). Finally, there are 3 patronymics attested four times = 12 attestations. On a 1 : 1 distribution we get, e.g., 1 recorded four times as the father of four sons, plus one recorded three times as the father of 3 sons as against 5 persons recorded as the father of one son each (i.e. 1 + 1 + 5 = 7 persons as against 4 + 3 + 5 attestations). On this model we get 50 + 13 + 2 = 65 citizens attested as the father of more than one son, as against 100 + 34 + 5 = 139 more fathers of one son only and thus to be added to the 554 different patronymics attested only once = 693 persons of the older generation, each the father of one adult son.

The 693 patronymics attested as names of fathers with one son and the 65 patronymics attested as names of fathers with two or more sons add up to 758 different persons attested by patronymic. But these 758 fathers must be compared with the 830 sons attested in the nominative.

If we suppose that Eretria had a stationary population, there must have been 830 citizens too in the fathers' generation, and we can infer that the difference between these 830 citizens attested in the nominative and the ca. 758 citizens attested by patronymic = 72 persons must indicate the number of citizens of

the previous generation who had no (surviving) adult son. Either they never had a son, or they had one who had not yet come of age, or they had had an adult son who had died when the *stele* was inscribed. Of the citizens who had no adult son inscribed on the *stele*, some were still alive and they must be found among the names in the nominative without being attested as fathers too. Others had died and were not recorded at all either in the nominative or in the genitive. Now, 758 citizens out of 830 constitute 91%, and 72 citizens constitute 9%, but in ancient populations it is implausible that 91% of all citizens over 48 had adult sons whereas 9% only had sons under 18 or no sons at all. According to a computer simulation of the Roman family, about 67% of all men over 45 had one or more living sons of any age.[25] So a stationary population at mortality level 4 seems incompatible with the evidence of the Eretrian roster. To change the life expectancy to mortality level 3 or 5 does not result in any significant change, but a change of the growth rate does.

If, instead, we suppose that in this period Eretria's population grew by, on average, 0.5% per year, the 830 citizens recorded in ca. 290 correspond to ca. 720 citizens of the previous generation ca. 30 years earlier.[26] But this calculation is incompatible with the evidence of the roster, which indicates a population of ca. 758 fathers with one or more adult sons. Thus, the roster shows that any growth of population in this period is out of the question.

The alternative is to suppose that in this period Eretria's population declined by, on average, 0.5% per year. In that case the 830 citizens attested in ca. 290 correspond to ca. 990 citizens of the previous generation ca. 30 years earlier.[27] There would in the fathers' generation be ca. 160 citizens without an adult son and they must be added to the ca. 758 who had one or more adult sons. In this case we shall have 83% of all citizens as fathers of adult sons as against 17% who have no son or a son under 18. That is still an implausibly high score of fathers with adult sons, but there can be little doubt that a declining population provides the only possible interpretation of the evidence.

To conclude: Eretria cannot have experienced any population growth during the period ca. 320-290. It is also most unlikely

that the *polis* had a stationary population. The evidence of *IG* XII.9 245 points to a declining population. For a possible explanation of the still very high percentage of fathers with adult sons, see 74-75 *infra*.

Homonymity between Names and Patronymics

If – deme by deme – we match names in the nominative with patronymics in the genitive we find 164 attestations of correspondence between name and patronymic, e.g.:

Aristodemos Xenoklou Dism. (B435)
Ploutarchos Aristodemou Dism. (A47)

In most of these cases the reason for the correspondence must be identity: the same person is registered twice, both as a citizen and as the father of another citizen. But not all 164 cases testify to identity.

(a) As argued above, there are altogether 60 occurrences of a chiastic combination of name and patronymic. In 30 cases the name denotes a grandson and the patronymic a grandfather. In the other 30 cases name and patronymic must denote the same person. Thus the number of citizens attested both by name and by patronymic drops from 164 to a maximum of 134.

(b) We must assume the same degree of homonymity between names in the nominative and in the genitive as attested among the names in the nominative, *viz.* ca. $^1/_6$. It follows that $^1/_6 = 22$ of the remaining 134 cases of correspondence between name and patronymic are attestations of homonymity, not identity.

We are left with 112 different citizens recorded both in the nominative and in the genitive as against 758 minus 112 = 646 citizens attested in the genitive only. The 112 and 646 persons are, respectively, surviving and deceased persons of the previous generation. Since the persons registered on the *stele* are citizens over 18 (73 *infra*), and since the average length of a generation is ca. 30 years, it follows that these 112 persons must be citizens aged 48 or more who are registered as fathers of adult sons but

also in their own right as citizens. Thus, all these patronymics denote persons who were still alive when the *stele* was inscribed, by contrast with the 646 other patronymics which must denote deceased citizens.

