

Demography and the Graeco-Roman World

New Insights and Approaches



EDITED BY

**Claire Holleran
and April Pudsey**

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DEMOGRAPHY AND THE GRAECO-ROMAN WORLD

Through a series of case studies this book demonstrates the wide-ranging impact of demographic dynamics on social, economic and political structures in the Graeco-Roman world. The individual case studies focus on fertility, mortality and migration and the roles they played in various aspects of ancient life. These studies – drawn from a range of populations in Athens and Attica, Rome and Italy, and Graeco-Roman Egypt – illustrate how new insights can be gained by applying demographic methods to familiar themes in ancient history. Methodological issues are addressed in a clear, straightforward manner with no assumption of prior technical knowledge, ensuring that the book is accessible to readers with no training in demography. The book marks an important step forward in ancient historical demography, affirming both the centrality of population studies in ancient history and the contribution that antiquity can make to population history in general.

CLAIRE HOLLERAN is a Leverhulme Early Career Fellow at the University of Liverpool. Her research interests lie primarily in ancient social and economic history, focusing in particular on the city of Rome. She is the author of a forthcoming monograph, *Shopping in Ancient Rome*, and is co-editor with Amanda Claridge of *A Companion to the City of Rome* (2011).

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Introduction

Studies in ancient historical demography

Claire Holleran and April Pudsey

Populations in the past behaved in diverse ways in terms of fertility, mortality and migration – the key elements of demographic dynamics. There are many variables which influence these dynamics, including environment and epidemiology, economic activity, urbanisation, reproductive decision making and war. These variables are socio-economically and culturally specific, and are therefore likely to impact differently on populations across time and place. Population historians of most periods in European history have long acknowledged such specificity and diversity in population dynamics and behaviour; in fact, established models that suggest ‘regional’ patterns of demographic behaviour and fail to take diversity into account have recently been challenged with data from a range of populations.¹ Similarly, the notion that all pre-modern populations can be grouped together and be seen to behave in the same way as one another is no longer tenable.² Accordingly, ancient historians must view the populations of the Graeco-Roman world against the backdrop of their environmental, socio-economic and cultural diversity. The populations of the areas discussed in this volume – Athens, Rome, the metropolises and villages of Ptolemaic and Roman Egypt, and the rural and coastal demes in Attica – all existed within specific contexts determining, at least in part, the variables shaping their population dynamics. For this reason we cannot categorise the range of populations of the Graeco-Roman world along with all pre-modern European populations, nor can we see them as making up one distinct and homogeneous category of their own. On the other hand, there are lots

We would like to thank Ben Akriigg, Amy Coker, Neville Morley, Tim Parkin, John Pearce, Walter Scheidel, Claire Taylor and Bob Woods for their invaluable comments on earlier drafts of this paper.

¹ Livi-Bacci, 2007. See also Woods, 2003a, 2003b. Regional patterns, for instance the ‘European marriage patterns’ of late marriage, proposed by Hajnal, 1965, and the family formation patterns suggested by Laslett and Wall, 1972, have been contradicted by census data from Nordic countries, among others; see Pudsey in this volume.

² The model suggesting this, known as demographic transition theory, has been challenged by many studies: see discussion in Morley in this volume.

of commonalities between the populations of the ancient, pre-modern and more recent past. The value of comparative research on population lies in establishing what these common relationships are, and the ways in which an understanding of one population in its particular context can help to develop a fuller picture of another. For the ancient historian, for instance, a study on population in early modern England can suggest not only the differences but also the similarities in the ways in which individuals, families and populations influence and respond to social and economic change.

Historical demography is important precisely because a wide range of responses to social and economic change can be observed through the study of a population's demographic dynamics. Demographic dynamics should, therefore, be central to any socio-economic analysis of the ancient world. This goes beyond simply knowing the size of any given population, and encompasses the structure and dynamics of a population: mortality, fertility, migratory movement and family structure should all be considered. In recent decades ancient historians have begun to recognise the exciting possibilities afforded by taking a demographic approach to the study of the ancient world. Brunt famously wrote that any statement about the Romans is meaningless if we do not know how many Romans there were, but in the years since this was written there have been a number of key shifts in approach to the serious incorporation of demography into ancient history.³ A number of groundbreaking studies have sought to evaluate the relative significance of population size and behaviour in ancient societies and economies.⁴ These studies, surveyed below, have laid the foundation for the relatively new discipline of ancient historical demography; further studies, also surveyed below, have built on this, expanding the discipline to shed more light on particular debates in Greek and Roman history.

Hopkins's hugely influential article of 1966 was the first work in ancient history to advocate employing demographic model life tables.⁵ He used these to demonstrate that collections of ancient epigraphic individual age data were too statistically flawed to be of any use to the population historian, highlighting the mathematical implausibility of some demographic conclusions that had previously been drawn from these data.⁶ The importance of Hopkins's article lies not only in its introduction of model life tables to ancient history – which have since become commonplace – but also in its

³ Brunt, 1971: 3.

⁴ For the most up-to-date discussion of ancient demography, see Scheidel, in press a; also, Scheidel, 2001c, 2007b.

⁵ Hopkins, 1966. See discussion below, pp. 4–5, on model life tables and their uses in ancient history.

⁶ Principally by Burn, 1953. See Akrigg in this volume.

explicit acknowledgement of the relationship between individuals in the past, and the age and sex structures of the populations of which they were members. Hansen's influential *Demography and Democracy* also made use of model life tables for Greek history. Hansen remains a central figure in highlighting the important role played by population in Greek history, and *Demography and Democracy* was particularly influential in demonstrating the potential impact of demographic dynamics on Athenian politics.⁷ Hansen's more recent work on the structure and institutions of the Greek polis has continued to give due weight to the importance of population and its dynamics.⁸ Sallares's study *The Ecology of the Ancient Greek World* (1991) also marked a key development, as the author stressed the significance of ecological factors in creating specific disease environments; these cause mortality patterns to vary between geographical regions.⁹ He revisited this issue in his *Malaria and Rome* (2002), which focused on the disease environment of ancient Italy.¹⁰ Scheidel also demonstrated the importance of the disease environment in shaping the mortality regime of Roman Egypt in his *Death on the Nile: Disease and Demography in Roman Egypt* (2001).¹¹

Roman historians have, in general, been better placed than Greek historians to exploit the potential of demographic approaches to ancient history.¹² Material which lends itself relatively easily to demographic inquiry has survived in greater quantity from Roman populations and, consequently, has framed the debates and narratives of Roman history: the survival of Augustan census figures and archaeological material, for example, has been used to argue for vastly different population counts in late republican Italy and correspondingly different accounts of the agrarian history of the late republic.¹³ The incorporation of demography into Roman history was helped in part by Parkin's book *Demography and Roman Society* (1992), which placed fertility, mortality and migration within the context of the surviving source material from the Roman world. This material includes the

⁷ Hansen, 1985. For key studies of the demography of the Greek world see Corvisier, 1985; Hansen, 1985, 1988, 2006a, 2006b; Sallares, 1991; Scheidel, 2003b.

⁸ See, for example, Hansen, 2005, 2006a; Hansen and Raaflaub, 1995, 1996.

⁹ Sallares, 1991. Horden and Purcell, 2000, also discuss the relationship between environment and disease. For the importance of ecological factors in determining the impact of disease on mortality, see Scheidel, 2001c: 77–9.

¹⁰ Sallares, 2002. ¹¹ Scheidel, 2001a.

¹² For key studies of the Roman world, see Saller, 1987, 1994; Parkin, 1992; Bagnall and Frier, 1994, 2006; Frier, 1994; Scheidel, 1996, 2001a, 2001b, 2001c, 2001d, 2003a, 2004a, 2004b, 2005, 2007b, 2007c, 2008c, in press a; Morley, 2001, 2003, 2006b; Shaw, 2001; Sallares, 2002; de Ligt, 2004; Rosenstein, 2004; Woods, 2007; de Ligt and Northwood, 2008.

¹³ See now de Ligt and Northwood, 2008, and below, p. 5. See Hin, Holleran and Morley in this volume.

juridical texts known as ‘Ulpian’s life table’ (an ancient estimation of mortality of Romans used for calculations of loan repayments), skeletal data from Roman provinces, and census documents listing household members, their ages and their relationships to one another in Roman Egypt.¹⁴ Parkin used this material to show that ancient historians can learn about life, death, old age and the movement of people when the material is approached from a demographic perspective. This accessible study was instrumental in introducing the methods and material of a potentially marginal and technical specialisation to Roman historians, and highlighted many of the issues involved in using legal, written and other source material for our understanding of birth, death and mobility.

Of all the demographic material surviving from the Graeco-Roman world, the Romano-Egyptian census data are the most comprehensive – the best we have, in fact, for any population before the fifteenth century. This material was catalogued and analysed by Bagnall and Frier in their seminal work *The Demography of Roman Egypt* (1994), which used demographic techniques of analysis and model life tables to argue that the population of this province adhered to the demographic patterns expected of all pre-modern Mediterranean populations.¹⁵ This was the first study to offer a systematic and wide-ranging demographic investigation of an ancient population. It analysed data on birth, marriage and death with the aid of modern demographic methods, and has significantly informed our understanding of the impact of these on society, economy and culture.

In the last decade Scheidel has been a key figure in the study of Roman demography. He edited the collection of essays *Debating Roman Demography* (2001), which advocated the use of demographic theory and methods to explore population trends in the Roman world.¹⁶ Scheidel highlights this approach as the most productive and sensible way forward for Roman demographic and population history: ‘Proxy data, comparative evidence and theoretical models may be poor substitutes for reliable statistics. At the same time, they encourage a more holistic perspective, transcending facile categorisation and compartmentalisation. This cross-disciplinary embeddedness is the future for Roman demography.’¹⁷ The papers in *Debating Roman Demography* demonstrate the value of such an

¹⁴ Parkin, 1992.

¹⁵ Bagnall and Frier, 1994, now updated, 2006. For some key demographic studies of Roman Egypt which make use of this material, see Bagnall *et al.*, 1997; Frier, 1994; Alston, 2001; Scheidel, 2001a; Tacoma, 2006. For the Ptolemaic period, see recently collated and published salt-tax registers and lists which can be used for demographic study: Clarysse and Thompson, 2006.

¹⁶ Scheidel, 2001b. ¹⁷ Scheidel, 2001c: 81.

approach to a number of areas in Roman history: the seasonal birthing cycle of Roman women (Shaw); military recruitment and overpopulation in republican Italy (Lo Cascio); population size and structure in the Roman Empire (Frier); and the urban population of late Roman Egypt (Alston).

The kind of 'holistic perspective' and 'cross-disciplinary embeddedness' proposed by Scheidel were most recently adopted by de Ligt and Northwood in *People, Land, and Politics: Demographic Developments and the Transformation of Roman Italy, 300 BC – AD 14* (2008).¹⁸ This edited collection presents a reconstruction of the demography of republican Italy, using demographic modelling alongside an analysis of census data and archaeological material, and explores the social, economic, military and political implications of demographic development in both urban and rural regions of Italy. The book's cross-disciplinary reconstruction challenges many of the traditional views of republican Italy's population and land development from the beginning of the third century BC onwards. The *Cambridge Economic History of the Greco-Roman World* (2007) also takes a holistic approach to the study of economy and demography, and seeks to identify and explain the relationship between the two.¹⁹

These studies have set the terms of debate for ancient historical demography: increasingly, ancient historians have engaged with this research, and have incorporated demographic methods and ideologies into more specialised areas of ancient history. Consequently, the discipline of ancient demography has advanced significantly over the past few decades, from studying not only population size, structure and growth, but also the relationships between these and particular areas of life in the ancient world. These areas include economic development, mobility and migration, military recruitment, political participation, and family and household organisation, each of which is addressed in the present volume.

Economic structures and development are, of course, heavily influenced by demographic change, and economies respond to, and are influenced by, fluctuations in population numbers.²⁰ The size and structure of a population affect the economy in various ways, impacting upon the distribution of resources, the availability of labour and overall living standards. On a macro level, the size of the population in relation to the available resources is crucial for estimating the relative prosperity or poverty of a population. Finite resources can be stretched to breaking point if a population increases

¹⁸ De Ligt and Northwood, 2008. ¹⁹ Scheidel *et al.*, 2007.

²⁰ Scheidel, 2007a; Morley in this volume; Holleran in this volume. See also Scheidel, 2001c: 72–7, for discussion of the importance of demography on economy.

too rapidly or beyond its means (the so-called ‘Malthusian trap’), and, conversely, falls in population numbers can result in increased living standards, since resources are shared between fewer people. Fluctuations in population numbers also affect the availability of labour and thus impact upon wage levels and living standards: an increase in population, for example, can result in a drop in wages due to the abundance of labour available, while a fall in population can have the opposite effect. The structure of a population – that is, both its sex and age distribution and its social structure – is also an important consideration, as this dictates the distribution of resources within that population. An overall increase in the economic output of a society, in modern terms its gross domestic product (GDP), might not necessarily indicate an overall increase in living standards. It could in fact reflect a growing inequality: a small number of the elite could become increasingly richer, while the majority of a population remained at subsistence level. For this reason, although detecting per capita growth rather than aggregate growth is preferable, even this can be a false indicator of the reality of an economy, as wealth is not necessarily shared equally.²¹

On a micro level the economic position of individuals necessarily impacts upon both their reproductive decision making and their life expectancy. The impact of demographic dynamics on the economy is one that is increasingly recognised by scholars of the ancient economy. Morley, for example, explored the economic effect of the population of Rome on the city’s Italian hinterland; in a more recent contribution he also highlighted the connection between social structure, demography and the economy.²² Jongman’s recent work on consumption has argued that the economic prosperity of the Roman Empire did spread beyond the elite, raising living standards for relatively large segments of the population, at least in the late republic and early empire.²³ Much of Scheidel’s recent work on Roman economic growth also considers the size and structure of the population to be a central factor in models of the Roman economy.²⁴ Mobility and migration of populations also have a significant impact upon an economy.

²¹ Aggregate growth could merely represent an increase in population, whereas per capita growth reflects growth per person and thus enables a rise in living standards for all, provided that the benefits of economic growth are shared equally across a population. For the importance of specifying the type of growth discussed, see Millet, 2001; Saller, 2002.

²² Morley, 1996; Morley, 2006b. ²³ Jongman, 2007.

²⁴ Scheidel, 2008a, 2009a, in press a; Scheidel and Friesen, 2009. Scheidel, 2004b, on the mobility of the free population; 2005, on mobility of the servile population.

Patterns of military recruitment, and the demographic dynamics of the populations from which recruits were drawn, also impact upon social and economic history. Scheidel's case study of the recruitment of legions in the Roman Empire, for example, illustrates the sheer scale of the influence of the army on men and women in Roman populations 'from cradle to grave'.²⁵ Rosenstein uses demographic modelling to illustrate that such an impact on the families of rural Italy in the late republic was, while wide scale, plausible.²⁶ Understanding movement to and from ancient cities is also central to our understanding of ancient urbanism: we can paint a much clearer picture of the infrastructure of cities if we have some level of understanding of the size and social composition of its population, and movements into and out of that population.²⁷ Similarly, levels of political participation are subject to the structures and movements of populations, as demonstrated clearly by Hansen, who has used data from the Greek world in conjunction with model life tables to investigate political participation in Athens and Attica.²⁸

At a more domestic level, family and household organisation also respond to demographic change, and are therefore central to a population's reproductive and economic behaviour. Fertility rates and changes in them are often reflective of cultural attitudes towards childbearing, birth spacing, and family and household organisation. Seminal studies on the structures of the ancient family, such as those by Saller and Shaw or Kertzer and Saller, have focused primarily on the static structures of 'nuclear' and 'non-nuclear' families.²⁹ Studies of fertility and mortality in rural Italy and in Egypt have sought to relate reproductive decision making to such demographic circumstances and also to household economics; biological, environmental and cultural determinants of fertility are important factors to consider in the study of the life course of the family.³⁰

²⁵ Scheidel, 1996.

²⁶ Rosenstein, 2004. See also De Ligt and Northwood, 2008, and Fischer-Bovet in this volume.

²⁷ Morley, 1996; Alston, 2001; Holleran in this volume.

²⁸ Hansen, 1985, 2006a, 2006b; Akriagg in this volume; Taylor in this volume.

²⁹ Saller and Shaw, 1984; Kertzer and Saller, 1991. Cf. Bagnall and Frier, 1994, 2006.

³⁰ On demography and family and household in the ancient world, see Saller, 1994, 2007; Alston, 2005; Scheidel, 2007b; Hübner, 2010; Pudsey in this volume. On birthing cycles, see Shaw, 2001. On reproductive decision making, see Frier, 1994, and Hin, in this volume. On house sharing and domestic space, see Alston, 1997. On fatherlessness in antiquity, see Hübner and Ratzan, 2009.

THE BOOK

As this survey of the historiography demonstrates, the importance of demography to ancient history is wide-ranging. This book applies demographic thinking to a set of ancient historical problems, providing a series of case studies which demonstrate the central role played by population in ancient societies and economies. The first two chapters discuss the development of demographic analysis in ancient history, placing the subsequent papers in context. Morley begins by detailing the development of ideas about the relationship between demography and development in classical antiquity, discussing the debate from its origins with Hume and Malthus to modern development economics. Taking as a case study the familiar debate concerning the population of Italy in the late republic, he draws on demographic theory and demonstrates that the debate about absolute population levels in Italy at the time of Augustus is irrelevant to the study of the relationship between demography and development; the range of economic possibilities that accompany any population estimate is too wide to enable any useful conclusions to be reached. He argues instead that we should consider the dynamics of population change, for example the impact of military recruitment, migration and colonisation on the economic structure and development of Roman Italy.

Akrigg's paper complements and builds upon this, exploring the issues raised by Morley in relation to Greek demography, but this time using Athens as a case study. He argues that the full importance of a demographic approach has not yet been appreciated in Athenian history: many Greek historians view demography as a minor field, and the focus of demographic investigations of Athens has been restricted to a narrow conception of the political implications of the population. While Hansen's work is of obvious importance here, Akrigg argues that its dominance has reinforced this trend. Instead, he makes the point that thinking seriously about Athenian demography can tell us much more than the extent of political participation, or the extent of Athenian dependence on imported food.³¹ He emphasises the wider relevance of demography to all aspects of Athenian history, demonstrating that the importance of demography should be appreciated by everyone with an interest in Athens and ancient Greece.

The following two papers are concerned with fertility and the family. In her chapter Pudsey considers nuptiality, one of the most important aspects of fertility: she explores the influence of marriage patterns on the family's

³¹ Hansen, 1985, 2006a, 2006b; Moreno, 2007.

demographic life cycle, with reference to recorded households in Roman Egypt. The chapter presents a case for the study of the family in Roman Egypt as an example of variety in family formation, particularly between social classes and urban and rural populations, and illustrates this with data on the family life cycle from the perspective of an important transition point – that is, when sons choose to marry. The chapter demonstrates that historical models of marriage patterns and family formation have over-estimated the explanatory value of regionally specific patterns of behaviour; it illustrates that pre-modern fertility schedules and family formation are not just regionally but also socio-economically specific.

Hin's paper tackles theories of fertility behaviour during the late Roman republic. She challenges the processes and interactions underlying fertility behaviour as put forward by Brunt in his influential *Italian Manpower*.³² Brunt argued that it was not just mortality that curbed demographic growth among Roman citizens of the late Roman republic, but a rational choice to limit fertility, driven by economic considerations. Hin takes full account of wider developments in the field of demography, drawing upon criticism of traditional rational choice theory, perspectives from the fields of cultural anthropology and human evolutionary ecology, and comparative material from other pre-modern populations. She argues that any decrease in the rural Italian population in the late republic was ultimately driven by excess mortality rather than declining fertility.

The three papers relating to migration, Taylor, Fischer-Bovet, and Holleran, are concerned with population movements and their implications for social and political life, military recruitment and economies, respectively. These chapters consider the influences of migration on three different populations, namely those of Attica, Ptolemaic Egypt and Rome, and together demonstrate the varied ways in which populations behave within different socio-economic, environmental and cultural contexts. Taylor, for example, considers migration within Attica, emphasising the 'circular' and 'non-permanent' nature of much of this population movement. She explores the motivation for moving and the effect of migration both on the place of origin and the receiving settlement. By taking a primarily qualitative approach, she demonstrates that it is possible to assess the involvement of the demes in the political life of Athens, the impact of migration on deme communities, and the relationship between demographic change and local social and political identity. Taylor demonstrates that significant advances can be made by analysing the demography of

³² Brunt, 1971.

Attica in this way, in terms of understanding not only the impact of demographic factors on Athenian society but also their impact on Athenian political life.

Fischer-Bovet investigates Greeks' migration to and mobility in Ptolemaic Egypt in the third century BC. She employs new calculations to challenge the assessments of immigration previously proposed – that is, that approximately 10 per cent of the population were Greeks. Using estimates drawn from ancient data, together with a mathematical model of the number of adult Greek males living in the Fayyum, she suggests a more irregular and much lower flow of immigration (*c.* 5 per cent) than previously supposed. She argues that these demographic revisions should be taken into account when analysing the Ptolemaic state, particularly the socio-economic and cultural interactions between the different groups of population, most notable of which are military settlers.

Holleran in her paper is also concerned with the movement of populations, and in it explores the critical relationship between migration and the urban economy of Rome. She considers the motivation of those who migrated to Rome, and then focuses on the economic effect of this population movement. Drawing upon a combination of ancient evidence, theoretical models and comparative material from contemporary cities in the developing world, she argues that the particular social and institutional framework of Rome limited the economic opportunities for new migrants, both temporary and permanent. Despite claims that poverty was always conjunctural for the able-bodied in Rome,³³ Holleran contends that many migrants faced absolute structural poverty and the ever-present threat of destitution. The implications of this view of the urban economy are explored, and the importance of population to our understanding of the city of Rome is thereby demonstrated.

Parkin offers some closing remarks which review the state of the subject of ancient historical demography since the publication of his *Demography and Roman Society* in 1992, and reconsider the structure of his book in relation to the papers in the present volume. He reflects on the methodological approaches and the advances made in the papers, and comments positively both on the centrality of demographic studies to ancient social and economic history, and on the future of research in ancient demography.

In considering the effects of demographic behaviour on ancient societies and economies, the papers demonstrate the importance of population dynamics in the ancient world. Our populations are shown to be

³³ For example, Grey and Parkin, 2003: 287; Osborne, 2006: 5.

active participants in their societies and economies, making choices about their demographic behaviour, which both respond to and create particular population structures or profiles and, in turn, particular societies and economies. The influence of mortality is not considered separately in this book, although it features largely in most of the chapters. Populations respond to mortality at both structural and domestic levels by changing their reproductive and economic behaviour in order to try to counter the impact of high mortality. Mortality thus works in conjunction with fertility and migration, and the chapters in this book discuss mortality where it can be seen to influence other areas of life.³⁴

The papers in this book cover a relatively broad geographical and chronological range but are fundamentally linked by their demographic approach to ancient history. The focus on areas such as Athens, Rome and the Fayyum region of Egypt is a predictable consequence of the survival of material and the interests of those working in these fields. The recently published tax and census documents of Ptolemaic Egypt (*P.Count*) in Clarysse and Thompson's *Counting the People in Hellenistic Egypt* (2006) will surely offer further opportunity for debate and discussion of demography of the family, the household, mobility, urbanism, Greek and Egyptian cultures, and other areas of the population history of Egypt in the Ptolemaic period. The development of more sophisticated approaches to archaeological material in other less well-documented areas of the ancient world, together with the use of scientific advances in the study of skeletal remains, such as isotopic and osteological analysis, should also yield some exciting new results concerning demographic dynamics, particularly relating to mortality and migration.³⁵ For example, a current project based at the University of Reading, 'A Long Way from Home: Diaspora Communities in Roman Britain', funded by the Arts and Humanities Research Council, explores the archaeological evidence for immigrant communities in Roman Britain through stable isotope analysis (oxygen and strontium), skeletal material and non-metrical analysis, and burial rituals.³⁶ Analysis

³⁴ For detailed studies of mortality patterns in the ancient world, see: Saller and Shaw, 1984; Sallares, 1991, 2002; Parkin, 1992; Scheidel, 2001a, 2001c, 2007b, 2007c; Woods, 2007.

³⁵ See also Parkin in this volume, p. 184. Recent work by John Pearce (2010) highlights the weakness of previous views of migration patterns derived from analysis of burial rituals. He argues that although it is simplistic to treat 'out of place' burial rituals as direct evidence for migrants, they still deserve consideration in terms of constructing a different group identity; he thus advocates a more sophisticated approach to the archaeological evidence which also takes into account factors such as age and sex.

³⁶ For case studies which demonstrate the potential of isotopic analysis of skeletal material in detecting migration, see Schweissing and Grupe, 2003; Price *et al.*, 2004; Evans, Chenery and Fitzpatrick, 2006; Evans, Stoodley and Chenery, 2006; Prowse *et al.*, 2007. Improved recording practices of skeletal data should help realise the potential of these methods of analysis. For comments on the use of skeletal data in the early 1990s, see Parkin, 1992: 41–58.

of skeletal material can also further our understanding of living conditions in the ancient world: non-specific stress indicators can be used to assess the general 'stress' levels in a population from malnutrition, endemic disease and general exposure to pathogens, while stature can be used to indicate nutritional status.³⁷

Overall, this book places demography in its rightful position at the centre of studies of the ancient world. Through the application of demographic methods to specific problems in Greek and Roman history, the authors approach a more nuanced understanding of their respective historical topics and questions. The case studies presented here are intended to be relevant not just to those interested in the particular historical areas discussed, but to a wider audience interested in exploiting the theory and methodology used by the authors to conceptualise populations and analyse ancient societies and economies. It is hoped that this will encourage the wider adoption of demographic approaches to ancient history and enable more researchers to exploit the potential of population analysis in the future.

The technical language of the discipline of demography can often make this difficult. For this reason, we have aimed to ensure that technical and methodological issues mentioned in this book are addressed in a clear and straightforward manner, with the intention that the papers are accessible to non-specialists. For a clear explanation of demographic concepts applicable to the papers in this book, we would refer the reader to Colin Newell's *Methods and Models in Demography* and to the glossary in Tim Parkin's *Demography and Roman Society*.³⁸

One particular technical issue, which is problematic for all areas of ancient historical demography and to which we therefore draw attention here, is that of the selection of model life tables for specific ancient populations.³⁹ Estimating mortality schedules for ancient populations is difficult, as demographic data are sparse. As with other poorly documented historical populations, model life tables are thus used to predict the average life expectancies of men, women and children at given ages. Much of the literature on ancient demography has incorporated the use of these models as heuristic devices in conjunction with the relatively sparse ancient data.⁴⁰

³⁷ For the use of skeletal analysis to assess the health of the population of Roman Britain, see Roberts and Cox, 2003a: 107–63, 2003b. Pers. comm. John Pearce. For stature as an indicator of nutritional status in the Roman world, see Bisel and Bisel, 2002; Kron, 2005; Jongman, 2007: 607–9.

³⁸ Newell, 1988; Parkin, 1992.

³⁹ For more in this volume on model life tables, see Akrigg, pp. 47–57; Parkin, pp. 184–6. See also Hin, p. 112.

⁴⁰ For example, with a view either to demonstrating the validity of the data, or to proving their inadequacy, see initially Hopkins, 1966. See also Frier, 1994; Scheidel, 2001a, 2001c, 2001d. See Scheidel, 2007b, 2007c, for a different approach to these data, which looks at the seasonality of patterns of death.

Given the fruitfulness of this approach to studying life expectancy, the use of model life tables has pushed forward the study of ancient demography significantly. The Princeton model life tables of Coale and Demeny are based on actual demographic data taken from a range of selected historical populations, and have been adopted as the most appropriate set of demographic models to apply to ancient data.⁴¹ However, these tables do not adequately describe all mortality patterns that an ancient population may experience: age-specific causes of mortality (as a consequence of epidemiology), for example, are not taken into account.⁴² They also assume a fixed relationship between infant and adult mortality levels which may not be representative of populations in certain regions.⁴³ More importantly, they do not accurately represent populations with extremely high levels of mortality.⁴⁴ Another set of model life tables has thus recently been explored for use in ancient demography.⁴⁵ Woods has developed these tables for use in Roman demography, taking into account the problem of the Princeton tables' misrepresentation of the relationship between early childhood and adult mortality. The use of these new tables will help to further the modelling of historical populations with very high levels of mortality, such as we expect to find in the ancient world.⁴⁶

⁴¹ Coale and Demeny, 1983. These models were used by Frier, 1994, and have been used in almost all ancient demographic studies since. Discussed also by Parkin, 1992: 67–90.

⁴² Woods, 2007: esp. 375–84.

⁴³ For a discussion of the relationship between infant and adult mortality and its importance to historical demography, see Woods, 1993.

⁴⁴ Woods, 2007.

⁴⁵ Preston *et al.*, 1993. Discussed by Scheidel, 2001a, and Sallares, 2002. These have been developed for use in Roman demography by Woods, 2007.

⁴⁶ As has been demonstrated by Scheidel, 2001a, and Sallares, 2002.

*Demography and development in classical antiquity**Neville Morley*

The relationship between demographic structures and economic performance in classical antiquity is a remarkably neglected subject; it is only very recently that a few scholars such as Walter Scheidel have begun to address such issues.¹ Studies of the ancient economy remained fixated for decades on the unanswerable but seductive question of how far antiquity could be considered ‘modern’, understood in terms of an under-analysed assortment of phenomena such as large-scale inter-regional trade in staples, systems of banking and credit, a rational approach to profit-making and the development of market-orientated industry, or primitive, agrarian and underdeveloped.² Even as historians have sought to escape this false dichotomy and developed more sophisticated conceptions, not least by recognising both the strict ‘limits of the possible’ within a pre-industrial economy and the scope for wide variation in economic organisation and performance within those limits, little attention has been paid to demography, except occasionally as a basis for highly speculative estimates of the GDP of the Roman Empire; there is certainly no obvious sense that change, not only in absolute numbers but in structures and processes, might be a, or indeed the, significant source of change in the economic sphere. ‘Demography’ is included as one of the ‘determinants of economic performance’ in the first section of the *Cambridge Economic History of the Greco-Roman World*, but most of its subsequent chapters nevertheless manage to limit their consideration of the subject to the usual estimates of overall numbers as an indicator of prosperity or crisis.³

Historical demographers, meanwhile, although they frequently emphasise the importance of understanding population in order to understand the dynamics of society as a whole – as Brunt argued, ‘what does a statement about the Romans *mean*, if we do not know roughly how many Romans there were?’ – have in practice focused on quixotic attempts at establishing

¹ For example, Scheidel, 2004a. ² Morley, 2004: 33–50; 2008: 3–13. ³ Scheidel *et al.*, 2007.

absolute numbers and relating these to historical events such as the fall of the Roman republic or the decline of the Roman Empire.⁴ Again, it is only comparatively recently that a more sophisticated understanding of demography, which sees population structure and dynamics as far more important than population size, has come to the fore, and there is still only limited consideration of the relation of demographic change to changes in society as a whole. When this topic is addressed, demography (and even now the focus tends to be on change in total numbers rather than on structures) is interpreted generally as an indicator of prosperity or national well-being or economic performance, as for example in debates about the state of Italy in the last two centuries BC: that is to say, as a symptom of changes in other areas of society rather than as a possible source of change in its own right.

A defence of this state of affairs might be to argue that we can scarcely evaluate the impact of demographic change on ancient economic performance until we have a much more secure and detailed understanding of ancient demographic structures, or, conversely, assess the demographic consequences of ancient economic development until we have established the nature and progress of that development. One objection to this argument is obvious: the state of the evidence, in many cases its problematic nature, and above all the lack of ancient statistics are such that we will never have definitive knowledge of one, whether demography or economy, to supply a firm basis for consideration of its possible impact on the other. More significantly, the two are in any case mutually dependent; our interpretation of one depends on our understanding of the other, so that attempting to consider them separately is a pointless exercise. The historical demographers, at least, have clearly recognised this: discussions of ancient mortality, fertility and family life cycles are predicated on an awareness of the pre-modern context, and the capabilities of a pre-industrial, agrarian economy are assumed to set limits on the plausibility of different reconstructions of population size and structure.⁵ The economic historians have as yet shown fewer signs of evaluating their hypotheses by reference to demographic realities, but this should be equally obvious and unavoidable.

The crucial point, however, is that just as there is enormous scope for variation in economic structure and performance within the limits of a broadly defined 'pre-industrial economy', so there is wide variation in demographic structures and dynamics within the broad category of a 'pre-modern

⁴ Brunt, 1971: 3.

⁵ As seen in debates about different reconstructions of the population of Italy in the late republic: for example, Lo Cascio, 1994, 2001; Morley, 2001; Scheidel, 2001c: 52–5.

population'. It makes sense, then, to draw the two subjects more closely together and to focus in detail on the parameters of the relationship between them. Research questions such as some of those considered in this volume, which concentrate on the nature of the interaction between demography and development, highlighting their interdependence, may yield results that illuminate both sides of the equation. At the very least they should compel each set of scholars to consider the implications of the others' arguments, in place of what can at present seem like the blithe ignorance of the economic historians and the grandiose claims but disappointingly vague results of the demographers.

Considering the importance of questions of population growth and demographic change for contemporary debates about economic development, both globally and especially in the developing world, the neglect of this subject by ancient economic historians is remarkable; it seems to require a more complex explanation, whether in sociological or cultural terms, than being merely a response to the problems of the evidence. If one takes a longer view of the history of ideas, it seems even more surprising, since the relation between population and economy was at the heart of both theories of economic development and theories of population from the mid-eighteenth century into the nineteenth. Indeed, the example of classical antiquity was frequently the focus of these debates, even though contemporary ancient historians remained largely oblivious to this. I shall therefore begin this paper by surveying the course of the debate, with particular attention to the ways in which the population history of antiquity was interpreted and the lessons that ancient historians might learn from it. I shall go on to consider some key issues in current debates on population and development, again with the aim of considering what this might offer to ancient historians, and conclude with a brief discussion of the implications of some of these ideas for debates over the familiar example of Italy in the later republic.

ORIGINS OF THE DEBATE: DAVID HUME

Many grounds of calculation proceeded on by celebrated writers are little better than those of the Emperor Heliogabalus, who formed an estimate of the immense greatness of Rome from ten thousand pound weight of cobwebs which had been found in that city.⁶

⁶ Hume, 1882: 414, citing SHA *Heliogab.* 26. Cited also by Holleran, p. 155.

David Hume's essay *On the Populousness of Ancient Nations*, first published in 1752, is invariably identified, in accounts of the history of the study of ancient demography, as a key moment in the development of a more critical attitude towards the figures provided by the ancient sources.⁷ In his criticism of writers who argued that contemporary European populations were at best no larger than those supported by the same regions in antiquity, and more likely significantly inferior, Hume raised two crucial questions: whether the numbers found in manuscripts could be trusted, given the ease with which figures might be changed in the process of transcription without altering the sense of the passage and thus indicating that a mistake had been made, and whether there was any reason to imagine that the ancient authors had any accurate knowledge of the size of the population in the first place. 'We know not exactly the numbers of any European kingdom, or even city, at present. How can we pretend to calculate those of ancient cities and states, where historians have left us such imperfect traces?'⁸ However, the significance of Hume's essay is not confined to these points, important though they are; it is thus insufficient to dismiss it, as Walter Scheidel does in his brief survey of the subject, as 'rather limited progress' and 'hesitant scepticism', on the grounds that Hume is reluctant to disbelieve ancient sources 'except in the most flagrant instances of improbability'.⁹

Prevailing models of historiography in the mid-eighteenth century, and their assumptions about the basis on which one might establish historical truth, meant that to reject ancient testimony outright – rather than merely arbitrating between two sources that contradicted one another – was a radical step.¹⁰ Hume showed himself well aware of this, in a passage which he added to later editions of his essay, but nevertheless made it clear that philology could not be the ultimate determinant of truth in historical questions:

The critical art may very justly be suspected of temerity when it pretends to correct or dispute the plain testimony of ancient historians by any probable or analogical reasoning. Yet the licence of authors upon all subjects, particularly with regard to numbers, is so great, that we ought still to retain a kind of doubt or reserve, whenever the facts advanced depart in the least from the common bounds of nature and experience.¹¹

Hume's position was indeed in part, as it is generally characterised, one of scepticism. He questioned not only the reliability of ancient authors and the trustworthiness of manuscript sources, but also the assumptions of his

⁷ Ulf, 1999; Scheidel, 2001c. ⁸ Hume, 1882: 383. ⁹ Scheidel, 2001c: 4.

¹⁰ See, for example, Reill, 1975. ¹¹ Hume, 1882: 417.

opponents about human nature and the course of historical development, which led them to lend credence so readily to the accounts of the ancients – above all, their belief in the decay of humanity since classical times:

As far, therefore, as observation reaches, there is no universal difference discernible in the human species; and though it were allowed, that the universe, like an animal body, had a natural progress from infancy to old age; yet as it must still be uncertain, whether, at present, it be advancing to its point of perfection, or declining from it, we cannot thence presuppose any decay in human nature.¹²

Besides this scepticism, however, Hume offered an alternative basis for knowledge: nature and experience, based on careful observation in the present. Philological arguments offered no secure basis for rejecting either a belief in the decay of the human species or the statements of ancient sources; natural science, on the other hand, provided the evidence that established the former as at best unproven, and some of the testimony of the latter as highly implausible. Hume insisted on the need to base all discussions on the premise that the human species is, in biological terms, the same today as it was in the time of the Roman Empire, and hence that contemporary knowledge must take precedence over ancient testimony. This is clearly a precursor of arguments, such as those of Hopkins, which resolve contradictions between the ancient evidence and the expectations of modern demography by discarding the ancient evidence.¹³

It is important to keep in mind that Hume was not interested in the question of the populousness of antiquity for its own sake; this certainly accounts for his failure to develop as full a critique of the ancient sources as some later commentators would like. On the contrary, his concern was with the relationship between population and society, and above all with what we would now call social and economic development. Ancient demography became a theme of debate from the seventeenth century onwards because of wider concerns about the state of contemporary Britain.¹⁴ Changes in British society, in particular the rapid expansion of trade and the improving standard of living of the mass of the population, were interpreted by some commentators as manifestations of ‘luxury’, the inevitable consequences of which could be seen in the fate of the Roman Empire. As well as extensive citation of Roman moralising texts on the subject, they brought forward, as proof of the corrupting effects of luxuriousness on the virility and martial

¹² Hume, 1882: 382. ¹³ For example, Hopkins, 1966.

¹⁴ On the debate on ‘luxury’, see Berry, 1994; Winch, 1996: 80–7; Morley, 1998.

prowwess of the nation, the inferiority of modern populations compared with those at the height of classical civilisation.

One response from those who took a more positive view of economic development was to emphasise the ‘public benefits’ of ‘private vice’, as Bernard de Mandeville put it in his *Fable of the Bees*, in increasing the prosperity of the nation, as wealth was spent rather than hoarded and the desire for material goods encouraged individuals to work harder. This was the line followed by Adam Smith and other early political economists, accompanied by alternative accounts of ancient history which demonstrated that the highpoints of classical civilisation, most notably Periclean Athens and the Roman republic, were in fact founded on trade. Hume’s essay took a slightly different approach, addressing more directly the relationship between economic and social change and population. He began from the assumption that humanity possessed an essential ‘desire and power of generation’, and surveyed the different factors which might have placed constraints on this: climate, environment, disease, political institutions (above all a lack of liberty), the distribution of wealth, and the degree of development of trade and manufacturing. ‘If everything else be equal, it seems natural to expect, that, wherever there are most happiness and virtue, and the wisest institutions, there will also be most people.’¹⁵ Population change, it should be noted, is treated as an entirely dependent variable; differences in populousness between nations and eras are the result of different political, economic, social and cultural institutions influencing the basic drives of a consistent and universal human nature.

In contrast to many contemporary commentators, Hume emphasised the material as well as institutional and moral differences between classical antiquity and modern Europe. His account, echoed in other essays such as ‘On commerce’, asserts the clear inferiority of the Greeks and Romans in terms of the development of trade and manufacturing, technology and the apparatus of business. A priori one would expect that this would have a direct impact on populousness, but at any rate it is enough to suggest that the conclusions of Hume’s opponents are not as certain as they pretend:¹⁶

All our later improvements and refinements, have they done nothing towards the easy subsistence of men, and consequently towards their propagation and encrease? Our superior skill in mechanics; the discovery of new worlds, by which commerce

¹⁵ Hume, 1882: 384.

¹⁶ Hume’s remarks on the failure of any ancient author to attribute the growth of a city to manufacturing, and on the limited nature of ancient commerce (1882: 415), were quoted approvingly by Finley, 1985: 22.

has been so much enlarged; the establishment of posts; and the use of bills of exchange. These seem all extremely useful to the encouragement of art, industry, and populousness.¹⁷

This argument now seems entirely obvious, but it is worth emphasising that this is one of its earliest manifestations, and it was not until the next century that the differences between ancient and modern came to be seen in terms of a qualitative change of the whole structure of economy and society, rather than in terms of merely quantitative differences in the volume of trade and manufacturing.¹⁸ But Hume's argument was not simply a matter of asserting the material superiority of the present over the past and concluding that the former must be more populous; rather, it was founded on an analysis, albeit not a detailed one, of the way that material differences affected populousness, the impact of economic development on what we would term mortality and above all nuptiality. He emphasised the importance of the decisions made by individuals about when to marry and how far to restrict the size of their families, which were clearly influenced by their access to resources and their beliefs about their prospects for the future. On this basis he argued that an expanding population – he fully shared the pronatalist ideology of his opponents, the belief that the nation's prosperity was determined by the number of people – depended on increased liberty in society and a more equal division of wealth. Echoing the arguments being developed by the political economists, he also urged the expansion, rather than restriction, of trade and industry. Population growth depends on there being sufficient food to support more people, and agricultural production will be best increased through incentives to the farmers to produce more: 'The most natural way, surely, of encouraging husbandry, is, first, to excite other kinds of industry, and thereby afford the labourer a ready market for his commodities, and a return of such goods as may contribute to his pleasure and enjoyment.'¹⁹

A particularly interesting example of Hume's emphasis on the factors that influenced population change is his treatment of the subject of infant exposure in antiquity. If his intent had been merely polemical, aimed solely at undermining the claims of those who believed in the greater populousness of antiquity, the practice of infanticide offered further grounds on which to argue that antiquity may have been less populous than generally supposed. However, Hume was more interested in the possible roots of the

¹⁷ Hume, 1882: 412–13. ¹⁸ Morley, 2008: 21–47. ¹⁹ Hume, 1882: 412.

practice in individual motivation, rather than simply dismissing it as barbaric, and its wider implications for the regulation of fertility:

Perhaps, by an odd connexion of causes, the barbarous practices of the ancients might rather render those times more populous. By removing the terrors of too numerous a family it would engage many people in marriage; and such is the force of natural affection, that very few, in comparison, would have resolution enough, when it came to the push, to carry into execution their former intentions.²⁰

He continues: 'The prolific virtue of men, were it to act to its full extent, without that restraint which poverty and necessity imposes on it, would double the number every generation.'²¹ In his emphasis on the checks to population growth, both those imposed by famine and disease and those deliberately adopted by individuals to restrict their fertility, Hume anticipates a key element in the theories of Thomas Malthus.

ORIGINS OF THE DEBATE: THOMAS MALTHUS

By the time of Thomas Malthus's first essay on the 'principle of population' in 1798, nearly fifty years after the first edition of Hume's essay, the context within which such issues were being discussed had changed significantly. The debate on 'luxury' had now effectively concluded, with general agreement (at least among writers on economic and social matters) that the growth of trade and manufacturing was the indispensable basis for national prosperity, rather than a source of potential weakness. The well-being of the nation was increasingly measured in material rather than moral terms, with emphasis on the volume of manufacturing and the global extension of trade; Adam Smith, for example, insisted on the importance of the average level of wages – in other words population in relation to wealth and the division of property, rather than as a wholly separate factor – as a basis for comparison between different countries and between past and present, although in practice he frequently used overall population size as a convenient index.²²

This new context gave rise to a new set of questions and debates: firstly, how (and how far) trade, economic activity and national wealth might be increased, with arguments focusing on such issues as the role of the state, the regulation of the market and the balance between competing 'interests' within society; secondly, how and whether the rewards of economic success could be distributed more evenly through society, rather than remaining for the most part in the hands of a minority. The emerging school of 'political

²⁰ Hume, 1882: 396. ²¹ Hume, 1882: 398. ²² Winch, 1996: 81.

economy' largely followed Smith's belief that the self-interest of individuals operating within a free market would be most likely to generate continuing prosperity (while largely ignoring his caveat that this could not be relied upon to generate justice or a stable society); a radical redistribution of property, as advocated by such writers as William Godwin, would, it was argued, remove all incentives for hard work and improvement and reduce the benefits of economies of scale and the division of labour. The French Revolution and its initial successes, however, gave added impetus to the arguments of those who believed that the widening gap between rich and poor was unacceptable and unsustainable, while a complete reorganisation of society along rational Enlightenment lines would establish peace and prosperity for all.²³ Malthus wrote:

The principal object of the present essay is to examine the effects of one great cause intimately linked with the very nature of man; which, though it has been constantly and powerfully operating since the commencement of society, has been little noticed by the writers who have treated this subject. The facts which establish the existence of this cause have, indeed, been frequently stated and acknowledged; but its natural and necessary causes have been almost totally overlooked, though probably among these effects may be reckoned a very considerable portion of that vice and misery, and of that unequal distribution of the bounties of nature, which it has been the unceasing object of the enlightened philanthropist in all ages to correct.²⁴

His essay was hailed by reviewers as the key conservative response to the 'perfectibility' thesis of Godwin and others, since it clearly implied that their egalitarian utopia was, for anything beyond the short term, unsustainable. The key to his argument was the emphasis on the inextricable interrelationship between population change and economic development, as encapsulated in his principle of population – the constant tendency in all animal life to increase beyond the nourishment prepared for it:²⁵

1. Population is necessarily limited by the means of subsistence. 2. Population invariably increases where the means of subsistence increase, unless prevented by some very powerful and obvious checks. 3. These checks, and the checks which repress the superior power of population, and keep its effects on a level with the means of subsistence, are all resolvable into moral restraint, vice and misery.²⁶

Malthus's approach to the study of population was recognisably within the same tradition as that of Hume, founded firmly upon scientific knowledge, emphasising the need for critical scrutiny of all historical evidence, and above all seeing absolute population numbers as less important than

²³ Winch, 1996: 223–32. ²⁴ Malthus, 1872: 1. ²⁵ Malthus, 1872: 2. ²⁶ Malthus, 1872: 12–13.

structures, processes and change over time. However, his conclusions could not have been more different: population growth was seen not as intrinsically good but as potentially problematic, since what mattered was, as Smith had begun to recognise, the relation between population and resources; and this growth was seen not as the effect of changes in the organisation of society and economy but as an independent variable, a universal attribute of human populations (indeed, all animal populations).

This not only undermined the utopian hopes of Godwin and his supporters – ‘no fancied equality, no agrarian regulations in their utmost extent, could remove the pressure of [population] for a single century’²⁷ – but also questioned the much more widely held belief that economic progress might enable the condition of the mass of the population to be improved beyond bare subsistence. Development was doomed to fail in the medium or long term, since any increase in the availability of resources would in due course be matched – or, more likely and more problematically, exceeded – by population growth, as either the voluntary, ‘preventative’ checks on population such as delayed marriage were abandoned, or the ‘positive’ checks such as malnutrition and disease ceased to operate. Malthus’s essay was seen by many readers as a heartless justification of inequality and misery, since it presented these as a fact of existence and suggested that any form of poor relief or charity would be ineffective, if not wholly counter-productive.²⁸ This reputation was scarcely helped by asides to the effect that increases in national wealth which were not distributed to the entire population would produce no such disastrous stimulus to population and so would be perfectly sustainable.²⁹

The original version of Malthus’s argument proceeded largely on a deductive basis, exploring the logical implications of the principle of population. His opponents sought to question the validity and universality of that principle, whether by pointing to the vast areas of agricultural land in regions such as the United States that were yet to be exploited or, in the case of Godwin, arguing that the inhabitants of a future enlightened and egalitarian society would largely lose interest in procreation, thus removing the difficulty.³⁰ In later editions of his essay, therefore, Malthus turned more and more to historical evidence to illustrate and support his argument: to show that the principle had been in operation in regions which similarly abounded in land – since what mattered was the relative rates of increase of population and resources, not simply the potential available resource – and

²⁷ Malthus, 1798: 72. ²⁸ Winch, 1996: 288–322. ²⁹ Malthus, 1872: 12 n. 2.

³⁰ Winch, 1996: 234–6.

that positive and preventative checks had operated in all historical societies, demonstrating that, as far as all the available evidence was concerned, human populations did indeed have a natural tendency to increase unless kept in check.³¹ Once again, classical antiquity played an important role in these discussions, and – as opposed to Hume’s tendency to contrast a monolithic and static ‘antiquity’ with contemporary society, and Smith’s habit of drawing straightforward comparisons between the two – Malthus, because of his focus on a dynamic principle that manifests itself diachronically, offered relatively detailed and sophisticated readings of events, demographic developments and social change in ancient history.³²

Classical Greece fitted the expectations of his theory perfectly. In the first place, the colonisation period showed a society under pressure from the growth of population, and illustrated one of the possible responses:

Population followed the products of the earth with more than equal pace; and when the overflowing numbers were not taken off by the drains of war or disease, they found vent in frequent and repeated colonization. The necessity of these frequent colonizations, joined to the smallness of the states, which brought the subject immediately home to every thinking person, could not fail to point out to the legislators and philosophers of those times the strong tendency of population to increase beyond the means of subsistence; and they did not, like the statesmen and projectors of modern days, overlook the consideration of a question, which so deeply affects the happiness and tranquillity of society.³³

Secondly, there was the practice of infanticide, which Malthus assumed (as did most of his contemporaries) to have been pervasive, another example of the operation of a preventative check. Echoing Hume’s comment on this topic, Malthus presented infanticide in more complex terms than simply a check on excess population; rather, it operated to bring population into equilibrium with resources from either direction:

When Solon permitted the exposing of children, it is probable that he only gave the sanction of law to a custom already prevalent. In this permission he had without doubt two ends in view. First, that which is most obvious, the prevention of such an excessive population as would cause universal poverty and discontent; and, secondly, that of keeping the population up to the level of what the territory could support, by removing the terrors of too numerous a family, and consequently the principal obstacle to marriage.³⁴

³¹ Wrigley, 1986.

³² Cf. Morley, 2008: 23–31. It is surprising, then, that Malthus does not even rate a mention in Scheidel’s survey of the subject, 2001c, presumably because his influence on mainstream ancient history was indirect at best.

³³ Malthus, 1872: 112. ³⁴ Malthus, 1872: 113.

The rest of the chapter on classical Greece sought to establish more explicit support for the principle of population from antiquity, by emphasising that both Plato and Aristotle had been concerned about the effects of uncontrolled population growth on social stability and prosperity; in other words, his own views on population were merely a rediscovery and development of ancient wisdom, not a radical new idea:

From these passages it is evident that Plato fully saw the tendency of population to increase beyond the means of subsistence. His expedients for checking it are indeed execrable; but the expedients themselves, and the extent to which they were to be used, shew his conceptions of the magnitude of the difficulty.³⁵

Ancient authorities not only vouched for the validity of the principle of population – some of them had also anticipated both the arguments of radicals such as Godwin and the pervasive belief that the strength of a nation was based on increasing its numbers:

Aristotle clearly saw that the strong tendency of the human race to increase, unless checked by strict and positive laws, was absolutely fatal to every system founded on equality of property; and there cannot surely be a stronger argument against any system of this kind than the necessity of such laws as Aristotle himself proposes . . . It is evident, as Aristotle most justly observes, that the birth of a great number of children, the division of the lands remaining the same, would necessarily cause only an accumulation of poverty. He here seems to see exactly the error into which many other legislators besides Lycurgus have fallen; and to be fully aware that to encourage the birth of children, without providing properly for their support, is to obtain a very small accession to the population of a country at the expense of a very great accession of misery.³⁶

Malthus discussed the example of Rome at greater length, because it appeared – and had been cited against him by his opponents as a result – to contradict the principle of population: if population has a natural tendency to increase up to and beyond the availability of subsistence, how does one explain the complaints of late republican sources about the depopulation of Italy or the need for legislation to promote marriage and childbearing under Augustus? Under the republic, the removal of constraints on fertility had supported the dramatic levels of military recruitment and had been balanced by the casualty rate, but Malthus accepted that there was a real problem in the succeeding period:

Among the Romans themselves, engaged as they were in incessant wars from the beginning of their republic to the end of it, many of which were dreadfully

³⁵ Malthus, 1872: 115. ³⁶ Malthus, 1872: 116–17.

destructive, the positive check to population from this cause alone must have been enormously great. But this cause alone, great as it was, would never have occasioned that want of Roman citizens under the emperors which prompted Augustus and Trajan to issue laws for the encouragement of marriage and of children, if other causes, still more powerful in depopulation, had not concurred.³⁷

Those additional causes were to be found in the vast upheavals that had taken place in the Italian countryside and their impact on the free population:

When the equality of property, which had formerly prevailed in the Roman territory, had been destroyed by degrees, and the land had fallen into the hands of a few great proprietors, the citizens, who were by this change successively deprived of the means of supporting themselves, would naturally have no resource to prevent them from starving, but that of selling their labour to the rich, as in modern states: but from this resource they were completely cut off by the prodigious number of slaves, which, increasing by constant influx with the increasing luxury of Rome, filled up every employment both in agriculture and manufactures. Under such circumstances, so far from being astonished that the number of free citizens should decrease, the wonder seems to be that any should exist besides the proprietors.³⁸

As well as showing that the population principle was, despite appearances, intact, Malthus used this account to establish a number of more detailed points. In judging the capacity of a population for further increase, what matters is not the absolute level of resources in a society but the degree of access to those resources – the Roman upper classes failed to reproduce themselves because of their ‘vicious habits’, but the mass of the population was already at the limits of subsistence, restricted by both preventative and positive checks, and maintained only through the corn dole:

Two hundred thousand received this distribution in Augustus’s time; and it is highly probable that a great part of them had little else to depend upon. It is supposed to have been given to every man of full years; but the quantity was not enough for a family, and too much for an individual. It could not therefore enable them to increase . . . What effect, indeed, could such a law have among a set of people, who appear to have been so completely excluded from all the means of acquiring a subsistence, except that of charity, that they would be scarcely able to support themselves, much less a wife and two or three children? If half of the slaves had been sent out of the country, and the people had been employed in agriculture and manufactures, the effect would have been to increase the number of Roman citizens with more certainty and rapidity than ten thousand laws for the encouragement of children.³⁹

³⁷ Malthus, 1872: 118. ³⁸ Malthus, 1872: 118. ³⁹ Malthus, 1872: 118–19.

