



HAL
open science

Demographic analysis of Pre-roman populations near the Greek colony of Massalia (southern France). The concept, the method and an introduction to historical openings

Delphine Isoardi

► To cite this version:

Delphine Isoardi. Demographic analysis of Pre-roman populations near the Greek colony of Massalia (southern France). The concept, the method and an introduction to historical openings. From the Pillars of Hercules to the Footsteps of the Argonauts. *Colloquia Antiqua 4.*, Mnemosyne Supplementum, 2012, From the Pillars of Hercules to the Footsteps of the Argonauts. *Colloquia Antiqua 4.* hal-01412295

HAL Id: hal-01412295

<https://hal.science/hal-01412295>

Submitted on 9 Dec 2016

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

COLLOQUIA ANTIQUA

— 4 —

FROM THE PILLARS OF HERCULES TO THE FOOTSTEPS OF THE ARGONAUTS

Edited by

ANTOINE HERMARY and GOCHA R. TSETSKHLADZE



PEETERS
LEUVEN – PARIS – WALPOLE, MA
2012

TABLE OF CONTENTS

Series Editor's Preface <i>Gocha R. Tsetskhladze</i>	VII
Introduction <i>Antoine Hermary and Gocha R. Tsetskhladze</i>	IX
List of Abbreviations	XI
List of Illustrations	XV

Part 1

Greeks and Celts in Provence and Languedoc before Roman Rule

CHAPTER 1	Greeks and Natives in South Gaul: Relationship, Acculturation and Identity <i>Michel Bats</i>	3
CHAPTER 2	Greeks, Celts and Ligurians in South-East Gaul: Ethnicity and Archaeology <i>Sophie Collin Bouffier and Dominique Garcia</i>	21
CHAPTER 3	Demographic Analysis of Pre-Roman Populations near the Greek Colony of Massalia (Southern France) <i>Delphine Isoardi</i>	37
CHAPTER 4	The First Century of Massalia: Foundation, Arrival of Migrants and Consolidation of a Civic Identity <i>Adolfo J. Domínguez</i>	61
CHAPTER 5	Topography and Town Planning in Ancient Marseilles <i>Henri Tréziny</i>	83
CHAPTER 6	Lakydôn, dieu ou héros indigène dans Marseille grecque <i>Antoine Hermary</i>	109
CHAPTER 7	Celts and Greeks: The Fight for Massalia in the Last Three Centuries of Her Independence. New Thoughts about the <i>Chora</i> <i>Loup Bernard</i>	125

CHAPTER 8	Greco et Celtes en Languedoc <i>Thierry Janin et Michel Py</i>	141
CHAPTER 9	D'Agde à Béziers: les Grecs en Languedoc occidental (de 600 à 300 av. J.-C.) <i>Daniela Ugolini</i>	163
Part 2 From Etruria to the Black Sea		
CHAPTER 10	Demaratus of Corinth and the Hellenisation of Etruria <i>David Ridgway</i>	207
CHAPTER 11	Sur l'urbanisme à Istros <i>Petre Alexandrescu</i> (†)	223
CHAPTER 12	Scène de tragédie sur une hydrie de Prague: Clytemnèstre et Cassandre ou la Danaïde Hypermèstre et son époux? <i>Jan Bouzek</i>	233
CHAPTER 13	Céramiques à figures rouges d'Apollonia du Pont, décou- vertes anciennes et récentes <i>Antoine Hermary</i>	239
CHAPTER 14	Les ateliers primordiaux de coupes ioniennes à la lumière des trouvailles de la mer Noire <i>Pierre Dupont et Vasilica Lungu</i>	255
CHAPTER 15	Contribution à la prosopographie externe des cités grec- ques et des peuples indigènes du nord et de l'est du Pont- Euxin <i>Alexandru Avram</i>	279
CHAPTER 16	Pots versus People: Further Consideration of the Earliest Examples of East Greek Pottery in Native Settlements of the Northern Pontus <i>Gocha R. Tsetskhladze</i>	315
	List of Contributors	375
	Index	377

DEMOGRAPHIC ANALYSIS OF THE PRE-ROMAN POPULATIONS NEAR THE GREEK COLONY OF MASSALIA (SOUTHERN FRANCE)

Delphine ISOARDI

Abstract

The aim of this paper is to study the Iron Age civilisation of southern France through its inhabitants. Demography is a good reflection of the vicissitudes through which these populations have passed. But the link between archaeological artefacts and population is not so easy to establish. The problems will be revealed, followed by an examination of the methodological side of the question. Once the 'archaeo-demographic' variations are obtained, an attempt will be made to interpret them from an historical point of view – that is to say, confronting the results with historical sources and the economic context – to see to what extent this comparison brings forth new elements, especially concerning the relationship between Phocaeen colonists and local societies.

INTRODUCTION

Until now, every archaeological and historical analysis of the pre-Roman civilisation of southern France has been based on artefacts. The objective of this paper is to understand this civilisation by means of those who lived within it; that is to say, by appraising and measuring the number of inhabitants throughout the period concerned. This explains the need for help from demography. The purpose is to find the best link between the archaeological remains and the level of the population at a given time.

In this case, the new picture we wish to establish concerns particular events: how the settlement of the Phocaeen colony of Massalia on the French Mediterranean coast and the setting for economic exchange with the local peoples during the Archaic period (the *emporion*) affect the size and the composition of these populations. In fact we know that the introduction of the Greek element into this territory was an essential condition for the development of these Iron Age societies (concerning proto-urbanisation, for example). We would like here to understand what the effects of these historical and economic events were on the individuals themselves.

Behind the fluctuations in the level of the populations captured over a long period, many historical and economic events may be hidden: wars, the arrivals and departures of populations, starvation, disease and epidemics, etc. Indeed, each historical or economic phenomenon leaves its print on the shape of human society. This is why a demographic analysis can act as a new tool for apprehending the Greek colonial impact on Iron Age societies in southern France. In the abstract, we are endeavouring to construct a ‘archaeo-demographic’ history built on enumeration and to interpret it in order to cast new light on historical events. This is not easy; the first part of this paper will address the difficulties met with in trying to obtain such an image of the Iron Age populations, and above all, the precautions required to interpret it.¹

The analysis falls into three parts. The first attempts to define in more detail the concept of demography used here, with an account of the various methods of enumerating populations used to this day. This review allows us then to work out three methods for enumerating the archaeological evidence that we shall expose. Finally comes the interpretation of the data.

CLARIFICATION OF CONCEPTS

Before discussing the effect of Archaic Greek colonisation on the indigenous population, it seems necessary to define properly the concept of demography that we intend to use here, to isolate the most appropriate aspect of the discipline for use with the specific archaeological data in the area. Thus, what follows is a short survey of the various approaches used by demographers, geographers, historians and archaeologists for different periods and areas. Demographic approaches can indeed be very diverse, but what flows from them is linked to the type of data.

WHAT SUITS OUR CIRCUMSTANCES?: A GLANCE AT TRADITIONAL AND HISTORICAL DEMOGRAPHY

Traditional demography has two main aspects: the enumeration of humans (the census), and study of the structure of populations (mainly by age and sex). To obtain such detailed figures for the whole of the population studied, the demographer undertakes many and various surveys of the living population. Of course, such surveys are out of reach for those of us studying past populations and

¹ See, for example, Isoardi 2005; 2008; 2009.

some adaptations have to be made in order to apply historical demography to some periods of Graeco-Roman civilisation. We enjoy some benefits from the existence of a number of written sources containing some figures, even if these are fragmentary and seldom originally devoted to a population study. Thus, it is still possible, with modification, to apply the traditional analytical tools of the demographer. Unfortunately, for the Iron Age societies of southern France, we lack sufficient written sources; and in their absence, we cannot obtain the bulk of the statistics usually handled by demographers. We are without the qualitative aspect of demography.

