

## FIELDWORK REPORTS

### Population Biology, Health and Diet in the Prehistoric Canary Islands

Lawrence Stewart Owens  
Institute of Archaeology, UCL.

#### Introduction

This project employs dental morphology and pathology recording systems to reconstruct human population dynamics and economy of the prehistoric Canary Islands. The geography and the unusually variable ecology of the Islands provides an opportunity to examine social patterning of human groups in terms of economic and ecological adaptation. A summary of progress and some preliminary results are presented.

#### *The Canary Islands*

The Spanish-owned Canarian archipelago is part of the volcanic Atlantic island group of Macaronesia, and consists of seven large and four small islands running for approximately 500 km, in roughly an east-west axis, from the north-west coast of Africa. Climatic and ecological conditions vary considerably throughout the archipelago, ranging from low-lying and deserts in the easternmost islands, to mountainous cloud forest and sub-alpine conditions towards the West.

#### *The Prehistoric Populations of the Canary Islands*

From the CE 1340s onwards, European raiding missions regularly visited the Canary Islands. This was followed by a prolonged French and Spanish invasion, which took place between CE 1402 and CE 1496. The indigenous populations of the Canaries were essentially eradicated by this war of attrition, which was followed by slavery, pestilence and biocultural assimilation (Crosby 1986). Most of what we know about the ancient Canarians is therefore derived from contact-period historical references and archaeological research.

The earliest occupation of the Canarian archipelago appears to have taken place during the first millennium BCE, although most known sites date to between CE 600 and CE 1300 (Onrubia-Pintado 1987). The origin of these populations is highly contentious, as archaeologically visible cultural repertoires display both archipelago-wide and insular endemism, with little evidence to link the prehistoric Canarians with any specific biological or cultural group. The Phoenicians, the Carthaginians, the Mehta-Afalou, the Taforalt and the Berbers have all been suggested as potential early Canarian colonists.

#### Dental Anthropology

The study of archaeologically derived human teeth can provide information on biological affinity and various lifestyle variables that is not readily obtainable by other means. Numerous experiments and population surveys indicate that dental morphol-

ogy is under strict genetic control, and can thus be used to assess biological relationships between human populations on a local, regional and international scale. The nature and prevalence of dental pathology namely wear, caries and enamel hypoplasia (malformation of the dental enamel caused by physiological insult, such as illness or malnutrition), reflects ancient diet, economy and health, and may be used to infer certain aspects of social structure. Dental morphology and pathology scoring systems devised by Turner *et al.* (1991), Hillson (2000 and forthcoming) and Reid and Dean (2000) have been incorporated into this study, to address the following project aims.

#### **Aims**

- To assess biological affinity within and between indigenous Canarian groups.
- To determine diet through examination of dental pathology.
- To infer aspects of social structure from the distribution of dental pathology.
- To examine the relationship between ecology and economy.
- To assess the impact of economic affinity on population health.
- To establish a biological and socio-economic narrative of island colonisation.

While the Canaries do not lack for European contact-period accounts, it has become increasingly apparent that these sources have assumed an inappropriately dominant position in reconstructions of Canarian prehistory (Cabrera Perez 1996). The behaviour of contact-period Canarians is too often assumed to echo that of their antecedents, despite the 1800-year hiatus between the first occupation of the archipelago and European contact. This unspoken assumption of behavioural stasis is thoroughly at odds with what is known of dynamic island populations in the Pacific and the Mediterranean (Broodbank 2000), and demands the construction of an appropriate temporal framework. This project is therefore restricted to the analysis of stratigraphically secure and well-dated individuals, in order to develop a temporospatially-refined colonisation/adaptation model for the Canarian archipelago.

#### **Preliminary Results**

200 individuals (approximately 20% of the intended total sample size ) from the collections of the Musée de l'Homme (Paris) and the Natural History Museum (London) have been recorded, and data collection is currently under way at the Canarian Institute for Palaeopathology and Biological Anthropology, Tenerife. No excavation work is to be undertaken for the present study. Research into island population dynamics, culture history and biogeography is being carried out under the tutelage of Dr Cyprian Broodbank. While all seven islands are to be assessed for this project, no specimens from La Palma or Lanzarote are included in the sample obtained so far. These results are based upon a pilot study carried out for the purposes of a regrade presentation in June 2001. All results presented here should therefore be regarded as preliminary.

The distribution of three selected dental variants: Cusp 7, Carabelli's Trait and 4-cusped molars, were assessed for all individuals. Patterning of these traits suggests temporospatial flux in population biology, with considerable differences between the islands, marked intra-insular diversity and variable relationships with Northern Af-



**Figure 1.** Late Prehispanic flexed burial, Tequise, Lanzarote (Photo by the author).

rica (Scott and Turner 1997). While the chronometric framework is not yet fully refined, it would seem that the archipelago experienced several colonisation events, followed by considerable island endemism.