Conversely, the presence of one or other incentive or impediment to population growth was insufficient to establish the level of population in a given society; it was always necessary to consider that society's constitution in more detail. Rome was a prosperous culture, rich in material goods – but because industry was handed over to slaves, that had a negative rather than positive effect on the population. High levels of casualties in war were not incompatible with growth; peace, and the prosperity of the upper levels of society, was not incompatible with decline:

On this account I cannot but agree with Wallace in thinking that Hume was wrong in his supposition, that the Roman world was probably the most populous during the long peace under Trajan and the Antonines. We well know that wars do not depopulate much while industry continues in vigour; and that peace will not increase the number of people when they cannot find the means of subsistence. The renewal of the laws relating to marriage under Trajan, indicates the continued prevalence of vicious habits and of a languishing industry, and seems to be inconsistent with the supposition of a great increase of population.⁴⁰

One clear conclusion was that, while the prosperity of a society could not be properly evaluated without consideration of the state of its population, demographic factors alone were an insufficient basis for judgement, since in the long run it was the volume and distribution of resources that set the limit on population growth:

The sum of all the positive and preventive checks taken together, forms undoubtedly the immediate cause which represses population; but we never can expect to obtain and estimate accurately this sum in any country; and we can certainly draw no safe conclusion from the contemplation of two or three of these checks taken by themselves, because it so frequently happens that the excess of one check is balanced by the defect of some other. Causes, which affect the number of births or deaths, may or may not affect the average population, according to circumstances; but causes, which affect the production and distribution of the means of subsistence, must necessarily affect population; and it is therefore upon these latter causes alone (independently of actual enumerations) that we can with certainty rely.⁴¹

THEORISING TRANSITION

From a twentieth-century perspective, the most obvious problem with the credibility of Malthus's theory is the assumption that in the medium and long term the rate of increase of agricultural productivity would invariably

⁴⁰ Malthus, 1872: 120. ⁴¹ Malthus, 1872: 123–4.

be less than the rate of increase of population. This assumption was not unique to Malthus: the idea that there were strict limits to the possibilities of 'economic development' and of any substantial increase in real incomes was common to all writers on such matters at the time. Even those who were most optimistic about the potential gains from the division of labour, a more rational approach to production and the incentives offered by a free market, including Adam Smith and David Ricardo, believed that a return to the 'stationary state' was inevitable, as in due course increased inputs of capital or labour would produce diminishing marginal returns.⁴² Malthus's principle of population simply suggested that the limits of development would be reached earlier than was generally assumed, when population exceeded the resources available to feed it, even if agricultural productivity was still increasing; it also implied that society would not settle into a new equilibrium, with a higher level of wealth per head, but was likely to regress as a result of the disruption generated by the positive checks of poverty, famine and disease. His opponents argued for the possibility that the men of the future would have less interest in procreation, thus removing the risk of overpopulation, and pointed to the vast amounts of uncultivated land in the Americas; they did not dispute the idea that agricultural productivity was subject to strict limits. The fact that the modern economy was already undergoing a fundamental qualitative transformation, based on the shift from organic to mineral sources of energy, which would enable a massive and sustained increase in productivity, began to be recognised only in the mid-nineteenth century.⁴³

Without compulsory labour, an enormous mass of food is annually extracted from the soil, and maintains, besides the actual producers, an equal, sometimes greater number of labourers, occupied in producing conveniences and luxuries of innumerable kinds, or in transporting them from place to place; also a multitude of persons employed in directing and superintending these various labours; and over and above all these, a class more numerous than in the most luxurious ancient societies of persons whose occupations are of a kind not directly productive, and of persons who have no occupation at all. The food thus raised supports a far larger population than had ever existed (at least in the same regions) on an equal space of ground, and supports them with certainty.⁴⁴

This immediately raised questions about the Malthusian theory, since it became ever clearer that growth in the means of subsistence was in fact significantly outstripping population growth, supporting substantial and sustained rises in the average wage despite the increasing numbers of

⁴² Wrigley, 1987b. ⁴³ Wrigley, 1988. ⁴⁴ Mill, 1871: 23.

European populations. Until the later twentieth century, when the Malthusian perspective was revived in the light of unprecedented population expansion in the developing world and concerns about global food supply, Malthus's concerns about overpopulation were regarded by most commentators as at best valid for the pre-modern, pre-industrial era, exemplifying the harshness of the conditions from which modernity had now freed itself.⁴⁵

However, the effects of 'modernisation' were seen not only in the field of production, consumption and technology. Accumulation of more and more information about populations in Europe and the United States over the course of the next century, and the development of more sophisticated and detailed analyses of these data, revealed that the situation was more complicated. It was not simply that agricultural productivity had increased, but the structure of the population had changed: mortality had fallen but so too had fertility; more children survived infancy but this did not immediately lead to uncontrolled population growth, because fertility was also being controlled.⁴⁶ As was the case with economic structures, a radical break was now perceived between pre-modern and modern populations. However, in part because of the shortage of statistical evidence for either economic performance or demographic change in earlier centuries, the chronology of this change was uncertain, and that left open questions of cause and effect. The classic version of transition theory argued that fertility declined after (and therefore in response to) declining mortality (as a result of improved medical technology or nutrition), meaning that population rose rapidly during the transition before returning to a new equilibrium with low levels of growth; some historical evidence, however, shows that fertility might decline simultaneously or even before mortality. More generally, was the new demographic regime a consequence of modernisation, or was it on the contrary a prerequisite for modernisation, or were both lines of development merely surface symptoms of a deeper historical development? Why was it that Malthusian constraints had apparently ceased to apply to the modern west?

This was not a merely historical question, though the search for its own origins and the radical contrast with its past was an essential component of modernity's self-conception.⁴⁷ Rather, it lay at the heart of two quite separate debates of contemporary relevance. The first concerned the ultimate fate of modernity: could the happy combination of unlimited growth

⁴⁵ See generally Cassen: 1994. ⁴⁶ Coale, 1973; clear summary in Newell, 1988: 10–12.

⁴⁷ Morley, 2008: esp. 21–47.

and limited population increase be maintained indefinitely? Writers of a pessimistic slant, such as Oswald Spengler, revived the old concern with populousness as a sign of national health, and saw the west's now declining birth rate as the outcome of vice and decadence, and the harbinger of its eclipse.⁴⁸ Until comparatively recently, economic writers in contrast were happy to assume an unlimited supply of fossil fuels, and to discount demography altogether as a causative factor, taking it for granted that the present structures of western society would continue indefinitely. The second and much more prominent debate concerned the export of modernisation to the rest of the world: here ideas about the nature of Europe's own transformation provided the foundation for different policies towards developing countries.⁴⁹ In so far as the 'Great Transformation' was seen as the product of a technological or agricultural revolution, aid money and western influence were devoted to transforming indigenous agriculture, promoting industrialisation and funding projects such as electrification. In so far as it was understood as a response to the incentives offered by a free market, countries were encouraged or compelled to break up traditional structures of landholding, to concentrate on production for export, and to remove tariffs and import restrictions. Alternative interpretations emphasised the fact that Europe's early industrialisation had benefited enormously from protectionism and capital controls, or rejected the western model altogether as inappropriate for a different ecological and social context.⁵⁰

Both the close association between Europe's economic transformation and its demographic transition, and the fear that the principle of population might undermine any nascent development, meant that arguments about population were at the heart of these debates – with no hint of agreement between those who believed that people would modify their behaviour, and so reduce fertility rates in response to suitable incentives without any need for special intervention, and those who insisted on the need for fertility control as a prerequisite for any reduction in poverty. The variation in the success and progress of 'modernisation' between different countries in Asia and Africa has not resolved the debate; however, the accumulation of ever more detailed studies of pre-transition populations and demographic change, and their relation to economic and social change, has transformed the basis of the argument, from abstract speculation to detailed discussion of demographic data.

⁴⁸ Spengler, 1980; Morley, 2008: 125–9. ⁴⁹ Cassen, 1994; Livi-Bacci and de Santis, 1998.

⁵⁰ Hill, 1986.

The widespread acknowledgement of the existence of a vast qualitative difference between modern and pre-modern economies meant that classical antiquity largely ceased to be of interest to most economists. In so far as they considered historical material at all, they tended to focus on the period immediately prior to modernisation and industrialisation, in order to explore the nature of the transformation; antiquity had neither developed nor experienced the demographic transition, and those few economists who continued to discuss ancient material, such as Marx, were interested in it precisely because it was not modern.⁵¹ While it had lost the prestige of being the crucial test case for economic or demographic theories, ancient economic history was now in a position to draw upon extensive technical literature and data from developing countries on the relationship between demography and development; and, as Max Weber and Karl Polanyi both recognised, the study of non-modern societies that had followed alternative paths of development (or, more crudely, failed to develop along western lines) could be an important part of understanding the dynamics of contemporary societies that were not, or not yet, modernised. However, ancient historians were slow to recognise this opportunity: as Scheidel has shown, suspicion of comparative material, inadequate understanding of complexities of demography, and a tendency to address the wrong questions – focusing solely on absolute population numbers rather than on demographic structures or variables – mean that ancient demographic history has, until relatively recently, been entirely insulated from debates in the rest of the subject.

The main result of decades of study of the demography of developing countries and its relation to economic development has been an emphasis on the complexity of the interactions between mortality, fertility, poverty, migration, economic and social structures, and culture. If one thing is clear, it is that the relationship between demography and economy is not merely a question of whether there is sufficient food to support the population. It is vital, therefore, for ancient history to recognise that many of its discussions of these issues have hitherto been desperately simplistic: even if, inevitably, the ancient evidence is insufficient to support firm conclusions, it is necessary for studies of the ancient economy not only to take into account demographic factors but to recognise the complexity of the subject, and accordingly to adopt more sophisticated models and interpretations. The rest of this section will sketch out the main parameters of three key debates

⁵¹ Kadish, 1989; Morley, 1999.

from contemporary development economics and historical demography which seem to be relevant to the classical world.

1 Population and resources. Clearly this remains the crucial issue that Malthus recognised: it is simply a more complicated relationship than he or his contemporaries assumed, above all because it is dynamic and interdependent – population density adapts to the food supply, and food supply systems adapt to changes in population.⁵² The size of population that can be supported in a region is not a constant, but depends both on environmental factors, such as climate, relief and the fertility of the land, and on the nature of farming practices, the level of technology, the availability of capital, and the availability and quality of labour. Changes to any one of these factors can affect the others, either positively or negatively. For example, one of the most important and influential post-Malthusian insights was that of Esther Boserup, who noted that population growth, rather than automatically undermining any improvements in productivity by consuming the increased surplus, might be a catalyst for development: the need to feed more mouths could be an incentive to adopt new techniques or technology, and indeed such development – a shift from one state of equilibrium to another – might depend on there being a sufficiently large population in the region to make it feasible and desirable.⁵³

Boserup draws an important distinction between extensive and intensive forms of agricultural development. The former involves bringing new land under cultivation: this might well accommodate population growth in the short and medium term, but the fertility of this new land might then become exhausted, and the loss of grazing (since marginal land is rarely unused, but just not cultivated) might have serious consequences for the rural economy. In the long term, therefore, extensive growth might indeed result in a Malthusian overpopulation scenario. Intensive agricultural development, concentrated on the suppression of fallow and increased frequency of cropping, is far more sustainable. However, it generally requires more capital and labour: where this is available, a positive feedback loop can develop, where for example an ox provides both additional labour power and manure, thus increasing productivity and hence the possibility for further investment – but if a farmer lacks the capital to buy an ox, or the land to make it worthwhile owning one, then traditional techniques are more appropriate.⁵⁴ In the latter case, there is

⁵² Boserup, 1981: 15. ⁵³ Boserup, 1965, 1981, 1990; cf. Lee, 1986.

⁵⁴ Cf. Jongman, 1988.

clearly an incentive to increase family size as a source of additional labour, even though this will reduce the possibility of accumulating savings and hence of being able to adopt more productive techniques. An expanding population might, therefore, contra Malthus, be the catalyst for development, but equally it might be the factor that impedes development, consuming the savings and capital that might otherwise have supported the adoption of new techniques. A survey of historical societies which underwent significant population change suggested that the examples were divided more or less evenly between those that conformed largely to a Malthusian scenario and those that supported Boserup's theory.⁵⁵

A balance between population and food supply can be maintained not only by the regulation of population growth or changes in farming technique but by various other methods. One is migration, either permanent or seasonal. Another is the regulation of food intake, since human calorie consumption is not a constant (and so the Malthusian conception of subsistence, and different ideas of 'carrying capacity', is too simplistic).⁵⁶ The human body can adapt to a reduced calorie intake, with people becoming on average smaller and lighter. However, this comes at a cost: they then have less energy, and work less intensively and efficiently. An undernourished society will be less productive, with a lower level of capital accumulation and less capacity to respond to incentives or opportunities.⁵⁷ There are also demographic consequences, as malnutrition and vitamin and mineral deficiencies harm the immune system and increase vulnerability to disease; the resultant increases in mortality rates may then help to keep population growth in balance with food supply, but the society will remain caught within a 'low-level equilibrium trap'. In other words, there are always many ways in which population and food supply can be in equilibrium: as Fogel argues, some levels have smaller people and higher mortality than others – and therefore a lower possibility of development.⁵⁸

- 2 The second point also follows from the fact that we are dealing with a dynamic system that can change significantly over time: a snapshot view of the relation between population and resources is of little help unless we can be sure that the system is more or less in equilibrium at that moment. Not only are different scenarios always possible, but in the absence of information about the direction and rates of change in different factors (for instance, mortality, fertility, wages, saving) it is impossible to tell

⁵⁵ Grigg, 1980. ⁵⁶ Fogel, 2004. ⁵⁷ Ferro-Luzzi and Branca, 1998.

⁵⁸ Cf. Osmani, 1998.

whether a society is heading towards the sort of crisis that might prompt major changes in demographic behaviour, agricultural practices or consumption. It is a matter of not just whether overall population levels are rising or falling, but of the age structure of the population and the degree of dependence (that is, the proportion of the population incapable of work that has to be supported by the labour of the rest).⁵⁹ Further, the rate of change is important, as some responses to population growth, especially those involving changes in demographic structures (for example, delayed marriage in response to low wage-levels), take decades to have an effect: if change is too rapid, short-term solutions such as migration, or short-term positive checks such as disease, seem more likely than less socially and economically disruptive measures.⁶⁰

- 3 This leads to the third key area of debate, namely the process of decision making in response to particular economic and demographic conditions, focusing on the micro level (families and individuals) rather than the macro level. In development economics the argument might be summed up as the question of whether development is the best contraceptive or vice versa: that is to say, does it make more sense to promote the use of contraception, to limit population relative to resources so that real wages rise and capital can be accumulated, or to expand economic opportunities on the assumption that people will choose to limit their families when there are sufficient incentives to do so?⁶¹ Studies of decision making at family level tend to support the latter approach. They emphasise that people are most likely to limit family size and invest more in their children (improved nutrition, education) if the level of infant mortality is reduced, so their risk of being left childless is low, if they are confident that opportunities will be available for their children to earn well, and if there are strong institutions that will give them some support in old age even if they are childless. On the other hand, it may be entirely rational to seek to maximise family size, even though this may reduce the family's chances of breaking free from poverty, if infant mortality is high, if there are few opportunities for skilled and educated workers, and if the parents feel insecure about their prospects in old age. Such decisions are always a question of balancing different priorities, under conditions of unavoidable uncertainty. Further, the wider context cannot be ignored: the cultural factors that also influence the decisions; the nature of family and community organisation, and the extent to which they may provide support that could to an extent replace that usually obtained from

⁵⁹ For example, Dyson *et al.*, 2004. ⁶⁰ Kelley and McGreevey, 1994. ⁶¹ Easterly, 2001: 87–98.

children; and at the macro level the impact of population change on wage levels, capital accumulation and economic opportunities.⁶²

CONCLUSION: DEMOGRAPHY AND DEVELOPMENT
IN ROMAN ITALY

The most obvious conclusion from this discussion is that the long-running debate about absolute population levels in Italy at the time of Augustus is largely irrelevant to the question of the relationship between demography and development.⁶³ The range of variation that can exist in, for example, average calorie intake and agricultural productivity means that attempts at defining the 'carrying capacity' of Italy in order to decide between the 'high' and 'low' interpretations of the Augustan censuses will at best exclude only the most extreme estimates from serious consideration. The opposite move, seeking to estimate the state of Italian economic development on the basis of one or other population count, is equally problematic, since both scenarios are compatible with a range of possibilities. The low count might indicate limited development and a low level of consumption, if there were too few people and hence too low a surplus to sustain major increases in productivity; or it might represent a population whose growth was controlled (whether voluntarily or by war and disease) so that average levels of consumption and saving could increase and support a higher standard of living. The high count would most likely indicate a population living close to the level of subsistence, if not an Italy that was actually overpopulated; the theoretical possibility of a large population enjoying a high standard of living has not been identified in any historical society before the Industrial Revolution.⁶⁴

Rather, the comparative material should direct our attention towards other questions. Reconstructions of the dynamics of population change in the late republic are closely bound up with the debate on absolute numbers, comparing one or other Augustan figure with an estimate for a date several centuries earlier.⁶⁵ However, on the assumption that the Italian population conformed broadly to the pre-industrial norm of high rates of both fertility and mortality, it is possible, as Scheidel has shown, to start to establish some parameters and orders of magnitude, and hence to explore such issues as the

⁶² See generally Livi-Bacci and de Santis, 1998.

⁶³ On this debate see, for example, Lo Cascio, 1994, 2001; Morley, 2001; and the papers in de Ligt and Northwood, 2008.

⁶⁴ Cf. Scheidel, 2008c: 47. On overpopulation in the Roman world in general: Frier, 2001.

⁶⁵ See generally De Ligt and Northwood, 2008.

impact of military recruitment and the dynamics of migration and colonisation.⁶⁶ Rosenstein's study shows the potential of such an approach: by focusing on the life cycle and economic behaviour of the peasant family, he explains how Rome's military enterprises could be sustained over centuries without (as has generally been assumed) pushing the Italian peasantry into demographic and economic crisis.⁶⁷ The existence of opportunities for unskilled labour, whether in the army, in the cities or on the farm, coupled with a high level of infant mortality and the lack of any institutions beyond the family to support children or old people, created a clear incentive for having a large family; this implies that the fatality rate on campaign, far from having a fatal effect on the Italian countryside, may have played a vital role in limiting growth and hence maintaining real incomes. On the other hand, the absence or death of a son at certain critical moments in the family life cycle could prevent the household from taking advantage of opportunities to improve their condition: in other words, the particular dynamics of Italian demography limited capital accumulation and hence the possibility for society as a whole, rather than a limited number of fortunate families, to lift themselves out of poverty, especially when army service became riskier and less profitable. Finally, we might turn to the expanding body of skeletal evidence for an indication of the nutritional status and health of the population. At present this material is being offered to support radically different conclusions, but in due course it should show how far equilibrium between population and food supply was maintained through restricting diet, and the implications of that for Roman economic history.

The long-standing division between optimistic and pessimistic views of the level of economic development under the Roman Empire is based in part on the contrast between different sources of evidence: the wealth of material culture, not only the products of elite and public expenditure but the wide range of goods found in even relatively humble households, versus the sense of the harsh realities and strict limits of a pre-industrial economy. Rome was clearly not modern, but, judged by some indicators at least, its economic performance ranked relatively highly among pre-modern societies. The question is whether this visible success was a veneer over a society dominated by structural poverty, poor health and malnutrition, or whether the mass of the population enjoyed at least some share in the apparent growth of GDP. At the heart of that question lies the multifaceted relationship between demography and development.

⁶⁶ E.g. Scheidel, 2001c, 2008c. ⁶⁷ Rosenstein, 2004.

*Demography and classical Athens**Ben Akrigg*

Should we care about the size of the population of classical Athens? And if so, why? To what extent can we quantify it, and how best should we attempt such quantification? In this chapter I consider both some influential answers to those questions that have been provided by ancient historians in the past, and some reasons for questioning and rethinking those answers.

Most fundamentally: *should* we care? Some historians at least would answer quite positively ‘yes’, for basically two reasons. First, we are interested in classical Athens today partly, even principally, because of its *dēmokratia*. How we understand the operation of Athens’ political institutions depends to an extent on how many citizens there were. If, for example, an ‘average’ meeting of the assembly had an attendance of about 5,000, what proportion of the total citizen body was that?¹ If it was only possible to serve twice on the boule, how many citizens would have experience of working in this important body in their lifetimes, and so how knowledgeable and experienced might those assembly-goers be?² Second, population size is obviously relevant to discussions of the Athenian grain trade, where a key issue of debate has been the extent to which Athens had (or did not have) a structural need for imported food because it had more people than its own agricultural resources could support.³ While there is some intrinsic interest in this question it has fairly obvious wider implications for the development of economic institutions in Athens, for the interconnectivity of the Greek world (and beyond), for Athens’ external relations and foreign policy, and for its internal politics.⁴

These are quite compelling reasons for being interested in the size of Athens’ population, and especially its citizen component. However, it could be argued that we should not single out Athens for particular emphasis, and

¹ Carey, 2000: 49–50; Hansen, 1991: 130–2. See also Taylor in this volume, pp. 117–18.

² Hansen, 1991: 248–9; Sinclair, 1988: 106–14.

³ Garnsey, 1998; Keen, 1993; Moreno, 2007; Sallares, 1991; Whitby, 1998.

⁴ Cohen, 1992; Horden and Purcell, 2000; Millet, 1991; Moreno, 2007; Whitby, 1998. All themes, *mutatis mutandis*, familiar to Roman economic historians. See Morley in this volume, pp. 24–7.

that we should be interested in other cities first, or in the Greek world as a whole,⁵ and that the subject of this chapter is yet another example of a pernicious and pervasive Athenocentrism, rooted ultimately in antiquarianism (of the kind that Finley wanted to dismiss with his talk of ‘numbers games’).⁶

There may be some justice in such claims, but a robust response is possible. In the first place, Athens really was quite an important place in the classical period, and especially in the fifth century. It is worth studying in its own right not just because it happens to be the city about which our literary and epigraphic sources happen to be most abundant and informative, but because it was big enough, rich enough and important enough to have considerable impact on other places too. We should be wary of attempts to generalize from Athens to the rest of the Greek *poleis*, but we should be equally wary of generalizing from what seems plausible and likely to be true about the Greek world in general to the specific and often unusual case of Athens.⁷

A focus on Athens and Attica can be justified, but there might also be objections to looking at population size. Even if the historical demography of Athens is a subject worth studying, it could be pointed out that there is much more to it than evaluating the size of a population at any given moment; population *structure* is much more interesting and important.⁸ While this is perfectly fair, two responses can be made. First, population size may not be what most interests demographers, but put in the context of other data (such as our knowledge of the institutions of Athenian democracy) it is not completely lacking in interest. Second, for the present at least,⁹ we do not have the evidence for doing much, if anything, more than guessing about most issues of structure. Furthermore, such discussion about those guesses has mainly taken place precisely in the context of debates about population size. It might also be pointed out that we actually have little direct evidence even for the size of Athens’ population. We do, however, have at least *some* evidence, and in the context of this chapter it is relevant that it is on this issue of size that the majority of past and current debate has centred.¹⁰

⁵ Scheidel, 2003b, 2007b; with a rather different emphasis, Hansen, 2006a.

⁶ Finley, 1968; also 1973: 17–30.

⁷ Oliver, 2007: 1–5, for good points on this, made with a revealingly apologetic tone.

⁸ Parkin, 1992; Sallares, 1991; Scheidel, 2001d. See also discussion by Morley in this volume, pp. 18–21.

⁹ The picture may change in future, with increased attention being paid to environmental archaeology and systematic analysis of human skeletal assemblages. See Holleran and Pudsey in this volume.

¹⁰ It is also worth noting in passing that population size is one of the few areas of what we call demography that was of some concern to ancient authors, because of perceived connections between

Finally, it could be objected that, for all the enthusiasm of a relatively small number of scholars, in practice research into population size has had little influence on the study of classical Athens more generally.¹¹ Is it really worth pursuing this line any further than it has already been taken? An important aim of this chapter is to show that it *is*, and that the low profile of demography in the study of classical Athens is unfortunate and a poor reflection of its true importance.¹²

APPROACHES TO THE POPULATION OF ATHENS

The size of Athens' population is a subject which for the past quarter century has been principally associated with Mogens Hansen, whose book *Demography and Democracy* (1985) has had unparalleled influence. Hansen's arguments and conclusions inevitably form the centrepiece for detailed discussion, but to understand them and their significance fully requires some context.

Interest in the subject goes back at least as far as systematic interest in the Athenian economy and Böckh's *Die Staatshaushaltung der Athener* of 1817. To an extent the connection between economic history and historical demography has persisted ever since, and in recent years has strengthened so that demographic study is starting to be driven by economic historians once again.¹³ However, for much of the twentieth century it was political historians who were most interested in the size of Athens' population. Gomme put the matter with his customary directness and clarity in *The Population of Athens in the Fifth and Fourth Century* (1933), which until the 1980s was the standard account in English:¹⁴

That it [the subject of population] is of great importance we cannot deny . . . chiefly because it would, obviously, add so much to the vividness and truth of our picture of Greece, and of Athens in particular, if we could give even approximate answers to

population size and military power, and between population size and political (in)stability. Thucydides 3.87.3 and Plato *Laws* 737d, 740b1–741a5 are the clearest statements. See Morley in this volume, pp. 31–5, for more recent concerns of this kind.

¹¹ Strauss, 1986, takes an idiosyncratic approach. Gomme, 1933, is still sometimes referred to as a standard account, though replaced to a certain extent by Hansen, 1985. See also Taylor in this volume, pp. 117–18.

¹² Archaic Athens has attracted more attention, principally because of the arguments of Morris, 1992. See Morley in this volume; he is more sceptical of the value of further discussion of population size, but there has already been a great deal more of it in that context than in that of classical Athens.

¹³ Scheidel, 2007b.

¹⁴ Moreno, 2007: 28–31; Scheidel, 2007b. Also, note that in many senses Gomme, 1933, has still not been replaced, since Hansen's work has such a restricted focus: see below. Also worth mentioning in this context is Sargent, 1924, which is still the only really systematic attempt to get to grips with the size of the slave population (and employed as such by Moreno).

three questions . . . perhaps the most interesting [of these is], because of the peculiarities of the Athenian constitution: if the assertion of the oligarchs in 411 that no more than 5000 citizens ever attended the *ekklesia* was not wildly untrue, what proportion was that of the whole number? And what proportion of the whole were the *dicasts*?¹⁵

To a large extent this set the tone for most of his successors, up to and including Hansen, who echoes these sentiments in the preface to his own book:

The most amazing aspect of Athenian democracy is the degree of participation. Every year the Athenians convened 40 *ekklesiai* which were regularly attended by no less than 6,000 citizens. On the ca. 150–200 court days thousands of jurors were appointed by lot from a panel of 6,000 citizens aged thirty or more. The council of five hundred was manned with citizens above thirty of whom only a few took the opportunity to serve twice in the *boule*. And ca. 700 other magistrates were elected or selected by lot. This massive participation must, of course, be related to the total number of citizens.¹⁶

It is virtually impossible to overstate the importance of Hansen's contribution to the subject. This fact is widely recognized, to the extent that the book from which this quotation is taken is often cited as being central to, if not the last word in, ancient *Greek* demography, not just that of Athens.¹⁷ But while this fame (and, mostly, acclaim) is largely justified,¹⁸ it is important to note just how limited its scope is, and was meant to be. The subtitle is revealing, and accurate: 'The number of Athenian citizens in the fourth century B.C.' Hansen was interested in *only* citizens,¹⁹ and *only* the fourth century.²⁰ It is also true of course that Hansen's interest in demographic issues has continued and widened to encompass the whole of the ancient Greek world – but it is important to note that still the basis of his account in

¹⁵ Gomme, 1933: 1–2. ¹⁶ Hansen, 1985: 6.

¹⁷ Golden, 2000 (this is, admittedly, in the context of a volume produced in honour of Hansen, but in fact Golden is barely exaggerating); Scheidel, 2007b: n. 1, is in a more neutral context and points out that, while there are all kinds of interesting work being done by Romanists, Hansen, 1985, is still the first place to point someone wanting to know the current state of Greek demography.

¹⁸ There was of course a long-running battle with Ruschenbusch (for whose views see, for example, Ruschenbusch, 1981, 1984), but Hansen has effectively been left in possession of the field.

¹⁹ In this context, 'citizen' has the strict sense of 'the acknowledged legitimate male offspring of a citizen and the daughter of another citizen, who was over the age of eighteen and enrolled in his local deme' – a long-winded definition required by the strict limitations of citizen status in classical Athens. But cf. Patterson, 2007 and 2009, on 'women citizens'.

²⁰ It is true that some of Hansen's other publications have considered the fifth century too, but the most detailed account (Hansen, 1988) turns out in fact to be primarily concerned with reconciling the claims of Thucydides about the Athenian armed forces in 431 – which Hansen himself has dismissed as having no real value for demographic study (see Hansen, 1981, 1982) – with his own picture of the size of the citizen population in the *fourth* century as it had previously been presented in *Demography and Democracy*.

1985 remains unchanged. He seems to share the general view that his work in the 1980s has basically settled the issue of the size of the population of Athens.²¹

It will be obvious that part of the point of this chapter is to show that this is not as safe a view to hold as it appears. This is not to deny that Hansen's work is extremely valuable as well as influential. However, precisely because it has been so influential, there is a need to understand more exactly what Hansen's arguments can and cannot actually do, as they have frequently been expected to bear much more weight than they were originally designed to support. Part of gaining that proper understanding requires a brief look at the background to Hansen's work.

By the time Hansen came to publish *Demography and Democracy* he was clearly writing in a well-established tradition, in which Gomme's work was only the most prominent contribution in English. Previous scholars had for some time been trying to provide estimates of the population of Attica (or just its citizen component), drawing on the scattered hints and figures provided in the historical and epigraphic record.²² Hansen himself neatly tabulated the available sources of evidence which needed discussion in the following way, though they would have been familiar to his predecessors in the field:²³

Our sources [for the number of citizens in fourth-century Athens] can be subsumed under the following seven headings. (1) Rough estimates of the total citizen population, mentioned in passing. (2) Counts of all citizens in connection with a change of the constitution. (3) Army figures giving the number of citizens called up and/or sent out on a campaign. (4) Naval figures stating the number of triremes (quadriremes) launched, and sometimes how they were manned. (5) The number of recipients when grain or money was distributed among the Athenians.

²¹ Hansen, 2006b; Moreno, 2007: 28; Scheidel, 2007b: 38 n. 1.

²² Archaeological data, beyond the use of inscriptions, were not much, if at all, incorporated into discussions of population size. To be fair, even in the early to mid-1980s this was not something that was unusual among ancient historians, as the potential for (especially) large-scale intensive field-walking survey was still something of a novelty, and was only just starting to be applied to – and the first results were being published from – the Mediterranean world. Even now, how best to gather data and then interpret them for demographic purposes remains an area of some controversy. In the case of Attica the picture is further complicated (to put it mildly) by the expansion of metropolitan Athens and the consequent difficulty of applying survey techniques directly to many of the most important areas of Attica. Those areas which have been intensively surveyed are marginal, and their wider significance is difficult to assess (Lohmann, 1993; Munn, 1990). See, however, Moreno, 2007, for interesting use of the data that we do have; Hansen, 2006b, for other archaeological proxy data and attempts (possibly over-optimistic) to use them for answering questions about population sizes.

²³ The details have changed to some extent: new inscriptions under heading (6) continue to be published, and the question of exactly what 'constitutionally' under (7) means continues to be a matter of some debate (for example, Hansen, 2006a).

(6) Epigraphical evidence for the number of ephebes. (7) The number of citizens required to run the council of five hundred constitutionally.²⁴

A number of observations can be made about this list. First, and most obvious to anyone even vaguely familiar with the historical demography of other times and places, this is a depressingly feeble collection, all the more so as it deals only with the relatively well-documented citizen population.²⁵ We have even less information about the metics (resident but free non-citizens) and slaves: that is to say, virtually none. There is nothing here to give us any data on vital rates. There are no first-hand census data, only more or less dubious reports of alleged censuses whose purposes are not clear to us, even assuming that they actually took place. What Hansen, along with most of his predecessors, regarded as among the most promising kinds of evidence, the army figures, are likewise not original documents but reports in the writings of historians of varying (but mainly poor in this regard) reliability, even before any consideration of the problems in the transmission of such figures.²⁶

HANSEN IN CONTEXT

Hansen's approach to this body of evidence was not revolutionary, but did involve important original contributions, whose scale and nature is best appreciated by comparison. The way that Gomme went about the problem is exemplified by his treatment of the first piece of evidence he discussed in his book, Thucydides 2.13.6–8:²⁷

[Pericles also said that] there were thirteen thousand hoplites, apart from the sixteen thousand who were in the garrisons and manning the defences. For at the start of the war, whenever the enemy invaded, there were this many men on guard, drawn from the oldest and the youngest men, and from those metics who were hoplites . . . He pointed out that there were twelve hundred cavalry, including mounted archers, that there were sixteen hundred foot-archers, and that there were three hundred seaworthy triremes.

²⁴ Hansen, 1985: 26. ²⁵ Cf. Hollingsworth, 1969. ²⁶ Henige, 1998; Scheidel, 2001d.

²⁷ The context is Thucydides' report of a speech which, he claims, was delivered by Pericles at the outset of the Peloponnesian War and designed to reassure the Athenians that victory was virtually certain because of the scale of their resources. A sceptic could argue that we should expect (Thucydides') Pericles to be exaggerating, weakening the value of these and the other figures in the speech (most of it has to do with the Athenians' financial resources – for full discussion see Kallet-Marx, 1993). On the other hand, Xenophon in *Memorabilia* 3.6.9 suggests that this is the kind of information which was in the public domain.

In a couple of respects this passage is almost uniquely valuable for the study of Athens' population – it is (or at least purports to be) Athens' total military strength and not just what was mustered for a single campaign, and it was written by an intelligent, well-informed and contemporary observer. Nonetheless, there are clearly formidable obstacles to using this passage as a source of useful demographic information. It refers only to soldiers, that is, men of military age. Some mention is made of (some) metics, but there are no data about the presumably significant numbers of citizens and metics who did not fight as hoplites, cavalry or archers, but instead in the fleet or as light-armed troops. Nor does it tell us anything about the number of slaves in Attica.²⁸

Still, Gomme used this passage to develop an influential estimate of the size of the total population of Attica in 431. He started by inferring that there were in total 25,000 citizens of hoplite and cavalry status between the ages of 20 and 60, plus about 5,500 metics of hoplite census. His calculation started from the observation that 13,000 hoplites, 1,000 cavalry and an unspecified number of troops in the frontier forts imply a total of 14,000–15,000. Some 3,000 metics are known to have taken part in a 'small sector of the active operations':²⁹ they 'were, in all probability, not so thoroughly organized as the citizens', so 'we may assume that there were at least 2,000 or 2,500 more – unorganized, unfit and old – of hoplite census'.³⁰ So there were about 14,500 citizens in the active army, and 10,500 more in the garrison or defence forces (that is, the 16,000 men referred to by Thucydides 2.13, less the 5,500 taken to be metics), making a grand total of 25,000 citizen soldiers.

For those citizens who did not fight as hoplites or cavalry because they could not afford the necessary equipment,³¹ the information we have is still sketchier. On the fragile basis of Athens' apparent naval capability and what little we can tell about numbers of light troops, Gomme inferred that 18,000 was a reasonable minimum number for these men, though this was little more than a guess.³² The 25,000 plus 18,000 gave a total for adult citizens in 431; this figure Gomme multiplied by four to give a number inclusive of

²⁸ Many of whom also presumably had military roles: see Hunt, 1998, and van Wees, 1995.

²⁹ The invasion of the Megarid by the Athenians in 431: Thucydides 2.31.2. ³⁰ Gomme, 1933: 5.

³¹ Like most historians before and since, Gomme assumed that these poorer citizens could straightforwardly be identified with the bottom group of the Solonian four-tier 'property class' system, the thetes. While this is a common assumption, it is not necessarily correct: see de Ste. Croix, 2004: 5–63; van Wees, 2004: 56, 268 n. 38.

³² To cut the story less short, the basis for Gomme's inference was as follows: in autumn 428, when Athens was already suffering from the plague, it was possible to crew a total of at least 170 ships, and, Gomme reasoned, at least another 10 on 'routine duties'; 100 of these were crewed as an emergency measure to deter a Peloponnesian attack on the Piraeus. The 80 ships already at sea, according to Gomme, required 800 marines (assumed all to be citizens) and 13,500 rowers. Of the latter, no more than 30 per cent need have been citizens and metics; if citizens were only just in the majority, there would have been about

women and children of 172,000. To his 5,500 metics of 'hoplite' status he added 4,000 of 'thetic' status (seeing no reason why poorer metics should be more numerous or even equal in number to their richer fellows). The resulting figure of 9,500 he multiplied by three, 'for there must have been large numbers of men newly settled without the normal proportion of women and children' for a total of 28,500. His number of 115,000 slaves – men, women and children – in 431 is another guess, derived primarily by extrapolating from the dubious authority of Thucydides 7.27.3–5 (where 'more than' 20,000 slaves are said to have deserted during the last phase of the Peloponnesian War) and the implication of 3.17.4 (that every hoplite and cavalryman took a slave attendant on campaign).³³ Clearly, as Gomme himself recognized, these figures are based on little more than guesswork and (often quite dubious) assumption. For one thing, it is not necessary to accept Gomme's interpretation of the Thucydides passage from which he starts – and there have been plenty of disagreements.³⁴

The most significant issue of methodology in this context is that of how a total population figure can be derived from a figure for males of military age. At first glance, Gomme's solution to the problem of age structure seems unsophisticated to the point of crudity. In his analysis of the army figures provided by Thucydides for Athens at the outbreak of the Peloponnesian War, from which he derived the frequently quoted estimate of 43,000 for the size of the citizen population in 431, he simply multiplied this number (which was offered as a figure for men aged 18 to 59) by four to give a total population figure inclusive of women and children.

Gomme's lengthy note C, however, reveals the argument behind this 'multiplier'.³⁵ Beloch had already used a census for Italy in 1881 to establish a

2,500. With the marines, this would give a total of 3,300. In the scratch fleet of 100 ships, Gomme thought that no more than a quarter could have been untrained men (drawn from the hoplites), and so there would have been something like 13,000 trained men – citizens, metics and foreigners. If half were foreigners, there would have been 6,500 metics and citizens of these status. Gomme supposed that 1,500 were metics, and so about 5,000 citizens, for a total of 8,000–9,000 thetes on active service. Therefore, there would have been at least 13,000 men aged 18–60 in this class. Many men would not have been fit enough to row, and 'there must have been large numbers left engaged in various industries'. In 431, before any plague losses, there must therefore have been more like 16,000–17,000, plus 1,800 archers and some old and unfit ex-archers – hence the minimum figure of 18,000.

³³ Gomme, 1933: 21.

³⁴ These range from (relatively) minor technical quibbles about exactly which age groups were included in the 'oldest and youngest' (discussed for example in Jones, 1957), to whether the number of metics Thucydides seems to be implying is really credible (Gomme, 1927, defended the manuscript tradition against attempts to emend the numbers downwards; Duncan-Jones, 1980, remains the best recent discussion), all the way to full-blown scepticism about the value of the passage for population purposes at all, shared (perhaps surprisingly, given his preparedness to take seriously the figures for the fourth century found in Xenophon and Diodorus) by Hansen, 1981, 1982.

³⁵ Gomme, 1933: 75–83.

multiplier of four as appropriate for Roman history. Gomme noted that Beloch's choice of date for the comparative model was meant to avoid the distortion caused by emigration from Italy to the US and by heavy casualties in the First World War. Athens in 431, however, had been subject to both emigration and war casualties, and so Gomme, not unreasonably, thought that the issue did deserve some more detailed attention. He therefore tabulated data from a number of European nations in the late nineteenth and early twentieth centuries, with the intention of illustrating a number of different population structures, birth and death rates, rates of increase, and degrees of industrial development. Consideration of these data led him to conclude that in fact the right multiplier for Athens was, after all, four.

In his account of Athenian democracy A. H. M. Jones had a number of problems with Gomme's treatment of Thucydides 2.13. Only one matters here, and that is his rejection of Gomme's answer to the issue of age structure, and his alternative suggestion that the age distribution of the Athenian population was likely to have been similar to that proposed by Burn for Roman Africa under the principate.³⁶ Jones based this suggestion on a pair of inscriptions from the late fourth century, one revealing that in c.330 BC there were about 500 ephebes, and another, that in 325/4 BC there were 103 arbitrators. Although these figures were 'startling' when compared with those for England and Wales in the mid-twentieth century, they accorded quite closely with what Burn suggested:

The main conclusion from his statistics, applied to Athenian figures, is that the Athenians suffered a uniformly high death rate from the age of 20 to 60 so that of 500 young men of 20 not many more than 100 survived to be 60 forty years later. Having reached about 60 a man was, it appears, so tough that he might easily live another ten or fifteen years. There are no ancient statistics of the child death rate, but it was probably at least as high as that of adults. The population would therefore have been very young, with a high percentage of children.³⁷

In the end, Jones's conclusions about the number of citizens of hoplite status in Athens in 431 were not all that different from Gomme's. Jones's argument was importantly different from Gomme's, however. In adopting a whole comparative age structure, rather than just confirming what was the right 'multiplier' for the militarily active population, Jones allowed for *further* use of the model for other purposes and addressing questions other than those of simple population size, as he hints at the end of the passage quoted above. It is worth noting that both Gomme and Jones started from research by other

³⁶ Jones, 1957: 82–3. ³⁷ Jones, 1957: 83.

scholars in *Roman* history. It was another Roman historian who moved the argument about Athens on another crucial step, Keith Hopkins.

HOPKINS

It is appropriate at this point to turn to Hopkins's article 'On the probable age structure of the Roman population'.³⁸ In spite of its title and aims it had a profound impact too on the study of classical Greece in general and of Athens in particular. Hopkins's aim was ostensibly limited, and largely negative. Previous accounts of the population of the Roman Empire had attempted to calculate average life expectancy at birth (and at later ages) on the basis of ages at death given on Roman tombstones. Hopkins's point was that this evidence, while it produced superficially plausible results, could not in fact be used because the distribution pattern of ages at death suggested by the tombstones was at best highly improbable and often close to impossible. Although he acknowledged Jones's advice and help in the writing of this article, Hopkins demolished the underpinning of one of Jones's arguments about the population of Athens. Jones had used Burn's suggested age distribution pattern, which was based on a combination of census data from India in 1900 and the Roman tombstones. While Hopkins allowed that Burn's article was 'by far the most sophisticated and serious discussion of Roman mortality', it was nonetheless one of his principal targets: 'his method and his presentation of data are open to grave objections'.³⁹

A key part of Hopkins's argument was the use, in place of a comparative model from any single modern society, of the first set of empirical model life tables, developed by the United Nations for use in countries where detailed census data and accurate records of vital events were not available: '[t]he most important aspect of this argument is that the "truth" of the inscriptional evidence is "tested" by reference to the external standard of the UN model life tables'.⁴⁰ And it was this point that turned out to be most interesting to, and influential upon, Greek historians, perhaps precisely because they had no data set like the Roman tombstones available to them in the first place (Greek grave stelae very rarely mention age at death⁴¹).

³⁸ Hopkins, 1966. See also Parkin in this volume, p. 185.

³⁹ Hopkins, 1966: 250, referring to Burn, 1953. ⁴⁰ Hopkins, 1966: 264.

⁴¹ That of Dexileos, the young Athenian cavalryman killed in the Corinthian War of the early fourth century BC is the obvious exception – but the crucial political significance of his age makes it a rule-proving one. Rhodes and Osborne, 2003: 40–3.

When Hopkins was writing, the UN tables were effectively the only ones available. As he was well aware, however, they were subject to considerable criticism even at the time of their publication, and have long since been abandoned. The more satisfactory alternative of the 'Princeton' regional model life tables constructed by Coale and Demeny appeared in the same year as Hopkins's article.⁴² However, Greek historians proved reluctant to abandon the UN tables. In this they were blind to what Hopkins had gone on to say:

Our attention therefore should no longer be directed to different aspects of inscriptions, but rather a more general assessment of the applicability of these model life tables and to an analysis of the determinants of mortality, both in Rome in particular, and in general. To do this more accurately and sensitively we need life tables based on the total range of existing historical material and the critical construction of theories explaining population growth.⁴³

Clearly the Coale and Demeny tables would not have answered all the concerns expressed by Hopkins here, but they would at least have been a step in the right direction. As more recent research in Roman demography has demonstrated, they can at least be the basis for fruitful further discussion.⁴⁴

Hopkins had pointed the (or at least a) way forward to a more sophisticated and promising approach to assessing population size. An important example of its exploitation by Greek historians is provided by Patterson's *Pericles' Citizenship Law of 451–50 B.C.*, which remains the most comprehensive account of the citizen population of fifth-century Athens.⁴⁵ Patterson explicitly applied the lessons of Hopkins's article to the work of Gomme and Jones on Athenian historical demography – and chose the UN model life table 35 (males; life expectancy at birth *c.*25 years) as a 'likely model for Athens'.⁴⁶ In her criticism of Gomme and Jones she also drew on the work of other historical demographers (principally Wrigley) and pointed out explicitly the weakness of Jones's straightforward linking of the wealth generated by the Athenian empire with the apparently rapid growth of the Athenian population in the fifth century to 431.

Likewise, in his study of classical Athens, Osborne employed the arguments of Hopkins, and explicitly appealed to the latter's authority for using the UN life tables. Osborne wanted to use the age distribution model to

⁴² Coale and Demeny, 1966, superseded by a second edition, 1983. ⁴³ Hopkins, 1966: 264.

⁴⁴ The line taken by Parkin, 1992, and Scheidel, 2001d, is more overtly sceptical, but see below, pp. 53–5. And as the editors of this volume point out, there are now more options open to ancient historians than just the UN or Princeton tables.

⁴⁵ Note that here once again the primary motivation for a demographic survey was political history.

⁴⁶ Patterson, 1981: 41–2.

derive the size of the population not from army figures but from the numbers of men required to run the council of 500 and from the number of *diaitētai* (a position held by men in their sixtieth year).⁴⁷ At which point we should turn at last to Hansen himself.

HANSEN

Like both Patterson and Osborne, Hansen followed Hopkins in rejecting the use of any modern population as an appropriate analogy for any ancient population, and preferring to use instead a set of model life tables. Unlike them he did choose to use the Coale and Demeny tables and not the old UN tables. Unlike almost all his predecessors, too, Hansen dismissed the use of Thucydides 2.13.6–8 as a source for the historical demography of Athens.⁴⁸

Hansen's choice of life table and model population is worth examining at greater length. Of the four 'regional' models, Coale and Demeny recommended Model West for use when there is no reliable information available on the age pattern of mortality in a population, and it is hard to criticize Hansen for using it.⁴⁹ Serious objections *could*, however, be raised about the way in which Hansen went about choosing the appropriate mortality and growth rate within the model. Like Jones before him, Hansen appealed to the work of Romanists to establish the credentials of his model for age distribution in Athens:

Recent studies in the population of the Roman empire suggest that the demographic structure of the Mediterranean world in the early centuries A.D. resembles the European demographic system ca. 1500–1750. Roman life expectancy at birth was in the region of 25 years, and the natural increase of the population was very slow, in most cases probably less than 0.5% per year ... On the reasonable assumption that the demographic structure of Greece in the fourth century B.C. was basically the same as the demographic structure of the early Roman empire, we must adopt an age distribution of adult males which fits a life expectancy of ca. 25 years and a growth rate of 0–0.5% per year.⁵⁰

So Hansen selected from Coale and Demeny Model West, males, mortality level 4 (life expectancy at birth 25.26 years⁵¹) and growth rate 5.00 (annual increase of 0.5 per cent).⁵² In the end this probably was as good a model as

⁴⁷ Osborne, 1985. ⁴⁸ See n. 20 above.

⁴⁹ For practical purposes it made little difference which model he chose, since the margins of error were so wide that they overwhelmed the detailed differences between the models.

⁵⁰ Hansen, 1985: 10–11.

⁵¹ The awkward figure is a consequence of adopting the 'male' model rather than the 'female' one.

⁵² Hansen, 1985: 10–11.

any available to Hansen for looking at the age distribution of the Athenian population. But his arguments for adopting it gloss over many serious problems and potential objections. Some of these problems have no easy solution, but they are important and must be addressed openly.

One obvious problem is the analogy with the Roman Empire. It is highly probable that its demographic structure was more like that of early modern Europe than it was that of nineteenth-century Europe. But this is a weaker claim than it appears to be. All it amounts to is that populations that existed before what has conventionally been termed the 'demographic transition' resemble each other much more closely than they do populations that are undergoing or have undergone that transition.⁵³ So the relevance of bringing the Roman Empire into a discussion of fourth-century Athens is not immediately apparent. But Hansen's choice of analogy seems to rest almost entirely on his 'reasonable assumption' that the demographic structure of fourth-century BC Greece was 'basically' the same as that of the early Roman Empire.

There are two related problems here. One is fairly obvious: that it is surely impossible to talk about *the* demographic structure of the early Roman Empire. One of the results of the 'revolution' in historical demography to which Hansen refers in his preface was to make it clear that demographic structures can vary enormously even within quite small areas – let alone one as huge and diverse as the Roman Empire. To be sure, this variety of structures could be averaged out to give a (theoretical) 'typical' structure for the whole empire. But the chances of any single area within the empire (such as Attica) having a population structure that matched this average template would be small, and even if it did, the similarity would only be coincidental. Saying that fourth-century Athens had a 'basically similar' population structure to that of the Roman Empire is effectively meaningless.

The second problem is that Hansen appears to overstate the extent of our knowledge about the demography of the Roman Empire. The rhetorical advantage of using the example of Rome when addressing ancient historians of Greece is obvious. His reference to 'recent studies' and confident assertion about Roman life expectancy at birth give the impression that we are

⁵³ Newell, 1988: 10–11: 'The classical description of the theory [of demographic transition] . . . is roughly as follows. There are a series of stages during which a population moves from a situation where both mortality and fertility are high, to a position where both mortality and fertility are low. Both before and after the transition population growth is very slow. In between, during the transition, population growth is very rapid, essentially because the decline in mortality tends to occur before the decline in fertility.' However, although transition theory was still at the centre of much demographic study when Hansen was writing, it was already recognized that the notion of a transition was highly problematic in this simple formulation: Golden, 2000: 28–9; Newell, 1988: 11. For more on the demographic transition, see Morley in this volume.

better informed about the demographic structure of Roman populations than we are about Greek ones. This was not really the case in 1985 and even now the situation is not greatly improved, in spite of an increasing level of interest in demography among Roman historians.

Putting 'Roman' life expectancy at 'in the region of 25 years' is a reasonable, even likely, figure. But it is not based on Roman data. Rather, the argument is that life expectancy at birth must have been somewhere between 20 and 30, and 25 is simply the mid-point in this plausible range of figures.⁵⁴ A population where life expectancy at birth was below 20 years over the long term would have had difficulty reproducing itself, and would rapidly have declined in numbers. There is no indication that such a decline occurred across the Roman Empire. On the other hand, if life expectancy at birth had been significantly greater than 30 years, then this would have to imply a much lower level of infant mortality in particular than seems plausible given the available standards of medical care and the likely prevailing disease regimes, and would make the Roman Empire exceptional if not unique among comparable pre-industrial societies.