We might hope to fill this blank with data from physical anthropology, specifically archaeo-demography, based on bones and human remains, which is defined as demography for societies without written sources. By working on bones we can obtain data on age, sex and even the living conditions and sanitary state of populations. Some preconditions are required, however, such as very well-preserved bones; and many criteria have a part to play in the accuracy and reliability of the results. Unfortunately, in our case this method cannot be applied everywhere on account of the unequal state of preservation of bone remains across periods and areas. Such a study would have to be limited spatially and chronologically and would thus be inadequate for a study of the structure of the Iron Age populations of our area.

Therefore, in order to make the demographic approach viable, it is essential to obtain a continuous and broader panorama of these societies, spatially and chronologically. Such a global view of the population would seem to be more easily achieved quantitatively than qualitatively (population structure). Hence the strong focus on enumeration. Our aim is to obtain demographic spatial and chronological variations, in order to interpret them in historical terms.

To provide the most reliable estimate of the level of population, we need to know how to make the best use of the various archaeological data we possess; but none of the previous attempts at enumerating this civilisation has been methodologically satisfying (a summary of the different approaches used in archaeology follows). To go further and to put forward an efficient method of enumeration suited to our data, we need to take into account past successes as well as past failures.

DEMOGRAPHIC METHODS USED IN ARCHAEOLOGY²

Many of those working on prehistory like to make a more or less direct connection between the carrying capacity of the environment and the maximum

² This is a summary of a more detailed study in Isoardi 2003.

level of human population.³ However, this determinist and Malthusian principle, in which environmental factors preside over the growth of population, meets with some opposition. For example, it means that population is in equilibrium with its environment, which is not necessarily so. Moreover, this principle becomes less fundamental for more technically evolved societies, such as those studied here, which are able to free themselves from natural and environmental factors. Nor does it take into account social and psychological factors. Finally, it is not applicable in all situations, because it requires a knowledge of some parameters that are often out of reach or difficult to obtain (measurement of the biomass, the vegetal varieties, the rate of precipitation, etc.). To conclude, as a result, these various methods only propose a fork, more or less wide, for the evaluation of the level of the populations, what is hardly satisfactory according to our problem.

For antiquity, historians rely mainly upon Graeco-Roman written sources and try to extract the maximum information from casual indications: distribution of food or money, the movement of individuals on ground or by sea, population counts from military activity or from death in battle, etc.⁴ Most of the time, there is no proper population census. There are techniques for obtaining the ratio of men to women, free men to slaves, and so on, but they are prone to unreliability: historians rarely agree about these coefficients, or what to include and what to leave out, and the margins of error can be huge. And this method is hardly suitable for this Iron Age civilisation when there are so few texts concerning it. It is an approach able to offer only isolated demographic indicators and quite insufficient for our purposes and the need for a deep analysis.

What remains is to study the archaeological evidence. Various attempts to derive demographic figures from particular types of artefact have been made, but they are either unsatisfactory or unsuited to the specific archaeological data of the Iron Age in southern France. For example, some have tried to link the number of humans to that of cooking or eating utensils.⁵ Attempts have been made to estimate the size of the population through the human capacity of some great public buildings (theatres, amphitheatres, etc.) or through the number of persons necessary to construct some collective works (erection of the menhirs of Locmariaquer, statues of Easter Island).⁶ Others have sought to establish a link between the quantity of remains of foodstuffs and the scale

³ For instance Nougier 1959; Thompson 1966; Bordes 1968; Birdsell 1968; Zubrow 1971; Casteel 1972; Angel 1972; Hassan 1975; Rozoy 2001; etc.

⁴ A method first elaborated by J. Beloch (in 1886) and still used today.

⁵ See Cook 1972; David 1972; Turner and Lofgren 1966.

⁶ Like Nougier 1959, 277–78; or Diamond 2006, 114–15.

of a human community (a usual method with Upper Palaeolithic *escargotieres*)⁷. On the other hand, some archaeologists have been keen to estimate food production from the extent of cultivation, likely crop-yield, daily food requirements, etc.,⁸ or deduce real food production from the remains of cereals found inside settlements.⁹ The evolution of the vegetal cover may also reflect, in certain conditions, the pressure of population.¹⁰ Another approach is to use more or less sophisticated formulae to relate dwelling surface to a minimum number of occupants, or to define the minimum surface area required per individual on the basis of ethnographic or anthropological references. At a regional scale, numerous have been the attempts to build theoretical growth models, sometimes by analogy with traditional societies still extant, through examination of many factors (environmental, social and economic, technical development, growth rate, etc.). But they remain theoretical.¹¹ To sum up, however relevant these approaches may be, they are often controversial and, regrettably, are practicable only in exceptional cases. Thus, they do not allow us to obtain a general and continuous vision of the population level.

With funeral remains, many attempts have been made to estimate the total number of graves, especially through density formulae.¹² However, we all know that the number of dead is not reliable guide to the number of the living. There is a selection among humans: not everyone benefited from burial, and some types of grave have survived better than others. There are many other variables, which is why working in this domain requires much caution.

This leaves just the settlements. In fact this material is the most readily available and best preserved in southern France. But current methods of enumeration are still not wholly satisfactory. Population figures seem often to be the result of a global estimate made 'at a quick glance' and linked to the urban framework, variations in the inhabited area, to the subdivision or enlargement of dwellings, etc. For example, it is common to attribute to a site an overall population figure linked to surface area, sometimes with regard to settlements of similar size for which the number of inhabitants is already known. Such estimates remain very

⁷ About prehistoric *escargotieres*, see Lubell *et al.* 1976; Ascher 1959. Animal bones: Wheat 1972; Muller-Beck 1961; Phillips 1972; Howells 1960. Domestic waste: Barbaza 1988; Blanton 1972; Parsons 1971.

⁸ Like Carneiro 1960; Cook 1972; or Zubrow 1971.

⁹ The method used by F. Verdin (1996–97, 191) in southern France.

¹⁰ Dupâquier 1988, 11; Corvisier and Suder 2000, 81–82; Lo Cascio 2004, 145.

¹¹ Above all, see Naroll 1962; Leblanc 1971; Casselberry 1974; Schacht 1981; Million 1973; Kolb 1985; Sumner 1979; Longacre 1976; Cook and Heizer 1965; 1968; Cook 1972; Clarke 1971.

¹² As, for example, by J. Heurgon (1961) with Etruscan graves, and by B. Dedet (1992) in southern France. See also Acsadi and Nemeskeri 1970; Asch 1976; Howells 1960; etc.

approximate.¹³ The other solution consists in applying a density formula to the whole occupied area. But real applications are quite disappointing. It is indeed not uncommon to use the density calculated on a better excavated and documented settlement to others less well documented and of a different period or geographical environment (even with a totally different vocation).¹⁴ As each settlement shows a specific urban and topographical pattern, the results are inevitably biased. In fact, there is no entirely satisfactory method of enumeration for the Iron Age: the various approaches are either unsuited to our problem or impossible to apply (with the archaeological data available).

However, all things considered, a method based on settlements appears to be the most promising for providing a reliable and continuous image of the population throughout the whole period studied, although in need of some improvement; and having criticised the various methods, we are able to take their various strengths and weaknesses into account to elaborate our own tools, suited to the remains of Iron Age societies from southern France.

THREE METHODS OF ENUMERATION OF THE IRON AGE POPULATIONS OF SOUTHERN FRANCE

Settlements are by far the best documented and preserved material. Some improvements have been made to the traditional density formula. Obviously, this analysis is really archaeo-demography rather than demography. It is not a direct measure of the number of individuals but indirect and slightly distorted, even if this method is the most reliable.

