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CHAPTER FOUR

CABEÇO DA ARRUDA IN THE 1860S

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Abstract

The identification of osteological evidence from the earliest excavation of Cabeço da Arruda in 1864, still preserved in two Lisbon museums, provides the occasion for a reminder of the importance of the burials in the history of European anthropology. The material is briefly summarized, together with a discussion on the location of the finds. An AMS analysis of a charcoal sample contained within a skull provides a date consonant with other evidence.

Introduction: the First Publication

Cabeço da Arruda is a Portuguese Mesolithic site on the northern bank of the Muge River consisting of midden deposits formed on a remnant of terrace sands overlooking the marshy valley. Following its discovery in 1863 and its excavation in 1864 by Carlos Ribeiro (1867: 715), da Costa (1865) published the first description, noting the excavation of at least 45 human skeletons (Pereira da Costa 1865: 13), mostly in one level and all in one area. In order to situate these burials, the published cross-section and profile must be scaled (Pereira da Costa 1865: 6, Figs. 1 & 2). Our scaling (Fig. 4.1 and 4.2) derived from statements that the mound was 40 x 95 m, rising 5 m above the sand (da Costa 1865: 4), the burials mostly occurring in a 70 cm thick level. The scaling is only approximate because the mound cross-section was idealized. Excavations could not have reached the high point of the mound. Ribeiro (1884: 282) said the mound rose 7 m above the sands, based on the 1880 excavations where 5 m of midden deposits were exposed closer to the high point: the 1880 excavation face was still ~2 m below that point (Jackes et al., this volume). Furthermore, the upper part of his Fig. 2 image (Fig. 4.2 here) appears to represent not the actual excavation profile, but an artistic rendering of the topography of the mound above that cut. Since the angled cross-section was rendered as a profile image at 90 degrees, ~10% change in height might be expected.

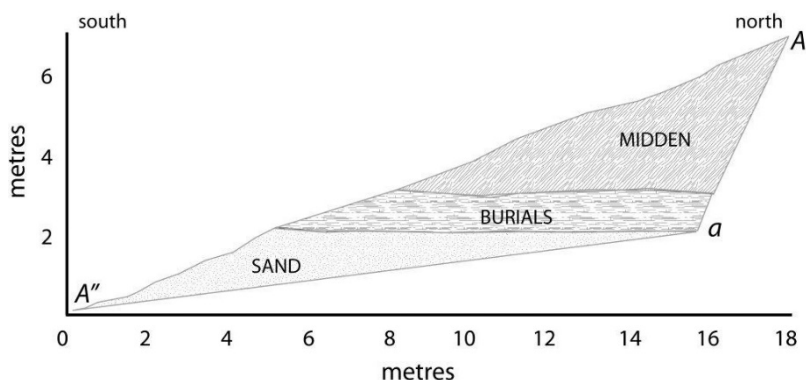


Fig. 4.1. Reconstructed cross-section of the 1864 excavation from da Costa (1865, Fig. 1). The italic letters correspond to those used on the original.

Pereira da Costa's section (1865: 6, Fig. 1) imagines the original, pre-erosion, mound edge at point A'. Rather than envisioning the mound prior to erosion, our Figure 1 begins at A'', showing a reconstruction of the excavation based on the 1865 section through the site, from roughly SW to NE, corresponding to da Costa's points A'' and B. The section begins at an erosional edge stated to be 10 m in from a drainage ditch: our scaling is such that da Costa's A' to A'' equals 10 m. Because the excavation floor and profile were both illustrated as angled, we estimate that burials were exposed in a limited portion of the excavation (Fig. 4.1), even though the trench cut into the mound ~18 m. All burials were in a restricted layer which overlay 2 m of the sterile terrace sand that was exposed at the edge, covered with eroded archaeological materials.

