CEMETERIES, SOCIAL CHANGE AND MIGRATION IN THE TIME OF THE ANCIENT CANARIANS*

Verónica Alberto-Barroso**, Javier Velasco-Vázquez***,
Teresa Delgado-Darias**** & Marco A. Moreno-Benítez**

Abstract

This paper delves into the proposal for periodisation of funerary practices among the Ancient Canarians. New radiocarbon dates are provided together with a Bayesian treatment used to estimate the onset and later tempo of the three burial categories previously established: caves, tumuli, and pit-graves/cists, as well as their temporal activity patterns. Changes in funerary practices can only be understood within the social framework of reference which in the case of Gran Canaria needs to be reconsidered. To substantiate this claim, the period corresponding to pit-graves and cist burials from 11th-15th centuries AD is reviewed, in an attempt to identify the innovations that arise during this phase. It is concluded that the new developments identified in the archaeological record seem to be caused by foreign stimuli, stemming from the arrival of new North African settlers that act as agents of change.

Keywords: Pre-Hispanic period, funerary practices, social dynamics, Bayesian model, radiocarbon dates, migration, North African archaeology.

CEMENTERIOS, CAMBIO SOCIAL Y MIGRACIÓN
EN EL TIEMPO DE LOS ANTIGUOS CANARIOS

Resumen

Este trabajo profundiza en la periodización de las prácticas funerarias de los antiguos canarios. Se aportan nuevas fechas y se usa un tratamiento bayesiano de las dataciones para examinar los intervalos de inicio, final y tasa de cambio de las tres categorías sepulcrales definidas: cuevas, túmulos y fosas/cistas. Los cambios en las prácticas funerarias solo pueden ser entendidos en el marco social de referencia, que en el caso grancanario necesita ser repensado. Para probar este planteamiento se testea el periodo vinculado a las fosas y cistas, siglos XI-XV d.C., tratando de reconocer las innovaciones que surgen en esta fase. A la luz de los resultados, las novedades identificadas en el registro arqueológico de este periodo parecen estar promovidas por estímulos foráneos, a partir de la llegada de nueva población norteafricana, que actúan como factor dinamizador del cambio.

Palabras clave: periodo prehispánico, prácticas funerarias, dinámica social, modelo bayesiano, carbono 14, migración, arqueología del norte de África.

DOI: https://doi.org/10.25145/j.tabona.2022.22.21
Revista Tabona, 22; mayo 2022, pp. 407-433; ISSN: e-2530-8327

1. INTRODUCTION

Archaeology in Gran Canaria has experienced significant changes in recent decades, providing alternative scenarios to previous, long-accepted proposals. This has been driven in part by the gradual increase in attention awarded to radiocarbon dating, which has offered new dates and led to the critical revision of pre-existing ones. By focusing on the time of the Ancient Canarians as a sequence, rather than a succession of dates, a greater understanding of historic events has been possible and new content has been provided on the social timeline of these populations. Ultimately, it has led to the creation of a temporal framework in which events are identified and given meaning, based on continuity, recurrence, breaks and changes in living conditions, with a sense of process. This requires that the succession of collective events be identified and categorised, and an investigation be carried out into their causes, agents and the circumstances that generate changes to established conditions or to the general terms of social consensus, whereby time can offer clarification.

In our case, this goal is linked to the study of funerary expressions. It has already been proven that they can serve to set out chronological frameworks of reference and probability estimates of onset dates, end dates and the duration of certain expressions in the islands' archaeological records. This proposal offers greater detail regarding apparent differences and similarities within the processes of appearance, disappearance, change or continuity, territory, materials, and scale...for each of the established categories (Alberto *et al.*, 2019). In this study we continue in the same vein, with the aim of improving the proposed model and going beyond the current framework that explains the history of the Ancient Canarians, as a result of their total isolation throughout their existence. To this end, the analysis will be focused on identifying periods of continuity and breaks affecting funerary practices, as well as other cultural elements and testimonies of socio-economic organisation between the 11th and 15th centuries AD.

2. MATERIAL AND METHOD

Chronological analysis employs a wide set of funerary dates to build sepulchral categories or phases, to determine the onset and end of each phase, as well as its rate of change. For this assessment, the "tempo plot" technique is used (Dye, 2016), which calculates the cumulative frequency of specified events, measuring how many instances there were before a given moment within a specific time range (Dye, 2016; Philippe & Vivet, 2018). In the resulting graphs the slope of the curve

* This work forms part of the research project "*Cuerpos, objetos y espacios. Muertes convergentes, muertes divergentes*" (Bodies, objects and spaces. Convergent deaths, divergent deaths) (2018PATRI05), financed by the *Fundación CajaCanarias* and the *Caixabank* foundation.

** Tibicena Arqueología y Patrimonio.
*** Servicio Patrimonio Histórico. Cabildo de Gran Canaria.
**** El Museo Canario.

reflects the rate at which different events occur. A steep curve indicates greater frequency while a flat curve reflects a slower trend (Dye, 2016; Di Napoli *et al.*, 2020). This type of analysis has been combined with so-called activity curves that provide a sequence of the average number of event dates per unit of time. For the calculation of these variables we used the Bayesian modelling programme *Chronomodel* 2.0 (Lanos & Dufresne, 2019). For the calibration of radiocarbon dates we used the *IntCall 13.14c* curve. The *IntCall 20* curve (Reimer *et al.*, 2020) was used in the calculations performed with *Oxcal 4.4* (Bronk, 2017), including the various Bayesian phase clustering models performed with this application.

The series includes 107 dates from a previous study (Alberto *et al.*, 2019) and 24 new ones contributed by various projects and archaeological interventions in funerary spaces. The new dates are shown in table 1.

TABLE 1. NEW RADIOCARBON DATES IN FUNERARY CONTEXTS

Archaeological site	Type	Sample	Mét.	Lab code	Conventional age BP	Calibration/ Calendar	Ref.
Acusa	Cave	Vegetal fabric	AMS	Beta 539739	1230 ± 30	HPD (95%): [689-751] (32%), [759-882] (63%) AD	*
Angostura	Cave	Human bone	AMS	Beta 539747	1460 ± 30	HPD (95%): [554-647] (95%) AD	*
Angostura	Cave	Human bone	AMS	Beta 539748	1500 ± 30	HPD (95%): [433-459] (5%), [467- 488] (5%), [533-637] (85%) AD	*
Angostura	Cave	Human bone	AMS	Beta 539745	1590 ± 30	HPD (95%): [405-541] (95%) AD	*
Angostura	Cave	Human bone	AMS	Beta 539746	920 ± 30	HPD (95%): [1029-1169] (93%), [1172-1183] (2%) AD	*
Bentayga	Cave	Human bone	AMS	Momia MSA	1000 ± 45	HPD (95%): [909-912] (0%), [969-1158] (95%) AD	**
Cardones	Cave	Human bone	AMS	Beta 539726	1150 ± 30	HPD (95%): [777-793] (8%), [799-971] (87%) AD	*
Crucecitas	Pit-grave/ cist	Human bone	AMS	Beta 539732	750 ± 30	HPD (95%): [1223-1286] (95%) AD	*
Crucitas (Agüimes)	Pit-grave	Human bone	AMS	D-AMS 037585	911 ± 22	HPD (95%): [1036-1169] (94%), [1175-1182] (1%) AD	***
C. Linagua	Cave	Human bone	AMS	Beta 539735	890 ± 30	HPD (95%): [1041-1107] (36%), [1117-1216] (59%) AD	*
C. Linagua	Cave	Human bone	AMS	Beta 539741	920 ± 30	HPD (95%): [1029-1169] (93%), [1172-1183] (2%) AD	*
El Drago	Cave	Human bone	AMS	Beta 539731	870 ± 30	HPD (95%): [1046-1093] (17%), [1120-1140] (5%), [1147-1229] (71%), [1231-1248] (3%) AD	*
Fortaleza	Cave	Human bone	AMS	DAMS 036316	1616 ± 30	HPD (95%): [389-478] (58%), [481-536] (37%) AD	**

