Quaternary International xxx (2015) 1–16

Contents lists available at ScienceDirect

Quaternary International

journal homepage: www.elsevier.com/locate/quaint

Pigeons and choughs, a usual resource for the Neanderthals in Gibraltar

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ARTICLE INFO

Article history:
Available online xxx

Keywords:
Middle Palaeolithic
Neanderthals
Taphonomy
Birds
Gorham's Cave
Gibraltar

ABSTRACT

An ecological perspective is essential to our understanding of variations in the faunal communities and their relationships with human groups, as well as the foraging strategies that hominids practised in Pleistocene environments. Using the Middle Palaeolithic avifauna, the ecological quality of the Strait of Gibraltar shows a complex scenario in which cliff-dwelling species represented one of the most important and abundant taxa. Pigeons (*Columba*) are a species that favour rocky habitats, typically nesting on cliff ledges and at the entrances to large caves, while corvids are forest birds and only a few Palaearctic species, including colonial ones such as choughs (*Pyrrhocorax*), can also breed on rocky outcrops or cliffs. At Gorham's Cave, Gibraltar, the Neanderthals exploited pigeons and choughs for a period of more than 40 ka, with the earliest evidence dating from at least 67 ka. We show that such exploitation was not occasional, having found repeated evidence of the practice in different layers within the cave. The Gibraltar sites seem to provide ideal conditions for broadening the spectrum of prey during MIS 3. The high diversity of avian species identified in the faunal assemblages could be related to the location of the caves, which enables the exploitation of coastal and rocky habitats. This fact seems to point to the unique circumstances and foraging opportunities at this particular locality, where the available prey and environmental conditions seem to be influencing, among other factors such as site functionality and socio-cultural variables, the Neanderthal diet.

1. Introduction

Birds are one of the most successful biological groups of the biosphere in terms of evolution. Their extensive history, which dates back to the Mesozoic period, has enabled them to develop a large number of forms and taxa (about 10,000 species currently listed according to Clements [2011] and Clements et al. [2014]) and maintain stable populations in virtually all climatic regions and environments on the planet. This makes them authentic biomarkers for research related to life sciences, not only because of the information they provide on the specific characteristics of ecosystems, but also because of their ecological relationships with other biological entities. Therefore, their potential as a source of ecological data has not gone unnoticed by many researchers who study the past, using birds to aid them in making more accurate palaeoclimatic and palaeoecological reconstructions (e.g., Finlayson et al., 2011; Stewart and Jacobi, 2015).

Recently, birds have become increasingly important in studies related to the behaviour of human groups in the Pleistocene, especially relating to hominids that preceded anatomically modern ones. In this latter case, their contribution is not solely limited to providing ecological details, but significantly contributes to the clarification of fundamental aspects of behaviour and subsistence. One of the best examples can be found in the ornamental use of feathers and talons of raptors by the Neanderthals of the Late Pleistocene (Peresani et al., 2011; Finlayson et al., 2012; Morin and Laroulandie, 2012; Romandini et al., 2014; Radovčić et al., 2015). However, the debate on the interaction between hominids and birds in this period goes beyond its possible symbolic capabilities

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http://dx.doi.org/10.1016/j.quaint.2015.10.040
1040-6182/

and should be considered within the complex world of the diversity of human behaviour and subsistence strategies.

According to some studies, the hominids of this period were sufficiently able to adapt to very different climates and to exploit the wide range of animal resources depending on the eco-geographical area (see examples in Gaudzinski, 2006; Stringer et al., 2008; Cochard et al., 2012; Yravedra et al., 2012; Yravedra and Cobo-Sánchez, 2015; Saccà, 2012; Blasco et al., 2013). Against this backdrop, birds seem to have always played a secondary role as a source of meat, which could be due to their characteristics (small and elusive prey –especially flying birds) and be linked directly to the tenets of the Optimal Foraging Theory ([OFT] e.g., Smith, 1983) – that is, the imbalance between the energy invested in capturing quick-flying animals and the energy return that they supply makes their regular catching unprofitable without the appropriate technology. The blanket application of OFT to fossil material is, however, highly questionable (Finlayson, 2004). Several observations made in present-day hunter–gatherer populations seem to show the ease with which some species can be captured with relatively simple methods if prior knowledge of their behavioural patterns is present (e.g., Lévi-Strauss et al., 1992; Juste et al., 1995; Emperaire, 2002; Negro et al., in this volume). These captures often coincide with 1) incubation periods of ground-nesting species, in which the cryptically-coloured females of some species remain fairly static for long periods (e.g., waterfowl such as pochards); 2) capturing hatched individuals of altricial species which usually remain in the nest for several weeks depending on the species; and 3) birds forming colonies of hundreds of individuals, as is the case with many seabirds. Many of these animals (or their eggs) may be obtained directly by hand without much difficulty. An example of this is the case of Cory's shearwaters (*Calonectris borealis*) in the Canary Islands, which were heavily hunted by the Guanches before the arrival of Europeans in the fifteenth century (Rando and Perera, 1994), or the case of fulmars (*Fulmarus glacialis*) in the Faroe Islands, whose chicks were taken by Inuits who climbed the cliffs to collect them (Mallory, 2006). Therefore, these cases (and other, similar ones) suggest some degree of profitability in the capture of some species depending on the time of year and the surrounding environment. We should also bear in mind that birds contain potentially useful non-edible products (Peresani et al., 2011; Finlayson et al., 2012; Morin and Laroulandie, 2012; Blasco et al., 2014; Romandini et al., 2014; Radovčić et al., 2015), and that factors such as age composition, sex, and the physical-motor limitations of some individuals of the group may also have influenced the inclusion of certain small animals in foraging strategies (e.g., Bird et al., 2009; Codding et al., 2010; Cochard et al., 2012; Morin, 2012). Perhaps, from this perspective, it would be possible to explain a growing body of data, but occasionally, birds are being considered within the faunal spectrum of some human groups in the European Middle Palaeolithic and previous periods (e.g., Roger, 2004; Gaudzinski-Windheuser and Niven, 2009; Hardy and Moncel, 2011; Morin and Laroulandie, 2012; Blasco et al., 2013, 2014; Gerbe et al., 2014; Fiore et al., in this volume).