Furthermore, as our project is to extend the area studied to regions with few settlement excavations (or for which settlements have not yet been located), we will need to handle surface discoveries (data from fieldwalking or from chance finds). However, with these the link between artefacts and demography is even thinner.

THE DWELLING DENSITY FORMULA

Indirect estimation of the population based on the number of houses is particularly suitable with this civilisation. Indeed, Iron Age settlement shows a specific urban form, with dwellings highly standardised – of approximately the

¹³ As we can see in Grenier 1912, 36; Jehasse 1971, 77; Johannowski 1982, 226–27; Nogara 1936, 18; Garcia 1995, 155; Sanmarti 1992, 29; Rouillard 1991, 257; Morel 1982, 484; Chitchevlov 1992, 28.

¹⁴ For southern France, see Verdin 1995, 292–94; 1999; Trément 1996, 102–03.

same size and mainly unicellular; rarely composed of two or three rooms¹⁵. As a consequence, a density formula is easy to calculate and can be applied without any problem. Moreover, it has been proved many times by the contents of each dwelling that an increase in size (especially at the end of the period) is linked to economic development (diversification and spatial partition of activities) rather than to a change in family composition or increase in family size.¹⁶ Thus the variable 'number of houses' appears to be a reliable appraiser of the number of individuals, even if the accurate number of dwellers is still out of range. Naturally, we must be aware that we are handling the number of inhabited houses and not of humans; hence the use of the term archaeo-demography and not demography.

Against general expectations, we have decided not to suggest a number of individuals but to limit the analysis to the number of dwellings. Indeed, during our research, it has become apparent that the figure of 4–6 individuals per dwelling usually proposed for this civilisation rests, insofar as it has support, on weak arguments: it is either deduced from the dimensions of the dwelling or is based upon anthropological considerations. The first is quite subjective and empirical, especially from a contemporaneous point of view instead of an ethnographic analysis;¹⁷ in the second, a similar number is obtained through anthropological formulae, but following the postulate of a stable or minimal growth rate.¹⁸ Since our primary aim is to discover how the level of population has fluctuated through time, such an approach is in direct contradiction with it. Hence, the number of dwellings inside each settlement remains a more objective appraisal of the population size and dynamic. So we will stay with an indirect measure: the number of houses.

For our purposes, a dwelling is something that contains an autonomous domestic room or rooms in which all the daily and domestic activities of a family take place: hearth(s), cooking area, eating area, place of rest, food storage, and sometimes an area devoted to small handicrafts, etc. These activities may be physically separated, and the rooms are not necessarily contiguous.

Contrary to what was previously done, we intend here to calculate a density formula for each distinct settlement. This must take into account the specific topographical and urban peculiarities of each site and for each period, so that the final result will not be a generalisation based on a better-

¹⁵ See, for instance, Nin 2000, 45 (Provence); Py 1993, 135 (Languedoc).

¹⁶ Arcelin 1992, 321; Dedet 1987, 205–06.

¹⁷ For example Dedet 1987, 172, 205–06; 1999, 313–14; Py 1990, 40–41; 1993, 70; 1996, 251; Dedet *et al.* 1991, 95.

¹⁸ Audouze and Buchsenschutz 1989, 232.

excavated site (like all the others). This method is based on that of M. Py, elaborated on the site of Lattes (Hérault, France),¹⁹ to which we have brought some modifications. It does not mean counting dwellings over a sample of space and then applying the usual density formula to the whole occupied surface (the number of dwellings per unit area). The formula seeks to differentiate domestic and non-domestic spaces and combine the average surface of a dwelling with the average surface of collective (non-domestic) space. This method is in fact no more sophisticated than the usual 'number of dwellings per unit area', and far from being just an artifice, it enables us to distinguish what belongs to the domestic space and what to collective life. Thus, it opens up many issues concerning urbanism (these are not developed here).

DETAILED EXPLANATION (Fig. 1):

1. For each chronological phase of the site, we begin by selecting one or more 'sample area' from which measurements will be taken.
2. On these 'sample areas', analysis of artefacts and fixed structures enables us to identify the rooms and uncovered spaces devoted to domestic activities. In contrast are the surfaces devoted to collective activities (non-domestic spaces): all circulation areas (streets, etc.), public structures (called 'rectangular rooms'), communal granaries, cisterns, etc., and production zones (craft or trade).
3. Once each dwelling of each 'sample area' is clearly delimited (from the domestic activities identified in the rooms or by the communication between rooms), the average surface of a dwelling for each chronological phase is calculated from those fully excavated.
4. The whole domestic surface divided by the average surface of a dwelling gives the exact number of dwellings on the 'sample area'. Here, in contrast to the usual density formula, where the number of dwellings is always a whole number (and thus incorrect), this method provides an exact number in decimal form. This at least will reduce errors of estimation.
5. Then the non-domestic surface is divided by the figure just obtained, and we add to this result the average surface of a dwelling. We obtain a value called 'space per dwelling'. It corresponds to the average surface of a house associated with an average surface of non-domestic space. This is the archaeo-demographic indicator to be used to obtain an estimate of the dwellings for the entire settlement.

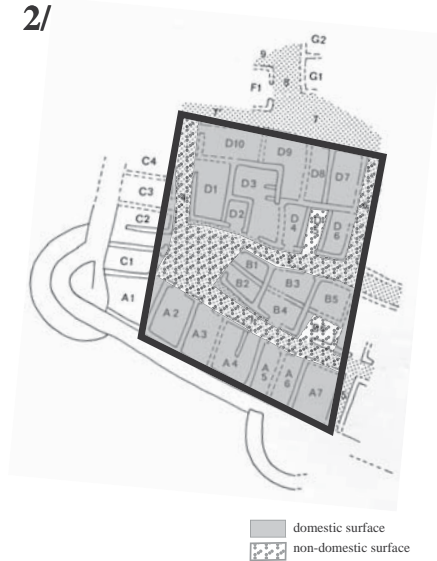
¹⁹ Py 1999, 653.

For each chronological phase :

1/



2/



3/



Main operations to obtain the density formula :

- 2/ domestic surface : A
non-domestic surface : B
- 3/ average surface of a dwelling : C
- 4/ exact number of dwellings on the 'sample area':
 A / C
- 5/ 'space per dwelling' : $B / (A / C) + C = D$
- 6/ inhabited surface of the settlement: E
estimation of the number of dwellings for this
chronological phase : E / D

Fig. 1: Detailed explanation of the dwelling density formula. Example on 'L'Île', phase 4 (Martignes, 13) (plan after Chausserie-Laprée *et al.* 1987, 36; drawing: D. Isoardi).

