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DISLOCATED ANATOMICAL BLOCKS: A COMPLEX FUNERARY TREATMENT FROM CAPSIAN CONTEXT

ABSTRACT: Skeleton 3A-1 at Aioun Bérèche (also known as Site 12), a Capsian escargotière in eastern Algeria testifies to a complex treatment prior to burial. A study of the skeleton and the field records through the lens of archaeoethanatology allows a more detailed interpretation of the burial than previously published. Osteological analysis revealed the presence of cutmarks on different bones of the skeleton. The location of these cutmarks near major joints (neck, elbow, and knee) shows that the intention of the cutting operation was to partition off the body into pieces. Archaeoethanatomical analysis provides evidence that these operations were conducted promptly after death as well as the deposit in earth of the partitioned body into "anatomical dislocated blocks". This very specific treatment is not a unique case and appears, on the contrary, to play an important part in the Capsian funerary identity.

KEY WORDS: Capsian grave – Complex pre-burial treatment – Dislocated anatomical blocks – Cutmarks – Northwest Africa

INTRODUCTION

The last hunter-gatherers of the high steppe plains of Algeria and Tunisia developed the Capsian culture between 9000 and 4500 cal BP. It is characterized by the production of microlithic tools by lamellar knapping (e.g., Balout 1955a, b, Camps 1974, Grébénart 1972, Inizan 1976a, Pond *et al.* 1928, 1938, Tixier 1963, Vaufrey 1932, 1933, 1955) and by the introduction of pressure flaking beginning ca. 8000 cal BP and marking

a new phase: the Upper Capsian (Rahmani 2003, 2004, Rahmani, Lubell 2013, Sheppard 1987). Capsian human groups made bone tools and sickles with flint inserts. They carved stone and engraved and shaped ostrich egg shell (Tixier 1960). They are also known for their use of various red pigments (Camps-Fabrer 1975, Gobert 1952, Inizan 1976b). Capsian sites are most often open-air middens, known either as *escargotières* or *rammadiya* (Gobert 1937). Their density is often very high, and occupancy may have been seasonal (Lubell, Sheppard

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1997, Lubell *et al.* 1976, 1984, Shipp *et al.* 2013). Capsians are also known to have modified human bones (Aoudia 2013, Aoudia-Chouakri 2009, 2013, Aoudia-Chouakri, Bocquentin 2009, Camps-Fabrer 1966, 1975).

An analysis of all available Capsian graves (Aoudia-Chouakri 2013), has permitted characterization of the burial customs of that period. Graves are found within occupational deposits and they are systematically single individuals, as the dead are never grouped together whatever the age at death. Although only primary burials are documented, two kinds of funerary deposits are known. Most commonly, the dead are buried in simple pits, in various positions and orientations. Apart from this more usual treatment, a few of the dead are subject to a complex standardized pre-burial treatment implying specific practices which will be described here using skeleton 3A-1 at Aïoun Bérêche as a case study.

GRAVE CONTEXT AND METHODOLOGICAL APPROACH

The Aïoun Bérêche *escargotière*, also known as Site 12 (Balout 1955b: 124, Pond *et al.* 1938), is about 15 km NNW of the town of Aïn Beïda in northeastern Algeria (Figure 1). The occupation is dated between approximately 9000 and 7800 cal BP based on two charcoal dates (SMU1132 and SMU1135) and one human bone collagen date (TO-12195), but may well have lasted

longer (Jackes, Lubell 2014). The excavation of the site by A. W. Pond and A. E. Jenks in 1930 produced numerous burials (Jackes, Lubell 2014). Eight of these skeletons along with the relevant excavation records, were stored at the Department of Anthropology, University of Minnesota for many years. They have been on loan to and under study by two of us (MJ and DL) since 1988, and are currently housed at the University of Waterloo in Canada. Skeleton 3A-1 is shown in 11 photographs of uneven quality. Five skeletons show cutmarks (Haverkort, Lubell 1999) that appear to have led to segmentation of the body, which was eventually deposited in dislocated anatomical blocks, sometimes imitating a natural position as reveals our archaeothanatological approach (Aoudia-Chouakri 2013). Archaeothanatology (Boulestin, Duday 2005, Duday *et al.* 2014, Duday 1990) aims to reconstruct and interpret the initial context of burial deposition in order to identify the mortuary practices involved. Joints dislocation and bone displacements of skeletons are carefully observed because this allows us to reconstruct the circumstances of burial and funerary gestures, taking into account the specific context of a grave and its taphonomy (literally: "the laws of burial") (e.g., Duday 2009, Duday *et al.* 1990).