All this was clear to Hopkins in 1966, and 'recent studies' have done little to alter the picture.⁵⁵ Hansen was perfectly justified in making similar assumptions about classical Athens, but the validity of those assumptions derives not from any work by Roman historians but from comparative data from other, better-documented human populations and what we know about human reproductive biology (which has probably not significantly altered over recorded history). As for the rate of growth of the population, Hansen's claim that it was very slow over the period in which he is interested is no more *obviously* true of the fourth century than it was for Patterson when she was talking about the fifth. In the end, however, Hansen goes for an annual rate of 0.5 per cent – which again in reality is not all that slow. A population that could sustain growth at that rate would double in under 140 years – or the time between the battles of Plataea and Chaeronea.

⁵⁴ Parkin, 1992: 84. See also Hin in this volume, p. 102.

⁵⁵ Bagnall and Frier's analysis of the Egyptian census returns (1994, 2006) provides a *partial* exception, in that it does at least give us a picture of *an* ancient population structure from the Roman Empire. Again, though, the problem is one of generalizing to the whole of Egypt, let alone the empire as a whole – the bulk of the surviving documents are from the Fayyum, an atypical region within a generally atypical province. And in any case, even Bagnall and Frier had to make use of model life tables in their work, as the information in the returns alone did not suffice to give a plausible picture of child mortality. See Sallares, 2002: 1–5, and Scheidel, 2001a, for the variety in Egypt's disease environment and, therefore, the scope of particular model life tables. See also discussion in Pudsey in this volume and 2007 for Egypt's demographic regime within the context of ancient and other pre-modern populations.

So much for the parameters of Hansen's analogy. But what about the model he actually went on to select? To a greater extent than his predecessors, Hansen did acknowledge that the use of model life tables in general, and the ones he was using in particular, did present some problems, and that all his later calculations which start from it 'must be taken *cum grano salis* and we must always allow for a certain margin of error'.⁵⁶ Specifically, he pointed out that the Coale and Demeny models apply only to *stable* populations (that is, closed populations with constant birth and death rates).⁵⁷ They therefore cannot take account of the effects of migration.⁵⁸ Moreover no population is ever really stable. Hansen points out that the models are an abstraction in which '[t]he effects of war, famine and epidemics have been smoothed'.⁵⁹ Nonetheless, he is confident enough in their utility to carry on using them. The only explicit justification is that the age distribution he adopts is not all that different from those calculated by other scholars, but there is also an implicit claim that the level of abstraction is not so great that the model is not reflective of an underlying long-term pattern of age distribution.⁶⁰

In fact Hansen has considerably underestimated (or at least understated) the problems involved in the adoption and use of his model. Hansen adopted the Coale and Demeny models in the absence of empirical data for the age structure of ancient populations, and because the demographic statistics available from more recent periods did not provide a valid comparison. The basis for the Coale and Demeny models is in fact the same evidence that Hansen rejected as inappropriate for comparison with ancient Greece.

That this might pose some difficulties for their employment by historical demographers of periods earlier than the nineteenth century was observed shortly after the publication of the first edition of the Coale and Demeny tables in 1966 (which was the edition used by Hansen). Hollingsworth, for

⁵⁶ Hansen, 1985: 12.

⁵⁷ Not to be confused with a *stationary* population, which is one which is of a constant size (neither increasing nor decreasing); the overall size of a stable population may be changing very rapidly – but will be doing so at a constant rate. A stable population *may* also be stationary, but on the other hand a stationary population does not have to be stable – a situation could be envisaged where the rates of fertility and mortality were *both* changing in ways that effectively cancelled each other out in such a way that the total size of the population remained unaltered. See Newell, 1988; Parkin in this volume, pp. 185, 187–8.

⁵⁸ This is not a problem for Hansen when he is talking about the total number of Athenian citizens, as they did constitute a closed population (most of the time: events such as the enfranchisement of the Plataeans or the Samian isopolity did not happen very often, and the number of citizens losing their rights cannot have been very great), but remains something to bear in mind when considering the age distribution of citizens actually resident in Attica.

⁵⁹ Hansen, 1985: 12. See also Holleran and Pudsey in this volume, pp. 12–13.

⁶⁰ Especially Ruschenbusch, 1979, 1981, 1984; see also Rhodes, 1988: 271–7.

example, observed that: '[t]he Tables are in fact based upon populations where the expectation of life at birth was between 35 and 70, and so the mortality schedules calculated for expectations of life at birth of 20 to 35, which are important for historical demography in Western Europe because they are what is usually found before 1800, are really only extrapolations of observation.'⁶¹

Coale and Demeny themselves did not think that their model life tables would be appropriate for use in all situations:

there is no strong reason for supposing that the age patterns of mortality exhibited in these [life tables] cover anything like the full range of variability in age patterns under different circumstances . . . The question of what is the pattern of mortality in a population of an underdeveloped area is essentially unresolvable . . . By the time a population has reached the stage where age-specific mortality rates can be measured with confidence, the level and age pattern of mortality may have changed, so that the pattern of mortality during the underdeveloped period may never be known.⁶²

This is not what one would expect from Hansen's claim that the Coale–Demeny tables represent 'models of all possible (stable) populations at 24 different mortality levels'.⁶³

For model life table extrapolation to work, it has to be assumed that age-specific mortality will vary in predictable ways across all the possible range of levels of mean life expectancy at birth. That it can vary in more than one way is reflected by the fact that Coale and Demeny felt the need to generate four different families of tables. But as they pointed out, these families do not cover 'anything like' the full range of potential variability. One major problem is that in low-mortality populations infant mortality rates can vary substantially *wholly independently* of adult mortality rates.

Scheidel has argued this case most forcefully to Roman historians in the recent past, but the observation itself is not a new one.⁶⁴ Wrigley and Schofield, for example, demonstrated that infant and childhood mortality rates could be either much higher or much lower than model life tables would have suggested from the adult mortality rates in the populations they were looking at (parishes in sixteenth- and seventeenth-century England); similarly, Woods has argued for the varying relationship between infant and adult mortality in historical populations.⁶⁵ The recognition of the potential weakness of model life tables in this regard was another factor in the very 'revolution' in historical demography that Hansen was trying to take into

⁶¹ Hollingsworth, 1969: 343. ⁶² Coale and Demeny, 1983: 25. ⁶³ Hansen, 1985: 11.

⁶⁴ Scheidel, 2001d: 6. ⁶⁵ Woods, 1993, 2007; Wrigley and Schofield, 1981.

account. To an extent it could be argued that this particular problem is not fatal for Hansen because he is interested in only *adult* mortality rates, but the point is that the hypothesis that underlies the derivation of *all* the life tables is indemonstrable.

There is another problem that life tables face as a result of this derivation from recent low-mortality populations. The higher mortality of pre-transition societies was mainly a result of the high incidence of endemic infectious diseases. Many of the most dangerous diseases have individual age-specific impacts. The obvious consequence is that the age structure of a population will largely reflect the dominant disease regimes, which of course are wholly different in post-transition societies. Again, Scheidel in particular has stressed the importance of this for the use of life tables, reaching the depressing conclusion 'that model life tables cannot reasonably be expected to capture or even credibly approximate the demographic experience of high-mortality populations'.⁶⁶

This should make deeply uncomfortable reading for Hansen, or for anyone who wants to use his figures. The evidential base for his argument was always flimsy: is one of his major tools for interpreting it also worthless?

It is possible to use the Coale–Demeny life tables in a more flexible way that would answer some of the objections of those such as Scheidel. As one of his examples of child mortality varying independently of adult mortality, Scheidel notes that Wrigley *et al.* found that in England, in the 1680s, mortality up to the age of 15 corresponded to Model North level 8 (in which life expectancy at birth, both sexes averaged, is around 36), while adult mortality was close to level 2 (in which life expectancy at birth is just over 21).⁶⁷ In a model population with this pattern of mortality, average life expectancy for males would be close to 30, and within Hansen's parameters for an acceptable model. The experience of Wrigley *et al.* was that the Coale–Demeny life tables *did* approximate quite closely to what could be derived from historical data if more than one table was used. Using the same principle, different Coale–Demeny tables could be 'spliced' to provide a much greater range of age distribution patterns and possibly a closer fit to historical reality.

Scheidel quite reasonably objects to the use of models like that adopted by Hansen, because in general the evidence from better-documented historical populations, and what is known about the age-specific impacts of diseases such as tuberculosis, suggests that they underestimate adult mortality and overstate child mortality. If it is accepted that this was the case in

⁶⁶ Scheidel, 2001d: 11. See also Woods, 2007. ⁶⁷ Scheidel, 2001b: 6 n. 25.

Table 2.1. *A comparison of stable populations based on three different model life tables.*

Age	Population at age x (%)		
	Hansen's model	Coale and Demeny, Model West 'hybrid'	Woods's southern Europe model
0	3.53	3.02	3.12
1	10.49	10.70	9.86
5	11.51	12.08	10.68
10	10.76	11.42	9.91
15	10.05	10.67	9.31
20	9.21	9.66	8.57
25	8.31	8.58	7.75
30	7.41	7.51	6.96
35	6.52	6.46	6.23*
40	5.61	5.43	5.57
45	4.73	4.44	4.95
50	3.86	3.50	4.37
55	3.01	2.63	3.81
60	2.20	1.83	3.20
65	1.46	1.14	2.48
70	0.84	0.60	1.68
75	0.38	0.25	0.96
80	0.12	0.07	0.46
85+	0.02	0.01	0.13

Athens, then we can create new models to reflect this. One option would be to use different mortality levels from the Coale and Demeny tables for child and adult mortality. Another alternative would be to employ the high-mortality relational tables developed by Woods.⁶⁸ In either case, we could use them to see how much difference they would make to the credibility of Hansen's arguments. For the sake of illustration I provide in Table 2.1 a comparison of stable populations based on three different model life tables.

All three age distributions here are stable populations with an annual growth rate of 0.5 per cent, for the sake of easy comparison. 'Hansen's model' is based on Coale and Demeny's Model West, males, mortality level 4 (average life expectancy at birth, 25.26). The 'Coale and Demeny hybrid' model uses age-specific death rates for ages up to 15 from Model West, males, mortality level 8 (average life expectancy at birth 34.89), and for ages

⁶⁸ Woods, 2007.

over 15 from Model West, males, mortality level 2 (average life expectancy at birth 20.44). The actual average life expectancy at birth in this population would be 29.76. 'Woods's southern Europe model' is derived from that model with an average life expectancy at birth of 30.

A number of observations can be made here. While neither new model is necessarily close to representing the actual age structure of Athens at any time in the classical period, both of them answer most, if not all, of Scheidel's criticisms of the model life tables previously used by ancient historians, and account for substantially lower child mortality and higher adult mortality than any of the high-mortality regional models in Coale and Demeny. Looking at the numbers, however, suggests that Hansen's model did not seriously mislead him when it came to quantifying the fourth-century citizen population. In Hansen's chosen model, 20–39-year-olds make up 37.06 per cent of the population; in the 'hybrid' model they are 37.64 per cent; in Woods' SE model they are 35.08. For 20–59-year-olds the figures are 50.86, 50.04 and 51.41 per cent respectively. These are very small discrepancies compared to the level of uncertainty in the figures in the ancient evidence. (In passing, this also indicates that Gomme's use of relatively recent population statistics did not necessarily have very seriously misleading consequences either, when he settled on his 'multiply the militarily active age groups by four' rule of thumb). There is therefore no reason to dispute Hansen's quantification of the Athenian citizen population on the basis of military mobilization figures. This accords with intuition too. If Hansen's age structure model overestimated child mortality but underestimated adult mortality, then he would have thought that there were more older men and fewer younger men in the active age groups than there were in reality, but the *total* would not necessarily have been much different.

The other key group for Hansen's argument is the 40-year-olds who provided the bulk of new *bouleutai*. Again, all three models show similar numbers – they make up about 1.2 per cent of the male population. In fact Hansen's argument would actually be strengthened by the adoption of either of the other two models. In his model, 40-year-olds make up slightly more than 1.2 per cent of the male population; in both the others they are slightly less than 1.2 per cent – so according to those models a given number of 40-year-olds would actually imply an even greater total population (or to put it the other way round, a larger total population would be needed to provide the necessary number of 40-year-old men). In any case, Hansen's model may be suspect in theory, but in practice the conclusions he reached with it were sound.

What that does *not* mean, however, is that the model is actually a good one that can be used for the interpretation of other kinds of evidence or other arguments. For the quantitative arguments Hansen was developing it may not have mattered which model for age structure he used,⁶⁹ but there are important differences between them. This is best illustrated by the ratio of ‘ephebes’ (men of eighteen or nineteen) to ‘arbitrators’ (men in their sixtieth year).⁷⁰ On Hansen’s model, the ratio is 3.7:1; on the ‘hybrid’ model, 4.6:1; on the Woods model, 2.6:1. This also highlights the scale of difference between the two alternative models – from this perspective Hansen’s occupies a middle position between them. With its relatively benign environment for children but brutal regime for adults, it is only the hybrid model which would match the 5:1 ephebe:arbitrator ratio accepted by Jones on the basis of the inscriptions from Euonymon.⁷¹ On Hansen’s model, and still more the Woods model, the inscriptions cannot be a straightforward reflection of demographic reality (or at least not one which can be generalized for the whole of Attica from a single – albeit large – deme at the end of the fourth century).

To explore the implications of the sheer range of possibility in age structure fully is beyond the scope of this chapter. The point I want to stress here is that Hansen’s arguments for the fourth century have provided a solid basis for the size of the Athenian (citizen) population, but, first, this is only a small part of the potential of pursuing the historical demography of classical Athens further and, second, while Hansen’s quantitative conclusions are sound, his arguments about age structure and the right comparative model are indefensible and should be abandoned. It is simply not good enough to carry on using Coale and Demeny’s Model West, males, mortality level 4, on his authority, any more than it was good enough to use the UN tables on Hopkins’s authority. This matters because, although quantifying the population is important, we also want to think about the experiences of that population’s members. How were citizen households structured? How likely was it that a man’s father would still be alive when he reached adulthood (and so how

⁶⁹ This amplifies a point made by Rhodes in his commentary on Thucydides book 2 (Rhodes, 1988: 277), where he notes that in spite of Hansen’s criticisms of the use of Mitchell’s figures, his own chosen model was not that different. *All* of the models cited by Rhodes, however, are vulnerable to the criticisms levelled by Scheidel.

⁷⁰ All the model life tables provide data on age-specific death rates for five-year cohorts: ancient historians in practice derive single-year cohorts for 18-year-olds and 59-year-olds by taking them to be equivalent to 10 per cent of the 15- to 24-year-olds and 55- to 64-year-olds respectively, which provides a very close approximation. The ephebe : arbitrator ratios presented here are strictly the ratios of 15–24-year-olds to 55–64-year-olds.

⁷¹ Jones, 1957: 82.

typical was the plight of the young Demosthenes)? Did the ratio of young to old men affect perceptions of generational conflict? These are the kinds of questions to which we should like to have answers, but Hansen provides us with no help whatsoever – unsurprisingly, because they were not the questions he was addressing.

CONCLUSIONS

While there is a great deal to admire in *Demography and Democracy*, and its conclusions are far from trivial either in themselves or in their implications, it has to be remembered how narrow the focus of the work is. Hansen's interest is only in the citizen population, and only in the period when we have the most detailed knowledge of the operation of the institutions of democracy. His argument (and his rhetoric) is designed only to show that previous accounts of that population tended to underestimate it. The focus is sufficiently tight that even his later analysis of what is generally regarded as the best evidence for the fifth century is framed entirely in terms of demonstrating that, contrary to what may superficially appear to be the case, if we take that evidence at face value it does not contradict his arguments about the fourth century.⁷² Hansen does not pursue at all the striking implication of his argument: that the population just before the war was very large indeed (Hansen's suggestion of 60,000 citizens is a *minimum*), in spite of the fact that the Athenians had been engaged in years of quite intensive warfare to win and keep their empire, including some spectacular reverses (such as in Egypt) which involved heavy casualties.⁷³ It is of course likely that some at least of this increase was generated by migration into Attica, and this is a factor which is notoriously under-appreciated and understudied by ancient historians.⁷⁴ This much is suggested by the sheer existence of the Periclean citizenship law of 451/0 BC, although there are other possible reasons behind this legislation. Clearly there were also large numbers of metics living in Athens – it was never easy to become a citizen in fifth-century Athens.

This raises a connected but more general issue with Hansen's work on the fourth century, which is that it presents a static, stable picture of the Athenian citizen population which significantly understates the importance

⁷² Hansen, 1988.

⁷³ Discussed by Patterson, 1981: 40–71 – but her interest stops at the beginning of the Peloponnesian War and the onset of a period of rapid change in the population.

⁷⁴ See Taylor in this volume, pp. 121–3, 129–31, for a clear and detailed example of why it does matter.

and occurrence of change in both its size and structure. This is partly another direct consequence of the narrowness of Hansen's focus – while he does present a tentative model for change over the course of the fourth century in his conclusion, we do not have the data to track significant change in the period he is interested in, and inevitably a picture drawn by collecting scattered pieces of evidence into a comprehensible whole is going to smooth out local variation.⁷⁵ This is also reflected in Sallares's passing acknowledgement of the existence of significant change in the citizen population: he notes that the unusual demographic consequences of the plague and the Peloponnesian War would have been ironed out by the time of Demosthenes, on which period he then chooses to focus his discussion without further elaboration of the implication that late fifth- and early fourth-century Athens was in fact well outside the 'demographic mainstream'.⁷⁶

The population of Athens in the immediate pre-war period was almost certainly much larger than it was immediately after the Peloponnesian War. Loss of numbers would surely have had profound effects on the age structure of the population too.⁷⁷ The structure of the population earlier in the fifth century is also a matter which deserves much more attention than it usually receives.

Treating the Athenian citizen population as though it were static, however, has another unfortunate effect, which is to give the impression that population size is a variable independent of any others in Athenian history, with the possible exception of the presence and wealth of imperial possessions. Again, this is partly a reflection of the inaccessibility of technical debates, but the size of the citizen population was not so independent, and was instead part of a complex interaction of factors. Direct evidence for some of these factors and the scale of their impact is not always abundant (or even present at all), but that does not mean that they were absent or unimportant. The legal and constitutional framework is one factor, and the Periclean citizenship law already mentioned is an obvious one, but the

⁷⁵ Hansen, 1985: 68–9. This is a problem with many aspects of Athenian history and life – Oakley and Sinos, 1993: 3–5, for example, highlight the difficulty we have tracking any changes in Athenian marriage rituals over the course of the classical period. More generally Osborne, 2007, demonstrates the difficulties of identifying changes in classical Athens, although the picture is slightly obscured by consideration of whether the changes we can see are sufficient to justify (any of the senses of) the word 'revolution'.

⁷⁶ Sallares, 1991.

⁷⁷ Note that Hansen, 1988, continues to use his later fourth-century model of a population that is growing at a moderate rate for a population which he thinks is much more quickly shrinking, without any comment that this might not be appropriate.

provision of pay for public offices would have had some effect too. We know that large casualties were sustained by the Athenians as a result of the plague; what is less clear is how they responded to those losses and to military defeat. Did the Athenians produce fewer children in an atmosphere of gloom and pessimism, or did they experience a baby boom at the end of the war as immediate threats dissipated and new opportunities arose? Either response could be paralleled in other, better-documented societies.

More generally and importantly, Athens' population history cannot be divorced from its economic history and development, any more than from its political development. As I have argued elsewhere,⁷⁸ the likelihood of a very large and dense fifth-century population makes it probable both that the relatively sophisticated economic institutions and high levels of marketization which are well attested for the fourth century have their origins in the pressures of the fifth century, and that patterns of wealth distribution and landholding (and hence also agricultural strategies, and carrying capacity) were different in the fifth century from the fourth century (even ignoring the likelihood of change within each period); generally extrapolating back from the later period is dangerous and likely to be misleading.⁷⁹ Hansen has provided us with a good quantitative assessment of the citizen population in the second half of the fourth century. But this is effectively *all* we currently have in the historical demography of classical Athens. There is less evidence for the size of the citizen population in the fifth century (and less still for the non-citizen population), but every indication both that it was very large before the Peloponnesian War and that it was drastically reduced during that war, and the full implications of this have yet to be worked out. On the question of the age structure of the population at any time, historians of Athens have failed to meet the challenge set by Hopkins in 1966. Definitive answers will probably never be achieved, and the best answers will demand the use of a wider range of evidence to ascertain the likely dietary and disease regimes. We should, however, be able to accept immediately that the answers we have been giving are baseless and inadequate, and start the search for better ones.

⁷⁸ Akrigg, 2007.

⁷⁹ A recent example of an argument of this kind that really cannot work is provided by Moreno, 2007: 311–12.

*Nuptiality and the demographic life cycle of
the family in Roman Egypt*

April Pudsey

The history of the ancient family has focused principally on two central questions: how can we classify the structure and formation of the ancient family within a historical framework, and what were the obligations of its members towards one another within that structure? For the first of these questions the issue is one of continuity, or otherwise, from family forms in pre-modern populations through to modern, western European populations; this is an issue of precisely when and where what we now refer to as the nuclear family came into existence.¹ The appearance of the nuclear family in European history is tied to the theory of a European demographic transition: a widespread fertility decline associated with industrialisation, which was in large part a consequence of the tendencies of married couples to delay marriage and/or to consciously limit their family size through means of birth control. This theory, though widely criticised for its inability to explain the socio-economic and cultural aspects of human reproductive behaviour, is one that remains central to many studies of family formation. Yet research has suggested that a number of historical populations for which demographic data are abundant deviated significantly from the patterns this theory predicts.²

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¹ This issue is the main thrust of the debate on family formation and marriage patterns in European history: see Goody, 2005; Goody *et al.*, 1976; Hajnal, 1965, 1983; Kertzer and Saller, 1991; Laslett and Wall, 1972; Reher, 1998. For Roman family formations see especially Saller and Shaw, 1984, who argue, on the basis of epigraphic material, for a predominance of nuclear families in Roman Italy contra Martin, 1996, who disputes their conclusions. See also n. 24 below.

² See Morley in this volume. Work on demographic transition theory is extensive, but for a detailed overview of literature on this, and on developments of the theory, see van de Kaa, 1996. Critics of the demographic transition theory have demonstrated its failure to explain demographic change in a number

It is, therefore, not easy to place the ancient family in a historical framework of marriage and family formation patterns; this difficulty creates further problems for ancient historians because the nature of the developmental life cycle of the family impacts on the legal and social obligations of family members towards one another, and therefore forms an important part of the socio-economic and cultural history of the family within wider society. For instance, it is important to note male mortality rates in a society whose values were such that paternal power was central to authority, both in the family and in wider society; but under a demographic regime where male mortality would have lessened the likelihood of fathers surviving into their sons' adulthood, these values may not have reflected reality. The obligations of children towards their parents, in particular widowed mothers, would also have been affected by demographic patterns which meant that widowhood was most likely when mothers were relatively young. Legal, social and cultural obligations and responsibilities within the family, then, are to a large extent dependent on the demographic life cycle of the family – its formation and developmental life cycle. The demographic realities of birth and death that acted on individuals had a crucial impact on decisions to marry and the consequent family life cycles, especially in societies where there were significant age gaps between husbands and wives, and where age- and sex-specific mortality rates were very high. A fuller understanding of the social and cultural history of the family requires an understanding of the demographic dynamics of mortality and fertility – or birth, death and marriage – and the influence of these dynamics on family formation and development.

This paper takes as its focus fertility and specifically the part played in this by nuptiality – the collective patterns of marriage, divorce and remarriage.³ It considers aspects of both female and male nuptiality and their demographic influences on the developmental life cycle of the family.⁴ In light of recent debate on the unsuitability of models of marriage patterns and family

of historical populations both before and after the supposed transition: Caldwell, 1996; Chesnais, 1992; Coale, 1973; Demeny, 1988; Kirk, 1996. For a challenge to the notion of any universal pattern of population behaviour, particularly of fertility decline, see Riley and McCarthy, 2003. Alternatives to the demographic transition theory can be found in the wealth flows theory – Caldwell, 1982, and Hin in this volume, pp. 100–2 – and in the theory of homeostasis, Hirschman, 1994.

³ See n. 2 above and discussion on pp. 63–9. The role played by mortality in shaping the demographic life cycle of the family is beyond the scope of this paper, but see Scheidel, 2009b. On the impact of mortality on numbers of widows and familial networks, see Hübner, 2010; Pudsey, in press; Vuolanto, 2002. For a review of research on mortality in the ancient world, see Holleran and Pudsey in this volume, pp. 1–5.

⁴ In demographic terms, the fertility of a population usually refers to marital fertility, that is to say the gross reproduction rate and total fertility rate of married couples (on which, see n. 8 below). This is not

formation to a range of pre-modern historical populations, it is clear that the role played by marriage in shaping the family's life cycle is varied across time and place. In the first part of this paper I examine the range of relationships between the nuptiality and marital fertility of individuals and the developmental life cycle of the family, and our understanding of historical patterns in these relationships; in the second part I use this understanding to explore the developmental life cycle of families and some familial relationships recorded in the fourteen-yearly census of the first three centuries AD of Roman Egypt.

Demographic and historical models of marital fertility have an important role in our understanding of the relationship between nuptiality and fertility. From the perspective of female fertility – and indeed the overall fertility levels of a population – three variables are significant: the average age at first marriage of women, the proportion of the population of adult women who are unmarried, and the extent and efficacy of deliberate and parity-dependent birth control or birth-spacing practices within marriage.⁵ From the perspective of the demographic life cycle of the family these are important variables, but so too are patterns of nuptiality and marital fertility from the perspective of adult men; one of the most significant points of transition for families is the point at which young adult men decide to marry and either set up home with their new wife (neolocal marriage) or, conversely, bring their new wife into their parental household (virilocal marriage). Men's average age at first marriage and their marriage patterns are therefore also of great significance for developing a demographic history of the family. This paper will attempt to assess what we can know about aspects of the individual life courses of women and men and the reproductive decisions married couples made in a historical population, and what happened to the family at one of the most formative points in its life cycle, when young adult men married. The individual life courses of women and men, respectively, in terms of nuptiality, can be shown to have influenced the demographic life cycle of the family in Roman Egypt in ways which deviated from patterns of family formation and development in the European and Mediterranean past.

to neglect the social and cultural significance of the fertility of the unmarried, who go largely unrecorded in census and other records and whose impact on fertility is therefore near impossible to measure.

⁵ The first two of these relate to nuptiality. For explanations of these and other factors and variables in shaping female marital fertility, see Coale, 1971; Coale and McNeil, 1972; Coale and Trussell, 1974. Note also the importance of remarriage of widows and divorcees in terms of reducing the proportions unmarried. See n. 7 below for further discussion of these models. See also Hin in this volume, pp. 104–14.

FERTILITY AND NUPTIALITY

Of the factors that influence fertility, those with a direct impact can be either biological in nature (for instance patterns in age of menarche and menopause, and sterility) or behavioural (such as patterns of marriage, divorce and remarriage, celibacy, birth spacing and family limitation), and it is through such determinants on fertility as these that socio-economic and environmental factors can influence fertility indirectly.⁶ These socio-economic and environmental factors are the proximate determinants of fertility, and include variables such as the average age of women on first marriage, and proportions of the population of women who remain unmarried. There are distinct sets of demographic models which elucidate the nature of these dependencies in mathematical terms, illustrating precisely how proximate determinants can influence fertility levels on a population-wide scale.⁷ These and other causal relationships between biological and behavioural influences on fertility are consistent across human populations in the ways in which they can potentially impact on fertility, enabling the use of mathematical models to estimate the range of potential effects of socio-economic change on demographic profile. Any deviation from such trends will lie largely in the extent of these effects, rather than in the nature of them. It follows that in all historical populations socio-economic and environmental factors influenced fertility in similar and predictable ways, if to varied extents. Therefore, in those historical populations whose proximate determinants varied – for instance in rates of fecundity of women (their biological ability to bear children) and in cultural attitudes influencing sexual and reproductive behaviour within marriage – then the characteristics of those populations' fertility patterns would also have varied, characteristics such as gross reproduction rate (GRR), net reproduction rate (NRR), and total fertility rate (TFR).⁸ These functions have obvious ramifications for the structure and development of the family since they all

⁶ Bongaarts and Potter, 1983: 1. See also Hin in this volume, pp. 99, 115. For a discussion, from postmodern perspectives, of the ways in which socio-economic, environmental and cultural variables may influence fertility, see Riley and McCarthy, 2003.

⁷ Coale, 1971; Coale and McNeil, 1972; Coale and Trussell, 1974. The 1974 (empirically based) model was devised to set out the range of age-specific patterns of fertility in populations and to measure the associated levels of fertility control, determined by marriage patterns and maternity. This model was based on the 1972 model of average age at first marriage, and the 1971 model schedule of fertility rates for married women. The overall model illustrates the dependence of fertility rates of a population on average age at entry into marriage, and on levels of fertility control. See Coale, 1971, for descriptions of these models and applications of them. See also Wilson, 1985: 32–3.

⁸ GRR is the hypothetical average number of female births per woman in a birth cohort which is required for that birth cohort to reproduce itself by the time of death of all of its original members.

relate to the numbers of children born to married couples in the recorded population, maternal starting and stopping points for childbearing, and spacing between births.

Nuptiality contributes to overall fertility and family formation patterns within a population, through the means described above. In demographic terms, marriage is key to fertility and family formation since it is the means by which families are formed and transformed, and elements such as divorce and death are instrumental in the dissolution of families. The important variables are the ages at which each sex typically enters first marriage (AAF_M, average age at first marriage) and the relative proportions of each sex unmarried (as a result of divorce, widowhood or failure ever to marry).⁹ Population and family historians have constructed regional models of the demographic, social and economic relationships between patterns of marriage and their associated family formation patterns in order to establish demographic and behavioural trends across geographic regions in the past. The 'Mediterranean European marriage pattern' first proposed by Hajnal for pre-industrial populations predicted a trend for relatively early marriage for both women and men, along with near universal marriage (equating to a low proportion of unmarried women and men) and a preference for the extended (or joint) family, where more than one conjugal couple resided together.¹⁰ Since newly married couples in such populations resided in existing parental households (usually of the parents of the husband) there was no pressing economic need for couples to delay marriage. Hajnal's '(North western) European marriage pattern', on the other hand, outlined a preference for relatively late marriage for both men and women, along with a large proportion of men and women who remain unmarried; the result of this was a preference for the nuclear family, in which newly married couples would prefer to delay marriage until sufficient wealth had been built up in order to establish a new household distinct from those of either spouse's parents.

Historical populations and their behaviours in terms of marriage and family formation have often been ascribed one or other of these regional patterns, and, consequently, pre-modern European populations have typically fallen into the category of Hajnal's Mediterranean European marriage pattern that

NRR is a function of fertility taking into account a more detailed analysis of mortality. TFR is the number of children of both sexes that women must have in order to reproduce the original birth cohort. TFR is approximately $GRR \times 2$. Detailed explanations of these demographic terms and concepts can be found in Newell, 1988; Shyrock and Siegal, 1976; Wilson, 1985. See Parkin, 1992: xv–xvi, for a list of demographic terms and symbols commonly used by historical demographers.

⁹ See n. 7 above. For a discussion of AAF_M in republican Italy see Hin in this volume, pp. 111–14. For ages at marriage of women and men in the Roman world, see: Bagnall and Frier, 2006: 111–21; Hopkins, 1965; Lelis *et al.*, 2003; Saller, 1987, 1994: 25–41; Scheidel, 2001c: 33, 2007c; Shaw, 1987a.

¹⁰ Hajnal, 1965, 1983.

predicts relatively early marriage for both women and men, near universal marriage and a preference for extended families. These regional marriage patterns have had great influence on our picture of the history of marriage and the family in their demographic context, and have served as starting points for explorations into the history of the ancient family.¹¹ These geographic and regional patterns, however, offer only a limited framework against which we can observe the Graeco-Roman family; given the range of socio-economic, cultural and environmental contexts of the ancient Graeco-Roman world across the Mediterranean and the Near East, we might expect that non-European demographic behaviours and patterns could provide more appropriate comparative material and patterns.¹² We might also expect, given that the socio-economic and cultural context of Graeco-Roman Egypt differed in many ways from other areas of the ancient world, that patterns of nuptiality, and therefore fertility and family life cycles, varied among ancient populations too.

MARRIAGE AND THE FAMILY

The study of the family in history has largely focused on the nature of the shift from traditional complex family structures to simpler nuclear structures, in direct relation to these regional marriage patterns;¹³ family and household typologies were established by Peter Laslett and the Cambridge Group for the Study of Population and Social Structure, and are closely linked with Hajnal's regional marriage patterns discussed above.¹⁴ Laslett and Wall identified five types of household structure: (1) solitary persons; (2) multiple persons with no conjugal family present; (3) conjugal families in various phases; (4) conjugal families extended through the presence of non-resident kin; (5) multiple families linked by kinship.¹⁵ This categorisation, however, poses a problem in that the categories do not account for the different social organisations of a wide range of societies; nor do they explain fluidity in family structure across relatively short periods of time.¹⁶ In a

¹¹ In particular, Roman Egypt: Bagnall and Frier, 2006: 171–3; Frier, 1994. For studies of the Greek and Roman family, see n. 24 below.

¹² This type of contextualisation and comparison is the focus of Hübner, 2010, who studies the family in the Graeco-Roman east from such cross-cultural perspectives.

¹³ And in terms of economic change, Berkner, 1972; Shaw, 1984, or in terms of the influence of urbanism on the family unit: Alston, 2005: 129–30; Saller, 1984a, 1994: 5–8; Saller and Shaw, 1984; Shaw, 1984.

¹⁴ Hammel and Laslett, 1974: 73–103. See also Flandrin, 1979: 66–74; Kertzer and Saller, 1991; Laslett and Wall, 1972: 23–44.

¹⁵ Laslett and Wall, 1972: 23–44.

¹⁶ Berkner, 1975: 728, on Laslett's volume comments that family histories of Serbia, Japan and Australia are forced into such categories, erroneously. Hammel, in Laslett, 1984: 370.

recent special journal volume, celebrating the anniversary of the publication of Laslett and Wall's research, three papers in particular revisit the issues and problems with applying these universal categories to populations across such broad sweeps of time and space.¹⁷ In these papers family formation in the past and the factors that influence it are shown to be far from homogeneous or specific to certain regions and times. The analysis of data from Denmark, Finland, Iceland, Norway and Sweden reveals that Hajnal's north-west European pattern of nuclear households, and late marriage typically attributed to these populations, does not account for a great deal of the populations of regions such as coastal areas, where economic circumstances and opportunities influenced family formation and reproductive decision making.¹⁸ Critics of the Mediterranean family and marriage patterns have provided data from countries exhibiting tendencies that either deviate from the patterns expected and predicted by Hajnal's patterns, or that fit into the categories of family and household proposed by Laslett and Wall.¹⁹ The patterns of remarriage after divorce or death of a spouse which are associated with Hajnal's regional marriage patterns have also been subject to scrutiny on the basis of demographic data – a variety of co-residential patterns and economic circumstances across nineteenth-century Italy had varied implications on the decisions of the divorced or widowed to remarry at various ages.²⁰

The theory of demographic transition and widespread fertility decline in Europe, along with its associated regional patterns of marriage and nuptiality and family formation, have provided population and family historians with a clear frame of reference against which both pre-modern and more recent populations within Europe can be examined. But empirical and qualitative research into European populations has consistently shown that these patterns are far from universally applicable, and even the need for universal or unifying theories of population behaviour has been questioned.²¹

The ancient family has often been ascribed patterns of pre-modern demographic behaviour, with the Romano-Egyptian family exhibiting a typically pre-modern Mediterranean pattern.²² This issue of continuity of family forms from the ancient world was revisited when Saller and Shaw first proposed, on the basis of thousands of funerary epitaphs, that the nuclear family was not in

¹⁷ Moring, 2003; Schürer, 2003; Viazzo, 2003. ¹⁸ Moring, 2003.

¹⁹ See Kertzer, 1991; Viazzo, 2003.

²⁰ See Kertzer and Karweit, 1995. See also Hübner, 2010, and Pudsey, in press.

²¹ See n. 2 above. For anthropological perspectives, see Roth, 2004.

²² See Bagnall and Frier, 2006: 171–3.

fact new to Europe but had been predominant in the Roman world (or in the western provinces at least).²³ This traditional picture of the extended Roman family with the powerful father and paternal grandfather was far from evident in these data, which rather illustrated a preference for wives setting up epitaphs for their husbands, and children for their parents, so that the commemoration displayed the importance of nuclear family relationships in commemorative practice; on the basis of this work the prevalence of the nuclear family in the Roman west, broadly in line with Hajnal's north-western European pattern, is a notion which has persisted.²⁴

There are a number of problems with Saller and Shaw's analysis which highlight the problematic nature of the surviving demographic data from the ancient world. The epitaphs record the nature of the family at a particular point in its life cycle, and do not reflect any change or developmental aspect of the life cycle; furthermore, commemorative practice, not family structure, would have determined which family member was to set up the epitaph. One of the more important critiques of Saller and Shaw's method is that the analysis records individual relationships as given on part of an inscription (which may contain more familial relationships), which means that there is always a statistical likelihood that the nuclear relationship (wife and husband, or father and daughter and so on) will be over-counted, since one family may contain more than one of these types of relationships.²⁵ The epigraphic material cannot conclusively support the suggestion implicit in Saller and Shaw's analysis, that the marriage and family formation patterns of the population of the Roman world fit Hajnal's north-western European marriage pattern. These data present us with what appears to be a preference for nuclear families, associated with relatively late marriage for both sexes and a pattern of near universal marriage, yet the

²³ Saller and Shaw, 1984, but see discussion in Martin, 1996.

²⁴ For the paternal power of the traditional Roman family see Crook, 1967b; Dixon, 1992; Gardner, 1986. For a challenge to this picture of the preference for nuclear families, based on demographic contextualisation, see Scheidel, 2009b, and in general the edited volume of Hübner and Ratzan, 2009, for discussions of the impact of male mortality and absent fathers on the ancient family. See also Hübner, 2010 and 2011, on this pattern. On the Roman family more generally, see Bradley, 1991; Dixon, 1988, 1992; Evans Grubbs, 2002; Gardner, 1998; Garland, 1990; George, 2005; Parkin, 2003: 203–35; Rawson, 1986, 1991, 2003, 2011; Rawson and Weaver, 1997; Saller, 1994. On the Greek family, see Cox, 1998; Golden, 1990; Nevett, 1999; Patterson, 1988; Pomeroy, 1997. Studies in the history of the Greek family have been fewer than those in the Roman family. Efforts to redress this shortcoming formed one focus of the fifth Arachne conference: 'Oikos–Familia: The Family in the Ancient Greco-Roman Society', proceedings of which are to be published: see Laurence and Strömberg, in press, and Lovén and Harlow, in press.

²⁵ See Martin, 1996: 43–5.

demographic context suggests that families are unlikely to have been in this formation for long periods.²⁶

On the other hand, the other major body of quantitative data on families surviving from the ancient world, the census from the first three centuries of Roman Egypt, suggests a different picture. The province of Egypt in the first three centuries AD provides us with the most detailed body of statistical data for the population dynamics of any population before the fifteenth century. Bagnall and Frier's catalogue and analysis of the census data makes available the information from the returns and uses it to make suggestions about the fertility, and the family and household structure, of the recorded, married, population of Roman Egypt.²⁷ Census data afford historians the opportunity to explore demographic profile and change, and domestic and family organisation of populations in the past,²⁸ and the study of these data by Bagnall and Frier uses modern demographic techniques of analysis – namely Princeton model life tables – to illustrate that the population of this province adhered to the patterns expected of all pre-modern Mediterranean populations.²⁹ Such a category as discussed above allows for equally high birth and death rates, and a high level of infant mortality relative to that of adults;³⁰ and because of the high probability of death in infancy, married couples would seek to increase their fertility by having more children and, consequently, family and household structures would reflect this in large numbers of offspring within a 'nuclear' or 'extended' family. However, such analysis assumes that the population of Roman Egypt fell into the category of behaviour of pre-modern populations set by the theory of demographic

²⁶ See Scheidel, 2009b; cf. Saller, 1994.

²⁷ For discussion of this, see Bagnall and Frier, 2006 (and Parkin, 1995, a detailed review of the first edition, 1994); Bagnall *et al.*, 1997. See also Hopkins, 1980: 312–20, who discusses the representivity of the census data: 63 per cent of the census returns relate to the Fayyum region of Egypt; the surviving returns record 880 individuals from 270 households; 79 per cent of the returns are dated from the second century AD and all the periodic censuses between AD 19 and 257 (except for 229) are recorded. See also Parkin, 1995; Sallares, 2002: 1–7; Scheidel, 2001a.

²⁸ One of the most significant examples of this type of work is the reconstruction of the English population 1541–1871 produced by Wrigley and Schofield, 1981, through a demographic analysis of the 1871 census data for England. For a discussion of the benefits to the state of collecting such information, see Clarysse and Thompson, 2006: 10–35, who offer the first systematic publication and analysis of census and tax register data from Hellenistic Egypt.

²⁹ Bagnall and Frier, 2006: 171–3, where it is argued that the population of Roman Egypt, especially its female population, fell in line with this pattern. It is suggested that this may also be the case for other Roman populations: 'Nor is there any strong a priori reason why most of these attributes should be regarded as unique to Egypt among Roman provinces': Bagnall and Frier, 2006: 173; cf. Parkin, 1992: esp. 129. Princeton model life tables are the standard descriptors created by Coale and Demeny, 1983. See also Frier, 1994, for the use of Princeton model life tables to demonstrate the 'typicality' of the female population in terms of its fertility schedule.

³⁰ In accordance with Princeton model life table West, level 3, females, see discussion in Scheidel, 2001a, 2001c.

transition, and that the standard Princeton model life tables are the best representation of these populations. Yet the use of Princeton model life tables (or variations on them) in studying ancient populations is problematic: the data on which they are based do not incorporate populations with very high mortality, nor with disease patterns (such as tuberculosis), and the ratio they present between infant and adult mortality may not accurately represent ancient populations with particular age-specific mortality schedules.³¹

Bagnall and Frier's analysis presents us with some nuptial and family formation patterns which appear to follow Hajnal's 'Mediterranean' European marriage pattern – relatively early marriage for women and men (though slightly later for men), near universal marriage (low proportion unmarried), patterns of natural (uncontrolled) fertility and a preference for extended families.³² Their analysis suggests that Romano-Egyptian women began to marry soon after the age of 12 and that the proportion of women married rose steeply during the later teens,³³ and that the proportion of recorded women still married reached 80 per cent at the age of 30. This looks like a pattern of early female marriage, coupled with near universal marriage: the Mediterranean marriage pattern.³⁴ These census data on marriage patterns of men in Roman Egypt suggest the age patterns of first marriage of males aged 16 to 52,³⁵ most of whom appear to have married in their early twenties, and by the age of 25 half of all recorded males appear to have been married, and the percentage of men (unlike women) rises until 70 per cent are married by their mid-forties.

The overall patterns of marriage observed both over the data as a whole, and from the perspectives of individual families, however, reveal a more nuanced set of behaviours. Hajnal's patterns seem to fit quite neatly with the observed average ages at first marriage, but not so well with patterns of remarriage, or with family limitation within marriage, and the apparently

³¹ See Pudsey, 2007. See also Akrigg in this volume and Parkin in this volume for discussion of the tables' usefulness for ancient populations; Coale and Demeny, 1983: 4; Sallares, 2002; Scheidel, 2001a, 2001c; Woods, 2007, for uses of different model life tables for Roman Egypt which better represent the relationship between infant and adult mortality (new model life tables based on those in Preston *et al.*, 1993, whose tables are more accurate for populations with high mortality estimates and whose data are based on the population of African Americans who moved to Liberia in the period between 1820 and 1843).

³² Bagnall and Frier, 2006: 351–3, table B, appendix 4.

³³ Bagnall and Frier, 2006: 113, fig. 6.1. The additional data presented for Ptolemais in Bagnall *et al.*, 1997, offer nothing to firmly suggest substantial deviation from this pattern.

³⁴ Bagnall and Frier, 2006: 113. As in Hajnal, 1965: 101–43; Hajnal, 1983: 65–104, esp. 66–7. See also Coale, 1992: 333–41.

³⁵ Bagnall and Frier, 2006: 117, fig. 6.2.

widespread practice of brother–sister marriage. The patterns assume that men and women will tend to remarry on divorce or death of their spouse, and, while this appears to be largely the case for men in Roman Egypt, women appear to have been reluctant to remarry under these circumstances. Those women declaring themselves widows exhibited a tendency not to remarry, thus keeping themselves part of the proportion of the population unmarried and lowering the high proportion of married women predicted by Hajnal’s patterns.³⁶ Single women (probably widows) with children are also evident in the census data, and suggest a tendency towards remaining unmarried. As Bagnall and Frier indicate, the census data show that the total proportion of men married in their forties was 70 per cent (an increase from 20 per cent in their twenties); the total proportion of women married (or rather, still married) had actually dropped from 80 per cent in their twenties to 30–40 per cent by the time they had reached their late forties.³⁷ This would seem to suggest that, while men remained married, or remarried (or simply died and fell out of the record), well into their forties, women would remain unmarried once they had divorced or become widowed (or perhaps even never married). This pattern is more dramatic than, but similar to, patterns in eighteenth-century France where 52 per cent of men in their forties were married, as opposed to 20 per cent of women in the same age group (67 per cent of women in their twenties).³⁸ In terms of marriage patterns the census data for Roman Egypt (particularly for women) exhibit the tendency towards the predicted Mediterranean patterns of early first marriage and near universal marriage within particular age groups, but the data on remarriage do not fit the pattern as clearly, as a large number of widowed or divorced women did not remarry.³⁹

Furthermore, while one means of controlling or limiting family size was delaying marriage, another was limiting childbearing within marriage, either by means of birth control, or of spacing the intervals between births;⁴⁰ a range of typical departures from natural fertility and these patterns are age-specific, and are determined by voluntary control. The extent of deviation from patterns of ‘natural fertility’ within marriage is one further variable in determining both the overall fertility of a population, and its patterns of family formation. ‘Natural fertility’ – fertility in the absence of deliberate and

³⁶ See Bagnall and Frier, 2006: 123–7. ³⁷ Bagnall and Frier, 2006.

³⁸ See Kertzer and Laslett, 1995.

³⁹ See Pudsey, in press, for discussion of the implications of the remarriage patterns of widows and divorcées on the family. See also Hanson, 2000; Hübner, 2010; Rathbone, 2006; Vuolanto, 2002.

⁴⁰ See Alter, 1992; Bagnall and Frier, 2006: 150.

parity-dependent family limitation – is a pattern that has been attributed to most European and Mediterranean pre-modern populations, including ancient populations.⁴¹ But there are problems with the application of one type of fertility pattern to a diverse range of historical populations, as with the models of marriage and family formation discussed above. Indeed, the empirical data from other pre-modern populations support a considerable deviation from patterns of natural fertility (in the measured coefficient, I_g , the index of marital fertility, which is the ratio between the number of recorded births within marriage and the number of expected births under the circumstances of natural, uncontrolled, fertility).⁴²

Henry's concept of natural fertility depends on parity and the number of children desired; when couples reach a desired family size, they stop reproducing and this behaviour is referred to as controlled fertility, which is said to have occurred at the demographic transition in Europe.⁴³ On the strength of his analysis of data from nineteenth-century Belgium (Leuven 1846–1910), van Bavel illustrates that birth spacing was an extremely important player in family limitation during the demographic transition, and that pre-transitional populations used this as a method of family limitation.⁴⁴ A notion of 'supply and demand' for children is one which population historians have used to examine family limitation in a number of populations: 'demand' is represented by the desired family size, changes in which across time reflect changing economic circumstances; 'supply' is represented by the supply of children, dependent on mortality and fertility, and the knowledge of, and cultural attitudes towards, birth control.⁴⁵

Fertility control is often discussed in response to parity, or number of surviving children,⁴⁶ but certain behaviour patterns have led populations to employ other mechanisms, such as a change in the median age at marriage, an increase in celibacy or proportion of the birth cohort never married, or an

⁴¹ Devised by Henry, 1961. All the pre-transitional societies discussed by Henry illustrate similar age distributions of marital fertility. See also Frier, 1994: 320, fig. 2. Frier illustrates a pattern of standardised marital fertility rates in which all the pre-transitional societies follow the 'natural fertility' curve; the data for the USA result in a 'controlled fertility' curve, highlighting this relationship.

⁴² For explanation and discussion of this and of other coefficients, see Coale, 1967: 206–9. I_g ranges between 0.65 and 1.0: in India in the 1950s it was less than 0.60; in Taiwan in 1935, 0.70. In Henry's data for 'natural fertility' populations across Europe between the sixteenth and eighteenth centuries, I_g ranged from 0.64 to 1.0: see Henry, 1961. There are also variations in fertility in many fully modern societies: see Coale, 1971: 58–60, where data from Sweden, England and Wales, and Japan illustrate that there had always been pre-industrial variation in marital fertility, implying that fertility was subject to some degree of control on a population-wide basis.

⁴³ Coale, 1971: 207; Henry, 1961; van Bavel, 2004: 104. See also Coale and Watkins, 1986.

⁴⁴ See van Bavel, 2004: *passim*.

⁴⁵ Easterlin, 1978, discussed by Alter, 1992. See also Hin in this volume, pp. 100–3.

⁴⁶ Coale and Watkins, 1986.

increase in birth spacing within marriage. Child spacing could serve the same purpose as economic pressure-relief within the family.⁴⁷ Evidence suggests that, in pre-industrial populations, couples deliberately lengthened the duration of breastfeeding for economic reasons.⁴⁸ In Roman Egypt the effects of breastfeeding in this respect were certainly well known.⁴⁹ Close-kin marriage was one other means of retaining the family's wealth in Roman Egypt, and was widespread; in the extant census returns full brother–sister marriages account for one-fifth of all marriages, or almost one-sixth including marriages between half-siblings and cousins.⁵⁰ All of these factors affected family and household structure, formation and development in a way not fully accounted for by studies of the Romano-Egyptian family.

The assertion that the population of Roman Egypt was typical of pre-modern Mediterranean populations in terms of its demographic dynamics and family formation patterns is, therefore, not as clear-cut as it might seem. Age patterns of marriage and the practice of birth spacing and family limitation among married couples in Roman Egypt related to the desire to limit family size. These environmental and socio-economic factors will have had varied impact on different sections of the population of Roman Egypt, who lived under different socio-economic circumstances. The nature of fertility and consequently family formation in a historical population depended to a great extent on its proximate determinants, in this case reproductive decision making and biological factors such as fecundity and sterility rates; it also depended on the socio-economic specifics of family and household and of ecological environment. There are many reasons, then, for the variety in deviation from a course of natural fertility: biological, behavioural, cultural and socio-economic, all of which have been taken into account in European historical populations.

The population of Roman Egypt, or any part of the ancient world, need not necessarily have behaved in ways characteristic of pre-modern populations described by this theory and model – indeed there is a wealth of evidence in Roman Egypt that suggests the opposite. Sex differential mortality patterns and the subsequent reluctance of widows to remarry would have increased the proportions of women in Roman Egypt who were unmarried through to the increased ages in their life courses; this, in conjunction with a relatively low

⁴⁷ Scott and Duncan, 2000. See also Hin in this volume, p. 102. ⁴⁸ Van Bavel, 2004.

⁴⁹ Bradley, 1980, 1986; Dupras *et al.*, 2001.

⁵⁰ See Bagnall and Frier, 1994: 131–3. For the most recent treatments of close-kin (particularly brother–sister) marriage, see Hopkins, 1980; Hübner, 2007; Shaw, 1987b; Remijson and Clarysse, 2008; Rowlandson and Takahashi, 2009; Scheidel, 1996, 1997. For the undoubted existence of this practice in pre-Roman Egypt, see Ager, 2005.

average age at first marriage for women, slightly older for men, affected the individual life courses of men and women and their influences on overall fertility within the population. Aspects of the regional marriage patterns, fertility schedule and family formation have varied significantly across historical populations; in Roman Egypt, socio-economic and cultural factors such as close-kin marriage and failure to remarry on divorce or widowhood, among other proximate determinants of fertility, influenced fertility and nuptiality, particularly for women.

THE FAMILY LIFE CYCLE

At this point it should be clear that there is a distinct relationship between fertility and mortality, on the one hand, and family formation, on the other: birth and marriage (as factors of fertility) and death (mortality) as they occur as demographic events in the lives of individuals have great bearing on the formation and dissolution of families. In trying to develop a fuller understanding of the nature of the family in historical populations, demographic models may be particularly useful as heuristic devices in predicting the frequency of, and trends in, such demographic events; however, caution must be exercised in imposing such models onto populations for which the proximate determinants of fertility differ. We must also be aware of the fact that the family and its formation are not static. The placing of families in the past into Laslett's typologies is slightly misleading.⁵¹ The family goes through its life cycle in accordance with the individual life courses of its members as they experience demographic events, including marriage, childbirth, divorce, remarriage and death. The decisions made by individuals on the point at which they decide to marry (the AAFM), on how many children they should have and on when they stop having children, and their decisions to dissolve marriages and perhaps remarry, are clearly significant in shaping not only family formation but also the developmental life cycle of the family. What happens within the family in terms of its formation, when young women and men marry, is a vital point in the life cycle of the family.⁵² This demographic life cycle of families is the focus of the rest of this paper, in which the cycles of some recorded families in

⁵¹ Hammel's study of the Serbian *zadruga*, a joint family system, demonstrates that families can move through phases of their life cycles very quickly: brothers who are both married may not live together for a very long time, and the cycle is more a process than a structure. Hammel, 1984.