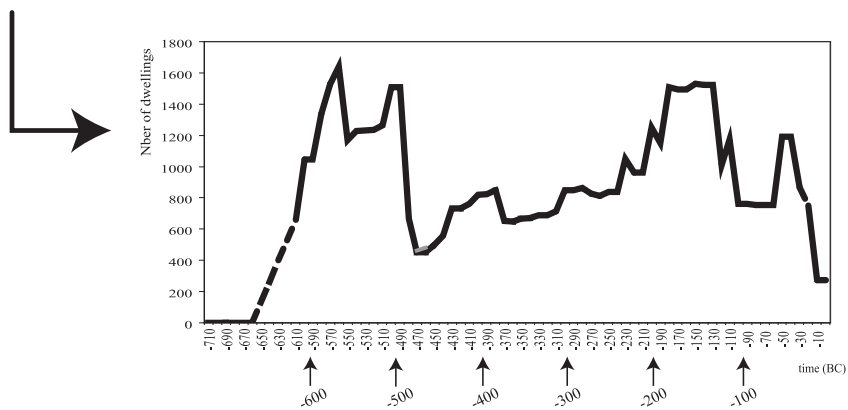
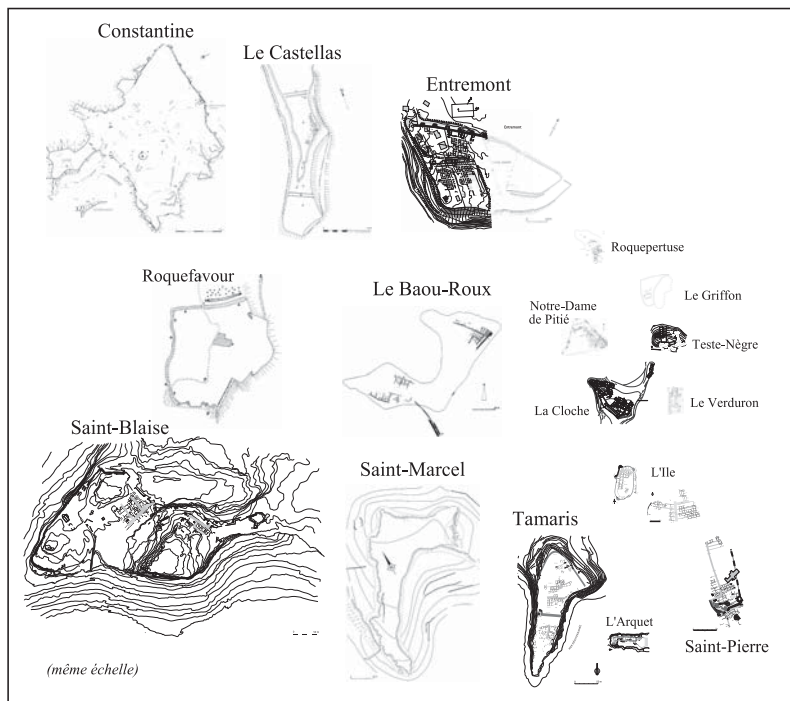


Fig. 2: The main oppida (drawing: D. Isoardi). And numbers of dwellings on the 17 main oppida.

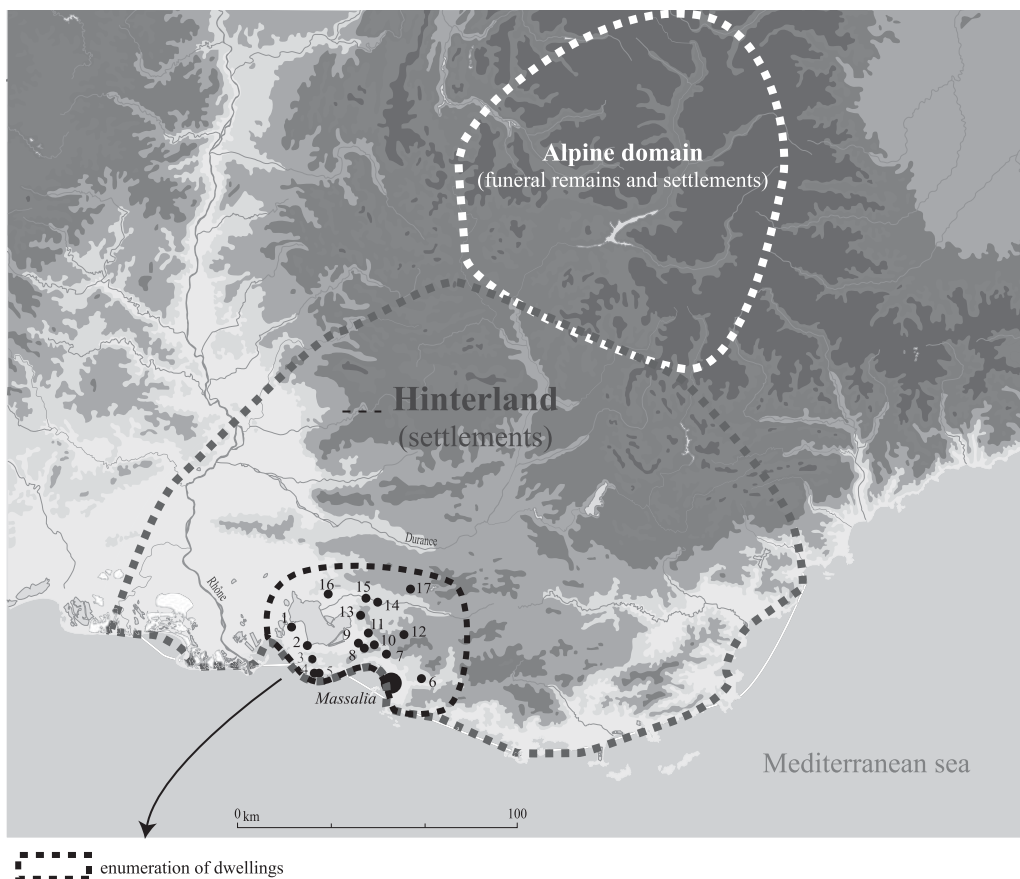


Fig. 3: Localisation of the studied areas (drawing: D. Isoardi).

Main *oppida*: 1 – Saint-Blaise; 2 – L'Île; 3 – Saint-Pierre; 4 – L'Arquet;

5 – Tamaris; 6 – Baou de Saint-Marcel; 7 – Le Verduron; 8 – La Cloche;

9 – Notre-Dame-de-Pitié; 10 – Teste-Nègre; 11 – Le Griffon;

12 – Le Baou-Roux; 13 – Le Castellas; 14 – Roquefavour; 15 – Roquepertuse;

16 – Constantine; 17 – Entremont.

6. The last stage consists in dividing the whole occupied surface of the settlement during this phase by the 'space per dwelling'. It provides one of the most reliable estimations of the number of families inside the habitat.

Obviously, some small problems may occur with applying this method. The first deals with the representativeness of the 'sample space' chosen.

Perhaps modifications observed here through time are not the best image of the evolution of the whole site? One other frequent hindrance concerns the identification, on a plan, of dwellings composed of separate, non-adjacent rooms (and without communication). This is why the method requires long and careful analysis of all published and non-published reports to be undertaken. Great attention to detail is paramount, especially concerning the dating of structures, because the reliability of all future appraisal relies on it (see results in Fig. 2).

FIELDWALKING DATA AND CHANCE FINDS

The second method is elaborated from heterogeneous archaeological data, since all surface discoveries must be taken into account. Indeed, this is the only way to obtain numerically sufficient evidence to produce a reliable reconstruction of the population of regions in which little or no excavation has occurred. What we have comes from either fieldwalking or (mainly) chance finds. Naturally, the link between artefacts and population is thinner than with the previous approach. The results will look rather like a 'dynamic of peopling' than an appraisal of the demographic weight through time and space. Unfortunately, because of the nature and quality of fieldwalking data available, we cannot presently do better.

Here we base our approach on all the contemporary settlements in Provence, on the one hand, and on graves of the Alpine area (the southern and western Alps) on the other. In the first case (Fig. 3b), in order to obtain the most complete image of the populations around Massalia/Marseilles, all the data of excavations and surveys of settlements has been collated. Naturally, to achieve the best demographic value, we have taken into account, as far as possible, the demographic weight of every type of settlement, grouped (*oppida*) and small (scattered settlement). For this purpose, every *oppida* is multiplied by a coefficient (10) to calculate the average surface of the grouped settlements *vis-à-vis* that of a scattered settlement.

