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Portugal

The first Portuguese contacts with the Stone Age came through the navigators who reached the coasts of Africa, South America, and Asia in the fifteenth and sixteenth centuries. By A.D. 1500 these contacts had already resulted in the production of the first reports on such peoples as the Guanche of the Canary Islands, the San (Bushmen) of Southern Africa, and the Indians



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of BRAZIL, including accurate descriptions of polished stone axes and other tools. However, these descriptions failed to produce any impact on sixteenth- and seventeenth-century humanists and scholars who studied Roman and pre-Roman antiquities.

By the end of the eighteenth century archaeology had become an established discipline. The first scientific excavations in Portugal were undertaken at the time by Friar Manuel do Cenáculo, in the Iron Age settlement of Cola (Alentejo). Several descriptions and inventories were published of dolmens, which were correctly interpreted as pre-Roman monuments but generally thought to be altars, not burial chambers. And, as elsewhere in Europe, it was not until the mid-1800s that the concept of the remote antiquity of humanity was finally accepted, mainly as a result of developments in the geological sciences.

Beginning in 1848 several organizations were created to survey the geology of the country, and prominent members of their staffs, such as Carlos Ribeiro and Joaquim Filipe Nery Delgado, became interested in the problem of human origins. Ribeiro's work on the colith problem and the possible existence of people in Europe in the Tertiary era is well known. It led scholars of the time to agree to convene the 1880 session of the Congrès International d'Anthropologie et d'Archéologie Préhistoriques in Lisbon in order to be able to inspect his sites and finds.

Delgado's work is not as well known but is of greater general methodological relevance. He was appointed to the Geological Survey in August 1857 at the age of twenty-two, but his first independent work was the geological mapping of the Peniche area. This project eventually led him to the excavation of the Casa da Moura cave site, which he began on January 19, 1865. The results obtained after initial testing led to the almost immediate publication of an extensive bilingual (Portuguese and French) monograph whose title, *The Existence of Man on Our Soil in Very Remote Times Proved by the Study of Caves*, leaves no doubt as to the research design that drove him in this early stage of his scientific career.

At that time the evidence from caves was re-

garded as untrustworthy. It was the fluvial deposits of the Somme Valley that played a key role in the establishment of the remote antiquity of humans. They, in turn, were used to validate some of the associations between artifacts and extinct fauna found in various caves of Germany, England, FRANCE, and BELGIUM. Several objections had been raised against such evidence. Some argued that deposits of very different ages could easily be intermixed during the flooding to which caves are often submitted; others contended that the use of caves by people to bury their dead may have caused the occurrence of human bone in apparent association with extinct faunas; and still others suggested that although the deposits might have been originally undisturbed, mixing could arise from careless investigation.

Since his work was wholly based on the exploration of caves, Delgado had to deal with these objections, which probably explains the most remarkable characteristic of his monograph: the fact that it represents an integrated geo-archaeological approach to site-formation processes. Moreover, the great detail with which he recorded stratigraphic observations (the correctness and precision of which have since been demonstrated by reexcavation of the residual deposits at Casa da Moura) was intended to avoid any objections that his conclusions were based on careless excavation.

His most important find was a carefully described and measured human skull and mandible, which were enveloped in a matrix of concreted red sands just like the ones that composed the in situ lower deposit of the site. This cranial material was clearly of Pleistocene age and should therefore be counted, alongside better-known fossils such as the Engis adult skull and the Red Lady of Paviland, as one of those early findings of Upper Paleolithic human fossil remains that took place before the 1868 discovery of the Cro-Magnon burials. However, unlike the material at Paviland and Engis, the Casa da Moura material's age was correctly recognized and established by the discoverer.

Later revision of the Paleolithic artifacts from the cave identified Gravettian and Solutrean components. At that time, however, in-

vestigations in France had only just begun to address the question of the periodization of Quaternary human artifacts. Both ÉDOUARD LARTET's chronology, based on fauna, and GABRIEL DE MORTILLET's, based on lithic types, were presented to the first meeting of the Congrès International d'Anthropologie et d'Archéologie Préhistoriques, which was held in Paris in 1867, the year in which Delgado published his results. In this theoretical context, therefore, the only question that made sense was whether the lower deposit (and the skull derived from it), now known to date to the Upper Paleolithic, could be considered of Quaternary age.