Guayadeque	Cave	Human Soft tissue	AMS	Beta 539327	1500 ± 30	HPD (95%): [433-459] (5%), [467-488] (5%),[533-637] (85%) AD	*
Guayadeque	Cave	Human Soft tissue	AMS	Beta 539738	1530 ± 30	HPD (95%): [428-498] (40%), [504-598] (56%) AD	*
Guayadeque	Cave	Human Soft tissue	AMS	Beta 539733	1420 ± 30	HPD (95%): [582-660] (95%) AD	*
Guayadeque	Cave	Human bone	AMS	DAMS 032113	1340 ± 34	HPD (95%): [641-721] (81%), [741- 766] (14%) AD	**
Guayadeque	Cave	Human bone	AMS	DAMS 032114	853 ± 25	HPD (95%): [1059-1064] (1%), [1067-1073] (1%), [1155-1255] (94%) AD	**
Guayadeque	Cave	Human bone	AMS	DAMS 032115	927 ± 23	HPD (95%): [1034-1159] (95%) AD	**
Guayadeque	Cave	Human bone	AMS	DAMS 036315	1169 ± 25	HPD (95%): [773-901] (84%), [921-952] (11%), [960-960] (0%) AD	***
Guayadeque	Cave	Vegetal fabric	AMS	**DAMS 036314**	1058 ± 27	HPD (95%): [900-922] (10%), [947-1022] (85%) AD	***
Metropole	Fosa/ cista	Human bone	AMS	Beta 539742	590 ± 30	HPD (95%): [1299-1371] (68%), [1379-1412] (27%) AD	*
Tederas	Fosa/ cista	Human bone	AMS	DAMS 032111	542 ± 28	HPD (95%): [1317-1353] (30%), [1390-1434] (65%) AD	**
Tirajana	Cave	Human bone	AMS	Beta 539740	1240 ± 30	HPD (95%): [684-780] (61%), [787-877] (34%) AD	*

* *El Museo Canario.* Project financed by the General Directorate for Cultural Heritage of the Canary Islands Government.
** *Tibicena Arqueología y Patrimonio.* Financed by the General Directorate for Cultural Heritage of the Canary Islands Government.
*** *Tibicena Arqueología y Patrimonio.* Emergency archeological intervention. Financed by the Gran Canaria Island Government.

This is a representative sample of aboriginal funerary phenomena, providing a robust model. However, there are limitations that must be addressed. For instance, the remaining small number of samples for tumuli burials[1] and the gap that exists for those cist burials that are located in the interior of the island, isolated to a greater or lesser extent. We would also highlight the need to introduce certain variables such as the so-called reservoir effect, which takes into account distortions in C14 levels in bone remains from individuals who consumed a lot of sea-based foods (Bronk, 2008; Lanting & van der Plicht 1998). In these instances, radiocarbon measurements may make them appear slightly older than land-based organisms existing at the same time that consumed less of these products. Due to a lack

[1] Following the write-up of this report, new dates have been obtained for tumuli which extend the end limit for this burial category. This data reveals a more attenuated transition with regards cist and pit-burial cemeteries than that envisaged in this work.

Figure 1. Map of Gran Canaria with the archeological sites mentioned in the text.

of data, this study has not taken into consideration this potential bias in certain dated individuals, particularly those from pit-graves and cist burials located mostly in coastal areas, whose diet included a large amount of marine animals (Arnay *et al*., 2010; Lécuyer *et al*., 2021).

In order to validate the significance of documented changes in funerary expressions, particularly in cist burials and pit-grave cemeteries, and to be able to explain this phenomenon in a global historical context, other dates taken from domestic spaces and storage locations from the same period and with appropriate geographical representation have been included in the discussion (fig. 1). Dates that do not meet basic radiometric hygiene criteria have been excluded from this series (Velasco *et al*., 2019). Out of the 78 available[2] (Alberto *et al*., 2019; Martín *et al*.,

[2] This figure does not include those carried out on sea shells because of the great uncertainty that tends to surround their correct calibration.

1994; Onrubia *et al*., 2004, those compiled in Velasco *et al*., 2019 and two unpublished from El Tejar and another from la Restinga[3]), only 25, a little over 30%, were carried out on short-cycle materials with the required guarantees of accuracy and reliability. In addition to this, certain catalogues of materials considered exclusive to this period have been evaluated, offering greater understanding of the new historical scenario that emerged from the 11th century onwards.

3. RESULTS

After incorporating the new dates and analysis tools to verify the model of burial categories/phases linked to the existence of three distinct funerary formulas, there is very little change to the previously obtained parameters. The probability calculation of the onset, end and duration of each of the phases according to the Bayesian modelling offered by *Chronomodel 2.0* maintains the previously established chronological framework, although some temporal margins are slightly adjusted. The Bayesian phase estimation (Amodel= 81; Aoverall= 82.8; Bronk 2009) of Oxcal 4.4 presents a similar picture, although somewhat more constrained by the probability calculation procedure employed, mainly with regards the onset period (table 2).

TABLE 2. RESULTS FROM BAYESIAN MODELLING OF DATES

"Cave" phase	Maximum a posteriori (MAP) Average	Modelled dates (68% probability cal BC)	Modelled dates (95% probability cal BC)
Onset Chronomodel	MAP: 433 408 ± 68 (*) MAP = 409 378 ± 55	365-484 (*) 339-449	256- 526 (*) 258- 463
Onset Oxcal 4.4		490-531	453-541
End Chronomodel	MAP: 1476 1433 ± 56 (*) MAP=1371 1369 ± 53	1401-1490 (*) 1306-1411	1290-1509 (*) 1278-1482
End Oxcal 4.4		1296-1325	1285-1343
Duration Chronomodel	MAP: 1021 1026 ± 90 (*) MAP=976 992 ± 77	937- 1107 years (*) 907-1060 years	851-1206 years (*) 849-1142 years

"Tumuli" phase	Maximum a posteriori (MAP) Average	Modelled dates (68% probability cal BC)	Modelled dates (95% probability cal BC)
Onset Chronomodel	MAP: 700 655 ± 101 (*) MAP=700 657 ± 95	622- 758 (*) 617-753	421- 803 (*) 444-807

[3] El Tejar (animal bone): 640 ± 40 BP y 610 ± 40 BP; Restinga (animal bone): 902 ± 24 BP.

Onset Oxcal 4.4		747-830	671-864
End Chronomodel	MAP: 1102 1100 ± 100 (*) MAP=1002 1030 ± 89	1012-1156 (*) 951-1058	888-1294 (*) 893-1229
End Oxcal 4.4		897-963	891-1052
Duration Chronomodel	MAP: 393 (*) 445 ± 141 MAP=312 373 ± 129	299-523 years (*) 227-428 years	217-770 years (*) 175-658 years

"Pit-grave/cist burial" phase	Maximum a posteriori (MAP) Average	Modelled dates (68% probability cal BC)	Modelled dates (95% probability cal BC)
Onset Chronomodel	MAP: 1072 1014 ± 156 (*) MAP=1054 985 ± 151	985-1163 (*) 962-1132	681- 1210 (*) 635-1175
Onset Oxcal 4.4		1186-1211	1163-1217
End Chronomodel	MAP: 1587 1543 ± 38 (*) MAP = 1494 1477 ± 16	1526- 1600 (*) 1472-1500	1477-1600 (*) 1449-1500
End Oxcal 4.4		1439-1461	1429-1477
Duration Chronomodel	MAP: 472 529 ± 160 (*) MAP =423 492 ± 153	374-574 years (*) 342-517 years	307-877 years (*) 296-843 years

(*) Results obtained from a previous study (Alberto *et al.*, 2019).

It is useful, to this end, to compare each of the three categories in the temporal reference framework in the "tempo plot" (fig. 2).