As argued above the 835 *patronymika* recorded on the *stele* probably denote 758 different persons who all had one or more adult sons recorded among the citizens. Of these 758 persons, 646 had died when the *stele* was inscribed (they are attested only as patronymics) whereas 112 were still alive and are attested both in the nominative and in the genitive. The proportion of surviving citizens aged 48 or more is 112 : 758 = 15%.

We must keep in mind, however, that these 758 citizens do not constitute the entire citizen population of the previous generation identified by patronymics. Some citizens of fathers' generation are missing from the patronymics recorded on the *stele*, *viz.*, (a) names of citizens whose oldest son was still under 18, (b) names of citizens whose adult sons had died before their fathers, and (c) names of citizens who did not have any son at all. None of these citizens would be recorded among the patronymics. Some of them would have died when the *stele* was inscribed, others would still be alive and accordingly recorded among the names in the nominative but without any corresponding patronymic in the genitive, and therefore we cannot spot them by combining names with patronymics.

How many citizens of the older generation have disappeared without being recorded among the patronymics? If we assume, as suggested above, that Eretria's population was declining by 0.5% per year, the previous generation must have numbered ca. 990 citizens, *viz.* some 160 citizens more than the 830 citizens recorded in the nominative. The inference is that ca. 990-758 = 232 adult citizens have left no trace among the patronymics.

Of these 232 "ghost-citizens" some would have died while some would still be alive when the *stele* was inscribed. The total number of citizens over 48 and still alive when the *stele* was inscribed must have been higher than the 112 attested both as names and as patronymics; but how much higher it was cannot be ascertained any longer.

Who are Recorded in the Roster?

There can be no doubt that the persons recorded in *IG* XII.9 245 are adult male citizens, but are all adult male citizens included? In one of the older rosters of citizens of *phyle* 4 we find the heading *epheboi* (*IG* XII.9 249.B76). On the reasonable assumption that the various lists of citizens are from different years but drawn up for the same purpose we can infer that *IG* XII.9 245 must have included ephebes too and, accordingly, recorded citizens from 18 when, probably, they came of age.

In the previous sections I have assumed that the lists include all full male citizens from 18 and as long as they lived. But we must contemplate the alternative that they are primarily military lists and comprise citizens of military age only (18 to 59) and fit for military service.[28] If so they exclude all citizens over 60 and, probably, citizens between 18 and 59 who for reasons of health were unfit for military service.

To make a choice between these alternatives we must compare the total number of citizens with the number of those who have survived to the age of 48 or more (i.e. those who are recorded both in the nominative and as patronymics) and then compare the ratios we obtain with model life tables which can be presumed to fit ancient populations. As argued above, I presume mortality level 4 and a negative population growth of 0.5%.

On the assumption that the rosters list citizens between 18 and 59, the 112 citizens recorded both in the nominative and as patronymics must be citizens between 48 and 59. Assuming a negative population growth of 0.5%, males from 48 to 59 come to 19.6% of adult males aged 18-59 which means that we can expect a total of 571 citizens aged 18-59, to match 112 aged 48-59. There is a gap between 830 (the citizens whose names are still attested on the lists) and 571 (the number of citizens 18-59 to be expected if there were 112 citizens aged 48-59). But that gap is explained if we assume that there were 50 citizens aged 48-59 who had no adult sons when the citizen list was inscribed. A total of 112 + 50 = 162 citizens aged 48-59 corresponds to a total of 827 citizens aged 18-59. Of these 162 citizens aged 48-59 some

112 = 69% would be fathers of adult sons, whereas 50 = 31% were fathers of sons under 18 or without any sons at all.

On the alternative assumption that the rosters list citizens between 18 and 80+, we still have 112 citizens recorded both in the nominative and as patronymics, i.e. citizens aged 48 or more. Assuming a negative population growth of 0.5%, males aged 48 or more come to 28.9% of all adult males (18-80+). The number of adult males corresponding to 112 males aged 48 or more is then 388. To reach the attested number of 830 citizens we shall have to assume that there were ca. 130 citizens aged 48-80+ who had no adult son and, accordingly, are recorded in the roster by name only, and not by patronymic too. A total of 112 + 130 = 242 citizens aged 48 or more corresponds to a total of 837 citizens aged 18-80+. Of these 242 citizens aged 48-80+, some 112 = 46% were fathers of adult sons, whereas 130 = 54% were fathers of sons under 18 or without any sons at all.