Ideally, this type of analysis should be done at the time of excavation (Duday 1981, 1995, 2009, Duday *et al.* 1990, Leclerc 1975). In our case, however, field observations were minimal since the grave was excavated in 1930, long before relevant excavation methods were

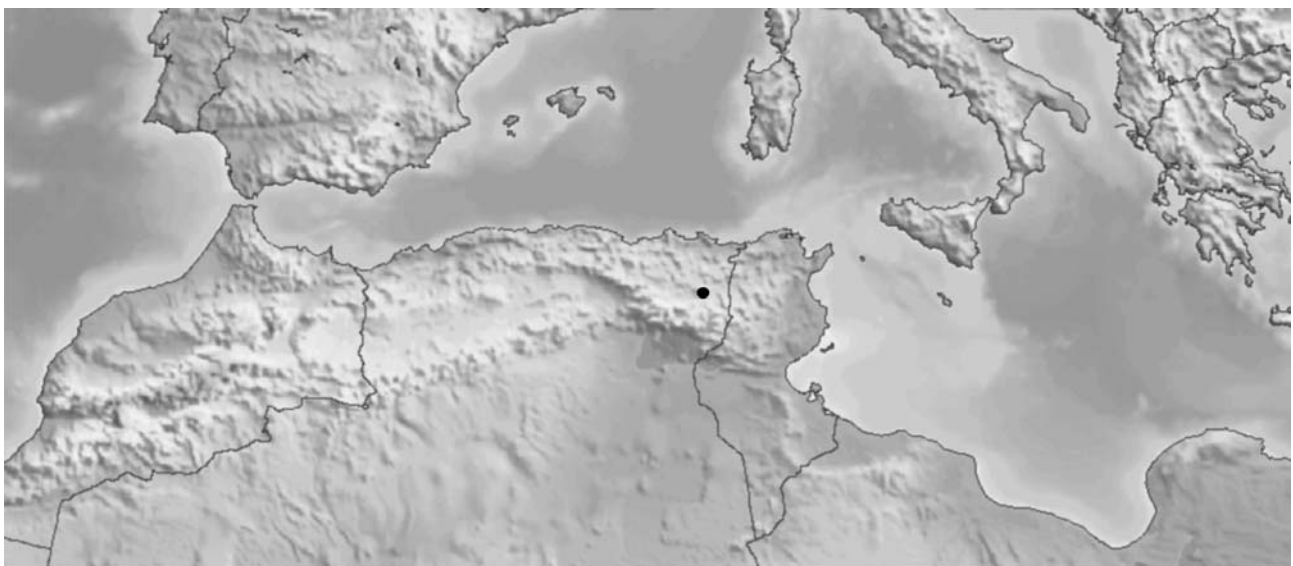


FIGURE 1. Geographical location of the site Aïoun Bérêche.

established. However, Skeleton 3A-1 benefited from a careful dig. It was excavated by L. Wilford and A. E. Jenks, the leaders of the University of Minnesota team at Aïoun Bérêche in 1930. They were experienced excavators and interpreters of burials, having excavated and recorded in explicit detail 363 skeletons the previous year in New Mexico (Anyon, LeBlanc 1984). Excavation records and photographs have been preserved by two of us (MJ and DL). The context of this skeletal sample within the site is established elsewhere (Aoudia-Chouakri 2013, Haverkort, Lubell 1999, Jackes, Lubell 2014).

THE TAPHONOMY OF SKELETON 3A-1

Skeleton 3A-1 was well preserved and its collection was carefully handled as shown by the presence of hyoid bone with its horns in the collection now. However, the axis and some foot and hand bones are absent. The individual was identified as female in the field and this is confirmed by such evidence as the form of the sciatic notch and the orbital margins published elsewhere (Jackes, Lubell 2014).