Gibraltar is an ideal setting in which to study the possible existence of such strategies among Neanderthals. From an ecological point of view, the Rock is located in a prime area where the Mediterranean Sea to the east connects with the Atlantic Ocean to the west and the Iberian plate to the north comes into contact with the African plate to the south. This encourages the existence of a wide variety of avian species, among which there are many migratory birds that move between Africa and Europe on a regular basis, and resident birds, which are mainly marine birds that usually nest in the cliffs. The sites associated with Middle Palaeolithic in this locality tend to have an abundant number of recorded birds, which indicates that this ecological diversity has remained unchanged over time (Finlayson et al., in this volume). These species have natural habitats associated with crags and currently remain numerous in the area of Gibraltar, forming resident colonies and arriving to settle there at various times in the year. This study focuses on the most represented taxa in the Mousterian levels of the Gorham's Cave site, which are pigeons and corvids (especially choughs). Our intention here is to find out the extent of Neanderthal predation on these cliff-dwelling avian species in Gorham's Cave, in order to expand and complement the previously published data on pigeons (Blasco et al., 2014). Furthermore, the data obtained will be compared with the finds from level III –which is associated with anatomically modern humans (Finlayson et al., 2006), allowing us to contribute to the debate on the exploitation of birds in Middle Palaeolithic contexts.

2. The archaeological setting: Gorham's Cave

Gibraltar is located on the southern tip of the Iberian Peninsula (36°07′13″N 5°20′31″W), at the eastern end of the bay of the same name. The peninsula is part of the northern shore of the Strait of Gibraltar, and is adjacent to the Mediterranean Sea and the Atlantic Ocean (Fig. 1). Currently, the Rock of Gibraltar contains 213 listed caves, of which at least 26 feature archaeological remains. One such cave is Gorham's Cave, which was discovered by Captain A. Gorham of the *2nd Battalion Royal Munster Fusiliers* in 1907. The name

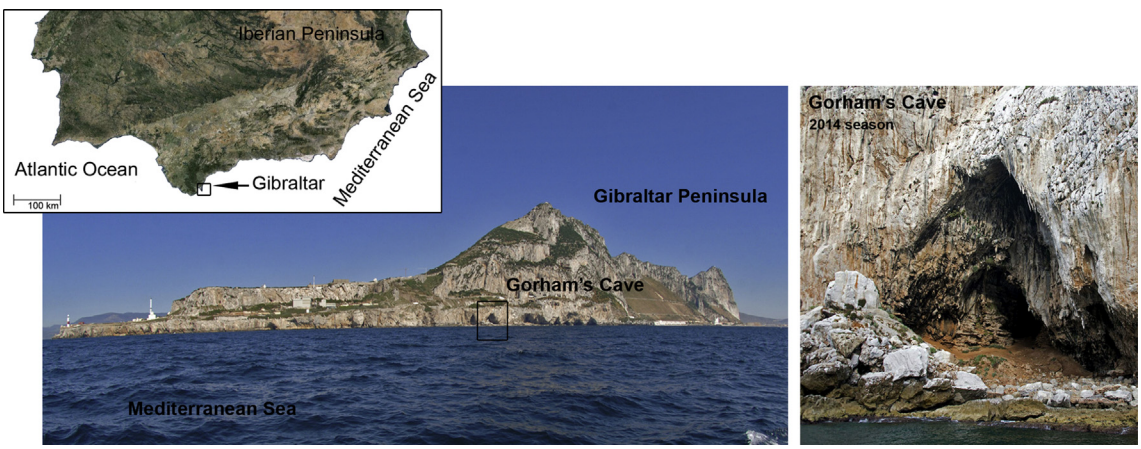

Fig. 1. Location of Gorham's Cave, Gibraltar, in the southern Iberian Peninsula.

Please cite this article in press as: Blasco, R., et al., Pigeons and choughs, a usual resource for the Neanderthals in Gibraltar, Quaternary International (2015), http://dx.doi.org/10.1016/j.quaint.2015.10.040