To have 69% as fathers of adult sons is most unlikely. To have 46% is the preferable solution, but even this percentage is too high. What is the reason for the very high percentage of citizens over 48 who had an adult son in ca. 290, i.e. 46% calculated from the 830 names in the nominative? And, again, what is the reason for the very high percentage of fathers who sooner or later had an adult son, i.e. 83% calculated from the 835 patronymics (70 *supra*)?

There is one factor I have not taken into account, namely adoption. A citizen who had no male offspring might adopt a son who would carry his adopted father's name as patronymic and be a full member of his deme. In the roster, natural and adopted sons are indistinguishable. That may be an explanation of the fact that so many citizens appear as fathers of adult sons. On the other hand, the only person a childless citizen could adopt would be another citizen, typically the son of a citizen who had two or three sons. So if there were many adopted sons among those recorded in the roster and if we could spot them, it would reduce the attested number of (biological) fathers with one adult son, but increase the number of (biological) fathers with two or more adult sons. Two observations seem to support such a scenario:

(a) To have a total of 693 fathers of one son as against 65

fathers of two or more sons (see 69 *supra*) seems to be an overrepresentation of fathers with one son and an underrepresentation of fathers with two or more sons; and this observation is valid even on the assumption that, in this period, Eretria had a declining population.[29]

(b) In ancient Greek society there was a strong desire to perpetuate family lines, to have male descendants who could take care of one in old age and inherit one's property. To use adoption to satisfy that desire would be the obvious course of action in a period with declining population.

So as a concomitant of declining population, I suggest that adoption was a demographically important factor in Eretria in the Early Hellenistic period and that adoption is the explanation of the extraordinarily high number of fathers with adult sons, a number that cannot be explained by natural procreation alone.

The List of Ephebes from Phyle 1 (SEG 36 799)

In addition to the roster of citizens we have one more source for the demography and prosopography of citizens of the first Eretrian *phyle* in the early Hellenistic period, *viz.* an inscription that records the ephebes of that *phyle* in, probably, two consecutive years, dated by *archon*.[30] It is *IG* XII Suppl. 555 republished with corrigenda by F. Cairns in *ZPE* 64 (1986) 149-58 = *SEG* 36 799. Forty-three names with patronymics are listed in the first year, twenty-five only in the second. The distribution among the various demes is as follows.

Zarex	15	9
Teleidai	1	0
Xeniadai	2	0
Dismaros	14	6
Phlieus	9	7
Raphieus	2	0
Karkinous	0	2
Phallas	0	1
Total	43	25

Large demes such as Zarex, Dismaros and Phlieus are represented in both years; small demes such as Teleidai, Xeniadai and Karkinous in one year only. That is what one would expect, but the variations from year to year is rather strange, and it is even more strange that some rather large demes are missing in both years, *viz.* Ne(don), Oinoe and Styra, see 79 *infra*. Admittedly, "the stone is broken and cut down at the bottom" but, apparently, "little has been lost" and "if anything is lost at the bottom, it is only a brief entry for Τελειδῶν or Ῥαφιεῦθεν", i.e. one or two names.[31] For the sake of the argument, let us assume that two names are lost in the second year. The most likely explanation of the variations between the demes is that the Eretrians may not have fussed about the exact age of the ephebes: some of the middlesized demes may have gathered their ephebes together and contributed a contingent every second or third year. If so, the young Eretrians may have performed their ephebic service between 18 and 21.

Furthermore, the form and content of the ephebic inscription may "indicate a two-year structure of some sort in the ephebate at Eretria".[32] Therefore, the best we can do is to treat the two years together: a total of 68 ephebes plus, possibly, 2 whose names are lost served during those two years and that corresponds to a year-class of 35 ephebes. In the model population I use for this study, men aged 18 (or 19 or 20) constitute 2.8% of all men over 18. A year class of 35 ephebes corresponds to a an adult male citizen population of ca. 1250 persons, some 330 more than the 922 attested in the roster of citizens.[33] I shall come back to this problem *infra*.