On the one hand, the situation at onset is established and on the other, the rate represented in each case. The series of events linked to the category of caves determines the earliest moment of this burial practice, displaying a progressive horizontal growth, while the tumuli and in particular the pit-graves/cists burials present a much steeper rise. In the case of pit-graves and cist burials, the events happen within a very specific time period and with rapid progression, resulting in the vertical trend in both graphs. This model highlights the fact, as already observed (Alberto *et al.*, 2019), that open air burials appear during an advanced stage of settlement. Tumuli appear first around the 7th to 8th centuries, and later, cemeteries of pit-graves and cist burials, from the 11th and 12th centuries onwards. With the dates that are available, it is hard to consider the possibility of a limited use of these funerary practices in the first centuries of settlement, only to become more widespread later. On the contrary, the data suggests that they are new practices implemented hundreds of years after the first stages of colonisation.

The activity phase of each category suggests the same (fig. 3), and allows for a direct evaluation of how they relate to each other from a time perspective.

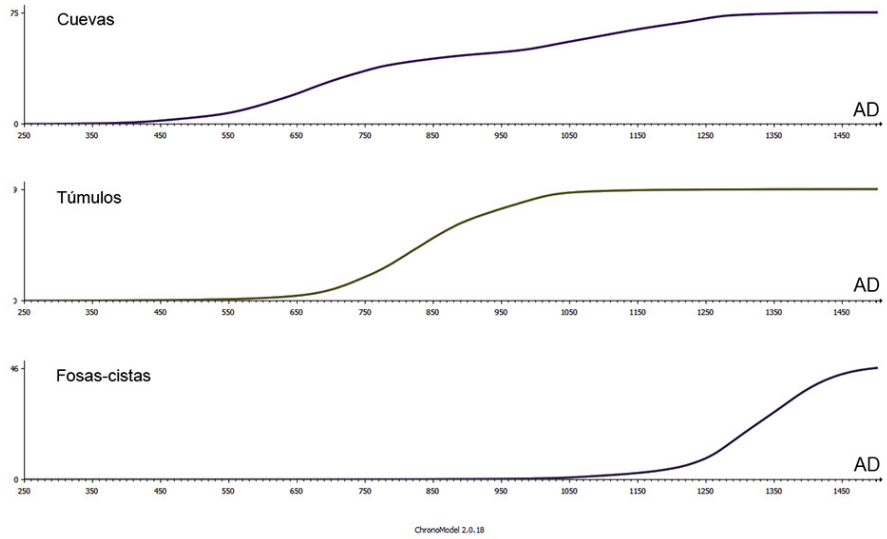

Figure 2. Tempo Plot of funerary categories.

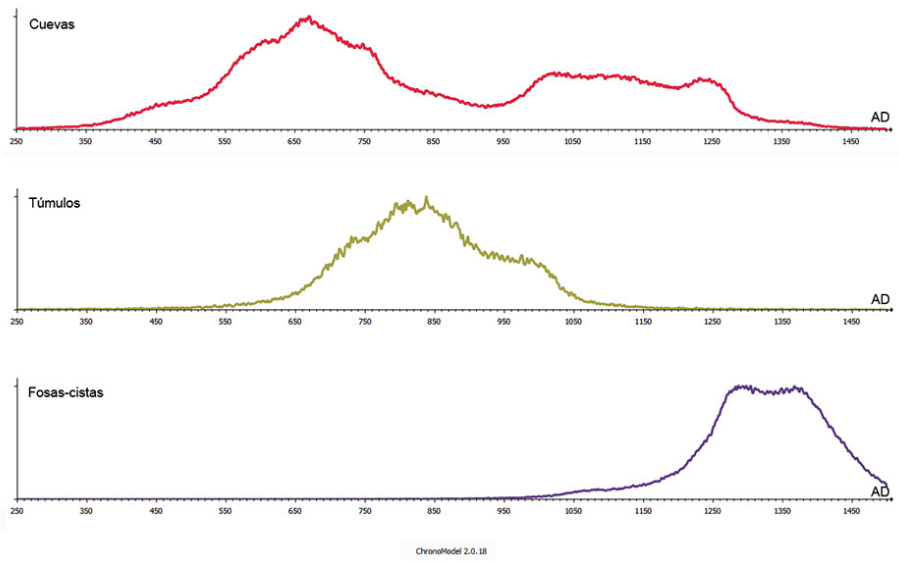

Figure 3. Activity phase of each funerary category.

Throughout the sequence, each category exhibits specific behaviour with significant variations in time. The category of caves is the only burial group that

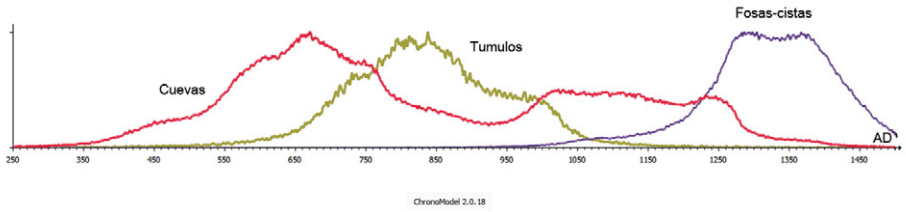

Figure 4. Combined activity of funerary categories.

persists over more than approximately 1200 years. Both the "tempo plot" and the activity phase reveal progressive growth, reaching their peak around the 7th century, when there is a decline, followed by a small recovery between the 11th and 13th centuries, and continuing through to the 14th century. Tumuli appear from the middle of the 7th century, reaching their peak around the 9th century. This upward curve coincides temporally with the reduction in the number of caves, expressing a trend that is not due to chance or to sample selection criteria. After a gradual decline between the 11th and 12th centuries, signs of tumuli activity disappear from the graph, coinciding with the aforementioned brief recovery of caves. Finally, pit-grave and cist burial cemeteries begin to appear in small numbers from the end of the 10th and during the first decades of the 11th century, demonstrating a particularly steep increase in the 13th century, at which point they become the most common form of burial.

The connection between the activity curves of the three proposed categories (fig. 4), supports the idea of a distinction beyond the physical structure of the funerary practice, and should be based on other historical criteria.

4. DISCUSSION

The dates maintain the effective settlement from the first centuries of this millennium, with the current limit being the 4th century AD, located primarily along the mid-hillside and interior of Gran Canaria. This model of territorial occupation corresponds to their condition as farmers and especially livestock breeders, with goat and sheep having particular importance in the ways of life. Territorial analysis (Moreno y González, 2014) and the revision of some dietary data (Arnay *et al*., 2010; Delgado, 2009) in the light of new radiometric information could serve to strengthen this proposal. Continental populations transferred their way of life to the new island setting, settling in places similar to the landscapes they had left behind where they could continue with their lives and minimise the insecurity inherent in the process of colonisation. The success of the permanent occupation of the island can be seen in the time graphs, in particular between the 5th and 7th centuries as can be seen in the gradual increase in population and territorial expansion and diversification.

This explains the scarcity of coastal settlements in these first centuries, at least compared to those in the interior of the island. The oldest coastal settlement, from the 4th to the 6th century AD, is located at Aguadulce beach (Martín, 2000). However, through the application of correction criteria (Parker *et al.*, 2020) which were not considered at the time, the range of probability of the date widens considerably: cal AD 352-829 (http://calib.org/calib/calib.html), thus significantly reducing its accuracy. Coastal settlements dated with short cycle samples, such as the Maspalomas sand dunes, appear to be more recent, from the 8th to 9th centuries AD (Rodríguez *et al.*, 2012; Velasco, 2018). In any case, intensity of exploitation of marine resources appears to remain quite low in comparison with that observed in later periods. It does not seem that the absence of "ancient" coastal enclaves could be due to a sampling issue, since the number of coastal sites to have been dated is quite high. It is not until the 13th century that there is extensive occupation of the coast and intensive use of the resources and possibilities that this territory offers.

Tumuli and pit-graves/cist burials all appear later in the sequence, only considerably after the first permanent settlement. Also, both categories are introduced and grow rapidly, as shown in the verticality in the tempo-plot graphs. Changes identified in burial practices go beyond the formal aspect of the tombs, and can be characterised according to temporal and territorial factors, as well as the social consideration of the individual with respect to the group (Alberto *et al.*, 2020). That is to say, they are clearly identifiable and classifiable manifestations (justifiable units), distinguishable from earlier examples and scalable in time and space (Kristiansen, 2011; Roberts & Vander Linden, 2011).