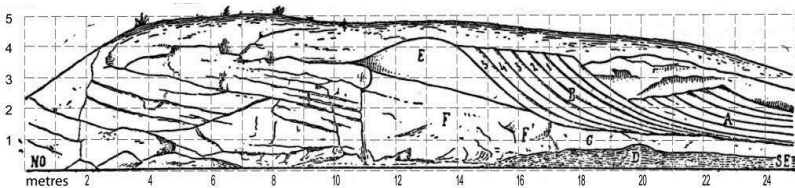


Fig. 4.2. Scale suggested for the “profile” of the 1864 excavation, facing along the marsh, from da Costa (1865, Fig. 2).

The reported 95 m length of the mound accords with Veiga Ferreira (Cardoso and Rolão 1999/2000: 225, Fig. 56). We have scaled Pereira da Costa's profile at 25 m length (Fig. 4.2) on the basis that the general horizontal of Layer D is specified as 70 cm high, leading to the profile having a height of 5 m, with the actual midden deposits just over 4 m high. This agrees with evidence that the excavation did not extend far into the mound with the profile not extending down to the sand. Pereira da Costa (1865: 4) stated that the excavation extended along the southwest face of the mound. Our 25 m length and the location of the profile fit well with changes in the orientation of the eroded scarp edge, shown in maps from 1880 and the 1960s (Jackes and Cunha, 2015). There is also concordance with an area of previous excavation noted on a 1930 map (Jackes et al., this volume; see also Jackes and Cunha, 2015).

Since Pereira da Costa stated that burials were found in Layer D, with very few in F', the skeletons were within a restricted area of ~10 m in length on the basis of our scaling. The description of the burials as above the sands, and underlying a layer (C) containing fire-cracked pebbles,

broken mammal bones and charcoal, concurs with the 1880 sources. Skulls were crushed, with knees folded on the thorax in the one fully described burial, typical again of skeletons excavated in 1880. Individuals were of diverse ages.

We can never be sure how many individuals were found at Arruda in 1864, but it seems likely that at least 45 were excavated. A clustering of burials was not unusual. While “mass burials” were found both at Moita and Arruda in 1880 (Jackes and Alvim 2006; Jackes et al. this volume), these included only ~16 and nine individuals, found in areas of only ~2 m x 4 m and 1 m x 2 m, respectively. In fact, Pereira da Costa (1865: 13) quotes the excavators as having said that the skeletons were in a restricted space with heads to the northwest, reminiscent of the Moita mass burial where skeletons were roughly oriented in the same direction. However, the burial description suggests the varied dispositions of cadavers, unlike Moita. Da Costa noted dispersed bone, indicating purposeful burial over a lengthy period, with the disturbance of earlier by later interments (Pereira da Costa 1865: 16): he also noted that variations in damage were probably caused by the weight of the sediment (Pereira da Costa 1865: 14).

We do not know whether da Costa actually saw most of the bones, but his sophisticated discussion of soft tissue decomposition resulting in voids into which bones could fall, with articulations flattening or undergoing torsion (Pereira da Costa 1865: 19) indicates that he saw some material en bloc, especially as he also discussed the development of calcareous breccia. With Ribeiro, he was one of the two directors of the Geological Survey of Portugal in the early 1860s, but Ribeiro had been in charge of the excavation: since this was unacknowledged it perhaps led to discord between the two men (Antunes 1986: 795). Ribeiro was a military man and civil servant in charge of mines with an interest in lithics. Although Pereira da Costa was Professor of Mineralogy, he had medical training and was certainly knowledgeable about human bones. Pereira da Costa (1865:14) simply states that a collector of the Geological Commission of Portugal provided information. At that time, there were four collectors (Anon. 1899) and one of them, Manuel Roque, would later work for Ribeiro at Arruda in 1880 (Jackes and Alvim 2006), and might have been on site in 1864.

Perhaps only the material described in detail (Pereira da Costa 1865: 14) was taken to Lisbon. First, an almost complete skeleton was apparently still brecciated: the description of hyperflexion of the legs onto the trunk and other features of the disposition make it evident that this was similar to many burials found since (Jackes and Lubell, in press). Secondly, an almost complete skeleton with the skull broken after

excavation was found near the first, probably a young female, buried with knees only slightly raised. Thirdly, there were a number of crushed skulls, some perhaps associated with non-conserved bones (suggesting that much material was not brought to Lisbon), some mixed pell-mell with other bones (Pereira da Costa 1865: 15). These skulls could be crushed bilaterally, or anterior-posteriorly; others were separated at suture lines. The conclusion was that the differences related to burial position and soil pressures. Pereira da Costa (1865: 15), while emphasizing the number of skeletons in such a small space, was at pains to disprove any idea of a massacre.