Description of the funerary deposit

Figure 2 provides our best record of the disposition of the 3A-1 skeleton. It reveals a surprising organization

of the bones. Three separated anatomical segments are immediately recognizable: 1) the cranium with the mandible appearing in antero-superior view; 2) the complete pelvis in dorsal view; and 3) the trunk resting in ventral decubitus, at a slight angle to the pelvis. The apparently missing thoraco-lumbar vertebral region was removed before photography. Wilford, the main excavator of the Minnesota trench, recorded in his field notes that the vertebrae in that gap were "not in place" but "sagged down". According to Wilford (1930a), "the torso was undoubtedly buried as a unit". Re-examination of the skeleton confirms that all thoracic and lumbar vertebrae were present as they were reconstructed by one of us (MJ), only T.8 being fragmentary, but can be seen in *Figure 2*.

Despite a first impression of major anatomical disorder, numerous joints are still fully articulated, many others are only slightly dislocated. In the case of the trunk, *Figure 2* shows a succession of ribs, down to the eighth left rib. There is some connection to the vertebrae on the right side, but the left ribs show slightly more slippage after soft tissue decomposition. The ribs maintain the thoracic volume, with little movement evident apart from the fact that lower ribs have slightly slide down into the thorax.

The scapulae are clearly in anatomical position on the thorax despite their expected instability with decomposition.



FIGURE 2. A. W. Pond with Skeleton 3A-1. Logan Museum of Anthropology, Beloit College, negative 30-108.

Equally, the three bones of the pelvic girdle have maintained articulation relatively well so that the encompassed volume was preserved (*Figure 3*). Near the right ilium, the skull lies on its base facing NW, that is, away from its original position atop the cervical spine. The left side of the occipital rests on a smoothly curved stone which keeps the maxilla in good occlusion with the mandible.

The right tibia and fibula were exposed by the removal of the skull and the sediments in the abdominal region and around the pelvis. The right femur lies with its distal end beyond the lower right ribs. The femoral shaft is aligned with the right iliac blade, suggesting that the body was placed in a fully flexed position. This is supported by the fact that the right patella lay originally by the right distal femur, as recorded by Wilford and seen in *Figure 3*. However, the metatarsals beside the stone on which the skull lies are those of the right foot. We would expect to find the right MTII, III, and IV caudal to the pelvis, not – as they lie – with their dorsal sides facing up beside the right knee. The right leg bones can be seen in *Figure 2*, diagonally beyond the right ilium and the sacrum, with the distal ends lying under the skull. Clearly, some articulations were maintained; the tibia and fibula still formed a unit, with the right foot to some degree attached to them. At the contrary, the right knee joint was fully disarticulated.

The left femur lay parallel to the right, probably with the head in the acetabulum. But the left tibia lay on the other side of the body, with the dorsal surface up and the proximal end under the right foot. A bone visible at the distal end of the tibia (see Haverkort, Lubell 1999: Fig. 3B) has defied attempts at positive identification, but seems most likely to be the left talus, suggesting that the left foot lay beyond the right iliac blade Wilford's notes (Wilford 1930b): "... [a] lower leg in place along right side of pelvis with foot at end of pelvis", support the idea that the left foot must have lain in the position where he would have expected the right foot.

The right humerus is not visible in any photograph, but Wilford wrote in his diary that it lay along the right side of the thorax, with the proximal end in the glenoid cavity. His field notes for the same date record that a humerus was the first element of 3A-1 to be found, providing evidence of where it lay. Even the earliest photograph showing the position of the exposed ribs within the trench as a whole (*Figure 4*) gives no glimpse of the humerus, suggesting that it was removed before the ribs could be seen. During fieldwork, the left humerus was identified as lying under the torso. Wilford stated that the proximal end was with the scapula ("in the socket"). Since the distal shaft can be seen to the right of the rib cage (*Figure 2*) and there is old breakage within and below the humeral head, the impression given by