⁵² Reher, 1998, argues, for instance, that this moment in the life cycle of the family is one of transition, and that there are very clear differences between the ways in which families with different socio-economic and cultural backgrounds deal with this.

Roman Egypt can be shown to have been influenced not only by those aspects of nuptiality which relate to reproductive decision making,⁵³ but also by what happens when the younger generations of men in the family marry.

The relationship between the demographic events in the lives of individuals, and the stages in the life cycle of families with which they coincide, are of particular value. *The Dictionary of Demography* defines the life course as 'The sequence of stages through which individuals or families pass beginning with birth and ending in death (for individuals) or beginning with formation and ending in dissolution (for families).'⁵⁴ The two are clearly dependent on one another: the incidence (and expectation) of birth, death and marriage for individuals influences the patterns of forming families through marriage, and the dissolving of families through divorce or death of their members. The household's life cycle, when studied in conjunction with the life course of individuals in the same society, can reveal demographic relationships and socio-economic influences (irrespective of age) on the family in that society, placing the historical family in its demographic and social, economic and cultural contexts. The life cycle of a joint family (that is, one in which there appear more than one conjugal couple) has various stages – the duration and timing of which largely depend on age- and sex-specific mortality, and ages at marriage – from simplicity to 'fission' (that is, when the original sons take over as head of the household on the death of their father).⁵⁵ Wheaton's discussion of the joint family household offers a development course for joint households, the timing of which depends largely on the ages at which children leave the household.⁵⁶

None of the major studies of the Romano-Egyptian family engages a great deal with the relationship between the demographic life course of the family and its role in the society and culture of Roman Egypt; Bagnall and Frier mention the significance of the issue but do not explore it fully.⁵⁷ Bagnall and Frier tabulate the data in these terms and argue that this puts

⁵³ See discussion above, pp. 70–2, on natural fertility, family limitation and birth spacing.

⁵⁴ Wilson, 1985: 123.

⁵⁵ Wheaton, 1975: 607, fig. 1. Wheaton demonstrates that in a particular sample of recorded households, of all the families passing through the life course, at best only 50 per cent of them would be likely ever to produce two or more sons who would survive to marriageable age. This is based on a high average life-expectancy at birth, and expectation of life at age 22 of a further 48 years ($e_{22} = 48$). Every man who marries would have one son aged 23 and one aged 25, who would in turn marry at age 22 and leave the home on the death of the father; if fission occurs at the eldest son's maturity, then 25 per cent of families would pass through this phase, yet it only appears with a 17.5 per cent incidence in the census, because of the relatively short duration of this phase in the family's life cycle.

⁵⁶ Wheaton, 1975: 606–7. ⁵⁷ Bagnall and Frier, 2006: 64–5. See also Alston, 1997, 2005.

the Romano-Egyptian household and family structure on a par with others of the pre-modern Mediterranean.⁵⁸ Census data such as survive from Roman Egypt do not represent the formation of a particular family or household as it always appears. Rather, they represent a snapshot of one of the phases of the family life course; a family may appear 'complex', but then move through this phase to become 'simple' as aged parents die and older children leave the home, as in Wheaton's description, discussed above.⁵⁹ It is clear from the material on households and families in Roman Egypt that there is a tendency for families to appear in the 'joint' phase of their life course. But this need not imply that families spent most of their life course in this state. Nor does it mean that the ratios cited above between nuclear, extended and joint families reflect the normative patterns.

Data on which these discussions of family formation and the developmental life cycles of the family rest are primarily census data or parish records, and as such record the family in a particular stage of its life cycle, much as Saller and Shaw's epitaphs do for the Roman family. The recorded moment is precisely that, and cannot reveal in itself the developmental stages through which a family may change from comprising predominantly nuclear relationships to incorporating extended family members into the same household, for instance when sons or daughters marry. The developmental life cycles of families would tell us more about those families' formation patterns, how demographic, socio-economic and cultural factors influence these formation patterns, and the legal and moral obligations of family members towards one another at various points in this life cycle. The census data from Roman Egypt, then, can be useful in tracing the developmental life cycles of the recorded families, if we do more than simply count types of families in the data.

FAMILIES IN ROMAN EGYPT: OBSERVING THE LIFE CYCLE

Bagnall and Frier's catalogue features eight households that can be observed in more than one census year. [Table 3.1](#) in my Appendix I lists these families, and [Tables 3.2–3.9](#) present the members of each of them, their ages, relationships to one another and marital status, where these details are known. From these data (although the sample size is of course very small) it is clear that there is a range in developmental life cycles as some of the families easily morph from one of Laslett's Cambridge types into another, while others appear to have changed relatively slowly.

⁵⁸ Bagnall and Frier, 2006: 59, [table 3.1](#). The discussion and tables which follow are based on the census data contained in Bagnall and Frier, 1994, 2006; Bagnall *et al.*, 1997.

⁵⁹ See Berkner, 1975: 729.

The family of Aurelius Ammonios in AD 231 and then in 245 is outlined in [Table 3.2](#). This household resides in Arsinoe, an urban capital in the Arsinoite nome. The structure of the household over fourteen years changes relatively undramatically, though the roles of its members alter. In 231 Aur. Ammonios is the declarant at the age of 48, and married to Thermoutharion (whose age is lost to us), and together they have a daughter (again, her age is lost). But by 245 Aur. Ammonios has died, leaving his widow the official declarant, and with a new young son (whose age is lost); their daughter appears to have left the household (perhaps to marry?) or is simply lost from the record (though the former is more likely). The ages of all of the individuals are lost apart from that of the original declarant, who was 48 in 231, and likely ages for the others must be inferred; for instance, NN the young son in 245 must be 14 years or younger, since he had not appeared in the return of 231, and NN the daughter in 231 must have been over the age of around 2 years, in order to have married and left the household by 245.

There are more discernible patterns in the family of Hermaios alias Pathotes from the urban centre of Hermopolis ([Table 3.3](#)). The family appears over the three censuses of 188, 217 and 231 (the return from 202 is not preserved). The declarant is different at each stage, as are the size and shape of the family, with regard to its members and their ages. In 188 the declarant, 47-year-old Hermaios alias Pathotes, his 51-year-old wife, Souerous, and their three sons and daughters present an example of a nuclear-type family. By 231 the original declarant has died and his eldest son, Hermeinos alias Moros, has filled this role. Isidora appears to have left the home some time between the ages of 13 and 41, and Theognostos alias Moros, the youngest of the original three sons, was married by 217 and eventually became declarant of the much-reduced household by the time he had reached the age of 50 in 231.

Mysthes alias Ninnos and his family, again from an urban setting in Arsinoe, are recorded in two censuses, 161 and 175 (see [Table 3.4](#)). Mysthes has presumably died by 175, and his eldest (and married) son has become the declarant. Mysthes' two children, aged 5 and 4 in 161, are no longer part of the household in 175 (aged 19 and 18) but the couple have had three more sons and one daughter.⁶⁰ Zosime (the original declarant's daughter-in-law) had therefore had five children in her adult life (when she was between the ages of 17 and 30). It is unclear whether the two sons had at some point died, or if they had left the home.

⁶⁰ See Bagnall and Frier, 2006: 249.

This time from the Prosopite nome, the family of Patermouthis appears over two censuses (whose dates are likely to be 131 and 145;⁶¹ see [Table 3.5](#)). By the time of the second of these returns, the original declarant has left the household, probably deceased (aged 62). The original declarant lived with his wife and two children, his three brothers and their sons and daughters; by the time of the second return, these grandchildren have also left the household, probably in marriage. All who remain by the time of the second return are the original declarant's nephew, and his son and daughter.

Peteuris' family, the largest in this group of families and from the relatively small village of Bacchias, south-east of the village of Karanis, is recorded in the censuses of 91, 104 and 119, and appears to have transformed in each ([Table 3.6](#)). In 91 Peteuris, aged 30, is married to Tapeine, aged 25, and has two brothers, Horos and Horion, aged 20 and 7, respectively. By the next census Tapeine is not recorded, presumably divorced or deceased, and Horion, now 21, has married Thenantymis, aged 25, and continues to reside in the family home. By 119 Horos has replaced Peteuris as declarant and head of the household, at the age of 48 (Peteuris is most probably deceased), and has taken a wife, Tapekysis, aged 45. They have a son, as do Horion and Thenantymis.

In the large urban capital of Herakleopolis in the Herakleopolite nome, Petesouchos' family appears over two censuses ([Table 3.7](#)): this is a nuclear family whose only apparent development is the birth of another child and the death of the declarant's mother-in-law. In [Table 3.8](#) a family of renters declared by Philippiana resides in Arsinoe in the Arsinoite nome. The eldest son of the family in 119 becomes the head of the household in 133 on what is presumably the death of his father (who would have been aged 67 in 133). He resides with his wife (who is also his sister) and five children; his eldest sister (now aged 47) has left the household. The head of the household is Sokrates' mother, Zois, whose husband is presumably dead. Tithoes' family in Mesobe, in the Great Oasis ([Table 3.9](#)) changes its structure little between 132 and 146. In 132 the declarant, Tithoes, and his wife, Talaeus, aged 39 and 36, respectively, have two daughters aged 3 and 2; by 146 these family members are all still residing in the house and the daughters remain unmarried, at ages 17 and 16.

These households illustrate the course of households one might expect as parents die and children marry, and demonstrate clearly the significance of marriage in the transformation of families from one stage of their life cycles to another. The sample of families that appear over more than one census is

⁶¹ See Bagnall and Frier, 2006, catalogue notes for 131-Pr-1 and 145-Pr-1.

small, and it is therefore difficult to discern any geographic or socio-economic patterns in family life cycles in this way, other than that in the only rural example from the Arsinoite nome (Peteuris' family in Table 3.6) the family is much larger than urban families of the same nome. One important factor to note is that, in line with what we would expect of families in a society where it is usual for women to move into their new husbands' households, the *frèreche* type of family, in which married brothers live together in their parental home, with their new wives and their own parents, is a common stage. The marriage of sons in a family, then, acts as a catalyst for transformation of that family potentially from one stage of its life cycle to another; the point at which sons marry, from the perspectives of their families, is the focus of the rest of this paper.

MEN'S MARRIAGE PATTERNS AND THE FAMILY

We can use information on the rest of the census population from various stages in individuals' life courses to say something about the life course of the family at various stages, for instance when sons or daughters marry, or when parents or grandparents die. Some 182 recorded men in the census data live in the same household as their father: of these, 56 are over the age at which marriage first occurs (in this case 14 years) and a further 71 are of uncertain age (the age has been lost); 55 are under the usual age of marriage. From these data we can see a total of 23 recorded households in the census data in which married men live in the same household as their father (the details are tabulated in Appendix 2, grouped by region).⁶² From these examples it may be possible to observe trends in male marriage patterns in relation to the life cycle of the families. In some cases the married son is the only child residing in the parental household, suggesting one of three possibilities: either that the married son is the only child, or that his sisters have already married and left the household, or that any other brothers have left the household and are not recorded. Consider, for example, the family declared by the 78-year-old widow Kronous, of Arsinoe (Table 3.12), in which Kronous' 61-year-old son resides with his 60-year-old wife and their two adult offspring, a son and daughter, both unmarried: one might of

⁶² The references in Bagnall and Frier's catalogue are, in catalogue order: 89-Hm-1, 117-Ap-5, 117-Ap-6, 117-Ar-1, 117-Ar-11, 131-Ar-12, 131-He-4, 131-Ox-1, 145-Ar-3, 145-Ar-9, 145-He-2, 159-Ar-1, 159-Ar-10, 159-Ar-11, 173-Ar-9, 173-Pr-5, 173-Pr-15, 173-Me-3, 187-An-2, 187-Ar-4, 187-Ar-8, 187-Ar-22, 215-He-3. To these can be added five families in the census material from the metropolis of Ptolemais in Upper Egypt (the bulk of the census data comes from the Fayyum region), in Bagnall *et al.*, 1997: 89-Pt-9, 89-Pt-27, 89-Pt-36, 89-Pt-47, 89-Pt-61, appendix 2, table 24.

course say in this case that Apronios' mother lives with the adult family, but even so the thing to note is that a married couple in their sixties reside with the husband's mother, and that, in the next generation, single adults aged 21 and 31 are not married, and still reside with their parents. In Arsinoe, the capital of the Arsinoite nome, Mysthes' only child, a son, is married with children (Table 3.15). In neither of these cases does the married son become head of household, or declarant, regardless of the relatively advanced age of his parent.

In other households the married son is one of a number of siblings residing at home, but the only married one. An example is Aurelius Menches' family from the village of Leonidou in the Herakleopolite nome (Table 3.25), in which there are two sons (aged 32 and 29) and one daughter (aged 19); the eldest of these is married, and the others remain single. Hartbos' family, from the village of Tanyaithis in the Apollonopolites nome (Table 3.22), is another example of this. Hartbos has three sons and two daughters, all but one of whom is of marriageable age, but only one of whom is married. Another family from the same village (Table 3.23) is in a similar position: the 59-year-old declarant's one (29-year-old) son is married, with two minor children, and his two daughters, though they are aged 24 and 18, are not married. In Thelbonthon Siphtha, a village in the Prosopite nome (Table 3.29), the 42-year-old declarant's eldest son of 19 years is married and has a minor child, and his other two sons are, themselves, minors. In the large urban capital Oxyrhynchos, of the Oxyrhynchite nome, Heliodoros declares his family: he has two daughters of marriageable age with his present wife, though they are unmarried, and two sons of marriageable age from a previous marriage, one of whom is married and has a minor child (Table 3.30). Pascheis of Hermopolis, a large urban centre in the Hermopolite nome, declares his two sons and two daughters, each of marriageable age (Table 3.27); only one son is married, and has a child of his own. Again, in none of these examples does the married son take on the role of declarant from his parent. The married offspring is often the eldest, but some ages are not certain, and this does not take into account any siblings who may be away from the home and, therefore, not recorded there.

In a large number of families, more than one son or daughter will be married (in many cases to each other). In Dioskoros' family of Arsinoe (Table 3.17) there are three sons and three daughters, and it is the son who was of the declarant's previous marriage who has married, to one of his three half-sisters, and together they have two children; the other siblings remain unmarried, and most ages are lost, though they are likely to be over the age of 14.

In the urban capital of Arsinoe there are several further examples of close-kin marriage. In Pasigenes' family (Table 3.18) the only son (aged 30) is married to one of his four stepsisters (aged 18), and the declarant remains his 61-year-old stepfather. The younger of two sons of Chares' family (Table 3.14) is married (at the age of 21) to his sister (aged 13), and the eldest son (aged 40) is unmarried. Two of the three sons of the declarant in Dioskoros' family (Table 3.17) are married, one to his sister; the unmarried son is aged 17, and their 68-year-old father is the declarant of the household. Sokrates, of Zois' family (Table 3.10), in the list is married to one of his sisters (aged 33), and they reside in the parental home with the mother (who remains declarant) and other, unmarried, sister (aged 28). Apronios alias Pasinikos of the Heron family, aged 21, is the only married son living at the parental home in 133, along with his wife and sister (who is 31). There appear to be two declarants in this family: Apronios, aged sixty-one, and Apronios alias Pasinikos, aged 78. In Petheus' family, from the village of Karanis in the Arsinoite nome (Table 3.20), the 73-year-old declarant's son, aged 40, is married to his sister, whose age is lost.

Outside of the Arsinoite nome there are cases of brother–sister marriage. In the village of Thelbonthon Siphtha in the Prosopite nome, in Pantbeus' family (Table 3.28) the 68-year-old declarant's two sons, aged 35 and 21, are married, the elder to his 13-year-old sister. In the village of Machor in the Herakleopolite nome the 61-year-old declarant's two children aged 31 and 29, who are married to one another, are also declarants, and have four children (Table 3.26). Most examples of brother–sister marriage in these families occur in the Arsinoite nome, and in both urban and rural settings, but primarily in the urban centres.⁶³ Further cases of more than one married offspring living in the parental home can also be observed both within and outside the Arsinoite nome.

The family of Zoilos the elder, of Arsinoe (Table 3.11), is a large household, with three married sons living with their spouses in the same household (two of these sons have children of their own). The youngest son (NN) is aged 19, and the other two are of uncertain age, but one is probably in his twenties (Satabous) and the other is over 30 (Harphaesis). The parents of this family are both aged 60 or over, the father remaining the declarant and the head of the family. The 50-year-old declarant of a family from Arsinoe (Table 3.16) has six sons, two of whom are aged 29 and 26, and married with children, and four of whom are unmarried; the age of one of these is lost, and the others are 9, 7 and 23. A total of five

⁶³ Bagnall and Frier, 2006: 171–3.

conjugal units reside in this household, including those of the declarant and of his sons, one of his nephew's and one of the couple whose relationship to the declarant is uncertain.

In Serempis' family (Table 3.24) of the village of Ankyronon in the Herakleopolite nome, the son and stepson of the declarant are married, aged 20 and 26 respectively; their father, aged 50, remains the declarant. In Peteamounis' family, of the village of Moithymis in the Memphite nome (Table 3.31), there are three married sons, aged 45, 36 and 30, two of whom have a child; their 75-year-old father is still the declarant.

In each of these cases, the married son is not necessarily the eldest son of the household, nor is he necessarily the only married son (or child) in the household. Briefly, from the twenty-three families, nine married sons are the only adult son of the family, and two of these are married to their sisters. In four families all adult sons are married, in one case to his sister. In eight families it is the eldest adult son (or sons) who is married, in one case to his sister, and in two families it is the youngest son (where ages are known) who is the only married son, in one case to his sister. In the five families with married sons from Ptolemais, both adult sons are married in one family, and the only adult son in each of the others is married. It is clear from this, admittedly small, sample that even when household size was very large, men did not tend to leave the household on marriage, irrespective of their age. Households became more extended when sons married and had children, especially when they married their own sisters or half-sisters, as appears to be the case primarily in the Arsinoite nome, but also in the villages and urban centres of other nomes. In most cases the eldest male relative remained sole declarant of the household, whether his eldest or only son was married with children or not; in the cases where there was more than one declarant, it was the married son who took on the extra role, and there is only one case where the married son takes over the role completely. These are some of the trends which can be observed when the life cycle of the family is considered from the perspective of the point at which sons marry, and there are clear distinctions between urban and rural families.⁶⁴

⁶⁴ There are many important distinctions between urban and rural household formation patterns and marriage patterns, both for men and women, which contribute greatly to the variety we see in these phenomena across Egypt itself. See Bagnall and Frier, 2006: *passim*, and Parkin in this volume, pp. 183–4, for a discussion of what this means in terms of empire-wide variety (he suggests that geographic distinction between the populations of the Roman provinces are less important than the distinction between social groups, something which the above discussion supports).

CONCLUSIONS

The population of Roman Egypt has been taken to be typical of pre-modern Mediterranean populations, and of having applicability to populations in the other Roman provinces.⁶⁵ But the geographic patterns of demographic behaviour of pre-modern populations themselves are not as clearly defined as this statement implies. Widespread variety between socio-economic and geographic population groups in the past, in terms of marriage and child-bearing, undermines the universality of European and Mediterranean marriage patterns and their complete applicability to ancient populations; moreover, such variety in marriage patterns, and nuptiality more broadly, has great bearing on fertility patterns and family formation. This makes it difficult to accept the notion that 'nuclear' and 'extended' families appeared only at certain points in European and Mediterranean history, a notion which is further distorted by the fluidity in family formation as families go through demographic life cycles.

The data from the census material can offer an insight into the life course of the family in the recorded population, which can be related to the life course of individuals (although the life course of individuals in Roman Egypt is one which the evidence for mortality and fertility can only partly illuminate). The evidence reveals that the Cambridge typology of households is only useful to the extent that it categorises a household at a particular point in its life course; this limits our understanding of the demographic course of the family. By tracing households across more than one census, we have seen that the shape of households can change dramatically, over one or two generations. The collection of family data can be used to assess the census data from the perspective of the individual's life course. The results indicate a substantial amount of deviation from typical and normative family and household structures in the census population. The number of examples of more than one married son in a household suggests that men tended not to leave the household on marriage; but some did. Such decisions were independent of the age of married sons, the number of siblings they had, or the presence of their mother in the household. The only trend that is constant in this respect is that men and women who marry their siblings tended to remain in the household of their parents.

The demographic life cycle of the family in Roman Egypt – largely dependent on the demographic life cycle of its adult members through proximate determinants of fertility – varied and changed greatly. Fertility

⁶⁵ See Bagnall and Frier, 2006: 171–3.

patterns for women in many European historical populations, in terms of nuptiality (average age at first marriage, divorce, remarriage and so on), often deviated from the patterns predicted by Hajnal's regional marriage patterns; their fertility in terms of family limitation and family formation also deviated from typically pre-modern behaviour as predicted by the demographic transition theory and the Cambridge household typologies. From the perspective of men, fertility and family formation have often varied according to the range of options available to men through marriage; the point at which adult men take over the role of their fathers is the point at which they most influence the formation and development of the family, and this is particularly true of joint households in which those men had other adult siblings.

The material from Roman Egypt can be examined from both of these perspectives, and it is hoped that this paper has demonstrated the value in exploring ways in which this population's fertility, nuptiality and family formation patterns were not fully explained by the demographic transition theory and its associated regional patterns of marriage and family formation.

APPENDIX I. FAMILIES RECORDED ACROSS MORE
THAN ONE CENSUS

Table 3.1. *Eight households appearing in more than one census year.*

Year	Location	Declarant	Ref. in Bagnall and Frier, 2006
1 231, 245	Arsinoe	Aurelios Ammonios	229-Ar-2 <i>BGU</i> III 971.8–15 (231 AD); 243-Ar-4 <i>BGU</i> III 971.16–21 (245 AD)
2 188, 217, 231	Hermopolis	Hermaios alias Pathotes	187-Hm-1 <i>P.Lond.</i> III 923 (188/9 AD); 215-Hm-1 <i>P.Lond.</i> III 935 p.29 (217 AD) and 215-Hm-2 <i>P.Lond.</i> III 936 p.30 (217 AD); 229-Hm-1 <i>P.Lond.</i> III 936 (231 AD)
3 161, 175	Arsinoe	Mysthes alias Ninnos	159-Ar-1 <i>BGU</i> I 55 ii.1–10 (161 AD); 173-Ar-3 <i>BGU</i> I 55 ii.11–22 (175 AD)
4 –	Prosopite	Patermouthis	145-Pr-1 <i>P.Lond.</i> II 324 25–9 p.63; 131-Pr-1 <i>P.Lond.</i> II 324 1–24 p.63
5 91, 104, 119	Bacchias	Peteuris	89-Ar-1 <i>P.Mich.</i> III 176 (91 AD); 103-Ar-8 <i>P.Mich.</i> III 177 (104 AD); 117-Ar-4 <i>P.Mich.</i> III 178 (119 AD)
6 133, 147	Herakleopolis	Petesouchos	131-He-2 <i>P.Bad.</i> IV 75a (133 AD); 145-He-1 <i>P.Bad.</i> IV 75b (147 AD)
7 119, 133	Arsinoe	Declared by Philippiana	117-Ar-1 <i>P.Corn.</i> 16.21–38 (119 AD); 131-Ar-3 <i>P.Corn.</i> 16.39–58 (133 AD)
8 132, 146	Mesobe	Tithoes	131-Oa-1 <i>P.Kell.</i> ined. p 99.2d (133 AD); 145-Oa-2 <i>P.Kell.</i> ined. p 99.2 (146 AD)

Each of these families is detailed separately in Tables 3.2–3.9.

Table 3.2. *The family of Aurelios Ammonios.*

Year	Member	Role and relationship	Age	Marital status
231 AD (229- Ar-2)	Aur. Ammonios	Declarant	48	Married
	Thermoutharion	Wife of declarant	Lost	Married
	NN	Their daughter <i>apator</i>	Lost	Not married
245 AD (243- Ar-4)	Thermoutharion	Declarant <i>apator</i>	Lost	Widowed
	NN	Son	Lost but probably under 14	

Table 3.3. *The family of Hermaios alias Pathotes.*

Year	Member	Role and relationship	Age	Marital status
188 AD (187- Hm-1)	Hermaios alias Pathotes	Declarant	47	Married
	Soueros	Wife of declarant	51	Married
	Hermeinos alias Moros	Their son	21	Not married
	Isidoros	Their son	13	–
	Theognostos alias Moros	Their son	8	–
	Isidora	Their daughter	Under 1	–
217 AD (215- Hm-1 and 215-Hm-2)	Aur.	Declarant (son of original declarant,	49	Not married
	Hermeinos alias Moros	Hermaios alias Pathotes, and his wife, Soueros, both now deceased)		
	Aur.	Brother of declarant	36	Married
	Theognostos alias Moros			
231 AD (229- Hm-1)	Aur.	Declarant (215-Hm-2), wife (and sister?) of Aur. Theognostos alias Moros	30	Married
	Dioskoros			
	Aur.	Declarant (brother of declarant in previous census)	50	Married
	Theognostos alias Moros			
	Aur.	Wife (and sister?) of declarant	44	Married
	Dioskoros			

Table 3.4. *The family of Mysthes alias Ninnos.*

Year	Member	Role and relationship	Age	Marital status
161 AD (159-Ar-1)	Mysthes	Declarant	Lost	Married
	Zozime	Wife of declarant (and a freedwoman)	22	Married
	Mysthes alias Ninnos	Their son	33	–
	Ammonios	Their son	5	–
	Didymos	Their son	4	–
175 AD (173-Ar-3)	Mysthes alias Ninnos	Declarant (son of original declarant)	47	Married
	Zosime	Wife of declarant (and a freedwoman)	38	Married
	NN	Their son	11	–
	Dioskoros	Their son	10	–
	NN	Their son	9	–
	Isodora	Their daughter	8	–

Table 3.5. *The family of Patermouthis.*

Year	Member	Role and relationship	Age	Marital status
Date unclear (131 AD?) (131-Pr-1)	Patermouthis	Declarant	47	Married
	Thaneutis	Wife of declarant	Lost	Married
	Thaesis	Their daughter	Lost	Not married
	Anikos	Their son	Lost	Not married
	Thenthnoupis	Brother of declarant	45	Married
	Demetrous	Wife of Thenthnoupis	Lost	Married
	Thamistis	Daughter of Thenthnoupis and Demetrous	10	–
	Anikos	Son of Thenthnoupis and Demetrous	6	–
	Herpaesis	Brother of declarant	42	Married
	–esies	Wife of Herpaesis	29	Married
	Anikos	Son of Herpaesis and –esies	20	Not married
	Thaseis	Daughter of Herpaesis and –esies	8	–
	Tertia	Daughter of Herpaesis and –esies	4	–
	Pantbeus	Brother of declarant	38	Married

Table 3.5. (*cont.*)

Year	Member	Role and relationship	Age	Marital status
Date omitted (145 AD?) (145-Pr-1)	Thaesis	Wife of Pantbeus	21	Married
	Anikos	Son of Pantbeus and Thaesis	4	–
	Chentmouphis	Head of household	52	Divorced/ widowed
	Anikos	Son of Chentmouphis	20	Not married
	Thamistis	Daughter	24	Not married

Table 3.6. *The family of Peteuris.*

Year	Member	Role and relationship	Age	Marital status
91 AD (89-Ar-1)	Peteuris	Declarant	30	Married
	Tapeine	Wife of declarant	25	Married
	Horos	Brother of declarant	20	Not married
	Horion	Brother of declarant	7	Not married
104 AD (103-Ar-8)	Peteuris	Declarant	44	Not married
	Horos	Brother of declarant	34	Not married
	Horion	Brother of declarant	21	Married
119 AD (117-Ar-4)	Thenantymis	Wife of Horion	25	Married
	Horos	Declarant	48	Married
	Tapekysis	Wife of declarant	45	Married
	Horos	Son of Horos and Tapekysis	Lost	Not married
	Horion	Son of Horos (declarant) and Tapekysis	Lost	Not married
	Horion	Brother of declarant	35	Married
	Thenantymis	Wife of Horion (declarant's brother)	39	Married
	Horos	Son of Horion (declarant's brother) and Thenantymis	1	–

Table 3.7. *The family of Petesouchos.*

Year	Member	Role and relationship	Age	Marital status
133 AD (131-He-2)	Petesouchos	Declarant	28	Married
	Tausiris	Wife of declarant	20	Married
	Pnephoros	Their son	3	–
	Themphrokos	Mother of Tausiris	50+	Divorced or widowed
147 AD (145-He-1)	Petesouchos	Declarant	42	Married
	Tausiris	Wife of declarant	34	Married
	Pnephoros	Their son	17	Not married
	Psenamounis	Their son	5	–
	Pnephoros	Their son (listed as deceased)	9	–

Table 3.8. *The family of renters declared by Philippiana.*

Year	Member	Role and relationship	Age	Marital status
119 AD (117- Ar-1)	Zois	Head of household	53	Presumably widowed
	Sokrates	Her son	32	Married to sister
	Aphrodous	Her daughter	33	Not married
	Aphrodous	Her daughter, and wife and sister of Sokrates	28	Married to brother
	Isarous	Paternal aunt of siblings and sister of husband (deceased) of Zois	70	Not married
133 AD (131- Ar-3)	Sokrates	Head of household	46	Married to sister
	Aphrodous	Wife of Sokrates	42	Married to brother
	Dioskoros	Their son	12	–
	Onesimos	Their son	10	–
	Asklas	Their son	8	–
	Zoidous	Their daughter	6	–
	Herais	Their daughter	2	–

Table 3.9. *The family of Tithoes.*

Year	Member	Role and relationship	Age	Marital status
132 AD (131-Oa-1)	Tithoes	Declarant	39	Married
	Talaeus	Wife of declarant	36	Married
	-s	Their daughter	3	-
	Sentithoes	Their daughter	2	-
146 AD (145-Oa-2)	Tithoes	Declarant	53	Married
	Talaeus	Wife of Tithoes	50	Married
	-s	Their daughter	17	Not married
	Sentithoes	Their daughter	16	Not married
	-ous	Slave of Talaeus	6	-

APPENDIX 2. HOUSEHOLDS WITH MARRIED SONS
RESIDING IN THEIR PARENTAL HOME

The Arsinoite nome

Table 3.10. *Arsinoe, Zois' family.*

Member	Role and relationship	Age	Marital status
Zois	Declarant	53	Probably widowed
Sokrates	Son of Zois and Dioskoros	32	Married
Aphrodous	Daughter of Zois and Dioskoros	33	Not married
Aphrodous	Daughter of Zois and sister-wife of Sokrates	28	Married
Isarous	Paternal aunt of Zois' children	70	Not married

Only son is married (32).

Source: 117-Ar-1. See 131-Ar-3 for same family later on, and Table 3.1, family number 7. *P. Corn.* 16.21-38 (AD 119).

Table 3.11. *Arsinoite, Zoilos the elder's family.*

Member	Role and relationship	Age	Marital status
Zoilos the elder	Declarant	Over 60	Married
NN	Wife	60	Married
Harphaesis	Son of Zoilos the elder and NN	30	Married
NN	Wife of Harphaesis	30	Married
NN	Son of Harphaesis and NN (Harphaesis' wife)	4	-

Table 3.11. (*cont.*)

Member	Role and relationship	Age	Marital status
NN	Son of Harphaesis and NN (Harphaesis' wife)	4	–
NN	Daughter of Harphaesis and NN (Harphaesis' wife)	10	–
Satabous	Son of Zoilos the elder and NN	Lost	Married
NN	Wife of Satabous	18	Married
NN	Daughter of Satabous and NN (Satabous' wife)	1	–
NN	Son of Zoilos the elder and NN	19	Married
NN	Daughter of Zoilos the elder and NN	22	Unmarried

All three sons are married (30, 19 and one age lost).

Source: 117-Ar-II. *P.Lond. Inv.* 1570b (AD 119).

Table 3.12. *Arsinoe, Kronous' family.*

Member	Role and relationship	Age	Marital status
Kronous	Declarant (female)	78	Probably widowed
Apronios	Declarant's son	61	Married
Ammonous	Apronios' wife	60	Married
Apronios alias Pasinikos	Son of Apronios and Ammonous	21	Not married
Kroniaina	Daughter of Apronios and Ammonous	31	Not married

Married son (61) lives with widowed mother.

Source: 131-Ar-12 *ZPE* 98 (1993): 283–91 col. I 23–41 (AD 133).

Table 3.13. *Tebtunis, Herias' family.*

Member	Role and relationship	Age	Marital status
Herias	Declarant (female)	40	Probably widowed
Apias alias Didyme	Declarant's mother	70	Divorced
Kronion	Declarant's son	21	Married
Serapias	Wife of Apronios	18	Married
Protas	Declarant's son	19	Not married
Achillis	Declarant's daughter	15	Not married

Eldest son (21) of female (widowed?) declarant is married; 19-year-old son is unmarried.

Source: 145-Ar-3 *P.Mil. Vogl.* III 194a (AD 146/7).

Table 3.14. *Arsinoe, Chares' family.*

Member	Relationship	Age	Marital status
Chares	Head of household	63	Married
Herois	Wife and half-sister of Chares	41	Married to her half-brother
Atarias	Their son	21	Married
Athenarion	Their daughter, and sister-wife of Atarias	13	Married to her brother
Charition alias Theodote	Daughter	11	–
Didyme	Daughter	Lost	–
NN	Son	40	Not married

Younger son (21) married to his sister; elder son (40) unmarried.
Source: 145-Ar-9 *P.Meyer* 9 (AD 147).

Table 3.15. *Arsinoe, Mysthes' family.*

Member	Role and relationship	Age	Marital status
Mysthes	Declarant	Lost	Divorced or widowed
Mysthes alias Ninnos	Son	33	Married
Zosime	Wife of Mysthes alias Ninnos	22	Married
Ammonios	Son of Mysthes alias Ninnos and Zosime	5	–
Didymos	Son of Mysthes alias Ninnos and Zosime	4	–

Only son (33) of (widowed?) declarant is married.
Source: 159-Ar-1 *BGU* 1 55 ii.1–10 (AD 161).

Table 3.16. *Arsinoe, Herodes' family.*

Member	Role and relationship	Age	Marital status
Herodes	Declarant	50	Married
Eirene	Sister-wife of Herodes	54	Married
Heron	Son of Herodes and Eirene, husband of Neilliaina	29	Married
Neilos	Son of Herodes and Eirene	26	Married
Sarapion	Son of Herodes and Eirene	Lost	–

Table 3.16. (*cont.*)

Member	Role and relationship	Age	Marital status
Herakleides	Son of Herodes and Eirene	9	–
Euporas	Son of Herodes and Eirene	7	–
NN	Son of Herodes and Eirene	23	Not married
Neilliaia	Daughter of Herodes and Eirene, sister–wife of Heron	Lost	Married
Thaisarion	Daughter of Herodes and Eirene	17	Not married
Herodes	Son of Heron and Neilliaia	1	–
Tryphon	Son of Herodes and Neilliaia	1	–
Thermoutharion	Wife of Neilos	19	Married
NN	Son of Neilos and Thermoutharion	13	–
Heron	Son of Neilos and Thermoutharion	13	–
Heron	Nephew (son of Herodes' deceased brother)	34	Married
Apion	Nephew (son of Herodes' deceased brother)	24	Not married
Herakleides	Nephew (son of Herodes' deceased brother)	19	Not married
Thaisarion	Wife of Heron (Herodes' 34-year-old nephew)	17	Married
Syra	Daughter of Heron and Thaisarion	1	–
Neilos	Non-kin	44	Married
Eirene	Sister–wife of Neilos	52	Married
Kastor	Son of Neilos and Eirene	8	–
Heron	Brother of Thermoutharion	34	Not married
Melanas	Brother of Thermoutharion	32	Not married
Heron	Brother of Thermoutharion in main family, above	26	Not married
NN	Sister of Heron	23	Not married

Two apparently eldest adult sons of declarant (29, 26) married; one adult son (23) unmarried; one adult son (age lost), marital status unknown; two minor sons. Of three adult nephews (declarant's brother), eldest (34) is married; youngest (24, 19) are unmarried.

Source: 187-Ar-4 BGU I 115 I (AD 189).

Table 3.17. *Arsinoe, Dioskoros' family.*

Member	Role and relationship	Age	Marital status
Dioskoros	Declarant	68	Married
Thaisarion	Wife (freedwoman)	Lost	Married
Horion	Their son	Lost	Married
NN	Their son	17	Not married
Satornilos	Their son	Lost	Married to his sister
Harpokratania	Their daughter, and wife of Satornilos	0	Married to her brother
Satornilos	Son of Satornilos and Harpokratania	Lost	–

Table 3.17. (*cont.*)

Member	Role and relationship	Age	Marital status
Satornilia	Daughter of Satornilos and Harpokratiana	14	–
Artemidora alias ? Dioskorous	Declarant and wife's daughter	Lost	–
Tasoucharion	Declarant and wife's daughter	Lost	–
Than(<i>Apatores</i>	29	Not known
Sarapous	<i>Apatores</i>	8	Not known

Of three sons, one (age lost) is married, one (17) is unmarried and one (age lost) is married to his sister.

Source: 187-Ar-8 BGU I 117 (AD 189).

Table 3.18. *Arsinoe, Pasigenes' family.*

Member	Role and relationship	Age	Marital status
Pasigenes	Declarant	61	Married
Herakleia	Declarant's wife	40	Married
Thasis	Their daughter	5	–
Sabeinos	Their daughter	18	Not married
Sarapias	Their daughter	22	Not married
Tapesouris	Their daughter (also wife of Eutyches)	18	Married to half-brother
Eutyches	Declarant's son (by previous marriage)	30	Married to half-sister

Declarant's only son (30) is married to his half-sister.

Source: 187-Ar-22 P. Tebt. II 322 (AD 189).

Table 3.19. *Karanis, Sisois' family.*

Member	Role and relationship	Age	Marital status
Sisois	Declarant	29	Married
Thermouthis	Declarant's wife	2[]	Married
Thermouth[Their daughter	Lost	–
Besas	Declarant's brother	2[]	Not married
Teonchonsis	Declarant's sister	14	Not married
Sisois	Declarant's cousin	Lost	Unknown
Thermouthis	Declarant's mother	54	Divorced or widowed

Of (widowed?) mother's two sons, one (29) is married and one in his twenties is unmarried.

Source: 159-Ar-10 BGU II 524 (AD 160/1).

Table 3.20. *Karanis, Petheus' family.*

Member	Role and relationship	Age	Marital status
Petheus	Declarant	73	Married to his sister
Isidoros	Declarant's son	40	Married to his sister
Ninnaros alias Ptolemaios	Son of Isidoros and Taonnophris	2	Married
Dideis	Sister–wife of Petheus	Lost	Married to her brother
Taonnophris	Daughter of Petheus and sister–wife of Isidoros	Lost	Married to her brother

One son (40) married to his sister.

Source: 159-Ar-II *P.Lond.* II 182b (p.62) (AD 160/1).

Table 3.21. *Karanis, Ptollos' family.*

Member	Role and relationship	Age	Marital status
Ptollos	Declarant	48	Married to his sister
Ptolemais	Sister and wife of declarant	38	Married to her brother
Vettia	Their daughter	Lost	–
Harpokras	Declarant's brother (in tax flight)	44	Not married
Vettia	Declarant's mother	72	Probably widowed
Other kin	Unclear		Unmarried

Of (widowed?) mother's two sons, one (48) is married to his sister and one (44) is unmarried and in tax flight.

Source: 173-Ar-9 *BGU* II 447 (AD 174).

Apollonopolites nome

Table 3.22. *Tanyaithis, Hartbos' family.*

Member	Role and relationship	Age	Marital status
Hartbos	Declarant	65	Married
Hartbos	Son of Hartbos and Tapeeis	Lost	Married
Pachoumis	Son of Hartbos and Tapeeis	Lost	–
Bekis	Son of Hartbos and Tapeeis	2	–
Tapeeis	Wife	Lost	Married
Senorsenouphis	Daughter of Hartbos and Tapeeis	20	Not married
Senosiris	Daughter of Hartbos and Tapeeis	16	Not married
Senrophis	Wife of Hartbos	20	Married

Of declarant's three sons, one (age lost) is married, one (age lost) is of unknown marital status and one is a minor.

Source: Tanyaithis (Apollonopolites) II7-Ap-5 *P.Brem.* 32 (AD II9).

Table 3.23. *Tanyaithis, Miusis' family.*

Member	Role and relationship	Age	Marital status
Miusis	Declarant	59	Married
Senpachompsais	Wife	53	Married
Pachoumis	Son of Miusis and Senpachompsais	29	Married
Pachoumis younger	Son of Pachoumis and Thatres	1	–
Senosiris	Daughter of Miusis and Senpachompsais	24	Not married
Senartbos	Daughter of Miusis and Senpachompsais	18	Not married
Thatres	Wife of Pachoumis	18	Married
Senpachoumis born to Pachoumis	Child of Pachoumis	1	–

One adult son (29) is married; one son is a minor.

Source: 117-Ap-6 *P.Brem.* 33 (AD 118/19).

Herakleopolite nome

Table 3.24. *Ankyronon, Serempis' family.*

Member	Role and relationship	Age	Marital status
Serempis	Declarant	50	Married
Thenosiris	Wife	54	Married
Patermouthis	Their son	20	Married
Thenamounis	Wife of Patermouthis	16	Married
Taas	Daughter	Not given	Married
Nouris	Nephew of Serempis (son of his deceased brother)	30	Not married
Patermouthis	Nephew of Serempis (son of his deceased brother)	26	Not married
Pnephoros	Son of Thenosiris	26	Married
Tamounis	Wife of Pnephoros	18	Married
Taphorsois	Sister of Tamounis	Not given	Married
Taas	Sister of Tamounis	Not given	Married

Two adult sons (20, 26) are married; one nephew, declarant's deceased brother's son (26), not married.

Source: 145-He-2 *P.Corn.* 17 (AD 147).

Table 3.25. *Leonidou, Aurelius Menches' family.*

Member	Role and relationship	Age	Marital status
Aurelius Menches	Declarant	60	Divorced or widowed
Aurelius Horos	Son	32	Married
The[Wife of Aurelius Horos	31	Married
Ps[-]	Son of Aurelius Horos and The[4	–
Nechthenibis alias –	Declarant and wife's son	29	Not married
Tsenatis	Declarant and wife's daughter	19	Not married

Of two sons, one (32) is married, one (29) is not married.

Source: 215-He-3 *P.Oxy.* XXXIII 2671 (AD 216/17).

Table 3.26. *Machor, Piathres' family.*

Member	Role and relationship	Age	Marital status
Piathres	Declarant	61	Not married
Psois	Declarant and son of Piathres and Thautis	31	Married
Thapetemounis	Declarant and daughter of Piathres and Taphel(), and sister-wife of Psois	29	Married
Chath()	Son of Psois and Thapetemounis	14	Not married
Achorais	Daughter of Psois and Thapetemounis	6	–
Thaphe. . . es	Daughter of Psois and Thapetemounis	3	–
Thaara..	Daughter of Psois and Thapetemounis	2	–

Of three adult sons, two (31, 29) are married, one (14) is not married.

Source: 131-He-4 *P.Bon.* I 18, col. II (AD 133).

Table 3.27. *Hermopolis, Pascheis' family.*

Member	Role and relationship	Age	Marital status
Pascheis	Declarant	Lost	Divorced or widowed
Harpaesis	Son	Lost	Not married
Inarous	Son	20	Divorced or widowed
Tothes	Son of Inarous	1	–
Taseus	Daughter	17	Not married
Tanarous	Daughter	14	Not married

Of three sons, one (age lost) is of unknown marital status, one (20) is divorced or widowed, one is a minor.

Source: 89-Hm-1 *P.Hamb.* I 60 (AD 90).

*Prosopite nome*Table 3.28. *Thelbonthon Siphtha, Pantbeus' family.*

Member	Role and relationship	Age	Marital status
Pantbeus	Declarant	69	Married
Taapolis	Wife	52	Married
Isidoros	Their son	3	—
Pkouthis	Declarant's son by a previous marriage	35	Married
Thermouthis	Wife of Pkouthis	16	Married
Phibis	Son of Pantbeus and Taapolis	21	Married to his sister
Thermouthis	Daughter of Pantbeus and Taapolis, sister-wife of Phibis	13	Married to her brother
Taaronnesis	Daughter of Pantbeus and Taapolis	24	Not married

Of three sons, one (35) from a previous marriage is married, one (21) is married to his sister, one son is a minor.

Source: 173-Pr-5 *P.Brux.* 1 5 (AD 174).

Table 3.29. *Thelbonthon Siphtha, Thermouthis' family.*

Member	Role and relationship	Age	Marital status
Thermouthis	Declarant	42	Divorced or widowed
Tithoennesis	Son	19	Married
Areia	Wife of Tithoennesis	16	Married
Thermouthis	Daughter of Areia	1	—
Perpheis	Son of Thermouthis	10	—
Dionysios	Son of Thermouthis	9	—

One son (19) is married; two sons are minors.

Source: 173-Pr-15 *P.Brux.* 1 1. Complete (AD 174).

*Oxyrhynchite nome*Table 3.30. *Oxyrhynchos, Heliodoros' family.*

Member	Role and relationship	Age	Marital status
Heliodoros	Declarant	Lost	Married
Ptollous	Wife	60	Married
NN	Son	Lost	Married
NN	Relationship uncertain	Lost	Not known
NN	Relationship uncertain	Lost	Not known
NN	Relationship uncertain	3	Not known
Dionysios	Son of Heliodoros and [Tne]phersois	20	Not married

Table 3.30. (*cont.*)

Member	Role and relationship	Age	Marital status
Kleopatra	Daughter of Heliodoros and Ptollos	20	Not married
NN	Daughter of Heliodoros and Ptollos	15	Not married
NN	Daughter of Heliodoros and Didyme	20	Not married
NN	Relationship uncertain, female	50	Not known
-is	Daughter-in-law	25	Married
NN	Granddaughter	5	-
Heliodoros	Son	Lost	Married
NN	Relationship uncertain, male	Lost	Not known

One son (20) is married.

Source: 131-Ox-1 *PSI* I 53, col. 1 (AD 132).

Memphite nome

Table 3.31. *Moithymis, Peteamounis' family.*

Member	Role and relationship	Age	Marital status
Peteamounis	Declarant	75	Divorced or widowed
Ammonas	Son	45	Married
Jis	Wife of Ammonas	40	Married
NN	Daughter of Ammonas	4	-
Horos	Son	36	Married
Taoris	Wife of Horos	31	Married
Amounis	Daughter of Horos and Taoris	4	-
NN	Son of Peteamounis	30	Married
-asis	Wife of NN	19	Married

Three sons are married (45, 36, 30).

Source: 173-Me-3 *SPP* XX II (AD 174).

Table 3.32. *Antinoopolis, Valerius alias Philantinoos' family.*

Member	Role and relationship	Age	Marital status
Valerius alias Philantinoos	Declarant	24	Married
Didyme	Wife	21	Married
Sarapion	Father	38	Divorced or widowed
Diodora	Slave	42	Not married
Koprias	Slave (child of Diodora?)	15	Not married

Son (declarant, 24) is married.

Source: 187-An-2 *PSI* XII 122 (AD 188).

Table 3.33. *Families in Ptolemais.*

89-Pt-9 <i>P. Oxy.</i> VI 984A. 39–58 (AD 91–2)	Two sons, ages lost, both married
89-Pt-27 <i>P. Oxy.</i> VI 984A. 183–90 (AD 91–2)	Only son, married, age 39
89-Pt-36 <i>P. Oxy.</i> VI 984A. 239–44 (AD 91–2)	Only son, married, age 29
89-Pt-47 <i>P. Oxy.</i> VI 984A. 349–53 (AD 91–2)	Only son, married, age lost
89-Pt-61 <i>P. Oxy.</i> VI 984A. 434–41 (AD 91–2)	Only son, married, age lost

Source: Bagnall, Frier and Rutherford, 1997.

CHAPTER 4

Family matters: fertility and its constraints in Roman Italy

Saskia Hin

INTRODUCTION

As yet, fertility in the ancient world has not received full attention from a behavioural perspective. This paper adds to recent attempts to put our understanding of childbearing in the ancient world into a wider theoretical perspective. It aims to re-evaluate the hypothesis of the occurrence of a fertility decline in Roman republican Italy with the help of demographic theory.

The theory concerning fertility behaviour during the late Roman republic that has been put forward previously by Brunt depends largely on an argument of economic rationality.¹ As poverty rendered childbearing irrational from an economic perspective, a fertility decline would have set in on the Italian peninsula. However, while Brunt's population development scenario is still influential among republican historians, traditional rational choice theory (RCT) – which originates from the discipline of economics and assumes that human behaviour is the result of decisions made by rational preference ranking – has long come under fire. The shortcomings of RCT have been revealed by experimental economics and game theory, and have affected a wide range of disciplines.² It is now widely accepted that decision-making processes are embedded in specific cultural and social settings that affect outcomes through the creation or upholding of practical, structural, normative and/or perceived constraints.

I wish to thank Jeremia Pelgrom, Luuk de Ligt and Walter Scheidel for their useful comments.

¹ Brunt, 1987: ch. II.

² Cf. Boudon, 1998. In the field of political science, for example, rational choice theory has sparked criticism for its inability to explain voting behaviour. Cf. e.g. Landmore, 2004, who quite correctly describes her article 'Politics and the economist-king: is rational choice theory the science of choice?' as 'another unapologetic contribution to 'the gentle art of rational choice bashing''. An amalgam of responses has been put forward by rational choice theorists in different disciplines. The most significant modifications consist in the introduction of the concepts of 'bounded rationality' (Simon, 1957b) and 'unintended consequences of individual rational action'. For criticism of rational actor models in a demographic context, cf. Riley and McCarthy, 2003: 85f.

In the field of modern demography, criticism of the focus on economic rationality emerged with the failure of the European Fertility Project to explain the timing of fertility declines in purely economic terms.³ Perspectives from the fields of cultural anthropology and human evolutionary ecology have since been employed to approach the phenomenon of fertility. Therefore, for the Roman republic a reappraisal of the processes and interactions underlying fertility behaviour that accommodates the insights of a wider spectrum of approaches seems due. This paper briefly sets out the main arguments against a substantial fertility decline in the late republic, and aims at encouraging a more fundamental embodiment of demographic theory in further studies.

ECONOMIC INCENTIVES: CHILDREN AS AN ASSET
TO THE HOUSEHOLD

The late Roman republic was characterized by expansion. In Brunt's view, this expansion coincided with the absence of natural demographic growth among Roman citizens in Italy.⁴ According to him, it was not just (excess) mortality that curbed growth, but also a deliberate limitation of fertility by all Romans that was induced by economic motivations. As he put it in his still influential *Italian Manpower*:

If the rich sought to limit the number of their children in order to keep together their wealth, smaller proprietors will have acted in the same way, in order to protect their natural heirs against penury. [...] Thus the rich and the peasant proprietors (or tenants) must have desired to restrict the number of their children. The *proletarii* simply could not afford them. For this reason, as contended earlier, many must have remained celibate; if they chose to marry, or if they already had wives before they fell into destitution, they had every motive to avoid procreation in the first place, and if they failed in this, to abstain from rearing the children born.⁵

Caldwell's 'wealth flows' theory is the most influential view on fertility among pre-transitional societies to have emerged in the field of anthropological demography. It stands in marked opposition to Brunt's idea that deliberate fertility limitation was widespread among the inhabitants of Roman Italy. Instead, pre-industrial societies would by default be characterized by high fertility among the mass of the poor, since in societies where education costs are low or non-existent, children are an economic asset to

³ Roth, 2004.

⁴ Brunt, 1987: e.g. 154–5. See Hin, in press, on demographic developments in late republican Italy.

⁵ Brunt, 1987: 142–3.

their parents.⁶ According to this view, children compensate for the little food and other means of subsistence (mainly clothing) they need. They do so through the positive contributions of their labour to their family's income, as well as through their insurance value in times of danger, disaster, and parents' old age. Net lifetime wealth flows run upwards from children to parents; benefits outweigh costs and procreation is stimulated.⁷ Therefore high fertility rather than fertility limitation is economically rational, and poverty and fertility in the context of pre-industrial societies show a positive rather than a negative correlation. The Caldwellian framework thus predicts by contrast that fertility in Roman Italy was invariably high.

Yet in the wake of Caldwell's first publication a substantial debate has emerged in the fields of anthropology and demography as to whether children in pre-industrial societies actually compensate for their consumption, and, if so, at which age benefits start outweighing costs. A wide range of ages have been designated as 'break-even points'. Whereas some argue that a child already produces more than it consumes by about the age of twelve, others hold that the break-even point (that is, exclusive of compensation for deficits previously accumulated) is only reached somewhere between twenty and twenty-nine. These latter studies instead imply that children are a net drain, or even a substantial net drain, on household resources.⁸ The range of outcomes provided by the anthropological surveys is indicative of the seriousness of their methodological shortcomings. Its most fundamental weaknesses are that lower labour productivity of children relative to adults, as well as consumption costs, are often not accounted for. Children's net contributions to the income of the household therefore tend to be overestimated.⁹

In fact, it seems to be only outside the context of smallholder agriculture that children are an economic asset. If children are to contribute positively

⁶ First presented in Caldwell, 1982, and thereafter elaborated in numerous publications, most recently Caldwell, 2005, where he states (721–3) that people in pre-industrial societies had 'rational reasons for not adopting contraception'.

