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THE DAWN OF PLEISTOCENE VERTEBRATE PALEONTOLOGY IN PORTUGAL

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ABSTRACT

The Pleistocene vertebrate paleontology in Portugal began with the works of the 2nd Geological Commission, which started operating in 1857. During the second half of the XIX century, Portugal was in the frontline of this area, thanks to the works of the pioneers Carlos Ribeiro and Nery Delgado that crystallized in the “IX International Congress of Anthropology and Prehistoric Archaeology” held in Lisbon in 1880. After a phase of stagnation; between 1950 and 1985 the works of Octávio da Veiga Ferreira and mostly Georges Zbyszewski restarted the interest in the field. Between 1985 and 2000, supervised by Miguel Telles Antunes several scientists were trained, one of them (João Luis Cardoso) marked a milestone for the area in 1993 with his PhD thesis, a key reference for the study of big Pleistocene mammals from Portugal. During the XXI century the works of several scientists continued to add knowledge to the area.

Keywords: History of Science, Iberian Peninsula, Nery Delgado, Georges Zbyszewski, Miguel Telles Antunes.

1. INTRODUCTION

Most of the works on the History of Quaternary paleontology in Portugal are strongly focused on one scientist’s career and the most general ones are several decades old (Cardoso, 1997). On this work, we provide a summary of the History of Pleistocene vertebrate paleontology in Portugal. This chronological overview will assist researchers in understanding its development and integrating the evolution of this discipline with the broader History of paleontology at Iberian and European levels.

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The study of Quaternary fossil faunal assemblages, particularly in their early years, was closely linked to archaeological research. In the mid-19th century, two significant factors drove the interest in Pleistocene paleontology: Charles Darwin's publication of "The Origin of Species" and the rise of nationalist sentiment, which prompted European scientists to compete with each other. As we will see, Portugal was not exempt from this European trend (Cardoso, 2015a).

2. CHRONOLOGY

2.1. The first studies (1857-1880)

In Portugal, the scientific study of the Quaternary started in 1857 with the 2nd Geological Commission of Portugal, especially important was the leadership of Carlos Ribeiro (1813-1882) (Cardoso, 2015a).

Carlos Ribeiro was a military engineer who pioneered prehistoric archaeology and Pleistocene paleontology in Portugal (Daveau, 2000). He led the Geological Commission alongside Pereira da Costa from 1857 until his death (Daveau, 2000). Ribeiro provided an accurate description of Quaternary deposits (Cardoso, 2015a). He conducted fieldwork in the late 1870s, possibly to discover new materials to present at the IX International Congress of Anthropology and Prehistoric Archaeology, held in Lisbon in September 1880. This event marked the culmination of 25 years of his work (Cardoso, 2013).

Also a significant figure in the study of the Quaternary in Portugal was Joaquim Felipe Nery Delgado (1835-1908). In 1857, he became an adjunct to the Director of the Geological Commission of Portugal. Later, he led the commission since the death of Carlos Ribeiro in 1884 until his own death in 1908 (Cardoso, 2015a). During the 1880s he excavated Furninha cave, which was a crucial excavation in the History of the Portuguese Pleistocene paleontology. The excavation methodology employed was advanced for its time. Each item was identified at the layer level and coordinated in a grid system; making Nery Delgado a pioneer in the 3D location of archeological artifacts (Cardoso, 2015a).

Both Delgado and Ribeiro were respected scholars who corresponded with other scientists from abroad (Cardoso & Avila de Melo, 2001). At the time, the quality of their work put Portugal in the frontline of this type of research in Europe (Cardoso, 2015a).

2.2. The turn of the century (1880-1911)

During the turn of the century Nery Delgado focused more on the study of the Paleozoic of Portugal. Paul Choffat, a swiss geologist, who inherited the lead of the Geological Services after Nery Delgado uncovered some hippopotamus and proboscidean dental remains in the calcareous tuffs of Condeixa in 1893 (Cardoso, 1993b). Around the same time, the French sci-

entist Edouard Harlé, one of the top experts in the Pleistocene research at that time, studied Portuguese material from sites like Furninha. He published a work that became a major reference for the study of Pleistocene paleontology in Portugal for the next 80 years (Cardoso, 1993b).