Secondarily, we have examined funerary remains. Naturally, these only give a simple idea of the level of and variations in the population. However, for a critical approach, we have distinguished the 'monumental' graves (tumuli, burials in caves, etc.), which are much better preserved. By appraising their proportion versus that of non-monumental graves (those with material unable to resist destruction), we can understand in part why the population level is higher at a given time. This enables us to determine that we lack

bodies. Funeral remains without their archaeological context (for example ornaments) were then taken into account. Consequently, phases for which graves are less well preserved appear, and their importance is not ignored or underestimated (Fig. 3c). Finally, the curve obtained is compared with that of the (rare) settlements of the region of this time (Fig. 3d). The correlation of the variations of both curves allows to approach with more reliability the real variations in population.²⁰

PRESENTATION OF AREAS STUDIED

The littoral spreads from the Arc valley to the Étang de Berre, between the Rhône delta and the city of Marseilles (Fig. 3). This Mediterranean landscape of about 900 km² will be our sample for the study of the evolution of the population, thanks to an appraisal of the dwellings of 17 *oppida* during the Iron Age (excavated settlements, quite numerous and of various categories, will indeed be the support used here). From an historical point of view, this area is the contact zone where local peoples first met Mediterranean merchants. Its proximity to Massalia, the Phocaeen colony just 30 km distant, makes it a key place for understanding the relationship between colonists and natives.

In parallel, through the study of settlements we shall measure the dynamics of the populating of the whole littoral and the hinterland more remote from Marseilles. We suppose that here lay areas of native agriculture, which explains the importance of considering it in the study.

Finally, the Alpine region conceals, in theory, minerals, timber resources and grasslands. It is potentially a trading area. Indeed, it offers some raw materials which could have interested Mediterranean merchants, even if there is no proof of such a trade. Furthermore, it leads to the Italian side of the Alps. This is why its demographic importance must be measured, through the number of settlements but especially graves (whose remains are here well preserved).²¹

These two last areas have been chosen to allow us to widen our analysis to the hinterland, but they are able to give us only an idea of the evolution in population; as we have seen, this approach is less close to demography than the first one.

²⁰ On this point, see the study on Metapontum by J.C. Carter in the 1990s: Sbonias 1999, 229, fig. 16.10, 230 fig. 16.11.

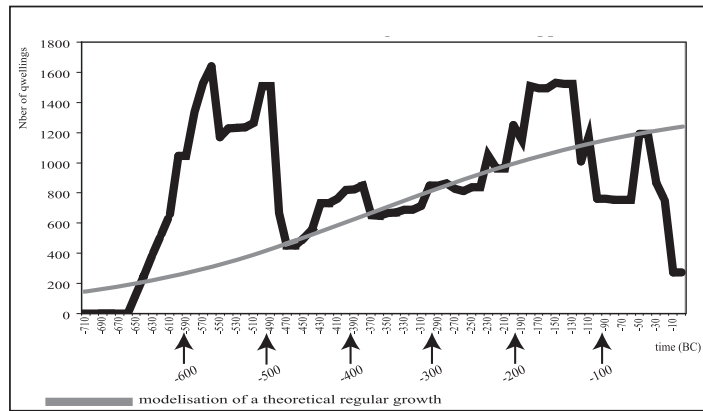
²¹ Isoardi 2001.

HISTORICAL ANALYSIS OF ARCHAEO-DEMOGRAPHIC VARIATIONS:
THE RELATIONSHIP BETWEEN INDIGENOUS PEOPLES AND
THE GREEK COLONY OF MASSALIA THROUGH ARCHAEO-
DEMOGRAPHIC DATA

It is now time to interpret the archaeo-demographic results obtained. In a few 'key' phases, we hope to throw new light on the main events in the relationship between local peoples and Greeks in this southern part of France between the founding of Massalia (*ca.* 600 BC) and the arrival of the Romans (*ca.* 120 BC), an event which entirely disturbed relations between natives and colonists.

We have thus put the curve of the number of dwellings close to the curves of the surface discoveries (settlements and funeral remains: Fig. 4). However, a

a



b

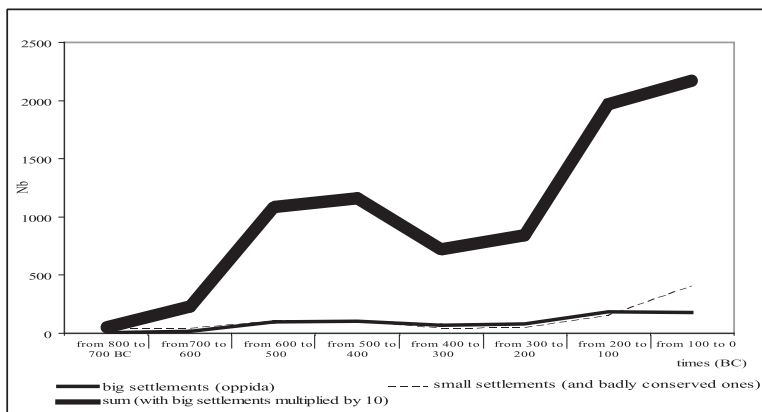


Fig. 4: Results of the archaeo-demographic and population appraisals (data and drawing: D. Isoardi): **a** – Numbers of dwellings on the 17 main *oppida*; **b** – Coastal and hinterland settlements;

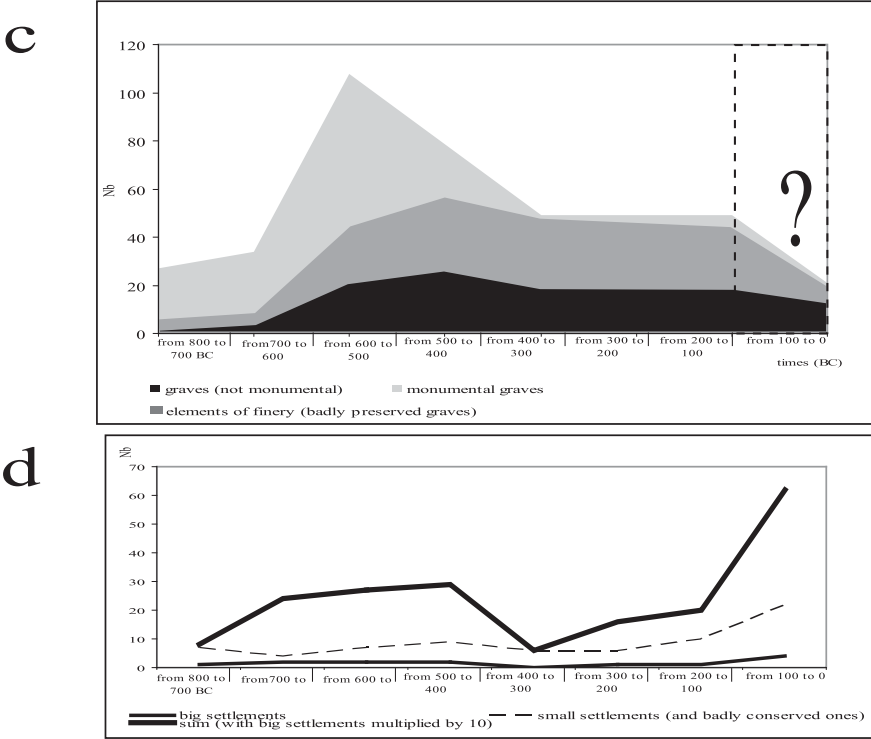


Fig. 4: Results of the archaeo-demographic and population appraisals (data and drawing: D. Isoardi): **c** – Alpine graves; **d** – Alpine settlements.

comparison is difficult to attempt, first because these curves are not elaborated with the same materials, and secondly because the accuracy in dating differs between stratigraphic and fieldwalking data. So we must be very careful when comparing or putting in parallel the archaeo-demographic results of the littoral with the appraisals of the hinterland and the Alps. We are conscious that the attempt presented here needs, in future, more precautions for a deeper analysis.