⁷ Caldwell, 2005: 334.

⁸ Nag *et al.*, 1978; De Tray, 1983; Dow and Werner, 1983; and Clay and Van der Haar, 1993 – as well as Caldwell, 2005 – regard children as net contributors to the family income. The opposite conclusions based on fieldwork are to be found in Mueller, 1976; Stecklov, 1999; Lee, 2000; Lee and Kramer, 2002. Cf. also Kaplan and Lancaster, 2003: 122.

⁹ Surprisingly, some of the often-cited work does not set production against consumption, but somehow manages to provide the outcome of the equation based on only one part of the calculation: for example, Nag *et al.*, 1978, and De Tray, 1983. For methodological criticism of anthropological surveying in this context, cf. Bardhan, 1978. Mueller, 1976, and Lee and Kramer, 2002, do take account of both consumption and production, as well as the factor of differential productivity per hour.

to the economic wealth of a household, this requires the availability of non-familial labour contexts in which they can work long hours, day in, day out, as hired labourers. Only in this way can they overcome the negative effects of structural underemployment that prevail in pre-modern agricultural systems such as that of Roman Italy. By contrast, on a farm where there is on average little work to do throughout the year, their opportunities to contribute are simply too scanty to compensate for the costs of their upbringing. In so far as the ancient evidence suggests that their labour contributions made children economically beneficial to their parents during childhood, it is outside the agricultural context.

This is exactly what the picture sketched by Caldwell shows, notwithstanding the fact that he presents it as though it were characteristic of any Roman childhood spent outside the upper class: 'lower-class children were put to work around 10 years of age, working from dawn to sunset and placing their earnings in the common family budget', the level of their earnings enhanced 'by first placing them in apprenticeships such as nail-making, copperwork, shorthand, woolcarding, linen and mat weaving, and building'.¹⁰ In reality the overwhelming majority of children in Roman Italy grew up in an agricultural context. The conclusion must therefore be that children were an economic drain rather than a net gain to the household budget. Moreover, one needs to account for the fact that Roman life expectancy at birth is thought to have been near 25 partly because of high infant mortality.¹¹ This phenomenon drives mean costs per child upwards.¹² It renders the scenario of economically beneficial children even more unlikely.

By implication, if the thesis is to hold that high fertility among the poor was effectively the result of the economic value of children – and is to affect our views of demographic developments during the late republic – it must have been their value as an old-age security investment that shifted the balance to favour fertility.¹³ For ancient Italy we may indeed hold that there were few alternatives to rely on but children, except for those who were fortunate enough to provide for their old age by financial reserves that they had built up. The question is merely whether this would have been a strong incentive to have children in the first place. Lack of other investment

¹⁰ Caldwell, 2004: 4; also Bradley, 1985: 319–20, 323. Our best source of information consists of the Egyptian apprenticeship documents that mostly concern slave children and the sons of artisanal families working in the textile industry.

¹¹ But see discussion in Akrigg in this volume, p. 50, and Parkin in this volume, pp. 185–6, of our understanding of ancient infant mortality.

¹² Cf. Robinson, 1997: 67. ¹³ Cain, 1983; Friedlander *et al.*, 1999: 505–6.

options to secure future well-being need not necessarily induce people to invest in children for security reasons, if the returns of those investments will be insecure and located in a distant future. One of the difficulties that arises is to what extent we can expect young people to base their behaviour on considerations pertaining to such a distant future.¹⁴ Children may have been 'the best deal around'.¹⁵ Still, if we want to hold that the main reason why poor young Romans had children was old-age security, the implication is that human tendencies towards preoccupation with present rather than future benefits and costs were overcome in a conscious decision-making process.

It is this set of assumptions that has led to criticism of the wealth flows theory. It is not necessarily true that the inclination to avoid long-term investments with insecure returns would be overturned. Indeed, when considering whether concern about old-age security was the major stimulus for fertility in ancient Italy, we should take the prevailing mortality conditions into account. They prescribe that parents – especially fathers – had a rather substantial chance of dying before or by the time their children (if those survived) would return their investments.¹⁶ This notion sits somewhat uneasily with the hypothesis that childbearing was a provision for old age. Putatively the stimulus to high fertility and continued childbearing could be searched for in the assistance that children provide to their parents in nursing their younger siblings.¹⁷ Also, the hazardous living conditions in the ancient world heightened the risk of disabilities and health conditions that made one already dependent upon others at an early age. 'Old-age security' was therefore perhaps an issue well before old age, and in this way could have encouraged childbearing among the young.¹⁸ However, as it stands, micro-economy seems unable fully to explain why adults should (marry and) have children in the first place, despite their poverty.

¹⁴ Cf. Robinson, 1997: 68, on human disinclination to invest in 'prevention' utilities (such as insurance) which are classified as 'negative goods' in economists' jargon.

¹⁵ Lee, 2000: 47.

¹⁶ According to the demographic micro-simulation performed by Saller, 1994: 51, table 3.1.d, at age twenty-five only 40 per cent of children would still have a living father – if we may take that age as a 'turning point' where benefits start to outweigh costs. Half of those fathers would die within the next five years. Mothers would be in larger supply: the percentage of all egos at age twenty-five that had a living mother was 60 per cent. Thus, while only two out of five fathers would survive to the (hypothetical) point where potential children would become beneficial in economic terms, three out of five mothers did. Cf. also Saller, 1987. See also Parkin in this volume, p. 186.

¹⁷ As suggested by Lee and Kramer, 2002.

¹⁸ It is estimated that in populations with a low overall life expectancy, individuals spend up to one-sixth of their lives in disability. Cf. Scheidel, 2007b: 41.

TOWARD CHILDBEARING: AN ALLIANCE OF BIOLOGY
AND CULTURE

What other factors aside from the economic value of offspring affect people's reproductive behaviour? Agreement emerged as to one matter: the notion that the onset of fertility decline was the result of economic factors was empirically contradicted, and the dominant consensus – to speak with Alter – ‘dramatically shattered’.¹⁹ Scientists focusing on the current fertility developments in both transitional and modern societies now hold that declines in the number of offspring per woman show a very strong correlation with what tends to be described as ‘the empowerment’ of women. Education and professional development have been designated as important factors in explaining marked diminishment in (or even the entire disappearance of) procreation through genes among women. Since both education and professional development tend to compete with motherhood for time and other forms of investment that are highly valued, their accessibility may alter preferences and distort reproductive behaviour.²⁰ Apart from education and/or professional development, these may obviously include an array of consumption goods and services to which access has been boosted. In other words, the opening up of alternative time investment options has worked as a major disincentive to childbearing.²¹

For women in ancient Italy, alternatives to genetic replication were far from omnipresent. Non-familial labour opportunities were constrained by structural underemployment as well the availability of slave women, and education was not within reach for the overwhelming majority of women. These structural conditions fit the average pattern for pre-modern agrarian societies, where the vast majority of people are illiterate and live in relatively isolated villages. In such contexts cultural transmission is overwhelmingly vertical, not horizontal. The predominance of this type of socialization is brought about because, for the majority of the population, the family is the most significant social institution, where production, consumption and

¹⁹ Alter, 1992.

²⁰ There is a vast body of literature on the importance of the ‘agency role’ or ‘status’ of women for the reduction of fertility, notably on the role of education. See, for example, Sen, 1999: 195f.; McDonald, 2000; Presser and Sen, 2000. The economist-demographer Folbre, 2001: 373, makes the bizarre but telling suggestion that ‘perhaps what policymakers [in Western countries worrying about fertility decline] consider the optimal rate of population growth requires some optimal level of female empowerment (just enough but not too much)’.

²¹ From a human evolutionary perspective, one might say that ‘genes’ as sexual replicators now compete with ‘memes’ as cultural replicators for prime position in cost–benefit balancing connected with fertility decisions. Cf. Dawkins, 1989: ch. 11, and Richerson and Boyd, 2005: 70f. and 150f.

normative education concentrate. This favours norms that encourage reproduction in order to increase the power of one's lineage, and leads to the depiction of childlessness as a condition of misfortune.²²

In Latin literature we find powerful evidence for the idealization of motherhood and family-oriented values, in political, religious and social contexts. We may truly speak of a standard catalogue of female virtues that stresses marital fidelity, wifely and motherly devotion, and dedication to housework.²³ In a funerary inscription a man adds to such typical praises the following comment, thus invoking the suggestion that taking care of a family is naturally and invariably a woman's role: 'Praise for all good women is simple and similar [. . .] they have all done the same good deeds [. . .] since their lives fluctuate with little variety.'²⁴ Others, set up for young girls, lament the fact that they died.²⁵ Relief and sculpture art tell the same story: the portrayal of women often symbolizes reproductive sexuality, dynastic continuity, and marital and familial concord.²⁶ The strong normative emphasis on the virtue of motherhood discernible in the ancient sources reflects that 'in Rome, as in many societies, motherhood had always established or enhanced a woman's status', and 'fertility was associated with the general good'.²⁷ The woman known as 'Turia' has become the embodiment of Roman procreative norms through the preservation of her suggestion to her husband to divorce her because her infertility deprived him of the offspring *she felt* he should have.²⁸ Richerson and Boyd's dual inheritance theory points to the demographic transition as an example of how natural selection pressures for cultural adaptation may lower genetic fitness.²⁹ However, examples such as these underscore the notion that, among the mass of the population of Roman Italy, culture and biology did not function as counteracting forces in the context of fertility. Rather, biological urges toward sexual reproduction were reinforced and even strongly encouraged by 'cultural' ideology, in which 'cultural' may be replaced by 'religious', 'social' or 'political'.

²² Richerson and Boyd, 2005: 170. ²³ For example, Forbis, 1990. ²⁴ *CIL* VI 10230.

²⁵ For example *CIL* III 2875 (Nedinum, Dalmatia), for a fourteen-year-old girl; *CIL* VI 9342 (seventeen years) and 20892 (fourteen years); *CIL* VIII 21445 (Mauretania Caesariensis, in Greek); *CLE* 153. More examples are referred to in Lattimore, 1942: 194. Cf. as well Pliny's letter to Aefulanus Marcellinus for a literary example (*Ep.* v.15).

²⁶ As shown, for example, by Kampen, 1991. ²⁷ Dixon, 1988: 71.

²⁸ *Laudatio Turiae*, ll. 25–50, in Hemelrijk, 2001a, 2001b (Dutch translation and commentary), with Hemelrijk, 2004; Flach, 1991.

²⁹ Richerson and Boyd, 2005; also Roth, 2004.

CHILDLESSNESS AND BACHELORHOOD – DID THE
ELITE SET A TREND?

Even so, we find references to several plants and drugs described as contraceptive or abortifacient, as well as evidence of exposure and infanticide: predicted behaviour does not necessarily equal actual behaviour. Our question, however, should focus on which circumstances could have created different patterns from what we would expect, given the conditions sketched above, and why. It is helpful to have a brief closer look at the material. The author of the Hippocratic corpus explains why we should trust his description of the development of the human foetus:

You might wonder how I know this: well, I have learned much in the following way. The common prostitutes, who have frequent experience in these matters, after having been with a man know when they have become pregnant, and they destroy the child. When it has been destroyed, it drops out like a piece of flesh.³⁰

Other sources refer not to professional sex workers, but to elite contexts, and proffer a wide range of comments suggesting low fertility among Roman women who belonged to the upper class. The best known and perhaps most telling example is Augustus' marriage laws that penalized the unmarried and childless and rewarded the prolific.³¹ 'Ordinary' population groups, as so often, do not come to the fore in the sources.

On the grounds that the plants and drugs mentioned by ancient authors were effective, available and used on a large scale, however, Riddle argues that they affected overall population trends. Indeed, he points out that modern laboratory research and, sometimes, animal testing or their use by people in traditional societies have established that at least some of the plants and drugs mentioned had spermicidal effects, or contained chemicals that induce distortions of the delicate hormonal balance necessary to ensure reproduction.³² But his subsequent inference that they were used on a large scale justifies Frier's comment that 'Riddle is clearly unfamiliar with demography'.³³ Substantial fertility decline is characterized by the limitation of family size to a specific number of children, a practice that can be tracked down by the presence of so-called parity-specific stopping behaviour. The

³⁰ Hp. *Carn.* 8.19 (*On Fleshes*, ed. and trans. P. Potter, Loeb Classical Library).

³¹ For example, Dixon, 1988: ch. 4.

³² Riddle, 1992: 32f., 1997. Caldwell, 2004: 7–8, challenges Riddle's findings on the effectiveness of some of them, but only presents material that antedates Riddle's work and fails to convince on this specific matter.

³³ Frier, 1994: 328. Cf. also Scheidel, 2001c: 38–9, and Caldwell, 2004.

analysis of the only data that allow for it, the Egyptian census records, shows no indication of the presence of such behaviour, and neither do data on other pre-industrial populations.³⁴ This shows that there were fundamental differences between post-transitional and pre-transitional fertility regimes, and confirms what the qualitative evidence cited above strongly suggests: that, in general, motherhood and fertility were highly valued and favoured by prevailing norms and conditions, and that people would not be inclined to stop after a certain number of children.³⁵ With reference to data on Assyria and medieval Europe, Riddle rejects the Egyptian findings as evidence of a natural fertility regime.³⁶ He argues that they deviate substantially from the standard pre-transitional pattern and that, in reality, fertility must have been much lower and indicative of fertility limitation and population decline. However, his argument is based on the completely misguided assumption that the number of children living in a family equals fertility rates, whereas the demographic life cycle demonstrates that the total number of offspring may be much higher than that living in the household at a certain moment.

There are more grounds to doubt a large-scale spread of fertility limitation among the free inhabitants of Roman Italy and to reject Brunt's designation of it as a cause for natural demographic decline. The prostitutes referred to above obviously had clear incentives to seek resort to abortion (and other methods) in order to ensure that their work would not be hindered by pregnancy and offspring. For them, the cost of children was very high. But we cannot declare their motivations applicable to the average Roman woman. To establish the likelihood of elite behaviour 'trickling down' towards the mass of the population, we must return to the phenomenon of ideology. It is the manoeuvring of Roman upper-class women that testifies to the firewalls put up by ideology: they could exert political influence, but provided that it be 'on the stage, behind the curtain'.³⁷ If, for example, they exerted political influence overtly and directly, rather than through their male relatives, they lost all (ideological) connection with the family context or traditional values, and risked being depicted in fairly negative terms. Another illustration of the phenomenon is given by Hemelrijk, who has shown how status demanded some education for women among the elite. But at the same time it asked for a defence, which led to the creation of the ideal of the 'matrona docta' that stressed

³⁴ Cf. Frier, 1994; see also Pudsey in this volume.

³⁵ But see below, p. 110, and Pudsey in this volume, pp. 70–2, on the many deviations from 'natural fertility' even among pre-transitional populations.

³⁶ Riddle, 1997: 16–18. ³⁷ Hillard, 1992.

how education enhanced a woman's qualities as a mother and benefited her children. The contradictory demands of class and gender met with ambivalent feelings as regards the education of upper-class women. In this respect, it is elucidative that the defence of the education of their own daughters by both men and women could coincide with negative verdicts on the education of girls in general, or that of other families.³⁸ It shows us how strongly the barriers that needed to be overcome could be felt, even where a break with tradition was considered to be required or desirable to maintain status.

The same striving for preservation of political, economic and social status is thought to lie behind decisions concerning marriage and fertility among the upper class. The limitation of childbearing in elite circles is said to have been induced by the wish to forgo the division of (landed) property. Clearly, such land division would bring about future impoverishment. For members of the highly competitive elite strata this would entail not just a loss of economic assets, but, more importantly, the decline of political and social status. The risk of a considerable slide downwards through overproduction was real, and the system of adoption of (adult) sons offered an efficient adaptive strategy to safeguard future political and social influence. Moreover, as a result of their wealth and status, elite men had plenty of access to resources for sexual satisfaction other than their legitimate wives, notably slaves and concubines. These enabled them to separate the desire to maximize offspring quantity from the desire to maximize offspring quality, and optimize what Scheidel terms 'marginal reproductive success'.³⁹

The behavioural strategies of European elites between 1600 and 1900 narrowly match Polybius' description of ancient Greece: 'ostentation, the love of money, and the habits of indolence have made men unwilling to marry, or if they do, to raise the children born, except for one or two at most out of a larger number, whom they desire to leave rich and bring up in self-indulgence'.⁴⁰ Rome's elite had its motives to limit their numbers of (legitimate) offspring. But for others, more encapsulated in traditional surroundings, matters were different. For individuals, it rarely pays to act against social defaults.⁴¹ In pre-modern Europe the conditions that led to demographic decline among the elite did not affect the mass of the population. In 1700 there was near uniformity in Europe in the maintenance of natural fertility within marriage. Wrigley puts it brusquely: 'in high

³⁸ Hemelrijk, 1999: 212. ³⁹ Scheidel, 2006.

⁴⁰ Polybius 36.17. Cf. also Salmon, 1999: 8, who interprets the passage as referring to elite behaviour. On pre-modern European elites see, for example, Johansson, 1987: 450f.

⁴¹ Sterelny, 2004: 254.

mortality regimes, some exceptions among small subgroups granted, what constituted the best fertility strategy for society as a whole prevailed over any strategy of heirship which might seem to promise benefits for individual families'.⁴² One of Juvenal's satires sketches a similar distinction:

yet these [poor women] at least endure the dangers of childbirth, and all the troubles of nursing which their fate urges them: how often do gilded beds witness a lying-in when we have so many sure-fire drugs for inducing sterility or killing an embryo child? Our skilled abortionists know all the answers. So cheer up, my poor friend, and give her the stuff to drink whatever it shall be. Things might be worse – just suppose she wanted to get big and torture her womb with bouncing boys; you might become the father of an Ethiopian, and soon you will find that a dark-coloured heir, whom you would rather not meet by daylight, shall fill up your wills.⁴³

Limitation of numbers of legitimate offspring may have become the standard for elite women – or, for that matter, their partners – who had high incentives to prevent a surplus of offspring, had access to the necessary means, and lived in an environment more prone to accommodate individual decision making. These conditions were different among the mass of the Romans. In addition, the *relative* value of children was certainly much higher for these population groups than in elite circles. Notwithstanding the criticism of the wealth flows theory that has cast severe doubts upon the net economic value of children who are put to work, it is worth noting that their labour contributions compensated for at least part of their consumption. This may well explain a divergence in fertility behaviour between upper-class Romans and those from the lower ranks. Moreover, the narrow definition of the wealth flows theory that is often employed in anthropological research concentrates on the productive economic value of children. In so doing it ignores the considerable stress laid upon the importance of the social and cultural value of children by Caldwell. The advocacy to bear children for the good of the state by a Roman censor may exemplify Wrigley's concept of the dominance of collective interests.⁴⁴ But statements such as these need not mislead us to think that parents by definition perceived childbearing as a burden, as something they needed to do because societal norms demanded it. Firstly, there is the effect of the mechanism of

⁴² Wrigley, 1978: 149.

⁴³ Juv. 6.592–601. Translation adapted from Riddle, 1992: 65, and *Juvenal and Persius*, trans. G. G. Ramsay, Loeb Classical Library, 1979.

⁴⁴ Gell. 1.6. Cic. *Off.* 1.54: procreation in family context forms the 'principium urbis et seminarium rei publicae'. Treggiari, 1991: 205f. Cf. also Dio Cassius' 'speech of Augustus' addressed to elite fathers, LVI.2.6–7: 'but for the State, for whose sake we ought to do many things that are even distasteful to us, how excellent and how necessary it is, if cities and people are to exist, and if you are to rule others and all the world is to obey you, that there should be a multitude of men'.

internalization of norms. The positive ‘image’ attached to childbearing that was all around them may well have led adults to find having children highly desirable. Moreover, children themselves can be a source of social status – specifically if there is little status to gain in other domains. For parents without resources, there is no need to manipulate their offspring, and they are more likely to benefit from opportunistic strategies by their children.⁴⁵

Clearly, though, at a certain point the balance may shift. The definition of family limitation as consisting only in ‘parity-specific stopping behaviour’, indicated by a sharp decline in births after a certain age, seems arbitrary and outdated. So does the concept of ‘natural fertility’ that has been defined as the absence of such behaviour.⁴⁶ The fact that no stopping behaviour can be detected for pre-transitional populations shall not imply absence of family limitation. It is difficult to establish to what extent infanticide and abandonment were direct effects of poverty, for they are also correlated with sex-specific preferences and extramarital procreation,⁴⁷ but lack of economic means certainly made some people kill their daughters or leave behind their children – either to be found by others or not. Ancient evidence shows considerable tolerance for both.⁴⁸ And when Dio Cassius lets Augustus address the elite bachelors of Rome, we cannot really tell whether it is anxiety for an overturn of elite power, or fear of overall population decline through fertility limitation, that makes him say:

What seed of human beings would be left, if all the rest of mankind should do what you are doing? [...] And even if no others emulate you, would you not be justly hated for the very reason that you overlook what no one else would overlook, and neglect what no one else would neglect, introducing customs and practices which, if imitated, would lead to the extermination of all mankind, and, if abhorred, would end in your own punishment?⁴⁹

⁴⁵ Kaplan and Lancaster, 2003: 197.

⁴⁶ Cf. Easterlin, 1978: 73, already describing it as ‘something of a misnomer’, and McDonald, 2000: 432: ‘In pretransitional societies, high fertility was/is socially determined, not naturally determined’. But cf. Oppenheim Mason, 1997: 447f., on the misconception of ‘culture’ as an eradicator of any individual strategic behaviour, or more specifically, family planning. See Pudsey in this volume, pp. 70–2.

⁴⁷ Infanticide: for example, Woolf, 2001, who does not consider female infanticide as an indication of family limitation per se, but as the result of the existence of a cultural preference for the male sex (146). Abandonment: analysis of medieval Florentine data showed that abandoned children were often illegitimate children of female servants, sent to foundling homes to avoid inheritance conflicts. In 1456 it was requested that ‘any person who places, hires or brings into the city, environs or countryside of Florence a slave or servant should pay and be required to pay for each head to the treasurer of the hospital of the Innocenti one large florin within eight days from when she was hired’. Roth, 2004: 143.

⁴⁸ Boswell, 1988: 75f., on abandonment; Eyben, 1980–1, on infanticide.

⁴⁹ Dio Cass. LVI.4.4–5. Translation from *Dio’s Roman History*, trans. E. Cary, Loeb Classical Library, 1924, VII.

There were ways out of fertility if one really wanted to find them, whatever they may have consisted in. But what matters is that the overall long-term fertility effects of fertility limitation do not seem to have been large. Augustus' fear of depopulation was certainly not strong enough to induce him to introduce 'fertility bonuses' outside the elite. Moreover, the demographer Davis already noticed that the claim that fear of absolute poverty led to decreases in fertility could not be substantiated. He concluded that 'fear of hunger as a principal motive [to reduce population] may fit some groups in an extreme stage of social disorganization or at a particular moment of crisis, but it fits none with which I am familiar'.⁵⁰ Under such extreme conditions, fertility will not have been limited by deliberate choice alone: biological mechanisms also respond to food crises and severe distress by preventing reproduction.⁵¹

ALTERNATIVE STRATEGIES

Instead, to avoid a downward slide into sheer poverty, adaptive strategies could be employed to ensure economic subsistence. A brief look into one of the main proximate determinants of fertility, age at first marriage (AAFM), shall exemplify the case. In pre-transitional populations, the age at which women marry has a deep impact on fertility.⁵² Generally, it is equated with the onset of childbearing – that is, provided that such is physiologically possible.⁵³ In demography, male age at marriage is often considered irrelevant since 'it is the females that matter most' in the analysis of fertility. Yet the ancient marriage pattern is a remarkable one. Women married fairly young, and there was a considerable age gap between partners. Though exact details are lacking, on the basis of commemorative shift patterns on inscriptions the AAFM for women is mostly placed between the ages of fifteen and twenty, and that for men, around thirty.⁵⁴ This large difference

⁵⁰ Davis, 1963: 362.

⁵¹ Whereas only extreme conditions lead to complete (temporay) infecundity, malnourishment will result in subfecundity through its effects on the age of menarche and by the creation of longer birth intervals: e.g. Scott and Duncan, 2000: 81. Moreover, it is not just sexually transmitted infections that cause infecundity; for antiquity, it is clearly relevant that malaria and tuberculosis can also lead to sterility. See Hobcraft, 1987: 824.

⁵² See Pudsey in this volume, pp. 63–70, for a detailed discussion of the demographic relationships between marriage, nuptiality and fertility in historical populations.

⁵³ Cf. for example Bongaarts and Potter, 1983: ch. 2.

⁵⁴ Saller, 1987: 29–30. Lelis *et al.*, 2003, proposed a revision of the dominant view. However, the sudden and steep increase in commemorative shift inscriptions for males strongly pleads for placing male AAFM near age thirty: see Scheidel, 2007c. For ages at marriage in Roman Egypt, see Pudsey in this volume, pp. 63–9.

is usually explained in terms of cultural habit. I would suggest in addition to these approaches that the age differences in the Roman marriage system can also be thought of as an adaptive strategy. It effectively helped minimize *both* the risk of 'underproduction' or demographic decline and that of 'overproduction' under limited land resources. The longer male marriage was postponed, the higher the chances rose that a man was able to accumulate sufficient resources or income to establish a neolocal marriage. Given the economic structure of Roman Italy, where the agricultural sector predominated, it seems particularly relevant that the extent of ownership of land would increase among the new generation as they grew older, since with rising age of their sons a larger share of fathers would have died. Although it was a less prominent phenomenon, in some cases men could also have profited from fallout of male siblings who competed over inheritable assets.⁵⁵ Saller's simulations suggest that, between the ages of twenty and thirty, the mean number of living brothers for an adult man would decline from 1.0 to 0.8. In reality this decrease might have been larger if, as Woods has suggested, the life tables that are commonly used overestimate infant mortality and underestimate the mortality of young and middle-aged adults due to infectious disease.⁵⁶ Late male marriage would therefore increase opportunities to gain resources. From a functionalist perspective one might observe that, on the other hand, the young age of brides ensured optimal utilization of the period of female high fecundity for procreation, and would as such minimize risk of demographic decline.

This is not at all to say that any marriage would be motivated by such macro-demographic concerns over population reproduction. That much already speaks clearly from the elite behaviour analysed above. What is relevant here is that, at a micro level, concerns over ill health and dependency that was potentially soon to come, and over continuance of the family name, would motivate people to ensure the survival of at least some offspring. The Roman high-mortality regime made such survival precarious and unpredictable. If one wanted to be sure to end with at least one or two children that survived into adulthood, it made sense for a woman to start childbearing at a young age.

Other perceived obstacles for childbearing deserve reconsideration too. For one, the argument that in ancient Italy the small peasant must have

⁵⁵ For the average number of living brothers: Saller, 1994: 48, table 3.1.a. Coale and Demeny, 1983, level 3 West, indicates that an adult male would have a 16 per cent chance of dying between the ages of twenty and thirty. See Akrigg in this volume, p. 50, and Parkin in this volume, pp. 185–6, for a discussion of the uses of these model life tables for ancient populations.

⁵⁶ Woods, 2007. See Holleran and Pudsey in this volume, pp. 12–13.

deferred marriage until he had succeeded to the enjoyment of a farm, whether owned or rented, need not hold. Household systems can vary, and the neolocal marriage system in which nuclear families prevail and the establishment of a marriage coincides with the establishment of a separate household is not a universal phenomenon. For ancient Italy we have only scattered evidence, but Roman census records and Ptolemaic salt-tax registers from Egypt show results that are strikingly similar to medieval Tuscan data, and suggest that the prevalence of larger than conjugal families was around 30 per cent in rural settings.⁵⁷ Given their larger size, though, a significantly higher proportion of family members must have lived in them.⁵⁸ Whether household types other than the nuclear family were equally widespread in the countryside of republican Italy, we cannot tell. The scanty literary references we have do not enable quantification. They do, however, point to the coexistence of various household types. Extended or multiple household arrangements could serve as a social risk-management strategy that enabled distribution of resources across more people.⁵⁹ One could start making a living on the farm of a parent or other relative, and shift towards a conjugal family system in a later phase.⁶⁰ Therefore, contrary to what Brunt presupposes, being the owner or renter of a farm was not necessarily a precondition for marriage.

In so far as the need for a dowry would be an insuperable barrier to marriage, we may note that bridal *dotes* provided by a girl's father were an established practice in all social strata. Such can be inferred from juridical evidence and Egyptian documents.⁶¹ But a comparison of the dowries given in Roman elite circles with those donated to brides in other pre-modern European societies has revealed that the Roman ones were markedly smaller as a proportion of family assets.⁶² Also, economic pressure on the household is partly a result of the life cycle. The younger the children, the more burdensome was their dependency. Living in an extended or multiple household could serve to help sustain this phase in the life cycle

⁵⁷ Bagnall and Frier, 1994: 57–66, with table 3.1 (Roman census); Clarysse and Thompson, 2006: vol. II, 246f. (Ptolemaic salt-tax registers); Herlihy and Klapisch-Zuber, 1985: 292 (fifteenth-century Tuscany). Note that in urban settings, non-nuclear households were less common.

⁵⁸ Bagnall and Frier, 1994: 66–7, with table 3.2. See also Pudsey, this volume, pp. 68–70.

⁵⁹ See for example Erdkamp, 2005: 64–71, on household formation in the Roman Empire. See also Pudsey in this volume on the fluidity of household formations and the family life cycle in Egypt.

⁶⁰ Bagnall and Frier, 1994: 61: the age of adults in Egyptian conjugal households was remarkably high by comparative standards.

⁶¹ Treggiari, 1991: 323. See, by contrast, Evans, 1991: 103f., for references to marriages without dowries in the ancient literature.

⁶² Saller, 1984b: 201, 1994: 212f.

by changing the adult–child ratio into more favourable proportions. Because adults other than the parents would bear part of the costs of offspring, a choice for non-neolocal marriage was an adaptive strategy that had its advantages.

Child spacing could serve the same purpose of pressure-relief within the family. Among Kalahari !Kung women in Botswana, long birth-intervals are said to be the result of adaptive behaviour to extreme ecologic constraints. Their four- to five-year birth intervals optimize the chances of survival for both mother and child.⁶³ We have no reason to presuppose that birth intervals were a static factor in antiquity. Before adding another mouth to the family, the optimization of the productivity of other children already in the household might be awaited.⁶⁴ In fact, one of the observations that have strengthened criticism of the concept of natural fertility is the recent accumulation of evidence that suggests that, in pre-industrial populations, couples deliberately lengthened the duration of breastfeeding to cushion (temporarily) adverse economic conditions.⁶⁵ This is obviously an adaptive strategy that has far less impact on fertility than an outright rejection of childbearing and marriage, which Brunt held responsible for propelling a decline of the free population in Italy. In the end it may have no effect at all, given the fact that prolonged breastfeeding pushes infant mortality downwards.

Also, although land played an important role in subsistence provision, it deserves mention that there were other economic niches. Urbanization is an obvious candidate. The rapid growth of Rome during the late republic attests to its qualities as a pull factor.⁶⁶ As Voland recently put it, '[migration] no doubt include[s] important components of reproductive strategy', but continues to be 'an automatically neglected stepchild of research' – and with reason, given that migration is both the most complex factor in demography and the least documented.⁶⁷ What the aggregate effects on fertility were is difficult to tell. One thing is clear: Rome came to be big and densely settled, and consequently a disease-prone environment. For this reason, it has acquired the epithet of 'urban graveyard' that tallies with what has been observed for other European pre-industrial cities. But whether migrants ever returned from Rome or were able to reproduce themselves

⁶³ Betzig, 1988: 10; Blurton Jones, 1986. On the positive effect of lengthened birth intervals and postponed weaning, cf. Hobcraft *et al.*, 1983, and Scott and Duncan, 2000: 77.

⁶⁴ Kaplan and Lancaster, 2003: 196.

⁶⁵ Van Bavel, 2004. Cf. Friedlander *et al.*, 1999, for more indications. See also Parkin, 1992: 129–32, for the significance of breastfeeding for fertility in the Roman world; also Pudsey in this volume, p. 72.

⁶⁶ For migration to Rome, see Holleran in this volume. ⁶⁷ Voland, 2000: 142.

within the city largely depends on the character of migration and urban–rural mortality differentials. The latter have been said to be fairly high. However, Erdkamp’s suggestion that migration to Rome or other cities was not a one-way phenomenon but often temporarily and seasonal in character⁶⁸ may have its implications for urban–rural mortality differences. If going to Rome to make a living did not imply a break with rural life, migrants going back and forth will have carried their diseases with them. On the positive side, their exposure to unhealthier living conditions was not permanent. What matters on a macro level is that both effects suggest that urban–rural mortality differentials may have been smaller than assumed.⁶⁹ Moreover, in recent years data from East Asia have pointed to the particular challenge of comparative approaches to urban–rural mortality differentials, and have cast doubt on the universal validity of the ‘European model’ of the urban graveyard.⁷⁰

More important given our present concern, though, is the observation that in other pre-industrial populations the prospect of the availability of future employment opportunities has had a positive effect on fertility levels. If migration was available as a ready alternative, there was no need to worry about the future opportunities of offspring.⁷¹ The ‘outlet’ or ‘niche’ provided by urbanization therefore formed another reason why countryside dwellers did not need to refrain from marriage and children. In similar vein as it did for the ‘third sons’ in the Middle Ages, for whom there was no religious function to fulfil or land to hold, the army could serve as a niche for Roman Italian families, at least during the republic. Its continual need for new recruits turned it into a stable outlet, thereby creating opportunities for a larger number of offspring. The army niche obviously brought along higher mortality risks for those who filled it, just like urbanization – even if the latter may have done so to a lesser extent than previously thought. This suggests that, in fact, changes in population size were driven by changes in mortality rather than by changes in fertility. Indeed, the patterns of fluctuations in real wages imply such a causative mechanism, and seem to be reasonably sound indicators of the relationship between population and economy. In other words, for all we can tell, the hypothesis that exogenous rather than endogenous factors made the difference is the stronger one.⁷²

⁶⁸ Erdkamp, 2008.

⁶⁹ See Holleran in this volume and Taylor in this volume for urban–rural and temporary migration.

⁷⁰ Woods, 2003a. ⁷¹ Davis, 1963: 354.

⁷² Scheidel, 2007b; cf. also Scheidel, in press a, esp. 23.

CONCLUSION

From the above, we may infer that the demand for fertility in Italy during the Roman republic was elastic to some extent. However, on a macro-demographic level, significant decreases in population size were ultimately driven by excessive mortality, not declining fertility. That is to say, we have no reason to presume that late republican Italy deviated from the patterns of natural fertility observed among other pre-industrial populations. The structures present and strategies available to the ancient Italians were conducive to fertility and created opportunities for couples to continue marriage and childbirth as they had done before, rather than turn to celibacy and childlessness when land became scarcer. This is not remarkable for a society that set great store by traditional family values. While – as Brunt rightly observes – Malthusian mechanisms would most likely render fertility limitation economically beneficial in the long run, a significant decline in childbearing did not occur among the wider population of Roman Italy. Instead, biology and culture cooperated in order to ensure long-term survival, and at the same time effectively contributed to trapping the Roman economy in a low equilibrium.⁷³ Although ancient demographers may wholeheartedly agree with Frier's 'more is worse',⁷⁴ we may suspect that, in general, the slogan 'the more, the merrier' was more attractive to Romans.

⁷³ On the ancient low-equilibrium trap: cf. Scheidel, 2007b.

⁷⁴ Frier, 2001.

Migration and the demes of Attica

Claire Taylor

Greek historians have been eager to work with demographic data, despite the difficulties the surviving evidence provides.¹ The adoption of life tables has become widespread in the past twenty-five years, but even with such models, assessing population dynamics is a tricky task. This is partly because any analysis relies on snapshot, and highly contestable, figures, such as those provided by Diodoros or Plutarch, or the use of proxy data, such as army numbers.² Every figure transmitted by literary sources is controversial in its own way.³ Long-term changes over large areas can be assessed by field survey, and many archaeologists have suggested demographic change in Greece from the classical to Hellenistic periods, but the interpretation of such data is not always straightforward.⁴ Assessing birth rates, death rates and migration – the principal interests of demographic analysis – is sometimes difficult to square with the surviving data, which leaves historians at a loss. Interpreting the demography of smaller units, such as the demes of Attica, or of non-citizens within any *polis* community (who show up less frequently and obviously in the evidence than citizens), is an even more difficult task.

Nonetheless, the usefulness of demographic approaches to the study of the ancient world, and their potential impact, has been recognised for a long time in the scholarship of fifth- and fourth-century Athens. The size of the

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¹ See, for example, Ruschenbusch, 1981; Hansen, 1985, 2006a, 2006b; Sallares, 1991; Scheidel, 2003b. Also Akrigg, 2007.

² For example, Diod. 18.18.5; Plut. *Phoc.* 28; Thuc. 2.13.6, 3.87.3; Xen. *Hell.* 4.2.17. See Parkin, 1992, who presents the issues relating to models and similar data for the Roman world; Akrigg in this volume.

³ See Hansen, 1985: 28–36, for discussion.

⁴ The principal criticism is that changes in the number of 'sites' (however defined) does not necessarily equate to changes in population size, rather than changes in the dispersal of the population, settlement structure or use of the landscape (for example changes in patterns of landholding, or different forms of economic exploitation etc.). See the review of a number of surface surveys by Osborne, 2004: 164–8.

citizen population is of great importance for understanding the nature of democratic life, for example, whether citizens, constrained by their own numbers, had a realistic chance to – or simply had to – participate in politics. But curiously, given the ancient historian's dislike for numbers in general, and the difficulties of the evidence itself, these questions have been inherently quantitative ('how many citizens were there in fourth-century Athens?'). From Gomme, who pioneered such an approach in the 1930s, to Hansen, who has brought such questions to the attention of most ancient Greek historians, there has been a recognition that demography is important for our understanding of Athenian politics and society, and that the size of the (citizen) population is worthy in itself of study.⁵ Hansen's use of model life tables has enabled serious demographic analysis, which he employs in conjunction with three main types of ancient evidence: epigraphic evidence – especially lists: for example, members of the Council of Five Hundred (*boule*), or young citizens (*ephebes*) on military service – literary evidence detailing army figures or citizen numbers in specific contexts, and estimates of grain consumption.⁶

Instead of focusing on 'how many?', this chapter takes a more descriptive approach, concentrating on a single aspect of demographic importance: migration. I will focus here on internal migration within the citizen body, that is the movement (primarily) of citizens within Attica. Since this is a preliminary sketch, I will assume that Attica is a closed population and will therefore not discuss in-migration or out-migration (of citizens and non-citizens) in any depth.⁷ This is not because it was negligible or unimportant (quite the opposite), but my aim here is to begin to build a workable model of Attic migration from the point of view of Athenian society by isolating certain factors. In fact, such a model allows deeper analysis of life in the Attic demes and the relationship between town and country.⁸

⁵ See Gomme, 1933. The main debate has been about whether the fourth-century Athenian citizen population was closer to 21,000 or 30,000. For the former, see Ruschenbusch, 1981, 1999; Sekunda, 1992; for the latter, see Hansen, 1985, 1994, 2006a. Hansen's views have become more widely accepted. See Akrigg in this volume, pp. 39–42.

⁶ See Hansen, 2006a: 22–45, for detailed discussion. Estimates based on grain consumption focus on the total population, rather than citizen population alone: see Moreno, 2007: 28–31. On Hansen's use of model life tables, see in this volume Akrigg, pp. 48–57; Parkin, p. 185.

⁷ This is certainly an important – but different – aspect of migration, and deserves closer scrutiny. There was frequent movement between Athens and the *cleruchies*, for example (see Moreno, 2007: 94). For 'inter-polis' migration in general in the ancient world, see papers in Olshausen and Sonnabend, 2006.

⁸ Previous work which has discussed migration within Attica: Osborne, 1991; Engels, 1992; Rosivach, 1993; Cohen, 2000: 112–29.

Modern theories of migration are usually conceptualised in economic terms, for example, as responses to the labour needs of the destination or of migrants themselves.⁹ However, recent studies by demographic anthropologists have stressed that the social and cultural context of migration should not be neglected: quantification is not the sole purpose of demography.¹⁰ Using some of the theoretical frameworks devised by demographers is useful for assessing migration among the citizen population of Athens and can shed new light on different aspects of the Athenian experience. On the other hand, historians have generally failed to differentiate between different types of mobility, but doing so raises a number of important questions: for example, to what extent was migration a response to poverty, or was it made possible through wealth? Did it perpetuate economic, social or cultural differences, or collapse them? How did the receiving settlements react to, or cope with, a changing population? How did migrants' status affect their migration decisions and their reception at the destination? This chapter seeks to address, at least in a preliminary fashion, these issues.

MIGRATION THEORY, DEMOGRAPHY AND ATTICA

Demographers stress that the reasons for migration are multiple. It is important to outline some of these in order to understand the decision-making process of migrants, as well as the consequences of this mobility. Migration theory emphasises variety here: while some people respond to positive factors at the destination (such as the desire to participate in politics in the city of Athens), others respond to negative factors at home (such as poverty), and these factors are not mutually exclusive.¹¹ Decisions were taken both by individuals and by families, at different stages of their life cycles and for a variety of purposes, be they economic, political or social, and some of these are outlined here.

Economic reasons may have encouraged citizens to leave their ancestral home: involvement in shipping, greater opportunities for trading in the city markets, and land shortage within families may have encouraged people to move.¹² However, not all economic mobility should be seen as a response to poverty: wealthy citizens lived outside their demes, and they did so not just because they wanted to be nearer the political action. Demosthenes –

⁹ See, for example, the papers in Cohen, 1996a. ¹⁰ Kertzner, 1997: 843–4; Szreter *et al.*, 2004: 4–6.

¹¹ Cohen, 1996b: xi–xv.

¹² For the wide range of goods sold in the agora, see Wycherley, 1957: 185–206. For the 'country bumpkin' motif in comedy see Steer, 2004.

although highly politically active – also had shipping interests and he owned property in the Piraeus as well as the city.¹³ Though it is admittedly unknown whether Demosthenes regularly lived in all of his properties or used them as some kind of investment, there is no evidence to link him with his home deme of Paiania; it is unlikely that he primarily lived there. Apollodoros, another wealthy citizen, was absent from his farm for relatively short periods of time on trierarchic service or private business arrangements, leaving it in the capable hands of his neighbour.¹⁴

At the other end of the social scale, the need for employment would have seen landless citizens such as Eutheros move around the Attic countryside looking for work.¹⁵ Even if the 5,000 landless citizens described by Dionysios of Halicarnassos is an exaggeration,¹⁶ there were certainly travelling tradesmen of various sorts, moving around Attica eking out an existence.¹⁷ In general, the division of land into small plots would have made citizens rather mobile, as they travelled from one area to another in order to farm.¹⁸ This mobility is also seen within non-agricultural labour: the Erechtheion building accounts show that men from non-city demes worked as carpenters, stonemasons or labourers. Many of these men came from demes within a few hours' walk of the city rather than those further away.¹⁹ Pherekrates describes hopeful labourers waiting to be picked up for a day's work by the Kolonos Agoraios in Athens, indicating that there was work available for the poor in the city.²⁰ Economic activities such as these may have been seasonal, fitting into the agricultural cycle.

¹³ Din. 1.69. There are many examples of property owners who were not members of the deme in which their property lay (for example, Dem. 50.8; Rhodes and Osborne, 2003: no. 36, lines 41–2, 45–7, 54–5 etc.).

¹⁴ Dem. 53.4. See pp. 128–9 for further discussion of this case.

¹⁵ The question of whether Eutheros is typical is a complex and much debated one. He is a fictional character used by Xenophon (Xen. *Mem.* 2.8.1–6) to highlight Socrates' unconventional wisdom. He is resistant to Socrates' advice to find work as a bailiff (*epitropos*) on a farm, as this goes against traditional attitudes to citizen self-sufficiency. Even if he is atypical of landless citizens in general, he may not be atypical of returning cleruchs.

¹⁶ Lys. 34 (hypothesis).

¹⁷ Isaios 6.20 describes the story of Alke, a freedwoman, who moves from a brothel in Piraeus to one in the city. For itinerant magic-workers, see Dickie, 2001: 58–60, 66–7.

¹⁸ Lys. 1.11. See Engels, 1992: 441.

¹⁹ The furthest is Angele, approximately 34 km from the city, but on a direct road route. See Randall, 1953: 204. The deme origins of citizens on the Eleusinian building accounts is even more diverse: see Feyel, 2006: 343–6.

²⁰ Pherekrates fr. 142 K-A. Glossed by Harpocration, s.v. Kolonetai: 'Hypereides in his speech *Against Apellaios about the Treasure*. They used to call hired men Kolonetai, since they stood by the Kolonos hill which is near the agora, where the Hephasteion and the Eurysakeion are.' Cohen, 2000: 142 n. 60, describes most of these people as non-free men, though there is no obvious reason to think this. For a similar phenomenon in Rome, see Holleran in this volume, pp. 169–73.

Examination of the inscriptions dedicated to Athena to commemorate the manumission of slaves can give some impressions of mobility in Attica.²¹ These inscriptions, set up on the Acropolis, record the dedication of silver bowls (*phialai*) worth 100 drachmas in order to pay for publication of a slave's manumission.²² Since the inscriptions record the slave's name, occupation and deme of residence, along with the owner's name and deme, it is possible to plot patterns of movement. The striking result of this pattern, as Osborne noticed, was that the vast majority of slaves were based within (or near) the city or in the Piraeus. This is not the case for the owners, however, whose demotics are scattered around Attica. Potentially this could indicate the movement of citizens from the demes in which their families were registered in 508/7 to the areas in which the slaves were based in the late fourth century. However, the different demes of slave and owner are just as likely to show slaves living apart from their masters (*choris oikountes*).²³ This is certainly the implication when an owner frees a number of slaves living in different areas: for example, Lysanias of Phrearrhioi (a deme in eastern Attica) freed a slave in Skambonidai (an intramural deme), as well as one in Thymaitadai (a deme to the west of Piraeus).²⁴

Political activity was also a major factor in citizen mobility, particularly from the countryside to the city, but also within demes. Jury service attracted men to the city, as did other forms of office-holding;²⁵ the boule met approximately five days a week and, although there are occasional hints of poor attendance,²⁶ it is easy to imagine *bouleutai* – especially those from the furthest away demes – living in the city for their year of office.²⁷ Likewise, other officials would have been – to a greater or lesser extent – required to serve their term of office in the city (e.g. *astynomoi*, *sitophylakes*). Taking part in city politics would have drawn citizens away from their deme temporarily.

Warfare may have forced others to abandon their homes in Attica and flee, but, as Thucydides makes clear, this could be meticulously planned.²⁸ Although leaving their demes was a wrench for many Athenians, they were persuaded to do so before the Spartans came into Attica, and perhaps had been doing so for generations before.²⁹ The fourth-century Dema and Vari houses

²¹ See Osborne, 1991: 244–6.

²² For discussion of the legal process (*dikai apostasiou*), whether it was a fictitious legal procedure and what the inscriptions commemorate, see Zelnick-Abramowitz, 2005: 282–90. Meyer, 2010, argues unpersuasively that the inscriptions record metics prosecuted for non-payment of the *metoikion*. For the inscriptions themselves, see Lewis, 1959, 1968.

²³ Zelnick-Abramowitz, 2005: 215–16. See also n. 44 below. ²⁴ *IG II² 1567*, lines 9–12.

²⁵ There are at least fifty different demes represented on the extant dikastic *pinakia*, spread evenly throughout Attica: see Kroll, 1972.

²⁶ Dem. 22.35–7. ²⁷ *Ath. Pol.* 43.3. See Hansen, 1999: 250–1. ²⁸ Thuc. 2.14–16.

²⁹ For example, when the Persians invaded. See Gouschin, 1999: 168, 172–3.

were not abandoned in a hurry: the owners had the time to remove the majority of roof tiles first.³⁰ Some movement was clearly forced, however: there was a strong contingent of Dekeleians in the city in the early fourth century, presumably remnants of those who fled when the Spartans set up camp near their deme. The oligarchy of the Thirty saw many people move to the Piraeus (and Thebes) to escape expulsion.³¹ Nonetheless, even if forced migration was a feature of the Peloponnesian War, in the more peaceful fourth century such interpretations do not so obviously apply.³²

It is clear that mobility was an important part of Athenian life, but quantifying it is difficult. The large number of funerary inscriptions from the fourth century which record demotics seem, at first glance, to give an insight into mobility of citizens within Attica. A large number of these grave markers were found outside of the deme of the person they record, and this has led scholars to suggest that this represents migration – particularly migration from rural demes to the city or Piraeus.³³ However, as Osborne has pointed out, other factors also play an important role in commemoration, and different demes show different patterns of commemoration.³⁴ Thus, Rhamnousians were more often commemorated in Rhamnous than they were in Athens, whereas Kephaleians were more often commemorated in Athens than Kephale. This pattern seems to be related to the mechanisms by which each community negotiated its own complex civic roles, and whether these encouraged or discouraged display in the local deme. Having few outsiders to display to in Kephale did not encourage commemoration within the deme.³⁵ It is very difficult, therefore, to accept funerary inscriptions as evidence of migration unproblematically. Commemoration can, but does not necessarily, mean residence.

Moreover, the distribution of funerary inscriptions reflects the excavation patterns of archaeologists over the past century, so even if the difficulties of commemoration are overcome they still present a rather unrepresentative sample.³⁶ A large part of the corpus was found in the city since this is where

³⁰ Pettigrew, 2001: 189–209.

³¹ Xen. *Mem.* 2.7.2. For the policies of the Thirty and their expulsions from the city, see Xen. *Hell.* 2.3.14; *Ath. Pol.* 37.1.

³² Ober, 1985, suggests that the defence of Attica was a major part of Athenian policy throughout the fourth century. See criticisms of Harding, 1988, and the response of Ober, 1989.

³³ Damsgaard-Madsen, 1988: 66.

³⁴ Osborne, 1991: 239–44. Engels, 1992: 448–9, also criticises the use of funerary inscriptions as unproblematic indicators of residence.

³⁵ Though it did occur to some extent. See Bergemann, 1997: V5 (= *CAT* 3.465a), a *peribolos* of the family of Nikon, son of Timotheos of Kephale, syntrierarch in c.323 (*IG* II² 1632). A *naiskos* and stela were found in the church of Agios Antoniou, 2 km north of Keratea (i.e. in the deme of Kephale), commemorating this family.

³⁶ They are also likely to be skewed towards the wealthy: see Oliver, 2000b, *pace* Nielsen *et al.*, 1989.

the bulk of excavation has historically occurred. Excavations of deme cemeteries at Myrrhinous, Rhamnous or Aixone provide an insight into non-city burials, but not all deme cemeteries have been found, so we are not always comparing like with like.³⁷ Any quantitative analysis should make clear these pitfalls. This is not to say the funerary inscriptions are worthless, merely that qualitative assessment may be more helpful, or may generate different questions. If nothing else, funerary inscriptions remind us that people moved around, if only to bury their dead. If the Kephaleians saw fit to commemorate their families in Athens even if they did not live there, this was presumably because they had visited the city on a number of occasions (not least to set up the monuments and perform the necessary rites at the appropriate times) and expected others to do so too. Their decisions to commemorate family members, and their (long- or short-term) mobility in order to do so, highlight an important area for discussion: to what extent was migration within Attica permanent?

PERMANENT OR TEMPORARY MIGRATION?

When migration has been discussed in the scholarly literature concerning fourth-century Athens, it has usually been assumed that it was permanent and directed towards the city: that is, that citizen X moved from deme Y into the city–Piraeus conglomeration and never turned back – it is almost as if Thucydides' refugees never returned home.³⁸ But this type of permanent migration is not a useful way of thinking about the Attic evidence. One problem is outlined by Damsgaard-Madsen. He noted that many wealthy citizens, commemorated on funerary inscriptions found in the city of Athens, owned land elsewhere in Attica. This was a paradox: 'one could hardly say that they have "migrated" to the city,' he observed, but their gravestones implied that they did indeed live there.³⁹ However, this assumes a rather fixed definition of migration, abnegating any degree of temporal dynamism. Migration need not be permanent; indeed there are many examples of dual residence – at least among the wealthy – at Athens, and this emphasises the difficulties of defining a seemingly simple concept such as migration. Does, for example, the maintenance of economic (or social or

³⁷ On the recent excavations at Myrrhinous, see Anetakis *et al.*, 2009.

³⁸ See, for example, Gomme, 1933: 39; Damsgaard-Madsen, 1988: 66; Cox, 1998: 52; and, for the extreme version, Jones, 2004: 54 ('the ongoing and more or less final departure of villagers'). Osborne comes closest to a model of circular migration: he wonders whether the lack of funerary commemoration by demesmen of Rhamnous and Kephale in nearby demes reflects a lack of migration to these places, or simply that any migration there was short-lived: Osborne, 1991: 243.