If we turn to prosopography, what can we learn by comparing the list of ephebes with the list of citizens? We can start with the observation that two of the names in the ephebic list reappear in the list of citizens, *viz.*, Archandrides Magalinou Dismarothen (*SEG* 36 799.40 & *IG* XII.9 245.A224) and Demippos Euphemou Zarekothen (*SEG* 36 799.14 & *IG* XII.9 245.A129). Both the name, the patronymic and the demotic is the same. The commonly accepted view is that homonymity in these two cases signifies identity,[34] and it follows that the ephebic list must antedate

the list of citizens. But if the ephebic list antedates the citizen list by, say, a decade only, we should expect most of the ephebes, and not just two, to reappear in the list of citizens. If the list of ephebes was inscribed before the list of citizens, the time interval must be so great that just two former ephebes were still alive when the list of citizens was drawn up. Let us suppose that the citizen list was inscribed ca. 290; it follows that the ephebic list must have been inscribed ca. 340. In that case it is a reasonable assumption that no more than two of the ephebes were still alive and both aged ca. 70.

But that is not enough. We should expect too that in the list of citizens a significant number of the names of the ephebes would reappear in the same demes as patronymics. There is indeed a fair number of matches: of 68 names of ephebes recorded in the list *IG* XII Suppl. 255, 17 reappear among the patronymics in the same demes in the roster of citizens.[35] But that is not an impressive score. Undoubtedly some of the matches denote two homonymous citizens and not the same citizen recorded twice. We should expect all ephebes who had a son in the period ca. 330-308 – and one who survived so as to come of age – to appear as patronymics in the citizen list if that list was inscribed in 290. The ephebes of ca. 340 who could not be registered by patronymic in ca. 290 in the list of citizens would be (1) those who never had an adult son and (2) those who had a son after 308 so that the son would not yet have come of age when the citizen list was inscribed in 290. It is unlikely that citizens in these two groups would amount to 3/4 of all the citizens found in the ephebic inscription.

Conversely we may suppose that the list of citizens antedated the list of ephebes by a few years. Let us assume that, e.g., the citizen list was inscribed in 290 and the list of ephebes in 285. In that case a substantial number of the fathers of the ephebes – attested by patronymic in the ephebic list – must be identical with some of the citizens recorded in the nominative in the list of citizens. And that is in fact the case. Of the patronymics in the ephebic inscription no less than 29 are identical with names in the nominative in the same deme in the roster of citizens.[36] Now,

the fathers of the ephebes were typically born ca. 340, *viz.* 308 + 30 ± some years). They would come of age ca. 320 and, if we apply the model life table described above, only half of them would still be alive in 290 when the citizen list was inscribed. Even allowing for a certain degree of homonymity between the patronymics in the ephebic list and the names in the roster of citizens, we must conclude that the sequence: list of citizens – list of ephebes fits the onomastic evidence much better than the reverse sequence.[37]

There is only one remaining problem: in that case the two names found both among the ephebes and among the citizens – Archandrides Magalinou Zar. and Demippos Euphemou Dism. – must denote homonymous citizens and are not repeated attestations of the same two citizens. As noted above, full homonymity between living citizens seems to have been avoided, see *supra* note 14. There is not one example of full homonymity in the list of citizens of the first *phyle* recorded in *IG* XII.9 245. But there is one in the list of citizens of the second *phyle* (*IG* XII.9 246) where we find an Euphronios Skythou ek Chythroi in line A261 and again in Line A272. Unless the cutter made a mistake and inscribed the same citizen twice we must assume an attestation of two different citizens with identical names. In line A47 we have a Skythes Euphroniou ek Chytroi and the most likely explanation is that the two Euphronioi Skythou were grandfather and grandson. A long deceased Skythes had a son Euphronios (A261) aged ca. 80; he had a son Skythes (A47) aged ca. 50, who had a son Euphronios (A272) aged ca. 20. Now, including 29 lost names, there were originally 462 names of citizens of the second *phyle* recorded in *IG* XII.9 246. It is no surprise if there were two similar instances of homonymity in the first *phyle* recorded in the list of citizens (*IG* XII.9 245) and in the almost contemporary list of ephebes (*SEG* 36 799). After all, the first *phyle* was almost twice as big as the second.

There is, however, an alternative explanation. As argued above the list of citizens was inscribed some years before the list of ephebes, and we may therefore presume that the Archandrides Magalinou Zar. and Demippos Euphemou Dism. recorded in the

citizen list ca. 290 had died in ca. 285 so that the two ephebes were now the only living citizens bearing those two names.

Having established the relative dates of the ephebic list and the roster of all citizens, I shall return to the number of ephebes, and here we have to admit that no proper comparison can be made between the ephebic list and the roster of citizens. As mentioned above, many important demes of the first *phyle* listed in the roster are missing from the ephebic list. Conversely, the ephebic list includes Karkinous, which is not recorded in the roster of citizens. The discrepancy appears from the following tabulation of the evidence in which I have organised the demes according to their size as attested in the roster.

