

Muge 150th:

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CHAPTER THREE

SOURCES FOR THE RECONSTRUCTION
OF CABEÇO DA ARRUDA

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Abstract

Archival resources provide us with some limited information on the excavation of Cabeço da Arruda in the spring and early summer of 1880. Further excavation in the 1880s is not well recorded, but we can make some comments. We will locate the excavations within the site and discuss the evidence of burials up to the present century. A greater understanding of the site and its mortuary archaeology allows us to present updated information on the human skeletal sample.

Cabeço da Arruda is a late Mesolithic site in central Portugal which lies on the northern bank of the Muge River, a tributary of the Tagus. Here, midden deposits lie on a terrace remnant which rises above the surrounding land and overlooks the broad marshy valley of the river. This site has a long history, beginning with its discovery in 1863 and the excavation in 1864 by Carlos Ribeiro (1867:715). The significance of the

first description by Pereira da Costa (1865) of materials from the site is outlined by Jackes et al. (this volume). Jackes and Meiklejohn (2004) made a first attempt at assessing the minimum number of individuals found at the site over the period from 1880 to the 2000s. The study did not include the material excavated in the 1930s.

Because the excavation of Arruda has a more complex history than other Muge sites, it is more difficult to determine the details needed for a mortuary or demographic study. We need to know what has been lost and how much more might be found. The basic question is the relationships between the Arruda skeletons: where were they all found between 1864 and 2000?

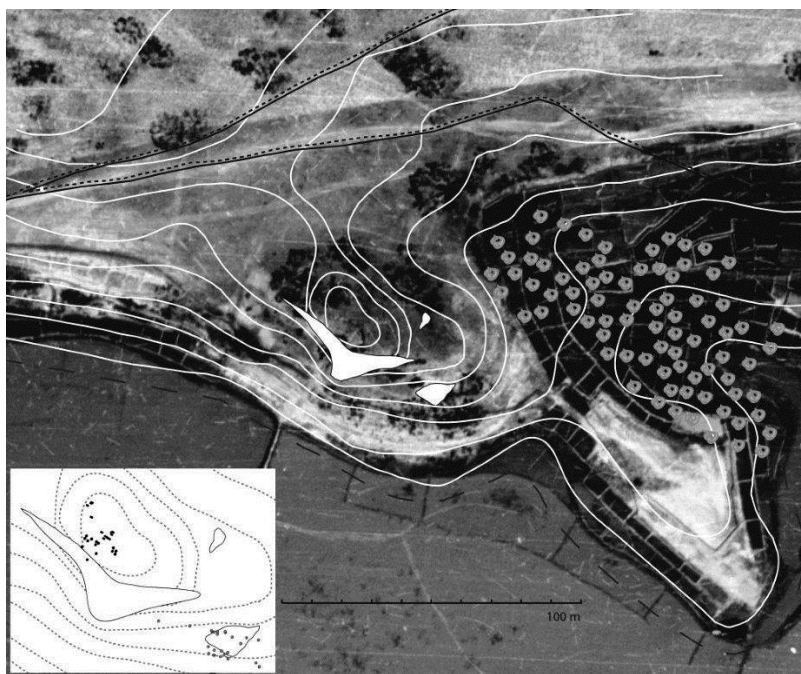


Fig. 3.1. Cabeço da Arruda, 1956 aerial © IGP, 2012 overlain by a tracing after a 1930 contour map. White areas indicate previous excavations and vegetation to the right was replaced by the rice fields evident on the aerial photograph. The inset shows the estimated locations of skeletons excavated in April-May 1880 (grey circles to the right) and in the 20th century (dark circles, 1937, and rectangles, 1964-5). The image is oriented to accord with approximate cartographic north (up).

Fig. 3.1 shows a 1956 aerial photograph. Rice was being grown in the mid-twentieth century and flooding led to the development of a peninsula. The peninsula was not present on old maps and is no longer shown, but on a 1947 aerial photograph it is even more prominent and is also emphasized in a contour map drawn in 1964 by Veiga Ferreira who collaborated with Jean Roche in the 1960s (Jackes and Meiklejohn 2004: Fig 9).