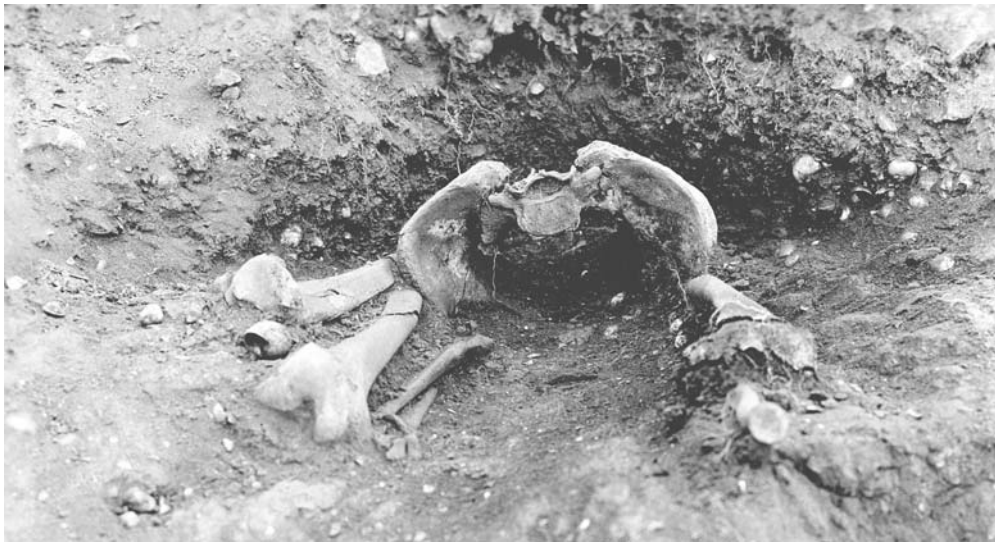


FIGURE 3. View from the excavation face after removal of the upper body of 3A-1. The slightly out of focus right radius head can be seen on the right, and the left wrist and forearm bones are under the right femur. The reasonable maintenance of the sacroiliac connections, especially on the left side, is evident, despite the slight slumping of the sacrum. Logan Museum of Anthropology, Beloit College, negative 30-106a.

several photographs that the left humerus was not in normal articulation is supported. The left scapula was pulled away from the midline.

Most of the bones of the forearms are exposed lying partially below the femora (*Figure 3*). The right radius is seen with its proximal end extending forward from the distal left femur about 10 cm. The right ulna is angled up beside the left ribs (*Figure 2*). The left forearm appears under the right femur (*Figure 3*). The left radius and ulna have their proximal ends directed into the pelvic girdle and at the distal end of the radius we can see a number of carpals. The radius is anteriorly oriented so that the hand bones should be in palmar view: thus, we should see the triquetral bone, lunate, and scaphoid if this is the proximal row, but if it is the distal row, we should see the distal surfaces of hamate, capitate, and trapezoid. Unfortunately, the left trapezium, trapezoid, and capitate are not present in the collection, so it is difficult to confirm the identifications. The hamate appears to have rotated so that its hook is displaced proximally. The third carpal in the photograph is most likely to be the trapezoid. A different view (Jackes, Lubell 2014: Fig. 3b) confirms that some proximal row carpals were present. They are still in the collection and the lunate appears to be identifiable.

Keys to interpretation

It is not conceivable that the anatomical segments just described were moved after decay process started. Firstly, numerous labile joints of the thorax and extremities are still articulated, showing that the segments were placed while still held together by soft tissue and that the bones were not manipulated afterwards. Second, the presence of several bones that were maintained in unstable anatomical position after decay despite gravity (scapulae, vertebrae, pelvis, and perhaps the right humerus) argues for a filled space of decomposition, which does not allow later manipulation without displacement. In addition to the surrounding sediment, transversal compression was also applied externally to the rib cage by the stones seen in *Figure 4* and the left ulna, the right distal femur, the distal left humerus (and presumably also the right humerus alongside the right ribs). Similarly, the long bones pressed against the ilia provided some bulwark against displacement outward of the initial volume of the soft parts. It is worth noting that the initial volumes of the corpse are preserved as well (thoracic cage and pelvic girdle), a pattern rarely seen in burial analysis and which shows an immediate filling of decomposing soft tissue. The ashy matrix of the heterogeneous sediment