	Roster	Ephebic list
Zarex	225	24
Phallas	93	1
Styra	85	0
Dismaros	85	20
Nedon	72	0
Phlious	68	16
Raphieus	66	2
Oinoe	55	1
Teleidai	39	0
Peraia	22	0
Xeniadai	16	2
Eschatia	5	0
Oichalia	3	0
Varia	9	0
Karkinous	0	2
Total	843	68

We have to admit that the ephebic list reflects a somewhat different system from what we find in the roster and that no demographic comparison is possible. A reform of the *ephebeia* – or some re-organisation of the citizens – may have taken place

between ca. 290 when the roster was inscribed and ca. 285 when the ephebic list was drawn up. Or the ephebes may have been called up and served in accordance with rules we do not know.

The Total Population of Eretria ca. 290 B.C.

As stated above, we possess exceptionally precise information about the number of adult male citizens belonging to two of the six *phylai*. Ca. 290 B.C. there were 922 citizens in the first *phyle* (*IG* XII.9 245) and 462 citizens in the second *phyle* (*IG* XII.9 246), i.e. a total of close to 1,400 citizens in two of six *phylai*. We have no reliable information about the size of the other four *phylai*. The fifth and sixth *phylai* had apparently fewer demes than the first four *phylai* and were probably smaller. If we assume that there were altogether 4,000 adult male Eretrian citizens in all six *phylai*, we cannot be far out in our reckoning.[38]

Now, 4,000 adult male citizens (18-80+) correspond to ca. 6,200 male citizens (0-80+).[39] Adding an equal number of female citizens we get a total of 12,400 citizens. If we assume that there were some 7,500 free foreigners and slaves, the population of Eretria comes to ca. 20,000 people, and that is a surprisingly low figure. Eretria had a territory of ca. 1,500 km^2,[40] and a total population of 20,000 corresponds to a population density of 13 persons per km^2. A cautious estimate for all of mainland Greece is ca. 40 persons per km^2 in the plains and ca. 15 in the mountains.[41] Thus, 13 persons per km^2 is less than half of the population density one would expect on one of the most fertile islands in the Aegean. Euboia provided Athens with much of its imported grain until the island defected from the Delian League in 411,[42] and in Athens the loss of Euboia was considered an even greater disaster than the loss of the army sent to Sicily in 415-413.[43] One could argue that a low population density in a fertile region is precisely what makes a massive export of grain possible. Still, 13 persons per km^2 is less than half what one should expect.

In my opinion, there is one obvious explanation: in Eretria ca. 300 B.C. full citizen rights must have been conditioned by a census which excluded at least half of all born citizens. If the ros-

ters we have preserved record full citizens only, and if they constitute only half the males of citizen birth, the total number of citizens of both sexes and all ages comes to ca. 25,000. Adding ca. 15,000 foreigners and slaves we get a total population of ca. 40,000 = a population density of ca. 27 per km^2.

A property census of that kind indicates that Eretria must have had an oligarchic constitution when the rosters *IG* XII.9 245-47 were inscribed. For most of the late fourth and early third century B.C. Eretria seems to have been a democracy, but Athens was probably an oligarchy between 294 and 287,[44] and the presumption is that Eretria too was an oligarchy in this period.[45] I suggest that the rosters *IG* XII.9 245-47 were drawn up in connection with the introduction of the oligarchy in the late 290s or in one of the following years, and that is my reason for dating the rosters to ca. 290 B.C. rather than to ca. 300 or to the last decade of the 4th century. Again, the ephebic list *IG* XII Suppl. 555 may have been inscribed shortly after a return to democracy in the late 280s and conform to a reform of the *ephebeia*.

An alternative solution is to return to the assumption that the rosters do not record all citizens but only citizens of military age and fit for military service, i.e. citizens aged 18-59 to the exclusion of those over 60 and those aged 18-59 who were unfit for military service. The result would be a somewhat larger population, i.e. a total in the range of 25,000 inhabitants.[46] But even that would result in too low a population density, *viz.* ca. 17 persons per km^2.

What really makes a difference would be to assume that only hoplites were recorded in the rosters. A total of 4,000 hoplites (the year classes 18-59) plus the same number of effectives recruited from citizens below hoplite status corresponds to a total population of ca. 50,000 inhabitants and a population density of 33 per km^2.[47] But, as argued above: the ratio of surviving citizens over ca. 48 to all the citizens recorded in the rosters is consistent with the assumption that the rosters cover all citizens from 18 to 80+ but, apparently, incompatible with the assumption that the rosters record the citizens from 18 to 59 only. Therefore, I find that the more likely solution of the problem is to assume that the

Eretrian constitution imposed a *timema* whereby over half the born citizens were deprived of full citizen rights and that the rosters list the full citizens only, but, on the other hand, all adult full citizens are listed from they came of age at, probably, 18 and as long as they lived.