In Fig. 3.1 contours overlain on the aerial photograph come from a map found at the Geological Museum, Lisbon in 1989. We see here, in white, the areas generally according with nineteenth-century archaeological work. It appears that the 1930s excavations by Mendes Correia² have not yet been undertaken and we can confirm the map is from 1930 (Abrunhosa, 2012: 122). The inset shows, on the left, our reconstruction of the location of the skeletons found by Mendes Correia in 1937 (dark circles), while the rectangles indicate the locations of the Roche skeletons. Upper level skeletons were reported for the first time in 1964, shown by the uppermost rectangles. The four upper level skeletons lay more than four metres above the nine lower level skeletons (rectangles grouped to the right), which were stated to be directly on the sand. In 2000, Rolão found a child's skeleton in or on the sand, close by the 1964 deep skeletons (Roksandic 2006, pers. comm. 2013; Rolão 2004, pers. comm.). But just to the east, there was another skeleton only 30 cm below the modern surface which was fragmentary, as were the upper skeletons from the 1960s (Roche 1974: 30).

The exact positions of the skeletons excavated in 1864 cannot be specified, but our reconstruction of their locations (Jackes et al., this volume) suggests that they were found in the area of the southern (bottom) lobe of the central white area shown in Fig. 3.1. That would accord with all the clues provided by Pereira da Costa (1865). The 1864 excavation would have extended far to the west of that area (all along the southwest face of the mound), but we know that skeletons were found only in a restricted area in the eastern part of the trench. Clear signs of the trench would have been removed by flooding which occurs frequently (Azevedo et al. 2004). Roche (1967:80) recorded that in 1966 the flood waters reached half-way up the profile, that is, perhaps five metres above the average level of the Muge.

A photograph from 1880 (Jackes and Meiklejohn 2004: Fig 13) clearly indicates the situation at the time of a sketch of the site dated 25 April 1880: part of this sketch is reproduced here as Fig. 3.2. Both the

² The spelling accords with the birth certificate of A. A. Mendes Correia (cf. Corrêa).

photograph and the sketch show skeletons mostly lying within four metres of the back wall of the trench. On the other hand, the plot published by Jackes and Meiklejohn (2004: Fig 12), showing an overall rough plan of the site which must derive from May 1880, accords with the transept published here as Figure 3.3, in which skeletons lie around 12.5 metres from the trench wall. The locations of the skeletons sketched on 25 April are indicated by no more than wavy lines on this wider plot, while the transept proves the skeletons had been lifted and that part of their former location had been excavated down to the sterile terrace sands. On the Figure 3.1 inset, we can see the two sets of skeletons, their positions indicated by the light circles: one group further in to the centre of the mound which was excavated in late April, and the other (less accurately recorded) to the south closer to the marsh, excavated in May and probably retained under shelter through the dry summer as an exhibit for participants at the 1880 *Congrès International d'Anthropologie et d'Archéologie Préhistoriques*.

As well as resources like these plots which were found in the Geological Museum, Lisbon in 1989 and copied by Lubell, giving an idea of the excavation at two points in time in the first half of 1880, there are also written reports which were copied by Alvim ten years ago when they were in the Instituto Geológico e Mineiro archives at Alfragide. These reports provide more answers and help date the transept and broader sketch plot.

We have a series of short reports to Carlos Ribeiro in Lisbon, written by the man who was actually excavating at Muge—Manuel Roque d'Oliveira (see Jackes et al., this volume for details).

The record begins on 19 March 1880 when the hired local men were moving earth that had previously been dug; by 21 March they had found a skeleton even though they were still moving back dirt. By the 23rd they were already four or five metres down and had dug a 15 x 4 metre trench. Obviously they were following the bottom of the (partly erosional, no doubt) scarp shown in the sketches of the site. In a letter which perhaps dates to 25 March, Roque reported on another skeleton, but he was getting frustrated and planning to move east and south, that is, further from the centre of the mound. He noted that local men had seen skeletons in that area. By 27 March he reported that skeletons had been found together with animal bones, four metres below the surface. Within a month they had dug a great deal of deposit to the east, judging from the 25 April sketch shown in Fig. 3.2.

On 3 May, Ribeiro visited and wrote in his notebook that they had found 13 skeletons and explored 20 to 30 metres (this accords with the

distance of 25 metres that we estimate as the extent of the trench shown in Fig. 3.2). Ribeiro was apparently noting the skeletons to the east on the Fig. 3.2 plot: they numbered exactly 13 on the 25 April.