described by the excavator may have been fluid enough to permit this happening. However, the maintenance of these volumes, despite the fact that the sacrum and the vertebrae were in a highly unstable position, is remarkable. Furthermore, Wilford's (1930a, b) observations allow additional information. He records that the skeleton lay on a clay surface associated with ash, charcoal, and some red ochre and we interpret this as evidence that a depression was made into the underlying surface. The material scraped from the clay was found to the sides and especially above the skeleton; "hard clay material was found over the top". The skeleton itself was described as buried "in" or "through" a hearth, meaning that the general mix of ash, charcoal, and whole and comminuted shell and bone was packed around and within the skeleton. This is clearly seen in several photographs. *Figure 2* gives a good idea of the



FIGURE 4. An early photograph of 3A-1 from a low angle showing the nature of the deposits on which the skeleton lay. We see right ribs, after the removal of the right humerus, with the right glenoid and scapular blade lying above them. The left distal humerus lies below the ribs. The right patella lies in front of the right lateral femoral condyle. The scale is 30 cm. Note the clay on the lower right under the pebbles. Anthropology Laboratories, University of Minnesota, negative 5230.

heterogeneous hearth materials, including whole shells, found within the thorax. Black material adhering to vertebrae and to the inner surfaces of most of the left ribs from the 4th to the 12th, and to the lower right ribs, confirms that ash and charcoal lay within and around the axial skeleton. Traces of ochre on several inner rib surfaces again suggest the heterogeneity of the material within the rib cage (red ochre was found nearby).

In order to explain the maintenance of the initial volumes, a first hypothesis might be that the body underwent some form of mummification. Very slow decomposition of the skin and ligaments following desiccation would have contributed to the maintenance of the volume (Maureille, Sellier 1996, Sellier, Bendezu-Sarmiento 2013). In case of natural desiccation, not preceded by evisceration, factors to be considered are whether the climate was sufficiently dry. Such conditions cannot be expected to have prevailed at Aïoun Bérèche during the Holocene (Shipp *et al.* 2013). Aufderheide (2003: 43–56) provides a discussion of mechanisms of natural mummification: neither extreme aridity nor sustained high temperature apply in this case. An example of what such conditions might lead to, is shown at http://www.britishmuseum.org/whats_on/exhibitions/virtual_autopsy.aspx. A second hypothesis would have the trunk emptied before burial, and this might have allowed, immediately after interment, penetration of sediment filling the interior, thus preventing the formation of a secondary created space and collapse of the bones. This could have been the result of purposeful stuffing of the cavity using perishable materials which would be replaced by fine sediments as these materials compacted and decomposed.

Since this cannot be a case of natural desiccation, we can consider evisceration. The ribs, sternum, and manubrium have been carefully examined by two of us (MJ and DL) with magnification and multiple angled lights, and no convincing signs of cutting were found. On the other hand, a process of evisceration cannot be completely ruled out as an opening up of the abdominal region could be accomplished without the cutting tool coming into contact with bone. Moreover, two other skeletons (3A-6 and 3A-7) may show traces of evisceration (Aoudia-Chouakri 2013, Haverkort, Lubell 1999: 160–161). And if evisceration is a distinct possibility, artificial mummification, might be taken into consideration, despite the fact that we cannot prove it with the field documents available today. Future excavators of Capsian burials should be aware of such possible treatment and describe precisely the degree of connection of all joints.

CUTMARKS AND CORPSE DISMEMBERING OF SKELETON 3A-1

Osteological analysis revealed the presence of cutmarks on several skeletal parts: the right gonial angle of the mandible, the medial condyle of the right humerus, and medial anterior surface of the left proximal tibia. The detailed description of these traces was published by Haverkort and Lubell (1999) and discussed again in a larger framework of Capsian burial customs by one of us (Aoudia-Chouakri 2013).