Conclusions

Summing up the results of all these complicated calculations, let me state my conclusions in the form of six shots from the shotgun.

1. The lists are rosters of all full citizens, not military lists recording citizens of military age and fit for military service.
2. The lists are best interpreted as reflecting a declining population.
3. The lists indicate, concomitantly, that a demographically significant number of Eretrians must have resorted to adoption in order to uphold their family line.
4. The preserved lists from *phyle* 1 and 2 indicate that the *phylai* were not of a size and that *phyle* 1 was exceptionally large, almost twice the size of *phyle* 2.
5. When we use the rosters to calculate the total number of citizens of both sexes and all ages, we get totals that are much too low for a flourishing *polis* with a territory of ca. 1,500 km^2. The presumption is that the rosters record full citizens only and that, by a census requirement, the number of full citizens was restricted to less than half of those who were Eretrian citizens by birth.
6. The rosters support Knoepfler's suggestion that Eretria had an oligarchic constitution in the late 290s and early 280s. The rosters *IG* XII.9 245-47 were inscribed during the oligarchy. The ephebic list *IG* XII Suppl. 555 was inscribed ca. 285 after a return to democracy. The possible average of 35 ephebes per year fits a much larger citizen population than the 922 recorded in *IG* XII.9 245.

Appendix: Distribution of Males, Mortality Level 4

	Decline 0.5%	Stationary	Growth 0.5%
0-17	35.3%	38.8%	42.6% of all males
18	1.8%	1.9%	1.9% –
18-47	45.9%	45.0%	43.8% –
18-59	57.2%	55.0%	52.5% –
18-80+	64.7%	61.1%	57.4% –
20-59	53.6%	51.2%	48.6% –
48-59	11.2%	10.0%	8.7% –
48-80+	18.7%	16.1%	13.7% –
60-80+	7.5%	6.1%	5.0% –

Ratios between different age groups:
Decline of 0.5% per year

0-17 : 18-80+ = 54.5%
18 : 18-59 = 3.1%
18 : 18-80+ = 2.8%
48-59 : 18-59 = 19.6%
48-80+ : 18-80+ = 28.9%
60-80+ : 18-59 = 13.1%

Notes

1. Knoepfler (1997) 393-400 and 403. Each of the first four *phylai* was subdivided into 10-12 *demoi*. The number of *phylai* belonging to *phylai* 5 and 6 seems to have been much smaller. Apparently, the sixth *phyle* was dominated by one *demos*: Dystos, see note 10 *infra*.
2. Hansen (2004) 119.
3. Hansen (1985) 11-13. Model West, mortality levels 2, 3, or 4 (for males) are still the analogies used by most Roman historians, see the critical survey in Scheidel (2001) 10-25.
4. For the shotgun method, see Hansen (2006): "To study ancient history is like hunting hares. The hunter uses a shotgun instead of a rifle. His weapon does not hit the bull's eye and is not constructed

for big game, but the spreading out of the pellets to cover a broader field is very efficient when used against smaller animals. Similarly, the quantifications presented by the ancient historian are never precise but within certain limits they can provide us with extremely valuable information about ancient societies."