600–END OF 5TH CENTURY BC: FIRST CONTACTS WITH GREEK COLONISTS

Around 600 BC, the first indigenous stone-and-earth-built settlements appeared in the littoral area. At the same time, a sudden large human concentration may be identified, recorded on *oppida* but also in all settlements throughout this region (cf. Fig. 4a–d). A high demographic level is also recorded in the more remote sector of the Alps (maybe with a slight gap?). We can deduce that a

broad region was touched by an event of quite major importance, so strong that it had a positive impact on the demography along a line of more than 300 km. Was it political, social or economic?

It is impossible not to make a link with the first contacts established with Mediterranean merchants, Etruscans and Greeks, which occurred at the same time, especially with the settlement of the Phocaeen colony of Massalia, founded in 600 BC (Justin 43. 3–4, for example). One hypothesis is that this city set up a mechanism for trade exchange with the natives (*emporía*):²² in brief, the Greeks had need of raw materials and managed to make the natives carry or produce them. As a consequence, the attraction of the seashore, as well as of the immediate agricultural hinterland, helps to confirm the friendly reception given the colonists by the natives and the success of the colony's mercantile plans. Such is the synchronicity between the demographic phenomenon and these historical and economic events as to prove that they played a real part in the distribution of population. Above all, such a great increase in population reflects the positive native response to the socio-economic stimulation provided by the Greeks,²³ with the establishment of *emporía* encouraging an economic dynamism among them, even in more distant regions such as the Alps (a real discovery supplied by this analysis). So the population increase must be linked to enhanced economic activity and, thanks to the specificity of this study, it is possible to estimate the geographical influence of the phenomenon.

END OF 5TH–END OF 3RD CENTURY BC: GENERAL DEMOGRAPHIC RECESSION IN THE NATIVE WORLD

Towards the end of the 5th century BC, a great fall took place. The littoral and the hinterland began rapidly to depopulate with people quitting the largest sites (Fig. 4a–b). The population reached its lowest level for the whole Iron Age. Such a great and quick decline cannot be explained by natural mortality.

The background to this is the altercations between natives and the Greeks of Massalia, recounted in some written sources (especially Justin 43. 5) but demonstrated by the signs of military destruction (fire, looting, etc.) first recorded on indigenous settlements in the late 5th century BC. It looks as though the Greek colony, certainly its trade, was increasingly thwarted by the hostile actions of some local peoples. The relationship between natives and colonists deteriorated, providing an historical climate in which the demographic situation

²² Most recently, see Garcia 2004, 76–80.

²³ See, for example, conjointly with this demographic increase, the appearance and increase in amphorae and imported ceramics on indigenous settlements (Arcelin 1992); or the great development of granaries (Verdin 1995, 376–77; Garcia 1987; Py 1990, 94–95).

makes more sense; conflict between Massalia and the natives may well explain the falling population: loss of life in battle, emigration, etc. Here there is an instructive parallel to draw between demographic data and historical events, and the evolution of the population allows us to appraise the real impact of these events on human beings.

But there is another interesting parallel to draw, this time with economic data. During the 5th century BC, the commercial route to the Celtic heartland via the Rhône valley was largely supplanted by that along the Po, the Tessin and the middle Rhine. The commercial flow had moved to the other side of the Alps (within indigenous settlements the quantity of Mediterranean imported goods clearly fell off). This new economic situation might also have been responsible for the depopulation of the littoral. We should also notice a decline in the population of the Alpine region (Fig. 4c–d). Economic recession could very well explain the movement of populations towards more promising zones. Should we deduce a change in the economic strategy of Massalia – a reflection of the shrinkage of its area of economic influence? Both factors (insecurity and economic decline) may have worked together to explain the population decline.

200–120 BC: NEW WAVE OF POPULATION IN PROVENCE

The littoral was characterised throughout this phase by a very high growth in population level, reached very quickly (Fig. 4a–b). Furthermore, if we compare the curve of the population on *oppida* with a regular and theoretical demographic progress, it seems that such growth could not result from populations already there. It implies a massive incoming of populations from without the studied zone. The growth logistic indicates the natural and regular growth of a population within the same space, free from any external perturbations. It has been modelled here with the data from the end of the 5th century (see Fig. 4a).

From 200 BC, the growth rate appears to have been too high to belong to a regular evolution, which means that this peak may have been due to the arrival of foreign populations over a very short time. In considering the explanations offered by demographers for such arrivals of population, a socio-economic mutation, with the introduction of various elements – commercial exchange, technical and dietary change, etc. – may be suitable here to explain either the attraction exerted by this area or the capacity of it to welcome a large human surplus.

Here, it is quite seductive to connect this with the formation of the ‘confédération salyenne’ (Strabo 4. 6. 3),²⁴ associated with a political evolution in native society. This confederation is described in written sources as a gathering of

²⁴ With the commentary of Pralon 1998.

many scattered populations, which may have occurred in the vicinity of Massalia at the end of the Iron Age. Written sources also talk particularly about some sort of turmoil among the natives during this period, especially in the 2nd century BC. Again, after a three-century break, relations between natives and colonists, and also Romans (new protagonist in southern France), began to deteriorate (piracy on some of Massalia's possessions, a Roman *praetor* attacked on indigenous territory, etc.: Polybius 33. 8–10; Livy 37. 57. 1–2). The erection of Massalia's new fortifications during the 2nd century BC and a new wave of military destruction on indigenous sites bear archaeological witness to such a strained climate. Historians see in these events a new confrontation between Greek colonists and local societies (the roots may lie in deep social evolution in a native population which, as the present analysis shows, had grown during the previous centuries). This demographic expansion sits very well with the idea of increased native pressure around Massalia, showing that the city had good reason to be worried, and may explain why it felt obliged to call on Rome for help to restore quietness in the years to follow (see below).

But nothing similar occurs in the Alps, where the stability in the population level (based on analysis of graves) for more than two centuries could indicate that this turmoil was confined to the southern area, close to Massalia. The ferment may not have spread into the far hinterland.

AFTER 130/120 BC: A GENERAL DECLINE OF IRON AGE POPULATIONS?

After a peak around 130/120 BC, there is a great fall in the curve for the *oppida* of the littoral (Fig. 4a). This can be explained only by a massive departure of population or great human losses.

Written sources again can provide some explanation. We learn that Roman interventions in southern France become more frequent from 125 BC, especially in order to pacify a people called the Salyes (or Salluvii) (*Fasti triumphales* 123. 122; Strabo 4. 1. 5; Florus 1. 37; Ammianus Marcellinus 15. 12; etc.), whilst the indigenous settlements near the littoral suffered new destruction. This phase concludes, after much fighting, with a Roman victory and the establishment, towards the end of the 2nd century BC, of Roman political control over southern France. The synchronicity with our archaeo-demographic results is quite striking: the years 130–120 BC see the Romans armies arriving and at this same time the decline starts. Even if they are not objective, written sources talk about huge human losses among local societies (Pliny 7. 166, for instance), whereas the elites would have found refuge with the nearby Allobroges people (Appian *Celtica* 4. 12; Livy *Epit.* 61). Moreover, natives might have been deprived of part of their territory. These are good explanations for

such a demographic situation. The human situation may be explained by such an efficient military intervention, or at least by the situation accompanying it. And if the demographic situation of the littoral area can indeed be linked to these historical events, the archaeo-demographic curve may reflect the real impact of the events on the human population.