Cutmarks observed in the gonial angle of the mandible are likely to be a result of cutting the upper part of the neck in order to remove the craniofacial block. Indeed, many authors agree that the traces produced by the beheading of a corpse are not located solely on the cervical vertebrae. If the severing of the spine is in the area of C.1 to C.3 traces can be seen on the mandibular rami (Billard *et al.* 1995, Boulestin 1994, McKinley 1993, Waldron 1996). The axis of 3A-1 is unfortunately missing and may well have been damaged during disarticulation. Close reading of the field records suggests that it would have been dug from the excavation face prior to discovery of the skeleton and not recognized during sieving. It would therefore have been associated with C.3. The atlas was found, however, and it is likely that it was in articulation with the skull, especially since it was weakened by *spina bifida occulta*: we note that the even more fragile hyoid is also present in the collection.

Cutmarks observed near the joint areas of the long bones were deep, parallel, and perpendicular to the axis of the bone, indicating disarticulation. Such traces were observed on the distal end of the right humerus and the proximal end of the left tibia (Haverkort, Lubell 1999: Fig. 14). The right elbow and left knee were therefore actively disarticulated. Wilford did not specifically record that the femoral heads were within the acetabuli so we can make no statement on the disarticulation at the hips. The absence of cutmarks on the femoral neck and on the pelvis, the most common location in Capsian and Iberomaurusian burials (Aoudia-Chouakri 2013, Aoudia-Chouakri, Bocquentin 2009), and in Iroquoian ossuaries in which wholesale disarticulation was practised (Jackes 1996), might clarify the situation. Unfortunately, the right proximal femur is now damaged. What can be seen of the left femoral neck gives no indication of cuts.

In sum, three of the articulations (neck, right elbow, and left knee) show cutmarks. The absence of cutmarks on the left elbow cannot be explained by poor preservation of the distal humerus – shafts and distal

ends of both humeri are perfectly preserved and we can confirm that the left humerus has no cuts equivalent to those on the right. Movement after decomposition cannot explain the location of the bones of the left forearm so that there is clear evidence of disarticulation although no cutmarks were recorded at the left elbow. Neither proximal tibia is perfectly preserved, but the right lacks the area on which cutmarks can be observed on the left. It should be, however, noted that cutting of soft tissue could perhaps be accomplished without making contact with bone: Crubézy and his colleagues (1996) have shown this to be possible. Absence of cutmarks is not absolute evidence for absence of disarticulation in all cases – clearly not in the case of the 3A-1 left elbow.

DISLOCATED ANATOMICAL BLOCKS: A CAPSIAN COMPLEX WAY OF HANDLING CORPSES

The detailed analysis of skeleton 3A-1 gives proof that three units (the head, forearms, and lower limbs) of the relatively fresh cadaver must have been purposefully disarticulated before burial. These operations most likely took place soon enough after death that there was minimal decomposition of the tissues that hold the labile joints of the rib cage and proximal limb elements together. The minimal number of cutmarks related to disarticulation is interesting. This might show that the performer was skillful (Crubézy *et al.* 1996). On the other hand, some kind of artificial mummification leading to the maintenance of labile articulations while weakening others (Maureille, Sellier 1996, Sellier, Bendezu-Sarmiento 2013) should be kept as a possible explanation.

The segmented cadaver was probably placed in a shallow depression with the thorax angled slightly upwards. A possible interpretation is that the right radius and the left radius, ulna, and hand were placed first, followed by the block of the thorax together with the humeri, pelvis, and femora (assuming they were in the acetabuli). The hips were tightly flexed. The body was thus placed as though kneeling and bent forward to lie on the stomach with the pelvis at an angle to the upper body axis. The thoracic spine itself was slightly curved. The remaining disarticulated long bones were placed around the pelvis. The right leg (tibia and fibula) and foot, perhaps in rather loose articulation at the tarsals, must have been laid down after the left. The left fibula is not recorded in any photograph, but it is a complete well-preserved bone, and the implication of the field

notes is that it lay with next to the left tibia (that is, pushed tightly against the right iliac crest). Finally, the skull and mandible were placed over the lower leg bones propped against the right ilium on one side. The left side of the skull was supported by a smooth stone, triangular in profile. In several poorly focused photographs which show the left side of the skull, we can see something lying between the left tibia and the smooth stone, serving to make the whole arrangement firm and stable. It is unfortunately impossible to determine what this is, and the excavator noted only "a large rock under left side of skull". The object is most likely to be another, more irregularly shaped and smaller stone, and in fact, a further smaller stone may have been pushed up against the left mandible condylar process. It appears that the placement of the skull was very carefully managed, which is not surprising since the positioning of skulls beside pelvis occurred in other Aïoun Bérêche burials (Aoudia-Chouakri 2013, Jackes, Lubell 2014).