What We Know about the Human Finds

Pereira da Costa (1865) published descriptions and illustrations of some of the Arruda finds. Dentitions were listed as follows (numbering here and in Figure 4.3 follows Pereira da Costa, 1865: 23-4):

- 1) a mandible of an elderly individual with heavy wear but no pathology (obviously incorrect);
- 2) a jaw of a younger individual with curved plane of wear;
- 3) a mandible broken at the symphysis during excavation, morphologically differing from the previous two, with unusual molar dentine, yellowed and deep below thick white enamel remnants;
- 4) maxilla with displacement of M1 and M2 into the sinus;
- 5) dentition with both maxilla and mandible, with a small lesion in the left upper M1, noted as very rare, but with major interest in unerupted left canines.

We searched for casts in the Geological Museum in Lisbon in the 1980s but were told there were none. These have now been found and some have been identified as from the Arruda 1864 excavations, namely, maxillae 4 and 5 and pathological mandible 1 (Fig. 4.3). One maxilla has an original paper label “3”, and the other is labelled “4” (Fig. 4.3, no. 4). Of two additional mandible casts, one was illustrated by Delgado (1867, Plate I, 5), coming from a specific area in the Neolithic level at Casa da Moura, and associated with a skull (Delgado, 1867, Plate I, 1) which was also cast. A further mandible retaining seven teeth but with central incisors and left lateral incisor and canine missing, cannot be identified with certainty.

Information on the casts was published in England when their receipt by the Ethnological Society was acknowledged (Busk 1869). The Royal Anthropological Institute took over the Ethnological Society collections

but no longer holds the casts (Sarah Walpole, RAI Archivist, in litt. 17/4/2013) which were sent to the Royal College of Surgeons based on a letter dated 9 March 1897 asking that casts of skulls be returned to the RAI. They are no longer held by the RCS (Sarah Pearson, Curator, Hunterian Museum, in litt. 2/9/2013).

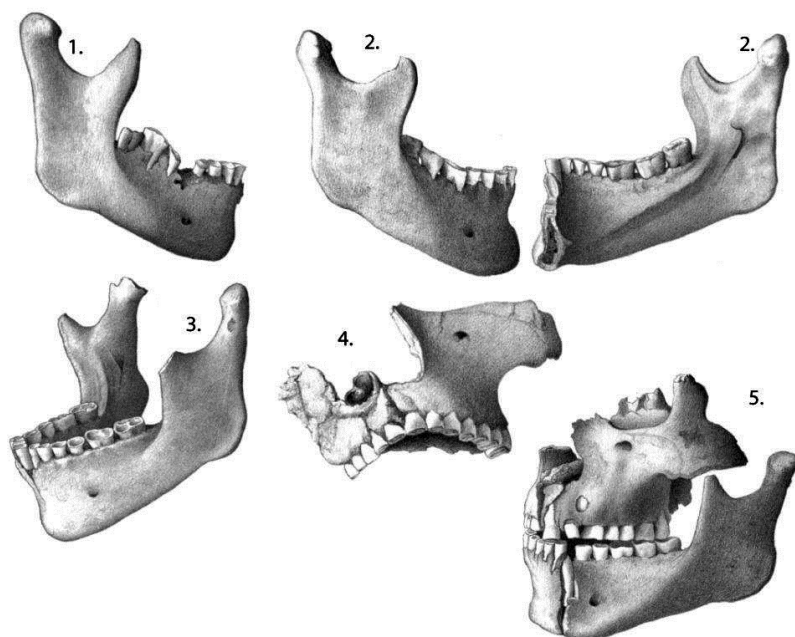


Fig. 4.3. Dentitions from Arruda 1864 excavations, after Pereira da Costa (1865, Plates I, II): numbering follows description in da Costa (1865:23-24).