2.3. The stagnation period (1911-1950)

Following the outburst of the early 20th century, the study of the Pleistocene fauna in Portugal entered a phase of stagnation. Paul Choffat noted that: *“By reasons that we should not comment, although that our faculties are filled with professors of great erudition, there are few of them that are dedicated to the progress of observation sciences”* (Daveau, 2000).

2.4. The Renaissance of Pleistocene paleontology in Portugal (1950-1985)

Octávio da Veiga Ferreira (1917-1997) was a mine engineer who joined the Geological Services in 1950. He became a prominent figure in Iberian archaeology and within paleontology, he authored 32 papers, four of them focusing on Pleistocene vertebrates. One of his most notable contributions is his study of Pleistocene rhinoceroses from Portugal (Cardoso, 2008 b).

Georges Zbyszewski (1909-1999) was the direct superior of Octávio da Veiga Ferreira. He was born in the Russian Empire, later becoming a French national. He visited Portugal for the first time in 1935 for his PhD thesis on tectonic movements. In 1940 he joined the Geological Services and spent 40 years researching a wide array of topics. He wrote approximately 300 scientific publications, including over 100 publications on Quaternary lithic industries and fauna which are crucial to our understanding of the area. Through the years “Zby” as he was affectionately known by friends and family (Cardoso, 2000) compiled information about the Quaternary of Portugal, which he published in the work “Le Quaternaire du Portugal”.

In 1990, they synthesized their many years of study in this matter with the new works of the next generation in the decade of 1980 (Zbyszewski & Veiga Ferreira, 1990).

2.5. The modern era (1985-2024)

Miguel Telles Antunes (1937) is a highly prolific figure in the History of the Portuguese paleontology. He began his career at the University of Lisbon in 1960 after earning his PhD in Geology. In 1974 he relocated to the Universidade NOVA de Lisboa. He has authored more than 450 scientific articles and supervised 9 doctoral theses, on various topics. In the 1980s, he produced several works on Pleistocene faunas from Portugal, which are crucial for our understanding of several important sites (Cardoso, 1993a). Antunes' contribution to the study of Pleistocene faunas remains significant to this day.

During the 1990s, João Luis Cardoso (1956), one of Antunes' students, emerged as a key researcher in the History of Pleistocene vertebrate paleontology in Portugal during the 1990s. He documented the occurrence of over 7 Pleistocene mammal taxa for the first time, and named a new subspecies of Pleistocene horse, *Equus ferus antunesi*. His doctoral thesis published in 1993 "*Contribuição para o conhecimento dos grandes mamíferos do Plistocénico Superior de Portugal*" is a book of more than 500 pages. To this date, it remains the most comprehensive publication on Portugal's Pleistocene megafauna, encompassing remains of 26 taxa across 28 localities nationwide (Cardoso, 1993a). During the next decades João Luis Cardoso continued to develop this research line, reviewing material from his thesis.

Other researchers have also made significant contributions to the advance of the field; either by focusing on other vertebrate groups or centering into the process of formation of entire sites. For example, Silvério Figueiredo focused on avifauna (Figueiredo, 2010), while archaeologist João Zilhão uncovered numerous faunal remains, with focus on the Almonda karstic system, while focusing on an archaeological perspective (Zilhão *et al.*, 2021).

3. DISCUSSION AND CONCLUSIONS

As demonstrated by the excavations of Nery Delgado in the XIX century to the more recent work at the Almonda karstic system, the Pleistocene vertebrate paleontology in Portugal has developed in tandem with prehistoric archeology and paleoanthropology. Future discoveries are expected to result from the continued collaboration between archaeologists and paleontologists, emphasizing the study of faunal remains not just with an archeozoological perspective but also delving into the paleobiology and paleoecology of Pleistocene fossil vertebrates. In the coming years, emphasis should be placed on areas with significant development potential in Portugal, particularly in the fields of molecular paleontology or microvertebrates (López-García *et al.*, 2022). However, it is important not to neglect the study of faunal remains in a geological context as said type of sites can be extremely useful for the reconstruction of the paleobiodiversity and past climate although no human activity is recorded on them (Cardoso, 1993a).

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