³⁹ Damsgaard-Madsen, 1988: 60. This is not simply a problem for classicists; it has been discussed often by demographers. See, for example, Guilimoto, 1998: 85.

cultural) ties in one area mean that the act of being in another area cannot be classified as ‘migration’? When does one change from a being a ‘visitor’ to being a ‘migrant’? If citizens retained the social support network of their deme, even if they did not live there, can they be classified as permanently removed from that deme? Clearly if we are to use the term migration at all, we need to highlight the range of meanings it contains.

Demographers use the concept of ‘circular’ or ‘non-permanent’ migration, which is helpful for ancient historians – that is, migration where ‘movers do not change their usual place of residence in the village but are absent . . . for periods longer than a single day’.⁴⁰ Often this is to take advantage of seasonal employment, usually in an urban area. This concept can serve Attica well: although there is an assumption that circular migration in the modern world is prompted by economic factors and directed towards an urban centre, which ancient historians do not necessarily have to follow, the movement of people from one area to another for relatively short periods of time can certainly explain, for example, the dual importance of deme and city politics. As both Osborne and Whitehead have demonstrated, there was an active political life in the demes which did not affect city politics, but acted within its own separate sphere.⁴¹ Bi-locality need not be a transitional phase nor a preliminary stage to permanent migration, though this is of course possible and perhaps can be seen in some demes: there is little Hellenistic material associated with Atene, and the settlement area of Thorikos seems to decline during this period too.⁴² Geographically widespread property ownership implies a certain degree of mobility among those property owners, but there is little positive evidence to suggest that these men were permanent residents in any one of their holdings: Ischomachos and Euphiletos both travelled to their land.⁴³

Furthermore, the manumission inscriptions mentioned above indicate patterns of non-permanent, rather than permanent, migration (among the citizen population at least). Lysanias, the manumitter of the two slaves discussed previously, could not have lived permanently with both of his slaves, and probably did not live with either. It is more credible to suggest that he had business interests in the areas where they were manumitted (unfortunately no occupations are recorded, so it is unknown what they were). Perhaps Lysanias

⁴⁰ Hugo, 1982: 61. De Jong, 2000: 311, uses, as a working model, absence from the community for a minimum of one month in a period of two years.

⁴¹ The personnel of deme and city politics does not seem to overlap, but demes regularly published decrees, elected officials and conducted other business. Osborne, 1985: 83–5; Whitehead, 1986: 317–24.

⁴² Hugo, 1982: 73–4; Lohmann, 1992: 56; Mussche, 1998: 64–5. ⁴³ Xen. *Oik.* 12.3; Lys. 1.11.

owned property in Skambonidai and Thymaitadai, and travelled between these areas and his own deme (Phrearrhioi).⁴⁴ There is further evidence of mobility in the groups of citizens who jointly owned (and freed) slaves: Sostratos of Hermos freed slaves in Alopeke whom he owned with both Timarchides of Euonymon and Mnesistratos of Alopeke.⁴⁵ The occupations of two of these slaves as (female) market traders (*kapelida*) imply that Sostratos, Timarchides and Mnesistratos had some kind of trading interests here.⁴⁶

The use of different categories of migration allows us to nuance the discussion more than has been possible previously. It is just as important to ask what type of migration is most commonly seen within Attica as it is to ask whether migration was widespread or minimal. A model of short-term migration is more appropriate, since it recognises that certain areas could be attractive for a variety of purposes at particular times, but that other areas could be active at the same time and prosper, socially as well as politically. The following section, therefore, uses the circular migration model to discuss different aspects of mobility within Attica.

MIGRATION DECISIONS AND EXPECTATIONS: (I) THE FAMILY

An important focus of demographers in recent years is examination of the expectations of migrants and their decision-making processes, which, it is argued, both reflect and contest social norms.⁴⁷ Unfortunately, no ancient Athenians explicitly recorded their intentions to leave their ancestral deme or other place of residence, but it is possible to examine their expectations as well as the related actions, and this allows us to assess mobility within Attica.

The decision-making process was undoubtedly as varied as the reasons why people moved, but in almost all cases the decision would have involved more

⁴⁴ In fact there are very few positive examples of slaves living in the same deme as their citizen owners (a pattern which is interestingly not the case for metics). If we suggest, taking the manumission records as a snapshot of citizen migration patterns since 508/7, that all masters lived in the deme in which their slaves were manumitted (i.e. take this as a proxy for mobility within Attica), it requires the assumption that 98 per cent of citizens lived outside of their ancestral deme, with 97 per cent living in the city. Clearly this is untenable; it is better to assume that the majority of these records represent slaves living apart.

⁴⁵ *IG* II² 1553, lines 4–7, 13–18.

⁴⁶ Presumably there was a large market in Alopeke: many of the slaves based here are involved in retail. For example, an *artopoles* (bread-seller) owned by Tydeus of Oe (Lewis, 1959: face B, column i. 5–7), a *sesamopolis* (sesame-seller) owned by a metic named Philon (Lewis, 1959: face A, column ii. 221–4) and a *kapelos* (market trader) owned jointly by a metic named Soterides and Diognetos of Poros (*IG* II² 1576 face B, 40–4).

⁴⁷ De Jong, 2000: 307.

than the individual citizen himself.⁴⁸ The expectations of the family would have been crucial, but so also would those of the deme community itself. Demographers highlight the importance of family, or community, perceptions in the decision-making process, and emphasise that 'stay decisions' need to be weighed up against 'move decisions', and that these affect the type, length and experience of migration of different groups.⁴⁹ For example, a family may well expect a member to leave home for a certain period of time, in order to help out in a period of crisis, to perform civic obligations or to serve as an ephebe, but that member may also be expected to return afterwards. Even after exile it seems that families expected sons to return to the family home (Andok. 1.148). These are examples not of permanent but of circular migration.

While men may have been expected to return to the family home in many circumstances, women were expected to leave it on marriage and live with their husband's family. Cox suggests, on the basis of a survey of funerary inscriptions, that in rural areas local marriages within demes or between neighbouring demes were the most common. Where partners came from further afield, the vast majority of couples were based in the husband's deme.⁵⁰ In the city the picture is different: marriage partners are more often from different and non-neighbouring demes. This may indeed imply migration to the city, and a greater mixing of citizens, but we have no way of telling whether marriages came about because of this movement, that is, the parties were living in the city when the marriages were contracted, or whether it occurred afterwards, or at all. The issues of commemoration discussed above are also present here.

It does not seem unusual for married couples to live initially with one or other of the parents, at least for a certain amount of time.⁵¹ Men and women seemed to have responded to different factors and often moved around Attica at different stages in their lives for different reasons. Evidently the impetus for migration was, in part, highly gendered. On the one hand, women seemed to have been more mobile than men, if the marriage patterns recorded in funerary inscriptions are anything to go by, but perhaps they were less likely to be involved in non-permanent migration. On the other hand, unmarried men may have been the most likely candidates for temporary economic migration, though we should not discount families

⁴⁸ For the family as an important part of migration decision making, see Cohen, 1996b: xiii.

⁴⁹ De Jong, 2000: 307–9. ⁵⁰ Cox, 1998: 60.

⁵¹ Gallant, 1991: 21, 24–5, estimates that 74.3 per cent of the fifty-two cases he recorded from law court speeches involved residence of married couples with parents. It was probably more common for women to live with their husband's parents, but Mantitheos' family (Dem. 39, 40) has a range of household organisations at various times.

moving together, or women moving alone (as they do in Xen. *Mem.* 2.7.2, though not primarily for economic reasons).⁵²

One response to household crisis might be to encourage a juvenile or adult member to leave, for example, to live with a relative or take some sort of employment.⁵³ The Piraeus, for instance, may have been attractive for men hoping to pick up work as rowers, or opportunities for mercenary service. Younger sons may have been particularly prominent here; if elder brothers had brought their wives to the natal home, there would have been more mouths to feed.⁵⁴ Younger sons may have been more likely to set up home in a new locality on marriage, easing the pressure on resources of the natal household as a whole. It seems sensible to suggest that there were different expectations of migration behaviour for different members of the *oikos* at different life stages, but that the long-term preservation of the *oikos* was a major factor in migration decisions.

MIGRATION DECISIONS AND EXPECTATIONS: (II) THE LOCAL COMMUNITY

The family was not the only group with interests in migration decisions. The local community may also have played a role in encouraging or discouraging mobility. Different groups, such as the deme and the family, may have had an input into these decisions, but their expectations could potentially be at odds. For example, the deme may have wanted its members to remain locally in order to fulfil political responsibilities, but the family may have needed a son to leave for economic reasons. Balancing these competing expectations would have been a major part of any decision. This balancing can perhaps be seen in the description of the deme assembly of the Halimousians in Demosthenes 57. As part of a law court speech contesting a decision of the Halimousians to remove him from the list of citizens of

⁵² Saller, 1987: 21–34, suggests that the proportion of independent unmarried men in the Roman world may have been low. He argues that the late age of marriage (around thirty) for men, combined with the short life expectancy (twenty to thirty years), would have meant that many fathers died before their sons married, which enabled sons to come into their inheritance while unmarried. Broadly speaking this may be able to be transferred onto Attica, but even so, there would be exceptions to the general trend. See further Hin in this volume, p. 112.

⁵³ See Gallant, 1991: 129–39, for response strategies in general. Female cohabiting relatives are recorded by Lys. 3.6, 29 ('sisters and nieces' of the male speaker); Xen. *Mem.* 2.7.2 ('sisters, nieces and cousins'). Lesis, the author of a lead letter complaining about his harsh treatment at the hands of the foundry owner for whom he is working, is a juvenile sent from his mother to learn a trade. See Eidinow and Taylor, 2010: 37–8. For the debate over whether he was a metic or a slave, see Jordan, 2000, *pace* Harris, 2004.

⁵⁴ See models of Gallant, 1991: 28–30, 133–7.

the deme, the speaker, Euxitheos, describes the assembly meeting in which the decision was made (in order to demonstrate that his enemies within the deme had conspired against him). This deme assembly was not, however, held within the deme, but in the city. Voting on all the citizens took a long time, and Euxitheos was left till late in the day, ‘when the older members (*hoi presbyteroi*) of the deme had gone back to their farms’.⁵⁵ This resulted in his being struck off the deme register.

This description implies that the demesmen of Halimous expected a large enough number of their fellow members to be living elsewhere in Attica in order to warrant an important meeting – which decided no less an issue than access to citizenship – outside of the deme. Though we cannot necessarily assume that the majority of these demesmen were living in the city (a central place easier to reach than Halimous might be required for an important vote), it seems likely that many of them were.⁵⁶ Living elsewhere did not prevent the Halimousians being active in the deme, however. The fact that it is the older men of the deme who leave to return to their farms (presumably, though not necessarily, in Halimous) seems to demonstrate the differential migration expectations both of individual deme members and the deme as a community, and of people at different life stages. The deme was able and willing to hold meetings outside of its territory in order to ensure as high a level of participation as possible, thereby enabling members to fulfil their political responsibilities. Additionally, the description shows that younger men lived outside their deme, whereas older men did not. There is no reason to see this as an isolated case (geographically or chronologically); instead it implies that citizens left in their youth, only to return to their deme later in life.

The living arrangements of Apollodoros also suggest a similar pattern. In an action against his neighbour Nikostratos, Apollodoros states that he went to live in the countryside, moving from the Piraeus after the death of his father, Pasion.⁵⁷ While Apollodoros is hardly a typical citizen, being the extremely wealthy son of a naturalised freed slave, his decision to move to the countryside at this point in his life may reflect a wider social pattern, whereby young men moved back to their ancestral demes to take up their inheritance.⁵⁸ Admittedly it is unknown whether Pasion ever owned this property, but it seems likely

⁵⁵ Dem. 57.10.

⁵⁶ Halimous is not particularly difficult to get to since it lies off the main road leading out of Athens to the south.

⁵⁷ Dem. 53.4.

⁵⁸ Nikostratos is thought to be from either Peleke or Acharnai (neighbouring demes). Apollodoros’ deme was Acharnai, and it is tempting (though there is no firm evidence) to place the farm in this area. See *APF*: 431, 481 n. 1; Trevett, 1992: 167 n. 45.

that Apollodoros mentions him in this context not simply as a chronological marker, but because he did own this land.⁵⁹ Apollodoros' lifestyle in general does suggest a certain eagerness to conform to what was perceived to be citizen-like behaviour, and it may be that he was keen to demonstrate that he returned to the countryside after the death of his father too.⁶⁰ Even after he moved to the countryside, he often relied on Nikostratos to manage the farm while he was away before their relationship broke down.⁶¹

Theorising migration suggests that permanent resettlement is not necessarily the best model for fourth-century Athens. Even though the deme had some territorial integrity, it was essentially a group of people defined through descent.⁶² Non-residence in the deme did not bar a citizen from membership of it. Arguably, kinship ties – the basis of deme life – would have ensured that migration was never truly permanent, and social pressure would have ensured that these ties were upheld to a large degree. Indeed, the widespread use of demotics, recorded on a variety of media, public and private, in the fourth century demonstrates that citizens identified themselves with this deme community strongly at this time.⁶³

MIGRATION AND THE DEME COMMUNITY

The model of non-permanent migration is useful not only because it can highlight the range of migration experiences discussed above, but because it can be used to sketch out how this type of mobility affected communities within Attica. The impact of non-permanent migration on Athenian deme structure, citizen identity and social interactions is therefore discussed in the following section.

Did migration deplete the demes? Was the countryside adversely affected by the mobility of the Athenians, or was it a positive aspect of Athenian life? If the epigraphic output and building activity of the demes in the fourth century are examined, it is clear that there was no mass exodus from these communities: many deme decrees were

⁵⁹ Additionally it is unknown whether Pasion ever lived there: he is heard of in the Piraeus (Dem. 49.6) and the city (Dem. 52.8) but not in the countryside (though this may be contextual in part). See Trevett, 1992: 162–5.

⁶⁰ Trevett, 1992: 167, interprets the move itself as 'the espousal of the values and lifestyle of the landed (citizen) gentleman and the rejection of those of the metic community'. Apollodoros was well known for his lavish trierarchical spending (Dem. 50.7–9), and for running a shield factory instead of his father's bank (Dem. 36.11).

⁶¹ Dem. 53.4.

⁶² For the debate on territorial demes, see Thompson, 1971; Langdon, 1985; Frost, 1994.

⁶³ For demotics recorded on decrees, see Osborne, 1985: 66; on gravestones: Meyer, 1993: 110.

decided, choregic monuments set up, houses built and public buildings renovated.⁶⁴ Indeed, the city was not the sole destination of migrants: Apollodoros' story demonstrates that migration was not one-way. In addition, religious pilgrims were attracted to Eleusis, soldiers were stationed at Rhamnous, and those exploiting the mines went to Sounion or Thorikos.⁶⁵ The countryside was not empty, and the urban destination of migration within Attica can be somewhat overstated. Certainly the city and the Piraeus did attract many migrants, but other areas of Attica gained demographically as well, which would not have been the case if the demes were isolated from many aspects of public life. From a migration point of view, there was no strong town/country divide.⁶⁶

Rhamnous is a case in point: a large number of 'outsiders' were attracted to this deme by the sanctuary, its role as a military base and its port. Indeed, by the third century the non-Rhamnousians in Rhamnous had an important decision-making role in the deme.⁶⁷ Not only were honours given for non-Rhamnousian military personnel based in the deme, but resident non-demesmen – rather than non-resident demesmen – were instrumental in the decree-making process, as the following publication formula attests: 'the Rhamnousians and the other Athenians and all those living at Rhamnous decided'.⁶⁸ This highlights the high levels of mobility within Attica (as well as the city), and demonstrates that the migrants became increasingly recognised and incorporated into political life. Incomers were not a problem for this deme.

The manumission records also show that the city was not the sole destination of (freedmen) workers.⁶⁹ Although the majority of freed slaves have demotics registering them in the city or Piraeus, this is strongly

⁶⁴ For deme decrees, see Whitehead, 1986: 40–3, 374–93. For choregic monuments set up in demes for victories in the city, see *IG II²* 3091 at Aixone: Wilson, 2000: 248–9. For houses at Halai Aixonides: Andreou, 1994: 192. For theatres at Euonymon and Thorikos: Camp, 2001: 314–15; Mussche, 1975: 124–5, fig. 64. For temples at Cape Zoster, Eleusis and Acharnai: Travlos, 1988: 468; Hintzen-Bohlen, 1997: 18–21; *SEG* 21.519. For a gymnasium at Rhamnous: Travlos, 1988: 402. For a palaestra at Kephissia: Vanderpool, 1969: 6–7.

⁶⁵ Engels, 1992: 440–1. Other major sanctuaries were at Brauron, Rhamnous and Sounion, in addition to smaller sanctuaries in Aixone or Acharnai and numerous minor shrines dotted around the Attic countryside. See Goette, 2002: 192–5, 197, 203–7, 246–8. Thuc. 8.4 describes the fortification of Sounion in 413/12 (Goette, 2000: 44–7). The silver mines in the Laurion region are discussed by Lauffer, 1979; Conophagos, 1980; Mussche, 1998.

⁶⁶ Contra Jones, 1999: 82–122; 2004: 12–16. ⁶⁷ See Osborne, 1990: 281–5.

⁶⁸ Other formulae were also used. See Osborne, 1990: 281.

⁶⁹ While the city/Piraeus is the most common destination, almost one-third are based outside the city–Piraeus area, though this drops to around 10 per cent if demes within a couple of hours' walk of the city are included in this category. Osborne raises the question whether poor, landless citizens would

correlated to their occupation: those employed in certain industries cluster together. For example, the most common occupation recorded on the lists is that of wool-worker (forty-five slaves). Where their residence is known, just over half are based in the intra-mural demes and Piraeus (though this rises to more like two-thirds if the demes just outside the city are included).⁷⁰ Although wool-working was an industry which could be – and was – performed anywhere, there were definite centres of activity in Melite and Kydathenaion where the workers congregated.⁷¹ On the other hand, the second most common occupation is that of farmer (thirteen examples), and their demes of residence are not concentrated in the city or Piraeus area but, as would be expected, are more spread throughout Attica.⁷² Although the general picture of freedman/slave residence is ‘urban’, there is clearly distinct variation according to occupation.⁷³

Certainly it was not the city alone which was attractive to migrants. The population density of southern Attica seems to have increased during the fourth century as mining resumed in the area. Terracing on Hymettos, and farming activity in Atene, suggests that the region was being increasingly exploited to feed the enlarged population of mining-slaves, as well as metics and citizens living in the Agrileza valley.⁷⁴ Property ownership and mine leasing by non-demesmen was common, demonstrating a high level of mobility in this area.⁷⁵ The general picture of urban pull is contradicted by examination of Attica itself.

follow a similar distribution pattern (i.e. that the city would be their predominant destination), but this is difficult to answer. On the one hand the economic activities of these groups may have been similar, with paid employment as their main form of survival (though one must question the ‘poverty’ of these freedmen, if they can afford a manumission publication ‘fee’ of 100 dr.). On the other hand, although most of these occupations were presumably not confined to slaves/freedmen (citizen wool-workers are mentioned by *Xen. Mem.* 2.7.6–12), there may have been certain areas where these groups congregated to practise these trades which may not have been so attractive to poorer citizens.

⁷⁰ For example, Alopeke, Keiriadai and Ankyle.

⁷¹ Other demes in which wool-workers were registered include Thorikos, Pallene and Lamprai.

⁷² There are eleven *georgoi* (farmers) and two *ampelourgoi* (vine-dressers). Farmers: Satyros in Hagnous (Lewis, 1959: face A, column i. 108–11); two slaves in Iphistidai, one named Sosias, one of unknown name (Lewis, 1959: face B, column i. 11–13; face A, column iv. 392–5); Antigon in Pa- (Lewis, 1959: face B, column i. 59–60); Eukles in Kol- (Lewis, 1959: face B, column i. 109–11); Ankhurion in an unknown area (Lewis, 1959: face B, column ii. 207–8); Manes in Phaleron (*IG* II² 1553 column i. 24–6); an unnamed slave on Salamis (*IG* II² 1566 face A, 21–3); unnamed in unknown area (*IG* II² 1566 face A, 39–41); Pataikos (*IG* II² 1570 face B, 69–70); Dionysios in Skambonidai (Lewis, 1959: face A, column iii. 247–50). Vine-dressers: Epikerdes in Oe (Lewis, 1959: face A, column v. 485–8) and an unknown slave (Lewis, 1959: face B, column i. 51–2). For a slightly different interpretation, see Davies, 1981: 48–9.

⁷³ See n. 46 above, for market traders congregating in Alopeke.

⁷⁴ Bradford, 1957: 31–4, plate 8; Lohmann, 1993: 226–9.

⁷⁵ Osborne, 1985: 112–23; Shipton, 2000: appendix 1.

MOBILITY AND DEME IDENTITY: THE CASE OF SOUNION

The large number of non-demesmen in areas such as the Agrileza valley no doubt affected the day-to-day interactions of the local population, and how they perceived their communities. Xenophon estimates that there were approximately 6,000 slaves living in the Laurion region alone (and he suggested increasing this to 10,000).⁷⁶ Even if his figures are quantitatively unreliable, there were certainly large numbers of slaves in the area (never mind the citizens and metics associated with mining). This influx of people affected how the Sounians exploited their local resources and interacted with their deme structures.

For example, many have commented on the relatively large numbers of towers in the Laurion area, and these have recently been associated (on analogy with towers elsewhere in the Greek world) with labour-intensive, profit-making activities.⁷⁷ However, towers appear in almost every other Athenian deme which has been excavated to any extent (Halai Aixonides, Anagyrous, Thorikos, Rhamnous, Myrrhinous) as well as in more remote areas (Vari house), and they do not obviously equate to control of slaves.⁷⁸ It is just as possible that they were built to demonstrate wealth as to demonstrate control over a hostile servile population.⁷⁹ Whatever their function, they were relatively expensive undertakings, and it is clear in Laurion that the incoming population changed the way in which the local demesmen organised their surroundings and interacted with the landscape. Whether they enabled citizens to leave their land in the hands of overseers and live elsewhere, as Morris and Papadopoulos argue, or whether they created an opportunity for conspicuous display to outsiders in the region, it is clear that the building of towers can be seen both as reacting to and promoting mobility within the deme.⁸⁰

In terms of deme activity, there is little official epigraphic output from Sounion (i.e. demesmen publishing their own decrees).⁸¹ While this may not indicate anything except the random patterns of survival, one might expect to find the Sounians joining with resident non-demesmen (especially soldiers stationed at the fort) to publish decrees by the third century, as was the case at Rhamnous (discussed above).

⁷⁶ Xen. *Por.* 4.23.

⁷⁷ Morris and Papadopoulos, 2005: 176–80. See also Young, 1956: 122–46; Percirka, 1973: 123–9; Osborne, 1987: 63–7.

⁷⁸ For towers elsewhere in Attica, see Morris and Papadopoulos, 2005: 168–9 n. 56.

⁷⁹ Nevett, 2005: 96. ⁸⁰ See Morris and Papadopoulos, 2005: 196–7.

⁸¹ *IG II²* 1180 is the only surviving deme decree from Sounion. See Stanton, 1996: 347, 350–2.

Instead, the soldiers stationed here did so alone.⁸² In comparison with the Rhamnousians the communities of soldiers and demesmen in Sounion seem to have had a more distant relationship.⁸³ These groups may not have made decisions together, but the Sounians were nonetheless receptive to outsiders in general. In their only surviving deme decree, the Sounians made provisions to positively encourage people into their deme: the agora of Leukios, built in the second half of the fourth century, was specifically for ‘the Sounians and anyone else who wishes to frequent [it]’.⁸⁴ The Sounians adapted to their migrant communities and assisted them in their economic activities.

The Sounians as a group had a clear communal identity as far back as the mid-sixth century. A fragmentary kouros dedicated to Zeus by ‘the Sounians’ attests to this community relationship.⁸⁵ But by the late fourth century the migration of people into the area changed the way in which they were seen by other citizens, and certain aspects of their deme became something of a joke. This joke relied on the perceived ease by which slaves could become citizens here (‘there are many who are now not free, but tomorrow are Sounians’).⁸⁶ The focus on slavery was something particularly relevant to Sounion, but this was not the only deme about which such jokes were made: the Potamians were also lambasted for their (lax) deme registration.⁸⁷ There was clearly a perception that non-demesmen could easily pass themselves off as members of the deme community. The mobility of both citizens and non-citizens prompted a constant dialogue between civic identity and local interests.

Indeed, this dialogue can be seen by the widespread use of demotics in this period: identifying oneself by deme was an important part of citizen identity. This deme identity ran so deep that demesmen considered themselves members even when they were abroad, as is demonstrated by a dedication from a group of ‘Rhamnousians on Lemnos’ at the sanctuary of Nemesis and Thetis in Rhamnous.⁸⁸ Furthermore, if the series of rupestral *horoi* do indeed demarcate land between demes, they could be seen as a way in which communities reacted to pressure on resources. Clearly not all *horoi*

⁸² *IG* II² 1270, 1281, 1300, 1302, 1308. See Whitehead, 1986: 406–7; Stanton, 1996, 345–7; Goette, 2000: 53–5.

⁸³ There are a number of reasons why this could be the case, e.g. the relative size of the demes, the spread of settlement in Sounion compared with Rhamnous (Whitehead, 1986: 406–7) or the possible invasion by the Macedonians (Goette, 2000: 55).

⁸⁴ *IG* II² 1180, lines 13–15.

⁸⁵ *IG* I³ 1024: ‘on Zeus the Fo[under (?), the S]ounians [dedicated this]’. See Stanton, 1996: 347–9.

⁸⁶ Anaxandrides, *Anchises*, fr. 4, lines 3–4. See Whitehead, 1986: 259 n. 15; Cohen, 2000: 129; Lambert, 2010: 144–6.

⁸⁷ Harpocration s.v. Potamos. See Whitehead, 1986: 342. ⁸⁸ Osborne, 1990: 279.

have this function, but the series which appear on marginal land such as that on Megalo Bafi, Spitharopousi or Kaminia perhaps were a response (not necessarily an 'official' response) of local populations to changes in the use of the landscape.⁸⁹

CONCLUSIONS

Changing the focus of the discussion about migration in Attica highlights a range of important issues from the relationship between mobility and poverty in Athenian society to citizen identity. Using a model of non-permanent migration suggests that there was a high degree of mobility but avoids ignoring the evidence for a productive and active Attic countryside in the fourth century. The high degree of mobility within 'rural' demes suggests that the town/country divide is not – in this instance – an appropriate model for Attica. Although there was clearly movement between the countryside and the city, demes outside of the city also attracted migrants, and some were remarkably 'urban' in characteristics, with theatres, defensive walls, sanctuaries and agoras.⁹⁰

The evidence suggests that the high mobility of citizens did not weaken the structure of the deme, but in fact strengthened it. Demes were able to appeal to their members sufficiently that they could function as an independent political unit, and citizens were defined by, and sought to define, the deme itself. The permanent migration model implies that the demes reacted to the loss of their members by pulling together and becoming increasingly insular, but this is not borne out by the evidence. Instead, by focusing on non-permanent migration we can suggest that the political processes of, and social life in, the demes were invigorated by this mobility. Instead of removing members from deme life, non-permanent migration allowed citizens access to diverse political, social, economic and religious resources and experiences, which could be brought back to enrich their community. Mobility within the polis strengthened the polis.

⁸⁹ Many *horoi* have been found (and continue to be found) in recent years. For a synopsis, see Stanton, 1996: 353–64. Apart from marking roads (Lalonde *et al.*, 1991: H32) and sanctuaries (Lalonde *et al.*, 1991: H5), *horoi* have been interpreted as boundaries of public spaces (Lalonde *et al.*, 1991: H25), private property (Langdon, 1999: 494) and an apiary (Ober, 1981: 73–7).

⁹⁰ Goette, 1999: 160–7.

Counting the Greeks in Egypt

Immigration in the first century of Ptolemaic rule

Christelle Fischer-Bovet

Migration patterns have been shaping the geopolitics of the Mediterranean for centuries.¹ New populations bring with them their customs and their skills, their languages and their religions. Many factors have an effect on the type of relationship that develops between the newcomers and the original inhabitants and on the cultural transfers that may occur in both directions. Ancient historians have investigated the impact of most of the relevant factors: power relations, cultural and socio-economic differences, and technological achievements. But the impact of immigrants in these various domains is of course also very much dependent on the size of their group as compared to that of the total population. The fundamental need for the quantification of immigrant population shares, however, is often neglected in ancient history because of the scarcity of the sources. This chapter tries to fill part of this gap by focusing on a group of immigrants that has been considered particularly important in Hellenistic history: the Greeks who migrated to Egypt in the late fourth and third centuries BC.

Greek immigration in the century after Alexander's conquest has for long been considered a watershed in the history of the Mediterranean. The migration flows that occurred with the expansion of the Greek world into places as far as present-day Afghanistan, India and Sudan have often been regarded as massive, causing the so-called Hellenization of the east. The papyrological documentation from Egypt offers a unique opportunity to evaluate the number of Greek migrants and their proportion within the existing population. Most evaluations for the number of Greeks in Egypt suggest 10 per cent of the total population. Although the scale of the migration reached unusual proportions, I argue that such a percentage is

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¹ On migration, see also Holleran in this volume and Taylor in this volume.

too high and the flow of immigration implicitly assumed by previous scholarship is too regular and long-lasting. These estimates are often based on inaccurate extrapolations of the data. In my view, overestimates of the size of the Greek immigrant population have been sustained and gone unchallenged for so long as a result of the overall approach to the study of the Hellenistic states until a few decades ago. Characteristically, scholarship had emphasized the changes – rather than the continuities – following Alexander's conquest of Egypt. The Greek presence in Egypt was seen as having a profound impact on all aspects of Egyptian state and society. High estimates of the Greek immigrant population fitted perfectly within this picture, and it may well be that the estimates have not been challenged hitherto for this reason.

In this paper I present the demographic data available to evaluate the number of Greeks, including the Macedonians, who migrated to Egypt in the late fourth and third centuries BC. On the basis of a more plausible use of the sources, I propose a lower number and proportion of Greeks, that is, around 5 per cent of the population. This re-evaluation provides us with a better insight into the ethnic composition of Egyptian society in the Hellenistic period. Moreover, these demographic revisions alter and, I believe, improve our understanding of Hellenistic Egypt in various but complementary ways, for they put its social, political and military history in a different light. Many of the migrants were indeed the soldiers of Ptolemy, one of the successors of Alexander who had secured Egypt for himself. Their descendants fought for the Ptolemaic dynasty while new immigrants continued to flow into Egypt for a few decades. A good number of them were granted plots called cleruchic land. The Fayyum, an artificial oasis reclaimed by the Ptolemies 100 km south of modern Cairo, became a sort of reservoir of cleruchs. The documentation preserved on papyri from this area, such as census lists, land surveys and official correspondence, is therefore fundamental for evaluating the number of migrants. We must, however, be cautious with extrapolation of the percentage of Greek immigrants that we find in this region to other areas of Egypt, for we have good reason to suspect that the Fayyum area was not representative of Egypt as a whole.²

The revisionary model I propose has a historiographical impact on several aspects of Ptolemaic society, to begin with on the military realm. The lower number of Greek soldiers suggests a different ethnic composition of the army and provides one more factor to explain the integration of Egyptian soldiers in the Ptolemaic army. Such a development was often downplayed

² See in this volume Akrigg, p. 49; Pudsey, p. 68; Parkin, p. 184.

and perceived as a weakness on the part of the Ptolemies.³ Beyond the military domain, my demographic revisions offer a framework in which historians can rethink the interaction between the diverse ethnic groups, notably in terms of matrimonial patterns and the adoption of religious practices. It also brings a better understanding of the overlaps of socio-economic and ethnic concerns during the revolts of the second and first centuries BC. In my conclusion I return to the historiographical significance of my model and point to openings for further research into Ptolemaic society.

In putting forward my new estimates, I use four independent methods to evaluate the number of Greeks from the eastern Mediterranean who settled in Egypt in the third century BC: first, an evaluation based on the number of Greek soldiers present at the battle of Raphia (217 BC);⁴ second, an estimate based on the number of Macedonian cleruchs settled in Egypt in the third century; third, an extrapolation from the number of cavalrymen with cleruchic land (*katoikoi hippeis*) in the second century BC;⁵ fourth, a calculation based on the number of Greek adult males living in the Fayyum, a number which is initially evaluated on the basis of census data from the third century BC and on the size of the metropolitan class living in the Fayyum during the Roman period. The first three methods focus on military settlers, while the fourth provides us with an evaluation for both Greek military and civilian settlers and allows us to check the plausibility of the first ones.

As a preliminary remark, it is useful to recall the numbers generally accepted for the total population of Ptolemaic Egypt (see Table 6.1). Rathbone describes the population increasing from below 3 million to almost 4 million in the third century BC, and then decreasing below 3 million in the second century BC;⁶ Manning suggests 3.5 to 4.5 million inhabitants, while Scheidel accepts numbers slightly below the 5 to 7 million that he calculated for the second century AD.⁷ For computational purposes I will use 4 million for the total population of Ptolemaic Egypt. Likewise, different numbers have been evoked for the total population of the Fayyum: for an area of cultivation of 1,200 to 1,600 km² (c.6–8 per cent of the 20,000 km² of cultivable land in Egypt) there were c.100,000 inhabitants in

³ For example, Launey, 1987.

⁴ The battle of Raphia opposed Ptolemy IV to the Seleucid king Antiochus III.

⁵ Cf. *P.Lips.* II 124. ⁶ Rathbone, 1990: 123.

⁷ Manning, 2003: 47–9 and n. 129. Scheidel, 2001a: 220–3, considers that 20,000 km² – a maximum for the Roman period on the basis of nineteenth-century data – is more reliable than the 9 million *arouras* (24,800 km²) inscribed on the Edfu temple during the reign of Ptolemy V (*Edfu VI* = Porter and Moss, 1960: VI, 164); for the total population, see 246–7.

Table 6.1. *Population and area under cultivation in Egypt.*

Author	Area	Total number of inhabitants	Area under cultivation (km ²)	Density in persons per km ²
Rathbone, 1990	Fayyum Egypt	70,000–100,000 4,000,000	1,200 25,000 (max.)	58–83 160; 120 (max. for rural population) ^a
Scheidel, 2001a	Egypt	5,000,000– 7,000,000	20,000	250–350
Manning, 2003	Egypt	3,500,000– 4,500,000	25,000	140–80
Clarysse/ Thompson, 2006	Fayyum Egypt	100,000 (max) 1,200,000	1,500 20,000	67 60

My calculations are in italics.

^a Rathbone, 1990: 109, does not calculate the average density (160 persons per km²) but only the maximum density of 120 persons per km² for the rural population based on papyrological evidence from the Graeco-Roman Fayyum.

145 villages in the mid-third century.⁸ Clarysse and Thompson evaluate that the percentage of the military population of the Fayyum at this date was somewhat greater than 15.5 per cent.⁹ But they are sceptical about applying a figure of c.100,000 inhabitants in the Fayyum to the whole country because the Fayyum is atypical and still has a low population density at this early time: 1.2 million inhabitants (calculated on the basis of 20,000 km² of cultivable land) would be indeed far too low for the entire population of Egypt.¹⁰

FIRST METHOD (RAPHIA)

Polybius' description of the troops of Ptolemy IV at the battle of Raphia in 217 BC against Antiochus III (Polyb. 5.65, 79.2) is essential to reconstruct the military migration pattern of the Greeks to Egypt under the Ptolemies.

⁸ Manning, 2003: 107 and note 49; Rathbone, 1990: 130–2, suggests 1,200 km² (435,420 *arouras*) and a range of 70,000–100,000 (population density 58 to 83 persons per km²).

⁹ Clarysse and Thompson, 2006: II, 90 n. 2, 94–5, count 1,500 km² (or 544,267 *arouras*) with 'canals, ravines, marshes and other uncultivated areas lying within the cultivated area' for 85,000–95,000 inhabitants in the mid-third century BC, with 100,000 as a maximum.

¹⁰ Clarysse and Thompson, 2006: II, 101, calculate the total population of Egypt on the basis of the population of the Fayyum, multiplying the latter by 12 (since the Fayyum is about one-twelfth of the cultivated area of Egypt according to their estimation). They conclude: 'Such a straightforward multiplication is, however, probably unjustified, since the Arsinoite was on most accounts an atypical area.'

My understanding of Polybius' passage is presented in Table 6.2. I count c.33,000 Greek military settlers (cf. 32,700 cleruchs coming from the Greek world) who descended from the original settlers. Concerning the phalangists (Polyb. 5.65.4), I follow Rathbone, according to whom there were indeed 25,000 Greek phalangists for a total of 70,000 infantrymen (cf. Pol. 5.79.2), contra Walbank, according to whom there were only 5,000 Greek phalangists for a total of 50,000 infantrymen.¹¹ In Walbank's view, there would be only c.12,000 Greek military (male) settlers.¹² Such a number would be surprisingly low, corresponding to the number of Greek soldiers in the 310s BC (cf. second method). Papyrological sources from the mid-third century show that far more immigrants settled in Egypt, and that such a low number is unwarranted. On this basis, I reject Walbank's interpretation.¹³

Rathbone calculated, on the basis of Raphia's numbers, that there was a maximum of 50,000 Greek military settlers at the end of the third century BC.¹⁴ My evaluation is slightly different on two points, since my approach tries to approximate the number of soldiers who settled long before Raphia: first, contrary to Rathbone, I discount the 11,000–13,000 new recruits mentioned at Raphia (cf. Table 6.2) because they were hired for that battle to complement the insufficient number of reservists. Second, Polybius did not take into account the Greeks still serving in garrisons and those unfit for

¹¹ Rathbone, 1990. Bar-Kochva, 1976, and Goudriaan, 1988: 122, defend the same number. Walbank, 1957: 590, follows the opinions of Mahaffy, 1899, Tarn, 1928: 730, Griffith, 1935: 122, and Rostovtzeff, 1941: 1397, who think that the 20,000 Egyptians in the phalanx (5.65.9) must be included among the 25,000 phalangists mentioned in 5.65.4, and thus conclude that there were only 5,000 Greeks in the phalanx.

¹² That is, 5,000 phalangists + 3,000 men in the *agēma* + 2,000 peltasts + 2,000 Cretans = 12,000, to whom we can add the Thracian and Galatian cleruchs (4,000).

¹³ There are indeed only two ways to explain Walbank's interpretation, and both can be rejected. First, the Ptolemies would have used only a very small proportion of the cleruchs and would have preferred to spend money on new Greek mercenaries and to hire Egyptians in large number rather than Greek settlers: in this case one does not understand why the Ptolemies created the cleruchic system. Second, the Ptolemies had only a very small number of cleruchs available because their number would have drastically shrunk during the first half of the third century: however, the sources do not indicate that the cleruchic system would have failed to that extent.

¹⁴ Rathbone, 1990: 112–13, does not explain in detail how he reaches these numbers. I reconstructed his interpretation in the following table, the 50,000 being based on 15,000–17,000 + 35,000–37,000:

Summary of Rathbone, 1990	Infantry	Cavalry	Total
New recruits (Greek mercenaries)	13,000–15,000	2,000	15,000–17,000
Egyptian and Libyan <i>machimoi</i>	23,000	–	23,000
Cleruchs (coming from the Greek world)	32,000–34,000	3,000	35,000–37,000
Total	68,000–72,000	5,000	73,000–77,000

Table 6.2. *Summary of Polybius 5.65.*

	Infantry		Cavalry		Total
New recruits (Greek mercenaries)	9,000	8,000 Greek mercenaries; 1,000 Neocretans ^a	2,000	Cavalry from Greece and mercenary cavalry	11,000
New recruits (Thracian and Galatian mercenaries)	2,000	Thracians and Galatians 'lately raised elsewhere'			2,000
Egyptian and Libyan <i>machimoi</i>	23,000	20,000 Egyptian phalanx; 3,000 Libyans with Macedonian equipment	2,300 ^b	Libyan and native Egyptian cavalry	25,300
Cleruchs (coming from the Greek world)	32,000	3,000 <i>agēma</i> ; 2,000 peltasts; ^c 25,000 phalangists; 2,000 Cretans	700	Cavalry of the guard ^d	32,700
Cleruchs (coming from Thracia and Gaul)	4,000	Thracians and Gauls 'among settlers and their descendants'			4,000
Total	70,000		5,000		75,000

^aThe meaning of 'Neocretans' is not clear: cf. Walbank, 1957, commentary to 4.3.1. It probably refers to soldiers sent by Cnossus, and for this reason I consider them as recently hired. But the term may simply reflect a special type of armament, perhaps light-armed soldiers with small round *peltai*.

^bThis number can be deduced from Polyb. 5.65.5, where he mentions the 700 cavalrymen of the guard, making 3,000 total with the Libyan and native cavalry.

^cThe question is debated whether they were cleruchs or mercenaries: see Lesquier, 1911, 14–15; however, on p. 25, he considers the *agēma* as part of the regular troops.

^dFor Lesquier, 1911: 25, they were regular troops; Lewis, 1986: 24, also considers that the members of the royal guard received *klēroi*.

service at the time of the battle. Rather than 33,000 Greek military settlers, I suggest a maximum of 40,000 in total.

The number of Greek migrants belonging to military families can be calculated on the basis of the 40,000 Greek military settlers. Usually scholars use comparative data from nineteenth- or early twentieth-century Egypt or from other developing countries, and multiply the number of adult males by 3.1 or 2.9.¹⁵ The reliability of these multipliers has to be checked since more men than women migrated to Egypt, causing a high sex

¹⁵ Rathbone, 1990: 130, uses a multiplier worth 3.1 based on Boak, 1955: 159, for calculating the total population from the Greek adult male population, and does not take into account the high sex ratio; from discussions with Saskia Hin about the problem of the multiplier, it appeared that Boak, 1955, based his calculations on Cleland, 1936, and his tables of census records for early twentieth-century

ratio among migrants.¹⁶ A census list from the Fayyum, *P.Count* 1, suggests a lower multiplier of 2.7 for counting the military population.¹⁷ However, if one includes the Egyptian families also recorded on the papyrus, the multiplier is 3.1. In fact, 2.7 is too low because the sex ratio may well have been quickly readjusted among the migrants, and 3.1 is too high. Consequently, I use an average multiplier, 2.9, and obtain 116,000 (2.9×40,000) Greeks belonging to military families. This represents the minimum number of Greek settlers in Egypt in the third century BC since it does not include the civilian immigrants.

SECOND METHOD (MACEDONIANS)

Macedonians made up a large proportion of Alexander's troops, and their descendants joined the Hellenistic armies. By approximating the number of Macedonian settlers in Egypt in the late fourth century and the third century BC and by establishing their proportion compared with other ethnic groups, we can check the total number of Greeks. There we face two problems. First, the term Macedonian was ambiguous,¹⁸ for it was used to designate cavalrymen or heavy infantry armed with Macedonian equipment, but it did not automatically imply that they were of Macedonian origin; the relationship in fact diminished over time.¹⁹ We can, however, give it weight as a marker of origin in the third century. Second, the evidence comes widely from the Fayyum, an area developed mainly under Ptolemy II, which means that the cleruchs settled in the third century – in opposition to the first cleruchs of Ptolemy I – 'might well be overrepresented compared to the total population of cleruchs. Newcomers may well, therefore, form a larger share of the Arsinoite cleruchs than they do elsewhere.'²⁰ In other words, the Macedonians may be underrepresented in our sources against other groups who settled in Egypt later on.

Egypt, but he seems to miscalculate one of his annual multipliers and should in fact obtain an average multiplier of 3.2. On similar uses of, and problems with, this multiplier for republican Italy, see Hin in this volume, pp. 113–15.

¹⁶ For example, 115.8 according to the numbers in *P.Count* 1. Scheidel, 2004b: 24–5, already raised the issue of high sex ratio among the Greek migrants. Clarysse and Thompson, 2006: 11, 95, use 2.9, following Bagnall and Frier, 1994: 103 n. 35.

¹⁷ *P.Count* 1 includes adult males and females living in military households but not the children. Consequently I have to rely on Cole and Demeny's stationary population model 'Female West 3', generally used by ancient demographers, which accounts for 33.27 per cent of children.

¹⁸ Launey, 1987: 292–3.

¹⁹ Cf. Fischer-Bovet, in press, for further discussion. ²⁰ Bagnall, 1984: 10.

Proportion of Macedonians

While keeping these biases in mind, the percentage of Macedonian cleruchs among the Greek settlers can be evaluated from Bagnall's tables based on Uebel's list of cleruchs.²¹ Two-thirds of the cleruchs attested in Uebel's list came from regions that the Ptolemies did not control, and thus 'are the descendants of those soldiers in the army formed by Ptolemy I Soter during his first couple of decades of satrapal rule'.²² In Table 6.3 I consider of Greek origin people coming from areas displayed in lines 1 to 7. I obtain 20 per cent as the proportion of Macedonian cleruchs among the Greek cleruchs up to 242 BC, and 30 per cent between 241 and 205 BC; that is, the Macedonians made up about one-fourth of the third-century Greek military settlers.

Absolute number of Macedonians

The number of Macedonian emigrants in the decades following Alexander's conquest is a starting point to quantify the number of Macedonian males who settled in Egypt in the late fourth century. Billows estimates that 25,000 Macedonians settled in Asia and Egypt between 334 and 319 BC, although we cannot know their exact distribution.²³ He suggests that emigration from Macedonia stopped after 315 BC because none of the Macedonian rulers had the power to order them to settle outside

Table 6.3. *The origins of cleruchs.*

		Until 242	242–204	205–145	III BC	Total
1	Macedonian	17	60	30	77	107
2	Balkan people	21	39	17	60	77
3	Greeks of the N. Aegean	1	9	0	10	10
4	Greek islands	1	13	5	14	19
5	Peloponnesos	9	15	1	24	25
6	Asia Minor/Propontis	15	23	10	38	48
7	Cyrenaica	29	49	7	78	85
8	Occident	2	5	2	7	9
9	Levant	0	3	11	3	14

Cf. Bagnall, 1984.

²¹ Bagnall, 1984: 10–12; Uebel, 1968. ²² Bagnall, 1984: 16.

²³ Billows, 1995: ch. 7, 183–217, esp. 196 and n. 32, for the Macedonians in Egypt. He concentrates on the number of Macedonian soldiers leaving Macedonia in order to demonstrate that Macedonian imperialism under Philip and Alexander did not cause population decline and economic difficulties in this region.

Macedonia *stricto sensu*.²⁴ On the contrary, Kassandros and his successors (Demetrios, Lysimachos, Ptolemy Keraunos, Antigonos Gonatas) probably tried to discourage Macedonian soldiers-to-be from joining the armies of the other kings. However, the 270s were certainly a period of large emigration from Macedonia because of the chaotic situation due to the Gallic invasion, its consequent plundering for three years and finally Pyrrhus' invasion. This same situation explains, in Billows's view, the relative decline of Macedonia in the following decades.²⁵

Using Scheidel's rough ratio of the distribution of Macedonian settlers between Asia and Egypt (2 : 1) I suggest that *c.*16,000 Macedonians settled in Asia and *c.*8,000 in Egypt by 319 BC.²⁶ But then, as Billows acknowledges, it becomes almost impossible to count the troops passing from one general or satrap to another in the last decades of the fourth century BC. Moreover, the evidence does not allow us to account for the emigrants who left Macedonia after 315 BC for Asia and Egypt with hopes of wealth and of a better life.

In 331 BC Alexander certainly left some Macedonians within the garrison set up in Egypt.²⁷ They were the nucleus of the Ptolemaic Macedonian force.²⁸ These soldiers must have constituted the Ptolemaic army at the battle of Gaza (312 BC), completed by other mercenaries and armed Egyptians, in total 22,000 infantrymen and 4,000 cavalrymen.²⁹ From these numbers, probably 8,000–10,000 were Macedonians (see the 8,000 mentioned above by 319 BC) and thus the ancestors of the Macedonian cleruchs of the third century BC. If Macedonians represent *c.*25 per cent of the Greek military settlers as stated above, we reach a total of 32,000 to 40,000. This matches the number of Greek military male settlers suggested with the first method (Raphia, *c.*40,000).

THIRD METHOD (*KATOIKOI HIPPEIS*), IN THE SECOND CENTURY BC

The cavalry settlers (*katoikoi hippeis*) formed a privileged group within the Ptolemaic army. Their number can be evaluated thanks to a second-century papyrus that indicates the amount of taxes they paid on the land they received in exchange for military service (cleruchic land).³⁰ It reveals two patterns: first, their small number; second, the stability of the group

²⁴ Billows, 1995: 157–9. ²⁵ Billows, 1995: 208–10. ²⁶ Scheidel, 2004b: 24–5.

²⁷ Arr. *Anab.* 3.5.5; Curt. 4.8.4–5. ²⁸ Bagnall, 1984: esp. 15–18. ²⁹ Diod. 18.4.3–4.

³⁰ *P.Lips.* II 124 (137 BC or later); cf. Duttonhöfer and Scholl, 2002.

between the third and the second centuries BC. Above all, the number matches the data for the battle of Raphia and allows us to check the first method with independent sources.

The papyrus records that all *katoikoi hippeis*, except those of the Thebaid, had to pay 234,777 *artabas* (col. III) each year. Either the tax concerned is the *diartabia* (l. 77), a land tax perfectly attested at this period,³¹ or the 234,777 *artabas* are for both the *diartabia* and the *epigraphē* (l. 36 and 70), a harvest tax, as in *P. Tebt.* I 99.³² In the first hypothesis, the *katoikoi hippeis* cultivated at most 117,389 *arouras* in total (323.5 km²). In the third century they usually received 80- to 100-*aroura* plots, but in the second century BC the extension of the *katoikia* to more people made for smaller plots (20 *arouras*).³³ If the *katoikoi hippeis* held between 80- and 20-*aroura* plots, they must have numbered a minimum of 1,460 and a maximum of 5,900, or 3,900 as an average. We can add a few hundred *katoikoi hippeis* who settled in the Thebaid: indeed cavalrymen in Upper Egypt were rather *misthophoroi* (mercenaries) and did not have cleruchic land. According to the second hypothesis the number of *katoikoi hippeis* is simply half, i.e. between 730 and 3,000, on average perhaps 1,800, plus a few hundred of those who settled in the Thebaid.³⁴ Of course these are only hypotheses and oversimplifications.³⁵

We can draw important results from this method: first, these approximations of the Greek cavalrymen in the 130s BC compare well with the c.3,000 Greek cavalrymen in Raphia, and confirm the order of magnitude suggested by the first method.³⁶ Second, this sample of population shows that Greek immigration stopped after Raphia and that the Greek population (in the sense 'Greeks coming from outside Egypt') did not increase.³⁷ Third, the fixed amount of 234,777 *artabas* is comparable to the sum paid by

³¹ Lesquier, 1911: 221; Préaux, 1979: 131. See for example *P. Tebt.* I 99, a close example to *P. Lips.* II 124.

³² On the *epigraphē* and the difference between a harvest tax and a land tax, Vandorpe, 2000: esp. 197–8; according to col. v, the *diartabia*, the *epigraphē*, the *phulakitiikon* (l. 83) and other amounts which were not called taxes (l. 89) could have flown into the account of the cavalrymen, but the fixed amount speaks in favour of a land tax (vs harvest tax). See Duttenhöfer and Scholl, 2002: 23, commentary to lines 21–9.

³³ Van 't Dack, 1977: 85.

³⁴ The evaluation is based on *P. Tebt.* I 99, where the amounts for the *diartabia* and the *epigraphē* are more or less equivalent. Consequently I consider that 117,388 *artabas* were paid as *diartabia*.

³⁵ We could also suppose, among other possibilities, that the *katoikoi hippeis* either paid the *diartabia* or the *epigraphē*, depending on the nome where they were settled (cf. l. 36), but the order of magnitude would not change.

³⁶ Cf. Table 6.2, rows 1 and 4: 700 cavalrymen of the guards and 2,000 cavalrymen from Greece and cavalry mercenaries whom I counted as new recruits in the first method, but who probably settled in Egypt after the battle of Raphia.

³⁷ If it increased, it must have been through intermarriage and cultural Hellenization. Chauveau, 1997: 9, admitted that immigration almost completely stopped under Ptolemy V, but I show in this section that it certainly stopped earlier.

all the *katoikoi hippeis* in 51/50 BC (*BGU* VIII 1760), i.e. 300,000 *artabas*, from which the *katoikoi hippeis* of the Herakleopolite nome paid *c.*12 per cent, according to Monson's new interpretation of the text. Another similar text from the Fayyum shows that the largest group of *katoikoi* was settled in that nome.³⁸

FOURTH METHOD (EXTRAPOLATION FROM THE FAYYUM)

Finally, I calculate the total Greek population in Egypt (i.e. both military and civilian) in order to check whether the order of magnitude for the number of Greek and Macedonian military settlers is correct. The estimation is made on the basis of the size of the metropolitan class in the Arsinoite nome during the Roman period, called 'the *katoikoi* from the total of 6,475 (or 6,470) Hellenic men in the Arsinoite'.³⁹ Knowing from the mid-third-century BC *P. Count* 1 that there were 4,898 military men (cavalrymen) in the Fayyum, the 6,500 men of Graeco-Macedonian origin – although this number is taken from a later period – is a reasonable guess for the Ptolemaic period.⁴⁰ It would also include some civilians and some infantrymen, these latter being absent from the incomplete *P. Count* 1. In any case, even calculations based on 8,000 Greek adult males in the Fayyum – to allow more space to the missing infantrymen – do not drastically alter the absolute number of Greeks and barely have an impact on the final percentage of the Greek population in Egypt.⁴¹

Since, according to Rathbone, the Fayyum represents about one-twentieth of the total cultivable land in Egypt, the 6,500 *katoikoi* could ideally be multiplied by 20 in order to obtain an estimate for the number of Greek males settled in Egypt.⁴² Rathbone worked out the total size of the Greek population from the Fayyum this way and obtained 130,000 Greek adult males,⁴³ as shown in his method (Equation 6.1) and calculation (Equation 6.2):

³⁸ Monson, in press, suggests *c.*23 per cent, based on the amounts in *P. Tebt.* 1 99, probably a minimum as these might be partial payments; for an overview, see Christensen, 2002: 189 n. 353, where he calculated the amount of land held by cleruchs in each nome till 145 BC (on the basis of Uebel, 1968); such a calculation is of course approximate because of the loss of evidence and obvious chronological problems.