But demographic decline affected only these main *oppida*; in the hinterland the population continued to grow (Fig. 4b). Should we suppose that the attacks were targeted specially at a certain part of the population, and consequently that native elites were living in these big *oppida*?

As for the Alpine regions, their demographic state is difficult to determine from now on: graves no longer represent the level of the population, but settlements seem to become more numerous. Proof of an Alpine evolution independent of that in Provence?

INTERPRETATION OF THE RELATIONSHIP BETWEEN THE GREEK COLONY OF MASSALIA AND IRON AGE SOCIETIES OF SOUTHERN FRANCE: CONCLUSIONS

By combining archaeo-demographic results with historical and economic data, the question of the relationship between colonists and natives has been put under a new light. The comparison is fruitful in many ways. On the economic front, we can suggest a correlation between phases of demographic prosperity and states of economic dynamism in Massalia, just as the demographic evolution of the region appears to be linked to its economic health.

The other main result of this analysis is to illuminate parallels with a great number of events mentioned in historical sources. Obviously, the combination and comparison of these different sources is risky, but we can see that the main historical events experienced by this region, or at least the climate in which they occurred, has influenced the configuration of the population. This should allow us, consequently, to appraise the real impact on the population of the successive phases in the relationship between Greeks and locals. Moreover, bringing the demographic situation of different contiguous areas into play will allow us, in future, to estimate the geographical spread of historical or economic events.

Lastly, by knowing the meaning of each demographic variation through comparison of the archaeo-demographic curve with logistic growth (Fig. 4a), the variations obtained can yield new information. Moreover, in the future, this comparison will allow us to study the pre-Roman societies using concepts traditionally in the realm of geographers, but new to archaeology: maximum population threshold, the optimum population, demographic regulation, etc.

BIBLIOGRAPHY

- Acsádi, G.Y. and Nemeskéri, J. 1970: *History of Human Life Span and Mortality* (Budapest).
- Arcelin, P. 1992: 'Société indigène et propositions culturelles massaliotes en basse Provence occidentale'. In *EtMass* 3, 305–36.
- Angel, J.L. 1972: 'Ecology and population in the Eastern Mediterranean'. *World Archaeology* 4, 88–105.
- Asch, D. 1976: *The Middle Woodland Population of the Lower Illinois Valley: A Study in Paleodemographic Methods* (Evanston, IL).
- Ascher, R. 1959: 'A prehistoric population estimate using midden analysis and two population models'. *Southwestern Journal of Anthropology* 15, 168–78.
- Audouze, F. and Buchsenschutz, O. 1989: *Villes, villages et campagnes de l'Europe celtique. Du début du IIe millénaire à la fin du Ier avant J.-C.* (Poitiers).
- Barbaza, M. 1988: 'La grotte-abri du moulin à Troubat (Hautes-Pyrénées). Premiers travaux et dispositions initiales de recherches'. *Travaux de l'institut d'art préhistorique de Toulouse* 30, 7–36.
- Beloch, J. 1886: *Die Bevölkerung der griechisch-römischen Welt* (Rome).
- Bintliff, J. and Sbonias, K. (eds.) 1999: *Reconstructing Past Population Trends in Mediterranean Europe (3000 BC–AD 1800)* (Oxford).
- Birdsell, J. 1968: 'Some predictions for the Pleistocene Based on Equilibrium Systems among recent Hunter-Gatherers'. In Lee, R.B. and DeVore, I. (eds.), *Man The Hunter* (Chicago), 229–40.
- Blanton, R.E. 1972: 'Prehispanic adaptation in the Ixtapalapa region, Mexico'. *Science* 175, 1317–26.
- Bordes, F. 1968: *Le Paléolithique dans le monde* (Paris).
- Carneiro, R.L. 1960: 'Slash-and-burn agriculture'. In Wallace, A.F. (ed.), *Men and Cultures: Selected Papers* (Philadelphia), 131–45.
- Casselberry, S.E. 1974: 'Further refinement of formulae for determining population from floor area'. *World Archaeology* 6.1, 117–22.
- Casteel, R.W. 1972: 'Two statistic maximum population density models for hunter-gatherers: a first approximation'. *World Archaeology* 4, 19–40.
- Chausserie-Laprée, J. and Nin, N. 1987: 'Le village protohistorique du quartier de l'Ile à Martigues (B.-du-Rh.). Urbanisme et architecture de la phase primitive (déb. Vème – déb. IIème s. av. J.-C.). II. Données nouvelles sur l'urbanisme et l'architecture domestique'. *DAM* 10, 31–89.
- Chtcheglov, A. 1992: *Polis et chorâ. Cité et territoire dans le Pont-Euxin* (Paris).
- Clarke, S.K. 1971: A Method for the Determination of Pre-historic Pueblo Population Estimates (typescript).
- Cook, S.F. 1972: *Prehistoric Demography* (Reading).
- Cook, S.F. and Heizer, R.F. 1965: 'The quantitative approach to the relation between population and settlement size'. *Reports of the University of California Archaeological Survey* 64, 1–97.
- . 1968: 'Relationships among houses, settlement areas and population in Aboriginal California'. In Chang, K.C. (ed.), *Settlement Archeology* (Palo Alto, CA), 79–116.
- Corvisier, J.M. and Suder, W. 2000: *La population de l'Antiquité classique* (Paris).

- David, N. 1972: 'On the lifespan of pottery type frequencies and archaeological inference'. *American Antiquity* 37, 141–42.
- Dedet, B. 1987: *Habitat et vie quotidienne en Languedoc au milieu de l'âge du Fer. L'unité domestique n° 1 de Gailhan, Gard* (Paris).
- . 1992: *Rites funéraires protohistoriques dans les garrigues languedociennes: approche ethno-archéologique* (Paris).
- . 1999: 'La maison de l'oppidum languedocien durant la Protohistoire: forme et utilisation de l'espace'. *Gallia* 56, 313–55.
- Dedet, B., Duday, H. and Tillier, A.-M. 1991: 'Inhumations de fœtus, nouveau-nés et nourrissons dans les habitats protohistoriques du Languedoc: l'exemple de Gailhan (Gard)'. *Gallia* 48, 59–108.
- Diamond, J. 2006: *Effondrement. Comment les sociétés décident de leur disparition ou de leur survie* (Paris).
- Dupâquier, J. 1988: 'Introduction'. In Dupâquier, J. (ed.), *Histoire de la Population Française, 1: Des origines à la Renaissance* (Paris), 1–18.
- Garcia, D. 1987: 'Observations sur la production et le commerce des céréales en Languedoc méditerranéen durant l'Age du Fer: les formes de stockage des grains'. *RAN* 20, 43–98.
- . 1995: 'Le territoire d'Agde grecque et l'occupation du sol en Languedoc central durant l'Age du Fer'. In *EtMass* 4, 137–68.
- . 2004: *La Celtique méditerranéenne. Habitats et sociétés en Languedoc et en Provence, VIIIe–IIe siècles av. J.-C.* (Paris).
- Grenier, A. 1912: *Bologne villanovienne et étrusque. VIII/IVe s. avant notre ère* (Paris).
- Hassan, F.A. 1975: 'Determination of the size, density and growth rate of hunting-gathering people'. In Polgar, S. (ed.), *Population, Ecology and Social Evolution* (Chicago), 27–52.
- Heurgon, J. 1961: *La vie quotidienne chez les Etrusques* (Paris).
- Howells, W.W. 1960: 'Estimating population numbers through skeletal remains'. In Heizer, R.F. and Cook, S.F. (eds.), *The Application of Quantitative Methods in Archaeology* (Chicago), 158–85.
- Isoardi, D. 2001: *La Protohistoire de l'Ubaye. Bilan bibliographique* (Dissertation, Université de Provence).
- . 2003: *Entre Provence littorale et Alpes du Sud: approche démographique des populations protohistoriques de Gaule méridionale* (Dissertation, Université de Provence).
- . 2005: 'Les Alpes protohistoriques: des tombes, des maisons ou des objets ... mais aussi des hommes'. In Delestre, X. (ed.), *15 ans d'archéologie en Provence-Alpes-Côte-d'Azur* (Aix-en-Provence), 138–39.
- . 2008: 'Tentative d'estimation démographique des populations de l'Âge du Fer du versant occidental et méridional des Alpes. De l'archéologie à la démographie'. In Richard, H. and Garcia, D. (eds.), *Le peuplement de l'arc alpin* (Actes du 131e congrès national des sociétés historiques et scientifiques, Grenoble, 24–28 April 2006) (Paris), 225–42.
- . 2009: 'L'apport des données démographiques dans une étude de l'organisation de la société préromaine de France méridionale. Une nouvelle lecture des oppida'. In Belarte, M.-C. (ed.), *L'espai domèstic i l'organització de la protohistòria de la Mediterrània occidental (Ier millenni aC)* (Actes de la IV Reunió Internacional