Casts were also sent to the Museum of the Société d'Anthropologie de Paris (de Quatrefages and Hamy 1882: 33), as acknowledged in 1867 (Pruner-Bey 1868: 33). Three skulls were included in the gift of casts, one being described as too crushed to be informative on “the question of the prehistoric human races of western Europe”. The statement that most mandibles were from Casa da Moura, and that at least five had chins differing in morphology from others, raises the question of how many casts were sent to Paris. Finally, there is mention of a massive mandible from Arruda that Pruner-Bey believed to be from a dolichocephalic skull, unlike the mandibles with chins which he associated with brachycephalic skulls. De Quatrefages and Hamy (1882: 33-34) make it clear that only

two maxillae were sent, both from Arruda, but confusingly say that two of the skulls were from Casa da Moura.

Pereira da Costa (1865, Plates II-V) published several images of one skull (Fig. 4.4) that became famous, illustrated again by Paula e Oliveira (1884 Plate III 5 a, b and c; b printed reversed and c “rectified”) and by Cartailhac (1886: 319, Fig. 446) where it was published as a “rectified outline”, based on the cast. It was mentioned as Skull 2 (de Quatrefages and Hamy 1882: 134) and, while one cast of it in Lisbon is labelled “170”, another has an original paper label “2”. The label “170” is mentioned for a cast having an estimated cephalic index of 86.4 in a letter from Barbosa Sueiro to Mendes Correia 3/i/1931 (Abrunhosa 2012: 168).

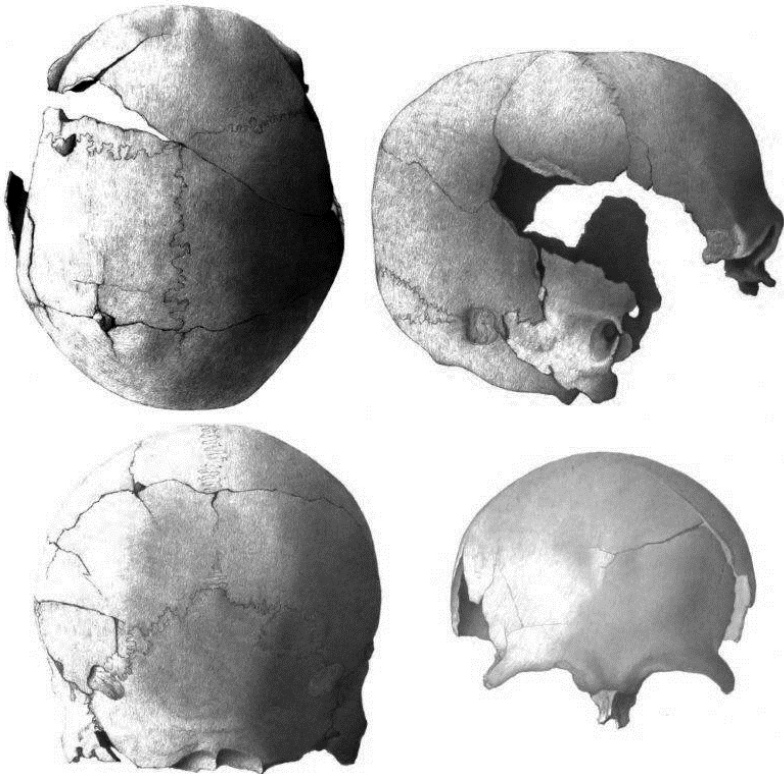


Fig. 4.4. Skull 2 from Arruda 1864 excavation, after Pereira da Costa (1865, Plates II-V).

The interest in Skull 2 was its shape, expressed by the cranial or cephalic index. Retzius introduced the concept in the 1840s (see Stewart, 1939, for an exhaustive history of this index). The maximum length and maximum width across the parietals are the relevant measurements, with the breadth expressed as a percentage of length. The maximum length would be measured from the glabella and any value above 80 was “brachycephalic”. Paula e Oliveira (1884: 294), discussing what he called “the brachycephalic male skull”, reported Skull 2 as having a cephalic index of 82.56 (Paula e Oliveira 1884: 296), stating that he “rectified” the norma verticalis image. A comparison of the illustrations demonstrates that brachycephaly was emphasized: Pereira da Costa’s image suggests a breadth ~81% of length and the 1884 image a breadth 89% of length, very slightly more than Cartailhac’s outline. All “rectifications” were based on casts. Vallois (1930) searched in vain for the actual skull in the 1920s.