³⁹ *SB* XII 11012 (55 AD) and, for instance, Capponi, 2005: 20 and 102.

⁴⁰ Thompson, 2007, suggests that in fact only *c.*1,500 to 2,800 of them were actual cavalrymen, for there were several males per household; it is not possible to know whether the other males living in the household were military (infantry) or civilians.

⁴¹ See Appendix, Table 6.7, col. C.

⁴² Respectively 1,200 km² and 25,000 km² – see Table 6.1 – according to Rathbone, 1990.

⁴³ Rathbone, 1990: 112–13.

$$\begin{aligned} \text{Greek ad. males in Fayyum} &\times \frac{\text{cult. area Egypt km}^2}{\text{cult. area Fayyum km}^2} \\ &= \text{Greek ad. males in Egypt} \end{aligned} \quad (6.1)$$

$$6,500 \times \frac{20}{1} = 130,000 \quad (6.2)$$

See also [Table 6.4](#). Rathbone then multiplied the number of adult males by a factor of 3.1, reaching a maximum of 400,000 for the total Greek population (*c.* 10 per cent of the total population in Egypt – as Segrè suggested in the past⁴⁴).

However, there are two flaws in Rathbone's argument that lead him to overestimate the total Greek population to a considerable extent. Indeed, two adjustments are needed. First, the low population density of the Fayyum in the third century prevents us from using this part of Egypt as a sample that can be multiplied to obtain an average number for the whole of Egypt.⁴⁵ I propose a new calculation in [Equation 6.3](#) (first adjustment), which compensates for the low population density of the Fayyum compared with Egypt, which is computed in [Equation 6.4](#).⁴⁶

$$\begin{aligned} \text{Greek ad. males in Fayyum} &\times \frac{\text{inh./km}^2 \text{ in Egypt}}{\text{inh./km}^2 \text{ in Fayyum}} \times \frac{\text{km}^2 \text{ in Egypt}}{\text{km}^2 \text{ in Fayyum}} = \\ \text{Greek ad. males in Fayyum} &\times \frac{\text{inh. in Egypt}}{\text{inh. in Fayyum}} = \text{Greek ad. males in Egypt} \end{aligned} \quad (6.3)$$

$$6,500 \times \underbrace{\frac{200}{58}}_{3.45} \times \underbrace{\frac{20,000}{1,500}}_{13.3} = 6,500 \times \frac{4,000,000}{87,000} = 298,850 \quad (6.4)$$

⁴⁴ Segrè, 1934: 67. ⁴⁵ Such a straightforward calculation is not possible: see n. 10 above.

⁴⁶ The compensation for the low population density of the Fayyum (see [Table 6.7](#), rows 8 to 10: 58 inhabitants per km² in the Fayyum vs 200 as an average for the whole of Egypt) is obtained by multiplying the number for the Fayyum, 6,500, by a factor of 3.45 (i.e. 200 divided by 58). This has the effect of levelling the numbers for the Fayyum to a hypothetical Egyptian average (see [Equations 6.3](#) and [6.4](#)). Then this number is multiplied by the factor in row 11, i.e. 13.33 (or 16.67) to obtain a number of Greeks for the whole of Egypt (row 12). Finally, to go from a male population to a total population (row 13), I use the multiplier 2.9, in row 4.

Table 6.4. *Number of Greeks in mid-third-century Egypt according to Rathbone, 1990.*

Number of Greek adult males in the Fayyum	6,500
Total number of adult males in the Fayyum	30,000
Greek adult males as percentage of the Fayyum population	c.20%
Rough ratio of the developed area of the Fayyum compared with Egypt	1 : 20
Number of Greek adult males in Egypt	130,000
Maximum number of the Greek population in Egypt (factor 3.1)	400,000
Greeks as percentage of the total population of 4 million	10% ^a

^a It is not possible to start with a sample of the population (in this case the Fayyum) where the percentage of Greek adult males is c.20% (row 3) and to have only 10% of the total population being Greek adult males (row 7) once the sample has been multiplied by the factor necessary to estimate the value for the whole of Egypt. In addition, the 10% happened only by chance to fit the estimates of Segrè, 1934. It is indeed incoherent to compare the Greek adult male population in Egypt on the basis of the multiplication by 20 of the number of Greek adult males in the Fayyum (1 : 20 being the ratio of the Fayyum territory compared to Egypt, according to Rathbone) with a total adult male population of c.1.3 million (i.e. the total number of adult males out of a population of 4 million) obtained by a random multiplication of the total male population of the Fayyum by 43. Thus follows the abnormal transformation of the Greek 20% of the Fayyum population (row 3) into the Greek 10% of the population of Egypt (row 7).

Second, the result of 298,650 Greek military settlers obtained in Equation 6.4 is still too high because of their high concentration in the Fayyum, which demands a second adjustment (larger number of Greek adult males in the Fayyum compared with Egypt), as illustrated in Equation 6.5:⁴⁷

$$\frac{298,850}{[4...5]} = [74,713...59,770] \quad (6.5)$$

Although Rathbone stressed that the settlers were not distributed equally throughout Egypt but that they formed pockets – notably in the Fayyum (c.20 per cent), Alexandria, Memphis, Ptolemais and Thebes – he did not take this into consideration in his calculation. It is indeed very difficult to evaluate the degree of magnitude of this concentration in view of our scarce data. Ideally we need to know the proportion of Greeks in different nomes to obtain an Egyptian average, but if we had such data we would not use the Fayyum, since it is not necessarily representative of the rest of Egypt in terms of population densities and migration patterns.⁴⁸

⁴⁷ The numbers in Table 6.7, row 12, must thus be divided. ⁴⁸ See n. 2 above.

My new calculation relies only on the total population of Egypt and that of the Fayyum, as can be seen in the simplification of Equation 6.3, line 2, and in Equation 6.4.⁴⁹ Consequently, the areas for Egypt and the Fayyum do not impact on the result at all.⁵⁰ However, if the calculations were based on a lower number for the total population in Egypt, the absolute number of Greeks would also be lower, but the proportions would remain the same.⁵¹ In other words, only new information on the number of Greek adult males in the Fayyum, on the total population of Egypt and on that of the Fayyum could alter these results. Table 6.7 in the Appendix contains the data and the results summarized in Equation 6.3.

My calculations in Equations 6.3 and 6.4 demonstrate that it is problematic to use the Fayyum evidence for the whole of Egypt, even for a rough approximation.⁵² Indeed, if we multiply a sample of land overpopulated with Greeks to obtain a number for the whole of Egypt, as Rathbone does, we will obtain a figure for Egypt that makes it overpopulated with Greeks. If there had been 130,000 Greek adult males available as Rathbone suggests, Ptolemy IV would not have needed to hire Greek soldiers for the battle of Raphia (see first method).

In order to approximate better the Greek proportion of the Egyptian population and at the same time the degree of higher concentration of Greek settlers in the Fayyum, I suggest using a mathematical model of diffusion, which describes the distribution of Greeks in Egypt as an exponential function along the north–south axis (diffusion function).⁵³ The calculation of the average of the diffusion function assumes, in concrete terms for the case of the Greek population in Egypt, that the Greeks propagated from the north of Egypt to the south, with many Greeks settling in the north (Alexandria and the Fayyum) and only a few in the south (Nile valley). This is of course an oversimplification because the distance from the coast

⁴⁹ The figure of 87,000 is the total population obtained by the multiplication by 2.9 of the number of adult males attested in the Fayyum: I counted c.30,000 according to *P.Count* 1 and Clarysse and Thompson, 2006: II, 94–5 and table 4.2. The figure of 200 for the population density of Egypt is reached by division of 4 million (for computational purposes as explained above) by 20,000 km² of cultivated area.

⁵⁰ See Table 6.7, cols. D and E. ⁵¹ See Table 6.7, col. B.

⁵² See Appendix. Scheidel, 2004b: 24–5, makes the same comment on the use of Fayyumic evidence. He guesses around 100,000 Greek settlers in Egypt and double this for the Seleucid empire; that makes a total of 400,000–500,000 adult and child emigrants from the Aegean world out of a population of about 4–5 million. He obtains a net rate of out-migration of 0.1 per cent to contrast to 0.25 per cent for emigration from Italy to the provinces in the first century AD and 0.7 per cent for the period 48–14 BC.

⁵³ The Greek percentage of the population at any given location is estimated by the diffusion function where f_0 is Greeks as a percentage of the Fayyum population, x denotes the north–south coordinate, and μ represents the degree of penetration of the Greeks in Egypt.

was not the only criterion for the settling of Greeks in Egypt, whereas in the mathematical model the distance is the only variable. However, because there was far more available land in the north (Delta and Fayyum) on which to settle new populations than in the south (Nile valley), and because soldiers needed to be available to fight in the Mediterranean, the distribution of the Greeks in Egypt may match, by chance and at a high level of simplification, a mathematical model of diffusion.

In order to calculate the average of this diffusion function, the percentage of the population that is Greek in at least two nomes is necessary, one in the north and the other in the south. I assume that the Fayyum is more or less representative of the Delta and that Edfu is more or less representative of Upper Egypt. The proportion of Greeks in the Fayyum, 22 per cent, is based on 6,500 Graeco-Egyptian men recorded as *katoikoi* in the Roman Fayyum divided by the male population of the Fayyum.⁵⁴ In order to evaluate the percentage of Greeks in the Edfu nome, the only way is to compare the amount of land granted to soldiers in the Fayyum with that in the Edfu nome.⁵⁵ If in the Fayyum 300 km² belonged to 6,500 Greek adult males, then, keeping the same proportion of land per Greek, the 1.84 km² of cleruchic land attested in the Edfu nome would have belonged to 40 Greek adult males (cf. Table 6.5).⁵⁶ The percentage of Greeks obtained for the Edfu nome is 0.2 per cent. If both nomes had the same size, there would be c.17 times more Greeks in the Fayyum than in the (standardized) Edfu nome (cf. Table 6.5, col. 3).⁵⁷

By inserting values for the factors we know into the diffusion function, such as the Greek percentage of the population in Edfu, we can then calculate the degree of penetration of Greeks into Egypt.⁵⁸ This result allows

⁵⁴ See Table 6.7, rows 2, 3 and 14 (6,500 divided by 30,000).

⁵⁵ Of course, these are estimates based on land at different periods and not on the number of persons, and they do not take into account any distinctions between cavalry and infantry and their different land allotments. In fact, the cleruchic land for the Fayyum is from now on simply based on the number of cavalrymen, because the number of infantrymen is so problematic; see n. 40. I am also aware that the source for the Edfu nome is from the second century BC and that the cleruchs there are probably mostly indigenous or from Graeco-Egyptian families. However, this does not question the whole approximation since the goal is to estimate how low military settlement could have been in certain areas.

⁵⁶ One has to accept the equivalence between land granted to soldiers and Greek migrants for the sake of obtaining an order of magnitude.

⁵⁷ In order to adjust the size of the Edfu nome to that of the Fayyum, it is necessary to use the factor 9.55: consequently, there would be 17.57 km² of cleruchic land in the Edfu nome (1.84 km² × 9.55), while there is 299 km² of cleruchic land in the Fayyum. See Table 6.5 for the absolute and adjusted values.

⁵⁸ See n. 53 above, where f_0 is the percentage of the Fayyum population that is Greek. We compute μ by using the data points that we know, that is, the Greek share respectively of the Fayyum (22 per cent) and Edfu (0.2 per cent) populations: $f(x) = 22 \cdot e^{-\mu x}$ and $f(1) = 22 \cdot e^{-\mu} = 0.2$, which leads to $\mu = \ln(22/0.2) = 4.7$.

Table 6.5. *Land and population in the Fayyum and in Edfu.*

	Fayyum	Edfu	Edfu (standardized at the size of the Fayyum: factor 9.55)	Egypt
Total no. inhab.	87,000	70,000 ^a (52,000)	<i>668,000 (497,000)</i>	4,000,000
No. of Greeks	19,500	<i>120 (105)</i>	<i>1,150 (1,003)</i>	<i>184,000</i>
No. of Greek ad. males	6,500	<i>40</i>	<i>383 (334)</i>	<i>63,500</i>
Size (km ²)	1,500	157 (137)	<i>1,500 (1,500)</i>	20,000
Land belonging to Greeks (km ²)	300	1.84	<i>17.6</i>	?
Density (inhab./ km ²)	58	445 (380)	<i>445 (380)</i>	200
Greeks (%)	22	<i>0.17 (0.2)</i>	<i>0.17 (0.2)</i>	<i>4.6</i>
Density of Greeks (inhab./km ²)	13	<i>0.77</i>	<i>0.77</i>	<i>9.2</i>

The figures are based on Christensen, 2002, for Edfu, and on Clarysse and Thompson, 2006, and Thompson, 2007; my calculations are in italics. Figures in parentheses are those based on Butzer, 1976: 74–5, used by Mueller, 2006: 4.

^aClarysse, 2003: 21, suggests this number on the basis of annual income coming from mummification business and thus the yearly number of deaths. However, we cannot, as in his note 21, simply multiply this number by 40 to obtain the total of inhabitants in Egypt, since Edfu does not represent 1/40 of the cultivated areas and does not have a representative density of population.

us to estimate, using the full function, the average percentage of Greeks for the whole of Egypt by computing the area under the diffusion curve in Figure 6.1, using a normalized north–south coordinate of Egypt (0 starts at the Fayyum and 1 ends at Edfu).⁵⁹

The result is Greeks accounted for 4.6 per cent of the Egyptian population on the basis of the mathematical calculation of the average of a diffusion function $f(x)$. It suggests that there were between four and five times more Greeks in the Fayyum (see Equation 6.5 and Table 6.6) and *c.*23 times less in Edfu than on a hypothetical average in Egypt. Of a total population of 4 million, there were about 184,000 Greeks in total, contra

⁵⁹ $\bar{f} = \int_0^1 f_0 \cdot e^{-\mu x} \cdot dx = \frac{f_0}{\mu} (1 - e^{-\mu}) = \frac{22}{4.7} (1 - e^{-4.7}) = 4.6\%$.

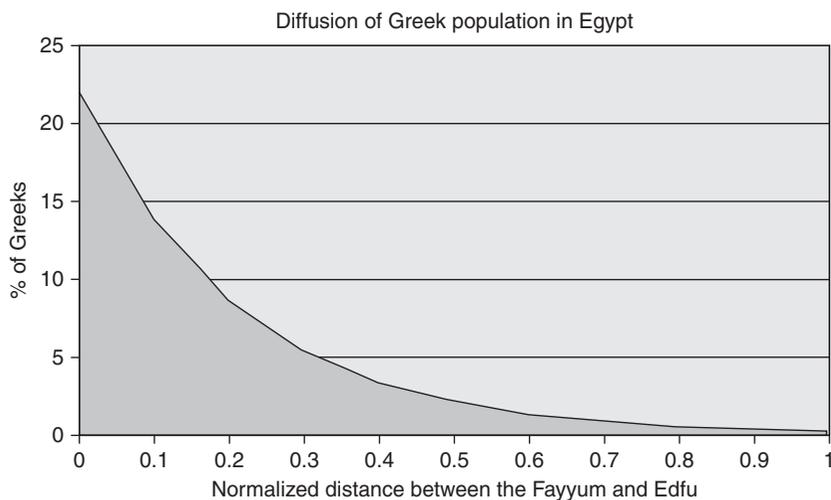


Figure 6.1. Diffusion of the Greek population in Egypt.

Rathbone, who stated that there was a maximum of 400,000 Greeks.⁶⁰ There were about 63,500 adult males.⁶¹

This last figure has the same order of magnitude as the number of Greek soldiers obtained in the first method (Raphia), a maximum of 40,000, and in the second one (Macedonians), that is, 32,000–40,000. Moreover, Raphia's number compared with this fourth method suggests that *c.*63 per cent of the Greek adult males were in the army in the third century BC, a percentage that seems reasonable in view of the papyrological documentation.⁶² All these estimates are still much below the ones advanced by scholars in the past decades.

⁶⁰ Rathbone, 1990: 113.

⁶¹ Even if we take into consideration that the population belonging to the Greek sectors for taxation purposes in the last decades of the third century Fayyum could have represented 29 or 32 per cent of the total adult population of the nome (see Clarysse and Thompson, 2006: 11, 140 and 156, and n. 62 below), and if we replace 22 by 32 in the mathematical model of diffusion, the Greek percentage of the Egyptian population, according to this schematization, could reach a maximum of 6.27 per cent.

⁶² This order of magnitude is corroborated by the census lists from the mid-third century BC where 54 per cent of the Greek adults (9,125 divided by 17,039) might have belonged to the military category; for these numbers see Clarysse and Thompson, 2006, who count 9,125 adults belonging to the category of the army and 7,914 tax-Hellenes, that is, a total of 17,039 Greeks out of 58,709 adult inhabitants in the Fayyum (29 per cent).

Table 6.6. *New estimates for the number of Greeks in mid-third-century Egypt.*

	Greek adult males in Egypt	Total no. of Greeks in Egypt	Greek population as percentage of Egyptian total
1	74,713	216,667	5.42
2	59,770	173,334	4.33

Rows 1 and 2 are based on the number of Greek adult males obtained in Table 6.7, row 12 (298,851), divided by 4 and 5 respectively to compensate for the higher number of Greeks in the Fayyum.

CONCLUSION

In conclusion, these new calculations of the number of Greeks in third-century BC Egypt demonstrate that c.5 per cent of the Egyptian population was Greek, rather than the 10 per cent usually accepted. In addition, the number of Macedonian settlers (second method) suggests that the flow of immigration was not regular. Greek immigration had stopped in the mid-third century – at least mass immigration of potential soldiers. Later on, emergency hiring of soldiers, as in the case of Raphia (217 BC), remained exceptional and involved a limited number of migrants. Further on, the third method (the *katoikoi hippeis*) illustrates that the Greek population did not grow during the second century BC.

These demographic revisions should be taken into account when analysing the nature and history of the Ptolemaic state, and more particularly the socio-economic and cultural interactions between the different groups of population in Egypt. Further studies can build on these new estimates that show to what extent the number of Greeks was limited in certain regions, and restricted to certain professional milieux. This observation implies that the impact of the Greek migrants on cultural change, political developments and army composition in Ptolemaic Egypt should be re-evaluated.

As noted in the introduction, there are several potential corollaries to my demographic model. I suggest that the low percentage of Greek immigrants did not significantly alter the daily life of the largest part of the Egyptian population, except in a few pocket areas such as Alexandria and the Fayyum. For instance, Egyptian religion in the countryside was almost not altered and was rather attractive to the Greek settlers. Regarding matrimonial patterns, it should be noted that if migrants

from diverse regions of the Greek world might at first have married each other, over generations the low percentage of Greeks, with male slightly outnumbering female migrants, stimulated marriages between Greek men and Egyptian women and subsequent intermarriages within certain groups of society. Finally, the small number of Greeks makes even clearer the 'double statistical convergence' model used by Vêisse to explain why mostly Egyptians took part in the revolts of the second and first century BC.⁶³ Indeed, her model draws on the fact that most of the inhabitants of Egypt lived on a minimum wage, whereas the small group of Greek immigrants had on average good living standards through their positions in the army and in the administration.

Regarding the military realm, the new estimate leads me to suggest that the non-Greeks, in particular the Egyptians, played a larger role within the army – and probably from an earlier date – than is commonly accepted. With regard to the Greeks in the Ptolemaic army I shall make a few more detailed comments on the implications of my revisions. For one, the number of cavalry settlers corresponds to the cavalry/infantry ratio of one to ten often found in the Hellenistic armies.⁶⁴ However, the very small percentage of infantry settlers in the tax lists of the late third-century Fayyum in comparison with that of cavalry settlers remains unexplained.⁶⁵ Most importantly, my calculation shows that while slightly more than half of the Greek migrants were military, at the same time the members of Greek military families represent a very small part of the population (c.116,000), that is, 2.9 per cent of the total population of 4 million; there were pockets of concentration, notably in the Fayyum, which was a very unique reservoir for the settled cavalry with the largest group *katoikoi hippeis*.

These numbers help in our consideration of how much the army could have cost the Ptolemies in money and land, how they organized their strategy of military settlement and to what extent the Ptolemaic government had to rely on the Egyptians, especially from Raphia on, to maintain or to mobilize an army sufficiently large for accomplishing its task.⁶⁶ The

⁶³ Cf. Vêisse, 2004: esp. 3–5, 146. ⁶⁴ See, for instance, Aperghis, 2004: 194.

⁶⁵ See nn. 40 and 55 above. The settlement of infantrymen with smaller plots in other nomes than the Fayyum, and in particular in the Delta, could explain their low percentage in the Fayyum, but such a hypothesis cannot be tested because of a lack of sources.

⁶⁶ Cf. Fischer-Bovet, in press, for a reassessment of the role and organization of the army in Ptolemaic Egypt.

inclusion of Egyptians has generally been considered as a weakness of the Ptolemaic state. However, my new estimates point to the judicious adaptation of the Ptolemaic dynasty to the new demographic setting by compensating for the low number of Greeks in hiring Graeco-Egyptians and Egyptians, certainly at a lower cost. More broadly, these results concerning the army and its composition aim at encouraging further studies on the nature of ethnic interaction in the Hellenistic world.

APPENDIX

Table 6.7 contains the data (rows 1 to 6) and the results (rows 7 to 14) summarized in Equation 6.3. The figures in italics do not represent any real values. They are an intermediary step.

Table 6.7. *Data and results after the first adjustment.*

	A	B	C	D	E
1 Pop. total, Egypt	4,000,000	3,500,000	4,000,000	4,000,000	4,000,000
2 Greek adult males in Fayyum	6,500	6,500	8,000	6,500	6,500
3 Adult males in Fayyum	30,000	30,000	30,000	30,000	30,000
4 Male→pop. total factor ^a	2.90	2.90	2.90	2.90	2.90
5 Fayyum (km ²)	1,500	1,500	1,500	1,200	1,500
6 Egypt (km ²)	20,000	20,000	20,000	20,000	16,000
7 Pop. total, Fayyum	87,000	87,000	87,000	87,000	87,000
8 Density Fayyum (inhab./km ²)	58	58	58	72.50	58
9 Density Egypt (inhab./km ²)	200	175	200	200	250
10 Low pop. density factor (Fayyum→Egypt)	3.45	3.02	3.45	2.76	4.31
11 Egypt/Fayyum	13.33	13.33	13.33	16.67	10.67
12 Greek adult males in Egypt	<i>298,850.57</i>	<i>261,494.25</i>	<i>367,816.09</i>	<i>298,850.57</i>	<i>298,850.57</i>
13 Greek pop. total	<i>866,666.67</i>	<i>758,333.33</i>	<i>1,066,666.67</i>	<i>866,666.67</i>	<i>866,666.67</i>
14 Greeks in Fayyum and Egypt (% of total)	21.67	21.67	26.67	21.67	21.67

^a Factor used to multiply the no. of males to calculate the total population.

Migration and the urban economy of Rome

Claire Holleran

Given the nature of our evidence, we can employ only slightly more sophisticated methods of calculating the population of Rome than Elagabalus, who proclaimed the greatness of the city on the basis of its cobwebs.¹ However, while we must be content with orders of magnitude rather than exact figures, a consideration of population is central to our understanding of the city of Rome.² The number and social composition of the inhabitants impacts upon many areas of urban life; for example, housing, leisure activities, sanitation, life expectancy, family structure, water and food supply, production and commerce, and politics. The demographic dynamic of a city's population also has a significant effect on that city's economic infrastructure.³ There is, for example, a critical relationship between voluntary migration and an urban economy, and this paper explores that particular relationship in the city of Rome. For much of its history, but particularly in the late republic and the principate, Rome was a city of free migrants, with a population profile that was in a constant state of flux. As a 'dynamic force', migration does not merely respond to demographic, economic or social developments, but creates them.⁴ The study thus begins with a consideration of the population of Rome and the

I would like to thank those who have read and commented on earlier versions of this paper, in particular Tim Cornell, Neville Morley, Henrik Mouritsen, April Pudsey, Rens Tacoma and Claire Taylor; any remaining errors of fact or argument are my own.

¹ SHA *Heliogab.* 26.6. See also Morley in this volume, p. 16.

² Few volumes on life in the city of Rome consider population to be a key variable in their studies. Paoli, 1963, for example, makes no numerical estimate of the population of Rome, nor does he examine the social composition of the city; the same is true of Dupont, 1992. Lo Cascio, 2000a, is a welcome exception; certain contributors to Edwards and Woolf, 2003, also consider the population of the city, most notably Jongman, Morley and Scheidel. The essay collection edited by Giardina, 2000, also includes Tantillo's discussion of the population of the city, but the economic implications of this population remain largely unexplored.

³ For more on the relationship between demographic structures and economic performance, see Morley in this volume.

⁴ Clark and Souden, 1987: 28. For the importance of migration, see also in this volume Taylor and Fischer-Bovet.

phenomenon of migration. The relationship between free migration, urbanisation and economic development is then explored. It is argued that the particular social and institutional framework of Rome limited the economic opportunities for the freeborn inhabitants of the city, particularly new migrants, both temporary and permanent. Drawing upon a combination of ancient evidence, migration theory, economic models and studies of comparative cities, this paper contends that many of the inhabitants of Rome remained trapped in absolute, structural poverty.

MIGRATION AND THE POPULATION

No literary testimony or inscription records a figure for the entire population of ancient Rome. Although Rome took regular censuses of its citizens, these refer primarily to adult male citizens, and the birth and death records kept in the city do not survive.⁵ In any case, even if our ancient sources had diligently recorded statistical population data, it is doubtful that there was ever any accurate means of recording a large and fluctuating urban population. In fact, for the metropolises of Roman Egypt, where we know more about the workings of census taking, the data are extremely susceptible to inaccuracies as a result of hidden or mobile individuals of both sexes and various ages, particularly young men.⁶ The problem of recording such a mobile population can also be demonstrated by recent experience in the developing world, where many of the population data are flawed and inaccurate, particularly in sub-Saharan Africa. This can, however, be used to draw some conclusions about the general order of magnitude of the population.⁷ Similarly, despite our lack of accurate data, most modern scholars now accept that at its greatest extent, in the late republic and the principate, the population of Rome was somewhere in the region of 1 million inhabitants.⁸

This population estimate is calculated on the basis of surviving figures for the number of recipients of grain distributions in Rome (the *plebs*

⁵ Death records were stored in the Temple of Venus Libitina (Hor. *Sat.* 2.6.19; Dion. Hal. *Ant. Rom.* 4.15; Suet. *Ner.* 39.1; Nicolet, 1991: 132–3).

⁶ See Bagnall and Frier, 1994: 1–52, esp. 40–52. See also Pudsey in this volume, p. 68.

⁷ Todaro, 1997: 46–7 n. 1. For flawed census data for Lagos in Nigeria, see Otchet, 1999.

⁸ For 1,000,000: Jongman, 2003; Lo Cascio, 2000b, 2001; Noy, 2000; Packer, 1967; Pleket, 1993; Stambaugh, 1988; Yavetz, 1958. For 1,250,000: Oates, 1934. For 870,000–970,000: Morley, 1996. Hermansen, 1978, merely suggests a qualitative ‘numerous’, while Storey, 1997, suggests an excessively conservative figure of around 450,000.

frumentaria);⁹ literary sources for the amount of grain consumed in the city;¹⁰ and the maximum number of people who could live in the built-up area of Rome, or be accommodated in the large number of *insulae* recorded in the fourth-century regionary catalogues.¹¹ None of these methods of calculation are without problems.¹² Extrapolating meaningful estimates for the entire population of Rome from the figures for the *plebs frumentaria*, for example, is difficult. These figures refer to male citizens, probably those over the age of ten,¹³ and it is unclear how many women, children, non-citizens, slaves, senators and equestrians we should add per recipient. Furthermore, Augustus' 'closing' of the lists of recipients in 2 BC,¹⁴ and the limitations suggested by the round figures recorded, makes it highly unlikely that the *plebs frumentaria* included all male citizens in Rome. Calculations based on the number of people who could be fed by a certain amount of grain imported to the city are also difficult, as they work on a sort of 'ideal population'. However, an individual's calorific needs are determined by considerations such as age, sex, occupation and so on, and while some in Rome must have enjoyed an excellent diet, many others suffered malnutrition. Finally, estimates based upon calculations of population density in the city are also questionable, as the actual limits of the city are difficult to discern and must have been fluid, while ideas of a reasonable population density vary. Yet the scraps of evidence which we do have point to a substantial urban population. The sheer size of public buildings in Rome,¹⁵ the seating capacity of venues such as the Circus Maximus or the Colosseum,¹⁶ the remarkable volume of water carried daily by the aqueducts,¹⁷ the complex infrastructure for feeding the city and even the

⁹ The number of recipients was cut from 320,000 to 150,000 in 46 BC by Caesar (Suet. *Inl.* 41.3; Dio Cass. 43.21.4) and fixed at just over 200,000 by Augustus in 2 BC (Aug. *RG* 15; Suet. *Aug.* 40.2; Dio Cass. 55.10.1).

¹⁰ For example, a fourth-century source records that under Augustus, Rome imported 20,000,000 *modii* of grain from Egypt (*Epit. de Caes.* 1.6). Also see the figures recorded by Josephus under Nero (Joseph. *Bj* 2.383, 386). See in particular Rickman, 1980: appendix 4.

¹¹ See especially Hermansen, 1978; cf. Lo Cascio, 2000b: 24.

¹² For a clear and succinct discussion of the evidence regarding the population of Rome, see Hopkins, 1978: 96–8. For a more detailed discussion, see now Lo Cascio, 2000b.

¹³ A comment in Suetonius (*Aug.* 41) suggests that males became eligible for membership of the *plebs frumentaria* at the age of ten, but this is by no means certain.

¹⁴ Dio Cass. 55.10.1.

¹⁵ See Cassiod. *Var.* XI, 39, who claims that the space within the walls and the facilities (for example, the baths, the spectacles, the flour mills) all point to a substantial population.

¹⁶ Modern estimates for the capacity of the Circus Maximus, from the time of Trajan at least, are around 150,000 spectators (Coleman, 2000: 213); the Colosseum accommodated an audience of over 50,000 spectators (Holleran, 2003: 56).

¹⁷ For details of the development of Rome's water supply, see Dodge, 2000. Also see Katherine Rinne's website: www.iath.virginia.edu/rome/first.html.

macabrely impressive death rates from plagues¹⁸ suggest a substantial population for Rome. Thus despite the difficulty in securely quantifying this population, it seems reasonable to accept that at its height in the late republic and principate, Rome was home to around 1 million inhabitants. This is a phenomenally large population for a pre-modern city, and it is often noted that ancient Rome was the most populous city in the western world until London in the early nineteenth century; a population of this order of magnitude clearly has important consequences for our understanding of the city.

A population of 1 million for Rome suggests that the city experienced rapid growth in the latter years of the republic. This was the result of a massive influx of people, rather than the result of natural increase. Indeed, with a high death-rate typical of pre-modern cities, Rome was reliant upon migration simply to maintain its population, let alone record any increase. The high population density and consequent overcrowded housing of the majority, coupled with poor sanitation, widespread poverty and malnutrition, and a dangerous disease environment all resulted in a population that was unable to reproduce itself.¹⁹ Although Laurence cautions against taking an overly pessimistic view of life in Rome, the comparative experience of historical cities in Europe or contemporary cities in the developing world demonstrates the largely negative outcome of the rapid unplanned growth of cities.²⁰ Rome consumed bodies, and although the city did not *need* migrants per se²¹ – rather Rome would have functioned better with fewer people – the large population was clearly a consequence of migration. A period of mass migration thus caused the soaring population of the late republic, which was then maintained through continual structural migration until at least the late second century AD. Some migrants were soldiers and a significant number were slaves, brought to Rome following the expansion of the empire; many of those who were then freed became integrated into the citizen body. The argument has been made, most

¹⁸ At one point during an outbreak of plague in 189, Cassius Dio claims that over 2,000 people were dying daily (74.14.3–4; also see Herodian 1.12.1–2). For other high death rates in Rome in times of plague, see Suet. *Ner.* 39.1; *Tit.* 8.3–4; Jer. *Chron.* 188.

¹⁹ For a pessimistic account of living conditions in Rome, see in particular the classic account of Scobie, 1986. Also Morley, 2005; Whittaker, 1993b; cf. Scheidel, 2003a, for an account of the spread of disease in the city, particularly malaria. Also Scheidel, in press b. For the republican period, see Yavetz, 1958, principally for a discussion of housing.

²⁰ Laurence, 1997. He argues that the notion of the ‘metropolitan dystopia’ is a twentieth-century construct of the English-speaking world. Contra Laurence, also see Scheidel, 2003a: 159–60.

²¹ A similar point is made by Morley, 2003: 150, contra Jongman, 2003: 119, who writes of the *need* for migrants in the city.

notably by Brunt, but more recently followed by Jongman, that the forced movement of slaves, and their subsequent manumission, was the most significant factor in the growth of Rome.²² Brunt claims that slaves and freedmen formed well over two-thirds and perhaps as much as three-quarters of the population of Rome in 70 BC, but this is based primarily on the epigraphic evidence, the flaws of which are well known.²³ Indeed, while the expansion of slavery in Rome was certainly a significant feature of the late republic, free migration from within Italy and the provinces was at least an equal, if not a more important, factor in the growth of the population.²⁴ Early studies of migration may have viewed pre-modern societies as largely static, but peasant societies could in fact be highly mobile.²⁵

Accurate quantification of migration to Rome is impossible, but we can suppose the large-scale migration of hundreds of thousands of people, most likely consisting primarily of Italians, in the latter two centuries of the republic, particularly in the first century BC.²⁶ Rome then continued to absorb thousands of migrants a year over the following centuries, drawn from a much wider Mediterranean-wide hinterland. Movement to Rome may have been well under way by the second century BC, when leaders of Latin colonies felt compelled to complain about the loss of their citizens to Rome.²⁷ For Sallust, Rome of the first century BC was a cesspool into which the disgraced and the criminal flowed, a sentiment echoed by Lucan; this situation was only exacerbated by the distribution of free grain from 58 BC onwards.²⁸ Seneca paints a rather more favourable picture of a 'multi-

²² Brunt, 1971: *passim*, esp. 382–7; also see now Jongman, 2003; Whittaker, 1993b: 9.

²³ Brunt, 1971: 387. For the epigraphic evidence reflecting cultural concerns rather than the social composition of the population, see below.

²⁴ Hopkins, 1978: 67, estimates that around half of the growth of Rome was down to peasant migration.

²⁵ Skeldon, 1997: 7–8. Large-scale migration, however, remains unique to the 'modern' period, despite the long record of population shifts in history (Cohen, 1996b: xi); given the levels of migration required to create and maintain Rome, we should bear in mind quite how unusual such a sizeable population move was in a pre-modern environment.

²⁶ Purcell's claim, 1994: 652, that migration was at its most rapid in the first half of the first century BC seems plausible, although accurate quantification is difficult. Scheidel, 2004b: 17, suggests the movement of almost half a million Italians between 100 and 50 BC, with a further 250,000 migrants over the next fifty years just to maintain the core population, an average of 5,000 migrants p.a. He argues for a reduction of Morley's figure, 1996: 43–4, of 10,000 migrants p.a. on the grounds that young adult migrants have twice the reproductive capacity of newborns (also Lo Cascio, 2001: 117–18). Erdkamp, 2008: 440–4, however, challenges Scheidel's figures on the grounds that he does not consider the effect on the fertility regime in Rome of temporary migrants who return home to marry, the high mortality regime of children born to migrants, or the effect of a sex ratio which may have been skewed in favour of young adult males.

²⁷ Liv. 39.3.4–6; 41.8.6–8.

²⁸ Rome as a 'cesspool': Sall. *Cat.* 37.5; Luc. 7.405–6. Grain distributions: Sall. *Cat.* 37.7; App. *B Civ.* 2.120. Also Var. *R.* 2 pr.

cultural' Rome in the mid-first century AD, in which 'the greater part . . . have left their homes and come to this city, which is truly a great and beautiful city but not their own'.²⁹ Inscriptions from Rome testify to the number of 'foreigners' living in the city (either permanently or temporarily), as does the periodic expulsion of these outsiders during times of food shortages.³⁰ Indeed, the sheer diversity of the Roman population, and the notion of Rome as representative of the whole world, is frequently commented on in ancient literature.³¹ Ancient Rome was a multi-ethnic, multicultural city, drawing people from across the Roman Empire and beyond.

Why did these people move? Traditionally, discussions of migration have focused on push–pull theory, in which people are either 'pushed' from their locality, principally by population pressure putting a strain on resources, or 'pulled' to their destination, primarily by favourable economic conditions.³² We must also take into account the social, political and cultural environment in which a migrant is embedded, rather than just their demographic and economic situation.³³ A variety of factors influence the decision to migrate, some of which go beyond abstract and ahistorical economic theory; the decision-making process of a migrant is not always wholly rational. Recent scholarship also places an emphasis on structural factors affecting migration,³⁴ but push–pull theory remains a useful approach for the analysis of pre-modern migration. Were our migrants then pulled to Rome by the opportunities which they perceived to be present in the city, or were they pushed to Rome by circumstances beyond their control in their local areas? Unfortunately our ancient sources rarely give us any sense of *why* our

²⁹ Sen. *Helv.* 6.3–4.

³⁰ Inscriptions: Noy, 2000: 5–10. Expulsion of foreigners: Suet. *Aug.* 42.3. Fourth-century expulsions: Libanius *Or.* 11.174; Them. *Or.* 18.222A; Amm. Marc. 14.6.19; Ambrose *De off.* 3.46–9; Symmachus *Ep.* 2.7.3 (Noy, 2000: 39–41). Ammianus notes (14.6.19) that, in the expulsion of AD 354, 3,000 dancers, together with their choruses and the same number of dancing teachers, were allowed to stay; if this is accurate, a city which counts 3,000 foreign dancers and their retinues among its residents suggests a considerable migrant population.

³¹ The diversity of the Roman population: Herodian 1.12.1; Amm. Marc. 16.10.6. Also Juv. 3.58–86 for a satirical tirade by Umbricius about the number of 'foreigners' in Rome. Rome as representative of the world: Cicero *Comment. pet.* 54; Ov. *Fast.* 2.684; Mart. *Spect.* 3; Aristid. *Or.* 26.61–2; Ath. 1.20b–c; Sid. Apoll. *Epist.* 1.6.2. Traditionally Rome was a city of outsiders from its very inception. Aeneas came from Troy, and Romulus granted asylum to potential citizens, who then took Sabine wives (Liv. 1.8.4–6; 1.9.10–16; Plut. *Rom.* 9).

³² Skeldon, 1997: 20; Williamson, 1988: 426f. ³³ Cohen, 1996b: *passim*; Skeldon, 1997: 22.

³⁴ Such structural factors include state intervention in migration, such as quotas, distinctions between economic migrants, asylum seekers and political refugees, and so on. See, for example, Appleyard, 1992, and Boyd, 1989. This new focus reflects the increased role of international migration as a political issue.

migrants moved to Rome.³⁵ Seneca is one of the few authors to consider the attraction of Rome, and he describes migrants pulled to the city by political ambition, education, entertainment and bonds of family or friendship, as embassies for their native cities, and by economic opportunities.³⁶ To Seneca's list we should add those drawn by the cultural opportunities of the city, such as writers, poets and artists, and also doctors, most famously Galen; in Christian Rome, people also came to the city as religious pilgrims.

However, such migrants are primarily drawn from the elite or semi-elite and were never numerically significant in a metropolis of around 1 million people. The aggregate value of this social and political migration, therefore, was insufficient for the maintenance of the population even in Seneca's day. Furthermore, such draws do not provide a satisfactory explanation for the rapid growth of Rome in the latter years of the republic, when the majority of the migrants to the city most likely came from within Italy. This particular population movement was the result of the specific political, demographic, social and economic conditions which prevailed within Italy in this period. Yet the motivation of Italians who migrated to Rome in the late republic is difficult to know, and depends upon two very different views of the demographic situation of Italy. These differing scenarios depend ultimately on the interpretation of the Augustan census figures, which *prima facie* reveal more than a fourfold increase in the citizen body.³⁷

Proponents of the first scenario (the so-called 'low count') argue that as Augustus changed the basis of the census, counting women and children as well as adult males, the citizen population was in fact declining. These scholars argue that the burden of military service, coupled with the import of slaves to staff new large agricultural estates, resulted in a dispossessed and declining Italian peasantry, who drifted to towns and cities.³⁸ This fuelled unprecedented urban growth in the Italian peninsula, particularly in the

³⁵ The only account which could conceivably be classed as migrant testimony is that of Augustine, who moved to Rome in the late fourth century AD (*August. Conf.* 5.8.). In any case, every migrant testimony may be different, with personal accounts too individualistic to allow generalisations to be drawn (Clark and Souden, 1987).

³⁶ Sen. *Helv.* 6.2–3. Noy, 2000: 90–1. Also see Ricci, 2005: 29–43.

³⁷ See de Ligt, 2004: 739, table 4, for known Roman census figures from 265/4 BC to AD 14. The census for 70–69 BC records 900,000 citizens (*Livy Per.* 98; Phlegon *FGHist* 257F 12, 6, gives 910,000), yet the Augustan census of 28 BC records 4,063,000 (*Aug. RG* 8). The controversy surrounding the interpretation of the Augustan census figures is well known and much discussed; any further discussion is beyond the scope of this paper. For an overview of the debate concerning the population size of Italy in the late republic, see now Scheidel, 2008c. See also Morley in this volume, pp. 25–7, 35–6.

³⁸ The classic account is Brunt, 1971. Also see De Neeve, 1984; Hopkins, 1978: 1–98. This picture is based primarily upon literary sources discussing T. Gracchus' motivation for the controversial land reforms of 133 BC (*Plut. Ti. Gracch.* 8; *App. B Civ.* 1.7).

city of Rome itself. Against this background, G. Gracchus' measure to distribute subsidised grain to the citizens of Rome can be seen as an attempt to feed an urban population swollen by dispossessed citizen farmers.³⁹ This would surely militate against the notion that the growth of Rome was primarily down to slavery; the problem here is unlikely to be the growth of domestic slavery, as these new residents would be fed at the expense of their owners.⁴⁰

In the second scenario (the so-called 'high count'), the citizen population was in fact increasing.⁴¹ The huge increase in magnitude is explained by more accurate decentralised census procedures;⁴² the enfranchisement of Italians, particularly in Cisalpine Gaul; the manumission and subsequent enfranchisement of an increasing number of slaves; the inclusion of enfranchised provincial adult males in veteran colonies and *municipia*; and some natural population increase within Italy, despite the effects of warfare on the citizen body. Even when all these factors are taken into consideration, the discrepancy in the figures remains dramatic. However, if the free Italian population were increasing, this population growth, coupled with the spread of large agricultural estates, may have led to rural land pressure and the 'Malthusian trap' of diminishing returns. Such a scenario could be indicated by the growing urbanisation of the Italian peninsula and the increasing foundation of citizen colonies from the second century BC, particularly outside Italy, which may be indicative of pressure on land.⁴³ The impoverishment of the Italian peasantry was, therefore, a consequence of rural population *growth*, rather than depopulation.⁴⁴ Urban centres such as Rome, together with citizen colonies, thus absorbed the growing population of Italy. We must also consider the effect of warfare and the consequent agrarian disruption in the Italian countryside caused by the social and civil wars (c.91–81 BC), which saw brief but intense fighting in the Italian

³⁹ Livy *Per.* 60; Plut. *C. Gracch.* 5; App. *B Civ.* 1.21. In a different scenario we could see the growth of agricultural estates and the subsequent increased productivity as freeing people from the land and providing them with the opportunity to pursue alternative employment; as this paper argues, however, the urban jobs were not available to absorb these people (see below).

⁴⁰ See n. 22 above.

⁴¹ The 'high count' scenario is traditionally associated with Frank 1924 and Jones 1948, but see now Lo Cascio, *passim*, but especially 1994, 2001. Also see Morley, 2001, for an 'alternative' history of late republican Italy, based on the 'high count' scenario.

⁴² The *Tabula Heracleensis* records the decentralisation of the Roman census by 45 BC (Nicolet, 1991: 127).

⁴³ For the spread of citizen colonies in the late second century BC, see Salmon, 1970: ch. 7, 112–25; for military and civilian colonies from Marius to Augustus, increasingly outside Italy, especially under Caesar, see ch. 8, 128–44.

⁴⁴ De Ligt, 2004.

peninsula. The inevitable devastation of buildings and crops, along with pillaging by soldiers and widespread instability and violence in rural areas, may have significantly increased the pace of movement to Rome.⁴⁵

Geraghty offers an alternative view, employing an economic model to argue that peasant migration was down to 'pull' rather than 'push' factors.⁴⁶ Peasants were drawn by the opportunities present in urban centres, rather than pushed by rural impoverishment. According to his model, rising prices for urban products were a significant 'pull' factor for the Italian peasantry; the *annona* was an additional draw for those who decided to move to Rome.⁴⁷ There are no actual data on urban goods prices to support the hypothesis of rising prices,⁴⁸ but the argument is based on the notion that increased demand for urban goods, both from the empire and domestic customers, pushed prices upwards. At the same time, Geraghty argues that imperial expansion caused a drop in the price of grain in Italy after 200 BC, although he claims that the effects of this could be almost offset by the increasing opportunities in urban areas.⁴⁹ This may indeed have been the case, but it is precisely the fall in grain prices that makes the rising prices in urban areas attractive. Continuing to farm grain in the face of declining prices would surely lead to impoverishment; indeed, even those who moved to urban centres faced a decline in real wages.⁵⁰ Thus even though rising prices for urban goods may have encouraged migration to Rome, we must consider this in the face of declining returns for growing grain. Furthermore, as this paper will demonstrate, we need to consider the functioning of the labour market and quite how peasant migrants could take advantage of the opportunities presented by this supposed rise in urban prices.

What are the implications of this for our migrants? In reality, the differing scenarios do not produce drastically different outcomes for Rome. Essentially, peasants were pushed from their land by dispossession, pressure on land or the effect of falling grain prices. Peasants thus moved to the city in order to find work and the means of survival; such migrants were victims of their circumstances, pushed to Rome by the situation in their locality. One difference to note in these scenarios, however, is that any movement due to population pressure was more likely to be temporary. In developing countries, rural households with numerous young adults often send family members to urban centres to make additional money on a temporary or seasonal basis. The city is thus a resource to be 'harvested' in order to

⁴⁵ Harrison, 2008a: 11–18; 2008b. Scheidel, 2007a, presents a far more positive view of late republican Italy.

⁴⁶ Geraghty, 2007: 1048–50. ⁴⁷ Geraghty, 2007: 1045–6.

⁴⁸ Geraghty, 2007: 1046. ⁴⁹ Geraghty, 2007: 1045–6, 1050.

⁵⁰ 'The model predicts that real wages decline by 9 percent' (Geraghty 2007: 1050).

maximise the profit potential of the household.⁵¹ Such movement is of course possible in the other direction, with urban residents relocating temporarily to rural areas; perhaps the most famous example is the annual September relocation of substantial numbers of Londoners to the hop fields of Kent in the nineteenth and early twentieth centuries.⁵² Italian peasants unable to find sufficient work as agricultural labourers – and such work is mostly seasonal – may have removed themselves temporarily from the household and searched for work in Rome.⁵³

Economic migrants chose to go to Rome rather than to a more local urban centre because they perceived the opportunities to be greater in such a large city; even when there were no particular crises in Italy or the Roman Empire as a whole, such perceived economic opportunities must have continued to draw people to Rome. Indeed, although migration theory suggests that migration is ‘step-wise’, with people moving from rural origins to urban centres in a series of stages or steps, this is not always the case.⁵⁴ In many countries of the developing world, for example, urbanism in general has developed at a relatively slow rate, but the growth of certain individual ‘megacities’ is striking.⁵⁵ This can also be paralleled in nineteenth-century England: Mayhew, for example, interviewed a turf-cutter in London who walked to the city from Lancashire when he was unable to secure local employment in his early twenties. The turf-cutter argued that ‘most men when they don’t know what in the world to do, come to London’;⁵⁶ perhaps the unemployed and displaced of Italy would have expressed similar sentiments. Of course, Rome had particular attractions which made it an appealing proposition for Italian migrants. The distribution of grain, for example, must have been a significant attraction from the inception of subsidies in 123 BC. Certainly in the period between 58 BC and Augustus’ ‘closing’ of the lists in 2 BC, the promise of free grain for Roman citizens was an important draw, particularly for those in poverty. Even following Augustus’ actions, potential migrants may not have known the details of the grain distributions, and may only have discovered the difficulties of receiving this benefaction upon arriving in Rome;⁵⁷ such migrants may not then have had sufficient funds

⁵¹ Skeldon, 1997: 22. ⁵² Clark and Souden, 1987: 17.

⁵³ The connection between the rural labour market and seasonal migration to Rome would merit further study, although this is beyond the scope of this particular paper; the important relationship between seasonality, population movement and the labour market is, however, explored by Hawkins, in press. Also see Erdkamp, 2008: 424–33, for seasonal mobility in second-century BC Italy. It is worth noting that it is unlikely that such migrants were able to send money home on a regular basis, as the banking facilities for this sort of transfer were simply not available for these people (Noy, 2000: 54).

⁵⁴ Ravenstein’s second law of migration stipulates that migration is step-wise.

⁵⁵ Skeldon, 1997: 8. ⁵⁶ Mayhew, 1851: vol. 1, 157. ⁵⁷ Noy, 2000: 48. See below.

to leave and thus remained in the city, mired in poverty. Furthermore, the lure of the 'big city' alone should not be underestimated.

Following historic migratory patterns, it is probable, although by no means certain, that young adults dominated among those migrating to Rome.⁵⁸ Although epigraphic evidence does not necessarily form a representative sample of a population, immigrant inscriptions from Rome also suggest a strong male bias, even when the military evidence is removed. Among civilian immigrant funerary inscriptions which record the age of death, men in their twenties form the largest age group, which suggests that such migrants tended to come to Rome in their late teens or early twenties.⁵⁹ This is congruent with modern migratory patterns, where migrants tend to move before they have married or started families. Migration of young adults, particularly men, must have had a dynamic social, political and economic effect on the city; it is the economic effect of these migrants with which this paper is concerned.

MIGRATION AND THE URBAN ECONOMY

What then was the effect of free migration on the urban economy of ancient Rome? In neoclassical economic theory, a clear relationship was drawn between migration, urbanisation and economic development, based primarily upon the influential 1950s labour surplus model of Lewis. This model viewed urban migrants in terms of their human capital: a surplus of labour in the rural sector was transferred to the urban sector, thus providing the necessary workforce for an industrial economy. Cities acted as the engines of industrialisation, and migration was therefore necessary for economic development.⁶⁰ However, this optimism was gradually replaced by the pessimism of the 1960s and 1970s, which considered the experience of developing countries, where people have tended to migrate in excess of the urban employment opportunities. Cities in developing countries typically demonstrate high levels of unemployment, underemployment and poverty. People are forced to create marginal employment for themselves in the informal sector. This results in a 'dual economy' operating on two levels, the 'formal' and 'informal' sector, or 'upper' and 'lower' circuits: the formal

⁵⁸ Skeldon, 1997: 34; Williamson, 1988: 430. For the probable dominance of young adult males among temporary or seasonal migrants to Rome, see Erdkamp, 2008: 434–7, 442–4. Of course, migration to ancient Rome was the result of a specific set of historical circumstances and may not reflect any 'historic migratory patterns'. Indeed, recent research based on the analysis of teeth removed from skeletons excavated in the Isola Sacra near Portus indicates that a significant minority of the sample were taken from individuals who migrated to Portus as children, suggesting that migration could involve the movement of family units rather than just young adults (Prowse *et al.*, 2007).

⁵⁹ Noy, 2000: 60–7. ⁶⁰ Skeldon, 1997: 20.

sector is characterised by economic activity such as banking, the export trade, and modern industry and services, while the informal sector is characterised by non-capital-intensive industry and services, such as street trading.⁶¹

When considering the relationship between migration and economic development, the nature of the city concerned must be taken into account; migration will have a very different effect on the economy of a manufacturing centre than on a political or administrative centre. In nineteenth-century England, for example, jobs in manufacturing absorbed unskilled migrants in industrial Manchester, but there was a lesser amount of regular wage work in London.⁶² London thus developed a more significant informal sector economy, similar to that of many developing world cities, which also tend to be political rather than industrial centres.⁶³ To understand the effect of migration on the economy of Rome, we must then consider the nature of the city and its economy, together with its social and institutional framework. Was there a functioning employment market in Rome, and did this effectively absorb migrants and other urban residents? Did migration turn Rome into a manufacturing centre like nineteenth-century Manchester, or are the experiences of developing world cities or nineteenth-century London more appropriate parallels?