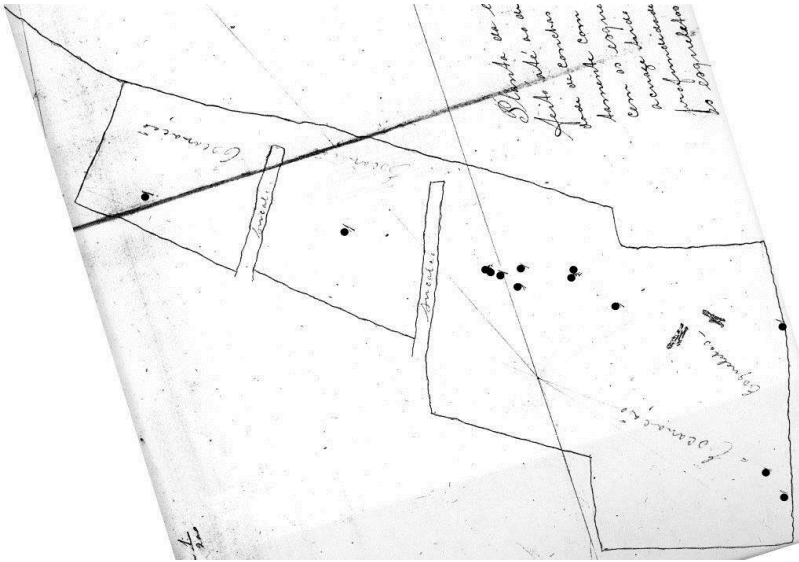


Fig. 3.2. Part of a sketch dated 25th April 1880 held in the Geological Museum, Lisbon in 1989, showing the location of 15 skeletons (the dots marking 13 of the skulls have been enlarged). The sketch is shown with estimated magnetic north for April 1880 oriented to accord with Fig. 3.1.

On 14 May, Roque stated that he had made transects across the mound, with one going over the skeletons to make the situation clear to Ribeiro—no doubt the transept reproduced here as Fig. 3.3. Next, on 19 May, Roque reported two more skeletons and said that as soon as all the work was finished near the skeletons they would move near to the big cork oak; this is shown in the plot published by Jackes and Meiklejohn (2004: Fig. 12) as the large black shape to the right—that is, they expanded the trench further to the south and east. Roque, by that time, also had men digging down to the sands at the deepest part, 5.5 metres below the surface. That work would have been carried on to the northwest, closer to the centre of the mound.

However, now the focus switched to Moita, where—as Roque reported on the 1 June—the excavators had uncovered the apparent mass burial of a group of perhaps 16 skeletons described in Jackes and Alvim (2006).

A man called Scolla was left in charge at Arruda and more work was done in the southern area. But, on 11 June, Roque reported that the excavations were also being extended to the northwest. There is, in addition, the record of nine skeletons found in a 1 x 2 metre area, all piled together like those found at Moita. By 21 June, three more skeletons had appeared. And that is almost all the information we have on the Arruda burials from 1880.

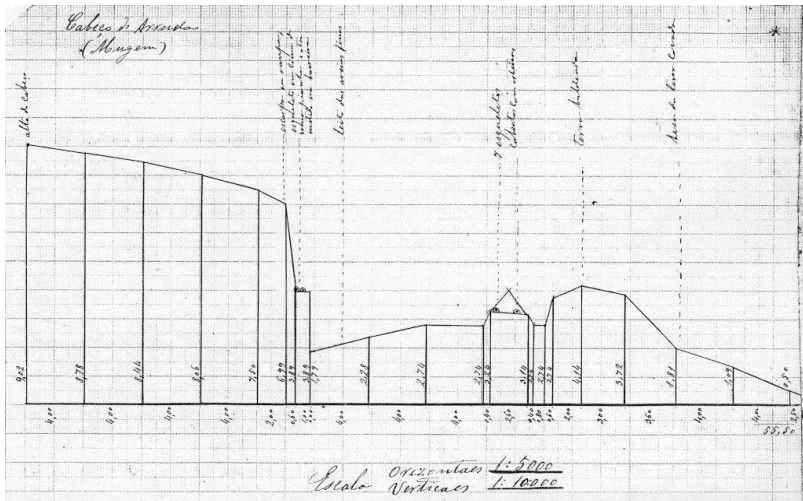


Fig. 3.3. A transect from May 1880. This transect runs from the high point of the mound, across the excavation edge, where a skeleton is shown on a pedestal, across an area from which the skeletons shown in Figure 2 have been removed, down to the level of the terrace sands at 2 m. The location of skeletons left in situ under a shelter for the 1880 Congress is indicated inside a pile of back dirt and the slope down to the edge of the mound. The trajectory of this transect (a – a') is not clearly specified on any sketch, but can be estimated to lie at ~42 degrees west of cartographic north.