Arruda got caught up in convoluted arguments about the meaning of skull shapes and European racial history. Particular focus was on whether the Furfooz “race” was represented at Arruda (de Quatrefages and Hamy 1882). Of two skulls excavated at Furfooz in Belgium in 1867, one was said to be brachycephalic, the other mesocephalic. This led to a complex of theories, the simplest being that broad-headed people migrated into Europe, mixing with long headed Cro-Magnon survivors. Pereira da Costa noted that compression had no doubt affected Arruda cranial measurements, yet Hervé (1899) would say that Muge demonstrated “a first ethnic mixing” with newly-arrived brachycephalics and Coon (1939: 63-64, 558) was still discussing whether Muge was relevant to the European racial makeup.

While discussions still continue on skull form (Gravlee et al. 2003a, b), no-one doubts that the cephalic index varies. Arruda adult skulls in the Geological Museum, Lisbon, have a mean index of 75.6 (female mean 76.6, n 6; range 70.2–83.2; male mean 74.6, n 6; range 69.4–81). Two females and one male have an index above 80. The Moita adult mean (75.9, n 23) is little different, but no values rise above 80 (male range 67.5–77.6, n 9; female range 66.3–79.5, n 14). A better understanding of normal variability and skeletal plasticity ensures that we no longer build ethnic history on minor variations of one trait.

Pereira da Costa was, for many years, a professor at the Polytechnic School which became the Faculty of Sciences, University of Lisbon. It was perhaps for this reason that the Arruda bones from 1864 were stored in the Bocage Museum, which was attached to the Faculty of Sciences. We were told in 1985 that a 1978 fire had destroyed all the Arruda bones (Jackes and Meiklejohn 2004: 95), and in 2006 were informed that there

were no remnants among the museum collections. Fortunately this was not true. Casts now located in the Geological Museum, Lisbon, can be compared with material in the Bocage. Neither casts nor bones are labelled, but we suggest that they are the remaining evidence from the 1864 Arruda excavations, citing:

- a rough note with the Bocage collection saying "probably Muge";
- the distinctive breccia on the Bocage specimens with charcoal fragments;
- accompanying samples of *Cardium* and *Scrobicularia*;
- a large skull with a depressed nasal region identical to a cast in the Geological Museum.

This skull (Fig. 4.5) included five adherent cervical vertebrae, confirming that it had slid forward and down under the pressure of the heavy deposits above it, typical for Muge burials (Jackes et al. 2013).

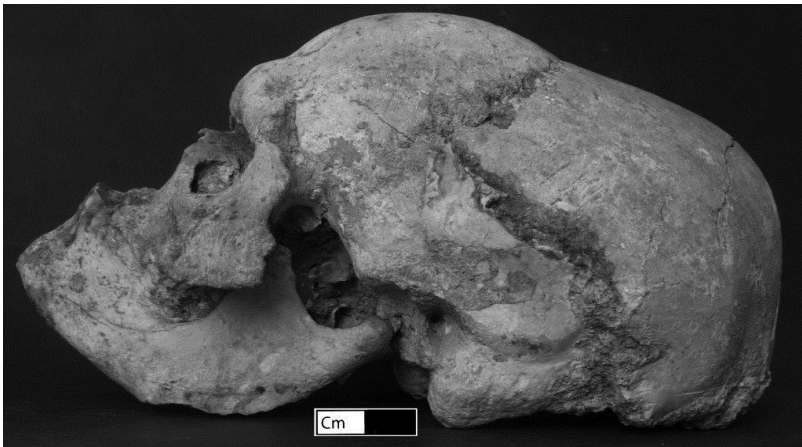


Fig. 4.5. Arruda skull 1 from the 1864 excavation conserved in the Bocage Museum, Lisbon.