Limited occlusal wear and higher levels of caries were noted for Gran Canaria and Tenerife, where agriculture is both ecologically viable and historically attested, whereas individuals from the more desiccated island of Fuerteventura demonstrated severe wear and a low prevalence of caries. The vertiginous western islands of La Gomera and El Hierro occupy an intermediate position between these opposing poles. This suggests that economic affinity varied throughout the archipelago, from the highly attritional, non-cariogenic regime of hunter-gatherer groups to the highly cariogenic and low-wear diet of agricultural communities (Hillson 1997; Larsen 1997; 2000; Smith 1984). Females displayed considerably more caries than males, implying possible social or economic differences between the sexes. The distribution of enamel hypoplasia is yet to be analysed comprehensively. However, a preliminary assessment suggests that, like most hunter-gatherer groups (Larsen 1997), the condition was not particularly common for the indigenous Canarians, and occurred most frequently in groups that also displayed marked prevalence of caries. Where occurring, physiological disturbances were most common in infancy (2-3 years) and late adolescence (16-18 years). No differences in hypoplasia prevalence between the sexes are evident on the basis of present evidence.

The temporospatial implications of this apparent diversity in economic regime, i.e. identifying the economic practices of the earliest colonists and how these changed through time, are under study at present.

### Discussion

These preliminary results suggest that the prehistoric inhabitants of the Canarian archipelago were both biologically and socio-economically diverse. It seems that the variable (and formidable) challenges presented by the different ecosystems in the Canaries, provoked a range of strategies which combined extant cultural repertoires with innovative adaptations to new environments. Elucidating the details of this process demands further study of the evidence however.

When completed, this project will be used to test traditional arguments on the biological and cultural endemism of the archipelago, and that of individual island populations within it (Bermudez de Castro 1985). It may also serve as a basis for future studies of island networks in other parts of the world (see Broodbank 2000), and to highlight the seminal importance of islands in general and the Canarian archipelago in particular, as fora for the study of human biological, cultural and socio-economic adaptation.

### Acknowledgements

I would like to acknowledge the kind support and assistance of my supervisors, Professor Simon Hillson and Dr Cyprian Broodbank. I also express my gratitude to the staff of the Musée de l'Homme (Paris), the Natural History Museum (London), the Canarian Institute for Palaeopathology and Biological Anthropology (Tenerife) and the Arrecife Archaeological Museum, Castillo de San Gabriel, Lanzarote for permission to take and use the photograph that appears as fig. 1. This project is supported by a Natural Environment Research Council (NERC) Studentship.

### References

- Bermudez de Castro, J. M. 1985. *La Denticion de los Pobladores Prehistoricos de las Islas Canarias, Estudio Antropologico*. Unpublished PhD Thesis, Complutense University, Madrid.
- Broodbank, C. 2000. *An Island Archaeology of the Early Cyclades*. Cambridge: Cambridge University Press.
- Cabrera Perez, J. C. 1996. *La Prehistoria de Fuerteventura: un Modelo Insular de Adaptacion*. Madrid: Ediciones Queimada.
- Crosby, A. W. 1986. *Ecological Imperialism: the Biological Expansion of Europe, 900–1900 AD*. Cambridge: Cambridge University Press.
- Hillson, S. 1997. *Dental Anthropology*. Cambridge: Cambridge University Press.
- Hillson, S. 2000. Dental Pathology, in Katzenberg, M.A., and Saunders, S.R. (eds.), *Biological Anthropology of the Human Skeleton*: Chichester: Wiley Liss, 249-286.
- Hillson, S. (Forthcoming). Recording Dental Caries in Archaeological Human Remains. *International Journal of Osteoarchaeology* (preview copy).
- Larsen, C. S. 1997. *Bioarchaeology: Interpreting Behaviour from the Human Skeleton*. Cambridge: Cambridge University Press.
- Onrubia-Pintado, J. 1987. Les Cultures Préhistoriques des Iles Canaries; État de la Question. *L'Anthropologie* 91(2), 653-678.
- Reid, D. J. and Dean, M. C. 2000. Brief Communication: the Timing of Linear Hypoplasias on Human Anterior Teeth. *American Journal of Physical Anthropology* 113, 135-139.
- Scott, G. R. and Turner, C. 1997. *Anthropology of Modern Human Teeth*. Cambridge: Cambridge University Press.
- Smith, B. H. 1984. Patterns of Molar Wear in Hunter-Gatherers and Agriculturalists. *American Journal of Physical Anthropology* 69, 39-56.

Turner, C. G., Nichol, C. R. and Scott, G. R. 1991. Scores Procedures for Key Morphological Traits of Permanent Dentition: the Arizona State University Dental Anthropology System. in Kelly, M. and Larsen, C. S. (eds.) 1991 *Advances in Dental Anthropology*. New York: Wiley-Liss, 13-31.