5. See appendix p. 83.
6. In *LGPN* vol. 1 all the persons recorded in the citizen lists *IG* XII.9 245-47 are dated iv/iii BC, which is the date suggested by Knoepfler (see the preface xi).
7. *IG* XII.9 249 is dated to the late fourth century by Knoepfler (1997) 447, n. 321.
8. For 347 (broken on all sides), only the thickness is known (0.012 m) and the height of the letters is not recorded in *IG* but I trust Knoepfler's testimony that 247 belongs to the same series as 245 and 246.
9. Knoepfler (1997) 446 n. 310. On Menedemos, see Knoepfler (1991).
10. *Phyle* 1: 922 citizens (*IG* XII.9 245). *Phyle* 2: 462 citizens (*IG* XII.9 246). *Phyle* 3: ? (*IG* XII.9 247: only 38 names are left, half of them broken; the names are inscribed in two columns on the face of the stone; the reverse is blank; the preserved fragment is from the left side of the stele). *Phyle* 4: ? (Knoepfler (1997) 398, unpublished: some 40 names are preserved; they are inscribed in two columns). *Phyle* 4: a roster belonging to a different series (*IG* XII.9 249) records a total of ca. 615 names, but the list inscribed on the face is apparently older than that on the reverse (Knoepfler (1997) 447 n. 321). We have no information at all about the size of the last two *phylai*. But *phylai* 5 and 6 had apparently fewer demes than the first four *phylai* and were probably smaller. Dystos was the dominant and may have been the only deme of *phyle* 6. It seems to have been a former *polis* incorporated into Eretria in the course of the Classical period (*CPCInv.* (2004) 651 no. 369. Cf. also *LGPN* vol. 1. p. xi). – Assuming that *phyle* 1 and 2 count for a third of all citizens we reach a total of 4,152 citizens.
11. For the date, see 81 *infra*.
12. A1-6, 147-53, 285-93 and 410.
13. B1-6, 146-52, 301-3. In two lines (149 and 152) the missing part of the name plus patronymic has been restored.
14. But comparing the roster (*IG* XII.9 245) with a roughly contemporary list of ephebes (*IG* XII Suppl. 555) there are two instances of

full homonymity, *viz.* Demippos Euphemou Zar. (*IG* XII.9 245.A129 & Suppl. 555.14) and Archandrides Megalinou Dism. (*IG* XII.9 245.A224 & Suppl. 555.40). Whether the two identical names denote the same person is discussed *infra* 76, 78-79. In the roster of citizens belonging to the second *phyle* (*IG* XII.9 246) there is one example of full homonymity: Euphronios Skythou ek Chyt. is recorded twice, *viz.* at A261 and again at A272. Perhaps the same person is erroneously recorded twice; perhaps this is one instance of full homonymity, see 78 *infra*. – In *IG* XII.9 245 there are two examples of a person called after his father so that the same name appears first in the nominative as *onoma* and then in the genitive as *patronymikon*: Euangelos Euangelou Raph. (A59) and Archias Archiou Raph. (B368). But there are numerous persons who had a name that was very like their patronymic, e.g., Kallipos Kallipidou egN. (A257), Bios Eubiou Oin. (B34), Blepyrides Blepyrou egN. (B264).

15. The 830 fully preserved names plus 5 attestations of patronymic plus demotic whereas the name is lost: B5-6, 146, 148, 151. I have left out B150 and 303. In B150 [Μνη]σιστράτου (cf. B291) is an alternative to [Λυ]σιστράτου, and in B303 Θεο[μ]έλου is an alternative to Θεο[βού]λου (cf. B343).
16. The same patronymic may of course appear in different demes, but in that case we know that it denotes as many different persons. Thus, we find the patronymic Paramonou in Zar. (A62, B375), Nedon (B111, B298), Phlieus (B127), Oinoe (A345, B18) and Peraia (B146), but it is only in the demes Zar., Nedon and Oinoe that we are in doubt as to whether the two patronymics denote one person or two homonymous persons.
17. See *LGPN* vol. 1 p. 268 s.v. where, however, the *onoma* and the *patronymikon* are supposed to refer to two different persons. There is no indication of the possibility that the *onoma* and the *patronymikon* may designate the same person.
18. See *LGPN* vol. 1 p. 101 s.v.
19. The two lines are often far removed from one another which shows that interrelated citizens were not recorded side by side.
20. In *LGPN* vol. 1. p. 215 s.v. Theokleides it is duly recorded that A94 may be identical with B372, but the entry page 388 s.v. Prokles does not mention the other possibility that it is Prokles who is mentioned twice, so that Theokleides refers to the grandfather at A94 and the grandson at B273. In most other similar cases, however,

both possibilities are duly recorded in *LGPN*, cf., e.g., *LGPN* vol. 1 page 20 s.v. Aischines (26) A306 and (27) A402 *versus* page 288 s.v. Lemniarchos (1) A306 and (2) A402.