It seems likely that this skull was mentioned (Pereira da Costa 1865: 14, 15) for its “fracture in the form of a cross” which is remarkable but not easily attributed to post-mortem compression. There are cut marks on the skull from cleaning, but certain features of breakage, cracking and marking, especially on the frontal, merit further examination which we were not able to undertake. Compression, excavation trauma and cleaning may not explain everything. The fracture was said to be on the right

parietal, but no impressive cross fracture can be seen on the right parietal, whereas the Skull 2 image (Fig. 4.4) displays a definite cross-shaped fracture on the left parietal. The frontal of Skull 1 was said to be broken along the suture line, with the temporals slightly spread outwards. The skull was crushed onto the face with the nasal root pushed in and the cervical vertebrae were within the mandible. The separated temporals, detached frontal, compressed nasion and the placement of the cervicals, as described, all characterize the skull shown in Figure 4.5. This appears to be part of the fully described "Skeleton 1", and there is at present a fragmentary paper label apparently marked "1" on the frontal of the skull, though not of the cast.

In 1930, Vallois wrote that the Zoological Museum (the Bocage) had material characterized as "debris" which was labelled "Arruda", although this did not include the skull that da Costa had thought female and numbered "2". In this "debris" Vallois included three damaged and deformed skulls. A fourth, a male, permitted some study, although still partly in matrix and also deformed. His description matches the skull shown in Figure 4.5. We can therefore expect three additional Arruda skulls. Three groupings of further material retained in the Bocage are as follows.

1. A box with a scribbled note, "probably Muge", contains cranial fragments, including a robust left temporal. There is also a damaged proximal left femur and left mandibular ramus with M2 and M3. The breakages on both femur and mandible appear recent and could relate to being salvaged from the 1978 fire. The mandibular molars have typical wear for Muge Mesolithic dentitions, the M3 worn flat with the mesio-lingual cusp worn into the dentine. M2 has all cusps removed with coalescent dentine exposure except for limited mesial and central retention of enamel. The disto-buccal cusp probably sustained trauma and there is alveolar resorption lingually below M3. While the mandible labelled 5 in Figure 4.3 could represent this specimen before breakage, this cannot be verified.

2. A further skull in another box is clearly different from the lost Arruda Skull 2 in Figure 4.4. Comparison with the Geological Museum cast makes the difference clear. While this Bocage skull has relatively gracile parietals, occipitals and temporals, the breakage pattern is quite different, and it lacks the frontal.

3. The final skull is that of a child. It appears to have lain on its right side and there is an indication that the skull was placed on a hand. The left side of the skull has been crushed against the right. The right frontal bears holes, one partially cleared of matrix, meriting further attention: they are

reminiscent of pick marks, which can become filled with matrix if bone becomes wet during excavation (Roksandic and Jackes 2013), or during cleaning or soaking with fire hoses. However, the exposed margin of one does not suggest excavation trauma. The matrix is soft compared with that of the compressed male skull, and it is full of shell and charcoal. Charcoal lodged in the breccia within the skull was identified as *Juniperus* sp. by Monica Ruiz Alonso (Instituto de Historia, Madrid) and dated at 7060 ± 40 bp (Beta 271927). This is close to the date for an Arruda canid (calculated without reservoir effect offset) excavated in 1880 from a similar depth. When calibrated, our date is 7960–7830 calBP (2σ), according well with other information on Arruda. While junipers may live for hundreds of years (Ward 1973: 918), there is no reason to think that a charcoal fragment, presumably associated with a hearth, would represent an extremely large old trunk. A date of around 7900 cal BP is consonant with a new date for Arruda 6, a burial excavated in the 1930s from close to the basal sands (Jackes et al., 2014).

Conclusion

The Bocage Museum in Lisbon retains materials excavated from Cabeço da Arruda in 1864, based on the date of associated charcoal, nineteenth and twentieth century literature, and casts made in the 1860s in Lisbon. There is no evidence that the famous Skull 2 (variously identified as male or female) has been examined since the 1860s. It was certainly lost by the 1920s.

Acknowledgements

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