- d'Arqueologia de Calafell, Calafell-Tarragona, 6 al 9 de març de 2007) (Barcelone), 67–77.
- Jehasse, A. 1971: 'La Corse antique. Grecs, Etrusques et Puniques'. In Arrighi, P. (ed.), *Histoire de la Corse* (Toulouse), 67–96.
- Johannowski, W. 1982: 'Considerazioni sullo sviluppo urbano e la cultura materiale di Velia'. *La Parola del Passato* vol. 37, 225–46.
- Kolb, C.C. 1985: 'Demographic Estimates in Archaeology: Contributions from Ethnoarchaeology in Mesoamerican Peasants'. *Current Anthropology* 26, 581–99.
- Leblanc, S. 1971: 'An Addition to Naroll's suggested floor area and settlement population relationship'. *American Antiquity* 36, 210–11.
- Lo Cascio, E. 2004: 'Peuplement et surpeuplement: leur rapport avec les ressources naturelles'. In Hermon, E. and Clavel-Lévêque, M. (ed.), *Espaces intégrés et ressources naturelles dans l'empire romain* (Actes du colloque de l'Université de Laval-Québec, 5–8 mars 2003) (Besançon), 136–52.
- Longacre, N.A. 1976: 'Population dynamics at the Grasshopper Pueblo, Arizona'. In Zubrow, E.B.W. (ed.), *Demographic Anthropology* (Albuquerque, NM), 169–84.
- Lubell, D., Hassan, F.A., Gautier, A. and Ballais, J.L. 1976: 'The Caspian escargotieres'. *Science* 4230, 910–20.
- Million, R. 1973: *The Teotihuacan Map. Urbanization at Teotihuacan* (Austin, TX).
- Morel, J.-P. 1982: 'Les Phocéens d'Occident: nouvelles données, nouvelles approches'. *La Parola del Passato* vol. 37, 479–500.
- Muller-Beck, H. 1961: 'Prehistoric Swiss lake dwellers'. *Scientific American* 205.6, 138–47.
- Naroll, R. 1962: 'Floor area and settlement population'. *American Antiquity* 27, 587–89.
- Nin, N. 2000: 'La maison protohistorique: espace fonctionnel, espace vécu'. In Chausserie-Laprée, J. (ed.), *Le temps des Gaulois en Provence* (Martignes), 43–50.
- Nogara, B. 1936: *Les Etrusques et leur civilisation* (Paris).
- Nougier, L.-R. 1959: *Géographie humaine préhistorique* (Paris).
- Parsons, J.F. 1971: *Prehistoric Settlement patterns in the Texcoco Region, Mexico* (Ann Arbor).
- Phillips, P. 1972: 'Population economy and society in the Chassey-Cortailod-Lagozza cultures'. *World Archaeology* 4, 41–56.
- Pralon, D. 1998: 'Les Salyens dans les textes historiques grecs'. *DAM* 21, 21–26.
- Py, M. 1990: *Culture, économie et société protohistoriques dans la région nîmoise* (Rome).
- . 1993: *Les Gaulois du Midi. De la fin de l'Âge du Bronze à la conquête romaine* (Paris).
- . 1996: 'Les maisons protohistoriques de Lattara (IVe–Ier s. av. n. è.). Approche typologique et fonctionnelle'. In Py, M. (ed.), *Urbanisme et architecture dans la ville antique de Lattes* (Lattes), 141–258.
- . 1999: 'La cité de Lattara dans le contexte économique et politique du IVe siècle'. In Py, M. (ed.), *Recherches sur le quatrième siècle avant notre ère à Lattes* (Lattes), 651–62.
- Rouillard, P. 1991: *Les Grecs et la Péninsule ibérique du VIIIe au IVe siècle av. J.-C.* (Paris).
- Rozoy, J.G. 2001: 'Biomasse et démographie préhistorique'. *Bulletin de la Société Préhistorique Française* 98, 21–24.

- Sanmarti, E. 1992: 'Massalia et Emporion: une origine commune, deux destins différents'. In *EtMass* 3, 27–41.
- Sbonias, K. 1999: 'Investigating the Interface between Regional Survey, Historical Demography and Paleodemography'. In Bintliff and Sbonias 1999, 219–34.
- Schacht, R.M. 1981: 'Estimating Past Population Trends'. *Annual Review of Anthropology* 10, 119–40.
- Sumner, W.M. 1979: 'Estimating population by analogy: an example'. In Kramer, C. (ed.), *Ethnoarchaeology: implications of ethnography for archaeology* (New York), 164–74.
- Thompson, H.P. 1966: 'A Technique using anthropological and biological data'. *Current Anthropology* 7, 417–24.
- Trément, F. 1996: 'Études micro-régionales et paléodémographie. L'apport de la recherche autour de Saint-Blaise'. In Gâteau, F., Trément, F. and Verdin, F., *L'Étang-de-Berre* (Carte archéologique de la Gaule n.s. 13-1) (Paris), 98–113.
- . 1999a: *Archéologie d'un paysage. Les étangs de Saint-Blaise, Bouches-du-Rhône* (Paris).
- . 1999b: 'Prospection archéologique et démographique en Provence. Approche paléodémographique de la Rive Occidentale de l'Étang de Berre sur la longue durée'. In Bintliff and Sbonias 1999, 93–115.
- Turner, C. and Lofgren, L. 1966: 'Household size of Prehistoric Western Pueblo Indians'. *Southwestern Journal of Anthropology* 22, 117–32.
- Verdin, F. 1995: *Les Salyens et leurs territoires* (Dissertation, Université de Provence).
- . 1996–97: 'Coudounèu (Lançon-de-Provence, Bouches-du-Rhône): une ferme-grenier et son terroir au Ve siècle avant J.-C.'. *DAM* 19–20, 165–98.
- . 1999: 'Occupation du sol et pression démographique indigène autour de Marseille au second âge du Fer'. In Bellancourt-Valdher, M. and Corvisier, J.-N. (eds.), *La démographie historique antique* (Actes du premier colloque international de Démographie antique, Arras, 22–23 novembre 1996) (Arras), 51–68.
- Wheat, J.B. 1972: *The Olsen-Chubbuck Site: A Paleo-Indian Bison Kill* (Menasha, WI).
- Zubrow, E.B.W. 1971: 'Carrying capacity and dynamic equilibrium in the Prehistoric Southwest'. *American Antiquity* 36.2, 127–38.