The criteria used at the time to assess such an antiquity were twofold: paleontological, or the secure association of human remains or artifacts with extinct faunas, and geological, or secure association with deposits indicative of an earth not yet "modern in form"—that is, association with the "extensive and general deposits of loam and gravel" for which WILLIAM BUCKLAND coined the term *diluvium*. Later, after the abandonment of the equation between such deposits and the great deluge, loam and gravel deposits also became known as *drift*. Drift was unequivocally recognized as a distinctive stratigraphic unit, regardless of the debate that animated mid-nineteenth-century geology over whether it owed its genesis to flooding or glaciation. However, this unit was generally considered to be associated with the extinct faunas; hence "anterior to the [earth's] surface assuming its present form" then meant both modification of the earth's topography and faunal extinctions.

Since Delgado was unable to identify any representatives of clearly extinct species among the animal bones recovered in the lower deposit at Casa da Moura, he was obliged to resort mainly to geological arguments in order to try to establish its chronology. Noting that the matrix of this deposit was very similar to the diluvial sands that covered the surrounding plateau and filled its karstic fissures, he thought that the sediments in Casa da Moura had been derived from these surficial deposits and were therefore more recent. Yet they were older than the last geomorphological changes that had affected the area, since they contained no pottery. The fact

that the absence of pottery could be used as an indicator of an earth "not yet modern in form" was demonstrated by the finding of shards in the lacustrine tuffs into which one of the small rivers of the plateau had cut its bed.

To complete his geological reasoning, Delgado also resorted to comparative analysis of the archaeological materials found in the lower deposit. In this context he noted that the primitive character of the artifacts and the absence of pottery indicated that they should predate the Danish *kjokkenmoddings* (kitchen middens). At the time, these were thought to be of late-Quaternary age. The resemblance of some of the flaked flints to similar materials reported by Carlos Ribeiro from diluvial deposits of the Tagus Valley further reinforced this argument. But Delgado also compared a rhomboidal bone fragment thought to be intentionally pointed, with the rhomboidal bone sagaie points found by Lartet at Aurignac. Although this last parallel is certainly ill founded, Delgado's suggestions proved to be generally correct. The lower deposit of Casa da Moura does belong to the same (Upper Paleolithic) period as Aurignac and does predate the Epipaleolithic shell middens.

The fact that geological and archaeological reasonings could be combined to produce chronological assessments was clearly dependent on the assumption of the integrity of the in situ lower deposit. Unless the integrity of these red sands could be demonstrated, the statement that the artifacts and the sediments that contained them were contemporary and undisturbed by subsequent events could come under attack on the grounds of Buckland's theories. Therefore, Delgado had to address the question of how the red sands were laid down. The discussion of this problem, embedded in an exposition of current knowledge on how caves were themselves formed, is a major and most interesting section of the monograph.

He determined that the lower deposit in Casa da Moura had not been washed in by floodwaters because the artifacts, bones, and charcoal it contained were not present in similar "diluvial" deposits found outside the cave, from which the interior deposits were presumably derived. Moreover, such a flooding process

could not have produced the sorting of the different parts of the skeletons of the animals whose remains were found in the lower deposit. Other possible agents of accumulation, such as carnivores, could not account for the presence of charcoal and flaked flint in the deposit.

Given these factors, Delgado concluded that there was no known natural cause that could account for the mixed accumulation inside the cave of sands, *éboulis*, bones, and artifacts. He therefore developed his own alternative explanation. He viewed the formation of the deposit as a gradual and slow process, not as the result of one or several catastrophic flooding events. Otherwise, he thought, it would be impossible to explain either the presence of bone at all depths or the vertical and horizontal discontinuities in the concretion of the sands at all levels. He therefore thought that the remains of human dwellings suggested by the association of the animal bones, charcoal, and artifacts had gradually been incorporated into the deposit as it built up. The provenience of the sandy matrix was thought to be the diluvial deposits outside the cave. Since no natural process was identified by geological authorities at the time as a possible cause for such a gradual filling of a cave by external sediments, Delgado attributed this process to human action: the sands were thrown in to elevate the floor of the cave and thus facilitate human access through its vertical entrance. Although this explanation is certainly wrong in terms of the specific agency invoked, it is certainly much closer to modern ideas regarding the nature of the process described than the theories current in his time.