In order to understand these shifts it is vital to evaluate the conditions and contexts in which these new elements are identified, and whether other vectors of change can be observed in the same spatial and temporal framework. For space reasons and in order to limit the scope of our analysis, we will focus on the period of pit-graves and cist burials, putting aside for now research on events in the first millennium.

4.1. A change in landscape

Only recently have there been enough dates available in order to chronologically arrange some of the archaeological manifestations in Gran Canaria. Our findings lead us to question the entrenched monolithic perspective of the past in which perceived "changes" have received little more explanation that their own announcement. The current situation offers a good framework in which to begin to disentangle the archaeological palimpsest of enclaves and material registers that predate the Castilian conquest.

Looking at the period of analysis, from the 11th century but principally in the 12th and 13th centuries, necropolises of pit-graves and cist burials were the most common funerary practices (figs. 5 and 6), although caves persist at a low frequency until almost the end. The new types of tombs, to some extent, are less monumental/visible when compared with the territorial expression of the earlier

Figure 5. Lomo Juan Primo pit-grave cemetery, Gáldar coast.

Figure 6. Cist burial at Tenefé necropolis.

formula –the large tumuli necropolises of the badlands, although they do maintain their individual prominence and the asymmetrical principle, expressing interpersonal differences through dimensions, the quality of construction, location and position in relation to other tombs, in comparison to the collective nature of caves in the first centuries (Alberto *et al.*, 2020).

Figure 7. Stone dwellings at Bocabarranco, Gádar.

These necropolises are closely related to the stone dwelling settlements of very specific geographic distribution. From a territorial perspective, while tumuli seem to connect populations from a wide area, although we do not know if they lived in caves or open-air settlements, cemeteries of pit-graves and cist burials reflect a much more divided and spatially delimited territorial model. The majority of these cemeteries, and their respective habitats, are located in coastal zones up to 200-250 m above sea level. This illustrates occupation of the coastal strip, directly linked to intensive use of both the main agricultural plains at the mouths of the large ravines, as well as marine resources (Rodríguez, 1996; Velasco *et al*., 2001; Delgado, 2009; Arnay *et al*., 2010; Morales, 2019). The model reveals human settlement of areas that were previously uninhabited or had a very small population, and which continued to grow from this point up until the conquest (fig. 7).

In order to verify this pattern of territorial settlement we must evaluate whether these dwellings, in many instances directly associated with pit-graves and cist burials, share the same temporal range. Although the sample is not representative of the whole island, it is clear that once calibrated, almost all of the dates are around the 13th century. If a Bayesian statistical treatment is applied in Oxcal 4.4

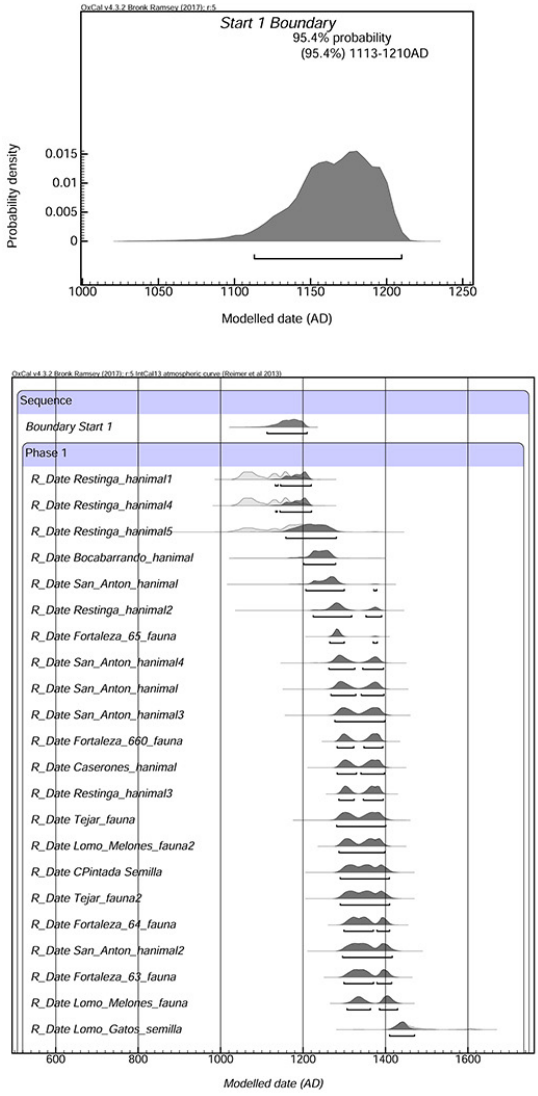

Figure 8. Bayesian treatment of the dwellings as a phase.
At the top is the start probability.

(fig. 8), treating the dates as a single phase, a model is obtained for the dwellings (A_{model}=116,2; $A_{overall}$=115) with an onset interval of between 1135-1214 (95.4%), and an end point in the second half of the 15th century. If this same procedure is carried out using Chronomodel 2.0, the start of the phase represented by the dwellings (with a mean of 1074 ± 44) would be between 1000-1155 (95%), becoming further limited if the calculation is at 68%: 1012-1099. In this case, the statistical mod-

Figure 9. Panoramic view of La Fortaleza, Santa Lucía, with a group of caves.

els for pit-graves/cist burials and dwellings coincide, which is to be expected given the physical proximity in many examples. In the 11th century in Gran Canaria a territorial model can be observed of open-air settlements combining domestic and funerary uses, all over the island, which is fully consolidated by the 13th century.

A large part of the population nuclei, at least the largest ones, are located along the coastal strip and in the most important plains of the island, reflecting intense exploitation of marine resources and, critically, the possibilities of intense cereal farming. Although given the island setting, this same typology is documented in other locations far away from the sea, but without the intensity that is observed in the lowlands. However, in areas with a long troglodyte tradition, the use of caves as dwellings and storage areas continues, such is the case in the sites at La Fortaleza (fig. 9), Acusa and Guayadeque (Morales *et al*., 2014; Oliveira *et al*., 2012; Henríquez *et al*., 2020).

In enclaves with a strong temporal projection such as La Fortaleza, the occupation of the site in this period is dominated by open-air habitats, forming a complex settlement of stone dwellings (fig. 10), although some caves are still used for domestic purposes (Moreno, 2020). This change in model occurring at La Fortaleza appears to follow the dynamic of consolidation of surface enclaves, participating in the same organisational proposals as in the rest of the island, with its corresponding local peculiarities, even though it was previously an important cave settlement.

Likewise there are certain sites that until very recently could not be placed in a chronological framework that should be considered: spaces specifically used for storage. Studies in recent years have provided a wide range of reliable dates (Morales *et al*., 2014; Henríquez *et al*., 2019; etc.) that allow for the adjustment of their time frame (fig. 11). As can be seen in the graphical representation of the dates, collective grain stores in adapted artificial or natural cavities, understood and used as

Figure 10. Aerial view of the dwellings at La Fortaleza, Santa Lucía.

Figure 11. Partial view of the grain store of Valerón, Guía.

spaces specifically for storage, where their safe keeping and protection are of prime importance, do not appear until the 11th century, as has been observed in other studies (Henríquez *et al*., 2019)[4], and are consolidated above all during the 12th

[4] This work has taken into the consideration the dates published for artificial grain stores at El Álamo, Cuevas Muchas, Cenobio de Valerón and Risco Pintado. Multi-specimen samples have been provisionally omitted from the analysis because of the problems they can create (Bronk, 2008). The proposed limitations of entomofauna samples have also been considered (Walker *et al*., 2001).