The majority of people in Rome had to work to support themselves.⁶⁴ It scarcely needs reiterating that the grain distributions and imperial benefactions did not provide the inhabitants with sufficient means for survival; in any case, there were many in the city ineligible for such assistance.⁶⁵ We must, therefore, envisage hundreds of thousands of skilled, semi-skilled and unskilled workers in Rome. However, the social and institutional structure of the city restricted the opportunities available to the freeborn inhabitants. Within elite households, for example, there was a preference for slave or freed labour, as the number of slaves owned was a clear indicator of a family's wealth and status. The Roman decision-making process was not determined solely by economic matters, but also by considerations of status, social pressures and convention; we should bear in mind that social and cultural factors play a key role in the construction and operation of an

⁶¹ In a city such as Lagos in Nigeria, for example, at least 60 per cent of the urban labour force is estimated to be employed in the informal sector (Orchet, 1999; Nwaka, 2005: 3; Packer, 2006). The literature on the informal economy is extensive, but a succinct discussion can be found in Drakakis-Smith, 2000: 125–31.

⁶² Hart, 1973: 89. ⁶³ Gugler, 1982: 66; McNulty and Adalemo, 1988: 214.

⁶⁴ See Tac. *Hist.* 1.86 for the misery caused by a flood in Rome in AD 69; the people of the city faced famine not only because of a lack of supplies, but also because of a lack of employment.

⁶⁵ Private benefactions from the senators resident in the city were neither widespread nor sufficient (Le Gall, 1971: 272).

economy.⁶⁶ Domestic slavery in particular was evidence of conspicuous consumption, and the seriously wealthy would purchase slaves to specialise in the smallest and most menial of tasks.⁶⁷ Thus even though migration and the subsequent competition for jobs in Rome may have kept wages low, the elite were not interested in employing cheap wage labour to carry out domestic duties, as there was no status to be gained from such an action. Rather the elite ideal was self-sufficiency within the household: it was demeaning for a man of wealth and status to be seen to employ outsiders domestically. A preference for domestic slavery restricted the opportunities available to women in particular. The domestic work which stimulated female migration in early modern Europe, or indeed in areas such as South America in the latter part of the twentieth century,⁶⁸ was not widely available in ancient Rome. Furthermore, there was little administrative work available, as the houses and estates of the wealthy were run by their slaves and freedmen. This was the case even within the imperial household, where slaves and freedmen dominated the administration.⁶⁹ This prevented the development of a civil service or indeed any stratum of 'white-collar' workers in Rome, thus limiting the opportunities available even to those who may have been educated and literate.

The structure and organisation of production and commerce in Rome also limited the economic opportunities available to the freeborn population. An array of crafts is known of in the city,⁷⁰ but production remained rooted in small individual workshops or *tabernae*, with the majority of the goods produced for local consumption rather than export. Such small-scale production required skilled workers, rather than the unskilled or semi-skilled workers who staffed the factories of the Industrial Revolution. Migration did not, therefore, necessarily stimulate economic development through the expansion of manufacturing in factories. Furthermore, the employment opportunities in production and commerce for the freeborn migrant were

⁶⁶ Bridge and Watson, 2000b: 111; Geraghty, 2007: 1053.

⁶⁷ See, for example, the scale of domestic slaves owned by Petronius' fictional freedman Trimalchio (*Sat.* 15.37). Although rhetorical in context, Pliny's suggestion that some slave-owners required a *nomenclator* may not be far off the mark (Plin. *Nat.* 33.26). Treggiari, 1975: 61–2, draws an illuminating parallel with the households of the British in eighteenth- and nineteenth-century India: 'prestige outweighed economy', and as the British emulated the local elites, they employed huge numbers of servants to perform intensely specialised tasks.

⁶⁸ De los Reyes, 2001: 280–2; Drakakis-Smith, 2000: 119; Gugler, 1997b: 121 n. 13.

⁶⁹ At the very top level, administrative roles were increasingly undertaken by men of equestrian status, but this hardly extended the employment opportunities of the free population of Rome. For slaves in administrative roles, see Saller, 2008: 8.

⁷⁰ See, for example, the list of 160 occupations (including a wide variety of crafts) attested in inscriptions from Rome, compiled by Treggiari, 1980: 61–4; also see Joshel, 1992: 176–82.

limited by the predominance of slaves and freedmen in this sector. There is little evidence for freeborn craftsmen in Rome, yet the epigraphic record points to a substantial number of slave and freed craftsmen in the city. This does not, of course, mean that there were no freeborn craftsmen; rather this reflects the particular cultural concern of freedmen with the stone commemoration of their lives and their craft. However, it is telling that freedmen dominate other spheres of archaeological evidence for production and commerce: at Pompeii, for example, the names of freedmen were painted onto amphorae, and they appear on seal stamps and in the archives of Jucundus and the Sulpicii.⁷¹ This is surely more than just a coincidence.

In essence, the slaves – and particularly the freedmen – of the wealthy were frequently in a superior economic position to the freeborn in Rome. Slaves were often trained in a craft or a skill, and if they were manumitted they were able to continue working as free men in their respective crafts. Slaves and freedmen thus had access to both training and the economic support of their owner or patron, which would assist them with the creation or expansion of a business. For freeborn migrants, on the other hand, securing the necessary start-up capital for a small business may have been difficult, unless they were able to save this money themselves. Although credit was available in Rome, from both the wealthy elite and from professional bankers,⁷² the instability and transience of the population as a whole probably worked against the development of a credit system that encouraged entrepreneurship. Similarly, accessing training was not necessarily straightforward. Apprenticeships may have been a possibility for the freeborn; these certainly existed in Egypt and elsewhere in the Roman world, but the extent of their availability in Rome is unknown.⁷³ Some of the migrants to Rome may well have had skills for which they expected greater demand in the capital,⁷⁴ but finding work in the city may not have been as easy as these craftsmen might have thought. Casual labour in workshops was probably available, since demand for certain goods fluctuated seasonally, but permanent jobs were generally undertaken by trained slaves or freedmen.⁷⁵

⁷¹ Mouritsen, 2005. ⁷² Andreau, 1999; Jones, 2006; Rathbone and Temin, 2008.

⁷³ For a discussion of the evidence from Roman Egypt, see in particular Bradley, 1991: 107–16; also Burford, 1972: 89; Crook, 1967a: 200–2. See also Ulp. *Dig.* 9.2.5.3, 9.2.7.pr, 19.2.13.4. For further literary and epigraphic evidence from elsewhere in the Roman world, see Bradley, 1991: 107–16. Although the Egyptian documents detail the apprenticeship of both free and slave children, the additional evidence which Bradley uses to argue that the pattern of apprenticeships discerned in Roman Egypt was common across the empire refers primarily, although not exclusively, to slave apprentices.

⁷⁴ Noy, 2000: 87–9, 113.

⁷⁵ For the instability of demand and the need to secure workers at short notice, see Hawkins, 2006: *passim*, but esp. 17–77.

The social and institutional infrastructure of Rome thus left many of the freeborn inhabitants of the city living in poverty.⁷⁶ Permanent skilled, or indeed unskilled, wage labour was not in demand since, for the most part, permanent jobs in the commercial sector were undertaken by slaves and freedmen. Yet Rome was a working city. What then did the hundreds of thousands of freeborn inhabitants of Rome do to earn a living? Even outside of the elite, a small proportion of the free population were presumably wealthy enough not to need to work, although the size and structure of this 'middling group' is largely unknown. Indeed, although it has recently been argued that this group was substantial in the late republic and early empire,⁷⁷ quite who these people were remains unclear. If the economy was structurally biased against entrepreneurship and social mobility, then those who formed this 'middling group' in Rome were probably reliant upon inherited wealth and the transmission of land and property; perhaps these people are best envisaged as urban property owners.

Others in the city may have secured more permanent jobs, but the majority relied on casual work. Given the numbers of people searching for employment in Rome, the sheer competition for such jobs probably kept wages low.⁷⁸ Furthermore, the availability of casual work fluctuated. Casual labour is by its very nature unstable, and workers in Rome must have been hired for varying lengths of time. The standard unit of work was probably a day, but weeks or even months are possible; an agreed fee may also have been paid for the completion of a particular task.⁷⁹ Short-term labour agreements were likely to have been made orally, as indicated by the hiring of the vineyard workers in the New Testament.⁸⁰ In this parable, men seeking work are found congregated in the marketplace, a

⁷⁶ For more on the restrictions faced by freeborn workers in Rome, see Holleran, in press.

⁷⁷ Jongman, 2007.

⁷⁸ Wages thus reacted to market forces. Scheidel, 2007a: 336, suggests that high prices in the capital would in fact have driven wages up, rather than competition driving wages down, but it seems unlikely, given the structure of the labour market, that wages for casual work were high.

⁷⁹ Such payment by the piece is attested in the construction of Greek temples, for example, the Erechtheion (pers. comm. Claire Taylor).

⁸⁰ Matt. 20.1–16. See also Apul. *Met.* 2.21, 9.5–6. Few traces of contracts or legal arguments pertaining to this sort of labour survive; contracts are known between employers and free labourers in the Dacian gold mines, but these are longer term and probably do not reflect the employment conditions in Rome. For evidence of the employment of day labourers in Liguria, see Millar, 1984: 9. Also see Brunt, 1980: 88–92; Treggiari, 1980: 51–2. Some workers in the imperial quarries of Mons Claudianus in Egypt were paid an annual wage on a monthly basis, while others were paid a daily rate. The annual wage is less than the multiplication of the daily wage, suggesting that it might be more advantageous to agree payment per day. However, such workers may not have been employed regularly, rendering such agreements unstable (Cuvigny, 1996: 141).

phenomenon documented elsewhere.⁸¹ Those seeking casual work still congregate in central areas of many contemporary towns and cities, and we can suppose that those who were seeking employment in Rome assembled in the forum Romanum, one of the imperial fora (perhaps depending upon the type of work sought), at the markets or at the docks. Employers were thus able to find potential workers easily and could make a verbal agreement about the work to be undertaken and the payment due.

The two main sources of casual employment in Rome were probably the movement of goods and the construction industry, both of which were subject to seasonal fluctuations in demand. Given the concentration of the purchasing power of the elite, coupled with the cumulative demand from the large population, serving Rome was a massive task. As the city grew, Rome required an increasingly large labour force to ensure the distribution of food, the provision of other goods and the construction of houses for the population; this was, however, a self-generating phenomenon and cannot be used to explain the growth of the city. Comestibles, manufactured goods and raw materials came into Rome from across the empire. The flow of goods came along the roads, down the Tiber from inland Italy, and from the ports of Puteoli and Ostia. Sea shipping was seasonal, and although barge transport along the Tiber was less susceptible to the seasons, the frequency of river and road traffic coming into Rome must have fluctuated.⁸² Yet once these goods reached Rome, people had to transport them all to their final destination. Loading and unloading barges at the docks, and the movement of goods through the streets of Rome, must, therefore, have provided temporary employment for a large number of the city's inhabitants. The prohibition of wheeled vehicles in the city in the daytime must have exacerbated the problem of moving goods, and required the employment of even greater numbers of people to distribute items throughout the city.⁸³

The construction industry was also a large employer of labour in Rome. Given the large population, there was a constant need to construct or replace private accommodation in the city. This need was exacerbated by

⁸¹ Pl. *Aul.* 280–3; *Ps.* 790, 804–7; *Trin.* 815. For a similar phenomenon in Athens, see Taylor in this volume, p. 120.

⁸² See Mayhew, 1851: vol. II, 220, for a similar use of casual labour in nineteenth-century London; an easterly wind could deprive thousands of dockhands of work, while favourable shipping weather created a huge demand for workers.

⁸³ From the late republic, wheeled vehicles, apart from those transporting building materials, were only allowed in the city at night (see the *Lex Julia Municipalis* of 45 BC: *CIL* 1² 593.56–61=ILS 6085).

the shoddy construction of much of this accommodation, which appears to have been subject to collapse; frequent fires and floods further undermined the buildings in the city.⁸⁴ The sheer scale of the imperial building projects undertaken in Rome also underlines the enormous size of the labour force required to construct these elaborate imperial complexes. DeLaine suggests that 12,000–20,000 men were employed directly in construction at any one time, although higher figures are plausible.⁸⁵ Given ancient construction techniques and technology, major imperial projects took years to complete, as did the construction of *insulae*.⁸⁶ However, the ratio of slave to free labour employed in the construction industry is unclear. This is, of course, a crucial distinction, not only for our purposes of examining the economic effect of migration, but also for our overall understanding of the urban economy of Rome. Indeed, although Skydsgaard argues that it is immaterial if the labour is servile or free, as the ‘multiplier effect’ – the need to feed and clothe these workers – will be the same,⁸⁷ the means of feeding and clothing these workers will differ depending upon their legal status. Slaves would be fed, clothed and accommodated within the household, but with the employment of free labour, money would circulate more freely in the city as these people had to purchase their food and clothing on the market, and rent their accommodation privately.⁸⁸

In the republic, large public building projects were let out to contract and this system probably continued under the principate;⁸⁹ the same is true of private projects. Some of the workers whom the contractors employed were

⁸⁴ Cic. *Att.* 14.9.1; Plut. *Crass.* 2.7; Tac. *Hist.* 1.86; Juv. 3.7–8, 193–202; Gell. 15.1.2.

⁸⁵ DeLaine, 2000: 132, 135–6. This would mean that 2 per cent of the overall population of Rome was directly employed in the construction industry. This can be compared to Renaissance Rome, where during the construction of St Peter’s in 1586 at least 6 per cent of the population was employed in the building trade. Higher figures for construction workers are, therefore, not implausible, especially if we include private building projects, perhaps well over 60,000 if Renaissance Rome is any guide. Such a figure is not as unlikely as it may first appear: in one exceptional ancient case, 30,000 men were employed for eleven years draining the Fucine Lake (Suet. *Claud.* 20.2). The percentage of adult males involved in this industry is thus likely to have been high: DeLaine, 2000: 135–6, suggests around 15 per cent of adult males, although given that a third of all late eighteenth-century Parisian wage-earners were employed in the building industry (Brunt, 1966: 14), a higher figure is possible. Clearly no definitive estimate can be reached.

⁸⁶ DeLaine, 2000: 126–9, calculates that the Baths of Caracalla took six years to complete (the Baths of Trajan, five years, and those of Diocletian, around eight years), whereas the average Ostian apartment block took between two and four years. See DeLaine, 2000, for a quantitative account of the building trade in Rome, especially public building. Also see Skydsgaard, 1983; Steinby, 1983.

⁸⁷ Skydsgaard, 1983: 225.

⁸⁸ Some food may have been provided in the form of *cibaria* for workers, but the extent of this is unclear. See, for example, the daily wage of one denar plus bread for a worker in Pompeii (*CIL* IV 6877; Scheidel, 2007a: 335 n. 51).

⁸⁹ DeLaine, 2000: 121.

likely to have been skilled slaves or freedmen,⁹⁰ but this was supplemented by the hiring of free labour.⁹¹ It is perhaps best to imagine a core of slave workers, but a changing periphery of free labourers, hired as and when they were required. Certainly the availability of building work must have fluctuated, especially considering the seasonality of construction; building activity was supposedly at its height in summer, when the longer working day enabled more work to be completed.⁹² The public building projects undertaken by the emperors thus not only monumentalised the centre of Rome, but also provided employment for freeborn workers, both skilled and unskilled; the same may well be true of the great building projects of the republican period.⁹³

The use of free labour was in fact beneficial to those who funded building projects. The building trade in antiquity was dangerous, and injuries and death among the labourers must have been relatively common. Yet although the owner of a slave could claim through the *lex Aquilia*, this law only gave an action to the owner of the thing damaged, and in Roman law a free man is not held to be the owner of his own body;⁹⁴ furthermore, losing a free labourer did not mean losing the capital investment made in a slave. It thus made financial sense to employ a free worker rather than a slave on dangerous or heavy work, a practice attested in the republic.⁹⁵ Of course the labour involved in building in Rome did not start with the construction; stone had to be quarried, timber cut down, and the raw materials shaped accordingly and transported to the city, thus providing more work for those involved in portage.

The urban poor also made a contribution to the 'rural' labour market, as additional workers were required on building projects or at harvest time in the villas surrounding Rome; Cicero, for example, describes a group of workers at his villa in Tusculum who stopped work in order to return to Rome to collect their grain rations.⁹⁶ Free workers in Rome were flexible and highly mobile, and moved to take advantage of job opportunities

⁹⁰ Most famously, see Crassus' skilled slaves, including carpenters, masons and architects (Plut. *Crass.* 2.4–5).

⁹¹ Ven *Dig.* 45.1.137.3. ⁹² Frontin. *Aq.* 123.

⁹³ Brunt, 1980, contra Casson, 1978, who argues against the inclusion of free labour in imperial building works; the use of free labour is a more convincing thesis.

⁹⁴ Ulp. *Dig.* 9.2.13.pr; Crook, 1967a: 198–200. It is possible that a *paterfamilias* could claim for injury or death to his *filius familias* (Gaius *Dig.* 9.1.3; Ulp. *Dig.* 9.2.7.pr); he does not strictly speaking own his son, but this is the inference (Crook, 1967a: 199).

⁹⁵ Var. *R.* 1.17; Thornton and Thornton, 1989: 35.

⁹⁶ Garnsey, 1980b: 42; Cic. *Att.* 14.3.1. The interpretation of this passage is debated. Casson, 1978, argues that *ad frumentum* merely refers to the workers going to purchase grain locally, rather than returning to Rome to receive public grain, although these workers do come back with rumours relating to the grain supply of the city of Rome. Even if we discount this passage, it remains likely that free workers contributed to the 'rural' labour market in the vicinity of Rome.

whenever possible; there were few restrictions in the free labour market of the late republic and early empire, with no barriers from guilds and no hereditary limitations.⁹⁷ The sort of casual employment market which dominated in Rome probably encouraged a mobile periphery of temporary migrants who took advantage of seasonal opportunities or specific openings; news of a large imperial building project, for example, may have increased movement to the city. However, given the large pool of unemployed and underemployed labour already present in Rome, wages may not have been high enough in the city to make 'harvesting' of the urban market economically rational. Indeed, increased migration 'thickened' the employment market, increasing the competition for jobs and further lowering wages.⁹⁸ Temin, on the other hand, interprets the episodic nature of monumental building in Rome positively, taking this as evidence of a flexible and mobile labour force that could be enticed to work on such projects by the wages offered.⁹⁹ This interpretation suggests almost continuous employment for the free workers of Rome, who could move from one job to another in order to maximise their income. It is, however, more likely that such large-scale building projects were welcomed by the free workforce of Rome, particularly as the longevity of these projects alleviated problems of unemployment for a number of years at a time. The fact that a free labour force could be gathered for such work could equally be taken as evidence of underemployment in Rome. The labour force may indeed have been mobile and flexible, but this was because these workers were chasing jobs rather than high wages; the flexibility was not necessarily a matter of choice.

What happened when casual employment was unavailable? Migrants could of course simply leave Rome, as could other residents. Yet migrants who were pushed to Rome by poverty were unlikely to have homes to which they could return. That people moved out of Rome is not to be doubted,¹⁰⁰ but there is no evidence of a mass exodus of workers from the city when large imperial building projects were completed. The notion of leaving Rome for rural poverty appears untenable, although there were probably itinerant workers who were constantly on the move looking for work on a casual or seasonal basis.¹⁰¹

⁹⁷ Temin, 2004: 518.

⁹⁸ For an approach that emphasises transaction costs and the thickness of the market for unskilled and semi-skilled workers in Rome, see Hawkins, in press.

⁹⁹ Temin, 2004: 518, 537. ¹⁰⁰ For a satirical account of this phenomenon, see Juv. 3.

¹⁰¹ Perhaps most famously, Paul the Apostle supported himself financially through his work as an itinerant craftsman, constructing tents from leather (see Hock, 1980). For mobility of workers in second-century BC Italy, see Erdkamp, 2008. For mobility and short-term migration in Attica, see Taylor in this volume.

However, many free workers must have remained in the city, where it was easier to scrape a living;¹⁰² the experience of contemporary cities in the developing world suggests that urban centres offer more opportunities for casual work and informal economic activity, however unstable.

Indeed, informal activities are used as a survival strategy by millions in cities in developing countries, the current archetypal example of which is Lagos in Nigeria.¹⁰³ This phenomenon was also documented in cities such as seventeenth- and eighteenth-century Beijing or nineteenth-century London.¹⁰⁴ Although all these cities are historically unique, they share the common characteristic of a rapidly growing population which outstrips the formal employment opportunities available. The employment market does not expand at the same rate as the city population, and rural migrants and urban residents form a large pool of excess labour; this labour force has limited skills and is never fully employed.¹⁰⁵ There is no form of social security, yet people find the means to survive by obtaining sporadic, temporary employment in the informal sector, mainly as day labourers, or by creating work for themselves or their families, most notably as street traders and hawkers.¹⁰⁶

Street trading is a relatively easy occupation to enter, as it requires few skills, little education and minimal initial capital. Street traders also provide an important service, as they tend to sell goods in small amounts at low prices, which is essential in cities where many live a hand-to-mouth existence.¹⁰⁷ The widespread presence of street traders and hawkers can in fact be taken as indicative of a formal labour market that is not functioning properly. These comparative cities give us some idea of what is plausible in ancient Rome, and given the structure of the urban economy, we can suppose that many turned to informal economic activity out of necessity. This will probably have included street trading and hawking, an avenue that was also open to women, who were unlikely to work as casual labourers.¹⁰⁸ Furthermore, if a large proportion of the population of Rome relied on casual labour, purchasing goods from street traders on a daily basis would

¹⁰² Thornton and Thornton, 1989: 37.

¹⁰³ For more on Lagos, see, for example, Davis, 2004; Otchet, 1999; Packer, 2006.

¹⁰⁴ Beijing: Braudel, 1973: 427–8. London: Green, 1982; Mayhew, 1851: vol. 1.

¹⁰⁵ Gugler, 1997b: 114; 1982: 67–9.

¹⁰⁶ Todaro, 1997: 15. See n. 61 above. For more on the phenomenon of street trading in both comparative cities and ancient Rome, see Holleran, in press.

¹⁰⁷ Bromley, 1988: 171; Teltscher, 1994: 171.

¹⁰⁸ That women outside of the elite sphere were economically active wherever possible should not be doubted (contra Carcopino, 1941: 201–3). Women appear frequently in depictions of retail (see Kampen, 1981).

suit their unstable existence.¹⁰⁹ Others provided services or entertainment, working as prostitutes, barbers, fortune-tellers and so on, while still others collected items for reuse or recycling. Indeed, some in Rome must have made a living selling whatever they could scavenge, just as in contemporary cities such as Lagos, where ‘an army of unemployed boys and girls’ is described as offering ‘anything’ for sale in order to scrape a living.¹¹⁰ Incomes were probably supplemented by begging and criminality where necessary.

Migrants to the city of Rome will not, therefore, have been easily absorbed into the urban economy. The population of the city grew over and above the available employment opportunities, and even those born and raised in the city must have struggled to find steady employment. That people moved to Rome and survived is certain, but just as in our comparative cities, people lived on the very margins of subsistence. Many in Rome endured an irregular and unstable existence, working on a casual basis and supplementing their income with informal activities wherever possible. Casual workers were expendable, supplementing a core of slave and freed labour; the need for labour fluctuated, and at times of low demand it was the periphery of casual workers who suffered, rather than the slaves or freedmen. Given the difficulties of measuring poverty and living standards even in the modern era, it is unsurprising that quantifying poverty in ancient Rome is problematic:¹¹¹ however, the casual workers in the city should certainly be classed as among ‘the poor’, rather as in developing world cities, where those with regular employment generally form the mid–upper income groups, while those who rely on part-time casual employment tend to be among the very poor.¹¹²

Recent works on Roman poverty have asserted that, for the able-bodied in Roman society, poverty was always conjunctural, but in fact many free able-bodied workers faced absolute, structural poverty.¹¹³ Income fluctuated

¹⁰⁹ A comment by Tacitus (*Hist.* 4.38) suggests that people in Rome purchased provisions on a daily basis; whether this was due to a lack of storage facilities and a concern with freshness, or whether this was due to the income patterns of the purchasers is unclear.

¹¹⁰ Lindijer, 2000. Also see McNulty and Adalemo, 1988: 227.

¹¹¹ For the problem of defining poverty, see Carrié, 2003; Osborne, 2006; also Finn, 2006: 18–26; Garnsey, 1998: 226–7; Morley, 2006a: 27–36; Whittaker, 1993b: 3–4. The poverty we encounter in Roman literature is primarily a literary construct, which bears little resemblance to the lives of those whom we would consider to be ‘the poor’ (see Woolf, 2006).

¹¹² Todaro, 1976: 14.

¹¹³ Conjunctural: Grey and Parkin, 2003: 287; Osborne, 2006: 5. Conjunctural poverty occurs when personal difficulties or general political and economic crises cause people to fall temporarily into a state of poverty. Those who encounter conjunctural poverty can expect things to improve, but those faced with structural poverty are born poor and remain poor, trapped in their situation by a particular economic system (Morley, 2006a: 28; Osborne, 2006: 1).

according to the availability of work, but the urban economy of Rome was structured in such a way that it prevented people breaking out of poverty. Economic poverty was the norm, and, despite previous claims, such long-term poverty *was* tenable in Rome, if unpleasant. Purcell, for example, takes the lack of freeborn poor in our epigraphic record at Rome as evidence that such a group did not exist, rather than as a reflection of the cultural habits or economic poverty of these people.¹¹⁴ Finn's analysis of the poor in the late Roman Empire also lacks a category of 'permanent poor'.¹¹⁵ His poor are either destitute and thus very susceptible to death, or are subject to conjunctural or episodic poverty; poverty is not a normal state of being in his analysis. However, both historical and modern cities demonstrate that it is possible for people to survive in poverty in an urban environment even with no visible or regular means of income: people are engaged in informal casual labour, hawking, criminality, prostitution, begging and so on, anything which enables them to survive. Poverty and destitution should be viewed as two separate categories – the former is possible as a long-term state, but the latter is untenable as a normal state of being, at least for any significant length of time, since the risk of death from hunger, cold, exposure and disease is high.¹¹⁶

There was, therefore, a group of 'permanent poor' in Rome, trapped in structural poverty. The hand-to-mouth existence of these people prevented saving, and they were thus extremely vulnerable to falling into destitution. As people in large cities such as Rome were divorced from the land, they were entirely dependent upon the market for subsistence;¹¹⁷ in this sense, absolute urban poverty could be more catastrophic than absolute rural poverty. In later periods there may have been a 'safety net' for the impoverished in urban areas, as the Christian Church concerned itself with the care of the poor,¹¹⁸ but even if charity was an accepted notion in the pre-Christian world, the systematic infrastructure to care for the poor simply did not exist.¹¹⁹

¹¹⁴ Purcell, 1994: 656–7, discussed by Morley, 2006a: 29–31. The lack of freeborn inscriptions in Rome probably reflects the fact that the 'epigraphic habit' was not common to all (Mouritsen, 2005). In any case, even if such commemorations were part of Roman culture as a whole, the structural poor were unlikely to be in a position to afford memorials.

¹¹⁵ Finn, 2006: 18–26. ¹¹⁶ Finn, 2006: 22.

¹¹⁷ Morley, 2006a: 33, 38. In smaller towns, such as Pompeii, residents may have had access to gardens in which they could grow some basic foodstuffs (see, for example, Jashemski, 1979), but the pressure on land in Rome probably rendered gardens the preserve of the wealthy.

¹¹⁸ Brown, 2002: 50.

¹¹⁹ Quite when the poor began to be seen as a separate group deserving of assistance, rather than condemnation for their moral corruption, is debated (Grey and Parkin, 2003: 289–93; Osborne, 2006: 2–3).

The grain distributions were neither charity nor poor relief: eligibility was based on political rather than economic status. Recent migrants were particularly vulnerable, as they lacked the established social ties and networks that would help them to survive in a crisis; those without families were also particularly vulnerable to destitution. The very real threat of destitution which many in Rome faced underlines what a divisive measure it was to place restrictions on access to the grain distributions. When Augustus fixed the number of recipients in 2 BC, he effectively divided the poor into two groups: those who had the safety net of state-sponsored grain, and those who did not, or 'the entitled and the excluded'.¹²⁰ The *plebs frumentaria* could at the very least rely on the authorities in Rome to provide the bare basics of survival in times of difficulty – five *modii* of grain every month, supplemented by occasional monetary donations from the emperor.¹²¹ However, the *plebs frumentaria* constituted a diverse group, and for those who were reliant on casual work, the right to receive grain at state expense merely cushioned them against the worst effects of hunger; it did not lift them out of poverty. Only a structural change in the social and institutional infrastructure of the city, or a more widespread system of social welfare not seen until the modern era (and even then, not entirely successful), would have achieved this; perhaps Vespasian recognised this, if his concern with providing work for the people is to be considered genuine.¹²²

If so many people faced structural poverty in Rome, why did people keep coming to the city? Firstly, some of those who moved to Rome, particularly in the first two centuries AD, were not drawn by the economic prospects of the city, but by the educational, political and cultural opportunities which it offered. Others, particularly in the late republic, were pushed to Rome by circumstances beyond their control. However, we must also consider the hopes and expectations of our migrants. The information available to those who decided to move to Rome was probably flawed, given the difficulties of communication in a pre-modern world. Even when access to grain distributions was controlled, potential migrants may not have been aware of the

¹²⁰ Morley, 2006a: 39.

¹²¹ For a consideration of the calorific requirements provided by the grain distribution and a discussion of diet in Rome in general (including incidences of malnutrition in the city), see Garnsey, 1998: 230, 236, 245–9; 1999: ch. 4, 43–61. It should be noted that the diet of a recipient of the grain distribution was very much dependent upon personal circumstances such as his economic background and the size and structure of his family.

¹²² Suet. *Vesp.* 18. According to Suetonius (*Vesp.* 19), Vespasian was also careful to hold regular banquets to provide work for the food sellers in Rome, although it is unclear quite who these (presumably luxury) food sellers were. If the food trade was dominated by slaves and freedmen, Vespasian may have been continuing to line the pockets of the wealthy.

intricacies of the system, expecting free grain to be readily available to all. Furthermore, these migrants may have perceived there to be great economic opportunities in the city. Even if this were not the case, it can be supposed that there was a wider variety of casual means of ‘surviving’ in Rome than in rural areas, or in smaller urban centres.

This is a phenomenon that is well documented in developing countries, where high rates of rural–urban migration need to be considered alongside rising urban unemployment. Todaro has sought to explain this anomaly with an influential model which takes into account *expected* urban income.¹²³ Young people migrate to the cities because urban wages are higher than rural wages (the so-called ‘positive urban–rural real income differential’), and although many will not secure a well-paid urban job immediately, the *expectation* remains that they may do so in the future. Many, however, never secure the anticipated well-paid job and are forced to find diverse ways to survive. Unfortunately, the quantitative data which would allow us to analyse rural–urban wage differentials for the city of Rome are lacking. Even if we had a reliable data set of wages, this would refer to nominal rather than real wages; we would need a full set of price data in order to ascertain wage differentials in real terms.¹²⁴ It is highly probable that people perceived there to be economic opportunities in an imperial centre such as Rome, whatever the reality, and with the wealth of the empire flowing into the city, a lucky few will indeed have made great fortunes. However, for the poor migrant with few skills and limited connections, the prospects were bleak. The social and economic infrastructure and the institutional hierarchy of Rome limited the opportunities available to the majority, who faced structural poverty and the ever-present threat of destitution.

¹²³ Todaro’s model of migration first appeared in the 1960s, but for an overview see Todaro, 1997. Todaro is certainly aware of the importance of social, cultural and psychological factors in the decision to migrate, which he recognises as ‘varied and complex’, but the emphasis in his analysis of the decision-making process is primarily on economic motivations. See also Drakakis-Smith, 2000: 59–63; Gugler, 1997b: 119; McNulty and Adalemo, 1988: 226.

¹²⁴ For the difficulties of ascertaining real wages in Rome, see Scheidel, 2007a: 335 n. 51; also 2008b. Scheidel, 2007a: 336, approaches this problem from a different direction, arguing that the sheer scale of immigration implies higher real wages in Rome than in rural areas. Such models also tend to argue that the growth of slave-staffed estates in Italy suggests high rural wages, which were then adversely affected by the rise in slavery (for example, Scheidel, 2007a: 336, or the model presented by Alexander Conison at the European Social Science History Conference, Lisbon, February 2008, ‘Slavery and the self-selected migrant’); the effect of urban slavery on wage levels in Rome, however, is largely neglected. We must also take into account competition for wage labour in the city.

CONCLUSION

The relationship between migration, urbanisation and economic development is thus not always a positive one. In the case of Rome, migration had a detrimental impact upon the employment market, as the increased competition for work probably depressed wages in the city. The expansion of employment opportunities was hindered by an institutional preference for slave labour among the elites, who preferred to spend their vast wealth on increasing the numbers of slaves and freedmen within their households, rather than employing freeborn labour. If our analysis of the employment market is correct, then the majority of urban inhabitants were poor, and their low and fluctuating income levels must have had a significant effect upon life in the city. For example, the little evidence which we have suggests that accommodation at Rome was expensive,¹²⁵ and we can suppose that rooms and apartments were densely populated in order to alleviate the burden of rent; at the lowest levels, rents were payable daily or weekly, reflecting a situation in which people were paid according to such patterns.¹²⁶ An unquantifiable number lacked permanent homes and found shelter wherever it was available; anecdotal evidence points to people living in attics, under stairs, in basements, in kitchens, under bridges, in porticoes, in temple porches, under theatre awnings and in tombs, or spending nights in cook shops, essentially wherever shelter were available.¹²⁷

The poverty and instability of the urban inhabitants also impacted upon areas such as production and commerce. Few in the city could afford more than basic consumer goods, thus limiting demand and failing to stimulate changes in production methods; the availability of free labour also had a negative effect on economic development, as there was no incentive to increase productivity. Furthermore, the price of the few consumer goods which the population of Rome purchased had to be kept low; in this economic environment the retail trade remains dominated by producer-

¹²⁵ In 48 BC Caesar granted remission of rents of up to 2,000 sesterces in Rome and 500 sesterces elsewhere, suggesting that the cost of housing was four times as high in Rome (Cic. *Off.* 2.83; Suet. *Caes.* 38.2; Dio Cass. 42.51.1).

¹²⁶ Val. Max. 4.4.8; Frier, 1977: 35.

¹²⁷ Sen. *Vit. Beat.* 25.2; Mart. 8.14.5–6, 11.32, 12.32; Juv. 3.209–11, 5.8, 8.158, 9.140; Dio Chrys. *Or.* 40.8–9 (Prusa); Tert. *Adv. Valent.* 7; Ulp. *Dig.* 47.12.3.11; Amm. Marc. 14.6.25; GrNys *PG* 46.457 (Constantinople); Aug. *Serm.* 345.1. Illegally constructed housing: Ulp. *Dig.* 43.8.2.17; *Cod. Theod.* 14.14.1, 15.1.4, 15.1.22, 15.1.25, 15.1.38, 15.1.39. Also see Frier, 1977: 33; Grey and Parkin, 2003: 286–7; Hermansen, 1978: 167; Scobie, 1986: 402; Whittaker, 1993b: 10–11. That conditions in much of the accommodation in Rome were grim should not be doubted; Petronius' description (*Sat.* 95) of bedding black with bugs is particularly evocative (cf. Mart. 11.32.1).

retailers, street traders, hawkers and markets, as the lower overheads inherent in such forms of retail mean lower prices for the consumer. Such forms of retail are also able to adapt quickly to changes in supply or demand. Criminality and social and political concerns are also likely in a city without a properly functioning employment market, not to mention problems associated with sanitation, disease, high mortality levels and the disposal of the dead. Furthermore, fertility levels among the freeborn inhabitants of the city may have been affected by poverty and instability. The relationship between poverty and fertility is complex, and the experience of urban populations in the developing world demonstrates that poverty does not always result in deliberate limitations being placed on fertility.¹²⁸ However, if young adult males did predominate among migrants, this would have temporarily skewed the sex ratio in Rome, and the combination of poverty, instability and a restricted urban marriage market probably limited fertility levels among the freeborn population, particularly among migrants.¹²⁹

Migration to Rome primarily had a negative effect on the city's infrastructure. Rome was a political rather than an industrial city. It had no economic need for the migrants who flocked there in the late republic and into the empire. The migrants may have enhanced the political status of the city – it was the people as much as the buildings that made Rome a thing of wonder to contemporary observers¹³⁰ – but migration over and above the economic opportunities of the city did little to enhance the quality of life of the urban inhabitants; by far the greater number in Rome were unable to lift themselves out of the structural poverty in which they were embedded. Our comparative cities suggest the likely consequences of migration in excess of the employment opportunities in a city. Indeed, the urban poor in contemporary developing countries have been described as tied into 'a vicious circle of low training, shortage of work opportunities, and low incomes';¹³¹ it appears that the situation for the urban poor in Rome was not vastly different.

¹²⁸ Williamson, 1988: 431. For a discussion of fertility in late republican Italy, see Hin in this volume.

¹²⁹ Rens Tacoma, 'Graveyards for Rome: migration to the city of Rome in the first two centuries AD', European Social Science History Conference, February 2008. Also see Erdkamp, 2008: 442–6.

¹³⁰ See n. 31. ¹³¹ Bromley, 1988: 174.

*From the margins to the centre stage*Some closing reflections on ancient historical
demography*Tim Parkin*

While ancient demography, in Bowersock's words, may well be 'there to stay', persistent reluctance to engage with its methods and concepts will condemn it to a marginal existence. Current shifts into qualitative, cultural history make this the most likely outcome. But all is not lost. The study of ancient demography has come a long way since Beloch's abortive experiment. Regardless of future progress or retrenchment, the advances of the past few decades will indeed be there to stay.

(Scheidel, 2001b: 10)

My book *Demography and Roman Society* appeared in 1992. Most of the writing of it actually took place in 1987, in my second year as a DPhil student at Oxford. The topic of my dissertation was age and the aged in the Roman world, supervised by Fergus Millar. It had become clear to me in my first year that the very basic question 'how many old people were there in the Roman world?' was not one for which anything approaching a ready answer was available. In my second year at Oxford I was fortunate to be able to attend classes in the methods of demography offered by David Coleman and Richard Smith. I also read a great deal, including Wrigley and Schofield's magisterial work (1981) on the population history of England, as well as Hollingsworth's 1969 introduction to historical demography. I then sat down and wrote what I thought would be a chapter of my dissertation. By the end of that academic year, it was very clear that the chapter had become too big and it began to take on a life of its own; thanks to Dr Lori-Ann Touchette, one of my contemporaries at St John's College, Oxford, an American publisher became interested in my manuscript. Hence, in the year that I submitted my dissertation on old age, my demography book appeared with Johns Hopkins University Press, in its Ancient History and Society series.

The intention of that book was to provide a guide for Roman historians to a field that was beginning to have an impact (to use a now fashionable

term here in the UK) on varied aspects of historical research; to put it in a nutshell, it was the sort of book I wished had existed when I started my research on ageing. Keith Hopkins's articles that appeared in *Population Studies* in the 1960s had, of course, had the most significant influence on me as I considered ancient demography, but they were not widely known, or at any rate widely understood, by Roman historians. Following his lead – and I was lucky enough to be able to discuss it with him on several occasions – I attempted in my book to bring to bear on aspects of ancient history some demographic methodologies and models. Despite the remarks of some of the more generous reviews of that book, *Demography and Roman Society* was not, I think, a catalyst so much as a reflection of the growing awareness of the need to take on board demographic aspects in ancient history.

On reading the chapters in this book – and I shall not undertake here what I had originally planned, namely a survey of scholarship since 1992, for the editors of this volume have done that very succinctly and effectively in their introduction – it has become clear to me both how far the subject has progressed since 1992 and, even more forcefully, how much potential demographic approaches hold for further exploration and understanding. My ventures into ancient demography were very much from a socio-historical perspective; I was particularly interested, and have remained so, in the ancient life course and the study of Graeco-Roman families and households. Hence, perhaps inevitably, the focus of my 1992 book was not on economic matters, and the lack of any detailed discussion of the ancient economy in that book was certainly one of its weaknesses. The appearance in 2007 of Scheidel, Morris and Saller's *The Cambridge Economic History of the Greco-Roman World* (2007), with its chapter by Walter Scheidel on demography, indicates just how much can and should be said in that regard (and that chapter is now the best general, up-to-date account of ancient demography, to be superseded when Scheidel's promised overview book is published by Cambridge University Press), although it is also worth remarking that, outside of that chapter, the impact of population studies is less evident in the book as a whole, as Morley also notes above. In any case, since 1992 I have been an interested spectator in the field of ancient demography as my own research has been focused primarily on other aspects of Roman social history. Of course, it must be added that the impact of demography on the study of the ancient family and the life cycle has been extremely significant, not least as a result of Richard Saller's 1994 book utilising the CAMSIM computer simulation programme of the Cambridge Group for the History of Population and Social Structure. So I have very much welcomed this opportunity to revisit the subject briefly as I read these

papers (the 2005 Manchester conference from which some of these papers derive was before my arrival in the UK), and I am grateful to the editors for inviting me to make some concluding remarks.

If economic issues did not receive the space they warranted in my 1992 book, the other, even more significant, omission was discussion of disease environments in antiquity. Robert Sallares's 2002 book on malaria in ancient Italy, along with a good deal of Walter Scheidel's work (especially Scheidel, 2001a), has served to illuminate the significance of such aspects, together with the question of the seasonality of patterns of mortality. What is also becoming abundantly clearer is the complexity and diversity, over time and especially over space, of ancient demographic realities. It is this complexity that the papers in this book do particularly well in highlighting. Perhaps what I mean by this will be made more evident if I reconsider the structure of my 1992 book in relation to the chapters above.

Demography and Roman Society opened with brief comments on population size. The focus of that book as a whole was very much on the structure of ancient populations but, of course, a great deal of the work done on ancient demography since 1992 (and a number of chapters in this book relate to it) has been on the size of citizen populations, particularly fourth-century BC Athens and Italy of the later republic. Mogens Hansen's work on the Athenian side is widely known and has been rightly influential, but Akrigg's chapter in this volume reminds us very usefully of the particular limits within which Hansen was working. At the same time, Akrigg very skilfully shows that questions of size are by no means separate from questions of population structure. He also does well to consider the vexed problem of the degree to which the Athenian polis has a similar demographic structure to the Roman Empire (put in those terms, of course, one sees the fragility of such an assumption). Akrigg also raises the thorny question of the utility of model life tables; I shall return to this point shortly.

My first chapter in *Demography and Roman Society* was a survey of ancient evidence that has been used in the past in attempts to elucidate aspects of ancient demography, in particular average life expectancy at birth. There is no need to rehearse those arguments, since the basic findings are widely, if not universally, accepted. The appearance in 1994 of Bagnall and Frier's *The Demography of Roman Egypt* (since updated to include further material in Bagnall and Frier, 2006) marked the most significant advance in ancient demographic studies (as I indicated in Parkin, 1995; the impact of Clarysse and Thompson, 2006 will help to build on this advance in years to come). Pudsey's chapter in this volume, following on from her University of Manchester PhD (2007), shows one way in which the Egyptian material

provides us with highly revealing insights into aspects of families and households. She also raises what is still, for me at least, a nagging question regarding the applicability of this material to wider aspects of the ancient world. The more I return to the Roman Egyptian census data, data which Bagnall and Frier scrutinised with such expertise and success, the more I am inclined towards the view (despite Parkin, 1995) that what we are seeing is not unique in many respects to Egypt, but is reflective of demographic realities, particularly in terms of household formation and fluidity of structure, of those in the lower socio-economic groups of the ancient world. In relation to this, and as several chapters in this book imply, much greater consideration needs to be given to the significance (or otherwise) of urban/rural differences (see, for example, Taylor in this volume). The only other comment I would make in relation to the various types of ancient evidence relating to demographic studies, and it is something that this book does not discuss (but see the editors' introduction, pp. 11–12, for some discussion of recent research in this field), is the potential for further advances in our understanding via skeletal material; despite my disappointment in this regard in 1992, it remains possible that further analysis and discoveries will enhance our picture of specific demographic realities, at least in terms of disease environments.

I have already mentioned my awareness of the fact that economic issues did not receive due discussion in my *Demography and Roman Society*. Morley's chapter here I found particularly stimulating for a number of reasons, not least being his incorporation not just of Malthus, but also of David Hume's classic essay *Of the Populousness of Ancient Nations*, an essay I had read with much profit in 1987 and had given passing reference to in my 1992 book – indeed I even went so far as to declare that 'many modern scholars could benefit from reading' it (p. 162). Morley's review of demographic transition theory is very important, not least for emphasising the dangers in conceiving of ancient demography, or indeed of any pre-modern population, in terms of a generalised or homogeneous model or theory. Having said that, however, I still believe in the utility of model life tables for the ancient historian (the focus of the second chapter of my 1992 book). Their use has been severely criticised, particularly by Scheidel and Sallares, and not without good reason. In my book I argued for the utility of a generalised model incorporating high mortality and correspondingly high fertility. I was, and am, very aware of the weaknesses inherent in such a generalised approach, not least in regard to the variability of mortality patterns over time and space, variability that model life tables disguise (hence the importance of considering disease environment in a demographic context). Nor would I ever suggest that the population of the ancient world was a stable, let alone stationary, one.

But the most concerted attacks on the use of model life tables in ancient demography have been on the uncertain relationship between infant and adult mortality levels (see also in this book discussion by the editors in their introduction and by Akrigg). It is certainly true that, for very high mortality populations, the infant mortality levels in the Coale–Demeny 1983 tables are predicted by algorithmic extrapolation. In other words, the problem is that these model life tables, whose use I advocated for population cohorts whose average life expectancy at birth was in the range of 20–30 years, are based on populations where life expectancy at birth is greater than 35 years; models with lower life expectancy at birth are extrapolated from lower mortality regimes. Or to put it another way, the models I used for the ancient world are not based on empirical evidence. More so now than ever, there is very real uncertainty in my mind that the levels of infant and early childhood mortality being predicted by the relevant Coale–Demeny tables (over 300 per 1000 in the first year of life; over 450 per 1000 in the first five years) were realistic. The year after my demography book was published, there appeared in the journal *Historical Methods* new model life tables for high mortality populations, tables based on (limited) empirical evidence (Preston *et al.*, 1993). Following that lead, in 2007 in the *Economic History Review*, Bob Woods developed two new sets of high mortality model life tables, dubbed South Europe and East Asia, based on a range of data sets (a version of this paper was in fact presented at the Manchester 2005 conference organised by the editors of this volume; see also Woods, 1993). To sum up some very detailed methodological arguments, there are good reasons to believe that the Coale–Demeny tables *overestimate* infant and early childhood mortality levels and *underestimate* mortality levels in later years. Infant mortality levels of 200 per 1000, rather than 300 per 1000, and early childhood mortality levels of 350, rather than 450, per 1000 (with average life expectancy at birth remaining around 25 years) seem to me highly plausible as generalised models for classical antiquity. But I must emphasise again, as I sought to do in 1992, that these are highly generalised models meant primarily as guides to what is probable or possible, as opposed to models that are specific to any particular population, isolated in terms of time and space. Akrigg’s suggestion in his chapter that model life tables might be spliced is exactly right (see Parkin, 1992: 178). Where empirical evidence of any value is lacking, or where evidence does emerge that warrants testing, such generalised models remain of enormous value.

One of the reasons why I think we should allow for lower levels of infant mortality as a generalisation is a factor which I raised in my 1992 book, but which has been little discussed since in terms of either mortality or fertility,

namely breastfeeding. Hence, it was a particular pleasure to me to see that issue being raised, among many others, in this book. The third and final chapter of *Demography and Roman Society* looked at issues ('demographic impressions') relating to mortality, fertility and migration. Both Hin and Pudsey, in their discussions of fertility in this book, briefly raise the issue of breastfeeding. The level of breastfeeding in a society, and maternal breastfeeding in particular, can act as a major determinant in a range of demographic factors. This also has relevance to the question of so-called differential demography and the question of differing mortality levels according to social class. I have always been of the view that such differences would have been relatively (and I stress, relatively) minor in antiquity. It has become increasingly common, as outlined for example by Saller, 1994, to assume a higher life expectancy at birth for 'senatorial' Romans than for 'ordinary' Romans. But the fact that senators lived in Rome might suggest that any advantage they enjoyed because of their wealth would be more than counterbalanced by the perils of the *urbs aeterna*. If the upper classes were not routinely employing maternal breastfeeding, and especially if they were following Soranus' advice regarding breastfeeding in the first weeks after birth (*Gyn.* 2.II–12), one can envisage that infant mortality levels among the upper classes would have been markedly increased.

Hin's chapter, with her reconsideration of Roman motives, economic and otherwise, for fertility, as well as other factors affecting fertility, moves us forward considerably from my 1992 book in terms of our awareness of fertility as a demographic factor in antiquity (although I would like to see further discussion of gender differences in regard to the economic benefits of childbearing and -rearing). Indeed her PhD dissertation on demographic developments in the late Roman republic (Leiden, 2009), which I had the privilege to examine, will, once it is published, provide a great deal of stimulus to the development of scholarly ideas on demography and economy, as well as to the debate regarding the low and high count of population numbers in the later Roman republic. Hin's chapter in this volume also brings up revealing aspects relating to household structure, something pursued further, as I have already mentioned, in Pudsey's chapter.

In my 1992 book I had very little to say about migration (Parkin, 1992: 135–6); my main point, in fact, was that we need to say more about it, but I was not sure how that was ever going to happen. So the final three chapters of this book are, in my view, particularly welcome and innovative. Taylor, Holleran and Fischer-Bovet come at migration from different but mutually advantageous angles, and indeed other papers, not least Hin, also point to it as a necessary factor for consideration. A number of chapters, particularly

that by Taylor, also mention the use that could be made of archaeological site surveys in this regard. It is worth mentioning here that this is an aspect that was an explicit aim of the Populus project led by Graeme Barker and David Mattingly; see in particular the first volume edited by John Bintliff and Kostas Sbonias, entitled *Reconstructing Past Population Trends in Mediterranean Europe, 3000 BC – AD 1800* (Oxbow Books, 1999).

Fischer-Bovet's paper here, while less focused on the ancient economy and written in the context of military history, serves to highlight both the advantages of approaching a particular question from a number of angles (cf. Hansen's shotgun method) and also the very important repercussions and implications of such calculations in terms of the socio-economic and political situation, in this case in Egypt of the third century BC. It may be noted in passing also that this paper raises a familiar problem, that of the correct multiplier when moving from figures from adult males to that of populations as a whole (see also again Hin in this volume). The use of demography in military history, something Scheidel has also published on and on which Brunt was so illuminating, is one that will continue to bear fruit. The impact of the Peloponnesian War comes home to students more, I have always found, if I try to relate it not just to the plague after Pericles' funeral speech, but also to some rough notions of the effect on population numbers; for example, if one makes a very rough estimate that at the beginning of the war there were around 60,000 adult male Athenian citizens, and conjectures (with fairly appropriate nods to Thucydides) that some 20,000 died of the plague and another 20,000 in the course of the war (including 10,000 in the disastrous Sicilian campaign) and then surmises that the adult male citizen number in 404 BC was of the order of 25,000, then the Peloponnesian War becomes more than just a historical point of fact, and is revealed as an earth-shattering reality.

But to return to migration. One important methodological approach that emerges from the papers of Taylor and Holleran is the consideration of non-permanent and/or seasonal migration, as well as consideration of migration in relation not just to the individual but also to the family and the wider community. Taylor's paper also raises important and fascinating questions regarding the status (economic and otherwise) of migrants. But it is Holleran's paper that in my view is particularly successful both in tying together demography and (in this case, urban) economy, and in its use of ancient evidence alongside modern theories and models, while also utilising comparative evidence en route. Her discussion of poverty, furthermore, provides important stimulus, and a possible corrective, to ongoing research in this area. In short, Holleran's paper is a model of how and why this

volume is important and is successful in its aim of using demographic methods and models to enhance our understanding of the ancient economy and indeed of the ancient world. The papers as a whole show that the study of ancient demography, while of increasing importance in its own right since 1992, also provides very important and fundamental insights into our understanding of ancient politics, of ancient military history and of ancient societies in general.

Ancient demographic studies are certainly here to stay; in fact, it is difficult to understand how ancient history got by for so long without them. Together with other recent studies which both build on existing work (such as Mogens Hansen's 2008 paper, 'An update on the shotgun method') and open up whole new approaches (such as, on the larger scale, Alan Bowman and Andrew Wilson's emerging project, *Oxford Studies on the Roman Economy*, and, in more particular detail, Rens Tacoma's ongoing work on migration and the Roman family, and Peter Turchin and Walter Scheidel's 2009 'Coin hoards speak of population declines in Ancient Rome'), the level of innovation that the papers in this volume both stimulate and foster shows that the subject will continue to flourish, centre stage.

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