Another remarkable feature of Delgado's monograph is the attention given to the discussion of taphonomic (site formation) issues. Taphonomic observations were instrumental in rejecting the action of flooding waters as an explanation for the origin of the lower deposit, and they also played an important role in sustaining Delgado's evaluation of its faunal content. For instance, rabbits and birds were represented mainly by mandibles (jawbones) and broken long bones. There were far fewer vertebrae and pelvises than could be expected given the number of individuals represented by the

mandibles, and ribs were almost completely absent. The minimum number of rabbits, based on the counting of mandibles, was over 1,000. As for the larger mammals, Delgado observed that spongy bones were generally lacking and that the bones richest in marrow were the most fractured. But unlike the herbivore bones, the carnivore bones were generally intact and did not show any signs of having been transported by water, which was another argument against the flooding hypothesis as an explanation for the deposit's origin. Carnivores were also mostly represented by mandibles, and the majority of the animals found were young individuals. Delgado interpreted these observations as confirming his conclusion that humans were the agents responsible for the bone accumulation. At that time there was no known natural cause that could account for the apparent sorting of the different skeletal parts and the differential preservation of herbivore and carnivore bones.

With the benefit of hindsight, we now know that Delgado's conclusions are not completely correct. The variety of large, medium, and small carnivores (especially wolves) identified from the deposits suggests that the cave was also a carnivore lair. The important point here, however, is that in order to substantiate his behavioral interpretation, Delgado took what would now be considered the correct scientific approach. He tried to derive from the characteristics of the bone assemblage itself objective criteria that might lead to the identification of the agent or agents responsible for its deposition and modification. What was lacking at the time was a set of actualistic reference studies that might provide the patterns against which it would be possible to validate such identifications. This and Delgado's predisposition to favor human action as the explanation for the site's characteristics (an understandable inclination, given the research design that drove him) probably biased his diagnosis.

Delgado reported on the Neolithic human bone remains from the cave's upper deposit with a similar taphonomic approach. Their great fragmentation, the sorting of the different parts of the skeleton, and the fact that some bore what he thought to be marks of cutting by tools led

him to conclude that the action of carnivores alone could not explain this set of characteristics and that they were evidence of cannibalism. In his era this behavior was commonly attributed to the "Celtic" peoples who inhabited Europe in pre-Roman times, as Delgado pointed out by extensively quoting such recognized authorities as JACQUES BOUCHER DE PERTHES, Laying, or Huxley and Spring, whose excavations at Chauvaux had led to similar conclusions.

He would develop this argument further based on the results of his later excavations at the Middle Paleolithic and Neolithic cave site of Gruta da Furninha, which he reported to the 1880 Lisbon conference. Applying a taphonomic approach to the issue of cannibalism, he completely excavated the deposit, carefully sieving all the sediments and taking note of the spatial distribution of the bones inside the cave. This enabled him to present quantified observations and to substantiate his arguments on differential body part representation with a statistical table of the counts for each skeletal part from each of the loci discriminated during the excavation. These showed, for instance, not only that several bones were not represented in the proportions they have in the human skeleton but also that such differential preservation was true for the distal and proximal parts of the same bone. Delgado conceded that there could be sample bias in the case of the smaller skeletal elements and that the low representation of spongy bones could be due to their greater perishability. However, he thought the other features of the assemblage, together with the breaks, burns, and supposed cut marks on the bones, could only be explained by human action. He therefore concluded that the deposit comprised the remains of cannibal meals.

Although this conclusion was accepted by some of the authorities present at the congress and subsequently proven true through chemical analyses showing that the bones had indeed been burned, the majority of the committee appointed by the congress to settle the issue did not agree with Delgado. Among his opponents were de Mortillet and EMILE CARTAILHAC. The latter rightly objected that the evidence instead suggested that people had been buried in the

cave, not eaten there. Similar phenomena had been observed in dolmen burials and could be easily accounted for by the action of carnivores or the practice of successive burial, which would disturb and damage the bones from previous interments. However, the point to note once more is that, right or wrong, Delgado had pushed observation beyond the practices current in his time. This was recognized by the committee itself, which recorded in its proceedings a unanimous appreciation of the rigorous methodology of his work and of the statistical treatment of his data that it allowed, in an attempt to establish specific characteristics of bone assemblages that could be correlated with specific animal or human behaviors. Coupled with experimentation and extended to ethnoarchaeological contexts, this is what archaeozoologists and taphonomists still do today. Delgado therefore deserves to be more widely recognized not only as one of the earliest excavators of Upper Paleolithic sites and first finders of Upper Paleolithic human fossils but also as a pioneer in the geo-archaeological study of cave deposits and in those related fields that play such an important part in contemporary PALEOLITHIC ARCHAEOLOGY.