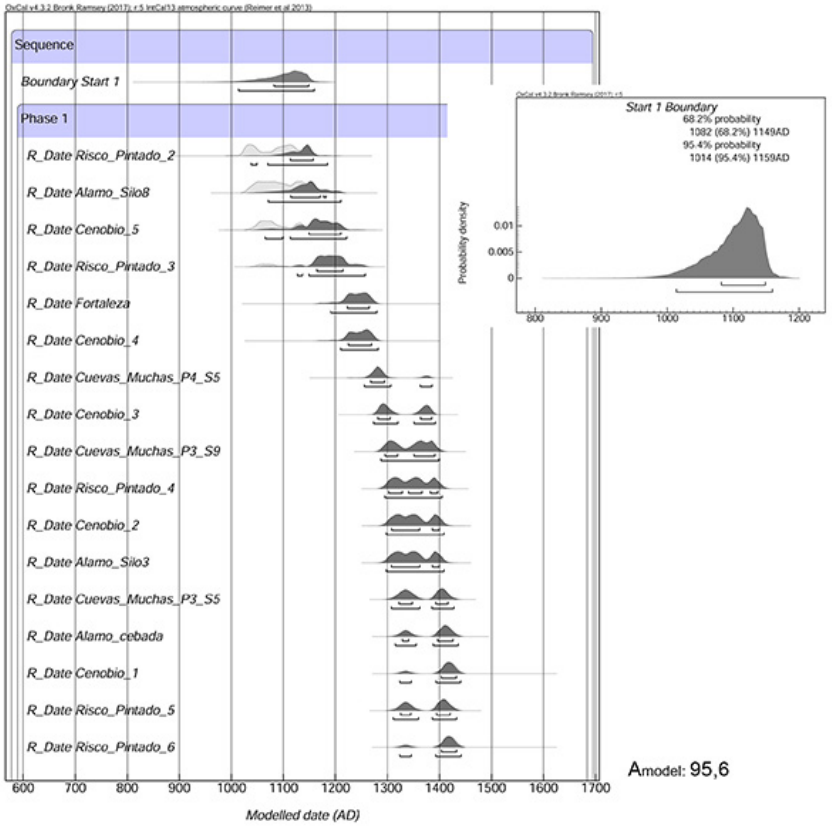

Figure 12. Bayesian treatment of the grain stores as a phase.
On the right is the start probability.

and 13th centuries. If, in the same way as the example of the dwellings, we consider these grain stores as a single phase in the Bayesian sense (Oxcal 4.4: A_{model}=95,3; $A_{overall}$=94,9) (fig. 12), the results match the dynamic described, with an onset date between the years 1038-1190 (95%).

Along with this specific model of residence and storage, other material elements also appear to be linked to this phase, at least this is what is suggested by the dates available. Objects such as the *pintaderas* (Cruz *et al*., 2013), the so-called idols (Onrubia *et al*., 2000) (fig. 13) and the ceramics of the IIb group (del Pino and Rodríguez, 2017, 24: "that include the majority of those elements that have traditionally been considered to be characteristic of pre-Hispanic pottery in Gran Canaria") are abundant in open-air contexts dated from the 11th century onwards and in troglodyte settlements with absolute dates from the same time frame. Therefore, as far as it has been possible to document, these elements do not seem to be present in earlier contexts.

Figure 13. Female figurine found in one of the dwellings at La Fortaleza, dated between the middle of the 13th century and the end of the 15th century AD. Photo by Agustín Casassa.

This data allows us to envisage a period of significant change in the island's archaeological records in aspects such as diet, occupation patterns in the island, production of food and other consumer goods, in the main physical activities associated with production, and storage (Delgado, 2009; Morales, 2010; 2019; Rodríguez *et al*., 2012; Santana *et al*., 2011; Del Pino *et al*., 2016; del Pino and Rodríguez, 2017; Henríquez *et al*., 2019; etc.). All of which is linked to mainstreaming architectural models unregistered until now –stone dwellings and tombs in pit-graves and cist burials–. Together, these elements paint a particular picture of the last 400-450 years of Gran Canaria's aboriginal society.

This new model of occupation and exploitation of territory constitutes the materialisation of shifts in the productive order with the assertion of the agricultural model, social relationships with the consolidation of a hierarchical system, and ideological content with the spread of symbols related to fertility and strengthening individual identities, among many other aspects, that the society of the Ancient Canarians experienced in the last centuries of its existence. Specifically, the period between the start of the second millennium and the year 1483 represents a stage of integration that affects not only funerary practices, but also developments in many material aspects and the forms of organisation of the lives of the Ancient Canarians.

4.2. Adaptation... Innovation... Development

Changes from the 11th century onwards affect different facets of the ancient island population: production, beliefs, institutions, territorial organisation, consumption..., yet there are very few proposals that explain these processes. Generally

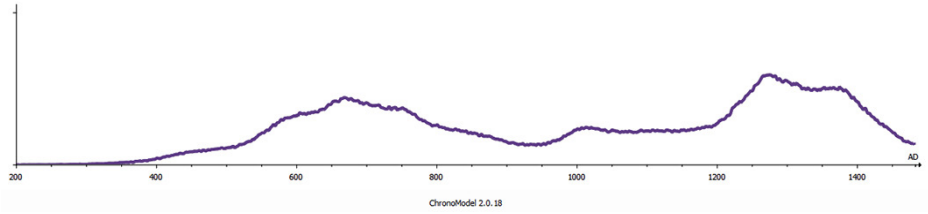

Figure 14. Activity phase of all the funerary samples.

speaking, these proposals do not address the global, social reality, and rely instead on individual interpretations conditioned by the type of record evaluated in each case. Often, arguments surrounding these questions come from processual claims in which changes have been understood as an adaptation strategy (to surroundings, to social requirements...), the product of internal dynamics (Velasco, 1999; Rodríguez *et al*., 2012; del Pino and Rodríguez, 2017) with demographic growth as the initial stimulus and consolidating factor in these transformations (Velasco, 2018; Morales, 2019). However, and without disregarding the contribution of these processes to the historical evolution of this society, are other explanations possible? And if so, on what basis?

Population growth is a variable in which accuracy is difficult from an archaeological point of view, even though it is a criteria commonly used to explain situations of transformation or change in societies of the past (Shennan y Sear, 2020). In the case of Gran Canaria, with the exception of those mentions in narrative sources of significant population density at the time of the conquest, we do not have sufficient data to put forward a coherent and complete proposal on this issue. In this regard, analysis of funerary dates allow for some considerations to be outlined, making way for the premise of a proportional relationship between population and frequency of events, such that the more people that lived on the island, the more likely it is that activities will have taken place that can be dated - including burials (fig. 14).

Between the 11th and 15th centuries the most obvious growth does not take place at the beginning but rather from the 13th century onwards. It is true that from the middle of the 10th century a slight rise can be observed in the curve, coinciding with the turn of the century. To take into account reservations regarding this process (Balsera *et al*., 2015), it should be noted that the dynamic of population growth doesn't explain the developments identified in archaeological records at the beginning of the second millennium. On the contrary, the demographic peak is a delayed consequence of a process that begins in the 11th century. The time frame of the majority of chronologies, both for cemeteries of pit-graves and cist burials as well as for stone dwellings and collective grain stores, would support this proposal. Initially, the changes observed don't appear to be the result of notable population growth requiring increased production and territorial diversification of settlements

at the turn of the millennium. In fact, the demographic picture of the 13th century is a result of previous social transformations that reach their maximum expression in that moment (Velasco *et al*., 2021). Later, from the end of the 14th century the trend changes, perhaps are denoting a new cycle which, among other causes, could be related to European presence in the islands. Ultimately, without discarding its ability to influence the phenomenon of transformations that is described, the increase in population shown in the graphs appears to be the delayed consequence of this period that from the 11th century onwards is full of change.

Revision of radiocarbon dates has narrowed the time frame of some manifestations that we believed to be older, to such an extent that it could be said that the history of the first millennium in Gran Canaria is yet to be discovered. This makes it hard to define a coherent account of the period we are referring to, as the period preceding it is unknown. This necessitates a wider time frame of reference, thus facilitating comparison of different scales of change and social transformation (Kneisel *et al*., 2019). It is true that certain elements appear to display obvious continuity: the treatment of bodies before burial, the persistence of plant and livestock as the basis of food production, the use of raw materials in technological solutions... such that other aspects that do change, for example the pattern of territory occupation, intensification in the use of certain resources, and growing specialisation, have ended up spreading as innovations stemming from internal transformations of the social order. But exactly what changes do occur? To what extent? At what speed? What transformations do they imply? How do they generate innovation?