The segmented body, which at first seems to have been in complete disorder, actually accords with specific practices. The displaced limbs with partial connections maintained, and the skull lying on them, are neither unique in this site, nor in other Capsian sites. In fact the recurrence of this burial deposition in "dislocated anatomical blocks" (DAB) (Aoudia-Chouakri 2013) testifies to a deliberate and standardized mortuary practice. Indeed, at Aïoun Bérêche this particular mode of deposition was found in four additional graves in this one trench (3A-2, 3A-5, 3A-6, and 3A-7) and can also be seen in photographs of skeletons from other trenches dug in 1930 (Jackes, Lubell 2014). Faïd Souar II, grave number 1, provides another clear case, while burial 1923-VI of Mechta El Arbi shows a remarkably similar treatment to 3A-1 (Aoudia-Chouakri 2013: Fig. 69). All together, these seven graves (Faïd Souar 1, Aïoun Bérêche 3A-1, 3A-2, 3A-5, 3A-6, 3A-7, and Mechta El Arbi 1923-VI) provide evidence for a remarkable pre-burial treatment which consists of beheading and the disarticulation of some limbs. In some cases, the chest has also been subject to external butchering and evisceration.

Other cases of cutmarks were found on Capsian human remains at Aïn Boucherit, Khenguet El Mouhaad, Medjez II, and Mechta El Arbi 1927-II and IV). Although the context of burial is unknown, the recorded cutmarks remind one strongly of the better documented dislocated anatomical blocks previously described. Finally, a last skeleton must be added to this list of complex pre-burial treatment: Medjez II-H4 was deposited in dislocated anatomical blocks. Absence of cutmarks in this case must

be due to poor preservation of the surface of the bone and of the joints (Aoudia-Chouakri 2013).

What is the meaning of these complex practices? Could we consider them as mortuary practices making a deposit a "real grave" or do they represent remains "dehumanized" (Leclerc 1990) by the actions of being disarticulated and thrown haphazardly into the pit. For 3A-1 as described, there are no grave goods and no clearly evident grave structure beyond a shallow depression. But this does not constitute an argument against it being a grave. This is because Capsian burials are only very rarely accompanied by specific items (Aoudia-Chouakri 2013). The only case of a grave structure is poorly described (Aoudia-Chouakri 2013, Debruge, Mercier 1912). The ultimate intent is difficult to guess but the recurrence of burial dispositions, their complexity and their frequency in the Capsian corpus suggests that it is a positive funerary treatment reserved to a selected part of the community according to criteria that remain to be identified.

CONCLUSION

The Capsian people performed complex mortuary practices comprising several steps in a *chaîne opératoire*. The corpse was at some point after death first cut into several anatomical segments entailing beheading, disarticulation, perhaps evisceration. Once separated, the segments were placed in the grave, as dislocated anatomical blocks (DAB) before the decay process could proceed. The organization of the segments did not necessarily follow anatomical order; the head may be far from the cervical spine. For several skeletons at Aïoun Bérèche the skull is placed by the pelvis, as with 3A-1. In other cases, some anatomical segments are missing from the graves suggesting that part of the skeleton was subject to additional handling or modification. Indeed, isolated worked human bones do exist (Aoudia 2013, Camps-Fabrer 1966, 1993, Jackes, Lubell 2014) suggesting that Capsians experimented with various manipulations of the dead (Aoudia 2013, Aoudia-Chouakri 2013).

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important resources of Lloyd Wilford's field notes, field diary, and an unpublished analysis of the skeletons. The diary of Ralph Brown who acted as Wilford's assistant is also helpful. As well, the resources include photographs of the discovery of 3A-1 taken by Dr. Jenks, by students, and by George L. Waite. Because of the extraordinary interest of this skeleton, it is the best recorded of any from the site. The Logan Museum, Beloit College is also to be thanked for providing access to photographs and some records of other trenches at Aïoun Bérèche.

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