The tradition begun by Ribeiro and Delgado of doing Paleolithic research within the framework of the normal mapping activities of the Geological Survey was not continued until the middle of the twentieth century. The onset of World War II took HENRI BREUIL to Portugal, where, accompanied by Zbyszewski, a geologist of Polish origin who would settle in the country, he undertook a systematic survey of the Quaternary deposits along the coast and the main river valleys. As a result they produced a detailed cultural stratigraphic scheme of the Portuguese Paleolithic.

This scheme contained several weaknesses. On the one hand it was based on a strictly altimetric interpretation of both the raised beaches and the river terraces. On the other hand it was largely based on the type fossil system of interpreting certain kinds of artifacts as representative of whole industries. Furthermore, almost all of the sites studied consisted of surface scatters or mixed colluvial deposits in which differ-

ent assemblages were distinguished, dependent upon the amount of patina the artifacts had developed. Artifacts with similar patina were thought to have been deposited at the same time and were sorted as kinds of stratigraphic units of a physicochemical nature. The assemblages thus distinguished were organized in a chronological sequence, the oldest being those presenting the most-developed surface weathering. In the decades that followed, the few new accidental finds that were made were accommodated to this scheme, whose methodological foundations were not questioned until quite recently. As a result, Quaternary geology and Paleolithic archaeology in Portugal did not participate in the enormous progress that was made elsewhere in Europe in the postwar period.

Breuil and Zbyszewski's scheme dealt mainly with the Lower and Middle Paleolithic. The Upper Paleolithic was largely ignored because of the dearth and poverty of cave assemblages, including the new sites excavated and studied by Jean Roche and O. da Veiga Ferreira in the 1950s and 1960s, such as Gruta das Salemas. Roche attributed this poverty to the fact that in the coastal areas of Portugal, the climate was temperate and humid during the Upper Paleolithic. This concept has been proven false by recent paleoenvironmental research, but it led Roche to believe that people lived mainly in the open and would only have used caves in exceptional circumstances. He may have been influenced by the fact that Manuel Heleno, then director of the National Museum of Archaeology, had discovered and excavated in the late 1930s and the early 1950s numerous open-air Upper Paleolithic sites in the Rio Maior and Torres Vedras areas.

However, these discoveries were never published, except via very short notices. Heleno was not an archaeologist in the modern sense of the word but a historian who wanted to establish the background of the "Portuguese nation." Therefore, he was mainly interested in establishing, using the equation

type fossil = Paleolithic industry = Paleolithic people
that such a background was European, not African. This question had become relevant be-

cause of University of Oporto anthropologist A. Mendes Corrêa's suggestion of a common background between the peoples of the Capsian and those of the Muge shell middens, where hundreds of Mesolithic burials had been excavated from the mid-nineteenth century onward. Corrêa's concept of a *Homo afer taganus* as the origin of the Portuguese also had significant political implications during World War II, given the possibility of a German invasion and occupation of Iberia. In this context the identification of supposedly diagnostic lithic types among the assemblages recovered allowed Heleno to state that Aurignacian, Gravettian, Solutrean, and Magdalenian were indeed all represented in the country. This was enough to establish the European affiliation of the Upper Paleolithic of Portugal, as he had hoped, making it unnecessary, from the point of view of his research design, to publish extensively on the sites he had excavated.

Paleolithic research in Portugal gained a new momentum only after 1975. The major political and economic changes experienced by the country since that time have helped to transform what was until then a field largely dominated by amateurs and a few university professors into an almost exclusively professional activity, most of whose practitioners are now in private consulting and in the heritage departments of the central and municipal administrations. With regard to the Paleolithic, this progress was mostly the result of the development of the careers of professionals who originally came together as a group of university students—the Grupo para o Estudo do Paleolítico Português (GEPP)—and of the establishment of collaborative projects with different French and U.S. colleagues. The work of a new generation fully integrated with the international mainstream of the discipline rapidly bore fruit. Among the recent and most spectacular products of this collaboration were, in 1994, the discovery of the Côa Valley complex of open-air Paleolithic rock-art and habitation sites, included in the World Heritage List in 1998, and the pivotal role played by Portuguese sites (especially the Lagar Velho child burial) in the debates about Neanderthal extinction and modern human origins in Europe.