Notable qualitative changes can be observed, principally the most widespread formulas for housing and burials and the production of certain items which are incorporated quickly and without precedent and thus cannot be understood as local innovations. And despite the previously mentioned gap in knowledge of pre-11th century archaeological records, there are some manifestations that can be described as new developments and allow for alternative explanations, as is the case with the emergence of pit-graves and cist burials.

This burial typology is well documented on the continent, with a firm time reference and wide territorial distribution (for example, Mattingly *et al*., 2019). Given its chronology in North Africa, these funerary formulas could well have arrived on the island with the first colonisers at the beginning of the first millennium. However, if this was the case, they were not put into practice until seven or eight hundred years later. Over 20 generations later, did they recover or remember burial formats which are practically indistinguishable from those found on the continent? It is clear that this is a question that deserves some reflection, especially because this type of burial, as it has been noted, is not the only element that does not have any known precursor.

This all leads us to the possibility of a migratory event during this time being the trigger or co-trigger for the changes described which should be included in archaeological literature and in the design of explanatory models.

4.3. The new millennium, continuity or a break?

The possibility of a migratory event of a North African population to the islands, distinct from the first colonisation, is not a new proposal within Canarian archaeological research, and is in fact mentioned in studies from the 19th century. At present, the proposal has fluctuated in line with various theoretical positions (Martín, 1986; 1988), with direct chronological and archaeological evidence (Navarro and Martín, 1985-1987; Navarro, 1997) and in the last decade, taking into account data from ancient DNA (Secher *et al*., 2014; Fregel *et al*., 2019).

In terms of archaeological studies, in Gran Canaria proposals such as this have made little headway due to a variety of reasons. Firstly, the strong racist content of works that, from the end of the 19th century until the last third of the 20th century, impregnated a large part of these proposals, meant that they were rejected and, by extension, any migratory hypothesis was denied. Secondly, the consolidation of processual positions that limited how far migratory events could explain cultural change, except perhaps for some technological innovations (Burmeister, 2016; McSparron *et al*., 2019; Van Dommelen, 2014). The reaction to racist postulates and the widely held positions on cultural ecologism led to the idea that any cultural component could - and should - be explained as adaptation: environmental conditions, availability of raw materials, soils, population growth, etc. For the creation of these proposals, it was enough to resort to internal processes which, although poorly defined, were able to support any cultural change. All of which was underlined by a set of practically unquestionable principles, such as the assumed total isolation of the entire aboriginal historical sequence, or that material elements were proof of one single ethnic identity which ended up being unifying. Finally, migration was synonymous with a large wave; a concept with an ideological burden that, just as in other contexts (Bellwood, 2014; Hakenbeck, 2008), provoked immediate rejection, often redescribed in recent years due to the challenges of dialogue between paleogenectic perspectives and those offered by archaeology (Booth, 2019).

In contrast, current studies of ancient DNA reveal greater genetic variability in certain islands, as well as the existence of asymmetries in the distribution of different mtDNA haplogroups (Fregel *et al*., 2019), coinciding with the hypothesis of a migratory phenomenon towards some of the islands that, although lacking a specific date, has been documented at different archaeological sites in Gran Canaria.

The elements of judgement that help to incorporate migration phenomena into societies of the past have changed substantially in recent years, in particular because it is no longer an axiomatic explanatory approach to cultural change, but a co-participatory one in the understanding of historical processes (Burmeister, 2016; Hakenbeck, 2008). Archaeological acknowledgement of this phenomenon and its distinction from other mechanisms of transmission and change are challenging, but their identification as cultural behaviour inevitably requires knowledge of their structure and historical particularities, both at the points of arrival and departure of populations (Anthony, 1990; McSparron *et al*., 2019). Migration, by definition, does not have to be massive, nor does it always involve the substitution or disappearance of cultural manifestations in the territory of destination. It is the driver of

cultural developments and innovations which gives renewed continuity to cultural forms in the destination. It also need not be interpreted as the origin of a distinct ethnic identity, as this would go against the very definition of a historical category in a continual process of negotiation and change (Fernández, 2013; Wimmer, 2013). Nevertheless, it is a historical phenomenon that must be explained, that may be seen in the identification of dynamics of cultural change and that, as demonstrated in increasing numbers of studies, is a frequent occurrence.

These approaches are consistent with the archaeological findings in Gran Canaria and specifically for the historical period we are referring to. We are within a temporal context in which changes are clear and it is not always easy to find antecedents that place them in a process of local genesis.

In this time frame of the 2nd millennium there are elements in material records that display a notable similarity with others on the continent. From a cultural viewpoint, the historical context of these elements in North Africa facilitate their eventual connection with the islands: expressions associated with populations with great mobility, for whom some manifestations - such as tombs - are elements of communication and negotiation of identity (Mattingly *et al*., 2019), with a set of ethno-linguistic features that remain close to those of the island populations, in a chronological and socio-political framework full of hostilities, resistance and displacement of people, not always voluntarily (Amara, 2011; Camps, 1983; etc.). The islands were also not unknown to populations on the mainland. (Marrero y Aguilar, 2017; Martínez, 1999; Martínez, 2006; Vernet, 1971, etc.). In any case, it is not so much a question of presenting a situation of contingency, but of placing ourselves in a scenario in which Gran Canaria –the archipelago– participates with its own particularities in the historical processes taking place in the North African context.

The possibility of a migratory event, which as a hypothesis could be placed around the second half of the 10th and the first half of the 11th century, would help to explain some archaeological manifestations in Gran Canaria. In a dynamic of arrival which, bearing in mind other turning points in the history of the Ancient Canarians, may not be the first instance (Alberto *et al*., 2021). In which case, what type of migratory event? Involving what population? What elements were incorporated and how were existing ones adapted? What was the process of interaction and the resulting synthesis between what was local and foreign? Were they recognised in the same way in all areas of life? And if this wasn't the case, how can we explain changes to the magnitude observed? What happened in Gran Canaria in the moments leading up to the change? Far from resolving uncertainty, this approach raises more questions, although possibly with the added benefit of removing us from a research panorama that otherwise has little chance of progress.

5. CONCLUSION

This is a cycle of change, not only as identified in material records, but also because it is time to reconsider and revise our own views of the past. The time of the Ancient Canarians is no longer restricted within set boundaries in which to

situate archaeological manifestations, but has become a symbol of change, innovation, permanence, heterogeneous cultural habits, etc.

The introduction of the time factor in the funerary world is revealing a previously unknown landscape, as is the revision of the validity of available dates. A reality of permanence but also of transformations that is key to critical historical analysis. Analysis that questions the moment of onset, brings into doubt the monotonous continuity from beginning to end, helps to explain variation in order to, in certain cases, see it as a new development instead, etc., opening the way for new proposed explanations and the recovery of others that had been abandoned without question. It is within this landscape that there is a gradual re-consideration of the possibility that peoples from the continent arrived in different moments of this historical sequence, responsible for the implantation of cultural contributions, overlapping with natives, transforming and sometimes disappearing over time.

There is an increased capacity to consider the Africanness of these populations which, without having to continually justify Amazigh roots, connects us more closely to the history of the continent. We must look to the continent not only in search of origin, but also to address the complex history of North Africa, trying to understand and explain the different processes that we identify in the islands. Relevant events at different moments on the continent are likely to have had a much greater impact than previously estimated, in understanding archaeological manifestations in Gran Canaria.

The Ancient Canarians arrived on the island and lived and buried their dead in caves. Centuries later, tumuli were the first important change, and not only in the architecture of death, as in this phase a new way of understanding and organising the world also appeared and gained ground. Then, pit-graves and cist burials from the 11th century onwards represent another turning point, significantly modifying the prior situation, consolidating a completely distinct system to that existing in the beginning. However, the last phase of the Ancient Canarians is not homogenous, and in this sense, as the dates suggest, it is very revealing how late the occupation and intensive exploitation of the coast was in coming, not becoming consolidated until the 13th century.