21. In five cases the name is missing and patronymic and demotic is all we have preserved, see 63 *supra*.
22. On thirty as the normal age of marriage for men, see Sallares (1991) 148 with n. 136 and Gallant (1991) 17-19.
23. In the model I use (mortality level 4, growth rate +0.5, 0.0 or -0.5) persons over 80 constitute between 1.5 and 2.5 per thousand of the population.
24. For what is probably an example of a citizen with four adult sons, see *IG* XII.9 249A.187-90, cf. *LGPN* vol. 1 p. 483.
25. Saller (1994) 52. Model West, mortality level 3, males, mean age of first marriage 25 years. I am much indebted to Walter Scheidel for having drawn my attention to this study which is of crucial importance for my interpretation of the Eretrian rosters of citizens.
26. An annual increase of 0.5% per year corresponds to an increase of 16% over a period of 30 years, thus a population of 720 persons grows to 835 persons in the course of one generation.
27. If a population of 990 persons declines by 0.5% per year, there are 832 left after 30 years. The difference between the two figures is 158.
28. The Eretrian *ephebeia* seems to have been modelled on the Athenian (Chankowski (1993)) and the presumption is that military service in Eretria as in Athens comprised the 42 years from 18 to 60 (Arist. *Ath. Pol.* 53.4-5).
29. The best comparative material is a large inscription from Tenos (*IG* XII.5 872, ca. 300 B.C.), which records various contracts and lists a large number of often interrelated persons. Altogether 344 names are recorded and they are distributed over 108 lineages. Most names are male, but a few females are recorded too. There are 17 attestations of fathers who had two or more children, and 7 of them had three children (20 sons and 1 daughter, indicating – as expected – that females are underrepresented), see Étienne (1990) 58-60 with stemmata 75-82.
30. Cairns (1986) 155-57; Knoepfler (1997) 394.
31. Cairns (1986) 155.
32. Cairns (1986) 154.
33. The discrepancy between the two documents is smaller when we take into account that the list of ephebes drawn up ca. 285 reflects

the declining population while the roster of 922 citizens drawn up ca. 290 comprises all citizens from 18 to 80+ and thus reflects an older and larger population, and we can expect the population in the decade ca. 303 when the ephebes were born to have been even larger than the population in ca. 290, but not amounting to the ca. 1,250 citizens which would match a year class of 35 ephebes.

34. *LGPN* vol. 1 p. 84 s.v. Archandrides (4) and (5); page 126 s.v. Demippos (9). In the first case the identification is suggested as a possibility, in the second case it is taken for granted.
35. First year: Ζαρ. Φανόδημος, Πολυκράτης, Εὐφάνης, Καλίστρατος Ἐπικράτης, Φιλόνικος, Δήμιππος, Ξενοπείθης, Τόλλος, Αριστώνυμος. Δισμ. Δημότιμος. Φλι. Αριστέας, Φιλοκλῆς, Ἄρχιππος. Second year: Δισμ. Κτηρίας, Ζαρ. Φιλιστίδης, Βίοττος.
36. First year: Ζαρ. Φίλωνος, Παντακλέου, Παραμόνου. Δημοσθένου, Δημάρχου, Παραμόνου, Εὐφήμου, Φιλοστράτου, Ἀριστάρχου, Παραμόνου, Αἰσχύλου. Ξεν. Ἀπολήξιδος, Ἀντιμάχου, Δισμ. Τιμάρχου, Τιμάρχου, Τιμάρχου, Τιμάρχου, Δημοφῶντος, Φίλωνος, Ἀρχανδρίδου, Μεγαλίνου. Second year: Δισμ. Νίκωνος, Χαροπίνου, Χαροπίνου, Θεοτέλου, [Θ]εοτέλου, Φανίππου. Ζαρ. Ἀριστοδήμου, Δημοκρίτου.
37. Chankowski (1993) 36 suggests ca. 285 or a little later.
38. See n. 10 *supra*.
39. Again I assume an annual decline of 0.5%. In such a population males aged 18-80 constituted 64.7% of all males, i.e. no more than a third of all males (35.3%) were children.
40. Knoepfler (1997) 371-73 with map on 402.
41. Corvisier and Suder (2000) 32. For higher figures attested in several *poleis*, see Hansen (2006).
42. Moreno (forthcoming).
43. Thuc. 8.96.1-3.
44. Habicht (1979) 26-30.
45. Knoepfler (1991) 208.
46. Assuming an annual decline of 0.5% the calculation is as follows: ca. 4,000 (citizens 18-59 fit for military service) + 25% = 1,000 (citizens 18-59 unfit for military service) = 5,000 (all citizens 18-59) + 13.1% = 655 (citizens 60-80+) = 5,655 (all citizens 18-80+), + 54.5% = 3,082 (males 0-17) = 8,737 (all male citizens 0-80+) + 8,737 (all female citizens 0-80+) = 17,474 (all citizens of both

sexes and all ages) + 7,526 (foreigners and slaves) = 25,000 people.

47. Same calculation as in n. 46 but starting from 8,000 instead of 4,000.

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Printed in Denmark by
Special-Trykkeriet · Byens Tryk a-s
ISSN 0106-0481. ISBN 87-7304-626-5

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