In spite of the fact that, currently, these Paleolithic finds have become Portugal's internationally best-known archaeological sites, most archaeology practiced in the country since 1800 has dealt principally with the later prehistoric periods and the era of Roman rule. Extensive excavations were carried out beginning in the mid-nineteenth century in the numerous *castros* (Iron Age hill-forts) of northern Portugal, the pioneer work of Martins Sarmento in the *Citânia de Briteiros* being of paramount importance in this regard. Other approaches tried to bring together archaeology, ethnography, and linguistics to procure a better understanding of the pre-Roman peoples of Portugal, and it was under the influence of such a program that the National Museum of Archaeology was founded, in the late 1800s, by J. Leite de Vasconcelos. Several fortified sites from the Copper and Bronze Ages were also extensively excavated in the twentieth century in central and southern Portugal. A good example is the site of Zambujal, first excavated by H. Schubart in the 1960s, which also well illustrates the role played by German archaeologists in this research (a delegation of the DEUTSCHES ARCHÄOLOGISCHES INSTITUT existed in Lisbon for some thirty years, until 1998), in the wake of the megalithic inventories made by Georg and Vera Leisner in war and postwar times. The most important methodological innovation of the postwar period, however, the introduction of SIR MORTIMER WHEELER's grid method, is due to E. Cunha Serão, an active amateur who eventually would become the president of the Associação dos Arqueólogos Portugueses, founded in 1863.

Given the richness of the empirical record, including some of the largest dolmens known (such as the Anta Grande do Zambujeiro), megalithic research has been pursued by many Portuguese archaeologists and has become a popular research topic since 1970. As a result and although the clarification of chronological issues is still a major concern, attention has progressively shifted toward issues of spatial and landscape archaeology. Attempts at integrating the study of the funerary and other ritual monuments (menhirs and cromlechs) with the survey for and investigation of the contemporary

settlement sites are commonplace in current Neolithic research. Indigenist views of the development of megalithic phenomenon as part of the increasing complexity of the first agricultural societies of Europe have also been completely removed from the debate. These comprised interpretations, common until the 1970s, that related it to oriental influences. But the issue of colonization is far from being settled, especially with regard to the large Copper Age hill-forts that spread through central and southern Portugal in the third millennium B.C.

Until quite recently in Portuguese archaeology, however, most efforts and resources were dedicated to the study of Roman antiquities. The most consistent archaeological project throughout the twentieth century was the excavation of the city of Conimbriga, and this was largely due to the commitment of the Institute of Archaeology of the University of Coimbra. Other sites, major by Portuguese standards but of relatively minor importance by international standards, have also been investigated, albeit to a lesser extent. Tróia, one of the largest industrial complexes connected to the processing of fish in the Roman world, is still largely unknown after 150 years of very discontinuous research. Since 1980 the development of salvage archaeology in urban environments has led to a major broadening of our knowledge of the Roman cities of Portugal, and this is especially the case with Braga (*Bracara Augusta*), but most of this work remains unpublished. Largely as a result of the same phenomenon, medieval archaeology and especially the archaeology of the period of Islamic rule are currently undergoing an explosion in terms of finds and resources devoted to their study. The same is true with underwater archaeology, and the fact that preliminary surveys have become mandatory in harbor works and humid areas has led to significant discoveries. These comprise, in continental Portugal as well as in the Azores, fifteenth-century vessels and their cargo; as a result, for the first time, the physical documentation of the construction of the caravels that pioneered European overseas expansion has been possible.

Several universities offer training in archaeology within the framework of their depart-



House of the Fountains at Conimbriga (Archivo Iconografico, S.A./CORBIS).

ments of history, and the degree given at the end of study generally combines history and archaeology. Integration with geography and the natural sciences is still very weak, but recent efforts by the central administration are designed to change this situation through the creation of

independent research units specifically devoted to the study of archaeology as human ecology. The growing number of professionals, however, is still insufficient to meet the market demand for salvage and contract work. Largely as a result of this, the main weakness of Portuguese

archaeology these days is that scientific publications are seriously lagging behind. Yet the fact that the pressing needs of dealing with the material record on the ground fully occupy most professionals also has a positive side effect. Postprocessualism has not really had an impact, and, theoretically, traditional cultural-historical and processual approaches continue to dominate a field in which the main concern for many years to come should continue to be pursuing a thorough, high-quality documentation of a rapidly disappearing empirical record.

João Zilhão

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