Ultimately, this changing landscape is the result of internal development processes which, nevertheless, may be conditioned by external influences that precipitate, or to a certain extent model, some of the perceived developments in the material records. However, it is obvious that continuity is also important, and should be included in explanatory proposals. This opens up a pathway towards revealing how the newly-arrived population and their ways of life were articulated with those already living on the island.

REFERENCES

Amara, A. (2011): "L'islamisation du maghreb central (VII^e-XI^e siècle)", in Valèrian, D. (dir.) *Islamisation et arabisation de l'Occident musulman médiéval (VII^e-XII^e siècle).* Publications de la Sorbonne. Paris: 103-128.

Alberto, V., Delgado, T., Moreno, M. & Velasco, J. (2019): "La dimensión temporal y el fenómeno sepulcral entre los antiguos canarios". *Zephyrus-Revista de Prehistoria y Arqueología*, *84*: 139-160.

Alberto V., Velasco J., Delgado T. & Moreno M. (2020): "Los antiguos canarios ante la muerte. Tradición vs ruptura", in Afonso, J. (ed.) *Gran Canaria: las huellas del tiempo*, Actas XV Semana Científica Telesforo Bravo. Instituto de Estudios Hispánicos de Canarias: 13-40.

Alberto V., Velasco J., Delgado T. & Moreno M. (2021): "The end of a long journey. Tumulus burials in Gran Canaria (Canary Islands) in the second half of the first millenium AD". Azania: Archaeological Research in Africa, DOI: 10.1080/0067270X.2021.1960674.

Arnay M., González, E., Yanes, Y., Velasco, J., Romanek, C.S. & Noakes, J.E. (2010): "Paleodietary analysis of the prehistoric population of the Canary Islands inferred from stable isotopes (carbon, nitrogen and hydrogen) in bone collagen". *Journal of Archaeological Science*, *37*(7): 1490-1501.

Anthony, D.W. (1990): "Migration in archeology: the baby and the bathwater". *American anthropologist*, *92*(4): 895-914.

Balsera, V., Bernabeu, J., Costa, M., Díaz, P., García, L. & Pardo, S. (2015): "The Radiocarbon Chronology of Southern S pain's Late Prehistory (5600-1000 cal BC): A Comparative Review". *Oxford Journal of Archaeology*, *34*(2): 139-156.

Bellwood, P. (2014): *First migrants: ancient migration in global perspective*. John Wiley & Sons. Chichester.

Bellwood, P. (2017): *First islanders: Prehistory and human migration in Island Southeast Asia*. John Wiley & Sons. Chichester

Booth, T.J. (2019): "A stranger in a strange land: a perspective on archaeological responses to the palaeogenetic revolution from an archaeologist working amongst palaeogeneticists". *World Archaeology*, *51*: 586-601.

Bronk C. (2017): "OxCal software version 4.3.2". Available at: http://c14.arch.ox.ac.uk/oxcal/OxCal.html.

Bronk, C. (2008): "Radiocarbon dating: revolutions in understanding". *Archaeometry*, *50*(2): 249-275.

Bronk, C.B. (2009): "Dealing with outliers and offsets in radiocarbon dating". *Radiocarbon*, *51*(3): 1023-1045.

Burmeister, S. (2016): "Archaeological research on migration as a multidisciplinary challenge". *Medieval worlds*, *4*: 42-64.

Camps, G. (1983): "Comment la Berbérie est devenue le Maghreb arabe". *Revue des mondes musulmans et de la Méditerranée*, *35*(1): 7-24.

Cruz, M.C., Delgado, T. & Velasco, J. (2013): *Pintaderas de El Museo Canario*. El Museo Canario. Las Palmas de Gran Canaria.

Delgado, T. (2009): *La historia en los dientes: una aproximación a la prehistoria de Gran Canaria desde la antropología dental*. Ediciones del Cabildo de Gran Canaria. Las Palmas de Gran Canaria. Col. *Cuadernos de Patrimonio Histórico*.

Di Napoli, R.J., Rieth, T.M., Lipo, C.P. & Hunt, T.L. (2020): "A model-based approach to the tempo of "collapse": The case of Rapa Nui (Easter Island)". *Journal of Archaeological Science*, 105094.

Dye, T.S. (2016): "Long-term rhythms in the development of Hawaiian social stratification". *Journal of Archaeological Science*, *71*: 1-9.

Del Pino Curbelo, M., Rodríguez Rodríguez, A., Buxeda i Garrigós, J., Mangas Viñuela, J., Day, P., González Quintero, P. & Moreno Benítez, M. (2016): "Las cerámicas aborígenes de Gran Canaria (Islas Canarias) a través del yacimiento de La Cerera: materias primas, tecnología y función". *Trabajos de Prehistoria*, *73*(1): 90-114.

Del Pino, M. & Rodríguez, A. (2017): "Propuesta para la clasificación de los materiales cerámicos de tradición aborigen de la isla de Gran Canaria (Islas Canarias)". *Lucentum*, *36*: 9-31.

Fernández, M. (2013): "Revisiting Iron Age Ethnicity". *European Journal of Archaeology*, *16*(1): 116-136.

Fregel, R., Ordóñez, A.C., Santana, J., Cabrera, V.M., Velasco, J., Alberto, V. [...] & Pais, J. (2019): "Mitogenomes illuminate the origin and migration patterns of the indigenous people of the Canary Islands". *PloS one*, *14*(3).

Hakenbeck, S. (2008): "Migration in archaeology: are we nearly there yet". *Archaeological Review from Cambridge*, *23*(2): 9-26.

Henríquez, P., Morales, J., Vidal, P., Santana, J. & Rodríguez, A. (2019): "Arqueoentomología y arqueobotánica de los espacios de almacenamiento a largo plazo: el granero de Risco Pintado, Temisas (Gran Canaria)". *Trabajos de Prehistoria*, *76*(1): 120-137.

Henríquez, P., Morales, J., Vidal, P., Moreno, M., Marchante, Á., Rodríguez, A. & Huchet, J.B. (2020): "Archaeoentomological indicators of long-term food plant storage at the Prehispanic granary of La Fortaleza (Gran Canaria, Spain)". *Journal of Archaeological Science*, *120*, 105179.

Kneisel, J., Dörfler, W., Dreibrodt, S., Schaefer, S. & Feeser, I. (2019): "Cultural change and population dynamics during the Bronze Age: Integrating archaeological and palaeoenvironmental evidence for Schleswig-Holstein, Northern Germany". *The Holocene*, *29*(10): 1607-1621.

Kristiansen, K. (2011): "Constructing social and cultural identities in the Bronze Age", in Roberts, B. & Vander Linden, M. (eds.) *Investigating Archaeological Cultures*. Springer Link. New York: 201-210.

Lanos, P. & Dufresne, P. (2019): "ChronoModel version 2.0: Software for Chronological Modelling of Archaeological Data using Bayesian Statistics". Available at: https://chronomodel.com.

Lanting, J.N. & Van Der Plicht, J. (1998): "Reservoir Effects and Apparent". *The Journal of Irish Archaeology*, *9*: 151-165.

Lécuyer, C., Goedert, J., Klee, J., Clauzel, T., Richardin, P., Fourel, F., Delgado-Darias, T., Alberto-Barroso, V., Velasco Vázquez, J., Betancort, J.F., Amiot, R., MAréchal, C. & Flandrois, J.P. (2021): "Climatic change and diet of the pre-Hispanic population of Gran Canaria (Canary Archipelago, Spain) during the Medieval Warm Period and Little Ice Age". *Journal of Archaeological Science*, *128*, 105336.

Mattingly, D., Gatto, M.C., Sterry, M. & Ray, N. (2019): "Burials, migration and identity: the view from the Sahara", in Gatto, M., Mattingly, D., Ray, N. & Sterry, M. (eds.): *Burials, Migration and Identity in the Ancient Sahara and Beyond. Trans-Saharan Archaeology*, Cambridge University Press: 1-50.