What else is there for 1880? There are two plates from the Ribeiro (1884) publication which are in fact parts of the same image. The correct reversed orientation was published in Cartailhac (1886) as an engraving which was stated to come from a photo in the Geological Museum, Lisbon, showing a wider view than Ribeiro's plates. Perhaps the burials shown were those protected by a shelter until displayed to the participants in the *Congrès International d'Anthropologie et d'Archéologie Préhistoriques*, held at Lisbon in late September 1880. First visiting Moita, the visitors

were given a sumptuous lunch and then a hardy few crossed the Muge valley to see the more extensive excavations at Arruda.

While the skeletons shown in the 1880 Congress publication plates appear similar to the 13 described by Ribeiro on 3 May—in parallel lines, and not dispersed—there are fewer than 13. That suggests the plates were indeed illustrating the burials retained under the shelter. However, there is one burial grouping not yet mentioned: on 3 May, Ribeiro discussed another group of burials—nine skeletons found at a depth of four metres in which the layout was apparently different, that is, not aligned. He mentioned that the slight differences in height made it seem as though the skeletons were distributed around a broad basin. The plan drawn by Ribeiro of this significant grouping has not been published and this notebook was apparently retained by Veiga Ferreira. He had had many of the resources discussed here and marked and wrote on them before returning them to the Geological Museum sometime between 1986 and 1989. Unfortunately, since this particular notebook was retained by Veiga Ferreira, it is not available to researchers although it has been partly published (Cardoso and Rolão 1999/2000: 121-122).

Sadly, Ribeiro was already ill in 1880, and he and Manuel Roque d'Oliveira both died in 1882. Further excavation was undertaken in 1884 (Paula e Oliveira, 1889: 59). Thirteen burials were excavated that year. Very few, if any, of those 13 skeletons came from Moita: Arruda is the more likely source (Jackes and Alvim 2006). Paula e Oliveira noted that some skeletons were in very poor condition, so there could have been upper level skeletons among these, especially as Arruda N in the Geological Museum is 1000 years younger than the oldest Arruda burial excavated in 1937 (Jackes et al., 2014).

There was one more image in the Geological Museum – an unpublished photograph. Based on the burial mode, it is clearly from Arruda, perhaps looking towards the eastern wall of the trench near the big cork oak. This would be at the edge of Veiga Ferreira's record of previous excavations, where the sand and the burials were very close to the surface slope of the mound. Perhaps this image came from late May or early June 1880.

We have no record for the 13 burials from 1884 and the work in 1885 at Arruda was not productive (Paula e Oliveira 1889: 59; Jackes and Alvim 2006: 96 fn 11). So our study moves to January 1928, when we know from one photograph in the Museu de História Natural, Porto that a preliminary visit was made to Arruda.

In 1933, while digging at Amoreira, Mendes Correia began some work at Arruda laying out east-west and north-south test trenches in 2.5 metre

squares. Then in 1937, a large scale excavation was undertaken. Apart from fragments, many mixed in with faunal remains perhaps as a result of the extensive erosion which can be seen to have occurred before June 1932 (Abrunhosa 2012: Document n° 32-07: 228), most of the *in situ* burials came from a very restricted area (marked by dark circles on Fig. 3.1 inset), except for a fragmentary small child found in 1933. All were found just above the terrace sands. All subsequent finds have been in the same area as the 1937 burials.



Fig. 3.4. From Porto positive xxvi.25.B, neg 1937/5. The profile of part of the Mendes Correia excavation, showing one full 2.5 meter square (for comparison with the 1864 profile and Roche 1974 Plate 3 reversed). The profile shown reaches down only to the beginning of the deep layer.

Fig. 3.4 is part of one of two photographs in the archives of the Museu de História Natural, Porto which gives us a very clear idea that the deposits exposed in 1937 were similar to those illustrated by Roche (1967: Fig. 2; 1974 Pl. III printed reversed). Cartailhac (1886: 55) described equivalent deposits that had been shown to him on a visit to Arruda, as we can determine from his statement that the 1865 illustration of the Arruda

profile was similar (the angle of the deposits appears to deepen slightly, further into the mound). It appears that a broad swathe along the mound produced skeletons from 1864, 1880, 1884, and 1937, 1964 and 2000 and the deposits below these also remained consistent, with the skeletons described as being just above the sands except for the burials furthest into the mound, below the highest point, which were excavated by Roche and Veiga Ferreira. Those skeletons are said to lie on the sand (Roche 1974: 27) while the 1937 burials are noted as between 25 and 140 cm above the sand (derived from field books, Cardoso and Rolão 1999/2000: 174-179).