Marrero, J. & Aguilar, M.A. (2017): "De historia atlántica: un recorrido por los textos latinos y árabes medievales que mencionan las Islas Canarias". *Fortunatae: Revista canaria de Filología, Cultura y Humanidades Clásicas*, *28*: 109-122.

Martín, C. (1986): "La arqueología canaria: una propuesta metodológica". *Anuario de Estudios Atlánticos*, *32*: 575-682.

Martín, C. (1988): "El horizonte cultural "Cueva Pintada" y el sustrato mediterráneo (Ensayo de aproximación y estrategia epistemológica)". *VI Coloquio de Historia CanarioAmericana* (Las Palmas, 1984), tomo 2 (1): 204-298.

Martín, C., Onrubia, J. & Saenz, J. (1994): "Trabajos en el Parque Arqueológico de la Cueva Pintada de Gáldar, Gran Canaria. Avance de las intervenciones realizadas entre julio de 1990 y diciembre de 1992". *Anuario de Estudios Atlánticos*, *40*: 17-115.

Martín, E.M. (2000): "Dataciones absolutas para los yacimientos de Risco Chimirique (Tejeda) y Playa de Aguadulce (Telde)". *Vegueta*, *5*: 29-46.

Martínez, M. (1999): "Rerum Canarium Fontes Arabici". *Revista de Filología de la Universidad de La Laguna*, *17*: 427-440.

Martínez, M. (2006): "Las Islas Afortunadas en la Edad media". *Cuadernos del CEMYR*, *14*: 55-78.

Mc Sparron, C., Donnelly, C., Murphy, E. & Geber, J. (2019): "Migration, Group Agency, and Archaeology: A New Theoretical Model". *International Journal of Historical Archaeology*, *24*: 219-232.

Morales, J., Rodríguez, A., González, M.C., Martín, E., Henríquez, P. & Del-Pino, M. (2014): "The archaeobotany of long-term crop storage in northwest African communal granaries: a case study from pre-Hispanic Gran Canaria (cal. ad 1000-1500)". *Vegetation history and archaeobotany*, *23*(6): 789-804.

Morales, J. (2010): *El uso de las plantas en la prehistoria de Gran Canaria: alimentación, agricultura y ecología*. Ediciones Cabildo de Gran Canaria. Col. *Monografía Cueva Pintada*, 1.

Morales, J. (2019): *Los guardianes de las semillas. Origen y evolución de la agricultura en Gran Canaria*. Ediciones Cabildo de Gran Canaria. Col. *La isla de los canarios*.

Moreno, M. (2020): *El tiempo perdido. Un relato arqueológico de la Tirajana indígena*. Tibicena Publicaciones. Las Palmas de Gran Canaria.

Moreno, M. & González, P. (2014): "Una perspectiva territorial al uso del suelo en la Gran Canaria prehispánica (siglos xi-xv)". *Tabona*, *20*: 9-32.

Navarro, J.F. & Martín, E. (1985-1987): "La prehistoria de la isla de La Palma (Canarias). Una propuesta para su interpretación". *Tabona*, *6*: 147-184.

Navarro, J. F. (1997): "Arqueología de las islas Canarias". *Espacio, Tiempo y Forma*, *10*, pp. 447-478.

Oliveira, H.R., Civáň, P., Morales, J., Rodríguez, A., Lister, D.L. & Jones, M.K. (2012): "Ancient DNA in archaeological wheat grains: preservation conditions and the study of pre-Hispanic agriculture on the island of Gran Canaria (Spain)". *Journal of Archaeological Science*, *39*(4): 828-835.

Onrubia, J., Rodríguez, A., Rodríguez, C. & Saenz, J. (2000): Ídolos canarios. Catálogo de terracotas prehispánicas de Gran Canaria. Ediciones El Museo Canario. Las Palmas de Gran Canaria.

Onrubia, J., Rodríguez, C.G. & Saenz, J. (2004): "El proyecto Cueva Pintada y la arqueología prehispánica de Gáldar (Gran Canaria). Balance y perspectiva de dos décadas de investigaciones". *Anuario de Estudios Atlánticos*, *50*: 705-730.

Parker, W., Yanes, Y., Mesa, E., Hernández, J.C., Pais, J., Soto, N. & Surge, D. (2020): "Shellfish exploitation in the western Canary Islands over the last two millennia", *Environmental Archaeology*, *25*(1): 14-36.

Philippe, A. & Vibet M.A. (2018): "Analysis of Archaeological Phases using the CRAN Package ArchaeoPhases". ffhal-01347895v5f.

Reimer, P.J., Austin, W.E., Bard, E., Bayliss, A., Blackwell, P.G., Ramsey, C.B. [...] & Grootes, P.M. (2020): "The IntCal20 Northern Hemisphere radiocarbon age calibration curve (0-55 cal kBP)". *Radiocarbon*, *62*(4): 725-757. DOI: https://doi.org/10.1017/RDC.2020.41.

Roberts, B.W. & Vander Linden, M. (2011): "Investigating archaeological cultures: material culture, variability, and transmission", in Roberts, B. & Vander Linden, M. (eds.) *Investigating Archaeological Cultures*. Springer Link. New York: 1-21.

Rodríguez, A., Morales, J., Del Pino, M.D., Naranjo, Y., Martín, E. & González, M.C. (2012): "Espacios de producción especializada, excedentes y estratificación social en la Gran Canaria pre-europea". *Tabona*, *19*: 101-123.

Rodríguez, C.G. (1996): *La pesca entre los Canarios, Guanches y Auaritas*. Ediciones Cabildo de Gran Canaria. Las Palmas de Gran Canaria.

Santana, J., Velasco, J. & Rodríguez, A. (2011): "Patrón cotidiano de actividad física y organización social del trabajo en la Gran Canaria prehispánica (siglos xi-xv): la aportación de los marcadores óseos de actividad física". *Tabona*, *19*: 125-163.

Secher, B., Fregel, R., Larruga, J.M., Cabrera, V.M., Endicott, P., Pestano, J.J. & González, A.M. (2014): "The history of the North African mitochondrial DNA haplogroup U6 gene flow into the African, Eurasian and American continents". *BMC evolutionary biology*, *14*(1), 109.

Shennan, S. & Sear, R. (2021): Archaeology, demography and life history theory together can help us explain past and present population patterns. *Phil. Trans. R. Soc. B*, 376: 2019071120190711. https://doi.org/10.1098/rstb.2019.0711.

Van Dommelen, P. (2014): "Moving on: archaeological perspectives on mobility and migration". *World Archaeology*, *46*:4, 477-483.

Velasco Vázquez, J. (1999): *Canarios. Economía y dieta de una sociedad prehistórica*. Ediciones del Cabildo de Gran Canaria. Las Palmas de Gran Canaria.

Velasco, J. (2018): *La isla de los canarios. Gentes, tiempos y lugares*. Ediciones del Cabildo de Gran Canaria. Las Palmas de Gran Canaria.

Velasco, J., Martín, E., Gonzalez, E., Arnay, M. & Betancor, A. (2001): "Contribución de la Bioantropología a la reconstrucción de los procesos productivos prehistóricos. Exostosis en el canal auditivo en la población prehispánica de Gran Canaria". *Trabajos de prehistoria*, *58*(1): 109-125.

Velasco, J., Alberto, V., Delgado, T., Moreno, M., Lecuyer, C. & Richardin, P. (2019): "Poblamiento, colonización y primera historia de Canarias: el C14 como paradigma". *Anuario de Estudios Atlánticos*, *66*: 066-001.

Vernet, J. (1971): "Textos árabes de viajes por el Atlántico". *Anuario de Estudios Atlánticos*, *17*: 401-427.

Walker, M.J.C., Bryant, C., Coope, G.R., Harkness, D.D., Lowe, J.J. & Scott, E.M. (2001): "Towards a radiocarbon chronology of the Late-Glacial: sample selection strategies". *Radiocarbon*, *43*(2B): 1007-1019.

Wimmer, A. (2013): *Ethnic boundary making: institutions, power, networks*. Oxford University Press. Oxford.