Are there other areas of the mound that may contain skeletons? We know that the 1864 excavations found skeletons only in the eastern portion of the trench and that Mendes Correia considered that the 1880s work was the most extensive and deepest in the eastern part of the mound (Abrunhosa 2012: 363). No doubt skeletons to the south, and possibly to the west, could have been lost to flooding, and there may well be deep burials below the present scarp, as well as some upper level skeletons still below the top of the mound. However, there are indications that some areas have no further skeletons. We know there was an excavation at Arruda in 1885 which was so unproductive that the campaign for that year was switched to Moita. On 4 June 1885, Paula e Oliveira wrote a letter to Nery Delgado in which he said that the work at Arruda had been “fruitless”. Fig. 3.1 shows a flat area to the east of the mound and an indication of an old excavation. A cadastral map (IGP 1960) indicates that the NE quadrant was disrupted, and partially removed from the mound, and this is echoed in Veiga Ferreira’s 1964 map at exactly that point. In each case, these indications of old excavations were to the northeast and it is very possible that this was the location of the 1885 excavation. Paula e Oliveira would not have been able to specify that there were burials only to the south if he did not dig in the north. He contrasted Moita, where the burials were in the northeast part of the mound, with Arruda where the burials were all located in a southern quadrant (Paula e Oliveira 1889: 74). It is unlikely then, that the burial of the dog found in 1880 at four metres would have come from that area (cp. Detry and Cardoso 2010: Fig. 5).

Our 2004 demographic study of the 1880s’ Arruda materials counted 97 individuals. Subtracting the 1884 maximum of 13, it seems that 84 burials were excavated in 1880. However, only about 50 are mentioned in the 1880 records, indicating that those records are indeed incomplete. Because of this, it is likely that further 1880 work pulled back the excavation deeper into the mound. Judging from the difference between the early 1880 scarp and the scarp surveyed in the 1950s (IGP 1960), it seems that there must have been an excavation in that area and, indeed,

further along to the west. There was erosion, no doubt, but given the fast pace of the 1880 excavation (once they learned to keep areas of potential interest free of spoil heaps), the digging of deposit is likely. The area of around 48 square metres to the southeast alone had the potential to add perhaps 30 skeletons during the continuing 1880 campaign. In comparison, between 1937 and 2000 at least parts of 21 deep level skeletons were found within an area of about 13 square metres.

Our suggestion is, then, that we should be able to undertake a demographic study of the surviving Arruda skeletons, given that no excavator has described an area in which there was the preferential burial of adults or children, and that a reasonable sample representing a broad area of the mound has been retained and is available to us. On that basis, we can add individuals from the 1964 basal sands' excavation (Jackes and Meiklejohn 2004: 102), and now materials from the deeper levels of the 1937 Arruda excavation (in the Museu de História Natural, Porto), to the 1880s material for a new total fertility rate (TFR) estimation. Previous estimates (Jackes and Meiklejohn 2008: 232) of higher fertility at Arruda (c. 6.5) than at Moita (c. 4.5) were based on a minimum of 105 individuals (MNI, derived from mandibles). Now we add the upper level 1964-5 individuals and attempt to arrive at a better understanding of how many burials were actually encountered in the 1930s. The materials in Porto are difficult to study because of possible mixing and loss, but, after studying the Porto material in 2010, we can confirm that five juvenile mandibles need to be added to the ten individuals numbered by Mendes Correia, for a new total of 124 individuals, which may still exclude one or two Porto adult mandibles no longer firmly assigned to a Muge site. Our method of arriving at a TFR allows us to compare the estimates using a 95% CI from two estimators: a wide range would arise from a discrepancy between the two estimators indicating a defective sample, in this case an underrepresentation of adults. The estimates of around seven to eight children live-born to the average woman of reproductive age is too high a rate for a group that is no more than semi-sedentary. As a result, it is important that we acknowledge the loss of the 1864 skeletons. The underrepresentation of adults could well result from that loss, suggesting a TFR that is probably too high for a late Mesolithic group. The addition of 45 adults to the Arruda sample would give us an estimate of around five live-born children for the average woman during her reproductive years (the total range is still too wide since not all of the 1864 skeletons were fully adult). It is clear that we can make no more than a guess, but that all indications are still that the Arruda TFR was slightly higher than that of the Moita sample, at least 5 to 5.5.

Acknowledgements

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